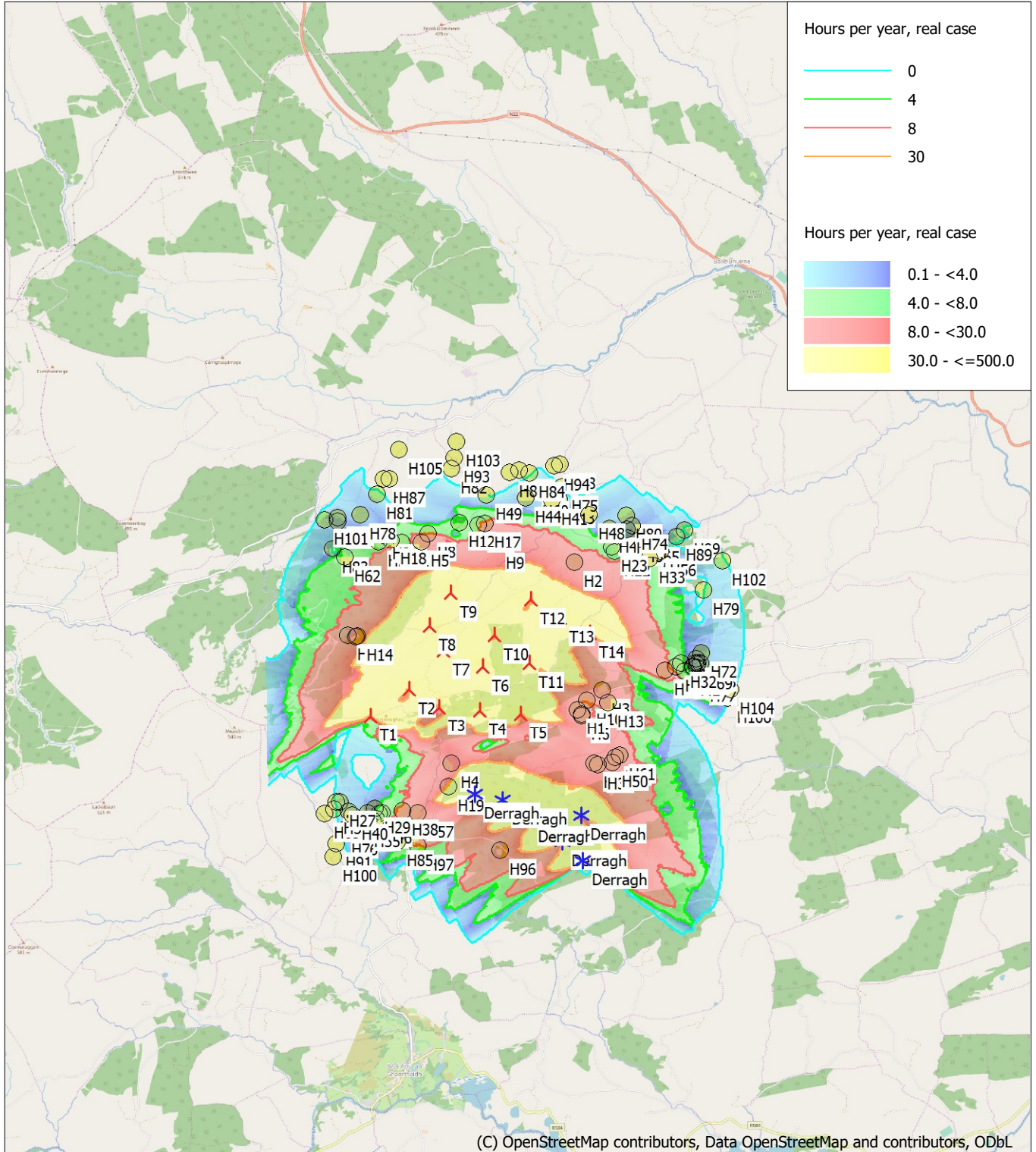


SHADOW - Map

Calculation: Alternative Scenario 1 - Real Case



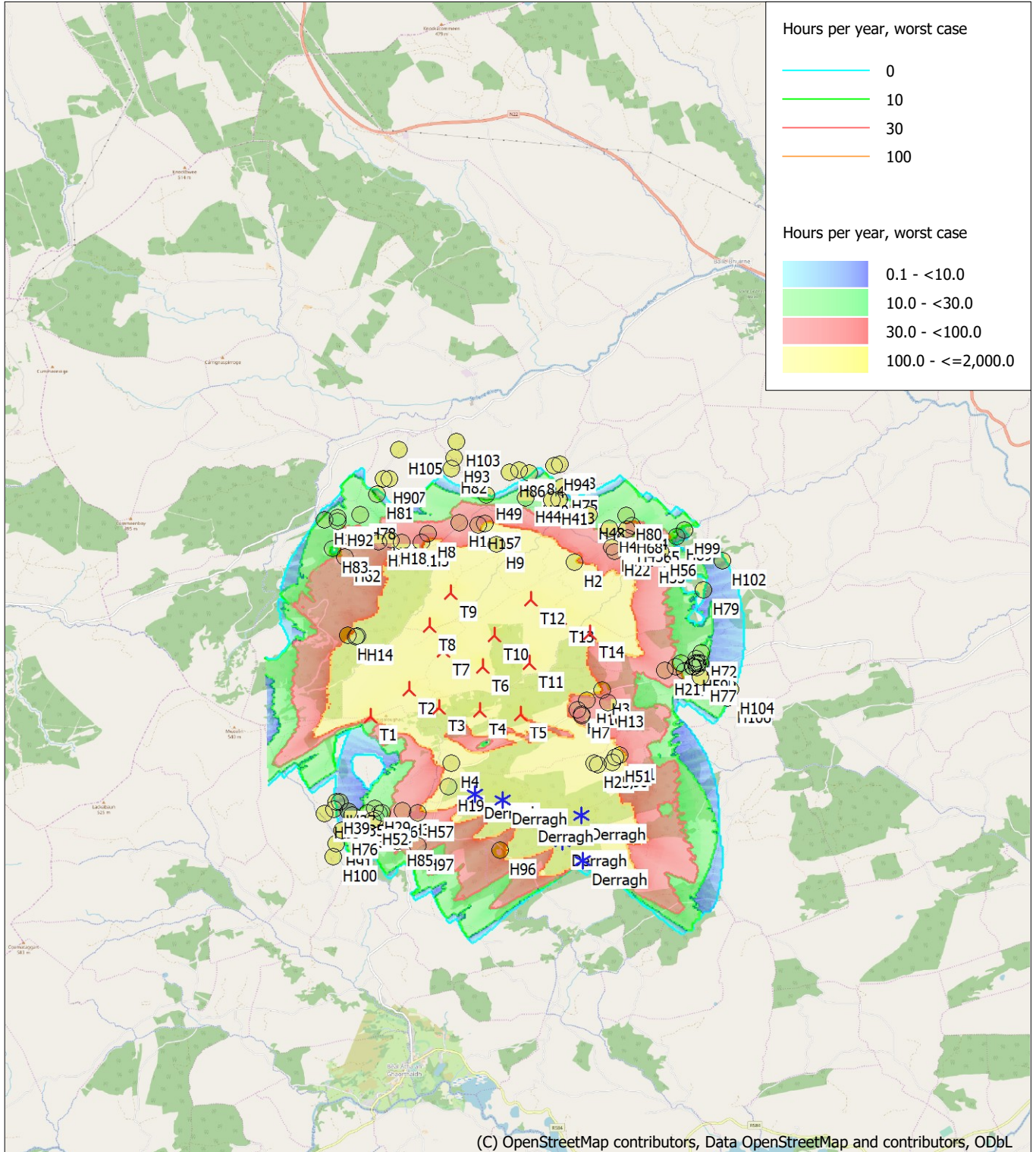
(C) OpenStreetMap contributors, Data OpenStreetMap and contributors, ODbL



Map: EMD OpenStreetMap , Print scale 1:75,000, Map center Irish ITM-IRENET95 (IE), geocentric, GRS80 East: 516,660 North: 573,620
 New WTG Existing WTG Shadow receptor
 Flicker map level: Elevation Grid Data Object: Gortyrahill_ShadowFlicker_12042022_EMDGrid_0.wpg (1)
 Time step: 3 minutes, Day step: 7 days, Map resolution: 20 m, Visibility resolution: 10 m, Eye height: 1.5 m

SHADOW - Map

Calculation: Alternative Scenario 1 - Worst Case



Map: EMD OpenStreetMap , Print scale 1:75,000, Map center Irish ITM-IRENET95 (IE), geocentric, GRS80 East: 516,660 North: 573,620
 New WTG Existing WTG Shadow receptor
 Flicker map level: Elevation Grid Data Object: Gortyrahill_ShadowFlicker_12042022_EMDGrid_0.wpg (1)
 Time step: 3 minutes, Day step: 7 days, Map resolution: 20 m, Visibility resolution: 10 m, Eye height: 1.5 m

SHADOW - Main Result

Calculation: Alternative Scenario 1

Assumptions for shadow calculations

Maximum distance for influence

Calculate only when more than 20 % of sun is covered by the blade

Please look in WTG table

Minimum sun height over horizon for influence 3 °

Day step for calculation 1 days

Time step for calculation 1 minutes

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

A ZVI (Zones of Visual Influence) calculation is performed before flicker calculation so non visible WTG do not contribute to calculated flicker values. A WTG will be visible if it is visible from any part of the receiver window. The ZVI calculation is based on the following assumptions:

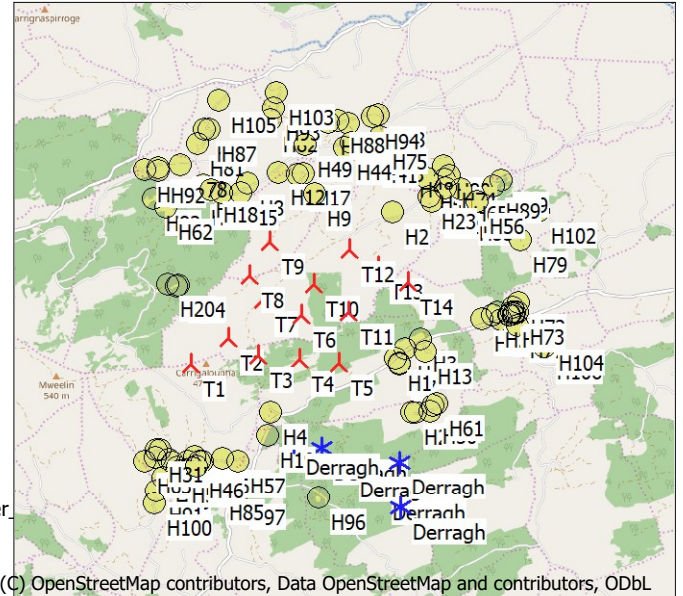
Height contours used: Elevation Grid Data Object: Gortyrahill_ShadowFlicker

Obstacles used in calculation

Receptor grid resolution: 1.0 m

All coordinates are in

Irish ITM-IRENET95 (IE), geocentric, GRS80



(C) OpenStreetMap contributors, Data OpenStreetMap and contributors, ODbL

Scale 1:100,000
 ▲ New WTG * Existing WTG ● Shadow receptor

WTGs

No	Easting	Northing	Z	Row data/Description	WTG type		Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Shadow data	
					Valid	Manufact.					Calculation distance [m]	RPM [RPM]
1	514,680	571,824	415.3	T1	Yes	Siemens Gamesa	SG 6.0-155-6,600	6,600	155.0	102.5	2,007	9.3
2	515,203	572,167	392.1	T2	Yes	Siemens Gamesa	SG 6.0-155-6,600	6,600	155.0	102.5	2,007	9.3
3	515,580	571,929	356.7	T3	Yes	Siemens Gamesa	SG 6.0-155-6,600	6,600	155.0	102.5	2,007	9.3
4	516,129	571,873	345.9	T4	Yes	Siemens Gamesa	SG 6.0-155-6,600	6,600	155.0	102.5	2,007	9.3
5	516,658	571,817	338.6	T5	Yes	Siemens Gamesa	SG 6.0-155-6,600	6,600	155.0	102.5	2,007	9.3
6	516,169	572,451	340.7	T6	Yes	Siemens Gamesa	SG 6.0-155-6,600	6,600	155.0	102.5	2,007	9.3
7	515,652	572,675	372.3	T7	Yes	Siemens Gamesa	SG 6.0-155-6,600	6,600	155.0	102.5	2,007	9.3
8	515,484	572,994	303.0	T8	Yes	Siemens Gamesa	SG 6.0-155-6,600	6,600	155.0	102.5	2,007	9.3
9	515,769	573,427	291.1	T9	Yes	Siemens Gamesa	SG 6.0-155-6,600	6,600	155.0	102.5	2,007	9.3
10	516,329	572,863	380.0	T10	Yes	Siemens Gamesa	SG 6.0-155-6,600	6,600	155.0	102.5	2,007	9.3
11	516,794	572,484	305.5	T11	Yes	Siemens Gamesa	SG 6.0-155-6,600	6,600	155.0	102.5	2,007	9.3
12	516,819	573,308	326.4	T12	Yes	Siemens Gamesa	SG 6.0-155-6,600	6,600	155.0	102.5	2,007	9.3
13	517,195	573,067	286.5	T13	Yes	Siemens Gamesa	SG 6.0-155-6,600	6,600	155.0	102.5	2,007	9.3
14	517,592	572,862	257.9	T14	Yes	Siemens Gamesa	SG 6.0-155-6,600	6,600	155.0	102.5	2,007	9.3
15	516,034	570,784	321.2	Derragh	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	100.0	1,823	10.7
16	516,405	570,706	285.7	Derragh	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	100.0	1,823	10.7
17	516,741	570,457	285.6	Derragh	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	100.0	1,823	10.7
18	517,429	570,484	311.2	Derragh	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	100.0	1,823	10.7
19	517,175	570,142	285.9	Derragh	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	100.0	1,823	10.7
20	517,446	569,894	246.0	Derragh	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	100.0	1,823	10.7

Shadow receptor-Input

No.	Name	Easting	Northing	Z	Width [m]	Height [m]	Elevation a.g.l. [m]	Slope of window [°]	Direction mode	Eye height (ZVI) a.g.l. [m]
A	H1	517,410	571,864	254.5	2.0	2.0	0.5	90.0	"Green house mode"	2.5
B	H2	517,402	573,794	210.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
C	H3	517,734	572,119	250.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
D	H4	515,736	571,186	296.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
E	H5	515,395	574,092	216.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
F	H6	517,462	571,790	234.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
G	H7	517,467	571,806	236.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
H	H8	515,487	574,211	217.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
I	H9	516,372	574,046	234.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5

To be continued on next page...

SHADOW - Main Result

Calculation: Alternative Scenario 1

...continued from previous page

No.	Name	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
				[m]	[m]	[m]	[m]	[°]		[m]
J	H10	517,533	571,990	257.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
K	H11	515,143	574,094	215.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
L	H12	515,896	574,342	196.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
M	H13	517,811	571,946	218.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
N	H14	514,534	572,878	305.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
O	H15	516,142	574,318	209.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
P	H16	514,510	572,872	306.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
Q	H17	516,223	574,321	211.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
R	H18	514,997	574,130	212.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
S	H19	515,702	570,880	296.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
T	H20	514,411	572,890	315.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
U	H21	518,556	572,363	233.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
V	H22	517,923	573,934	204.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
W	H23	517,883	573,984	196.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
X	H24	514,830	574,098	207.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
Y	H25	517,613	571,154	192.5	2.0	2.0	0.5	90.0	"Green house mode"	2.5
Z	H26	514,887	574,194	223.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AA	H27	514,265	570,703	232.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AB	H28	518,705	572,403	235.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AC	H29	514,728	570,617	256.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AD	H30	517,670	571,142	196.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AE	H31	514,223	570,697	230.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AF	H32	518,774	572,454	239.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AG	H33	518,384	573,830	215.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AH	H34	514,633	570,556	244.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AI	H35	514,379	570,581	225.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AJ	H36	514,814	570,551	250.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AK	H37	514,777	570,545	248.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AL	H38	515,088	570,586	257.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AM	H39	514,187	570,609	220.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AN	H40	514,433	570,535	223.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AO	H41	517,124	574,610	192.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AP	H42	518,824	572,353	223.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AQ	H43	518,107	574,098	177.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AR	H44	516,773	574,652	186.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AS	H45	517,869	574,232	179.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AT	H46	514,750	570,477	235.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AU	H47	518,434	573,927	210.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AV	H48	517,605	574,420	191.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AW	H49	516,256	574,698	198.5	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AX	H50	517,850	571,155	205.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AY	H51	517,890	571,229	190.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AZ	H52	514,698	570,464	232.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BA	H53	517,210	574,625	194.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BB	H54	514,485	570,469	217.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BC	H55	514,590	570,438	221.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BD	H56	518,528	573,917	219.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BE	H57	515,290	570,548	246.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BF	H58	514,512	570,431	214.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BG	H59	518,930	572,410	225.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BH	H60	516,878	574,725	190.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BI	H61	517,955	571,250	190.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BJ	H62	514,394	573,903	230.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BK	H63	514,059	570,556	212.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BL	H64	518,941	572,403	223.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BM	H65	518,321	574,087	175.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BN	H66	518,957	572,447	229.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BO	H67	518,976	572,514	232.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BP	H68	518,097	574,217	178.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BQ	H69	518,989	572,432	225.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BR	H70	519,003	572,456	227.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BS	H71	518,987	572,390	220.5	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BT	H72	519,042	572,577	229.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BU	H73	519,032	572,454	225.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5

To be continued on next page...

SHADOW - Main Result

Calculation: Alternative Scenario 1

...continued from previous page

No.	Name	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
				[m]	[m]	[m]	[m]	[°]		[m]
BV	H74	518,159	574,273	188.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BW	H75	517,248	574,791	194.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BX	H76	514,292	570,334	200.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BY	H77	519,031	572,269	210.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BZ	H78	514,600	574,467	239.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CA	H79	519,083	573,399	197.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CB	H80	518,088	574,393	211.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CC	H81	514,828	574,738	256.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CD	H82	515,800	575,045	228.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CE	H83	514,232	574,023	197.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CF	H84	516,832	574,974	226.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CG	H85	515,011	570,183	215.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CH	H86	516,572	574,987	243.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CI	H87	514,991	574,930	242.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CJ	H88	516,684	575,011	243.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CK	H89	518,743	574,118	179.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CL	H90	514,914	574,938	236.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CM	H91	514,204	570,162	194.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CN	H92	514,308	574,396	209.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CO	H93	515,847	575,193	208.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CP	H94	517,147	575,057	191.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CQ	H95	514,310	574,440	217.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CR	H96	516,360	570,045	235.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CS	H97	515,285	570,118	238.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CT	H98	517,237	575,083	187.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CU	H99	518,853	574,198	159.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CV	H100	514,172	569,993	196.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CW	H101	514,126	574,409	191.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CX	H102	519,337	573,772	183.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CY	H103	515,882	575,406	186.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CZ	H104	519,423	572,097	200.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
DA	H105	515,128	575,313	171.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
DB	H106	519,384	571,987	200.5	2.0	2.0	0.5	90.0	"Green house mode"	2.5

Calculation Results

Shadow receptor

No.	Name	Shadow, worst case			Shadow, expected values	
		Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]	
A	H1	75:02	150	1:02	12:23	
B	H2	107:20	175	0:51	11:55	
C	H3	103:55	183	0:53	20:48	
D	H4	170:28	163	1:53	21:33	
E	H5	98:27	131	1:13	10:48	
F	H6	80:09	175	0:52	13:10	
G	H7	76:16	169	0:53	12:21	
H	H8	79:50	105	1:10	8:03	
I	H9	186:19	112	2:13	18:42	
J	H10	60:58	128	1:02	9:55	
K	H11	55:59	123	0:41	6:37	
L	H12	44:46	94	0:49	4:21	
M	H13	65:11	141	0:46	13:15	
N	H14	131:15	272	1:05	20:38	
O	H15	90:04	80	1:28	8:39	
P	H16	125:34	267	1:03	19:42	
Q	H17	106:33	74	1:54	10:08	
R	H18	43:37	114	0:35	5:17	
S	H19	175:36	144	1:39	34:31	
T	H20	96:55	232	0:52	15:06	
U	H21	57:23	140	0:36	11:43	
V	H22	60:28	143	0:34	6:30	
W	H23	58:27	134	0:34	6:10	

To be continued on next page...

SHADOW - Main Result

Calculation: Alternative Scenario 1

...continued from previous page

No.	Name	Shadow, worst case		Shadow, expected values	
		Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
X	H24	49:07	114	0:34	5:47
Y	H25	155:27	242	1:11	18:43
Z	H26	29:36	81	0:32	3:28
AA	H27	6:41	27	0:20	1:26
AB	H28	29:56	87	0:33	6:31
AC	H29	18:35	58	0:27	3:59
AD	H30	153:59	247	1:08	18:41
AE	H31	6:21	24	0:19	1:21
AF	H32	24:58	72	0:34	5:24
AG	H33	51:00	131	0:32	5:31
AH	H34	17:22	58	0:25	3:43
AI	H35	8:01	28	0:21	1:43
AJ	H36	23:30	69	0:29	5:01
AK	H37	22:08	68	0:28	4:44
AL	H38	46:39	121	0:37	9:46
AM	H39	0:00	0	0:00	0:00
AN	H40	8:53	31	0:22	1:54
AO	H41	11:26	42	0:21	1:09
AP	H42	20:00	55	0:30	4:26
AQ	H43	35:42	111	0:28	3:49
AR	H44	23:37	66	0:25	2:05
AS	H45	33:32	92	0:28	3:17
AT	H46	22:56	71	0:27	4:53
AU	H47	43:03	121	0:29	4:35
AV	H48	30:00	74	0:28	2:44
AW	H49	0:56	10	0:07	0:04
AX	H50	122:56	247	0:56	15:55
AY	H51	121:08	250	0:51	16:26
AZ	H52	21:17	69	0:26	4:32
BA	H53	10:06	38	0:21	1:02
BB	H54	9:54	34	0:23	2:06
BC	H55	12:01	38	0:24	2:33
BD	H56	43:37	126	0:28	4:37
BE	H57	93:36	172	0:46	18:42
BF	H58	10:40	37	0:23	2:15
BG	H59	16:14	44	0:31	3:37
BH	H60	21:08	62	0:23	1:51
BI	H61	112:55	256	0:48	15:51
BJ	H62	35:12	84	0:41	4:41
BK	H63	0:00	0	0:00	0:00
BL	H64	16:08	45	0:31	3:36
BM	H65	31:40	104	0:25	3:23
BN	H66	15:24	43	0:32	3:24
BO	H67	15:09	43	0:33	3:19
BP	H68	37:15	103	0:27	3:44
BQ	H69	15:00	43	0:31	3:19
BR	H70	14:41	43	0:31	3:13
BS	H71	15:13	44	0:30	3:24
BT	H72	14:32	42	0:32	3:10
BU	H73	14:14	42	0:31	3:07
BV	H74	33:12	96	0:26	3:17
BW	H75	0:00	0	0:00	0:00
BX	H76	8:11	32	0:20	1:43
BY	H77	14:33	45	0:26	3:14
BZ	H78	14:53	48	0:25	1:44
CA	H79	9:04	31	0:23	1:20
CB	H80	19:08	71	0:23	1:51
CC	H81	7:29	30	0:19	0:40
CD	H82	0:00	0	0:00	0:00
CE	H83	8:08	28	0:22	1:17
CF	H84	0:00	0	0:00	0:00
CG	H85	25:18	93	0:25	5:15
CH	H86	0:00	0	0:00	0:00

To be continued on next page...

SHADOW - Main Result

Calculation: Alternative Scenario 1

...continued from previous page

No.	Name	Shadow, worst case		Shadow, expected values	
		Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
CI	H87	0:00	0	0:00	0:00
CJ	H88	0:00	0	0:00	0:00
CK	H89	8:08	32	0:20	0:59
CL	H90	0:00	0	0:00	0:00
CM	H91	0:00	0	0:00	0:00
CN	H92	27:57	94	0:22	3:07
CO	H93	0:00	0	0:00	0:00
CP	H94	0:00	0	0:00	0:00
CQ	H95	25:47	86	0:21	2:49
CR	H96	89:23	185	0:43	18:02
CS	H97	42:22	107	0:30	8:17
CT	H98	0:00	0	0:00	0:00
CU	H99	0:00	0	0:00	0:00
CV	H100	0:00	0	0:00	0:00
CW	H101	19:04	75	0:20	2:20
CX	H102	6:29	27	0:19	0:53
CY	H103	0:00	0	0:00	0:00
CZ	H104	7:28	33	0:19	1:40
DA	H105	0:00	0	0:00	0:00
DB	H106	8:50	39	0:19	1:56

Total amount of flickering on the shadow receptors caused by each WTG

No.	Name	Worst case [h/year]	Expected [h/year]
1	T1	31:01	3:25
2	T2	47:28	6:01
3	T3	31:56	4:25
4	T4	85:56	17:09
5	T5	143:09	28:41
6	T6	32:25	6:03
7	T7	72:01	8:26
8	T8	144:58	17:02
9	T9	395:54	44:25
10	T10	133:31	17:48
11	T11	108:58	20:34
12	T12	259:38	32:36
13	T13	253:51	30:18
14	T14	170:09	26:31
15	Derragh	413:34	70:50
16	Derragh	190:14	30:31
17	Derragh	63:27	10:04
18	Derragh	212:54	24:52
19	Derragh	97:09	13:06
20	Derragh	14:44	2:37

Total times in Receptor wise and WTG wise tables can differ, as a WTG can lead to flicker at 2 or more receptors simultaneously and/or receptors may receive flicker from 2 or more WTGs simultaneously.

The calculation of the total expected values for a given receptor assumes a weighted average directional reduction for all WTGs contributing to shadow flicker within the same day. In the case where shadow flicker from different WTGs is not concurrent within the day, the total expected time at a given receptor may deviate marginally from the individual flicker time caused by each turbine separately.

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: A - H1

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June						
1	08:45	15:25 (16)	08:18	16:19 (15)	07:25	07:14	18:34 (5)	06:10	05:25			
	16:36	23	15:48 (16)	17:24	18	16:37 (15)	18:16	20:10	56	19:30 (4)	21:00	21:46
2	08:45	15:26 (16)	08:17	16:19 (15)	07:23	07:12	18:33 (5)	06:08	05:24			
	16:37	23	15:49 (16)	17:26	17	16:36 (15)	18:18	20:11	57	19:30 (4)	21:02	21:47
3	08:45	15:27 (16)	08:15	16:20 (15)	07:21	07:10	18:31 (5)	06:06	05:23			
	16:39	22	15:49 (16)	17:28	15	16:35 (15)	18:19	20:13	59	19:30 (4)	21:04	21:48
4	08:45	15:28 (16)	08:14	16:22 (15)	07:18	07:08	18:30 (5)	06:04	05:22			
	16:40	22	15:50 (16)	17:30	11	16:33 (15)	18:21	20:15	60	19:30 (4)	21:05	21:49
5	08:44	15:28 (16)	08:12	16:25 (15)	07:16	07:05	18:29 (5)	06:02	05:21			
	16:41	22	15:50 (16)	17:32	7	16:32 (15)	18:23	20:16	62	19:31 (4)	21:07	21:50
6	08:44	15:29 (16)	08:10	07:14	07:14	07:03	18:29 (5)	06:00	05:21			
	16:42	21	15:50 (16)	17:33	18:25	20:18	62	19:31 (4)	21:09	21:51		
7	08:44	15:29 (16)	08:08	07:12	07:12	07:01	18:27 (5)	05:59	05:20			
	16:43	21	15:50 (16)	17:35	18:26	20:20	62	19:29 (4)	21:10	21:52		
8	08:43	15:30 (16)	08:07	07:09	07:09	06:58	18:27 (5)	05:57	05:20			
	16:45	20	15:50 (16)	17:37	18:28	20:22	62	19:29 (4)	21:12	21:53		
9	08:43	15:31 (16)	08:05	07:07	07:07	06:56	18:27 (5)	05:55	05:19			
	16:46	19	15:50 (16)	17:39	18:30	20:23	62	19:29 (4)	21:14	21:54		
10	08:42	15:32 (16)	08:03	07:05	07:05	06:54	18:27 (5)	05:53	05:19			
	16:47	18	15:50 (16)	17:41	18:32	20:25	61	19:28 (4)	21:15	21:55		
11	08:42	15:33 (16)	08:01	07:03	07:03	06:52	18:27 (5)	05:52	05:18			
	16:49	16	15:49 (16)	17:43	18:33	20:27	60	19:27 (4)	21:17	21:56		
12	08:41	15:35 (16)	07:59	07:00	07:00	06:49	18:26 (5)	05:50	05:18			
	16:50	15	15:50 (16)	17:45	18:35	20:28	59	19:25 (4)	21:18	21:56		
13	08:40	15:36 (16)	07:58	06:58	06:58	06:47	18:26 (5)	05:48	05:18			
	16:52	13	15:49 (16)	17:46	18:37	20:30	57	19:23 (4)	21:20	21:57		
14	08:40	15:38 (16)	07:56	06:56	06:56	06:45	18:26 (5)	05:47	05:18			
	16:53	10	15:48 (16)	17:48	18:39	20:32	55	19:21 (4)	21:22	21:57		
15	08:39	15:41 (16)	07:54	06:54	06:54	06:43	18:26 (5)	05:45	05:17			
	16:55	5	15:46 (16)	17:50	18:40	20:33	51	19:17 (4)	21:23	21:58		
16	08:38	07:52	07:52	06:51	06:51	06:41	18:27 (5)	05:44	05:17			
	16:56	17:52	18:42	20:35	43	19:10 (5)	21:25	21:59				
17	08:37	07:50	07:50	06:49	06:49	06:38	18:27 (5)	05:42	05:17			
	16:58	17:54	18:44	20:37	42	19:09 (5)	21:26	21:59				
18	08:36	16:20 (15)	07:48	06:47	06:47	06:36	18:28 (5)	05:41	05:17			
	17:00	7	16:27 (15)	17:56	18:46	20:39	41	19:09 (5)	21:28	21:59		
19	08:35	16:18 (15)	07:46	06:44	06:44	06:34	18:29 (5)	05:39	05:17			
	17:01	10	16:28 (15)	17:58	18:47	20:40	39	19:08 (5)	21:29	22:00		
20	08:34	16:18 (15)	07:44	06:42	06:42	06:32	18:29 (5)	05:38	05:17			
	17:03	12	16:30 (15)	17:59	18:49	20:42	37	19:06 (5)	21:31	22:00		
21	08:33	16:17 (15)	07:42	06:40	06:40	06:30	18:30 (5)	05:37	05:17			
	17:05	16	16:33 (15)	18:01	18:51	20:44	34	19:04 (5)	21:32	22:00		
22	08:32	16:17 (15)	07:40	06:37	06:37	06:28	18:31 (5)	05:35	05:18			
	17:06	17	16:34 (15)	18:03	18:53	20:45	32	19:03 (5)	21:33	22:01		
23	08:31	16:16 (15)	07:38	06:35	06:35	06:26	18:33 (5)	05:34	05:18			
	17:08	18	16:34 (15)	18:05	18:54	20:47	28	19:01 (5)	21:35	22:01		
24	08:29	16:16 (15)	07:36	06:33	06:33	06:24	18:35 (5)	05:33	05:18			
	17:10	19	16:35 (15)	18:07	18:56	20:49	24	18:59 (5)	21:36	22:01		
25	08:28	16:15 (15)	07:34	06:31	06:31	06:22	18:37 (5)	05:32	05:19			
	17:12	20	16:35 (15)	18:08	18:58	20:50	20	18:57 (5)	21:38	22:01		
26	08:27	16:16 (15)	07:31	06:28	06:28	06:20	18:40 (5)	05:30	05:19			
	17:13	20	16:36 (15)	18:10	18:59	20:52	13	18:53 (5)	21:39	22:01		
27	08:26	16:17 (15)	07:29	06:26	06:26	06:18	19:01 (5)	05:29	05:19			
	17:15	20	16:37 (15)	18:12	19:01	17:47 (5)	20:54	21:40	22:01			
28	08:24	16:16 (15)	07:27	06:24	06:24	06:16	17:42 (5)	05:28	05:20			
	17:17	21	16:37 (15)	18:14	19:03	18:22 (4)	20:55	21:41	22:01			
29	08:23	16:16 (15)	07:21	06:21	06:21	06:14	18:40 (5)	05:27	05:20			
	17:19	21	16:37 (15)	18:14	19:04	19:26 (4)	20:57	21:43	22:01			
30	08:21	16:17 (15)	07:19	06:19	06:19	06:12	18:38 (5)	05:26	05:21			
	17:20	20	16:37 (15)	18:15	19:06	19:28 (4)	20:59	21:44	22:00			
31	08:20	16:17 (15)	07:17	06:17	06:17	06:10	18:35 (5)	05:25	05:20			
	17:22	20	16:37 (15)	18:16	19:07	19:28 (4)	20:58	21:45	22:00			
Potential sun hours	259	278	367	416	485	499						
Total, worst case	511	68	185	1238								
Sun reduction	0.16	0.21	0.24	0.35								
Oper. time red.	1.00	1.00	1.00	1.00								
Wind dir. red.	0.60	0.60	0.67	0.67								
Total reduction	0.09	0.12	0.16	0.23								
Total, real	47	8	30	290								

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)



SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: A - H1

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22 22:00	05:58 21:28	06:48 20:26	18:26 (5) 19:26 (4)	07:37 17:11	08:21 16:31
2	05:22 22:00	06:00 21:27	06:49 20:24	18:25 (5) 19:26 (4)	07:38 17:09	08:23 16:30
3	05:23 21:59	06:01 21:25	06:51 20:22	18:25 (5) 19:27 (4)	07:40 17:07	08:24 16:29
4	05:24 21:59	06:03 21:23	06:53 20:19	18:24 (5) 19:26 (4)	07:42 17:05	08:25 16:29
5	05:25 21:58	06:04 21:21	06:54 20:17	18:24 (5) 19:26 (4)	07:43 17:04	08:27 16:28
6	05:25 21:58	06:06 21:20	06:56 20:15	18:25 (5) 19:27 (4)	07:45 17:02	08:28 16:28
7	05:26 21:57	06:07 21:18	06:57 20:13	18:24 (5) 19:26 (4)	07:47 17:00	08:29 16:27
8	05:27 21:57	06:09 21:16	06:59 20:10	18:25 (5) 19:26 (4)	07:48 16:59	08:31 16:27
9	05:28 21:56	06:11 21:14	07:01 20:08	18:25 (5) 19:24 (4)	07:50 16:57	08:32 16:27
10	05:29 21:55	06:12 21:12	07:02 20:06	18:26 (5) 19:24 (4)	07:52 16:55	08:33 16:27
11	05:30 21:55	06:14 21:10	07:04 20:03	18:26 (5) 19:22 (4)	07:53 16:54	08:34 16:26
12	05:31 21:54	06:15 21:08	07:06 20:01	18:27 (5) 19:21 (4)	07:55 16:52	08:35 16:26
13	05:32 21:53	06:17 21:07	07:07 19:59	18:28 (5) 19:18 (4)	07:57 16:51	08:36 16:26
14	05:34 21:52	06:19 21:05	07:09 19:56	18:30 (5) 19:16 (4)	07:59 16:49	08:37 16:26
15	05:35 21:51	06:20 21:03	07:10 19:54	18:32 (5) 19:13 (4)	08:00 16:48	08:38 16:26
16	05:36 21:50	06:22 21:01	07:12 19:52	18:34 (5) 18:51 (5)	08:02 16:46	08:39 16:26
17	05:37 21:49	06:23 20:59	18:47 (5) 19:02 (5)	07:14 18:41	08:04 16:45	08:39 16:27
18	05:38 21:48	06:25 20:57	18:43 (5) 19:04 (5)	07:15 18:39	08:01 16:44	08:40 16:27
19	05:40 21:47	06:27 20:54	18:41 (5) 19:06 (5)	07:17 18:37	08:02 16:42	08:41 16:27
20	05:41 21:45	06:28 20:52	18:38 (5) 19:07 (5)	07:19 18:35	08:04 16:41	08:42 16:27
21	05:42 21:44	06:30 20:50	18:37 (5) 19:09 (5)	07:20 18:33	08:06 16:40	08:42 16:28
22	05:44 21:43	06:31 20:48	18:35 (5) 19:09 (5)	07:22 18:30	08:07 16:39	08:43 16:28
23	05:45 21:42	06:33 20:46	18:33 (5) 19:10 (5)	07:23 18:28	08:09 16:38	08:43 16:29
24	05:46 21:40	06:35 20:44	18:32 (5) 19:11 (5)	07:25 18:26	08:11 16:37	08:44 16:29
25	05:48 21:39	06:36 20:42	18:31 (5) 19:11 (5)	07:27 17:24	08:12 16:36	08:44 16:30
26	05:49 21:37	06:38 20:40	18:29 (5) 19:11 (5)	07:28 17:22	08:14 16:35	08:44 16:31
27	05:51 21:36	06:40 20:37	18:29 (5) 19:12 (5)	07:30 17:20	08:15 16:34	08:45 16:32
28	05:52 21:35	06:41 20:35	18:28 (5) 19:19 (4)	07:32 17:18	08:17 16:33	08:45 16:32
29	05:54 21:33	06:43 20:33	18:27 (5) 19:22 (4)	07:33 17:16	08:18 16:32	08:45 16:33
30	05:55 21:31	06:44 20:31	18:27 (5) 19:24 (4)	07:35 17:15	08:20 16:31	08:45 16:34
31	05:57 21:30	06:46 20:28	18:26 (5) 19:25 (4)	07:39 17:13	08:29 16:31	08:45 16:35
Potential sun hours	502	454	381	331	266	244
Total, worst case			579	857	354	710
Sun reduction			0.30	0.28	0.18	0.13
Oper. time red.			1.00	1.00	1.00	1.00
Wind dir. red.			0.67	0.67	0.60	0.59
Total reduction			0.20	0.19	0.11	0.08
Total, real			114	161	39	55

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 1 **Shadow receptor:** B - H2

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January		February		March		April		May		June	
1	08:45	13:18 (13)	08:18	15:57 (10)	07:25	15:39 (12)	07:14	06:10	05:24			
	16:36	50 14:08 (13)	17:24	19 16:16 (10)	18:16	42 16:21 (12)	20:10	21:01	21:46			
2	08:45	13:18 (13)	08:17	15:56 (10)	07:23	15:40 (12)	07:12	06:08	05:24			
	16:37	50 14:08 (13)	17:26	21 16:17 (10)	18:17	40 16:20 (12)	20:11	21:02	21:47			
3	08:45	13:19 (13)	08:15	15:55 (10)	07:21	15:41 (12)	07:10	06:06	05:23			
	16:38	50 14:09 (13)	17:28	22 16:17 (10)	18:19	38 16:19 (12)	20:13	21:04	21:48			
4	08:45	13:20 (13)	08:14	15:55 (10)	07:18	15:42 (12)	07:07	06:04	05:22			
	16:40	49 14:09 (13)	17:30	23 16:18 (10)	18:21	36 16:18 (12)	20:15	21:06	21:49			
5	08:44	13:19 (13)	08:12	15:55 (10)	07:16	15:43 (12)	07:05	06:02	05:21			
	16:41	50 14:09 (13)	17:31	24 16:19 (10)	18:23	35 17:51 (9)	20:16	21:07	21:50			
6	08:44	13:21 (13)	08:10	15:54 (10)	07:14	15:45 (12)	07:03	06:00	05:21			
	16:42	49 14:10 (13)	17:33	26 16:20 (10)	18:25	40 17:55 (9)	20:18	21:09	21:51			
7	08:44	13:21 (13)	08:09	15:54 (10)	07:12	15:47 (12)	07:01	05:58	05:20			
	16:43	49 14:10 (13)	17:35	26 16:20 (10)	18:26	40 17:57 (9)	20:20	21:10	21:52			
8	08:43	13:22 (13)	08:07	15:51 (12)	07:09	15:51 (12)	06:58	05:57	05:20			
	16:45	49 14:11 (13)	17:37	29 16:20 (10)	18:28	37 17:59 (9)	20:22	21:12	21:53			
9	08:43	13:22 (13)	08:05	15:49 (12)	07:07	15:54 (12)	06:56	05:55	05:19			
	16:46	49 14:11 (13)	17:39	31 16:20 (10)	18:30	30 17:59 (9)	20:23	21:14	21:54			
10	08:42	13:22 (13)	08:03	15:47 (12)	07:05	17:39 (9)	06:54	05:53	05:19			
	16:47	49 14:11 (13)	17:41	33 16:20 (10)	18:32	20 17:59 (9)	20:25	21:15	21:55			
11	08:42	13:23 (13)	08:01	15:45 (12)	07:03	17:38 (9)	06:52	05:52	05:18			
	16:49	48 14:11 (13)	17:43	34 16:19 (10)	18:33	22 18:00 (9)	20:27	21:17	21:56			
12	08:41	13:24 (13)	08:00	15:44 (12)	07:00	17:37 (9)	06:49	05:50	05:18			
	16:50	48 14:12 (13)	17:45	35 16:19 (10)	18:35	22 17:59 (9)	20:28	21:18	21:56			
13	08:40	13:25 (13)	07:58	15:42 (12)	06:58	17:38 (9)	06:47	05:48	05:18			
	16:52	46 14:11 (13)	17:46	37 16:19 (12)	18:37	21 17:59 (9)	20:30	21:20	21:57			
14	08:40	13:25 (13)	07:56	15:41 (12)	06:56	17:38 (9)	06:45	05:47	05:17			
	16:53	46 14:11 (13)	17:48	39 16:20 (12)	18:39	20 17:58 (9)	20:32	21:22	21:58			
15	08:39	13:26 (13)	07:54	15:41 (12)	06:54	17:38 (9)	06:43	05:45	05:17			
	16:55	45 14:11 (13)	17:50	40 16:21 (12)	18:40	19 17:57 (9)	20:33	21:23	21:58			
16	08:38	13:27 (13)	07:52	15:40 (12)	06:51	17:39 (9)	06:41	05:44	05:17			
	16:56	44 14:11 (13)	17:52	41 16:21 (12)	18:42	17 17:56 (9)	20:35	21:25	21:59			
17	08:37	13:28 (13)	07:50	15:39 (12)	06:49	17:41 (9)	06:38	05:42	05:17			
	16:58	43 14:11 (13)	17:54	43 16:22 (12)	18:44	13 17:54 (9)	20:37	21:26	21:59			
18	08:36	13:29 (13)	07:48	15:39 (12)	06:47	17:42 (9)	06:36	05:41	05:17			
	17:00	42 14:11 (13)	17:56	44 16:23 (12)	18:46	9 17:51 (9)	20:39	21:28	22:00			
19	08:35	13:29 (13)	07:46	15:38 (12)	06:44		06:34	05:39	05:17			
	17:01	41 14:10 (13)	17:57	45 16:23 (12)	18:47		20:40	21:29	22:00			
20	08:34	13:31 (13)	07:44	15:38 (12)	06:42		06:32	05:38	05:17			
	17:03	39 14:10 (13)	17:59	46 16:24 (12)	18:49		20:42	21:31	22:00			
21	08:33	13:32 (13)	07:42	15:38 (12)	06:40		06:30	05:37	05:17			
	17:05	38 14:10 (13)	18:01	46 16:24 (12)	18:51		20:44	21:32	22:00			
22	08:32	13:34 (13)	07:40	15:38 (12)	06:37		06:28	05:35	05:18			
	17:06	35 14:09 (13)	18:03	46 16:24 (12)	18:53		20:45	21:34	22:01			
23	08:31	13:34 (13)	07:38	15:38 (12)	06:35		06:26	05:34	05:18			
	17:08	34 14:08 (13)	18:05	46 16:24 (12)	18:54		20:47	21:35	22:01			
24	08:29	13:36 (13)	07:36	15:38 (12)	06:33		06:24	05:33	05:18			
	17:10	31 14:07 (13)	18:07	46 16:24 (12)	18:56		20:49	21:36	22:01			
25	08:28	13:39 (13)	07:34	15:37 (12)	06:31		06:22	05:32	05:18			
	17:11	27 14:06 (13)	18:08	46 16:23 (12)	18:58		20:50	21:38	22:01			
26	08:27	13:40 (13)	07:31	15:38 (12)	06:28		06:20	05:30	05:19			
	17:13	24 14:04 (13)	18:10	45 16:23 (12)	18:59		20:52	21:39	22:01			
27	08:26	13:44 (13)	07:29	15:38 (12)	06:26		06:18	05:29	05:19			
	17:15	18 14:02 (13)	18:12	45 16:23 (12)	19:01		20:54	21:40	22:01			
28	08:24	13:48 (13)	07:27	15:39 (12)	06:24		06:16	05:28	05:20			
	17:17	10 13:58 (13)	18:14	43 16:22 (12)	19:03		20:55	21:42	22:01			
29	08:23	16:02 (10)			07:21		06:14	05:27	05:20			
	17:19	6 16:08 (10)			20:05		20:57	21:43	22:01			
30	08:21	16:00 (10)			07:19		06:12	05:26	05:21			
	17:20	12 16:12 (10)			20:06		20:59	21:44	22:00			
31	08:20	15:58 (10)			07:17			05:25				
	17:22	15 16:13 (10)			20:08			21:45				
Potential sun hours	259		278		367		416	485	499			
Total, worst case	1186		1021		501							
Sun reduction	0.16		0.21		0.24							
Oper. time red.	1.00		1.00		1.00							
Wind dir. red.	0.59		0.59		0.62							
Total reduction	0.09		0.12		0.15							
Total, real	108		125		75							

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: B - H2

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22 22:00	05:58 21:28	06:48 20:26	07:37 19:17	18:17 (9) 17:11	08:21 13:05 (13)
2	05:22 22:00	06:00 21:27	06:49 20:24	07:38 19:15	18:16 (9) 17:09	08:23 13:05 (13)
3	05:23 21:59	06:01 21:25	06:51 20:22	07:40 19:12	18:16 (9) 17:07	08:24 13:05 (13)
4	05:24 21:59	06:03 21:23	06:53 20:20	07:42 19:10	18:17 (9) 17:05	08:26 13:06 (13)
5	05:24 21:59	06:04 21:22	06:54 20:17	07:43 19:08	16:29 (12) 18:36 (9)	08:27 13:06 (13)
6	05:25 21:58	06:06 21:20	06:56 20:15	07:45 19:05	16:25 (12) 18:34 (9)	08:28 13:07 (13)
7	05:26 21:57	06:07 21:18	06:57 20:13	07:47 19:03	16:22 (12) 18:33 (9)	08:29 13:07 (13)
8	05:27 21:57	06:09 21:16	06:59 20:10	07:48 19:01	16:20 (12) 18:30 (9)	08:31 13:07 (13)
9	05:28 21:56	06:11 21:14	07:01 20:08	07:50 18:59	16:17 (12) 16:52 (12)	08:32 13:07 (13)
10	05:29 21:55	06:12 21:12	07:02 20:06	07:52 18:56	16:16 (12) 16:53 (12)	08:33 13:08 (13)
11	05:30 21:55	06:14 21:10	07:04 20:03	07:54 18:54	16:15 (12) 16:54 (12)	08:34 13:08 (13)
12	05:31 21:54	06:15 21:09	07:06 20:01	07:55 18:52	16:14 (12) 16:54 (12)	08:35 13:09 (13)
13	05:32 21:53	06:17 21:07	07:07 19:59	07:57 18:50	16:13 (12) 16:55 (12)	08:36 13:09 (13)
14	05:33 21:52	06:19 21:05	07:09 19:56	07:59 18:48	16:11 (12) 16:55 (12)	08:37 13:09 (13)
15	05:35 21:51	06:20 21:03	07:10 19:54	08:00 18:45	16:10 (12) 16:55 (12)	08:38 13:10 (13)
16	05:36 21:50	06:22 21:01	07:12 19:52	08:02 18:43	16:10 (12) 16:55 (12)	08:39 13:10 (13)
17	05:37 21:49	06:23 20:59	07:14 19:49	08:04 18:41	16:10 (12) 16:55 (12)	08:40 13:10 (13)
18	05:38 21:48	06:25 20:57	07:15 19:47	08:06 18:39	16:09 (12) 16:55 (12)	08:41 13:11 (13)
19	05:40 21:47	06:27 20:54	07:17 19:45	08:07 18:37	16:08 (12) 16:54 (12)	08:41 13:12 (13)
20	05:41 21:46	06:28 20:52	07:19 19:42	08:09 18:35	16:08 (12) 16:54 (12)	08:42 13:12 (13)
21	05:42 21:44	06:30 20:50	07:20 19:40	08:11 18:33	16:08 (12) 16:54 (12)	08:42 13:12 (13)
22	05:44 21:43	06:31 20:48	07:22 19:38	08:13 18:30	16:09 (12) 16:54 (12)	08:43 13:13 (13)
23	05:45 21:42	06:33 20:46	07:23 19:35	08:14 18:28	16:09 (12) 16:53 (12)	08:43 13:13 (13)
24	05:46 21:40	06:35 20:44	07:25 19:33	08:16 18:26	16:09 (12) 16:53 (12)	08:44 13:14 (13)
25	05:48 21:39	06:36 20:42	07:27 19:31	07:18 18:27 (9)	15:10 (12) 15:52 (12)	08:44 13:14 (13)
26	05:49 21:38	06:38 20:40	07:28 19:28	07:20 18:23 (9)	15:11 (12) 15:52 (12)	08:44 13:15 (13)
27	05:51 21:36	06:40 20:37	07:30 19:26	07:21 18:21 (9)	15:10 (12) 15:50 (12)	08:45 13:15 (13)
28	05:52 21:35	06:41 20:35	07:32 19:24	07:23 18:20 (9)	15:11 (12) 15:49 (12)	08:45 13:16 (13)
29	05:53 21:33	06:43 20:33	07:33 19:21	07:25 18:18 (9)	15:12 (12) 15:48 (10)	08:45 13:16 (13)
30	05:55 21:32	06:44 20:31	07:35 19:19	07:27 18:18 (9)	15:13 (12) 15:48 (10)	08:45 13:17 (13)
31	05:56 21:30	06:46 20:29		07:29 17:13	15:15 (12) 15:49 (10)	08:45 13:17 (13)
Potential sun hours	502	454	381	331	266	244
Total, worst case			92	1193	893	1554
Sun reduction			0.28	0.24	0.18	0.13
Oper. time red.			1.00	1.00	1.00	1.00
Wind dir. red.			0.65	0.60	0.59	0.59
Total reduction			0.18	0.14	0.11	0.08
Total, real			17	170	97	123

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: C - H3

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 16:36	08:18 17:24	07:25 18:16	07:14 20:10	06:10 21:00	20:12 (11) 20:20 (11)
2	08:45 16:37	08:17 17:26	07:23 18:17	07:12 20:11	06:08 21:02	20:08 (11) 20:23 (11)
3	08:45 16:38	08:15 17:28	07:21 18:19	07:10 20:13	06:06 21:04	20:05 (11) 20:25 (11)
4	08:45 16:40	08:14 17:30	07:18 18:21	07:07 20:15	06:04 21:05	20:04 (11) 20:28 (11)
5	08:44 16:41	08:12 17:31	07:16 18:23	17:25 (5) 17:38 (5)	07:05 20:16	20:03 (11) 20:29 (11)
6	08:44 16:42	08:10 17:33	07:14 18:25	17:23 (5) 17:41 (5)	07:03 20:18	20:01 (11) 20:29 (11)
7	08:44 16:43	08:08 17:35	07:12 18:26	17:21 (5) 17:43 (5)	07:01 20:20	20:01 (11) 20:31 (11)
8	08:43 16:45	08:07 17:37	07:09 18:28	17:20 (5) 17:45 (5)	06:58 20:22	19:59 (11) 20:31 (11)
9	08:43 16:46	08:05 17:39	07:07 18:30	17:18 (5) 17:45 (5)	06:56 20:23	19:58 (11) 20:31 (11)
10	08:42 16:47	08:03 17:41	07:05 18:32	17:17 (5) 17:46 (5)	06:54 20:25	19:58 (11) 20:33 (11)
11	08:42 16:49	08:01 17:43	07:03 18:33	17:16 (5) 17:46 (5)	06:52 20:27	19:57 (11) 20:32 (11)
12	08:41 16:50	07:59 17:45	07:00 18:35	17:15 (5) 17:46 (5)	06:49 20:28	19:58 (11) 20:33 (11)
13	08:40 16:52	07:58 17:46	06:58 18:37	17:15 (5) 18:04 (4)	06:47 20:30	19:57 (11) 20:33 (11)
14	08:40 16:53	07:56 17:48	06:56 18:39	17:15 (5) 18:06 (4)	06:45 20:32	19:57 (11) 20:34 (11)
15	08:39 16:55	07:54 17:50	06:54 18:40	17:14 (5) 18:07 (4)	06:43 20:33	19:56 (11) 20:33 (11)
16	08:38 16:56	07:52 17:52	06:51 18:42	17:14 (5) 18:08 (4)	06:41 20:35	19:56 (11) 20:34 (11)
17	08:37 16:58	07:50 17:54	06:49 18:44	17:15 (5) 18:09 (4)	06:38 20:37	19:57 (11) 20:34 (11)
18	08:36 17:00	07:48 17:56	06:47 18:46	17:14 (5) 18:08 (4)	06:36 20:39	19:56 (11) 20:34 (11)
19	08:35 17:01	07:46 17:57	06:44 18:47	17:15 (5) 18:08 (4)	06:34 20:40	19:57 (11) 20:34 (11)
20	08:34 17:03	07:44 17:59	06:42 18:49	17:16 (5) 18:08 (4)	06:32 20:42	19:57 (11) 20:34 (11)
21	08:33 17:05	07:42 18:01	06:40 18:51	17:16 (5) 18:07 (4)	06:30 20:44	19:57 (11) 20:41 (10)
22	08:32 17:06	07:40 18:03	06:37 18:53	17:18 (5) 18:06 (4)	06:28 20:45	19:57 (11) 20:44 (10)
23	08:31 17:08	07:38 18:05	06:35 18:54	17:21 (5) 18:06 (4)	06:26 20:47	19:57 (11) 20:45 (10)
24	08:29 17:10	07:36 18:07	06:33 18:56	17:25 (5) 18:04 (4)	06:24 20:49	19:58 (11) 20:47 (10)
25	08:28 17:11	07:33 18:08	06:31 18:58	17:49 (4) 18:02 (4)	06:22 20:50	19:58 (11) 20:48 (10)
26	08:27 17:13	07:31 18:10	06:28 18:59	17:53 (4) 17:58 (4)	06:20 20:52	19:59 (11) 20:49 (10)
27	08:26 17:15	07:29 18:12	06:26 19:01	06:18 20:54	06:18 20:54	19:59 (11) 20:49 (10)
28	08:24 17:17	07:27 18:14	06:24 19:03	06:16 20:55	06:16 20:55	19:59 (11) 20:50 (10)
29	08:23 17:19	07:21 19:04	06:14 20:04	06:14 20:57	06:14 20:57	20:00 (11) 19:58 (6)
30	08:21 17:20	07:19 20:06	06:12 20:59	06:12 20:59	06:12 20:59	20:01 (11) 20:52 (10)
31	08:20 17:22	07:17 20:08	06:11 20:58	06:11 20:58	06:11 20:58	20:02 (11) 21:45
Potential sun hours	259	278	367	416	485	499
Total, worst case			741	299	1153	1279
Sun reduction			0.24	0.35	0.37	0.30
Oper. time red.			1.00	1.00	1.00	1.00
Wind dir. red.			0.65	0.67	0.68	0.68
Total reduction			0.16	0.24	0.25	0.20
Total, real			117	71	290	262

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 1 **Shadow receptor:** D - H4

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June		
1	08:45	09:43 (15) 08:18	08:45 (16) 07:25	07:14	06:10	05:25		
	16:36	47 10:30 (15) 17:24	105 10:53 (15) 18:16	20:10	21:01	21:46		
2	08:45	09:43 (15) 08:17	08:43 (16) 07:23	07:12	06:08	05:24		
	16:38	48 10:31 (15) 17:26	107 10:53 (15) 18:18	20:11	21:02	21:47		
3	08:45	09:43 (15) 08:15	08:41 (16) 07:21	07:10	06:06	05:23		
	16:39	49 10:32 (15) 17:28	108 10:52 (15) 18:19	20:13	21:04	21:48		
4	08:45	09:44 (15) 08:14	08:39 (16) 07:18	07:08	06:04	05:22		
	16:40	50 10:34 (15) 17:30	110 10:52 (15) 18:21	20:15	21:06	21:49		
5	08:44	09:43 (15) 08:12	08:38 (16) 07:16	07:05	06:02	05:22		
	16:41	51 10:34 (15) 17:32	112 10:53 (15) 18:23	20:17	21:07	21:50		
6	08:44	09:44 (15) 08:10	08:37 (16) 07:14	07:03	06:00	05:21		
	16:42	51 10:35 (15) 17:33	113 10:53 (15) 18:25	20:18	21:09	21:51		
7	08:44	09:43 (15) 08:09	08:37 (16) 07:12	07:01	05:59	05:20	20:47 (1)	
	16:43	53 10:36 (15) 17:35	112 10:52 (15) 18:27	20:20	21:10	21:52	2 20:49 (1)	
8	08:43	09:44 (15) 08:07	08:37 (16) 07:10	06:59	05:57	05:20	20:44 (1)	
	16:45	53 10:37 (15) 17:37	112 10:52 (15) 18:28	20:22	21:12	21:53	7 20:51 (1)	
9	08:43	09:43 (15) 08:05	08:37 (16) 07:07	06:56	05:55	05:19	20:43 (1)	
	16:46	55 10:38 (15) 17:39	110 10:51 (15) 18:30	20:23	21:14	21:54	10 20:53 (1)	
10	08:42	09:43 (15) 08:03	08:37 (16) 07:05	06:54	05:53	05:19	20:43 (1)	
	16:48	55 10:38 (15) 17:41	109 10:51 (15) 18:32	20:25	21:15	21:55	12 20:55 (1)	
11	08:42	09:42 (15) 08:01	08:37 (16) 07:03	06:52	05:52	05:19	05:53 (5)	
	16:49	57 10:39 (15) 17:43	107 10:50 (15) 18:34	20:27	21:17	21:56	20 20:55 (1)	
12	08:41	09:43 (15) 08:00	08:38 (16) 07:01	06:50	05:50	05:18	05:52 (5)	
	16:50	58 10:41 (15) 17:45	106 10:50 (15) 18:35	20:28	21:18	21:56	24 20:56 (1)	
13	08:40	09:43 (15) 07:58	08:38 (16) 06:58	06:47	05:49	05:18	05:52 (5)	
	16:52	59 10:42 (15) 17:47	103 10:49 (15) 18:37	20:30	21:20	21:57	27 20:57 (1)	
14	08:40	09:43 (15) 07:56	08:39 (16) 06:56	06:45	05:47	05:18	05:51 (5)	
	16:53	59 10:42 (15) 17:48	100 10:48 (15) 18:39	20:32	21:22	21:58	30 20:58 (1)	
15	08:39	09:43 (15) 07:54	08:40 (16) 06:54	06:43	05:45	05:18	05:51 (5)	
	16:55	60 10:43 (15) 17:50	96 10:47 (15) 18:41	20:34	21:23	21:58	30 20:58 (1)	
16	08:38	09:42 (15) 07:52	08:41 (16) 06:51	06:41	05:44	05:17	05:51 (5)	
	16:57	62 10:44 (15) 17:52	92 10:46 (15) 18:42	20:35	21:25	21:59	32 20:59 (1)	
17	08:37	09:42 (15) 07:50	08:42 (16) 06:49	06:39	05:42	05:17	05:51 (5)	
	16:58	63 10:45 (15) 17:54	88 10:45 (15) 18:44	20:37	21:26	21:59	33 20:59 (1)	
18	08:36	09:42 (15) 07:48	08:43 (16) 06:47	06:36	05:41	05:17	05:51 (5)	
	17:00	64 10:46 (15) 17:56	84 10:44 (15) 18:46	20:39	21:28	21:59	33 20:59 (1)	
19	08:35	09:41 (15) 07:46	08:45 (16) 06:44	06:34	05:39	05:17	05:51 (5)	
	17:01	65 10:46 (15) 17:58	77 10:42 (15) 18:47	20:40	21:29	22:00	34 21:00 (1)	
20	08:34	09:02 (16) 07:44	08:47 (16) 06:42	06:32	05:38	05:17	05:51 (5)	
	17:03	66 10:46 (15) 17:59	70 10:41 (15) 18:49	20:42	21:31	22:00	35 21:00 (1)	
21	08:33	09:01 (16) 07:42	08:50 (16) 06:40	06:30	05:37	05:18	05:51 (5)	
	17:05	70 10:47 (15) 18:01	61 10:39 (15) 18:51	20:44	21:32	22:00	35 21:00 (1)	
22	08:32	09:00 (16) 07:40	09:56 (15) 06:38	06:28	05:35	05:18	05:51 (5)	
	17:06	74 10:48 (15) 18:03	40 10:36 (15) 18:53	20:45	21:33	22:01	35 21:00 (1)	
23	08:31	08:58 (16) 07:38	09:58 (15) 06:35	06:26	05:34	05:18	05:52 (5)	
	17:08	78 10:48 (15) 18:05	36 10:34 (15) 18:54	20:47	21:35	22:01	34 21:01 (1)	
24	08:30	08:57 (16) 07:36	10:01 (15) 06:33	06:24	05:33	05:18	05:52 (5)	
	17:10	81 10:49 (15) 18:07	30 10:31 (15) 18:56	20:49	21:36	22:01	34 21:01 (1)	
25	08:28	08:56 (16) 07:34	10:04 (15) 06:31	06:22	05:32	05:19	05:52 (5)	
	17:12	85 10:50 (15) 18:09	22 10:26 (15) 18:58	20:50	21:38	22:01	33 21:00 (1)	
26	08:27	08:54 (16) 07:31	10:11 (15) 06:28	06:20	05:31	05:19	05:53 (5)	
	17:13	88 10:50 (15) 18:10	7 10:18 (15) 18:59	20:52	21:39	22:01	32 21:01 (1)	
27	08:26	08:53 (16) 07:29		06:26	06:18	05:29	05:19	05:53 (5)
	17:15	91 10:51 (15) 18:12		19:01	20:54	21:40	22:01	31 21:00 (1)
28	08:24	08:51 (16) 07:27		06:24	06:16	05:28	05:20	05:54 (5)
	17:17	93 10:51 (15) 18:14		19:03	20:56	21:41	22:01	30 21:01 (1)
29	08:23	08:49 (16)		07:21	06:14	05:27	05:21	05:55 (5)
	17:19	97 10:51 (15)		20:05	20:57	21:43	22:01	27 21:00 (1)
30	08:21	08:48 (16)		07:19	06:12	05:26	05:21	05:56 (5)
	17:21	99 10:52 (15)		20:06	20:59	21:44	22:00	25 21:00 (1)
31	08:20	08:46 (16)		07:17		05:26		
	17:22	101 10:52 (15)		20:08		21:45		
Potential sun hours	259	278	367	416	485	499		
Total, worst case	2082	2217				645		
Sun reduction	0.16	0.21				0.30		
Oper. time red.	1.00	1.00				1.00		
Wind dir. red.	0.66	0.67				0.66		
Total reduction	0.10	0.14				0.20		
Total, real	215	305				127		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: D - H4

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22	05:57 (5)	05:58	06:48	07:37	07:30
	22:00	21	20:59 (1)	21:28	20:26	19:17
2	05:22	05:59 (5)	06:00	06:49	07:38	07:32
	22:00	16	20:59 (1)	21:27	20:24	19:15
3	05:23	20:48 (1)	06:01	06:51	07:40	07:34
	21:59	11	20:59 (1)	21:25	20:22	19:12
4	05:24	20:49 (1)	06:03	06:53	07:42	07:36
	21:59	8	20:57 (1)	21:23	20:20	19:10
5	05:25	20:51 (1)	06:04	06:54	07:43	07:38
	21:59	5	20:56 (1)	21:22	20:17	19:08
6	05:26		06:06	06:56	07:45	07:39
	21:58		21:20	20:15	19:06	17:02
7	05:26		06:08	06:58	07:47	07:41
	21:57		21:18	20:13	19:03	17:00
8	05:27		06:09	06:59	07:48	07:43
	21:57		21:16	20:10	19:01	16:59
9	05:28		06:11	07:01	07:50	07:45
	21:56		21:14	20:08	18:59	16:57
10	05:29		06:12	07:02	07:52	07:47
	21:55		21:12	20:06	18:56	16:55
11	05:30		06:14	07:04	07:54	07:48
	21:55		21:10	20:03	18:54	16:54
12	05:31		06:15	07:06	07:55	07:50
	21:54		21:09	20:01	18:52	16:52
13	05:33		06:17	07:07	07:57	07:52
	21:53		21:07	19:59	18:50	16:51
14	05:34		06:19	07:09	07:59	07:54
	21:52		21:05	19:57	18:48	16:49
15	05:35		06:20	07:11	08:00	07:55
	21:51		21:03	19:54	18:45	16:48
16	05:36		06:22	07:12	08:02	07:57
	21:50		21:01	19:52	18:43	16:46
17	05:37		06:24	07:14	08:04	07:59
	21:49		20:59	19:50	18:41	16:45
18	05:38		06:25	07:15	08:06	08:01
	21:48		20:57	19:47	18:39	16:44
19	05:40		06:27	07:17	08:07	08:02
	21:47		20:55	19:45	18:37	16:42
20	05:41		06:28	07:19	08:09	08:04
	21:46		20:52	19:43	18:35	16:41
21	05:42		06:30	07:20	08:11	08:06
	21:44		20:50	19:40	18:33	16:40
22	05:44		06:32	07:22	08:13	08:07
	21:43		20:48	19:38	18:31	16:39
23	05:45		06:33	07:24	08:14	08:09
	21:42		20:46	19:36	18:29	16:38
24	05:46		06:35	07:25	08:16	08:11
	21:40		20:44	19:33	18:26	16:37
25	05:48		06:36	07:27	08:18	08:12
	21:39		20:42	19:31	17:24	16:36
26	05:49		06:38	07:28	08:19	08:14
	21:38		20:40	19:29	17:22	16:35
27	05:51		06:40	07:30	08:21	08:15
	21:36		20:37	19:26	17:20	16:34
28	05:52		06:41	07:32	08:23	08:17
	21:35		20:35	19:24	17:19	16:33
29	05:54		06:43	07:33	08:25	08:18
	21:33		20:33	19:22	17:17	16:32
30	05:55		06:45	07:35	08:27	08:20
	21:32		20:31	19:19	17:15	16:31
31	05:57		06:46	07:37	08:29	08:22
	21:30		20:29	19:17	17:13	16:30
Potential sun hours	502	454	381	331	266	244
Total, worst case	61			1160		1447
Sun reduction	0.27			0.24		0.13
Oper. time red.	1.00			1.00		1.00
Wind dir. red.	0.67			0.67		0.66
Total reduction	0.18			0.16		0.09
Total, real	11			184		129

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 1 **Shadow receptor:** E - H5

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45	09:57 (10)	08:18	10:23 (9)	07:25	07:14
	16:36	45 10:55 (9)	17:24	41 11:04 (9)	18:16	20:10
2	08:45	09:54 (10)	08:17	10:23 (9)	07:23	07:12
	16:37	49 10:54 (9)	17:26	40 11:03 (9)	18:18	20:11
3	08:45	09:54 (10)	08:15	10:24 (9)	07:21	07:10
	16:39	52 10:55 (9)	17:28	38 11:02 (9)	18:19	20:13
4	08:45	09:54 (10)	08:14	10:26 (9)	07:19	07:08
	16:40	53 10:56 (9)	17:30	36 11:02 (9)	18:21	20:15
5	08:45	09:53 (10)	08:12	10:27 (9)	07:16	07:05
	16:41	56 10:57 (9)	17:32	33 11:00 (9)	18:23	20:17
6	08:44	09:53 (10)	08:10	10:28 (9)	07:14	07:03
	16:42	59 10:58 (9)	17:33	30 10:58 (9)	18:25	20:18
7	08:44	09:52 (10)	08:09	10:30 (9)	07:12	07:01
	16:43	61 10:58 (9)	17:35	26 10:56 (9)	18:27	20:20
8	08:43	09:52 (10)	08:07	10:33 (9)	07:10	06:59
	16:45	62 10:59 (9)	17:37	20 10:53 (9)	18:28	20:22
9	08:43	09:52 (10)	08:05	10:36 (9)	07:07	06:56
	16:46	63 10:59 (9)	17:39	13 10:49 (9)	18:30	20:23
10	08:42	09:51 (10)	08:03	07:05	06:54	05:53
	16:47	66 11:00 (9)	17:41	18:32	20:25	21:15
11	08:42	09:52 (10)	08:02	07:03	06:52	05:52
	16:49	67 11:01 (9)	17:43	18:34	20:27	21:17
12	08:41	09:52 (10)	08:00	07:01	06:50	05:50
	16:50	69 11:02 (9)	17:45	18:35	20:28	21:19
13	08:41	09:52 (10)	07:58	08:38 (12)	06:58	06:47
	16:52	69 11:02 (9)	17:46	2 08:40 (12)	18:37	20:30
14	08:40	09:52 (10)	07:56	08:33 (12)	06:56	06:45
	16:53	69 11:02 (9)	17:48	11 08:44 (12)	18:39	20:32
15	08:39	09:52 (10)	07:54	08:31 (12)	06:54	06:43
	16:55	71 11:03 (9)	17:50	15 08:46 (12)	18:41	20:34
16	08:38	09:52 (10)	07:52	08:30 (12)	06:51	06:41
	16:56	71 11:03 (9)	17:52	17 08:47 (12)	18:42	20:35
17	08:37	09:52 (10)	07:50	08:28 (12)	06:49	06:39
	16:58	72 11:04 (9)	17:54	19 08:47 (12)	18:44	20:37
18	08:36	09:52 (10)	07:48	08:27 (12)	06:47	06:36
	17:00	73 11:05 (9)	17:56	21 08:48 (12)	18:46	20:39
19	08:35	09:53 (10)	07:46	08:27 (12)	06:45	06:34
	17:01	72 11:05 (9)	17:58	22 08:49 (12)	18:47	20:40
20	08:34	09:52 (10)	07:44	08:27 (12)	06:42	06:32
	17:03	73 11:05 (9)	17:59	22 08:49 (12)	18:49	20:42
21	08:33	09:53 (10)	07:42	08:27 (12)	06:40	06:30
	17:05	72 11:05 (9)	18:01	22 08:49 (12)	18:51	20:44
22	08:32	09:53 (10)	07:40	08:27 (12)	06:38	06:28
	17:06	73 11:06 (9)	18:03	22 08:49 (12)	18:53	20:45
23	08:31	09:53 (10)	07:38	08:27 (12)	06:35	06:26
	17:08	72 11:05 (9)	18:05	22 08:49 (12)	18:54	20:47
24	08:30	09:54 (10)	07:36	08:28 (12)	06:33	06:24
	17:10	72 11:06 (9)	18:07	20 08:48 (12)	18:56	20:49
25	08:28	09:55 (10)	07:34	08:28 (12)	06:31	06:22
	17:12	71 11:06 (9)	18:09	18 08:46 (12)	18:58	20:51
26	08:27	09:56 (10)	07:32	08:29 (12)	06:28	06:20
	17:13	69 11:06 (9)	18:10	16 08:45 (12)	19:00	20:52
27	08:26	09:57 (10)	07:29	08:31 (12)	06:26	06:18
	17:15	67 11:06 (9)	18:12	12 08:43 (12)	19:01	20:54
28	08:24	09:58 (10)	07:27	08:34 (12)	06:24	06:16
	17:17	63 11:05 (9)	18:14	6 08:40 (12)	19:03	20:56
29	08:23	10:00 (10)		07:21	06:14	05:27
	17:19	61 11:06 (9)		20:05	20:57	21:43
30	08:21	10:01 (10)		07:19	06:12	05:26
	17:21	56 11:05 (9)		20:06	20:59	21:44
31	08:20	10:04 (10)		07:17	05:25	
	17:22	48 11:04 (9)		20:08	21:45	
Potential sun hours	259	278	367	416	485	499
Total, worst case	1996	544				
Sun reduction	0.16	0.21				
Oper. time red.	1.00	1.00				
Wind dir. red.	0.65	0.67				
Total reduction	0.10	0.14				
Total, real	203	75				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 1 **Shadow receptor:** E - H5

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22 22:00	05:58 21:28	06:48 20:26	07:37 19:17	07:31 17:11	08:21 16:31
2	05:22 22:00	06:00 21:27	06:49 20:24	07:38 19:15	07:32 17:09	08:23 16:30
3	05:23 22:00	06:01 21:25	06:51 20:22	07:40 19:12	07:34 17:07	08:24 16:29
4	05:24 21:59	06:03 21:23	06:53 20:20	07:42 19:10	07:36 17:05	08:26 16:29
5	05:25 21:59	06:04 21:22	06:54 20:17	07:43 19:08	07:38 17:04	08:27 16:28
6	05:25 21:58	06:06 21:20	06:56 20:15	07:45 19:06	07:40 17:02	08:28 16:28
7	05:26 21:58	06:07 21:18	06:58 20:13	07:47 19:03	07:41 17:00	08:30 16:27
8	05:27 21:57	06:09 21:16	06:59 20:10	07:49 19:01	07:43 16:59	08:31 16:27
9	05:28 21:56	06:11 21:14	07:01 20:08	07:50 18:59	07:45 16:57	08:32 16:27
10	05:29 21:56	06:12 21:12	07:02 20:06	07:52 18:56	07:47 16:55	08:33 16:27
11	05:30 21:55	06:14 21:11	07:04 20:04	07:54 18:54	07:48 16:54	08:34 16:26
12	05:31 21:54	06:15 21:09	07:06 20:01	07:55 18:52	07:50 16:52	08:35 16:26
13	05:32 21:53	06:17 21:07	07:07 19:59	07:57 18:50	07:52 16:51	08:36 16:26
14	05:34 21:52	06:19 21:05	07:09 19:57	07:59 18:48	07:54 09:05 (12) 16:49	08:37 08:37 16:26
15	05:35 21:51	06:20 21:03	07:11 19:54	08:00 18:45	07:56 09:02 (12) 16:48	08:38 08:38 16:26
16	05:36 21:50	06:22 21:01	07:12 19:52	08:02 18:43	07:57 09:01 (12) 16:46	08:39 08:39 16:26
17	05:37 21:49	06:23 20:59	07:14 19:50	08:04 18:41	07:59 09:00 (12) 16:45	08:40 08:40 16:27
18	05:38 21:48	06:25 20:57	07:15 19:47	08:06 18:39	08:01 09:18 (12) 16:44	08:40 08:40 16:27
19	05:40 21:47	06:27 20:55	07:17 19:45	08:07 18:37	08:02 09:20 (12) 16:42	08:41 08:41 16:27
20	05:41 21:46	06:28 20:53	07:19 19:43	08:09 18:35	08:04 09:19 (12) 16:41	08:42 08:42 16:28
21	05:42 21:44	06:30 20:50	07:20 19:40	08:11 18:33	08:06 08:57 (12) 16:40	08:42 08:42 16:28
22	05:44 21:43	06:32 20:48	07:22 19:38	08:13 18:31	08:07 09:19 (12) 16:39	08:43 08:43 16:28
23	05:45 21:42	06:33 20:46	07:24 19:36	08:14 18:29	08:09 08:57 (12) 16:38	08:43 08:43 16:29
24	05:46 21:41	06:35 20:44	07:25 19:33	08:16 18:26	08:11 09:18 (12) 16:37	08:44 08:44 16:30
25	05:48 21:39	06:36 20:42	07:27 19:31	08:18 18:24	08:12 07:59 (12) 16:36	08:44 08:44 16:30
26	05:49 21:38	06:38 20:40	07:29 19:29	08:20 18:22	08:14 08:17 (12) 16:35	08:45 08:45 16:31
27	05:51 21:36	06:40 20:38	07:30 19:26	08:22 18:20	08:15 08:01 (12) 16:34	08:45 08:45 16:32
28	05:52 21:35	06:41 20:35	07:32 19:24	08:23 18:18	08:17 08:15 (12) 16:33	08:45 08:45 16:32
29	05:54 21:33	06:43 20:33	07:33 19:22	08:25 18:17	08:19 08:13 (12) 16:33	08:45 08:45 16:32
30	05:55 21:32	06:45 20:31	07:35 19:19	08:27 18:15	08:20 16:31	08:45 10:43 (9) 16:34
31	05:57 21:30	06:46 20:29		08:29 17:13		08:45 16:35 10:12 (9) 10:53 (9)
Potential sun hours	502	454	381	331	266	244
Total, worst case				270	1648	1449
Sun reduction				0.24	0.18	0.13
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.69	0.65	0.65
Total reduction				0.16	0.12	0.09
Total, real				44	199	127

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: F - H6

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January		February		March		April		May		June	
1	08:45	15:37 (16)	08:18	16:28 (15)	07:25	07:14			06:10		18:44 (5)	05:25
2	08:45	15:38 (16)	08:17	16:27 (15)	07:23	07:12			06:08	34	19:18 (5)	05:24
3	08:45	15:38 (16)	08:15	16:27 (15)	07:21	07:10		19:28 (3)	06:06		18:47 (5)	05:23
4	08:45	15:39 (16)	08:14	16:26 (15)	07:18	07:08	10	19:38 (3)	06:04	30	19:17 (5)	05:22
5	08:44	15:40 (16)	08:12	16:27 (15)	07:16	07:05	20	19:40 (3)	06:02	27	19:15 (5)	05:21
6	08:44	15:39 (16)	08:10	16:27 (15)	07:14	07:03	24	19:41 (3)	06:00	24	19:13 (5)	05:21
7	08:44	15:39 (16)	08:08	16:28 (15)	07:12	07:01	29	19:42 (3)	05:59	20	19:11 (5)	05:20
8	08:43	15:39 (16)	08:07	16:28 (15)	07:09	06:58	44	19:41 (3)	05:57	15	19:09 (5)	05:20
9	08:43	15:40 (16)	08:05	16:29 (15)	07:07	06:56	47	19:41 (3)	05:55	6	19:04 (5)	05:19
10	08:42	15:40 (16)	08:03	16:30 (15)	07:05	06:54	49	19:41 (3)	05:53			05:19
11	08:42	15:40 (16)	08:01	16:32 (15)	07:03	06:52	51	19:41 (3)	05:52			05:18
12	08:41	15:41 (16)	07:59	16:33 (15)	07:01	06:49	52	19:40 (3)	05:50			05:18
13	08:40	15:41 (16)	07:58	16:34 (15)	06:59	06:47	52	19:38 (3)	05:48			05:18
14	08:40	15:42 (16)	07:56	16:35 (15)	06:57	06:45	52	19:37 (3)	05:47			05:18
15	08:39	15:42 (16)	07:54	16:36 (15)	06:54	06:43	52	19:36 (4)	05:45			05:17
16	08:38	15:43 (16)	07:52	16:37 (15)	06:51	06:41	52	19:35 (4)	05:44			05:17
17	08:37	15:44 (16)	07:50	16:38 (15)	06:49	06:38	51	19:34 (4)	05:42			05:17
18	08:36	15:44 (16)	07:48	16:39 (15)	06:47	06:36	52	19:34 (4)	05:41			05:17
19	08:35	15:44 (16)	07:46	16:40 (15)	06:44	06:34	50	19:32 (4)	05:39			05:17
20	08:34	15:45 (16)	07:44	16:41 (15)	06:42	06:32	50	19:31 (4)	05:38			05:17
21	08:33	15:47 (16)	07:42	16:42 (15)	06:40	06:30	48	19:28 (4)	05:37			05:17
22	08:32	15:48 (16)	07:40	16:43 (15)	06:37	06:28	45	19:25 (4)	05:35			05:18
23	08:31	15:49 (16)	07:38	16:44 (15)	06:35	06:26	44	19:24 (5)	05:33			05:18
24	08:29	15:51 (16)	07:36	16:45 (15)	06:33	06:24	43	19:23 (5)	05:32			05:18
25	08:28	16:03 (16)	07:34	16:46 (15)	06:31	06:22	43	19:23 (5)	05:31			05:19
26	08:27	16:01 (16)	07:31	16:47 (15)	06:28	06:20	42	19:22 (5)	05:29			05:19
27	08:26	16:32 (15)	07:29	16:48 (15)	06:26	06:18	40	19:22 (5)	05:27			05:19
28	08:24	16:30 (15)	07:27	16:49 (15)	06:24	06:16	39	19:21 (5)	05:25			05:20
29	08:23	16:28 (15)	07:25	16:50 (15)	06:21	06:14	38	19:21 (5)	05:23			05:20
30	08:21	16:28 (15)	07:23	16:51 (15)	06:19	06:12	36	19:21 (5)	05:21			05:21
31	08:20	16:27 (15)	07:21	16:52 (15)	06:17	06:10		19:19 (5)	05:19			05:22
Potential sun hours	259	278	367	416	485	499						
Total, worst case	612	199	1198	188								
Sun reduction	0.16	0.21	0.35	0.37								
Oper. time red.	1.00	1.00	1.00	1.00								
Wind dir. red.	0.58	0.61	0.68	0.68								
Total reduction	0.09	0.12	0.24	0.25								
Total, real	54	25	282	46								

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker
			(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: F - H6

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22 22:00	05:58 21:28	06:48 20:26	18:47 (5) 07:37 19:39 (3) 19:17	07:30 17:11	16:00 (15) 08:21 16:14 (15) 16:31
2	05:22 22:00	06:00 21:27	06:49 20:24	18:48 (5) 07:38 19:39 (3) 19:15	07:32 17:09	15:59 (15) 08:23 16:15 (15) 16:30
3	05:23 21:59	06:01 21:25	06:51 20:22	18:50 (5) 07:40 19:39 (3) 19:12	07:34 17:07	15:58 (15) 08:24 16:16 (15) 16:29
4	05:24 21:59	06:03 21:23	06:53 20:19	18:51 (5) 07:42 19:38 (3) 19:10	07:36 17:05	15:57 (15) 08:25 16:17 (15) 16:29
5	05:25 21:58	06:04 21:21	19:06 (5) 19:17 (5) 20:17	06:54 07:43 19:38 (3) 19:08	07:38 17:04	15:57 (15) 08:27 16:17 (15) 16:28
6	05:25 21:58	06:06 21:20	19:02 (5) 19:19 (5) 20:15	06:56 07:45 19:00 (5) 19:05	07:39 17:02	15:57 (15) 08:28 16:18 (15) 16:28
7	05:26 21:57	06:07 21:18	19:01 (5) 19:22 (5) 20:13	06:57 07:46 19:36 (3) 19:03	07:41 17:00	15:57 (15) 08:29 16:18 (15) 16:27
8	05:27 21:57	06:09 21:16	18:58 (5) 19:23 (5) 20:10	06:59 07:47 19:15 (4) 19:01	07:43 16:59	15:57 (15) 08:31 16:18 (15) 16:27
9	05:28 21:56	06:11 21:14	18:56 (5) 19:24 (5) 20:08	07:01 07:50 19:22 (3) 18:59	07:45 16:57	15:58 (15) 08:32 16:18 (15) 16:27
10	05:29 21:55	06:12 21:12	18:55 (5) 19:25 (5) 20:06	07:02 07:52 18:56 07:53	07:46 16:55	15:58 (15) 08:33 16:17 (15) 16:27
11	05:30 21:55	06:14 21:10	18:53 (5) 19:26 (5) 20:03	07:04 07:54 18:54 07:55	07:48 16:54	15:59 (15) 08:34 16:17 (15) 16:26
12	05:31 21:54	06:15 21:08	18:52 (5) 19:27 (5) 20:01	07:06 07:56 18:52 07:57	07:50 16:52	15:59 (15) 08:35 16:15 (15) 16:26
13	05:32 21:53	06:17 21:07	18:52 (5) 19:28 (5) 19:59	07:07 07:57 18:50 07:59	07:52 16:51	16:00 (15) 08:36 16:15 (15) 16:26
14	05:34 21:52	06:19 21:05	18:50 (5) 19:28 (5) 19:56	07:09 07:59 18:48 08:00	07:54 16:49	16:02 (15) 08:37 16:13 (15) 16:26
15	05:35 21:51	06:20 21:03	18:50 (5) 19:29 (5) 19:54	07:10 08:00 18:45 08:02	07:55 16:48	16:04 (15) 08:38 16:12 (15) 16:26
16	05:36 21:50	06:22 21:01	18:48 (5) 19:29 (5) 19:52	07:12 08:02 18:43 08:04	07:57 16:46	16:12 (15) 16:26 16:26 08:39
17	05:37 21:49	06:23 20:59	18:48 (5) 19:30 (5) 19:49	07:14 08:04 18:41 08:06	07:59 16:45	15:27 (16) 08:39 15:35 (16) 16:27
18	05:38 21:48	06:25 20:56	18:47 (5) 19:29 (5) 19:47	07:15 08:06 18:39 08:07	08:01 16:44	15:25 (16) 08:40 15:37 (16) 16:27
19	05:40 21:47	06:27 20:54	18:47 (5) 19:30 (5) 19:45	07:17 08:07 18:37 08:09	08:02 16:42	15:24 (16) 08:41 15:39 (16) 16:27
20	05:41 21:45	06:28 20:52	18:46 (5) 19:29 (5) 19:42	07:19 08:09 18:35 08:11	08:04 16:41	15:23 (16) 08:42 15:41 (16) 16:27
21	05:42 21:44	06:30 20:50	18:46 (5) 19:29 (5) 19:40	07:20 08:11 18:33 08:13	08:06 16:40	15:22 (16) 08:42 15:41 (16) 16:28
22	05:44 21:43	06:31 20:48	18:45 (5) 19:30 (4) 19:38	07:22 08:13 18:30 08:14	08:07 16:39	15:21 (16) 08:43 15:42 (16) 16:28
23	05:45 21:42	06:33 20:46	18:45 (5) 19:33 (4) 19:35	07:23 08:14 18:28 08:16	08:09 16:38	15:21 (16) 08:43 15:43 (16) 16:29
24	05:46 21:40	06:35 20:44	18:44 (5) 19:34 (4) 19:33	07:25 08:16 18:26 07:18	08:11 16:37	15:21 (16) 08:44 15:44 (16) 16:29
25	05:48 21:39	06:36 20:42	18:45 (5) 19:35 (4) 19:31	07:27 08:17 17:24 07:20	08:12 16:36	15:21 (16) 08:44 15:44 (16) 16:30
26	05:49 21:37	06:38 20:40	18:44 (5) 19:35 (4) 19:28	07:28 08:18 17:22 07:21	08:14 16:35	15:21 (16) 08:44 15:45 (16) 16:31
27	05:51 21:36	06:40 20:37	18:45 (5) 19:36 (4) 19:26	07:29 08:15 17:20 07:23	08:15 16:34	15:21 (16) 08:45 15:45 (16) 16:32
28	05:52 21:35	06:41 20:35	18:45 (5) 19:37 (4) 19:24	07:24 08:17 17:18 07:25	08:17 16:33	15:22 (16) 08:45 15:46 (16) 16:32
29	05:54 21:33	06:43 20:33	18:45 (5) 19:37 (4) 19:21	07:25 08:18 17:16 07:27	08:18 16:32	15:22 (16) 08:45 15:46 (16) 16:33
30	05:55 21:31	06:44 20:31	18:46 (5) 19:38 (3) 19:19	07:27 08:20 17:15 16:05 (15)	08:20 16:31	15:22 (16) 08:45 15:47 (16) 16:34
31	05:57 21:30	06:46 20:28	18:46 (5) 19:38 (3)	07:29 08:21 17:13 16:12 (15)	08:22 16:31 10	16:02 (15) 08:45 16:35 15:59 (16)
Potential sun hours	502	454	381	331	266	244
Total, worst case		1070	329	14	540	659
Sun reduction		0.30	0.28	0.24	0.18	0.13
Oper. time red.		1.00	1.00	1.00	1.00	1.00
Wind dir. red.		0.68	0.68	0.61	0.60	0.58
Total reduction		0.20	0.19	0.14	0.11	0.08
Total, real		211	62	2	58	50

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: G - H7

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45	15:36 (16)	08:18	16:26 (15)	07:25	07:14
2	08:45	15:36 (16)	08:17	16:26 (15)	07:23	07:12
3	08:45	15:37 (16)	08:15	16:26 (15)	07:21	07:10
4	08:45	15:38 (16)	08:14	16:26 (15)	07:18	07:08
5	08:44	15:37 (16)	08:12	16:27 (15)	07:16	07:05
6	08:44	15:38 (16)	08:10	16:27 (15)	07:14	07:03
7	08:44	16:02 (16)	17:33	16:46 (15)	18:25	20:18
8	08:43	16:02 (16)	17:35	16:46 (15)	18:26	20:20
9	08:43	16:02 (16)	17:37	16:45 (15)	18:28	20:22
10	08:42	16:03 (16)	17:41	16:42 (15)	18:32	20:25
11	08:42	16:03 (16)	17:39	16:43 (15)	18:30	20:23
12	08:41	16:04 (16)	17:43	16:38 (15)	18:33	20:27
13	08:40	16:05 (16)	17:45	18:35	20:28	20:32
14	08:40	16:05 (16)	17:46	18:37	20:30	20:34
15	08:39	16:05 (16)	17:48	18:39	20:32	20:36
16	08:38	16:05 (16)	17:50	18:40	20:33	20:37
17	08:37	16:05 (16)	17:52	18:42	20:35	20:39
18	08:36	16:05 (16)	17:54	18:44	20:37	20:41
19	08:35	16:05 (16)	17:56	18:46	20:39	20:43
20	08:34	16:05 (16)	17:58	18:47	20:40	20:44
21	08:33	16:04 (16)	17:59	18:49	20:42	20:46
22	08:32	16:04 (16)	18:01	18:51	20:44	20:48
23	08:31	16:03 (16)	18:03	18:53	20:45	20:49
24	08:29	16:02 (16)	18:05	18:54	20:47	20:51
25	08:28	16:02 (16)	18:07	18:56	20:49	20:53
26	08:27	16:01 (16)	18:08	18:58	20:50	20:54
27	08:26	16:01 (16)	18:10	18:59	20:52	20:56
28	08:24	16:01 (16)	18:12	19:01	20:54	20:58
29	08:23	16:01 (16)	18:14	19:03	20:55	21:00
30	08:21	16:01 (16)	18:15	19:05	20:57	21:02
31	08:20	16:01 (16)	18:16	19:07	20:59	21:04
Potential sun hours	259	278	367	416	485	499
Total, worst case	594	183		1198		85
Sun reduction	0.16	0.21		0.35		0.37
Oper. time red.	1.00	1.00		1.00		1.00
Wind dir. red.	0.59	0.61		0.68		0.68
Total reduction	0.09	0.12		0.23		0.24
Total, real	53	23		281		21

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: G - H7

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December						
1	05:22 22:00	05:58 21:28	06:48 20:26	18:42 (5) 07:37 19:34 (4) 19:17	07:30 17:11	16:00 (15) 08:21 16:12 (15) 16:31	15:21 (16) 25 15:46 (16)					
2	05:22 22:00	06:00 21:27	06:49 20:24	18:42 (5) 07:38 19:33 (4) 19:15	07:32 17:09	15:59 (15) 08:23 16:13 (15) 16:30	15:22 (16) 25 15:47 (16)					
3	05:23 21:59	06:01 21:25	06:51 20:22	18:43 (5) 07:40 19:33 (4) 19:12	07:34 17:07	15:58 (15) 08:24 16:14 (15) 16:29	15:22 (16) 24 15:46 (16)					
4	05:24 21:59	06:03 21:23	06:53 20:19	18:44 (5) 07:42 19:32 (4) 19:10	07:36 17:05	15:57 (15) 08:25 16:15 (15) 16:29	15:23 (16) 24 15:47 (16)					
5	05:25 21:58	06:04 21:21	06:54 20:17	18:46 (5) 07:43 19:31 (4) 19:08	07:38 17:04	15:57 (15) 08:27 16:16 (15) 16:28	15:23 (16) 24 15:47 (16)					
6	05:25 21:58	06:06 21:20	06:56 20:15	18:48 (5) 07:45 19:31 (4) 19:05	07:39 17:02	15:56 (15) 08:28 16:16 (15) 16:28	15:24 (16) 24 15:48 (16)					
7	05:26 21:57	06:07 21:18	06:57 20:13	18:49 (5) 07:47 19:29 (4) 19:03	07:41 17:00	15:56 (15) 08:29 16:17 (15) 16:27	15:24 (16) 24 15:48 (16)					
8	05:27 21:57	06:09 21:16	19:04 (5) 06:59 19:12 (5) 20:10	18:54 (5) 07:48 19:27 (4) 19:01	07:43 16:59	15:56 (15) 08:31 16:17 (15) 16:27	15:25 (16) 23 15:48 (16)					
9	05:28 21:56	06:11 21:14	18:59 (5) 07:01 19:15 (5) 20:08	19:11 (4) 07:50 19:24 (4) 18:59	07:45 16:57	15:57 (15) 08:32 16:17 (15) 16:27	15:25 (16) 23 15:48 (16)					
10	05:29 21:55	06:12 21:12	18:57 (5) 07:02 19:18 (5) 20:06	19:15 (4) 07:52 19:20 (4) 18:56	07:46 16:55	15:57 (15) 08:33 16:17 (15) 16:27	15:26 (16) 23 15:49 (16)					
11	05:30 21:55	06:14 21:10	18:54 (5) 07:04 19:19 (5) 20:03	19:20 (4) 07:53 18:54 07:54	07:48 16:54	15:58 (15) 08:34 16:17 (15) 16:26	15:27 (16) 22 15:49 (16)					
12	05:31 21:54	06:15 21:08	18:53 (5) 07:06 19:21 (5) 20:01	18:53 (5) 07:06 18:52 07:55	07:50 16:52	15:58 (15) 08:35 16:15 (15) 16:26	15:27 (16) 23 15:50 (16)					
13	05:32 21:53	06:17 21:07	18:52 (5) 07:07 19:22 (5) 19:59	18:52 (5) 07:07 18:50 07:59	07:52 16:51	15:58 (15) 08:36 16:15 (15) 16:26	15:28 (16) 22 15:50 (16)					
14	05:34 21:52	06:19 21:05	18:50 (5) 07:09 19:23 (5) 19:56	18:50 (5) 07:09 18:48 07:59	07:54 16:49	16:00 (15) 08:37 16:14 (15) 16:26	15:29 (16) 21 15:50 (16)					
15	05:35 21:51	06:20 21:03	18:49 (5) 07:10 19:24 (5) 19:54	18:49 (5) 07:10 18:45 08:00	07:55 16:48	16:01 (15) 08:38 16:13 (15) 16:26	15:29 (16) 22 15:51 (16)					
16	05:36 21:50	06:22 21:01	18:47 (5) 07:12 19:24 (5) 19:52	18:47 (5) 07:12 18:43 08:02	07:57 16:46	16:04 (15) 08:39 16:11 (15) 16:26	15:29 (16) 21 15:50 (16)					
17	05:37 21:49	06:23 20:59	18:47 (5) 07:14 19:25 (5) 19:49	18:47 (5) 07:14 18:41 08:04	07:59 16:45	16:04 (15) 08:39 16:11 (15) 16:27	15:30 (16) 21 15:51 (16)					
18	05:38 21:48	06:25 20:57	18:45 (5) 07:15 19:25 (5) 19:47	18:45 (5) 07:15 18:39 08:06	08:01 16:44	15:27 (16) 08:40 15:34 (16) 16:27	15:31 (16) 20 15:51 (16)					
19	05:40 21:47	06:27 20:54	18:45 (5) 07:17 19:26 (5) 19:45	18:45 (5) 07:17 18:37 08:07	08:02 16:42	15:25 (16) 08:41 15:37 (16) 16:27	15:31 (16) 21 15:52 (16)					
20	05:41 21:45	06:28 20:52	18:44 (5) 07:19 19:25 (5) 19:42	18:44 (5) 07:19 18:35 08:09	08:04 16:41	15:24 (16) 08:42 15:38 (16) 16:27	15:32 (16) 21 15:52 (16)					
21	05:42 21:44	06:30 20:50	18:43 (5) 07:20 19:26 (5) 19:40	18:43 (5) 07:20 18:33 08:11	08:06 16:40	15:22 (16) 08:43 15:39 (16) 16:28	15:32 (16) 21 15:53 (16)					
22	05:44 21:43	06:31 20:48	18:42 (5) 07:22 19:25 (5) 19:38	18:42 (5) 07:22 18:30 08:13	08:07 16:39	15:22 (16) 08:43 15:40 (16) 16:28	15:32 (16) 21 15:53 (16)					
23	05:45 21:42	06:33 20:46	18:42 (5) 07:23 19:26 (4) 19:35	18:42 (5) 07:23 18:28 08:14	08:09 16:38	15:21 (16) 08:43 15:41 (16) 16:29	15:33 (16) 21 15:54 (16)					
24	05:46 21:40	06:35 20:44	18:41 (5) 07:25 19:29 (4) 19:33	18:41 (5) 07:25 18:26 08:16	08:11 16:37	15:21 (16) 08:44 15:42 (16) 16:29	15:33 (16) 21 15:54 (16)					
25	05:48 21:39	06:36 20:42	18:41 (5) 07:27 19:31 (4) 19:31	18:41 (5) 07:27 17:24 08:12	08:12 16:36	15:20 (16) 08:44 15:42 (16) 16:30	15:34 (16) 20 15:54 (16)					
26	05:49 21:37	06:38 20:40	18:41 (5) 07:28 19:32 (4) 19:28	18:41 (5) 07:28 17:22 08:14	08:13 16:35	15:42 (16) 08:44 15:43 (16) 16:31	15:34 (16) 21 15:55 (16)					
27	05:51 21:36	06:40 20:37	18:41 (5) 07:30 19:33 (4) 19:26	18:41 (5) 07:30 17:20 08:15	08:14 16:34	15:41 (16) 08:45 15:44 (16) 16:32	15:35 (16) 21 15:56 (16)					
28	05:52 21:35	06:41 20:35	18:41 (5) 07:32 19:34 (4) 19:24	18:41 (5) 07:32 17:18 08:17	08:15 16:33	15:41 (16) 08:45 15:45 (16) 16:32	15:35 (16) 22 15:57 (16)					
29	05:54 21:33	06:43 20:33	18:41 (5) 07:33 19:34 (4) 19:21	18:41 (5) 07:33 17:16 08:18	08:18 16:32	15:21 (16) 08:45 15:45 (16) 16:33	15:36 (16) 21 15:57 (16)					
30	05:55 21:31	06:44 20:31	18:42 (5) 07:35 19:35 (4) 19:19	18:42 (5) 07:35 17:15 08:20	08:20 16:31	15:22 (16) 08:45 15:46 (16) 16:34	15:36 (16) 22 15:58 (16)					
31	05:57 21:30	06:46 20:28	18:41 (5) 07:36 19:34 (4) 19:18	18:41 (5) 07:36 17:13 08:29	08:21 16:30	15:22 (16) 08:45 16:03 (15) 16:09 (15)	15:36 (16) 22 15:58 (16)					
Potential sun hours	502	454	381	331	266	244						
Total, worst case			936	373	6	515						686
Sun reduction			0.30	0.28	0.24	0.18						0.13
Oper. time red.			1.00	1.00	1.00	1.00						1.00
Wind dir. red.			0.68	0.68	0.61	0.60						0.58
Total reduction			0.20	0.19	0.14	0.11						0.08
Total, real			184	70	1	56						53

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: H - H8

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45	10:06 (10)	08:18	07:25	07:14	06:10
	16:36	69 11:33 (9)	17:24	18:16	20:10	21:01
2	08:45	10:05 (10)	08:17	07:23	07:12	06:08
	16:37	70 11:33 (9)	17:26	18:18	20:11	21:02
3	08:45	10:06 (10)	08:15	07:21	07:10	06:06
	16:39	70 11:34 (9)	17:28	18:19	20:13	21:04
4	08:45	10:07 (10)	08:14	08:55 (12)	07:19	07:08
	16:40	69 11:34 (9)	17:30	2	08:57 (12)	18:21
5	08:45	10:07 (10)	08:12	08:51 (12)	07:16	07:05
	16:41	69 11:34 (9)	17:32	10	09:01 (12)	18:23
6	08:44	10:08 (10)	08:10	08:49 (12)	07:14	07:03
	16:42	69 11:35 (9)	17:33	14	09:03 (12)	18:25
7	08:44	10:08 (10)	08:09	08:47 (12)	07:12	07:01
	16:43	69 11:35 (9)	17:35	17	09:04 (12)	18:27
8	08:43	10:09 (10)	08:07	08:46 (12)	07:10	06:59
	16:45	68 11:36 (9)	17:37	19	09:05 (12)	18:28
9	08:43	10:09 (10)	08:05	08:46 (12)	07:07	06:56
	16:46	67 11:35 (9)	17:39	20	09:06 (12)	18:30
10	08:42	10:09 (10)	08:03	08:45 (12)	07:05	06:54
	16:47	67 11:35 (9)	17:41	22	09:07 (12)	18:32
11	08:42	10:10 (10)	08:02	08:46 (12)	07:03	06:52
	16:49	66 11:36 (9)	17:43	22	09:08 (12)	18:34
12	08:41	10:11 (10)	08:00	08:45 (12)	07:01	06:50
	16:50	65 11:36 (9)	17:45	23	09:08 (12)	18:35
13	08:41	10:11 (10)	07:58	08:45 (12)	06:58	06:47
	16:52	64 11:36 (9)	17:46	23	09:08 (12)	18:37
14	08:40	10:12 (10)	07:56	08:45 (12)	06:56	06:45
	16:53	63 11:36 (9)	17:48	23	09:08 (12)	18:39
15	08:39	10:12 (10)	07:54	08:46 (12)	06:54	06:43
	16:55	62 11:36 (9)	17:50	22	09:08 (12)	18:41
16	08:38	10:13 (10)	07:52	08:46 (12)	06:51	06:41
	16:56	58 11:35 (9)	17:52	21	09:07 (12)	18:42
17	08:37	10:14 (10)	07:50	08:46 (12)	06:49	06:39
	16:58	56 11:35 (9)	17:54	19	09:05 (12)	18:44
18	08:36	10:15 (10)	07:48	08:47 (12)	06:47	06:36
	17:00	54 11:35 (9)	17:56	17	09:04 (12)	18:46
19	08:35	10:17 (10)	07:46	08:49 (12)	06:45	06:34
	17:01	50 11:35 (9)	17:58	14	09:03 (12)	18:47
20	08:34	10:18 (10)	07:44	08:51 (12)	06:42	06:32
	17:03	45 11:33 (9)	17:59	9	09:00 (12)	18:49
21	08:33	10:20 (10)	07:42	06:40	06:30	06:20
	17:05	40 11:33 (9)	18:01	18:51	20:44	21:32
22	08:32	11:04 (9)	07:40	06:38	06:28	06:18
	17:06	28 11:32 (9)	18:03	18:53	20:45	21:34
23	08:31	11:05 (9)	07:38	06:35	06:26	06:16
	17:08	25 11:30 (9)	18:05	18:54	20:47	21:35
24	08:30	11:08 (9)	07:36	06:33	06:24	06:14
	17:10	21 11:29 (9)	18:07	18:56	20:49	21:36
25	08:28	11:11 (9)	07:34	06:31	06:22	06:12
	17:12	16 11:27 (9)	18:09	18:58	20:51	21:38
26	08:27	11:15 (9)	07:32	06:28	06:20	06:10
	17:13	7 11:22 (9)	18:10	19:00	20:52	21:39
27	08:26		07:29	06:26	06:18	06:08
	17:15		18:12	19:01	20:54	21:40
28	08:24		07:27	06:24	06:16	06:06
	17:17		18:14	19:03	20:56	21:42
29	08:23			07:21	06:14	06:04
	17:19			20:05	20:57	21:43
30	08:21			07:19	06:12	06:02
	17:21			20:06	20:59	21:44
31	08:20			07:17		06:00
	17:22			20:08		21:45
Potential sun hours	259	278	367	416	485	499
Total, worst case	1407	297				
Sun reduction	0.16	0.21				
Oper. time red.	1.00	1.00				
Wind dir. red.	0.63	0.68				
Total reduction	0.10	0.14				
Total, real	138	42				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: H - H8

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22	05:58	06:48	07:37	07:31	08:15 (12) 08:21 09:52 (10)
	22:00	21:28	20:26	19:17	17:11	21 08:36 (12) 16:31 66 11:18 (9)
2	05:22	06:00	06:49	07:38	07:32	08:15 (12) 08:23 09:52 (10)
	22:00	21:27	20:24	19:15	17:09	21 08:36 (12) 16:30 67 11:18 (9)
3	05:23	06:01	06:51	07:40	07:34	08:16 (12) 08:24 09:53 (10)
	22:00	21:25	20:22	19:12	17:07	19 08:35 (12) 16:29 67 11:19 (9)
4	05:24	06:03	06:53	07:42	07:36	08:17 (12) 08:26 09:53 (10)
	21:59	21:23	20:20	19:10	17:05	17 08:34 (12) 16:29 68 11:20 (9)
5	05:25	06:04	06:54	07:43	07:38	08:19 (12) 08:27 09:53 (10)
	21:59	21:22	20:17	19:08	17:04	14 08:33 (12) 16:28 69 11:20 (9)
6	05:25	06:06	06:56	07:45	07:40	08:21 (12) 08:28 09:54 (10)
	21:58	21:20	20:15	19:06	17:02	10 08:31 (12) 16:28 69 11:21 (9)
7	05:26	06:07	06:58	07:47	07:41	08:30 09:54 (10)
	21:58	21:18	20:13	19:03	17:00	16:27 69 11:21 (9)
8	05:27	06:09	06:59	07:49	07:43	08:31 09:54 (10)
	21:57	21:16	20:10	19:01	16:59	16:27 69 11:21 (9)
9	05:28	06:11	07:01	07:50	07:45	08:32 09:55 (10)
	21:56	21:14	20:08	18:59	16:57	16:27 70 11:23 (9)
10	05:29	06:12	07:02	07:52	07:47	08:33 09:55 (10)
	21:56	21:12	20:06	18:56	16:55	16:27 69 11:23 (9)
11	05:30	06:14	07:04	07:54	07:48	08:34 09:56 (10)
	21:55	21:11	20:04	18:54	16:54	16:26 69 11:23 (9)
12	05:31	06:15	07:06	07:55	07:50	08:35 09:56 (10)
	21:54	21:09	20:01	18:52	16:52	16:26 70 11:24 (9)
13	05:32	06:17	07:07	07:57	07:52	08:36 09:57 (10)
	21:53	21:07	19:59	18:50	16:51	16:26 68 11:24 (9)
14	05:34	06:19	07:09	07:59	07:54	08:37 09:57 (10)
	21:52	21:05	19:57	18:48	16:49	16:26 70 11:25 (9)
15	05:35	06:20	07:11	08:00	07:56	08:38 09:58 (10)
	21:51	21:03	19:54	18:45	16:48	16:26 69 11:25 (9)
16	05:36	06:22	07:12	08:02	07:57	10:48 (9) 08:39 09:59 (10)
	21:50	21:01	19:52	18:43	16:46	7 10:55 (9) 16:26 69 11:26 (9)
17	05:37	06:23	07:14	08:04	07:59	10:44 (9) 08:40 09:58 (10)
	21:49	20:59	19:50	18:41	16:45	16 11:00 (9) 16:27 69 11:26 (9)
18	05:38	06:25	07:15	08:06	08:01	10:42 (9) 08:40 09:59 (10)
	21:48	20:57	19:47	18:39	16:44	21 11:03 (9) 16:27 70 11:27 (9)
19	05:40	06:27	07:17	08:07	08:02	10:40 (9) 08:41 10:00 (10)
	21:47	20:55	19:45	18:37	16:42	25 11:05 (9) 16:27 69 11:27 (9)
20	05:41	06:28	07:19	08:09	08:04	10:39 (9) 08:42 10:00 (10)
	21:46	20:53	19:43	18:35	16:41	28 11:07 (9) 16:28 69 11:27 (9)
21	05:42	06:30	07:20	08:11	08:06	09:56 (10) 08:42 10:01 (10)
	21:44	20:50	19:40	18:33	16:40	40 11:09 (9) 16:28 68 11:28 (9)
22	05:44	06:32	07:22	08:13	09:21 (12) 08:07	09:54 (10) 08:43 10:01 (10)
	21:43	20:48	19:38	18:31	10 09:31 (12) 16:39	45 11:09 (9) 16:28 68 11:28 (9)
23	05:45	06:33	07:24	08:14	09:19 (12) 08:09	09:53 (10) 08:43 10:02 (10)
	21:42	20:46	19:36	18:28	15 09:34 (12) 16:38	50 11:11 (9) 16:29 69 11:29 (9)
24	05:46	06:35	07:25	08:16	09:17 (12) 08:11	09:53 (10) 08:44 10:02 (10)
	21:41	20:44	19:33	18:26	18 09:35 (12) 16:37	53 11:12 (9) 16:29 69 11:29 (9)
25	05:48	06:36	07:27	07:18	08:16 (12) 08:12	09:52 (10) 08:44 10:03 (10)
	21:39	20:42	19:31	17:24	20 08:36 (12) 16:36	56 11:13 (9) 16:30 69 11:30 (9)
26	05:49	06:38	07:29	07:20	08:16 (12) 08:14	09:51 (10) 08:45 10:03 (10)
	21:38	20:40	19:29	17:22	21 08:37 (12) 16:35	59 11:13 (9) 16:31 69 11:31 (9)
27	05:51	06:40	07:30	07:22	08:15 (12) 08:15	09:52 (10) 08:45 10:04 (10)
	21:36	20:38	19:26	17:20	22 08:37 (12) 16:34	61 11:15 (9) 16:32 69 11:31 (9)
28	05:52	06:41	07:32	07:23	08:15 (12) 08:17	09:52 (10) 08:45 10:04 (10)
	21:35	20:35	19:24	17:18	23 08:38 (12) 16:33	63 11:16 (9) 16:32 69 11:31 (9)
29	05:54	06:43	07:33	07:25	08:14 (12) 08:19	09:51 (10) 08:45 10:04 (10)
	21:33	20:33	19:22	17:17	23 08:37 (12) 16:32	64 11:16 (9) 16:33 69 11:32 (9)
30	05:55	06:45	07:35	07:27	08:14 (12) 08:20	09:52 (10) 08:45 10:05 (10)
	21:32	20:31	19:19	17:15	23 08:37 (12) 16:31	65 11:17 (9) 16:34 69 11:32 (9)
31	05:57	06:46	07:37	07:29	08:14 (12) 08:21	08:45 10:05 (10)
	21:30	20:29	19:17	17:13	23 08:37 (12) 16:30	70 11:33 (9)
Potential sun hours	502	454	381	331	266	244
Total, worst case				198	755	2133
Sun reduction				0.24	0.18	0.13
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.68	0.64	0.64
Total reduction				0.16	0.12	0.09
Total, real				32	89	182

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: J - H10

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

Day	January		February		March		April		May		June	
	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set
1	08:45	16:36	15:29 (16)	08:18	07:25		07:14	18:19 (5)	06:10	05:25		
2	08:45	16:37	15:30 (16)	08:17	07:23		07:12	18:20 (5)	06:08	05:24		
3	08:45	16:39	15:31 (16)	08:15	07:21		07:10	18:20 (5)	06:06	05:23		
4	08:45	16:40	15:33 (16)	08:14	07:18		07:08	18:22 (5)	06:04	05:22		20:56 (11)
5	08:44	16:41	15:33 (16)	08:12	07:16		07:05	18:25 (5)	06:02	05:21		20:54 (11)
6	08:44	16:42	15:34 (16)	08:10	07:14		07:03	18:28 (5)	06:00	05:21		20:52 (11)
7	08:44	16:43	15:35 (16)	08:08	07:12		07:01	18:39 (5)	05:59	05:20		20:51 (11)
8	08:43	16:43	15:35 (16)	08:07	07:09		06:58		05:57	05:20		20:50 (11)
9	08:43	16:44	15:37 (16)	08:05	07:07		06:56		05:55	05:19		20:49 (11)
10	08:42	16:44	15:39 (16)	08:03	07:05		06:54		05:53	05:19		20:48 (11)
11	08:42	16:45	15:41 (16)	08:01	07:03		06:52		05:52	05:18		20:48 (11)
12	08:41	16:45	15:46 (16)	07:59	07:00		06:49		05:50	05:18		20:48 (11)
13	08:40	16:52		07:58	06:58	12	17:34 (5)	06:47	05:48	05:18		20:48 (11)
14	08:40	16:53		07:56	06:56	19	17:46 (5)	06:45	05:47	05:18		20:48 (11)
15	08:39	16:55		07:54	06:54	24	17:49 (5)	06:43	05:45	05:17		20:48 (11)
16	08:38	16:56		07:52	06:51	28	17:51 (5)	06:41	05:44	05:17		20:47 (11)
17	08:37	16:58		07:50	06:49	30	17:53 (5)	06:38	05:42	05:17		20:47 (11)
18	08:36	17:00		07:48	06:47	33	17:54 (5)	06:36	05:41	05:17		20:47 (11)
19	08:35	17:01		07:46	06:44	40	17:55 (5)	06:34	05:39	05:17		20:48 (11)
20	08:34	17:03		07:44	06:42	49	18:10 (4)	06:32	05:38	05:17		20:48 (11)
21	08:33	17:05		07:42	06:40	55	18:14 (4)	06:30	05:37	05:17		20:48 (11)
22	08:32	17:06		07:40	06:37	58	18:15 (4)	06:28	05:35	05:18		20:48 (11)
23	08:31	17:08		07:38	06:35	60	18:17 (5)	06:26	05:34	05:18		20:48 (11)
24	08:29	17:10		07:36	06:33	61	18:18 (4)	06:24	05:33	05:18		20:49 (11)
25	08:28	17:11		07:34	06:31	61	18:19 (4)	06:22	05:32	05:19		20:49 (11)
26	08:27	17:12		07:31	06:28	62	18:18 (4)	06:20	05:30	05:19		20:50 (11)
27	08:26	17:13		07:29	06:26	62	18:17 (5)	06:18	05:29	05:19		20:50 (11)
28	08:24	17:15		07:27	06:24	61	18:19 (4)	06:16	05:28	05:20		20:50 (11)
29	08:23	17:17		07:25	06:22	61	18:17 (4)	06:14	05:27	05:20		20:51 (11)
30	08:21	17:19		07:21	06:19	60	18:17 (5)	06:12	05:27	05:21		20:52 (11)
31	08:20	17:20		07:19	06:17	59	18:18 (5)	06:10	05:26	05:21		20:52 (11)
	08:20	17:22		07:17	06:15	57	18:17 (5)	06:08	05:25	05:21		20:52 (11)
Potential sun hours	259	278	367		416	485	499	613				
Total, worst case	163	0.16	0.35	1.00	0.66	0.23						
Sun reduction	0.16		1.00	0.66	0.23							
Oper. time red.	1.00		0.66	0.23								
Wind dir. red.	0.59		0.16	0.66	0.23							
Total reduction	0.09		0.16	0.66	0.23							
Total, real	15		141	44	125							

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: J - H10

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22	20:52 (11)	05:58	06:48	07:37	18:19 (5)
	22:00	23 21:15 (11)	21:28	20:26	19:17	1 18:20 (5)
2	05:22	20:53 (11)	06:00	06:49	07:38	07:32
	22:00	22 21:15 (11)	21:27	20:24	19:15	17:09
3	05:23	20:54 (11)	06:01	06:51	07:40	07:34
	21:59	21 21:15 (11)	21:25	20:22	19:12	17:07
4	05:24	20:55 (11)	06:03	06:53	07:42	07:36
	21:59	18 21:13 (11)	21:23	20:19	19:10	17:05
5	05:25	20:56 (11)	06:04	06:54	07:43	07:38
	21:58	17 21:13 (11)	21:21	20:17	19:08	17:04
6	05:25	20:57 (11)	06:06	06:56	18:25 (5)	07:39
	21:58	15 21:12 (11)	21:20	20:15	18:35 (5)	17:02
7	05:26	20:59 (11)	06:07	06:57	18:20 (5)	07:41
	21:57	12 21:11 (11)	21:18	20:13	18:38 (5)	17:00
8	05:27	21:01 (11)	06:09	06:59	18:18 (5)	07:48
	21:57	8 21:09 (11)	21:16	20:10	18:40 (5)	16:58
9	05:28		06:11	07:01	18:15 (5)	07:50
	21:56		21:14	20:08	19:03 (4)	16:57
10	05:29		06:12	07:02	18:13 (5)	07:52
	21:55		21:12	20:06	19:05 (4)	16:55
11	05:30		06:14	07:04	18:11 (5)	07:53
	21:55		21:10	20:03	19:06 (4)	16:54
12	05:31		06:15	07:06	18:10 (5)	07:55
	21:54		21:08	20:01	19:07 (4)	16:52
13	05:32		06:17	07:07	18:08 (5)	07:57
	21:53		21:07	19:59	19:07 (4)	16:51
14	05:34		06:19	07:09	18:07 (5)	07:59
	21:52		21:05	19:56	19:07 (4)	16:49
15	05:35		06:20	07:10	18:07 (5)	08:00
	21:51		21:03	19:54	19:08 (4)	16:48
16	05:36		06:22	07:12	18:05 (5)	08:02
	21:50		21:01	19:52	19:07 (4)	16:46
17	05:37		06:23	07:14	18:05 (5)	08:04
	21:49		20:59	19:49	19:07 (4)	16:45
18	05:38		06:25	07:15	18:04 (5)	08:06
	21:48		20:57	19:47	19:06 (4)	16:44
19	05:40		06:27	07:17	18:04 (5)	08:07
	21:47		20:54	19:45	19:05 (4)	16:42
20	05:41		06:28	07:19	18:04 (5)	08:09
	21:45		20:52	19:42	19:05 (4)	16:41
21	05:42		06:30	07:20	18:03 (5)	08:11
	21:44		20:50	19:40	19:03 (4)	16:40
22	05:44		06:31	07:22	18:04 (5)	08:13
	21:43		20:48	19:38	19:01 (4)	16:39
23	05:45		06:33	07:23	18:03 (5)	08:14
	21:42		20:46	19:35	18:59 (4)	16:38
24	05:46		06:35	07:25	18:04 (5)	08:16
	21:40		20:44	19:33	18:56 (4)	16:37
25	05:48		06:36	07:27	18:05 (5)	07:18
	21:39		20:42	19:31	18:39 (5)	16:36
26	05:49		06:38	07:28	18:05 (5)	07:20
	21:37		20:40	19:28	18:36 (5)	16:35
27	05:51		06:40	07:30	18:06 (5)	07:21
	21:36		20:37	19:26	18:35 (5)	16:34
28	05:52		06:41	07:32	18:08 (5)	07:23
	21:35		20:35	19:24	18:33 (5)	16:33
29	05:54		06:43	07:33	18:09 (5)	07:25
	21:33		20:33	19:21	18:30 (5)	16:32
30	05:55		06:44	07:35	18:12 (5)	07:27
	21:31		20:31	19:19	18:27 (5)	16:31
31	05:57		06:46			07:29
	21:30		20:28			17:13
Potential sun hours	502	454	381	331	266	244
Total, worst case	136		1096		1	568
Sun reduction	0.27		0.28		0.24	0.13
Oper. time red.	1.00		1.00		1.00	1.00
Wind dir. red.	0.69		0.66		0.65	0.59
Total reduction	0.18		0.18		0.15	0.08
Total, real	25		202		0	45

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: K - H11

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec. Values range from 1.06 to 2.04.

Operational time

Table with 13 columns: N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum. Values range from 194 to 8,760.

Main shadow calculation table with columns for months (January to June) and rows for days (1 to 31). Includes potential sun hours and reduction metrics.

Table layout: For each day in each month the following matrix apply

Matrix with 4 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time).

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: K - H11

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (July-December) and rows for each day of the month, including start/end times and potential sun hours.

Table layout: For each day in each month the following matrix apply

Summary table with 4 columns: Day in month, Sun rise/set, Minutes with flicker, and First/Last time with flicker.

Project:

6225Gortyrahill_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: L - H12

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

	January	February	March	April	May	June	July	August	September	October	November	December			
1	08:45	12:53 (9)	08:18	09:38 (12)	07:25	07:14	06:10	05:25	05:22	05:58	06:48	07:37	07:31	08:21	12:47 (9)
2	08:45	12:53 (9)	08:17	09:39 (12)	07:23	07:12	06:08	05:24	05:22	06:00	06:49	07:38	07:32	08:23	12:45 (9)
3	08:45	12:54 (9)	08:15	09:40 (12)	07:21	07:11	06:06	05:23	05:23	06:01	06:51	07:40	07:34	08:24	12:45 (9)
4	08:45	12:56 (9)	08:14	09:42 (12)	07:18	07:08	06:04	05:22	05:24	06:03	06:53	07:42	07:36	08:26	12:44 (9)
5	08:45	12:56 (9)	08:12	09:43 (12)	07:16	07:05	06:02	05:21	05:25	06:04	06:54	07:43	07:38	08:27	12:43 (9)
6	08:44	12:57 (9)	08:10	09:45 (12)	07:14	07:03	06:00	05:21	05:25	06:06	06:56	07:45	07:40	08:28	12:44 (9)
7	08:44	12:58 (9)	08:09	09:56 (12)	07:12	07:01	05:59	05:20	05:26	06:07	06:58	07:47	07:41	08:30	12:43 (9)
8	08:43	13:00 (9)	08:07	07:10	06:58	05:57	05:20	05:27	06:09	06:59	07:49	07:43	07:37	08:31	12:43 (9)
9	08:43	13:01 (9)	08:05	07:07	06:56	05:55	05:19	05:28	06:11	07:01	07:50	07:45	07:39	08:32	12:44 (9)
10	08:42	13:02 (9)	08:03	07:05	06:54	05:53	05:19	05:29	06:12	07:02	07:52	07:47	07:41	08:33	12:43 (9)
11	08:42	13:04 (9)	08:01	07:03	06:52	05:52	05:18	05:30	06:14	07:04	07:54	07:48	07:42	08:34	12:43 (9)
12	08:41	13:04 (9)	08:00	07:01	06:50	05:50	05:18	05:31	06:15	07:06	07:55	07:50	07:44	08:35	11:13 (10)
13	08:41	13:23 (9)	07:45	07:01	06:50	05:50	05:18	05:31	06:15	07:06	07:55	07:50	07:44	08:35	11:13 (10)
14	08:40	13:23 (9)	07:43	06:58	06:47	05:48	05:18	05:32	06:17	07:07	07:57	07:52	07:46	08:36	11:11 (10)
15	08:39	13:24 (9)	07:41	06:56	06:45	05:47	05:18	05:33	06:19	07:09	07:59	07:54	07:48	08:37	11:11 (10)
16	08:38	13:24 (9)	07:39	06:54	06:43	05:45	05:17	05:35	06:20	07:11	08:00	07:55	07:49	08:38	11:11 (10)
17	08:37	13:25 (9)	07:37	06:51	06:41	05:44	05:17	05:36	06:22	07:12	08:02	07:57	07:51	08:39	11:11 (10)
18	08:36	13:26 (9)	07:35	06:48	06:38	05:42	05:16	05:37	06:23	07:13	08:03	07:58	07:52	08:40	11:10 (10)
19	08:35	13:27 (9)	07:33	06:46	06:36	05:41	05:15	05:38	06:25	07:15	08:06	08:01	07:55	08:41	11:10 (10)
20	08:34	13:28 (9)	07:31	06:44	06:34	05:40	05:14	05:39	06:27	07:17	08:07	08:02	07:58	08:42	11:10 (10)
21	08:33	13:29 (9)	07:29	06:42	06:32	05:38	05:13	05:41	06:28	07:19	08:09	08:04	07:59	08:43	11:10 (10)
22	08:32	13:30 (9)	07:27	06:40	06:30	05:37	05:12	05:42	06:30	07:20	08:11	08:06	07:59	08:44	11:10 (10)
23	08:31	13:31 (9)	07:25	06:38	06:28	05:35	05:11	05:44	06:32	07:22	08:13	08:07	07:59	08:45	11:10 (10)
24	08:30	13:32 (9)	07:23	06:36	06:26	05:34	05:10	05:45	06:33	07:24	08:14	08:09	07:59	08:46	11:10 (10)
25	08:29	13:33 (9)	07:21	06:34	06:24	05:33	05:09	05:46	06:35	07:25	08:16	08:11	07:59	08:47	11:10 (10)
26	08:28	13:34 (9)	07:19	06:32	06:22	05:32	05:08	05:47	06:36	07:26	08:17	08:12	07:59	08:48	11:10 (10)
27	08:27	13:35 (9)	07:17	06:30	06:20	05:31	05:07	05:48	06:37	07:27	08:18	08:13	07:59	08:49	11:10 (10)
28	08:26	13:36 (9)	07:15	06:28	06:18	05:30	05:06	05:49	06:38	07:28	08:19	08:14	07:59	08:50	11:10 (10)
29	08:25	13:37 (9)	07:13	06:26	06:16	05:29	05:05	05:50	06:39	07:29	08:20	08:15	07:59	08:51	11:10 (10)
30	08:24	13:38 (9)	07:11	06:24	06:14	05:28	05:04	05:51	06:40	07:30	08:21	08:16	07:59	08:52	11:10 (10)
31	08:23	13:39 (9)	07:09	06:22	06:12	05:27	05:03	05:52	06:41	07:31	08:22	08:17	07:59	08:53	11:10 (10)
Potential sun hours	259	278	367	416	485	499	502	454	381	331	266	583	244	1211	13:26 (9)
Total, worst case	782	110													
Sun reduction	0.16	0.21										0.18		0.13	
Oper. time red.	1.00	1.00										1.00		1.00	
Wind dir. red.	0.64	0.66										0.66		0.61	
Total reduction	0.10	0.14										0.12		0.08	
Total, real	77	15										71		99	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 1 **Shadow receptor:** M - H13

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 16:36	08:18 17:24	07:25 18:16	07:14 20:10	18:36 (5) 21:00	06:10 21:46
2	08:45 16:37	08:17 17:26	07:23 18:17	07:12 20:11	18:36 (5) 19:21 (4)	06:08 21:02
3	08:45 16:38	08:15 17:28	07:21 18:19	07:10 20:13	18:36 (5) 19:19 (4)	06:06 21:04
4	08:45 16:40	08:13 17:30	07:18 18:21	07:07 20:15	18:37 (5) 19:18 (4)	06:04 21:05
5	08:44 16:41	08:12 17:31	07:16 18:23	07:05 20:16	18:37 (5) 19:16 (4)	06:02 21:07
6	08:44 16:42	08:10 17:33	07:14 18:25	07:03 20:18	18:39 (5) 19:13 (4)	06:00 21:09
7	08:44 16:43	08:08 17:35	07:12 18:26	07:01 20:20	18:39 (5) 18:59 (5)	05:59 21:10
8	08:43 16:45	08:07 17:37	07:09 18:28	06:58 20:22	18:41 (5) 18:57 (5)	05:57 21:12
9	08:43 16:46	08:05 17:39	07:07 18:30	06:56 20:23	18:44 (5) 18:54 (5)	05:55 21:14
10	08:42 16:47	08:03 17:41	07:05 18:32	06:54 20:25	05:53 21:15	05:19 21:55
11	08:42 16:49	08:01 17:43	07:03 18:33	06:52 20:27	05:52 21:17	05:18 21:56
12	08:41 16:50	07:59 17:45	07:00 18:35	06:49 20:28	05:50 21:18	05:16 21:56
13	08:40 16:52	07:58 17:46	06:58 18:37	06:47 20:30	05:48 21:20	05:18 21:57
14	08:40 16:53	07:56 17:48	06:56 18:39	06:45 20:32	05:47 21:22	05:18 21:57
15	08:39 16:55	07:54 17:50	06:54 18:40	06:43 20:33	05:45 21:23	05:17 21:58
16	08:38 16:56	07:52 17:52	06:51 18:42	06:41 20:35	05:44 21:25	05:17 21:59
17	08:37 16:58	07:50 17:54	06:49 18:44	06:38 20:37	05:42 21:26	05:17 21:59
18	08:36 17:00	07:48 17:56	06:47 18:46	06:36 20:39	05:41 21:28	05:17 21:59
19	08:35 17:01	07:46 17:57	06:44 18:47	06:34 20:40	05:39 21:29	05:17 22:00
20	08:34 17:03	07:44 17:59	06:42 18:49	06:32 20:42	05:38 21:31	05:17 22:00
21	08:33 17:05	07:42 18:01	06:40 18:51	17:52 (5) 17:56 (5)	06:30 20:44	05:17 22:00
22	08:32 17:06	07:40 18:03	06:37 18:53	17:47 (5) 18:01 (5)	06:28 20:45	05:18 22:01
23	08:31 17:08	07:38 18:05	06:35 18:54	17:45 (5) 18:03 (5)	06:26 20:47	05:18 22:01
24	08:29 17:10	07:36 18:07	06:33 18:56	17:42 (5) 18:16 (4)	06:24 20:49	05:18 22:01
25	08:28 17:11	07:33 18:08	06:31 18:58	17:41 (5) 18:19 (4)	06:22 20:50	05:18 22:01
26	08:27 17:13	07:31 18:10	06:28 18:59	17:40 (5) 18:21 (4)	06:20 20:52	05:19 22:01
27	08:26 17:15	07:29 18:12	06:26 19:01	17:39 (5) 18:22 (4)	06:18 20:54	05:19 22:01
28	08:24 17:17	07:27 18:14	06:24 19:03	17:37 (5) 18:22 (4)	06:16 20:55	05:20 22:01
29	08:23 17:19	07:21 19:04	06:14 20:04	18:37 (5) 19:22 (4)	06:14 20:57	05:20 22:01
30	08:21 17:20	07:19 20:06	06:12 20:06	18:37 (5) 19:22 (4)	06:12 20:59	05:21 22:00
31	08:20 17:22	07:17 20:08	06:11 20:08	18:36 (5) 19:21 (4)	06:11 21:45	05:21 22:00
Potential sun hours	259	278	367	416	485	499
Total, worst case			365	372	482	1087
Sun reduction			0.24	0.35	0.37	0.30
Oper. time red.			1.00	1.00	1.00	1.00
Wind dir. red.			0.67	0.67	0.68	0.69
Total reduction			0.16	0.24	0.25	0.21
Total, real			59	88	121	224

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: N - H14

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with columns: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec and values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with columns: N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum and values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January to June) and rows for sun rise/set times and reduction percentages. Includes a summary table at the bottom with 'Potential sun hours', 'Total, worst case', 'Sun reduction', 'Oper. time red.', 'Wind dir. red.', 'Total reduction', 'Total, real'.

Table layout: For each day in each month the following matrix apply

Matrix layout table with columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: N - H14

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22	05:58	06:27 (9)	06:48	07:14 (8)	07:37
	22:00	21:28	19 06:46 (9)	20:26	31 07:45 (8)	19:17
2	05:22	06:00	06:28 (9)	06:50	07:15 (8)	07:38
	22:00	21:27	17 06:45 (9)	20:24	29 07:44 (8)	19:15
3	05:23	06:01	06:30 (9)	06:51	07:17 (8)	07:40
	22:00	21:25	15 06:45 (9)	20:22	26 07:43 (8)	19:12
4	05:24	06:03	06:31 (9)	06:53	07:19 (8)	07:42
	21:59	21:23	14 06:45 (9)	20:20	23 07:42 (8)	19:10
5	05:25	06:04	06:33 (9)	06:54	07:20 (8)	07:44
	21:59	21:22	12 06:45 (9)	20:17	31 07:53 (10)	19:08
6	05:26	06:06	06:34 (9)	06:56	07:22 (8)	07:45
	21:58	21:20	10 06:44 (9)	20:15	31 07:55 (10)	19:06
7	05:26	06:08	06:36 (9)	06:58	07:23 (8)	07:47
	21:58	21:18	8 06:44 (9)	20:13	30 07:55 (10)	19:03
8	05:27	06:09	06:37 (9)	06:59	07:25 (8)	07:49
	21:57	21:16	5 06:42 (9)	20:11	28 07:56 (10)	19:01
9	05:28	06:11	06:39 (9)	07:01	07:26 (8)	07:50
	21:56	21:14	3 06:42 (9)	20:08	26 07:56 (10)	18:59
10	05:29	06:12	07:03	07:03	07:36 (10)	07:52
	21:56	21:13	20:06	20	07:56 (10)	18:57
11	05:30	06:14	07:04	07:04	07:35 (10)	07:54
	21:55	21:11	20:04	31	08:28 (7)	18:54
12	05:31	06:15	07:06	07:06	07:35 (10)	07:55
	21:54	21:09	20:01	37	08:31 (7)	18:52
13	05:33	06:17	07:07	07:07	07:36 (10)	07:57
	21:53	21:07	19:59	40	08:33 (7)	18:50
14	05:34	06:19	07:09	07:09	07:36 (10)	07:59
	21:52	21:05	19:57	41	08:34 (7)	18:48
15	05:35	06:20	07:11	07:11	07:37 (10)	08:01
	21:51	21:03	8 07:35 (8)	19:54	41	08:35 (7)
16	05:36	06:22	07:12	07:12	07:38 (10)	08:02
	21:50	3 06:32 (9)	21:01	16	07:38 (8)	19:52
17	05:37	06:24	07:14	07:14	07:41 (10)	08:04
	21:49	9 06:26 (9)	20:59	21	07:41 (8)	19:50
18	05:38	06:25	07:15	07:15	08:06 (7)	08:06
	21:48	13 06:37 (9)	20:57	24	07:42 (8)	19:47
19	05:40	06:27	07:17	07:17	08:05 (7)	08:07
	21:47	15 06:39 (9)	20:55	27	07:44 (8)	19:45
20	05:41	06:28	07:18	07:18	08:04 (7)	08:09
	21:46	17 06:40 (9)	20:53	29	07:44 (8)	19:43
21	05:42	06:30	07:19	07:19	08:03 (7)	08:11
	21:44	19 06:41 (9)	20:50	31	07:45 (8)	19:40
22	05:44	06:32	07:20	07:20	08:04 (7)	08:13
	21:43	20 06:41 (9)	20:48	33	07:45 (8)	19:38
23	05:45	06:33	07:21	07:21	08:04 (7)	08:14
	21:42	22 06:43 (9)	20:46	34	07:46 (8)	19:36
24	05:46	06:35	07:22	07:22	08:03 (7)	08:16
	21:41	23 06:43 (9)	20:44	36	07:47 (8)	19:33
25	05:48	06:37	07:23	07:23	08:04 (7)	07:18
	21:39	25 06:44 (9)	20:42	37	07:47 (8)	19:31
26	05:49	06:38	07:24	07:24	08:05 (7)	07:20
	21:38	26 06:45 (9)	20:40	37	07:47 (8)	19:29
27	05:51	06:40	07:25	07:25	08:05 (7)	07:22
	21:36	25 06:45 (9)	20:38	38	07:47 (8)	19:26
28	05:52	06:41	07:26	07:26	08:07 (7)	07:23
	21:35	24 06:45 (9)	20:35	38	07:47 (8)	19:24
29	05:54	06:43	07:27	07:27	08:09 (7)	07:25
	21:33	23 06:46 (9)	20:33	37	07:46 (8)	19:22
30	05:55	06:45	07:28	07:28	08:11 (7)	07:27
	21:32	21 06:45 (9)	20:31	35	07:46 (8)	19:19
31	05:57	06:46	07:29	07:29	08:28 (6)	17:15
	21:30	20 06:45 (9)	20:29	33	07:45 (8)	17:13
Potential sun hours	502	454	381	331	266	244
Total, worst case	305	617	889	376	1450	557
Sun reduction	0.27	0.30	0.28	0.24	0.18	0.13
Oper. time red.	1.00	1.00	1.00	1.00	1.00	1.00
Wind dir. red.	0.64	0.66	0.67	0.67	0.67	0.61
Total reduction	0.17	0.20	0.19	0.16	0.12	0.08
Total, real	52	121	170	60	178	46

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: O - H15

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 12 rows (Sunshine probability values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06)

Operational time

Table with 13 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of values (357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760)

Main shadow calculation table with columns for months (January-December) and rows for time intervals (08:45 to 17:22). Includes summary rows for Potential sun hours, Total, worst case, Sun reduction, Oper. time red., Wind dir. red., Total reduction, and Total, real.

Table layout: For each day in each month the following matrix apply

Table with 4 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: P - H16

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 14 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January to June) and rows for each day (1-31) showing sun rise/set times, potential sun hours, and various reduction factors.

Table layout: For each day in each month the following matrix apply

Matrix table with 4 columns: Day in month, Sun rise/set, Minutes with flicker, and WTG causing flicker first/last time.

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: Q - H17

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January to December) and rows for each day (1 to 31) showing sun rise/set times and shadow reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix table with 4 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: R - H18

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-June) and rows for days (1-31) and summary rows (Potential sun hours, Total, worst case, Sun reduction, Oper. time red., Wind dir. red., Total reduction, Total, real).

Table layout: For each day in each month the following matrix apply

Matrix layout table with columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
 Finisklin Business Park
 IE-F91 RHH9 Sligo
 +353719161416
 Karen O'Neill / koneill@jodireland.com
 Calculated:
 06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 **Shadow receptor: R - H18**

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22	05:58	06:48	07:37	07:31	08:42 (9)
	22:00	21:28	20:26	19:17	17:11	08:22
2	05:22	06:00	06:49	07:38	34	09:16 (9)
	22:00	21:27	20:24	19:15	07:32	16:31
3	05:23	06:01	06:51	07:40	34	08:42 (9)
	22:00	21:25	20:22	19:12	17:09	16:30
4	05:24	06:03	06:53	07:42	35	09:17 (9)
	21:59	21:23	20:20	19:10	07:36	16:29
5	05:25	06:04	06:54	07:43	35	08:42 (9)
	21:59	21:22	20:17	19:08	17:05	16:29
6	05:25	06:06	06:56	07:45	35	09:17 (9)
	21:58	21:20	20:15	19:06	07:38	10:35 (7)
7	05:26	06:07	06:58	07:47	35	09:17 (9)
	21:58	21:18	20:13	19:03	17:04	16:28
8	05:27	06:09	06:59	07:49	35	08:42 (9)
	21:57	21:16	20:10	19:01	07:40	10:33 (7)
9	05:28	06:11	07:01	07:50	35	09:17 (9)
	21:56	21:14	20:08	18:59	16:59	16:27
10	05:29	06:12	07:02	07:52	34	08:43 (9)
	21:56	21:13	20:06	18:57	07:47	10:31 (7)
11	05:30	06:14	07:04	07:54	34	09:17 (9)
	21:55	21:11	20:04	18:54	16:55	16:27
12	05:31	06:15	07:06	07:55	32	08:44 (9)
	21:54	21:09	20:01	18:52	07:48	10:31 (7)
13	05:32	06:17	07:07	07:57	31	09:16 (9)
	21:53	21:07	19:59	18:50	16:52	16:26
14	05:34	06:19	07:09	07:59	29	08:47 (9)
	21:52	21:05	19:57	18:48	16:51	10:31 (7)
15	05:35	06:20	07:11	08:01	28	09:15 (9)
	21:51	21:03	19:54	18:45	16:49	16:26
16	05:36	06:22	07:12	08:02	26	08:47 (9)
	21:50	21:01	19:52	18:43	16:48	10:32 (7)
17	05:37	06:23	07:14	08:04	23	09:12 (9)
	21:49	20:59	19:50	18:41	16:46	16:26
18	05:38	06:25	07:15	08:06	21	08:50 (9)
	21:48	20:57	19:47	18:39	16:45	10:32 (7)
19	05:40	06:27	07:17	08:07	18	09:10 (9)
	21:47	20:55	19:45	18:37	16:44	16:27
20	05:41	06:28	07:19	08:09	15	08:52 (9)
	21:46	20:53	19:43	18:35	16:43	10:32 (7)
21	05:42	06:30	07:20	08:11	10	09:07 (10)
	21:44	20:50	19:40	18:33	16:41	16:28
22	05:44	06:32	07:22	08:13	10	08:42 (9)
	21:43	20:48	19:38	18:31	16:40	10:34 (7)
23	05:45	06:33	07:24	08:14	16	08:43 (9)
	21:42	20:46	19:36	18:29	16:39	10:34 (7)
24	05:46	06:35	07:25	08:16	14	08:44 (9)
	21:41	20:44	19:33	18:26	16:38	10:35 (7)
25	05:48	06:36	07:27	08:18	14	09:06 (9)
	21:39	20:42	19:31	18:24	16:37	10:36 (7)
26	05:49	06:38	07:29	08:20	19	09:09 (9)
	21:38	20:40	19:29	18:22	16:36	16:30
27	05:51	06:40	07:30	08:22	23	09:11 (9)
	21:36	20:38	19:26	18:20	16:35	10:36 (7)
28	05:52	06:41	07:32	08:23	26	09:13 (9)
	21:35	20:35	19:24	18:19	16:34	16:32
29	05:54	06:43	07:33	08:25	28	09:14 (9)
	21:33	20:33	19:22	18:17	16:33	10:38 (7)
30	05:55	06:45	07:35	08:27	30	09:14 (9)
	21:32	20:31	19:19	18:15	16:32	11:02 (8)
31	05:57	06:46	07:37	08:29	32	09:15 (9)
	21:30	20:29	19:17	18:13	16:31	10:37 (7)
Potential sun hours	502	454	381	331	266	244
Total, worst case				380	579	593
Sun reduction				0.24	0.18	0.13
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.68	0.67	0.64
Total reduction				0.16	0.12	0.09
Total, real				61	71	51

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: S - H19

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 16:37	08:18 17:24	07:25 18:16	07:49 (16) 08:00 (16)	07:14 20:10	08:29 (15) 21:01
2	08:45 16:38	08:17 17:26	07:23 18:18	07:46 (16) 08:01 (16)	07:12 20:11	08:29 (15) 21:02
3	08:45 16:39	08:15 17:28	07:21 18:19	07:44 (16) 08:03 (16)	07:10 20:13	08:28 (15) 21:04
4	08:45 16:40	08:14 17:30	07:18 18:21	07:42 (16) 08:04 (16)	07:08 20:15	08:27 (15) 21:06
5	08:44 16:41	08:12 17:32	07:16 18:23	07:40 (16) 08:06 (16)	07:05 20:17	08:27 (15) 21:07
6	08:44 16:42	08:10 17:34	07:14 18:25	07:37 (16) 08:06 (16)	07:03 20:18	08:27 (15) 21:09
7	08:44 16:44	08:09 17:35	07:12 18:27	07:35 (16) 08:30 (15)	07:01 20:20	08:27 (15) 21:10
8	08:43 16:45	08:07 17:37	07:10 18:28	07:33 (16) 08:37 (15)	06:59 20:22	08:26 (15) 21:12
9	08:43 16:46	08:05 17:39	07:07 18:30	07:30 (16) 08:41 (15)	06:56 20:23	08:26 (15) 21:14
10	08:42 16:48	08:03 17:41	07:05 18:32	07:28 (16) 08:44 (15)	06:54 20:25	08:26 (15) 21:15
11	08:42 16:49	08:01 17:43	07:03 18:34	07:26 (16) 08:47 (15)	06:52 20:27	08:26 (15) 21:17
12	08:41 16:50	08:00 17:45	07:01 18:35	07:23 (16) 08:49 (15)	06:50 20:28	08:26 (15) 21:18
13	08:40 16:52	07:58 17:47	06:58 18:37	07:21 (16) 08:51 (15)	06:47 20:30	08:25 (15) 21:20
14	08:40 16:53	07:56 17:48	06:56 18:39	07:20 (16) 08:53 (15)	06:45 20:32	08:26 (15) 21:22
15	08:39 16:55	07:54 17:50	06:54 18:41	07:20 (16) 08:55 (15)	06:43 20:34	08:26 (15) 21:23
16	08:38 16:57	07:52 17:52	06:51 18:42	07:20 (16) 08:55 (15)	06:41 20:35	08:26 (15) 21:25
17	08:37 16:58	07:50 17:54	06:49 18:44	07:20 (16) 08:57 (15)	06:39 20:37	08:26 (15) 21:26
18	08:36 17:00	07:48 17:56	06:47 18:46	07:20 (16) 08:58 (15)	06:36 20:39	08:27 (15) 21:28
19	08:35 17:01	07:46 17:58	06:44 18:47	07:20 (16) 08:58 (15)	06:34 20:40	08:27 (15) 21:29
20	08:34 17:03	07:44 17:59	06:42 18:49	07:20 (16) 08:59 (15)	06:32 20:42	08:28 (15) 21:31
21	08:33 17:05	07:42 18:01	06:40 18:51	07:21 (16) 09:00 (15)	06:30 20:44	08:28 (15) 21:32
22	08:32 17:06	07:40 18:03	06:38 18:53	07:21 (16) 09:00 (15)	06:28 20:45	08:29 (15) 21:33
23	08:31 17:08	07:38 18:05	06:35 18:54	07:22 (16) 09:01 (15)	06:26 20:47	08:29 (15) 21:35
24	08:29 17:10	07:36 18:07	06:33 18:56	07:23 (16) 09:02 (15)	06:24 20:49	08:30 (15) 21:36
25	08:28 17:12	07:34 18:09	06:31 18:58	07:24 (16) 09:02 (15)	06:22 20:50	08:30 (15) 21:38
26	08:27 17:13	07:31 18:10	06:28 18:59	07:26 (16) 09:02 (15)	06:20 20:52	08:31 (15) 21:39
27	08:26 17:15	07:29 18:12	06:26 19:01	07:28 (16) 09:03 (15)	06:18 20:54	08:32 (15) 21:40
28	08:24 17:17	07:27 18:14	06:24 19:03	07:30 (16) 09:02 (15)	06:16 20:56	08:33 (15) 21:41
29	08:23 17:19	07:25 18:16	06:22 19:05	07:31 (16) 10:03 (15)	06:14 20:57	08:33 (15) 21:43
30	08:21 17:21	07:23 18:18	06:20 19:07	07:32 (16) 10:03 (15)	06:12 20:59	08:34 (15) 21:44
31	08:20 17:22	07:22 18:19	06:19 19:09	07:33 (16) 10:04 (15)	06:11 21:00	08:35 (15) 21:45
Potential sun hours	259	278	367	416	485	499
Total, worst case		6	2362	2504	359	
Sun reduction		0.21	0.24	0.35	0.37	
Oper. time red.		1.00	1.00	1.00	1.00	
Wind dir. red.		0.67	0.67	0.67	0.67	
Total reduction		0.14	0.16	0.24	0.25	
Total, real		1	385	593	89	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: T - H20

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June					
1	08:45	11:24 (1)	08:18	08:58 (3)	07:25	07:15					
	16:36	18	11:42 (1)	17:24	47	09:45 (2)					
			08:18	08:58 (3)	07:23	20:10					
2	08:45	11:24 (1)	08:17	08:58 (3)	07:23	24					
	16:38	17	11:41 (1)	17:26	47	09:45 (2)					
			08:18	08:59 (3)	07:21	20:11					
3	08:45	11:26 (1)	08:15	08:59 (3)	07:21	26					
	16:39	15	11:41 (1)	17:28	47	09:46 (2)					
			08:19	08:40 (4)	07:19	20:13					
4	08:45	11:28 (1)	08:14	08:40 (4)	07:19	27					
	16:40	12	11:40 (1)	17:30	49	09:47 (2)					
			08:21	08:38 (4)	07:16	20:15					
5	08:45	11:29 (1)	08:12	08:38 (4)	07:16	28					
	16:41	10	11:39 (1)	17:32	51	09:47 (2)					
			08:23	08:36 (4)	07:14	20:17					
6	08:44	11:32 (1)	08:10	08:36 (4)	07:14	26					
	16:42	5	11:37 (1)	17:34	52	09:46 (2)					
			08:25	08:34 (4)	07:12	20:18					
7	08:44		08:09	08:34 (4)	07:12	21					
	16:43		17:35	09:46 (2)	18:27	14					
			08:07	08:32 (4)	07:10	20:20					
8	08:43		08:07	08:32 (4)	07:10	23					
	16:45		17:37	09:46 (2)	18:28	17					
			08:05	08:30 (4)	07:07	20:22					
9	08:43		08:05	08:30 (4)	07:07	25					
	16:46		17:39	09:45 (2)	18:30	18					
			08:08	08:28 (4)	07:05	20:23					
10	08:42		08:03	08:28 (4)	07:05	27					
	16:48		17:41	09:45 (2)	18:32	19					
			08:02	08:27 (4)	07:03	20:25					
11	08:42		08:02	08:27 (4)	07:03	29					
	16:49		17:43	09:45 (2)	18:34	18					
			08:00	08:28 (4)	07:01	20:27					
12	08:41		08:00	08:28 (4)	07:01	31					
	16:50		17:45	09:44 (2)	18:35	18					
			07:58	08:29 (4)	06:58	20:29					
13	08:41		07:58	08:29 (4)	06:58	32					
	16:52		17:47	09:43 (2)	18:37	19					
			07:56	08:30 (4)	06:56	20:30					
14	08:40		07:56	08:30 (4)	06:56	31					
	16:53		17:48	09:42 (2)	18:39	18					
			07:54	08:32 (4)	06:54	20:32					
15	08:39		07:54	08:32 (4)	06:54	31					
	16:55		17:50	09:40 (2)	18:41	22					
			07:52	09:21 (2)	06:51	20:34					
16	08:38		07:52	09:21 (2)	06:51	29					
	16:57		17:52	09:38 (2)	18:42	24					
			07:50	09:25 (2)	06:49	20:35					
17	08:37	09:06 (3)	07:50	09:25 (2)	06:49	27					
	16:58	4	09:10 (3)	17:54	9	09:34 (2)					
			09:05 (3)	07:48		26					
18	08:36		09:05 (3)	07:48		25					
	17:00	7	09:12 (3)	17:56		22					
			09:04 (3)	07:46		20:37					
19	08:35		09:04 (3)	07:46		22					
	17:01	10	09:14 (3)	17:58		18					
			09:02 (3)	07:44		20:40					
20	08:34		09:02 (3)	07:44		18					
	17:03	13	09:15 (3)	17:59		20:42					
			09:01 (3)	07:42		14					
21	08:33		09:01 (3)	07:42		20:44					
	17:05	24	09:30 (2)	18:01		4					
			09:00 (3)	07:40		07:29 (8)					
22	08:32		09:00 (3)	07:40		21:32					
	17:06	33	09:34 (2)	18:03		05:35					
			08:58 (3)	07:38		21:34					
23	08:31		08:58 (3)	07:38		05:34					
	17:08	37	09:35 (2)	18:05		21:35					
			08:57 (3)	07:36		05:33					
24	08:30		08:57 (3)	07:36		21:36					
	17:10	40	09:37 (2)	18:07		05:32					
			08:57 (3)	07:34		21:38					
25	08:28		08:57 (3)	07:34		05:31					
	17:12	42	09:39 (2)	18:09		21:39					
			08:56 (3)	07:32		05:29					
26	08:27		08:56 (3)	07:32		21:40					
	17:13	44	09:40 (2)	18:10		05:28					
			08:54 (3)	07:29		21:42					
27	08:26		08:54 (3)	07:29		05:27					
	17:15	45	09:41 (2)	18:12		21:43					
			08:56 (3)	07:27		05:26					
28	08:24		08:56 (3)	07:27		21:45					
	17:17	46	09:42 (2)	18:14		05:25					
			08:57 (3)			21:47					
29	08:23		08:57 (3)			05:24					
	17:19	46	09:43 (2)			21:48					
			08:57 (3)			05:23					
30	08:21		08:57 (3)			21:49					
	17:21	47	09:44 (2)			05:22					
			08:57 (3)			21:50					
31	08:20		08:57 (3)			05:21					
	17:22	47	09:44 (2)			21:51					
			08:57 (3)			05:20					
Potential sun hours	259		278		367	416	485				499
Total, worst case		562		718		629		527		231	
Sun reduction		0.16		0.21		0.24		0.35		0.37	
Oper. time red.		1.00		1.00		1.00		1.00		1.00	
Wind dir. red.		0.66		0.67		0.67		0.67		0.64	
Total reduction		0.10		0.14		0.16		0.24		0.24	
Total, real		58		99		103		125		55	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: T - H2O

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22 22:00	05:58 21:28	06:28 (9) 20:26	06:48 31	07:14 (8) 07:37	08:07 (7) 07:31
2	05:22 22:00	06:00 21:27	06:28 (9) 20:24	06:50 29	07:15 (8) 07:39	08:09 (6) 07:32
3	05:23 22:00	06:01 21:25	06:30 (9) 20:22	06:51 27	07:17 (8) 07:40	08:07 (6) 07:34
4	05:24 21:59	06:03 21:23	06:31 (9) 20:20	06:53 25	07:19 (8) 07:42	08:07 (6) 07:36
5	05:25 21:59	06:04 21:22	06:33 (9) 20:17	06:54 23	07:20 (8) 07:44	08:09 (6) 07:38
6	05:26 21:58	06:06 21:20	06:34 (9) 20:15	06:56 21	07:22 (8) 07:45	08:10 (6) 07:40
7	05:26 21:58	06:08 21:18	06:36 (9) 20:13	06:58 26	07:23 (8) 07:47	08:12 (6) 07:41
8	05:27 21:57	06:09 21:16	06:37 (9) 20:11	06:59 28	07:25 (8) 07:49	08:14 (6) 07:43
9	05:28 21:56	06:11 21:14	06:39 (9) 20:08	07:01 27	07:26 (8) 07:50	08:16 (6) 07:45
10	05:29 21:56	06:12 21:13	06:40 (9) 20:06	07:03 26	07:28 (8) 07:52	08:17 (6) 07:47
11	05:30 21:55	06:14 21:11	06:42 (9) 20:04	07:04 25	07:30 (8) 07:54	07:48 16:54
12	05:31 21:54	06:15 21:09	06:43 (9) 20:01	07:06 21	07:31 (8) 07:55	07:50 16:52
13	05:33 21:53	06:17 21:07	06:45 (9) 19:59	07:07 19	07:35 (10) 07:59	07:52 16:51
14	05:34 21:52	06:19 21:05	06:46 (9) 19:57	07:09 30	07:35 (10) 07:59	07:54 16:49
15	05:35 21:51	06:20 21:03	06:47 (9) 19:54	07:11 33	07:36 (10) 08:01	07:56 16:48
16	05:36 21:50	06:22 21:01	06:48 (9) 19:52	07:12 34	07:37 (10) 08:02	07:57 16:46
17	05:37 21:49	06:24 20:59	06:49 (9) 19:50	07:14 33	07:39 (10) 08:04	07:59 16:45
18	05:38 21:48	06:25 20:57	06:49 (9) 19:47	07:15 31	07:41 (10) 08:06	08:01 16:44
19	05:40 21:47	06:27 20:55	06:49 (9) 19:45	07:17 27	07:42 (10) 08:07	08:02 16:43
20	05:41 21:46	06:28 20:53	06:49 (9) 19:43	07:19 27	07:43 (10) 08:09	08:03 16:41
21	05:42 21:44	06:30 20:50	06:49 (9) 19:40	07:20 28	07:44 (10) 08:11	08:06 16:40
22	05:44 21:43	06:32 20:48	06:49 (9) 19:38	07:22 29	07:45 (10) 08:13	08:07 16:39
23	05:45 21:42	06:33 20:46	06:49 (9) 19:36	07:24 29	07:46 (10) 08:15	08:09 16:38
24	05:46 21:41	06:35 20:44	06:49 (9) 19:33	07:26 28	07:47 (10) 08:17	08:11 16:37
25	05:48 21:39	06:37 20:42	06:49 (9) 19:31	07:27 27	07:48 (10) 08:19	08:13 16:36
26	05:49 21:38	06:38 20:40	06:49 (9) 19:29	07:29 26	07:49 (10) 08:21	08:14 16:35
27	05:51 21:36	06:40 20:38	06:49 (9) 19:26	07:30 25	07:50 (10) 08:23	08:15 16:34
28	05:52 21:35	06:33 (9) 06:42 (9)	06:41 29	07:32 22	07:51 (10) 08:24	08:17 16:33
29	05:54 21:33	06:32 (9) 06:45 (9)	06:43 31	07:34 19	07:52 (10) 08:26	08:19 16:32
30	05:55 21:32	06:30 (9) 06:46 (9)	06:45 32	07:35 19	07:53 (10) 08:27	08:20 16:31
31	05:57 21:30	06:28 (9) 06:47 (9)	06:46 32	07:36 19	07:54 (10) 08:29	08:21 16:30
Potential sun hours	502	454	381	331	266	244
Total, worst case	57	419	795	381	976	520
Sun reduction	0.27	0.30	0.28	0.24	0.18	0.13
Oper. time red.	1.00	1.00	1.00	1.00	1.00	1.00
Wind dir. red.	0.64	0.66	0.67	0.67	0.67	0.60
Total reduction	0.17	0.19	0.19	0.16	0.12	0.08
Total, real	10	81	151	61	121	42

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: U - H21

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of sunshine probability values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of operational time values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January to June) and rows for days (1-31). Columns contain sun rise/set times, potential sun hours, and reduction factors.

Table layout: For each day in each month the following matrix apply

Matrix table with 2 rows and 4 columns: Day in month, Sun rise/set, Minutes with flicker, First/Last time with flicker.

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: V - H22

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:21	05:58	06:48	07:37	07:30	15:58 (10)
	22:00	21:28	20:26	19:17	17:11	18 16:16 (10)
2	05:22	06:00	06:49	07:38	07:32	15:58 (10)
	22:00	21:27	20:24	19:15	17:09	17 16:15 (10)
3	05:23	06:01	06:51	07:40	07:34	15:59 (10)
	21:59	21:25	20:22	19:12	17:07	16 16:15 (10)
4	05:24	06:03	06:53	07:42	07:36	16:00 (10)
	21:59	21:23	20:19	19:10	17:05	13 16:13 (10)
5	05:24	06:04	06:54	07:43	07:38	16:02 (10)
	21:59	21:21	20:17	19:08	17:04	10 16:12 (10)
6	05:25	06:06	06:56	07:45	07:39	16:05 (10)
	21:58	21:20	20:15	19:05	17:02	4 16:09 (10)
7	05:26	06:07	06:57	07:47	07:41	08:29
	21:57	21:18	20:13	19:03	17:00	08:29
8	05:27	06:09	06:59	07:48	07:43	15:03 (13)
	21:57	21:16	20:10	19:01	16:58	8 15:11 (13)
9	05:28	06:10	07:01	07:50	07:45	15:00 (13)
	21:56	21:14	20:08	18:59	16:57	15 15:15 (13)
10	05:29	06:12	07:02	07:52	07:47	14:58 (13)
	21:55	21:12	20:06	18:56	17:26 (12)	16:55
11	05:30	06:14	07:04	07:53	07:48	14:56 (13)
	21:55	21:10	20:03	18:54	17:29 (12)	16:54
12	05:31	06:15	07:06	07:55	07:50	14:54 (13)
	21:54	21:09	20:01	18:52	17:31 (12)	16:52
13	05:32	06:17	07:07	07:57	07:52	14:54 (13)
	21:53	21:07	19:59	18:50	17:32 (12)	16:51
14	05:33	06:18	07:09	07:59	07:54	14:53 (13)
	21:52	21:05	19:56	18:47	17:32 (12)	16:49
15	05:35	06:20	07:10	08:00	07:55	14:53 (13)
	21:51	21:03	19:54	18:45	17:33 (12)	16:48
16	05:36	06:22	07:12	08:02	07:57	14:52 (13)
	21:50	21:01	19:52	18:43	17:33 (12)	16:46
17	05:37	06:23	07:14	08:04	07:59	14:52 (13)
	21:49	20:59	19:49	18:41	17:34 (12)	16:45
18	05:38	06:25	07:15	08:06	08:01	14:52 (13)
	21:48	20:57	19:47	18:39	17:34 (12)	16:44
19	05:40	06:27	07:17	08:07	08:02	14:52 (13)
	21:47	20:54	19:45	18:37	17:33 (12)	16:42
20	05:41	06:28	07:19	08:09	08:04	14:52 (13)
	21:46	20:52	19:42	18:35	17:33 (12)	16:41
21	05:42	06:30	07:20	08:11	08:06	14:52 (13)
	21:44	20:50	19:40	18:32	17:32 (12)	16:40
22	05:43	06:31	07:22	08:13	08:07	14:52 (13)
	21:43	20:48	19:38	18:30	17:32 (12)	16:39
23	05:45	06:33	07:23	08:14	08:09	14:52 (13)
	21:42	20:46	19:35	18:28	17:31 (12)	16:38
24	05:46	06:35	07:25	08:16	08:11	14:53 (13)
	21:40	20:44	19:33	18:26	17:31 (12)	16:37
25	05:48	06:36	07:27	08:18	08:12	14:54 (13)
	21:39	20:42	19:31	17:24	16:30 (12)	16:36
26	05:49	06:38	07:28	08:20	08:14	14:53 (13)
	21:38	20:40	19:28	17:22	16:28 (12)	16:35
27	05:51	06:40	07:30	08:21	08:15	14:54 (13)
	21:36	20:37	19:26	17:20	16:26 (12)	16:34
28	05:52	06:41	07:32	08:23	08:17	14:55 (13)
	21:35	20:35	19:24	17:18	16:23 (12)	16:33
29	05:53	06:43	07:33	08:25	08:18	14:55 (13)
	21:33	20:33	19:21	17:16	16:16 (10)	16:32
30	05:55	06:44	07:35	08:27	08:20	14:56 (13)
	21:32	20:31	19:19	17:14	16:16 (10)	16:31
31	05:56	06:46		08:29	08:25	15:27 (13)
	21:30	20:29		17:13	16:16 (10)	16:35
Potential sun hours	502	454	381	331	266	244
Total, worst case				530	737	796
Sun reduction				0.24	0.18	0.13
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.63	0.59	0.59
Total reduction				0.15	0.11	0.08
Total, real				79	81	63

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 1 **Shadow receptor:** W - H23

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:21 22:00	05:58 21:28	06:48 20:26	07:37 19:17	07:30 17:11	15:50 (10) 16:11 (12)
2	05:22 22:00	06:00 21:27	06:49 20:24	07:38 19:15	07:32 17:09	15:50 (10) 16:09 (10)
3	05:23 21:59	06:01 21:25	06:51 20:22	07:40 19:12	07:34 17:07	15:50 (10) 16:09 (10)
4	05:24 21:59	06:03 21:23	06:53 20:19	07:42 19:10	07:36 17:05	15:51 (10) 16:08 (10)
5	05:24 21:59	06:04 21:21	06:54 20:17	07:43 19:08	07:38 17:04	15:52 (10) 16:08 (10)
6	05:25 21:58	06:06 21:20	06:56 20:15	07:45 19:05	07:39 17:02	15:53 (10) 16:07 (10)
7	05:26 21:57	06:07 21:18	06:57 20:13	07:47 19:03	07:41 17:00	15:54 (10) 16:06 (10)
8	05:27 21:57	06:09 21:16	06:59 20:10	07:48 19:01	07:43 16:58	15:56 (10) 16:04 (10)
9	05:28 21:56	06:10 21:14	07:01 20:08	07:50 18:59	07:45 16:57	08:32 16:27
10	05:29 21:55	06:12 21:12	07:02 20:06	07:52 18:56	07:47 16:55	08:33 16:26
11	05:30 21:55	06:14 21:10	07:04 20:03	07:53 18:54	07:48 16:54	08:34 16:26
12	05:31 21:54	06:15 21:09	07:06 20:01	07:55 18:52	07:50 16:52	14:50 (13) 15:01 (13)
13	05:32 21:53	06:17 21:07	07:07 19:59	07:57 18:50	07:52 17:06 (12) 17:15 (12)	08:36 14:46 (13) 15:02 (13)
14	05:33 21:52	06:18 21:05	07:09 19:56	07:59 18:47	07:54 17:02 (12) 17:17 (12)	08:37 14:45 (13) 15:04 (13)
15	05:35 21:51	06:20 21:03	07:10 19:54	08:00 18:45	07:55 17:00 (12) 17:19 (12)	08:38 14:44 (13) 15:06 (13)
16	05:36 21:50	06:22 21:01	07:12 19:52	08:02 18:43	07:57 17:20 (12) 16:46	08:39 14:43 (13) 15:07 (13)
17	05:37 21:49	06:23 20:59	07:14 19:49	08:04 18:41	07:59 16:57 (12) 17:21 (12)	08:40 14:42 (13) 15:08 (13)
18	05:38 21:48	06:25 20:57	07:15 19:47	08:06 18:39	08:01 16:56 (12) 17:22 (12)	08:40 14:42 (13) 15:09 (13)
19	05:40 21:47	06:27 20:54	07:17 19:45	08:07 18:37	08:02 16:55 (12) 17:22 (12)	08:41 14:41 (13) 15:10 (13)
20	05:41 21:46	06:28 20:52	07:19 19:42	08:09 18:35	08:04 16:54 (12) 17:22 (12)	08:42 14:41 (13) 15:11 (13)
21	05:42 21:44	06:30 20:50	07:20 19:40	08:11 18:32	08:06 16:54 (12) 17:22 (12)	08:42 14:40 (13) 15:11 (13)
22	05:43 21:43	06:31 20:48	07:22 19:38	08:13 18:30	08:07 16:54 (12) 17:22 (12)	08:43 14:40 (13) 15:12 (13)
23	05:45 21:42	06:33 20:46	07:23 19:35	08:14 18:28	08:09 16:54 (12) 17:22 (12)	08:43 14:40 (13) 15:13 (13)
24	05:46 21:40	06:35 20:44	07:25 19:33	08:16 18:26	08:11 16:54 (12) 17:22 (12)	08:44 14:41 (13) 15:13 (13)
25	05:48 21:39	06:36 20:42	07:27 19:31	08:18 18:24	08:12 15:54 (12) 16:22 (12)	08:44 14:41 (13) 15:14 (13)
26	05:49 21:38	06:38 20:40	07:28 19:28	08:20 18:22	08:14 15:55 (12) 16:21 (12)	08:44 14:41 (13) 15:14 (13)
27	05:51 21:36	06:40 20:37	07:30 19:26	08:21 18:20	08:15 15:53 (10) 16:19 (12)	08:45 14:41 (13) 15:14 (13)
28	05:52 21:35	06:41 20:35	07:32 19:24	08:23 18:18	08:17 15:52 (10) 16:19 (12)	08:45 14:42 (13) 15:15 (13)
29	05:53 21:33	06:43 20:33	07:33 19:21	08:25 18:16	08:18 15:51 (10) 16:17 (12)	08:45 14:42 (13) 15:15 (13)
30	05:55 21:32	06:44 20:31	07:35 19:19	08:27 18:14	08:20 15:50 (10) 16:16 (12)	08:45 14:42 (13) 15:16 (13)
31	05:56 21:30	06:46 20:29	07:37 19:17	08:29 18:13	08:21 15:50 (10) 16:14 (12)	08:45 14:42 (13) 15:16 (13)
Potential sun hours	502	454	381	331	266	244
Total, worst case				465	657	921
Sun reduction				0.24	0.18	0.13
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.62	0.60	0.60
Total reduction				0.15	0.11	0.08
Total, real				68	73	74

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: X - H24

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45	10:07 (8) 08:18	09:08 (10) 07:25	07:15	06:10	05:25
	16:36	30 10:37 (7) 17:24	15 09:23 (10) 18:16	20:10	21:01	21:46
2	08:45	10:07 (8) 08:17	09:07 (10) 07:23	07:12	06:08	05:24
	16:37	30 10:37 (7) 17:26	17 09:24 (10) 18:18	20:11	21:02	21:48
3	08:45	10:08 (8) 08:15	09:00 (9) 07:21	07:10	06:06	05:23
	16:39	29 10:37 (7) 17:28	24 09:24 (10) 18:19	20:13	21:04	21:49
4	08:45	10:09 (8) 08:14	08:58 (9) 07:19	07:08	06:04	05:22
	16:40	29 10:38 (7) 17:30	27 09:25 (10) 18:21	20:15	21:06	21:50
5	08:45	10:09 (8) 08:12	08:56 (9) 07:16	07:05	06:02	05:22
	16:41	29 10:38 (7) 17:32	30 09:26 (10) 18:23	20:17	21:07	21:51
6	08:44	10:10 (8) 08:10	08:54 (9) 07:14	07:03	06:00	05:21
	16:42	28 10:38 (7) 17:33	32 09:26 (10) 18:25	20:18	21:09	21:52
7	08:44	10:10 (8) 08:09	08:52 (9) 07:12	07:01	05:59	05:20
	16:43	28 10:38 (7) 17:35	33 09:25 (10) 18:27	20:20	21:11	21:53
8	08:44	10:11 (8) 08:07	08:51 (9) 07:10	06:59	05:57	05:20
	16:45	28 10:39 (7) 17:37	34 09:25 (10) 18:28	20:22	21:12	21:53
9	08:43	10:11 (8) 08:05	08:50 (9) 07:07	06:56	05:55	05:19
	16:46	28 10:39 (7) 17:39	34 09:24 (10) 18:30	20:23	21:14	21:54
10	08:43	10:12 (8) 08:03	08:50 (9) 07:05	06:54	05:53	05:19
	16:47	26 10:38 (7) 17:41	33 09:23 (10) 18:32	20:25	21:15	21:55
11	08:42	10:13 (8) 08:02	08:50 (9) 07:03	06:52	05:52	05:18
	16:49	26 10:39 (7) 17:43	33 09:23 (10) 18:34	20:27	21:17	21:56
12	08:41	10:14 (8) 08:00	08:50 (9) 07:01	06:50	05:50	05:18
	16:50	25 10:39 (7) 17:45	31 09:21 (9) 18:35	20:29	21:19	21:56
13	08:41	10:15 (8) 07:58	08:50 (9) 06:58	06:47	05:48	05:18
	16:52	24 10:39 (8) 17:47	31 09:21 (9) 18:37	20:30	21:20	21:57
14	08:40	10:16 (8) 07:56	08:49 (9) 06:56	06:45	05:47	05:18
	16:53	22 10:38 (7) 17:48	32 09:21 (9) 18:39	20:32	21:22	21:58
15	08:39	10:17 (8) 07:54	08:49 (9) 06:54	06:43	05:45	05:17
	16:55	21 10:38 (8) 17:50	32 09:21 (9) 18:41	20:34	21:23	21:58
16	08:38	10:18 (8) 07:52	08:50 (9) 06:51	06:41	05:44	05:17
	16:56	19 10:37 (8) 17:52	31 09:21 (9) 18:42	20:35	21:25	21:59
17	08:37	10:19 (8) 07:50	08:50 (9) 06:49	06:39	05:42	05:17
	16:58	17 10:36 (8) 17:54	31 09:21 (9) 18:44	20:37	21:26	21:59
18	08:36	10:21 (8) 07:48	08:49 (9) 06:47	06:36	05:41	05:17
	17:00	14 10:35 (8) 17:56	30 09:19 (9) 18:46	20:39	21:28	22:00
19	08:35	10:24 (8) 07:46	08:50 (9) 06:45	06:34	05:39	05:17
	17:01	10 10:34 (8) 17:58	29 09:19 (9) 18:48	20:40	21:29	22:00
20	08:34	07:44	08:51 (9) 06:42	06:32	05:38	05:17
	17:03	27 17:59	09:18 (9) 18:49	20:42	21:31	22:00
21	08:33	07:42	08:51 (9) 06:40	06:30	05:37	05:18
	17:05	26 18:01	09:17 (9) 18:51	20:44	21:32	22:01
22	08:32	07:40	08:53 (9) 06:38	06:28	05:35	05:18
	17:06	18:03	09:16 (9) 18:53	20:46	21:34	22:01
23	08:31	07:38	08:54 (9) 06:35	06:26	05:34	05:18
	17:08	18:05	09:14 (9) 18:54	20:47	21:35	22:01
24	08:30	07:36	08:56 (9) 06:33	06:24	05:33	05:18
	17:10	18:07	09:12 (9) 18:56	20:49	21:36	22:01
25	08:28	07:34	08:59 (9) 06:31	06:22	05:32	05:19
	17:12	18:09	09:07 (9) 18:58	20:51	21:38	22:01
26	08:27	07:32	06:28	06:20	05:31	05:19
	17:13	18:10	19:00	20:52	21:39	22:01
27	08:26	07:29	06:26	06:18	05:29	05:19
	17:15	18:12	19:01	20:54	21:40	22:01
28	08:24	07:27	06:24	06:16	05:28	05:20
	17:17	18:14	19:03	20:56	21:42	22:01
29	08:23	09:13 (10)	07:21	06:14	05:27	05:20
	17:19	4 09:17 (10)	20:05	20:57	21:43	22:01
30	08:22	09:10 (10)	07:19	06:12	05:26	05:21
	17:21	10 09:20 (10)	20:06	20:59	21:44	22:01
31	08:20	09:08 (10)	07:17		05:25	
	17:22	13 09:21 (10)	20:08		21:45	
Potential sun hours	259	278	367	416	485	499
Total, worst case	490	679				
Sun reduction	0.16	0.21				
Oper. time red.	1.00	1.00				
Wind dir. red.	0.66	0.68				
Total reduction	0.10	0.14				
Total, real	50	95				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: X - H24

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22	05:58	06:48	07:37	07:31	08:20 (9) 08:22 09:55 (8)
	22:00	21:28	20:26	19:17	17:11	33 08:53 (10) 16:31 26 10:21 (7)
2	05:22	06:00	06:49	07:38	07:32	08:20 (9) 08:23 09:55 (8)
	22:00	21:27	20:24	19:15	17:09	34 08:54 (10) 16:30 26 10:21 (7)
3	05:23	06:01	06:51	07:40	07:34	08:21 (9) 08:24 09:55 (8)
	22:00	21:25	20:22	19:12	17:07	34 08:55 (10) 16:29 28 10:23 (7)
4	05:24	06:03	06:53	07:42	07:36	08:22 (9) 08:26 09:55 (8)
	21:59	21:23	20:20	19:10	17:05	33 08:55 (10) 16:29 28 10:23 (7)
5	05:25	06:04	06:54	07:44	07:38	08:24 (9) 08:27 09:55 (8)
	21:59	21:22	20:17	19:08	17:04	31 08:55 (10) 16:28 28 10:23 (7)
6	05:25	06:06	06:56	07:45	07:40	08:26 (9) 08:28 09:56 (8)
	21:58	21:20	20:15	19:06	17:02	29 08:55 (10) 16:28 28 10:24 (7)
7	05:26	06:07	06:58	07:47	07:41	08:28 (9) 08:30 09:56 (8)
	21:58	21:18	20:13	19:03	17:00	27 08:55 (10) 16:27 29 10:25 (7)
8	05:27	06:09	06:59	07:49	07:43	08:32 (9) 08:31 09:56 (8)
	21:57	21:16	20:11	19:01	16:59	23 08:55 (10) 16:27 29 10:25 (7)
9	05:28	06:11	07:01	07:50	07:45	08:38 (10) 08:32 09:57 (8)
	21:56	21:14	20:08	18:59	16:57	16 08:54 (10) 16:27 29 10:26 (7)
10	05:29	06:12	07:02	07:52	07:47	08:39 (10) 08:33 09:57 (8)
	21:56	21:13	20:06	18:57	16:55	15 08:54 (10) 16:27 30 10:27 (7)
11	05:30	06:14	07:04	07:54	07:48	08:40 (10) 08:34 09:57 (8)
	21:55	21:11	20:04	18:54	16:54	13 08:53 (10) 16:26 30 10:27 (7)
12	05:31	06:15	07:06	07:55	07:50	08:42 (10) 08:35 09:57 (8)
	21:54	21:09	20:01	18:52	16:52	10 08:52 (10) 16:26 30 10:27 (7)
13	05:32	06:17	07:07	07:57	07:52	08:45 (10) 08:36 09:58 (8)
	21:53	21:07	19:59	18:50	16:51	4 08:49 (10) 16:26 30 10:28 (7)
14	05:34	06:19	07:09	07:59	07:54	08:37 09:58 (8)
	21:52	21:05	19:57	18:48	16:49	16:26 30 10:28 (7)
15	05:35	06:20	07:11	08:01	07:56	08:38 09:59 (8)
	21:51	21:03	19:54	18:45	16:48	16:26 30 10:29 (7)
16	05:36	06:22	07:12	08:02	07:57	08:39 09:59 (8)
	21:50	21:01	19:52	18:43	16:46	16:26 31 10:30 (7)
17	05:37	06:23	07:14	08:04	09:30 (9) 07:59	08:40 09:59 (8)
	21:49	20:59	19:50	18:41	11 09:41 (9) 16:45	16:27 30 10:29 (7)
18	05:38	06:25	07:15	08:06	09:27 (9) 08:01	08:40 10:00 (8)
	21:48	20:57	19:47	18:39	17 09:44 (9) 16:44	16:27 30 10:30 (7)
19	05:40	06:27	07:17	08:07	09:25 (9) 08:02	08:41 10:01 (8)
	21:47	20:55	19:45	18:37	21 09:46 (9) 16:42	16:27 30 10:31 (7)
20	05:41	06:28	07:19	08:09	09:23 (9) 08:04	08:42 10:00 (8)
	21:46	20:53	19:43	18:35	24 09:47 (9) 16:41	16:28 31 10:31 (7)
21	05:42	06:30	07:20	08:11	09:22 (9) 08:06	08:42 10:01 (8)
	21:44	20:50	19:40	18:33	26 09:48 (9) 16:40	16:28 31 10:32 (7)
22	05:44	06:32	07:22	08:13	09:21 (9) 08:07	08:43 10:02 (8)
	21:43	20:48	19:38	18:31	28 09:49 (9) 16:39	16:28 31 10:33 (8)
23	05:45	06:33	07:24	08:15	09:20 (9) 08:09	08:43 10:02 (8)
	21:42	20:46	19:36	18:29	29 09:49 (9) 16:38	10 10:10 (8) 16:29 31 10:33 (7)
24	05:46	06:35	07:25	08:16	09:20 (9) 08:11	09:58 (8) 08:44 10:02 (8)
	21:41	20:44	19:33	18:26	30 09:50 (9) 16:37	14 10:12 (8) 16:30 31 10:33 (7)
25	05:48	06:36	07:27	07:18	08:19 (9) 08:12	09:58 (8) 08:44 10:04 (8)
	21:39	20:42	19:31	17:24	31 08:50 (9) 16:36	16 10:14 (8) 16:30 30 10:34 (7)
26	05:49	06:38	07:29	07:20	08:19 (9) 08:14	09:56 (8) 08:45 10:04 (8)
	21:38	20:40	19:29	17:22	31 08:50 (9) 16:35	19 10:15 (8) 16:31 30 10:34 (7)
27	05:51	06:40	07:30	07:22	08:19 (9) 08:16	09:56 (8) 08:45 10:04 (8)
	21:36	20:38	19:26	17:20	32 08:51 (9) 16:34	21 10:17 (8) 16:32 30 10:34 (7)
28	05:52	06:41	07:32	07:23	08:19 (9) 08:17	09:56 (8) 08:45 10:05 (8)
	21:35	20:35	19:24	17:19	32 08:51 (9) 16:33	22 10:18 (7) 16:32 30 10:35 (7)
29	05:54	06:43	07:33	07:25	08:18 (9) 08:19	09:55 (8) 08:45 10:05 (8)
	21:33	20:33	19:22	17:17	31 08:49 (9) 16:32	24 10:19 (8) 16:33 30 10:35 (7)
30	05:55	06:45	07:35	07:27	08:18 (9) 08:20	09:55 (8) 08:45 10:06 (8)
	21:32	20:31	19:19	17:15	32 08:50 (10) 16:31	25 10:20 (7) 16:34 30 10:36 (7)
31	05:57	06:46	07:37	07:29	08:19 (9) 08:21	08:45 10:06 (8)
	21:30	20:29	19:17	17:13	33 08:52 (10) 16:30	16:35 30 10:36 (7)
Potential sun hours	502	454	381	331	266	244
Total, worst case				408	453	917
Sun reduction				0.24	0.18	0.13
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.68	0.67	0.65
Total reduction				0.16	0.12	0.09
Total, real				66	56	81

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: Y - H25

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January to June) and rows for each day of the month, including sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Summary table with 4 columns: Day in month, Sun rise/set times, Minutes with flicker, and First/Last time with flicker (WTG causing flicker).



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: Z - H26

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June					
1	08:45	10:31 (7)	08:18	09:06 (9)	07:25	07:15	06:10	05:25			
	16:36	13	10:44 (8)	17:24	31	09:37 (9)	18:16	20:10	21:01	21:46	
2	08:45	10:31 (8)	08:17	09:05 (9)	07:23	07:12	06:08	05:24			
	16:37	12	10:43 (8)	17:26	32	09:37 (9)	18:18	20:11	21:02	21:48	
3	08:45	10:33 (7)	08:15	09:05 (9)	07:21	07:10	06:06	05:23			
	16:39	9	10:42 (7)	17:28	32	09:37 (9)	18:19	20:13	21:04	21:49	
4	08:45	10:35 (7)	08:14	09:06 (9)	07:19	07:08	06:04	05:22			
	16:40	7	10:42 (7)	17:30	32	09:38 (9)	18:21	20:15	21:06	21:50	
5	08:45	10:38 (7)	08:12	09:06 (9)	07:16	07:05	06:02	05:22			
	16:41	1	10:39 (7)	17:32	32	09:38 (9)	18:23	20:17	21:07	21:51	
6	08:44		08:10	09:06 (9)	07:14	07:03	06:00	05:21			
	16:42		17:33	31	09:37 (9)	18:25	20:18	21:09	21:52		
7	08:44		08:09	09:06 (9)	07:12	07:01	05:59	05:20			
	16:43		17:35	31	09:37 (9)	18:27	20:20	21:11	21:53		
8	08:44		08:07	09:07 (9)	07:10	06:59	05:57	05:20			
	16:45		17:37	30	09:37 (9)	18:28	20:22	21:12	21:53		
9	08:43		08:05	09:07 (9)	07:07	06:56	05:55	05:19			
	16:46		17:39	29	09:36 (9)	18:30	20:23	21:14	21:54		
10	08:43		08:03	09:08 (9)	07:05	06:54	05:53	05:19			
	16:47		17:41	27	09:35 (9)	18:32	20:25	21:15	21:55		
11	08:42		08:02	09:10 (9)	07:03	06:52	05:52	05:18			
	16:49		17:43	25	09:35 (9)	18:34	20:27	21:17	21:56		
12	08:41		08:00	09:11 (9)	07:01	06:50	05:50	05:18			
	16:50		17:45	23	09:34 (9)	18:35	20:29	21:19	21:56		
13	08:41		07:58	09:12 (9)	06:58	06:47	05:48	05:18			
	16:52		17:47	20	09:32 (9)	18:37	20:30	21:20	21:57		
14	08:40		07:56	09:14 (9)	06:56	06:45	05:47	05:18			
	16:53		17:48	16	09:30 (9)	18:39	20:32	21:22	21:58		
15	08:39		07:54	09:17 (9)	06:54	06:43	05:45	05:17			
	16:55		17:50	10	09:27 (9)	18:41	20:34	21:23	21:58		
16	08:38		07:52		06:51	06:41	05:44	05:17			
	16:56		17:52		18:42	20:35	21:25	21:59			
17	08:37		07:50		06:49	06:39	05:42	05:17			
	16:58		17:54		18:44	20:37	21:26	21:59			
18	08:36		07:48		06:47	06:36	05:41	05:17			
	17:00		17:56		18:46	20:39	21:28	22:00			
19	08:35		07:46		06:45	06:34	05:39	05:17			
	17:01		17:58		18:48	20:40	21:29	22:00			
20	08:34		07:44		06:42	06:32	05:38	05:17			
	17:03		17:59		18:49	20:42	21:31	22:00			
21	08:33		07:42		06:40	06:30	05:37	05:17			
	17:05	12	09:14 (9)		18:51	20:44	21:32	22:01			
22	08:32		07:40		06:38	06:28	05:35	05:18			
	17:06	17	09:29 (10)		18:53	20:46	21:34	22:01			
23	08:31		07:38		06:35	06:26	05:34	05:18			
	17:08	20	09:31 (10)		18:54	20:47	21:35	22:01			
24	08:30		07:36		06:33	06:24	05:33	05:18			
	17:10	22	09:31 (10)		18:56	20:49	21:36	22:01			
25	08:28		07:34		06:31	06:22	05:32	05:19			
	17:12	24	09:33 (10)		18:58	20:51	21:38	22:01			
26	08:27		07:32		06:28	06:20	05:31	05:19			
	17:13	26	09:33 (10)		19:00	20:52	21:39	22:01			
27	08:26		07:29		06:26	06:18	05:29	05:19			
	17:15	27	09:34 (10)		19:01	20:54	21:40	22:01			
28	08:24		07:27		06:24	06:16	05:28	05:20			
	17:17	28	09:34 (9)		19:03	20:56	21:42	22:01			
29	08:23		07:25		07:21	06:14	05:27	05:20			
	17:19	28	09:35 (9)		20:05	20:57	21:43	22:01			
30	08:22		07:23		07:19	06:12	05:26	05:21			
	17:21	30	09:36 (9)		20:06	20:59	21:44	22:01			
31	08:20		07:21		07:17		05:25				
	17:22	31	09:36 (9)		20:08		21:45				
Potential sun hours	259		278		367		416		485		499
Total, worst case	307		401								
Sun reduction	0.16		0.21								
Oper. time red.	1.00		1.00								
Wind dir. red.	0.67		0.67								
Total reduction	0.10		0.14								
Total, real	32		55								

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)



SHADOW - Calendar

Calculation: Alternative Scenario 1 **Shadow receptor:** Z - H26

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22	05:58	06:48	07:37	07:31	08:37 (9) 08:22
	22:00	21:28	20:26	19:17	17:11	28 09:05 (9) 16:31
2	05:22	06:00	06:49	07:38	07:32	08:37 (9) 08:23
	22:00	21:27	20:24	19:15	17:09	29 09:06 (9) 16:30
3	05:23	06:01	06:51	07:40	07:34	08:36 (9) 08:24
	22:00	21:25	20:22	19:12	17:07	30 09:06 (9) 16:29
4	05:24	06:03	06:53	07:42	07:36	08:36 (9) 08:26
	21:59	21:23	20:20	19:10	17:05	31 09:07 (9) 16:29
5	05:25	06:04	06:54	07:44	07:38	08:36 (9) 08:27
	21:59	21:22	20:17	19:08	17:04	31 09:07 (9) 16:28
6	05:25	06:06	06:56	07:45	07:40	08:36 (9) 08:28
	21:58	21:20	20:15	19:06	17:02	31 09:07 (9) 16:28
7	05:26	06:07	06:58	07:47	07:41	08:36 (9) 08:30
	21:58	21:18	20:13	19:03	17:00	32 09:08 (9) 16:27
8	05:27	06:09	06:59	07:49	07:43	08:36 (9) 08:31
	21:57	21:16	20:10	19:01	16:59	32 09:08 (9) 16:27
9	05:28	06:11	07:01	07:50	07:45	08:36 (9) 08:32
	21:56	21:14	20:08	18:59	16:57	32 09:08 (9) 16:27
10	05:29	06:12	07:02	07:52	07:47	08:37 (9) 08:33
	21:56	21:13	20:06	18:57	16:55	31 09:08 (9) 16:27
11	05:30	06:14	07:04	07:54	07:48	08:37 (9) 08:34
	21:55	21:11	20:04	18:54	16:54	31 09:08 (9) 16:26
12	05:31	06:15	07:06	07:55	07:50	08:38 (9) 08:35
	21:54	21:09	20:01	18:52	16:52	29 09:07 (9) 16:26
13	05:32	06:17	07:07	07:57	07:52	08:38 (9) 08:36
	21:53	21:07	19:59	18:50	16:51	29 09:07 (9) 16:26
14	05:34	06:19	07:09	07:59	07:54	08:39 (9) 08:37
	21:52	21:05	19:57	18:48	16:49	28 09:07 (9) 16:26
15	05:35	06:20	07:11	08:01	07:56	08:39 (9) 08:38
	21:51	21:03	19:54	18:45	16:48	27 09:06 (10) 16:26
16	05:36	06:22	07:12	08:02	07:57	08:40 (9) 08:39
	21:50	21:01	19:52	18:43	16:46	26 09:06 (10) 16:26
17	05:37	06:23	07:14	08:04	07:59	08:42 (9) 08:40
	21:49	20:59	19:50	18:41	16:45	24 09:06 (10) 16:27
18	05:38	06:25	07:15	08:06	08:01	08:43 (9) 08:40
	21:48	20:57	19:47	18:39	16:44	22 09:05 (10) 16:27
19	05:40	06:27	07:17	08:07	08:02	08:45 (9) 08:41
	21:47	20:55	19:45	18:37	16:42	20 09:05 (10) 16:27
20	05:41	06:28	07:19	08:09	08:04	08:47 (9) 08:42
	21:46	20:53	19:43	18:35	16:41	17 09:04 (10) 16:28
21	05:42	06:30	07:20	08:11	08:06	08:50 (9) 08:42
	21:44	20:50	19:40	18:33	16:40	12 09:02 (10) 16:28
22	05:44	06:32	07:22	08:13	08:07	08:43
	21:43	20:48	19:38	18:31	16:39	16:28
23	05:45	06:33	07:24	08:15	08:09	08:43
	21:42	20:46	19:36	18:29	16:38	16:29
24	05:46	06:35	07:25	08:16	08:11	08:44
	21:41	20:44	19:33	18:26	16:37	16:30
25	05:48	06:36	07:27	08:18	08:12	08:44
	21:39	20:42	19:31	17:24	16:36	16:30
26	05:49	06:38	07:29	08:20	08:14	08:45
	21:38	20:40	19:29	17:22	16:35	16:31
27	05:51	06:40	07:30	08:22	08:16	08:45
	21:36	20:38	19:26	17:20	12 08:58 (9) 16:34	16:32
28	05:52	06:41	07:32	08:23	08:17	08:45
	21:35	20:35	19:24	17:19	17 09:00 (9) 16:33	16:32
29	05:54	06:43	07:33	08:25	08:19	08:45
	21:33	20:33	19:22	17:17	20 09:01 (9) 16:32	16:33
30	05:55	06:45	07:35	08:27	08:20	08:45
	21:32	20:31	19:19	17:15	24 09:03 (9) 16:31	16:34
31	05:57	06:46	07:37	08:29	08:22	08:45
	21:30	20:29	19:17	17:13	26 09:04 (9) 16:30	16:35
Potential sun hours	502	454	381	331	266	244
Total, worst case				99	572	397
Sun reduction				0.24	0.18	0.13
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.67	0.67	0.65
Total reduction				0.16	0.12	0.09
Total, real				16	71	34

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: AB - H28

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 16:36	08:18 17:24	07:25 18:16	07:14 20:10	19:23 (11) 06:10	20:17 (14) 05:24
2	08:45 16:37	08:17 17:26	07:23 18:17	07:12 20:11	19:23 (11) 06:08	20:15 (14) 05:24
3	08:45 16:38	08:15 17:28	07:20 18:19	07:10 20:13	19:22 (11) 06:06	20:14 (14) 05:23
4	08:45 16:40	08:13 17:30	07:18 18:21	07:07 20:15	19:23 (11) 06:04	20:14 (14) 05:22
5	08:44 16:41	08:12 17:31	07:16 18:23	07:05 20:16	19:23 (11) 06:02	20:13 (14) 05:21
6	08:44 16:42	08:10 17:33	07:14 18:25	07:03 20:18	19:24 (11) 06:00	20:12 (14) 05:21
7	08:44 16:43	08:08 17:35	07:12 18:26	07:01 20:20	19:25 (11) 05:58	20:12 (14) 05:20
8	08:43 16:45	08:07 17:37	07:09 18:28	06:58 20:21	19:28 (11) 05:57	20:12 (14) 05:20
9	08:43 16:46	08:05 17:39	07:07 18:30	06:56 20:23	19:33 (11) 05:55	20:11 (14) 05:19
10	08:42 16:47	08:03 17:41	07:05 18:32	06:54 20:25	05:53 21:15	20:11 (14) 05:19
11	08:42 16:49	08:01 17:43	07:03 18:33	06:52 20:27	05:52 21:17	20:11 (14) 05:18
12	08:41 16:50	07:59 17:44	07:00 18:35	06:49 20:28	05:50 21:18	20:11 (14) 05:18
13	08:40 16:52	07:58 17:46	06:58 18:37	06:47 20:30	05:48 21:20	20:11 (14) 05:18
14	08:40 16:53	07:56 17:48	06:56 18:39	06:45 20:32	05:47 21:21	20:12 (14) 05:17
15	08:39 16:55	07:54 17:50	06:54 18:40	06:43 20:33	05:45 21:23	20:11 (14) 05:17
16	08:38 16:56	07:52 17:52	06:51 18:42	06:41 20:35	05:44 21:25	20:12 (14) 05:17
17	08:37 16:58	07:50 17:54	06:49 18:44	06:38 20:37	05:42 21:26	20:13 (14) 05:17
18	08:36 17:00	07:48 17:56	06:47 18:46	06:36 20:38	05:41 21:28	20:13 (14) 05:17
19	08:35 17:01	07:46 17:57	06:44 18:47	06:34 20:40	05:39 21:29	20:14 (14) 05:17
20	08:34 17:03	07:44 17:59	06:42 18:49	06:32 20:42	05:38 21:31	20:14 (14) 05:17
21	08:33 17:05	07:42 18:01	06:40 18:51	06:30 20:44	05:37 21:32	20:15 (14) 05:17
22	08:32 17:06	07:40 18:03	06:37 18:52	06:28 20:45	05:35 21:33	20:15 (14) 05:18
23	08:31 17:08	07:38 18:05	06:35 18:54	06:26 20:47	05:34 21:35	20:17 (14) 05:18
24	08:29 17:10	07:36 18:07	06:33 18:56	06:24 20:49	05:33 21:36	20:18 (14) 05:18
25	08:28 17:11	07:33 18:08	06:30 18:58	06:22 20:50	05:32 21:37	20:19 (14) 05:18
26	08:27 17:13	07:31 18:10	06:28 18:59	06:19 20:52	05:30 21:39	20:21 (14) 05:19
27	08:25 17:15	07:29 18:12	06:26 19:01	06:17 20:54	05:29 21:40	20:22 (14) 05:19
28	08:24 17:17	07:27 18:14	06:24 19:03	18:29 (11) 06:15	20:25 (14) 05:28	20:25 (14) 05:20
29	08:23 17:19	07:21 19:04	06:13 19:39 (11)	06:13 20:57	20:28 (14) 21:41	20:29 (14) 05:20
30	08:21 17:20	07:19 20:06	06:12 19:26 (11)	06:12 20:59	20:29 (14) 21:43	20:29 (14) 05:21
31	08:20 17:22	07:17 20:08	06:11 19:24 (11)	06:11 20:59	20:31 (14) 21:44	20:31 (14) 05:21
Potential sun hours	259	278	367	416	485	499
Total, worst case			53	146	694	
Sun reduction			0.24	0.35	0.37	
Oper. time red.			1.00	1.00	1.00	
Wind dir. red.			0.68	0.68	0.68	
Total reduction			0.17	0.24	0.25	
Total, real			9	35	175	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 1 **Shadow receptor:** AB - H28

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:21	05:58	20:22 (14)	06:48	07:37	07:30
	22:00	21:28	33 20:55 (13)	20:26	19:17	17:11
2	05:22	06:00	20:21 (14)	06:49	07:38	07:32
	22:00	21:27	33 20:54 (13)	20:24	19:14	17:09
3	05:23	06:01	20:22 (14)	06:51	07:40	07:34
	21:59	21:25	33 20:55 (13)	20:22	19:12	17:07
4	05:24	06:03	20:21 (14)	06:53	19:25 (11)	07:42
	21:59	21:23	33 20:54 (13)	20:19	5 19:30 (11)	19:10
5	05:24	06:04	20:21 (14)	06:54	19:22 (11)	07:43
	21:58	21:21	31 20:52 (13)	20:17	11 19:33 (11)	19:08
6	05:25	06:06	20:22 (14)	06:56	19:19 (11)	07:45
	21:58	21:20	28 20:50 (13)	20:15	15 19:34 (11)	19:05
7	05:26	06:07	20:22 (14)	06:57	19:18 (11)	07:47
	21:57	21:18	26 20:48 (13)	20:13	17 19:35 (11)	19:03
8	05:27	06:09	20:23 (14)	06:59	19:18 (11)	07:48
	21:57	21:16	24 20:47 (13)	20:10	18 19:36 (11)	19:01
9	05:28	06:10	20:23 (14)	07:01	19:16 (11)	07:50
	21:56	21:14	22 20:45 (13)	20:08	19 19:35 (11)	18:59
10	05:29	06:12	20:24 (14)	07:02	19:16 (11)	07:52
	21:55	21:12	20 20:44 (13)	20:06	19 19:35 (11)	18:56
11	05:30	06:14	20:24 (14)	07:04	19:16 (11)	07:53
	21:55	21:10	17 20:41 (14)	20:03	18 19:34 (11)	18:54
12	05:31	06:15	20:26 (14)	07:06	19:16 (11)	07:55
	21:54	21:08	14 20:40 (14)	20:01	18 19:34 (11)	18:52
13	05:32	06:17	20:27 (14)	07:07	19:16 (11)	07:57
	21:53	21:06	11 20:38 (14)	19:59	15 19:31 (11)	18:50
14	05:33	06:18	20:29 (14)	07:09	19:17 (11)	07:59
	21:52	21:05	7 20:36 (14)	19:56	13 19:30 (11)	18:47
15	05:35	06:20	20:33 (14)	07:10	19:19 (11)	08:00
	21:51	21:03	1 20:34 (14)	19:54	9 19:28 (11)	18:45
16	05:36	20:33 (14)	06:22	07:12	9 19:21 (11)	08:02
	21:50	8 20:41 (14)	21:01	19:52	4 19:25 (11)	18:43
17	05:37	20:31 (14)	06:23	07:14	18:43	16:46
	21:49	12 20:43 (14)	20:58	19:49	18:41	16:45
18	05:38	20:29 (14)	06:25	07:15	08:05	08:00
	21:48	15 20:44 (14)	20:56	19:47	18:39	16:44
19	05:40	20:28 (14)	06:27	07:17	08:07	08:02
	21:47	17 20:45 (14)	20:54	19:45	18:37	16:42
20	05:41	20:28 (14)	06:28	07:18	08:09	08:04
	21:45	19 20:47 (13)	20:52	19:42	18:35	16:41
21	05:42	20:27 (14)	06:30	07:20	08:11	08:06
	21:44	22 20:49 (13)	20:50	19:40	18:32	16:40
22	05:43	20:25 (14)	06:31	07:22	08:12	08:07
	21:43	25 20:50 (13)	20:48	19:38	18:30	16:39
23	05:45	20:25 (14)	06:33	07:23	08:14	08:09
	21:42	25 20:50 (13)	20:46	19:35	18:28	16:38
24	05:46	20:25 (14)	06:35	07:25	08:16	08:10
	21:40	27 20:52 (13)	20:44	19:33	18:26	16:37
25	05:48	20:24 (14)	06:36	07:27	07:18	08:12
	21:39	28 20:52 (13)	20:42	19:31	17:24	16:36
26	05:49	20:23 (14)	06:38	07:28	07:20	08:14
	21:37	30 20:53 (13)	20:39	19:28	17:22	16:35
27	05:51	20:23 (14)	06:40	07:30	07:21	08:15
	21:36	31 20:54 (13)	20:37	19:26	17:20	16:34
28	05:52	20:22 (14)	06:41	07:32	07:23	08:17
	21:34	32 20:54 (13)	20:35	19:24	17:18	16:33
29	05:53	20:22 (14)	06:43	07:33	07:25	08:18
	21:33	32 20:54 (13)	20:33	19:21	17:16	16:32
30	05:55	20:22 (14)	06:44	07:35	07:27	08:20
	21:31	33 20:55 (13)	20:31	19:19	17:14	16:31
31	05:56	20:21 (14)	06:46		07:29	08:45
	21:30	33 20:54 (13)	20:28		17:13	16:35
Potential sun hours	502	454	381	331	266	244
Total, worst case	389	333	181			
Sun reduction	0.27	0.30	0.28			
Oper. time red.	1.00	1.00	1.00			
Wind dir. red.	0.68	0.68	0.68			
Total reduction	0.18	0.20	0.19			
Total, real	71	67	35			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: AC - H29
Assumptions for shadow calculations

Table with monthly average daily sunshine hours (VALENTIA OBS.) from Jan to Dec: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time table showing wind directions and speeds: N 357, NNE 232, ENE 194, E 296, ESE 505, SSE 722, S 799, SSW 1,057, WSW 876, W 1,557, WNW 847, NNW 1,318, Sum 8,760

Main shadow calculation table with columns for months (January-December) and rows for sun times (08:45-18:45), potential sun hours (259), and various reduction metrics (Total, worst case, Sun, Oper. time, Wind dir., Total, real).

Table layout: For each day in each month the following matrix apply

Summary table for daily shadow data: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, WTG causing flicker first time, WTG causing flicker last time

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: AD - H30

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec. Values range from 1.06 to 2.04.

Operational time

Table with 13 columns: N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum. Values range from 194 to 8,760.

Main table with columns for months (January to June) and rows for each day (1 to 31). Includes a summary section at the bottom for potential sun hours and various reductions (Total, Oper. time, Wind dir., Total reduction).

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time).

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: AD - H30

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (July-December) and rows for specific times (e.g., 05:22, 06:48, etc.) and summary rows at the bottom.

Table layout: For each day in each month the following matrix apply

Matrix with 4 columns: Day in month, Sun rise/set, First/Last time with flicker, and WTG causing flicker first/last time.

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: AE - H31

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with columns for months (Jan to Dec) and values for sunshine probability (1.30 to 1.06)

Operational time

Table with columns for wind directions (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW) and total sum (8,760)

Main calendar table with columns for months (January to December) and rows for each day of the year, including sunrise/set times and shadow reduction factors.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise, Sun set, Minutes with flicker, First time with flicker, Last time with flicker, and WTG causing flicker times.

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: AF - H32

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45	08:18	07:25	07:14	19:20 (11)	05:24
	16:36	17:24	18:16	20:10	06:10	20:03 (14)
2	08:45	08:17	07:23	07:12	19:37 (11)	05:24
	16:37	17:26	18:17	20:11	21:00	20:32 (13)
3	08:45	08:15	07:20	07:10	19:21 (11)	05:23
	16:38	17:28	18:19	20:13	21:02	20:02 (14)
4	08:45	08:13	07:18	07:07	19:36 (11)	05:22
	16:40	17:30	18:21	20:15	21:02	20:33 (13)
5	08:44	08:12	07:16	07:05	19:21 (11)	05:23
	16:41	17:31	18:23	20:16	21:04	20:02 (14)
6	08:44	08:10	07:14	07:03	19:34 (11)	05:22
	16:42	17:33	18:25	20:18	21:04	20:03 (14)
7	08:44	08:08	07:12	07:01	19:23 (11)	05:22
	16:43	17:35	18:26	20:20	21:05	20:37 (13)
8	08:43	08:07	07:09	06:58	19:32 (11)	05:21
	16:45	17:37	18:28	20:21	21:05	20:03 (14)
9	08:43	08:05	07:07	06:56	19:32 (11)	05:21
	16:46	17:39	18:30	20:23	21:06	20:36 (13)
10	08:42	08:03	07:05	06:54	19:34 (11)	05:21
	16:47	17:41	18:32	20:25	21:07	20:03 (14)
11	08:42	08:01	07:03	06:52	19:23 (11)	05:21
	16:49	17:43	18:33	20:27	21:05	20:37 (13)
12	08:41	07:59	07:00	06:49	19:32 (11)	05:21
	16:50	17:44	18:35	20:28	21:06	20:03 (14)
13	08:40	07:58	06:58	06:47	19:36 (11)	05:21
	16:52	17:46	18:37	20:30	21:07	20:36 (13)
14	08:40	07:56	06:56	06:45	19:21 (11)	05:21
	16:53	17:48	18:39	20:32	21:08	20:03 (14)
15	08:39	07:54	06:54	06:43	19:34 (11)	05:21
	16:55	17:50	18:40	20:33	21:09	20:37 (13)
16	08:38	07:52	06:51	06:41	19:23 (11)	05:21
	16:56	17:52	18:42	20:35	21:10	20:03 (14)
17	08:37	07:50	06:49	06:38	19:36 (11)	05:21
	16:58	17:54	18:44	20:37	21:11	20:36 (13)
18	08:36	07:48	06:47	06:36	19:34 (11)	05:21
	17:00	17:56	18:46	20:38	21:12	20:03 (14)
19	08:35	07:46	06:44	06:34	19:21 (11)	05:21
	17:01	17:57	18:47	20:40	21:13	20:37 (13)
20	08:34	07:44	06:42	06:32	19:36 (11)	05:21
	17:03	17:59	18:49	20:42	21:14	20:03 (14)
21	08:33	07:42	06:40	06:30	19:34 (11)	05:21
	17:05	18:01	18:51	20:44	21:15	20:36 (13)
22	08:32	07:40	06:37	06:28	19:23 (11)	05:21
	17:06	18:03	18:52	20:45	21:16	20:03 (14)
23	08:31	07:38	06:35	06:26	19:36 (11)	05:21
	17:08	18:05	18:54	20:47	21:17	20:37 (13)
24	08:29	07:36	06:33	06:24	19:21 (11)	05:21
	17:10	18:07	18:56	20:49	21:18	20:03 (14)
25	08:28	07:33	06:30	06:22	19:34 (11)	05:21
	17:11	18:08	18:58	6 18:32 (11)	20:50	21:19
26	08:27	07:31	06:28	06:19	19:23 (11)	05:21
	17:13	18:10	18:59	10 18:34 (11)	20:52	21:20
27	08:25	07:29	06:26	06:17	19:36 (11)	05:21
	17:15	18:12	19:01	13 18:35 (11)	20:54	21:21
28	08:24	07:27	06:24	06:15	19:21 (11)	05:21
	17:17	18:14	19:03	16 18:37 (11)	20:55	21:22
29	08:23	07:21	06:13	06:13	19:34 (11)	05:21
	17:19	07:04	18:04	18 19:39 (11)	20:57	21:23
30	08:21	07:19	06:12	06:12	19:23 (11)	05:21
	17:20	07:19	18:06	18 19:39 (11)	20:59	21:24
31	08:20	07:17	06:11	06:11	19:20 (11)	05:21
	17:22	07:17	18:08	18 19:38 (11)	21:00	21:25
Potential sun hours	259	278	367	416	485	499
Total, worst case			99	213	431	
Sun reduction			0.24	0.35	0.37	
Oper. time red.			1.00	1.00	1.00	
Wind dir. red.			0.68	0.68	0.68	
Total reduction			0.17	0.24	0.25	
Total, real			16	51	108	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: AF - H32

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December		
1	05:21	05:58	20:17 (14)	06:48	07:37	07:30	08:21	
	22:00	21:28	27 20:44 (13)	20:26	19:17	17:11	16:30	
2	05:22	06:00	20:16 (14)	06:49	07:38	07:32	08:23	
	22:00	21:27	29 20:45 (13)	20:24	19:14	17:09	16:30	
3	05:23	06:01	20:15 (14)	06:51	07:40	07:34	08:24	
	21:59	21:25	31 20:46 (13)	20:22	19:12	17:07	16:29	
4	05:24	06:03	20:14 (14)	06:53	07:42	07:36	08:25	
	21:59	21:23	32 20:46 (13)	20:19	19:10	17:05	16:29	
5	05:24	06:04	20:13 (14)	06:54	07:43	07:37	08:27	
	21:58	21:21	32 20:45 (13)	20:17	19:08	17:04	16:28	
6	05:25	06:06	20:13 (14)	06:56	07:45	07:39	08:28	
	21:58	21:20	33 20:46 (13)	20:15	19:05	17:02	16:28	
7	05:26	06:07	20:12 (14)	06:57	07:47	07:41	08:29	
	21:57	21:18	34 20:46 (13)	20:13	19:03	17:00	16:27	
8	05:27	06:09	20:12 (14)	06:59	19:18 (11)	07:48	07:43	08:30
	21:57	21:16	34 20:46 (13)	20:10	9 19:27 (11)	19:01	16:58	16:27
9	05:28	06:10	20:11 (14)	07:01	19:15 (11)	07:50	07:45	08:32
	21:56	21:14	34 20:45 (13)	20:08	13 19:28 (11)	18:59	16:57	16:27
10	05:29	06:12	20:11 (14)	07:02	19:14 (11)	07:52	07:46	08:33
	21:55	21:12	33 20:44 (13)	20:06	15 19:29 (11)	18:56	16:55	16:26
11	05:30	06:14	20:11 (14)	07:04	19:12 (11)	07:53	07:48	08:34
	21:55	21:10	30 20:41 (13)	20:03	17 19:29 (11)	18:54	16:54	16:26
12	05:31	06:15	20:11 (14)	07:05	19:12 (11)	07:55	07:50	08:35
	21:54	21:08	29 20:40 (13)	20:01	18 19:30 (11)	18:52	16:52	16:26
13	05:32	06:17	20:11 (14)	07:07	19:11 (11)	07:57	07:52	08:36
	21:53	21:06	27 20:38 (13)	19:59	18 19:29 (11)	18:50	16:51	16:26
14	05:33	06:18	20:11 (14)	07:09	19:11 (11)	07:59	07:54	08:37
	21:52	21:05	25 20:36 (13)	19:56	18 19:29 (11)	18:47	16:49	16:26
15	05:35	06:20	20:11 (14)	07:10	19:11 (11)	08:00	07:55	08:38
	21:51	21:03	23 20:34 (13)	19:54	17 19:28 (11)	18:45	16:48	16:26
16	05:36	06:22	20:12 (14)	07:12	19:11 (11)	08:02	07:57	08:39
	21:50	21:01	20 20:32 (13)	19:52	14 19:25 (11)	18:43	16:46	16:26
17	05:37	06:23	20:13 (14)	07:14	19:12 (11)	08:04	07:59	08:39
	21:49	20:58	18 20:31 (14)	19:49	11 19:23 (11)	18:41	16:45	16:26
18	05:38	06:25	20:13 (14)	07:15	19:13 (11)	08:05	08:00	08:40
	21:48	20:56	15 20:28 (14)	19:47	7 19:20 (11)	18:39	16:44	16:27
19	05:40	06:27	20:15 (14)	07:17	19:17 (11)	08:07	08:02	08:41
	21:47	20:54	12 20:27 (14)	19:45	1 19:18 (11)	18:37	16:42	16:27
20	05:41	06:28	20:16 (14)	07:18	18:09	08:04	08:04	08:42
	21:45	20:52	8 20:24 (14)	19:42	18:35	16:41	16:27	
21	05:42	06:30	20:18 (14)	07:20	18:11	08:06	08:42	
	21:44	20:50	5 20:23 (14)	19:40	18:32	16:40	16:28	
22	05:43	06:31		07:22	08:12	08:07	08:43	
	21:43	20:48		19:38	18:30	16:39	16:28	
23	05:45	06:33		07:23	08:14	08:09	08:43	
	21:42	20:46		19:35	18:28	16:38	16:29	
24	05:46	06:35		07:25	08:16	08:10	08:44	
	21:40	20:44		19:33	18:26	16:37	16:29	
25	05:48	06:36		07:27	07:18	08:12	08:44	
	21:39	20:42		19:31	17:24	16:36	16:30	
26	05:49	06:38		07:28	07:20	08:14	08:44	
	21:37	20:39		19:28	17:22	16:35	16:31	
27	05:51	06:40		07:30	07:21	08:15	08:45	
	21:36	20:37		19:26	17:20	16:34	16:31	
28	05:52	20:35 (13)	06:41	07:32	07:23	08:17	08:45	
	21:34	1 20:36 (13)	20:35	19:24	17:18	16:33	16:32	
29	05:53	20:22 (14)	06:43	07:33	07:25	08:18	08:45	
	21:33	18 20:40 (13)	20:33	19:21	17:16	16:32	16:33	
30	05:55	20:20 (14)	06:44	07:35	07:27	08:20	08:45	
	21:31	22 20:42 (13)	20:31	19:19	17:14	16:31	16:34	
31	05:56	20:18 (14)	06:46		07:29		08:45	
	21:30	25 20:43 (13)	20:28		17:13		16:35	
Potential sun hours	502	454	381	331	266	244		
Total, worst case	66	531	158					
Sun reduction	0.27	0.30	0.28					
Oper. time red.	1.00	1.00	1.00					
Wind dir. red.	0.68	0.68	0.68					
Total reduction	0.18	0.20	0.19					
Total, real	12	107	30					

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: AG - H33

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec. Values range from 1.06 to 2.04.

Operational time

Table with 13 columns: N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum. Values range from 194 to 8,760.

Main shadow calculation table with columns for months (January to June) and rows for each day of the month. Includes potential sun hours and various reduction factors.

Table layout: For each day in each month the following matrix apply

Matrix table with 4 columns: Day in month, Sun rise/set, Minutes with flicker, First/Last time with flicker. Includes notes about WTG causing flicker.



SHADOW - Calendar

Calculation: Alternative Scenario 1 **Shadow receptor:** AG - H33

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:21	05:58	06:48	07:37	07:30	16:01 (13)
	22:00	21:28	20:26	19:17	17:11	26 16:27 (13)
2	05:22	05:59	06:49	07:38	18:01 (12)	07:32 16:01 (13)
	22:00	21:27	20:24	19:14	17:09	26 16:27 (13) 16:30
3	05:23	06:01	06:51	07:40	17:58 (12)	07:34 16:01 (13)
	21:59	21:25	20:22	19:12	15 18:13 (12)	17:07 25 16:26 (13)
4	05:24	06:03	06:53	07:42	17:57 (12)	07:36 16:02 (13)
	21:59	21:23	20:19	19:10	18 18:15 (12)	17:05 24 16:26 (13)
5	05:24	06:04	06:54	07:43	17:55 (12)	07:38 16:03 (13)
	21:59	21:21	20:17	19:08	20 18:15 (12)	17:04 22 16:25 (13)
6	05:25	06:06	06:56	07:45	17:54 (12)	07:39 16:03 (13)
	21:58	21:20	20:15	19:05	21 18:15 (12)	17:02 22 16:25 (13)
7	05:26	06:07	06:57	07:47	17:54 (12)	07:41 16:04 (13)
	21:57	21:18	20:13	19:03	21 18:15 (12)	17:00 20 16:24 (13)
8	05:27	06:09	06:59	07:48	17:54 (12)	07:43 16:06 (13)
	21:57	21:16	20:10	19:01	22 18:16 (12)	16:58 17 16:23 (13)
9	05:28	06:10	07:01	07:50	17:53 (12)	07:45 16:08 (13)
	21:56	21:14	20:08	18:59	21 18:14 (12)	16:57 13 16:21 (13)
10	05:29	06:12	07:02	07:52	17:53 (12)	07:47 16:10 (13)
	21:55	21:12	20:06	18:56	21 18:14 (12)	16:55 9 16:19 (13)
11	05:30	06:14	07:04	07:53	17:54 (12)	07:48 16:11 (13)
	21:55	21:10	20:03	18:54	20 18:14 (12)	16:54 16:26
12	05:31	06:15	07:06	07:55	17:54 (12)	07:50 16:26
	21:54	21:08	20:01	18:52	19 18:13 (12)	16:52 16:26
13	05:32	06:17	07:07	07:57	17:55 (12)	07:52 16:26
	21:53	21:07	19:59	18:50	15 18:10 (12)	16:51 16:26
14	05:33	06:18	07:09	07:59	17:56 (12)	07:54 16:26
	21:52	21:05	19:56	18:47	13 18:09 (12)	16:49 16:26
15	05:35	06:20	07:10	08:00	17:59 (12)	07:55 16:26
	21:51	21:03	19:54	18:45	6 18:05 (12)	16:48 16:26
16	05:36	06:22	07:12	08:02	16:46 07:57	16:26 16:39
	21:50	21:01	19:52	18:43	16:46 16:26	31 15:35 (14)
17	05:37	06:23	07:14	08:04	07:59 16:45	16:26 16:40
	21:49	20:59	19:49	18:41	16:45 16:26	31 15:36 (14)
18	05:38	06:25	07:15	08:06	08:01 16:44	16:26 16:27
	21:48	20:56	19:47	18:39	16:44 16:27	31 15:36 (14)
19	05:39	06:27	07:17	08:07	08:02 16:42	16:27 16:27
	21:47	20:54	19:45	18:37	16:42 16:27	31 15:37 (14)
20	05:41	06:28	07:19	08:09	08:04 15:06 (14)	08:42 15:06 (14)
	21:45	20:52	19:42	18:35	16:41 10 15:16 (14)	16:27 31 15:37 (14)
21	05:42	06:30	07:20	08:11	08:06 15:03 (14)	08:42 15:07 (14)
	21:44	20:50	19:40	18:32	16:40 15 15:18 (14)	16:28 31 15:38 (14)
22	05:43	06:31	07:22	08:13	17:12 (13) 08:07	15:02 (14) 08:43 15:07 (14)
	21:43	20:48	19:38	18:30	5 17:17 (13) 16:39	18 15:20 (14) 16:28 31 15:38 (14)
23	05:45	06:33	07:23	08:14	17:08 (13) 08:09	15:01 (14) 08:43 15:08 (14)
	21:42	20:46	19:35	18:28	13 17:21 (13) 16:38	20 15:21 (14) 16:29 31 15:39 (14)
24	05:46	06:35	07:25	08:16	17:06 (13) 08:11	15:01 (14) 08:44 15:08 (14)
	21:40	20:44	19:33	18:26	17 17:23 (13) 16:37	22 15:23 (14) 16:29 31 15:39 (14)
25	05:48	06:36	07:27	07:18	16:05 (13) 08:12	15:00 (14) 08:44 15:08 (14)
	21:39	20:42	19:31	17:24	19 16:24 (13) 16:35	24 15:24 (14) 16:30 31 15:39 (14)
26	05:49	06:38	07:28	07:20	16:04 (13) 08:14	14:59 (14) 08:44 15:09 (14)
	21:38	20:40	19:28	17:22	21 16:25 (13) 16:35	25 15:24 (14) 16:31 31 15:40 (14)
27	05:50	06:40	07:30	07:21	16:02 (13) 08:15	14:59 (14) 08:45 15:10 (14)
	21:36	20:37	19:26	17:20	23 16:25 (13) 16:34	26 15:25 (14) 16:31 31 15:41 (14)
28	05:52	06:41	07:32	07:23	16:01 (13) 08:17	15:00 (14) 08:45 15:10 (14)
	21:35	20:35	19:24	17:18	25 16:26 (13) 16:33	27 15:27 (14) 16:32 31 15:41 (14)
29	05:53	06:43	07:33	07:25	16:01 (13) 08:18	14:59 (14) 08:45 15:10 (14)
	21:33	20:33	19:21	17:16	25 16:26 (13) 16:32	28 15:27 (14) 16:33 32 15:42 (14)
30	05:55	06:44	07:35	07:27	16:01 (13) 08:20	14:59 (14) 08:45 15:11 (14)
	21:31	20:31	19:19	17:14	26 16:27 (13) 16:31	29 15:28 (14) 16:34 31 15:42 (14)
31	05:56	06:46	07:36	07:29	16:01 (13) 08:21	14:59 (14) 08:45 15:12 (14)
	21:30	20:28	19:17	17:13	26 16:27 (13) 16:32	16:35 31 15:43 (14)
Potential sun hours	502	454	381	331	266	244
Total, worst case				442	448	956
Sun reduction				0.24	0.18	0.13
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.63	0.61	0.59
Total reduction				0.15	0.11	0.08
Total, real				66	50	76

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: AI - H35

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for days (1-31) and summary rows (Potential sun hours, Total, worst case, Sun reduction, etc.)

Table layout: For each day in each month the following matrix apply

Matrix layout table with columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: AJ - H36

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for time intervals (08:45-17:23) and summary rows (Potential sun hours, Total, worst case, Sun reduction, Oper. time red., Wind dir. red., Total reduction, Total, real).

Table layout: For each day in each month the following matrix apply

Matrix with 2 rows (Sun rise/set, Minutes with flicker) and 2 columns (First/Last time with flicker, WTG causing flicker time).



Project:

6225Gortyrahill_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: AK - H37

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec. Values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns: N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum. Values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January to December) and rows for various times of day (08:45 to 18:00). Includes summary rows for 'Potential sun hours', 'Sun reduction', 'Oper. time red.', 'Wind dir. red.', 'Total reduction', and 'Total, real'.

Table layout: For each day in each month the following matrix apply

Matrix defining day in month, Sun rise/set times, minutes with flicker, and first/last times with flicker (WTG causing flicker).



SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: AL - H38

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 16:37	08:18 17:24	07:25 18:16	07:15 20:10	06:10 21:01	05:25 21:46
2	08:45 16:38	08:17 17:26	07:23 18:18	07:12 20:11	06:08 21:02	05:24 21:47
3	08:45 16:39	08:15 17:28	07:21 18:19	07:10 20:13	06:06 21:04	05:23 21:48
4	08:45 16:40	08:14 17:30	07:18 18:21	07:08 20:15	06:04 21:06	05:22 21:49
5	08:44 16:41	08:12 17:32	07:16 18:23	07:05 20:17	06:02 21:07	05:22 21:50
6	08:44 16:42	08:10 17:34	07:14 18:25	07:03 20:18	06:01 21:09	05:21 21:51
7	08:44 16:44	08:09 17:35	07:12 18:27	07:01 20:20	05:59 21:10	05:20 21:52
8	08:43 16:45	08:07 17:37	07:10 18:28	06:59 20:22	05:57 21:12	05:20 21:53
9	08:43 16:46	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	05:19 21:54
10	08:42 16:48	08:03 17:41	07:05 18:32	06:54 20:25	05:54 21:15	05:19 21:55
11	08:42 16:49	08:01 17:43	07:03 18:34	06:52 20:27	05:52 21:17	05:19 21:56
12	08:41 16:50	08:00 17:45	07:01 18:35	06:50 20:28	05:50 21:19	05:18 21:56
13	08:40 16:52	07:58 17:47	06:58 18:37	06:47 20:30	05:49 21:20	05:18 21:57
14	08:40 16:53	07:56 17:48	06:56 18:39	06:45 20:32	05:47 21:22	05:18 21:58
15	08:39 16:55	07:54 17:50	06:54 18:41	06:43 20:34	05:45 21:23	05:18 21:58
16	08:38 16:57	07:52 17:52	06:51 18:42	06:41 20:35	05:44 21:25	05:17 21:59
17	08:37 16:58	07:50 17:54	06:49 18:44	06:39 20:37	05:42 21:26	05:17 21:59
18	08:36 17:00	07:48 17:56	06:47 18:46	06:36 20:39	05:41 21:28	05:17 22:00
19	08:35 17:01	07:46 17:58	06:45 18:48	06:34 20:40	05:40 21:29	05:17 22:00
20	08:34 17:03	07:44 17:59	06:42 18:49	06:32 20:42	05:38 21:31	05:18 22:00
21	08:33 17:05	07:42 18:01	06:40 18:51	06:30 20:44	05:37 21:32	05:18 22:00
22	08:32 17:06	07:40 18:03	06:38 18:53	06:28 20:45	05:35 21:33	05:18 22:01
23	08:31 17:08	07:38 18:05	06:35 18:54	06:26 20:47	05:34 21:35	05:18 22:01
24	08:30 17:10	07:36 18:07	06:33 18:56	06:24 20:49	05:33 21:36	05:18 22:01
25	08:28 17:12	07:34 18:09	06:31 18:58	06:22 20:50	05:32 21:38	05:19 22:01
26	08:27 17:13	07:31 18:10	06:28 19:00	06:20 20:52	05:31 21:39	05:19 22:01
27	08:26 17:15	07:29 18:12	06:26 19:01	06:18 20:54	05:30 21:40	05:20 22:01
28	08:24 17:17	07:27 18:14	06:24 19:03	06:16 20:56	05:29 21:41	05:20 22:01
29	08:23 17:19	07:21 19:05	07:21 20:05	06:14 20:57	05:27 21:43	05:21 22:01
30	08:21 17:21	07:19 20:06	07:19 20:06	06:12 20:59	05:27 21:44	05:21 22:01
31	08:20 17:22	07:17 20:08	07:17 20:08	06:10 21:45	05:26 21:45	05:21 22:01
Potential sun hours	259	278	367	416	485	499
Total, worst case			180	685	523	
Sun reduction			0.24	0.35	0.37	
Oper. time red.			1.00	1.00	1.00	
Wind dir. red.			0.68	0.66	0.65	
Total reduction			0.17	0.23	0.24	
Total, real			30	160	126	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 1 **Shadow receptor:** AL - H38

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22	05:58	07:12 (15)	06:48	07:18 (16)	07:37
	22:00	21:28	29 07:41 (15)	20:26	26 07:44 (16)	19:17
2	05:22	06:00	07:10 (15)	06:50	07:17 (16)	07:38
	22:00	21:27	31 07:41 (15)	20:24	26 07:43 (16)	19:15
3	05:23	06:01	07:10 (15)	06:51	07:17 (16)	07:40
	21:59	21:25	32 07:42 (15)	20:22	26 07:43 (16)	19:12
4	05:24	06:03	07:09 (15)	06:53	07:19 (16)	07:42
	21:59	21:23	33 07:42 (15)	20:20	24 07:43 (16)	19:10
5	05:25	06:04	07:09 (15)	06:54	07:20 (16)	07:43
	21:59	21:22	34 07:43 (15)	20:17	22 07:42 (16)	19:08
6	05:26	06:06	07:08 (15)	06:56	07:22 (16)	07:45
	21:58	21:20	35 07:43 (15)	20:15	19 07:41 (16)	19:06
7	05:26	06:08	07:08 (15)	06:58	07:23 (16)	07:47
	21:57	21:18	36 07:44 (15)	20:13	16 07:39 (16)	19:03
8	05:27	06:09	07:08 (15)	06:59	07:25 (16)	07:49
	21:57	21:16	36 07:44 (15)	20:10	13 07:38 (16)	19:01
9	05:28	06:11	07:08 (15)	07:01	07:26 (16)	07:50
	21:56	21:14	36 07:44 (15)	20:08	9 07:35 (16)	18:59
10	05:29	06:12	07:07 (15)	07:02	07:28 (16)	07:52
	21:55	21:12	37 07:44 (15)	20:06	4 07:32 (16)	18:57
11	05:30	06:14	07:07 (15)	07:04		07:54
	21:55	21:11	37 07:44 (15)	20:04		18:54
12	05:31	06:16	07:07 (15)	07:06		07:55
	21:54	21:09	36 07:43 (15)	20:01		18:52
13	05:33	06:17	07:07 (15)	07:07	07:52 (17)	07:57
	21:53	21:07	36 07:43 (15)	19:59	5 07:57 (17)	18:50
14	05:34	06:19	07:07 (15)	07:09	07:48 (17)	07:59
	21:52	21:05	36 07:43 (15)	19:57	11 07:59 (17)	18:48
15	05:35	06:20	07:07 (15)	07:11	07:46 (17)	08:00
	21:51	21:03	36 07:43 (15)	19:54	15 08:01 (17)	18:46
16	05:36	06:22	07:07 (15)	07:12	07:44 (17)	08:02
	21:50	21:01	34 07:41 (15)	19:52	18 08:02 (17)	18:43
17	05:37	06:24	07:08 (15)	07:14	07:43 (17)	08:04
	21:49	20:59	33 07:41 (15)	19:50	19 08:02 (17)	18:41
18	05:39	06:25	07:08 (15)	07:15	07:43 (17)	08:06
	21:48	20:57	32 07:40 (15)	19:47	20 08:03 (17)	18:39
19	05:40	06:27	07:09 (15)	07:17	07:42 (17)	08:07
	21:47	20:55	30 07:39 (15)	19:45	20 08:02 (17)	18:37
20	05:41	06:28	07:10 (15)	07:19	07:44 (17)	08:09
	21:46	20:52	27 07:37 (15)	19:43	18 08:02 (17)	18:35
21	05:42	06:30	07:11 (15)	07:20	07:45 (17)	08:11
	21:44	20:50	25 07:36 (15)	19:40	16 08:01 (17)	18:33
22	05:44	06:32	07:12 (15)	07:22	07:47 (17)	08:13
	21:43	20:48	22 07:34 (15)	19:38	14 08:01 (17)	18:31
23	05:45	06:33	07:14 (15)	07:24	07:49 (17)	08:14
	21:42	20:46	18 07:32 (15)	19:36	11 08:00 (17)	18:29
24	05:47	06:35	07:18 (15)	07:25	07:50 (17)	08:16
	21:40	20:44	21 07:39 (16)	19:33	8 07:58 (17)	18:27
25	05:48	07:22 (15)	06:37	07:25 (16)	07:27	07:52 (17)
	21:39	7 07:29 (15)	20:42	15 07:40 (16)	19:31	4 07:56 (17)
26	05:49	07:20 (15)	06:38	07:24 (16)	07:29	07:20
	21:38	13 07:33 (15)	20:40	18 07:42 (16)	19:29	17:23
27	05:51	07:17 (15)	06:40	07:22 (16)	07:30	07:22
	21:36	17 07:34 (15)	20:37	21 07:43 (16)	19:26	17:21
28	05:52	07:16 (15)	06:41	07:21 (16)	07:32	07:23
	21:35	20 07:36 (15)	20:35	23 07:44 (16)	19:24	17:19
29	05:54	07:15 (15)	06:43	07:19 (16)	07:33	07:25
	21:33	23 07:38 (15)	20:33	25 07:44 (16)	19:22	17:17
30	05:55	07:13 (15)	06:45	07:19 (16)	07:35	07:27
	21:32	25 07:38 (15)	20:31	25 07:44 (16)	19:19	17:15
31	05:57	07:13 (15)	06:46	07:18 (16)		07:29
	21:30	27 07:40 (15)	20:29	26 07:44 (16)		17:13
Potential sun hours	502	454	381	331	266	244
Total, worst case	132	915	364			
Sun reduction	0.27	0.30	0.28			
Oper. time red.	1.00	1.00	1.00			
Wind dir. red.	0.65	0.65	0.67			
Total reduction	0.17	0.19	0.19			
Total, real	23	178	70			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: AM - H39

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for days (1-31) and summary rows (Potential sun hours, Total, worst case, etc.)

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: AN - H40

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction factors. Includes summary rows for 'Potential sun hours', 'Total, worst case', 'Sun reduction', 'Oper. time red.', 'Wind dir. red.', 'Total reduction', and 'Total, real'.

Table layout: For each day in each month the following matrix apply

Matrix with 2 columns: Day in month, and 2 rows: Sun rise (hh:mm) / Sun set (hh:mm), First time (hh:mm) with flicker / Last time (hh:mm) with flicker. Includes notes about WTG causing flicker.



SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: AO - H41

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with 12 columns (months) and rows for each hour from 08:45 to 17:22, including summary rows for Potential sun hours and Total, real.

Table layout: For each day in each month the following matrix apply

Matrix with 2 rows: Day in month, Sun rise/set, First/Last time with flicker, and WTG causing flicker first/last time.

Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: AP - H42

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Table with columns for months (January to December) and rows for time slots (e.g., 08:45, 16:36, etc.). Includes summary rows for 'Potential sun hours', 'Sun reduction', 'Oper. time red.', 'Wind dir. red.', 'Total reduction', and 'Total, real'.

Table layout: For each day in each month the following matrix apply

Matrix with columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: AQ - H43

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June					
1	08:45	15:26 (13)	08:18	15:39 (13)	07:25	07:14	06:10	05:24			
	16:36	13	15:39 (13)	17:24	8	15:47 (13)	18:16	20:10	21:00	21:46	
2	08:45	15:25 (13)	08:17		07:23	07:12	06:08	05:24			
	16:37	14	15:39 (13)	17:26		18:17	20:11	21:02	21:47		
3	08:45	15:25 (13)	08:15		07:21	07:10	06:06	05:23			
	16:38	16	15:41 (13)	17:28		18:19	20:13	21:04	21:48		
4	08:45	15:25 (13)	08:14		07:18	07:07	06:04	05:22			
	16:40	17	15:42 (13)	17:30		18:21	20:15	21:05	21:49		
5	08:44	15:24 (13)	08:12		07:16	07:05	06:02	05:21			
	16:41	19	15:43 (13)	17:31		18:23	20:16	21:07	21:50		
6	08:44	15:25 (13)	08:10		07:14	07:03	06:00	05:21			
	16:42	19	15:44 (13)	17:33		18:25	20:18	21:09	21:51		
7	08:44	15:24 (13)	08:08		07:12	07:01	05:58	05:20			
	16:43	21	15:45 (13)	17:35		18:26	20:20	21:10	21:52		
8	08:43	15:25 (13)	08:07		07:09	06:58	05:57	05:20			
	16:45	21	15:46 (13)	17:37		18:28	20:22	21:12	21:53		
9	08:43	15:24 (13)	08:05		07:07	06:56	05:55	05:19			
	16:46	23	15:47 (13)	17:39		18:30	20:23	21:14	21:54		
10	08:42	15:24 (13)	08:03		16:41 (12)	07:05	06:54	05:53	05:19		
	16:47	23	15:47 (13)	17:41	3	16:44 (12)	18:32	20:25	21:15	21:55	
11	08:42	15:24 (13)	08:01		16:37 (12)	07:03	06:52	05:52	05:18		
	16:49	24	15:48 (13)	17:43	11	16:48 (12)	18:33	20:27	21:17	21:56	
12	08:41	15:25 (13)	08:00		16:35 (12)	07:00	06:49	05:50	05:18		
	16:50	24	15:49 (13)	17:44	15	16:50 (12)	18:35	20:28	21:18	21:56	
13	08:40	15:25 (13)	07:58		16:34 (12)	06:58	06:47	05:48	05:18		
	16:52	25	15:50 (13)	17:46	18	16:52 (12)	18:37	20:30	21:20	21:57	
14	08:40	15:25 (13)	07:56		16:33 (12)	06:56	06:45	05:47	05:17		
	16:53	26	15:51 (13)	17:48	20	16:53 (12)	18:39	20:32	21:22	21:58	
15	08:39	15:25 (13)	07:54		16:32 (12)	06:54	06:43	05:45	05:17		
	16:55	26	15:51 (13)	17:50	22	16:54 (12)	18:40	20:33	21:23	21:58	
16	08:38	15:25 (13)	07:52		16:31 (12)	06:51	06:41	05:44	05:17		
	16:56	27	15:52 (13)	17:52	23	16:54 (12)	18:42	20:35	21:25	21:59	
17	08:37	15:25 (13)	07:50		16:31 (12)	06:49	06:38	05:42	05:17		
	16:58	27	15:52 (13)	17:54	24	16:55 (12)	18:44	20:37	21:26	21:59	
18	08:36	15:25 (13)	07:48		16:31 (12)	06:47	06:36	05:41	05:17		
	16:59	28	15:53 (13)	17:56	24	16:55 (12)	18:46	20:39	21:28	22:00	
19	08:35	15:25 (13)	07:46		16:31 (12)	06:44	06:34	05:39	05:17		
	17:01	27	15:52 (13)	17:57	24	16:55 (12)	18:47	20:40	21:29	22:00	
20	08:34	15:25 (13)	07:44		16:31 (12)	06:42	06:32	05:38	05:17		
	17:03	28	15:53 (13)	17:59	24	16:55 (12)	18:49	20:42	21:31	22:00	
21	08:33	15:26 (13)	07:42		16:32 (12)	06:40	06:30	05:36	05:17		
	17:04	28	15:54 (13)	18:01	22	16:54 (12)	18:51	20:44	21:32	22:00	
22	08:32	15:27 (13)	07:40		16:32 (12)	06:37	06:28	05:35	05:17		
	17:06	27	15:54 (13)	18:03	22	16:54 (12)	18:52	20:45	21:33	22:01	
23	08:31	15:27 (13)	07:38		16:33 (12)	06:35	06:26	05:34	05:18		
	17:08	26	15:53 (13)	18:05	20	16:53 (12)	18:54	20:47	21:35	22:01	
24	08:29	15:28 (13)	07:36		16:33 (12)	06:33	06:24	05:33	05:18		
	17:10	26	15:54 (13)	18:07	18	16:51 (12)	18:56	20:49	21:36	22:01	
25	08:28	15:29 (13)	07:34		16:35 (12)	06:30	06:22	05:31	05:18		
	17:11	25	15:54 (13)	18:08	14	16:49 (12)	18:58	20:50	21:38	22:01	
26	08:27	15:29 (13)	07:31		16:38 (12)	06:28	06:19	05:30	05:19		
	17:13	24	15:53 (13)	18:10	9	16:47 (12)	18:59	20:52	21:39	22:01	
27	08:26	15:30 (13)	07:29			06:26	06:17	05:29	05:19		
	17:15	23	15:53 (13)	18:12		19:01	20:54	21:40	22:01		
28	08:24	15:31 (13)	07:27			06:24	06:15	05:28	05:20		
	17:17	21	15:52 (13)	18:14		19:03	20:55	21:41	22:01		
29	08:23	15:32 (13)				07:21	06:13	05:27	05:20		
	17:19	19	15:51 (13)			20:04	20:57	21:43	22:01		
30	08:21	15:34 (13)				07:19	06:12	05:26	05:21		
	17:20	17	15:51 (13)			20:06	20:59	21:44	22:00		
31	08:20	15:35 (13)				07:17		05:25			
	17:22	14	15:49 (13)			20:08		21:45			
Potential sun hours	259		278		367		416		485		499
Total, worst case	698		321								
Sun reduction	0.16		0.21								
Oper. time red.	1.00		1.00								
Wind dir. red.	0.59		0.62								
Total reduction	0.09		0.13								
Total, real	64		41								

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker
			(WTG causing flicker last time)

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: AQ - H43

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:21	05:58	06:48	07:37	07:30	08:21
	22:00	21:28	20:26	19:17	17:11	16:30
2	05:22	05:59	06:49	07:38	07:32	08:23
	22:00	21:27	20:24	19:15	17:09	16:30
3	05:23	06:01	06:51	07:40	07:34	08:24
	21:59	21:25	20:22	19:12	17:07	16:29
4	05:24	06:03	06:53	07:42	07:36	08:26
	21:59	21:23	20:19	19:10	17:05	16:29
5	05:24	06:04	06:54	07:43	07:38	08:27
	21:59	21:21	20:17	19:08	17:04	16:28
6	05:25	06:06	06:56	07:45	07:39	08:28
	21:58	21:20	20:15	19:05	17:02	16:28
7	05:26	06:07	06:57	07:47	07:41	08:29
	21:57	21:18	20:13	19:03	17:00	16:27
8	05:27	06:09	06:59	07:48	07:43	08:31
	21:57	21:16	20:10	19:01	16:58	16:27
9	05:28	06:10	07:01	07:50	07:45	08:32
	21:56	21:14	20:08	18:59	16:57	16:27
10	05:29	06:12	07:02	07:52	07:47	08:33
	21:55	21:12	20:06	18:56	16:55	15:18 (13)
11	05:30	06:14	07:04	07:53	07:48	08:34
	21:55	21:10	20:03	18:54	16:54	15:21 (13)
12	05:31	06:15	07:06	07:55	07:50	08:35
	21:54	21:09	20:01	18:52	16:52	15:22 (13)
13	05:32	06:17	07:07	07:57	07:52	08:36
	21:53	21:07	19:59	18:50	16:51	15:23 (13)
14	05:33	06:18	07:09	07:59	07:54	08:37
	21:52	21:05	19:56	18:47	16:49	15:24 (13)
15	05:35	06:20	07:10	08:00	07:55	08:38
	21:51	21:03	19:54	18:45	16:48	15:25 (13)
16	05:36	06:22	07:12	08:02	07:57	08:39
	21:50	21:01	19:52	18:43	17:07 (12)	15:26 (13)
17	05:37	06:23	07:14	08:04	07:59	08:40
	21:49	20:59	19:49	18:41	17:22 (12)	15:27 (13)
18	05:38	06:25	07:15	08:06	08:01	08:40
	21:48	20:57	19:47	18:39	17:24 (12)	15:28 (13)
19	05:39	06:27	07:17	08:07	08:02	08:41
	21:47	20:54	19:45	18:37	17:24 (12)	15:28 (13)
20	05:41	06:28	07:19	08:09	08:04	08:42
	21:46	20:52	19:42	18:35	17:24 (12)	15:29 (13)
21	05:42	06:30	07:20	08:11	08:06	08:42
	21:44	20:50	19:40	18:32	17:25 (12)	15:29 (13)
22	05:43	06:31	07:22	08:13	08:07	08:43
	21:43	20:48	19:38	18:30	17:25 (12)	15:29 (13)
23	05:45	06:33	07:23	08:14	08:09	08:43
	21:42	20:46	19:35	18:28	17:25 (12)	15:30 (13)
24	05:46	06:35	07:25	08:16	08:11	08:44
	21:40	20:44	19:33	18:26	17:25 (12)	15:30 (13)
25	05:48	06:36	07:27	07:18	08:12	08:44
	21:39	20:42	19:31	17:24	16:25 (12)	15:30 (13)
26	05:49	06:38	07:28	07:20	08:14	08:44
	21:38	20:40	19:28	17:22	16:25 (12)	15:30 (13)
27	05:51	06:40	07:30	07:21	08:15	08:45
	21:36	20:37	19:26	17:20	16:23 (12)	15:30 (13)
28	05:52	06:41	07:32	07:23	08:17	08:45
	21:35	20:35	19:24	17:18	16:22 (12)	15:31 (13)
29	05:53	06:43	07:33	07:25	08:18	08:45
	21:33	20:33	19:21	17:16	16:21 (12)	15:30 (13)
30	05:55	06:44	07:35	07:27	08:20	08:45
	21:32	20:31	19:19	17:14	16:20 (12)	15:30 (13)
31	05:56	06:46		07:29	08:21	08:45
	21:30	20:28		17:13	16:17 (12)	16:35
Potential sun hours	502	454	381	331	266	244
Total, worst case				315	497	311
Sun reduction				0.24	0.18	0.13
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.62	0.59	0.59
Total reduction				0.15	0.11	0.08
Total, real				47	54	25

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: AR - H44

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec. Values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns: N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum. Values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January to December) and rows for day numbers (1-31) and time slots (e.g., 08:45, 16:36). Includes summary rows for Potential sun hours, Total, worst case, Sun reduction, Oper. time red., Wind dir. red., Total reduction, and Total, real.

Table layout: For each day in each month the following matrix apply

Matrix with 4 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

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Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 **Shadow receptor:** AS - H45**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January		February		March	April	May	June
1	08:45	14:34 (13)	08:18	15:55 (12)	07:25	07:14	06:10	05:24
	16:36	26 15:00 (13)	17:24	23 16:18 (12)	18:16	20:10	21:01	21:46
2	08:45	14:34 (13)	08:17	15:54 (12)	07:23	07:12	06:08	05:24
	16:37	26 15:00 (13)	17:26	25 16:19 (12)	18:17	20:11	21:02	21:47
3	08:45	14:35 (13)	08:15	15:54 (12)	07:21	07:10	06:06	05:23
	16:38	25 15:00 (13)	17:28	25 16:19 (12)	18:19	20:13	21:04	21:48
4	08:45	14:36 (13)	08:14	15:53 (12)	07:18	07:07	06:04	05:22
	16:40	25 15:01 (13)	17:30	26 16:19 (12)	18:21	20:15	21:06	21:49
5	08:44	14:36 (13)	08:12	15:54 (12)	07:16	07:05	06:02	05:21
	16:41	24 15:00 (13)	17:31	26 16:20 (12)	18:23	20:16	21:07	21:50
6	08:44	14:37 (13)	08:10	15:54 (12)	07:14	07:03	06:00	05:21
	16:42	24 15:01 (13)	17:33	26 16:20 (12)	18:25	20:18	21:09	21:51
7	08:44	14:38 (13)	08:09	15:54 (12)	07:12	07:01	05:58	05:20
	16:43	23 15:01 (13)	17:35	26 16:20 (12)	18:26	20:20	21:10	21:52
8	08:43	14:39 (13)	08:07	15:54 (12)	07:09	06:58	05:57	05:20
	16:45	22 15:01 (13)	17:37	26 16:20 (12)	18:28	20:22	21:12	21:53
9	08:43	14:40 (13)	08:05	15:55 (12)	07:07	06:56	05:55	05:19
	16:46	21 15:01 (13)	17:39	24 16:19 (12)	18:30	20:23	21:14	21:54
10	08:42	14:40 (13)	08:03	15:55 (12)	07:05	06:54	05:53	05:19
	16:47	20 15:00 (13)	17:41	24 16:19 (12)	18:32	20:25	21:15	21:55
11	08:42	14:41 (13)	08:01	15:56 (12)	07:03	06:52	05:52	05:18
	16:49	19 15:00 (13)	17:43	22 16:18 (12)	18:33	20:27	21:17	21:56
12	08:41	14:44 (13)	08:00	15:57 (12)	07:00	06:49	05:50	05:18
	16:50	16 15:00 (13)	17:44	20 16:17 (12)	18:35	20:28	21:18	21:56
13	08:40	14:45 (13)	07:58	15:59 (12)	06:58	06:47	05:48	05:18
	16:52	14 14:59 (13)	17:46	17 16:16 (12)	18:37	20:30	21:20	21:57
14	08:40	14:47 (13)	07:56	16:01 (12)	06:56	06:45	05:47	05:17
	16:53	11 14:58 (13)	17:48	13 16:14 (12)	18:39	20:32	21:22	21:58
15	08:39	14:51 (13)	07:54	16:04 (12)	06:54	06:43	05:45	05:17
	16:55	4 14:55 (13)	17:50	6 16:10 (12)	18:40	20:33	21:23	21:58
16	08:38		07:52	16:11 (12)	06:51	06:41	05:44	05:17
	16:56		17:52		18:42	20:35	21:25	21:59
17	08:37		07:50	16:12 (12)	06:49	06:38	05:42	05:17
	16:58		17:54		18:44	20:37	21:26	21:59
18	08:36		07:48	16:13 (12)	06:47	06:36	05:41	05:17
	16:59		17:56		18:46	20:39	21:28	22:00
19	08:35		07:46	16:14 (12)	06:44	06:34	05:39	05:17
	17:01		17:57		18:47	20:40	21:29	22:00
20	08:34		07:44	16:15 (12)	06:42	06:32	05:38	05:17
	17:03		17:59		18:49	20:42	21:31	22:00
21	08:33		07:42	16:16 (12)	06:40	06:30	05:36	05:17
	17:04		18:01		18:51	20:44	21:32	22:00
22	08:32		07:40	16:17 (12)	06:37	06:28	05:35	05:18
	17:06		18:03		18:53	20:45	21:33	22:01
23	08:31		07:38	16:18 (12)	06:35	06:26	05:34	05:18
	17:08		18:05		18:54	20:47	21:35	22:01
24	08:29		07:36	16:19 (12)	06:33	06:24	05:33	05:18
	17:10		18:07		18:56	20:49	21:36	22:01
25	08:28		07:34	16:20 (12)	06:30	06:22	05:31	05:18
	17:11		18:08		18:58	20:50	21:38	22:01
26	08:27	16:00 (12)	07:31	16:21 (12)	06:28	06:19	05:30	05:19
	17:13	9 16:09 (12)	18:10		18:59	20:52	21:39	22:01
27	08:26	15:59 (12)	07:29	16:22 (12)	06:26	06:17	05:29	05:19
	17:15	13 16:12 (12)	18:12		19:01	20:54	21:40	22:01
28	08:24	15:57 (12)	07:27	16:23 (12)	06:24	06:15	05:28	05:20
	17:17	17 16:14 (12)	18:14		19:03	20:55	21:41	22:01
29	08:23	15:56 (12)		16:24 (12)	07:21	06:13	05:27	05:20
	17:19	19 16:15 (12)			20:04	20:57	21:43	22:01
30	08:21	15:55 (12)		16:25 (12)	07:19	06:12	05:26	05:21
	17:20	21 16:16 (12)			20:06	20:59	21:44	22:00
31	08:20	15:54 (12)		16:26 (12)	07:17		05:25	
	17:22	23 16:17 (12)			20:08		21:45	
Potential sun hours	259		278		367	416	485	499
Total, worst case	402		329					
Sun reduction	0.16		0.21					
Oper. time red.	1.00		1.00					
Wind dir. red.	0.60		0.59					
Total reduction	0.09		0.12					
Total, real	38		40					

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: AS - H45

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:21	05:58	06:48	07:37	07:30	15:25 (12) 08:21 14:24 (13)
	22:00	21:28	20:26	19:17	17:11	23 15:48 (12) 16:30 18 14:42 (13)
2	05:22	05:59	06:49	07:38	07:32	15:24 (12) 08:23 14:24 (13)
	22:00	21:27	20:24	19:15	17:09	25 15:49 (12) 16:30 19 14:43 (13)
3	05:23	06:01	06:51	07:40	07:34	15:24 (12) 08:24 14:23 (13)
	21:59	21:25	20:22	19:12	17:07	25 15:49 (12) 16:29 21 14:44 (13)
4	05:24	06:03	06:53	07:42	07:36	15:24 (12) 08:26 14:23 (13)
	21:59	21:23	20:19	19:10	17:05	26 15:50 (12) 16:29 22 14:45 (13)
5	05:24	06:04	06:54	07:43	07:38	15:24 (12) 08:27 14:23 (13)
	21:59	21:21	20:17	19:08	17:04	26 15:50 (12) 16:28 23 14:46 (13)
6	05:25	06:06	06:56	07:45	07:39	15:24 (12) 08:28 14:23 (13)
	21:58	21:20	20:15	19:05	17:02	26 15:50 (12) 16:28 24 14:47 (13)
7	05:26	06:07	06:57	07:47	07:41	15:24 (12) 08:29 14:23 (13)
	21:57	21:18	20:13	19:03	17:00	26 15:50 (12) 16:27 25 14:48 (13)
8	05:27	06:09	06:59	07:48	07:43	15:24 (12) 08:31 14:23 (13)
	21:57	21:16	20:10	19:01	16:58	26 15:50 (12) 16:27 25 14:48 (13)
9	05:28	06:10	07:01	07:50	07:45	15:25 (12) 08:32 14:23 (13)
	21:56	21:14	20:08	18:59	16:57	25 15:50 (12) 16:27 25 14:48 (13)
10	05:29	06:12	07:02	07:52	07:47	15:26 (12) 08:33 14:24 (13)
	21:55	21:12	20:06	18:56	16:55	23 15:49 (12) 16:26 26 14:50 (13)
11	05:30	06:14	07:04	07:53	07:48	15:26 (12) 08:34 14:24 (13)
	21:55	21:10	20:03	18:54	16:54	23 15:49 (12) 16:26 26 14:50 (13)
12	05:31	06:15	07:06	07:55	07:50	15:27 (12) 08:35 14:24 (13)
	21:54	21:09	20:01	18:52	16:52	21 15:48 (12) 16:26 27 14:51 (13)
13	05:32	06:17	07:07	07:57	07:52	15:28 (12) 08:36 14:24 (13)
	21:53	21:07	19:59	18:50	16:51	18 15:46 (12) 16:26 27 14:51 (13)
14	05:33	06:18	07:09	07:59	07:54	15:29 (12) 08:37 14:25 (13)
	21:52	21:05	19:56	18:47	16:49	16 15:45 (12) 16:26 27 14:52 (13)
15	05:35	06:20	07:10	08:00	07:55	15:31 (12) 08:38 14:25 (13)
	21:51	21:03	19:54	18:45	16:48	13 15:44 (12) 16:26 28 14:53 (13)
16	05:36	06:22	07:12	08:02	07:57	15:33 (12) 08:39 14:26 (13)
	21:50	21:01	19:52	18:43	16:46	9 15:42 (12) 16:26 27 14:53 (13)
17	05:37	06:23	07:14	08:04	07:59	08:40 14:25 (13)
	21:49	20:59	19:49	18:41	16:45	16:26 28 14:53 (13)
18	05:38	06:25	07:15	08:06	08:01	08:40 14:26 (13)
	21:48	20:57	19:47	18:39	16:44	16:27 28 14:54 (13)
19	05:39	06:27	07:17	08:07	08:02	08:41 14:27 (13)
	21:47	20:54	19:45	18:37	16:42	16:27 28 14:55 (13)
20	05:41	06:28	07:19	08:09	08:04	08:42 14:27 (13)
	21:46	20:52	19:42	18:35	16:41	16:27 28 14:55 (13)
21	05:42	06:30	07:20	08:11	08:06	08:42 14:28 (13)
	21:44	20:50	19:40	18:32	16:40	16:28 27 14:55 (13)
22	05:43	06:31	07:22	08:13	08:07	08:43 14:28 (13)
	21:43	20:48	19:38	18:30	16:39	16:28 27 14:55 (13)
23	05:45	06:33	07:23	08:14	08:09	08:43 14:29 (13)
	21:42	20:46	19:35	18:28	16:38	16:29 27 14:56 (13)
24	05:46	06:35	07:25	08:16	08:11	08:44 14:29 (13)
	21:40	20:44	19:33	18:26	16:37	16:29 28 14:57 (13)
25	05:48	06:36	07:27	07:18	08:12	08:44 14:29 (13)
	21:39	20:42	19:31	17:24	16:36	16:30 28 14:57 (13)
26	05:49	06:38	07:28	07:20	08:14	08:44 14:30 (13)
	21:38	20:40	19:28	17:22	16:35	16:31 28 14:58 (13)
27	05:51	06:40	07:30	07:21	8 15:33 (12) 08:15	14:30 (13) 08:45 14:31 (13)
	21:36	20:37	19:26	17:20	8 15:41 (12) 16:34	4 14:34 (13) 16:31 27 14:58 (13)
28	05:52	06:41	07:32	07:23	14 15:30 (12) 08:17	14:27 (13) 08:45 14:31 (13)
	21:35	20:35	19:24	17:18	14 15:44 (12) 16:33	11 14:38 (13) 16:32 27 14:58 (13)
29	05:53	06:43	07:33	07:25	15:28 (12) 08:18	14:25 (13) 08:45 14:32 (13)
	21:33	20:33	19:21	17:16	17 15:45 (12) 16:32	14 14:39 (13) 16:33 27 14:59 (13)
30	05:55	06:44	07:35	07:27	21 15:26 (12) 08:20	14:25 (13) 08:45 14:32 (13)
	21:32	20:31	19:19	17:14	21 15:47 (12) 16:31	16 14:41 (13) 16:34 27 14:59 (13)
31	05:56	06:46	07:37	07:29	23 15:25 (12) 08:21	08:45 14:33 (13)
	21:30	20:29	19:17	17:13	23 15:48 (12) 16:35	27 15:00 (13)
Potential sun hours	502	454	381	331	266	244
Total, worst case				83	396	802
Sun reduction				0.24	0.18	0.13
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.59	0.59	0.60
Total reduction				0.14	0.11	0.08
Total, real				12	43	65

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

SHADOW - Calendar

Calculation: Alternative Scenario 1 **Shadow receptor:** AT - H46

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 16:37	08:18 17:24	07:25 18:16	07:15 20:10	06:10 21:01	06:54 (15) 21:46
2	08:45 16:38	08:17 17:26	07:23 18:18	07:12 20:11	06:08 21:02	06:54 (15) 21:47
3	08:45 16:39	08:15 17:28	07:21 18:19	07:10 20:13	06:06 21:04	06:54 (15) 21:48
4	08:45 16:40	08:14 17:30	07:19 18:21	07:08 20:15	06:04 21:06	06:54 (15) 21:49
5	08:44 16:41	08:12 17:32	07:16 18:23	07:05 20:17	06:02 21:07	06:54 (15) 21:50
6	08:44 16:42	08:10 17:34	07:14 18:25	07:03 20:18	06:01 21:09	06:55 (15) 21:51
7	08:44 16:44	08:09 17:35	07:12 18:27	07:01 20:20	05:59 21:10	06:56 (15) 21:52
8	08:43 16:45	08:07 17:37	07:10 18:28	06:59 20:22	07:21 (16) 07:28 (16)	05:57 21:12
9	08:43 16:46	08:05 17:39	07:07 18:30	06:56 20:23	07:19 (16) 07:30 (16)	05:55 21:14
10	08:42 16:48	08:03 17:41	07:05 18:32	06:54 20:25	07:17 (16) 07:31 (16)	05:54 21:15
11	08:42 16:49	08:01 17:43	07:03 18:34	06:52 20:27	07:15 (16) 07:32 (16)	05:52 21:17
12	08:41 16:50	08:00 17:45	07:01 18:35	06:50 20:28	07:13 (16) 07:33 (16)	05:50 21:19
13	08:40 16:52	07:58 17:47	06:58 18:37	06:47 20:30	07:11 (16) 07:32 (16)	05:49 21:20
14	08:40 16:53	07:56 17:48	06:56 18:39	06:45 20:32	07:11 (16) 07:32 (16)	05:47 21:22
15	08:39 16:55	07:54 17:50	06:54 18:41	06:43 20:34	07:11 (16) 07:32 (16)	05:45 21:23
16	08:38 16:57	07:52 17:52	06:51 18:42	06:41 20:35	07:11 (16) 07:31 (16)	05:44 21:25
17	08:37 16:58	07:50 17:54	06:49 18:44	06:39 20:37	07:11 (16) 07:31 (16)	05:42 21:26
18	08:36 17:00	07:48 17:56	06:47 18:46	06:37 20:39	07:12 (16) 07:30 (16)	05:41 21:28
19	08:35 17:01	07:46 17:58	06:45 18:48	06:34 20:40	07:13 (16) 07:29 (16)	05:40 21:29
20	08:34 17:03	07:44 18:00	06:42 18:49	06:32 20:42	07:14 (16) 07:27 (16)	05:38 21:31
21	08:33 17:05	07:42 18:01	06:40 18:51	06:30 20:44	07:16 (16) 07:24 (16)	05:37 21:32
22	08:32 17:07	07:40 18:03	06:38 18:53	06:28 20:45	07:04 (15) 07:15 (15)	05:36 21:34
23	08:31 17:08	07:38 18:05	06:35 18:54	06:26 20:47	07:02 (15) 07:17 (15)	05:34 21:35
24	08:30 17:10	07:36 18:07	06:33 18:56	06:24 20:49	07:00 (15) 07:19 (15)	05:33 21:36
25	08:28 17:12	07:34 18:09	06:31 18:58	06:22 20:50	06:58 (15) 07:20 (15)	05:32 21:38
26	08:27 17:13	07:32 18:10	06:28 19:00	06:20 20:52	06:57 (15) 07:20 (15)	05:31 21:39
27	08:26 17:15	07:29 18:12	06:26 19:01	06:18 20:54	06:56 (15) 07:21 (15)	05:30 21:40
28	08:24 17:17	07:27 18:14	06:24 19:03	06:16 20:56	06:55 (15) 07:21 (15)	05:29 21:42
29	08:23 17:19		07:21 20:05	06:14 20:57	06:55 (15) 07:21 (15)	05:28 21:43
30	08:21 17:21		07:19 20:06	06:12 20:59	06:54 (15) 07:21 (15)	05:27 21:44
31	08:20 17:23		07:17 20:08		05:26 21:45	
Potential sun hours	259	278	367	416	485	499
Total, worst case				421		263
Sun reduction				0.35		0.37
Oper. time red.				1.00		1.00
Wind dir. red.				0.65		0.64
Total reduction				0.23		0.24
Total, real				98		63

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 1 **Shadow receptor:** AT - H46

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22 22:00	05:58 21:28	07:11 (15) 07:23 (15)	06:48 20:26	07:14 (16) 07:31 (16)	07:30 17:11
2	05:23 22:00	06:00 21:27	07:09 (15) 07:24 (15)	06:50 20:24	07:15 (16) 07:29 (16)	07:32 17:09
3	05:23 21:59	06:01 21:25	07:08 (15) 07:26 (15)	06:51 20:22	07:17 (16) 07:28 (16)	07:34 17:07
4	05:24 21:59	06:03 21:23	07:06 (15) 07:27 (15)	06:53 20:20	07:19 (16) 07:26 (16)	07:36 17:06
5	05:25 21:59	06:04 21:22	07:06 (15) 07:28 (15)	06:54 20:17	07:43 19:08	07:38 17:04
6	05:26 21:58	06:06 21:20	07:05 (15) 07:28 (15)	06:56 20:15	07:45 19:06	07:39 17:02
7	05:27 21:57	06:08 21:18	07:05 (15) 07:29 (15)	06:58 20:13	07:47 19:03	07:41 17:00
8	05:27 21:57	06:09 21:16	07:04 (15) 07:29 (15)	06:59 20:10	07:49 19:01	07:43 16:59
9	05:28 21:56	06:11 21:14	07:04 (15) 07:30 (15)	07:01 20:08	07:50 18:59	07:45 16:57
10	05:29 21:55	06:12 21:12	07:03 (15) 07:29 (15)	07:03 20:06	07:52 18:57	07:47 16:55
11	05:30 21:55	06:14 21:11	07:03 (15) 07:30 (15)	07:04 20:04	07:54 18:54	07:48 16:54
12	05:32 21:54	06:16 21:09	07:02 (15) 07:29 (15)	07:06 20:01	07:55 18:52	07:50 16:52
13	05:33 21:53	06:17 21:07	07:03 (15) 07:30 (15)	07:07 19:59	07:57 18:50	07:52 16:51
14	05:34 21:52	06:19 21:05	07:02 (15) 07:29 (15)	07:09 19:57	07:59 18:48	07:54 16:49
15	05:35 21:51	06:20 21:03	07:03 (15) 07:29 (15)	07:11 19:54	08:00 18:46	07:55 16:48
16	05:36 21:50	06:22 21:01	07:03 (15) 07:27 (15)	07:12 19:52	08:02 18:43	07:57 16:47
17	05:37 21:49	06:24 20:59	07:04 (15) 07:27 (15)	07:14 19:50	08:04 18:41	07:59 16:45
18	05:39 21:48	06:25 20:57	07:04 (15) 07:25 (15)	07:15 19:47	08:06 18:39	08:01 16:44
19	05:40 21:47	06:27 20:55	07:06 (15) 07:24 (15)	07:17 19:45	08:07 18:37	08:02 16:43
20	05:41 21:46	06:28 20:52	07:07 (15) 07:22 (15)	07:19 19:43	08:09 18:35	08:04 16:41
21	05:42 21:44	06:30 20:50	07:09 (15) 07:19 (15)	07:20 19:40	08:11 18:33	08:06 16:40
22	05:44 21:43	06:32 20:48	07:19 (16) 07:28 (16)	07:22 19:38	08:13 18:31	08:07 16:39
23	05:45 21:42	06:33 20:46	07:18 (16) 07:31 (16)	07:24 19:36	08:14 18:29	08:09 16:38
24	05:47 21:40	06:35 20:44	07:16 (16) 07:32 (16)	07:25 19:33	08:16 18:27	08:11 16:37
25	05:48 21:39	06:37 20:42	07:15 (16) 07:33 (16)	07:27 19:31	08:18 17:25	08:12 16:36
26	05:49 21:38	06:38 20:40	07:14 (16) 07:34 (16)	07:29 19:29	08:20 17:23	08:14 16:35
27	05:51 21:36	06:40 20:37	07:13 (16) 07:33 (16)	07:30 19:26	08:22 17:21	08:15 16:34
28	05:52 21:35	06:41 20:35	07:13 (16) 07:34 (16)	07:32 19:24	08:23 17:19	08:17 16:33
29	05:54 21:33	06:43 20:33	07:12 (16) 07:33 (16)	07:33 19:22	08:25 17:17	08:18 16:32
30	05:55 21:32	06:45 20:31	07:12 (16) 07:33 (16)	07:35 19:19	08:27 17:15	08:20 16:32
31	05:57 21:30	06:46 20:29	07:12 (16) 07:32 (16)	07:35 19:17	08:29 17:13	08:22 16:31
Potential sun hours	502	454	381	331	266	244
Total, worst case	7	636	49			
Sun reduction	0.27	0.30	0.28			
Oper. time red.	1.00	1.00	1.00			
Wind dir. red.	0.64	0.65	0.66			
Total reduction	0.17	0.19	0.19			
Total, real	1	123	9			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: AU - H47

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec. Values range from 1.06 to 2.04.

Operational time

Table with 12 columns: N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum. Values range from 194 to 1,318.

Main shadow calculation table with columns for months (January to June) and rows for each day (1-31). Includes sunrise, sunset, and shadow data. Summary rows at the bottom show potential sun hours and various reductions.

Table layout: For each day in each month the following matrix apply

Matrix table with 4 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time).



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: AU - H47

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 14 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (July-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix table with 4 columns: Day in month, Sun rise/set, Minutes with flicker, First/Last time with flicker.



Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: AV - H48

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Table with columns for months (January to December) and rows for each day of the month, showing sun rise and set times, and a summary row at the bottom for 'Potential sun hours'.

Table layout: For each day in each month the following matrix apply

Matrix with columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

Project:

6225Gortyrahill_SadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
 Finisklin Business Park
 IE-F91 RHH9 Sligo
 +353719161416
 Karen O'Neill / koneill@jodireland.com
 Calculated:
 06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: AX - H50

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 16:36 41	14:36 (18) 08:18 17:24 43	14:35 (18) 07:25 18:16 17	17:26 (16) 07:14 20:10	06:10 21:00	05:25 20:33 (5)
2	08:45 16:37 41	14:36 (18) 08:17 17:26 43	14:36 (18) 07:23 18:17 19	17:25 (16) 07:12 20:11	06:08 21:02	05:24 20:32 (5)
3	08:45 16:39 42	14:36 (18) 08:15 17:28 41	14:37 (18) 07:21 18:19 21	17:24 (16) 07:10 20:13	06:06 21:04	05:23 20:32 (5)
4	08:45 16:40 43	14:35 (18) 08:13 17:30 49	14:37 (18) 07:18 18:21 22	17:24 (16) 07:07 20:15	06:04 21:05	05:22 20:31 (5)
5	08:44 16:41 43	14:35 (18) 08:12 17:32 53	14:39 (18) 07:16 18:23 23	17:22 (16) 07:05 20:16	06:02 21:07	05:22 20:31 (5)
6	08:44 16:42 44	14:35 (18) 08:10 17:33 55	14:40 (18) 07:14 18:25 23	17:22 (16) 07:03 20:18	06:00 21:09	05:21 20:31 (5)
7	08:44 16:43 44	14:35 (18) 08:08 17:35 56	14:40 (18) 07:12 18:26 22	17:23 (16) 07:01 20:20	05:59 21:10	20:21 (4) 05:20 21:52 22
8	08:43 16:45 45	14:34 (18) 08:07 17:37 55	14:42 (18) 07:09 18:28 22	17:23 (16) 06:58 20:21	05:57 21:12	20:18 (4) 05:20 21:53 23
9	08:43 16:46 46	15:19 (19) 08:05 17:39 55	14:43 (18) 07:07 18:30 20	17:45 (16) 06:56 20:23	05:55 21:14	20:29 (4) 05:19 21:54 24
10	08:42 16:47 45	14:34 (18) 08:03 17:41 53	14:45 (18) 07:05 18:32 19	17:24 (16) 06:54 20:25	05:53 21:15	20:30 (4) 05:19 21:55 23
11	08:42 16:49 45	14:34 (18) 08:01 17:43 49	14:47 (18) 07:03 18:33 16	17:25 (16) 06:52 20:27	05:52 21:17	20:16 (4) 05:18 21:55 24
12	08:41 16:50 46	14:33 (18) 07:59 17:45 43	14:50 (18) 07:00 18:35 13	17:26 (16) 06:49 20:28	05:50 21:18	20:32 (4) 05:18 21:56 25
13	08:40 16:52 46	15:19 (19) 07:58 17:46 34	14:55 (18) 06:58 18:37 5	17:30 (16) 06:47 20:30	05:48 21:20	20:33 (4) 05:18 21:57 25
14	08:40 16:53 46	14:34 (18) 07:56 17:48 26	16:31 (17) 06:56 18:39	06:45 20:32	05:47 21:21	20:14 (4) 05:18 21:57 25
15	08:39 16:55 46	14:33 (18) 07:54 17:50 26	16:31 (17) 06:54 18:40	06:43 20:33	05:45 21:23	20:13 (4) 05:17 21:58 25
16	08:38 16:56 46	14:33 (18) 07:52 17:52 26	16:31 (17) 06:51 18:42	06:41 20:35	05:44 21:25	20:13 (4) 05:17 21:59 25
17	08:37 16:58 45	15:19 (19) 07:50 17:54 25	16:32 (17) 06:49 18:44	06:38 20:37	05:42 21:26	20:34 (4) 05:17 21:59 26
18	08:36 17:00 44	14:32 (18) 07:48 17:56 24	16:32 (17) 06:47 18:46	06:36 20:38	05:41 21:28	20:13 (4) 05:17 21:59 26
19	08:35 17:01 42	14:33 (18) 07:46 17:57 22	16:33 (17) 06:44 18:47	06:34 20:40	05:39 21:29	20:14 (4) 05:17 22:00 26
20	08:34 17:03 42	15:15 (18) 07:44 17:59 19	16:35 (17) 06:42 18:49	06:32 20:42	05:38 21:31	20:14 (4) 05:17 22:00 26
21	08:33 17:05 43	14:33 (18) 07:42 18:01 16	16:36 (17) 06:40 18:51	06:30 20:44	05:37 21:32	20:15 (4) 05:17 22:00 26
22	08:32 17:06 44	14:33 (18) 07:40 18:03 11	16:39 (17) 06:37 18:53	06:28 20:45	05:35 21:33	20:15 (4) 05:18 22:01 26
23	08:31 17:08 44	15:17 (18) 07:38 18:05 8	16:50 (17) 06:35 18:54	06:26 20:47	05:34 21:35	20:16 (4) 05:18 22:01 26
24	08:29 17:10 44	14:33 (18) 07:36 18:07 15	16:55 (17) 06:33 18:56	06:24 20:49	05:33 21:36	20:16 (4) 05:18 22:01 26
25	08:28 17:12 44	14:33 (18) 07:33 18:08 13	16:56 (17) 06:31 18:58	06:22 20:50	05:32 21:37	20:17 (4) 05:19 22:01 26
26	08:27 17:13 45	15:17 (18) 07:31 18:10 8	16:52 (17) 06:28 19:01	06:20 20:54	05:30 21:40	20:19 (4) 05:19 22:01 25
27	08:25 17:15 45	14:33 (18) 07:29 18:12 8	17:31 (16) 06:26 19:01	06:18 20:54	05:29 21:40	20:20 (4) 05:19 22:01 25
28	08:24 17:17 45	15:18 (18) 07:27 18:14 13	17:29 (16) 06:24 19:03	06:16 20:55	05:28 21:41	20:22 (4) 05:20 22:01 25
29	08:23 17:19 44	14:34 (18) 07:25 18:04 11	17:42 (16) 06:21 19:03	06:14 20:57	05:27 21:43	20:26 (4) 05:20 22:01 24
30	08:21 17:20 44	15:18 (18) 07:23 18:06 11	17:39 (16) 06:19 19:03	06:12 20:59	05:26 21:44	20:30 (4) 05:21 22:00 25
31	08:20 17:22 44	14:35 (18) 07:21 18:08 11	17:17 06:17 20:08	06:10 21:45	05:25 21:45	20:34 (5) 05:21 22:00 25
Potential sun hours	259	278	367	416	485	499
Total, worst case	1368	845	242			710
Sun reduction	0.16	0.21	0.24			0.30
Oper. time red.	1.00	1.00	1.00			1.00
Wind dir. red.	0.60	0.61	0.64			0.69
Total reduction	0.09	0.12	0.15			0.20
Total, real	126	105	37		92	144

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: AX - H50

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec. Values range from 1.06 to 2.89.

Operational time

Table with 13 columns: N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum. Values range from 194 to 8,760.

Main shadow calculation table with columns for months (July-December) and rows for days (1-31). Includes a summary section at the bottom for 'Potential sun hours', 'Total, worst case', 'Sun reduction', 'Oper. time red.', 'Wind dir. red.', 'Total reduction', and 'Total, real'.

Table layout: For each day in each month the following matrix apply

Matrix with 4 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time).

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: AY - H51

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22	20:19 (5)	05:58	20:15 (4)	06:48	07:37
	22:00	28	20:47 (5)	21:28	20:35 (4)	20:26
2	05:22	20:19 (5)	06:00	20:14 (4)	06:49	07:38
	22:00	28	20:47 (5)	21:27	20:34 (4)	20:24
3	05:23	20:20 (5)	06:01	20:15 (4)	06:51	07:40
	21:59	28	20:48 (5)	21:25	20:35 (4)	20:22
4	05:24	20:19 (5)	06:03	20:15 (4)	06:53	07:42
	21:59	28	20:47 (5)	21:23	20:34 (4)	20:19
5	05:25	20:20 (5)	06:04	20:15 (4)	06:54	07:43
	21:58	27	20:47 (5)	21:21	20:34 (4)	20:17
6	05:25	20:20 (5)	06:06	20:15 (4)	06:56	07:45
	21:58	28	20:48 (5)	21:20	20:33 (4)	20:15
7	05:26	20:20 (5)	06:07	20:16 (4)	06:57	07:47
	21:57	28	20:48 (5)	21:18	20:31 (4)	20:13
8	05:27	20:21 (5)	06:09	20:17 (4)	06:59	07:48
	21:57	27	20:48 (5)	21:16	20:31 (4)	20:10
9	05:28	20:21 (5)	06:11	20:18 (4)	07:01	07:50
	21:56	27	20:48 (5)	21:14	20:29 (4)	20:08
10	05:29	20:21 (5)	06:12	20:21 (4)	07:02	07:52
	21:55	27	20:48 (5)	21:12	20:26 (4)	20:06
11	05:30	20:22 (5)	06:14		07:04	07:53
	21:55	26	20:48 (5)	21:10	20:03	18:54
12	05:31	20:22 (5)	06:15		07:06	07:55
	21:54	26	20:48 (5)	21:08	20:01	18:52
13	05:32	20:23 (5)	06:17		07:07	07:57
	21:53	25	20:48 (5)	21:06	19:59	18:50
14	05:34	20:23 (5)	06:19		07:09	07:59
	21:52	25	20:48 (5)	21:05	19:56	18:48
15	05:35	20:23 (5)	06:20		07:10	08:00
	21:51	24	20:47 (5)	21:03	19:54	18:45
16	05:36	20:24 (5)	06:22		07:12	08:02
	21:50	23	20:47 (5)	21:01	19:52	18:43
17	05:37	20:24 (5)	06:23		07:14	08:04
	21:49	22	20:46 (5)	20:59	19:49	18:41
18	05:38	20:25 (5)	06:25		07:15	08:06
	21:48	21	20:46 (5)	20:56	19:47	18:39
19	05:40	20:25 (5)	06:27		07:17	08:07
	21:47	20	20:45 (5)	20:54	19:45	18:37
20	05:41	20:27 (5)	06:28		07:19	08:09
	21:45	18	20:45 (5)	20:52	19:42	18:35
21	05:42	20:28 (5)	06:30		07:20	08:11
	21:44	15	20:43 (5)	20:50	19:40	18:33
22	05:44	20:29 (5)	06:31		07:22	08:13
	21:43	13	20:42 (5)	20:48	19:38	18:30
23	05:45	20:20 (4)	06:33		07:23	08:14
	21:42	16	20:39 (5)	20:46	19:35	18:28
24	05:46	20:20 (4)	06:35		07:25	08:16
	21:40	10	20:30 (4)	20:44	19:33	18:26
25	05:48	20:18 (4)	06:36		07:27	08:18
	21:39	13	20:31 (4)	20:42	19:31	17:24
26	05:49	20:17 (4)	06:38		07:28	08:20
	21:37	15	20:32 (4)	20:39	19:28	17:22
27	05:51	20:17 (4)	06:40		07:30	08:21
	21:36	16	20:33 (4)	20:37	19:26	17:20
28	05:52	20:16 (4)	06:41		07:32	08:23
	21:34	17	20:33 (4)	20:35	19:24	17:18
29	05:54	20:16 (4)	06:43		07:33	08:25
	21:33	18	20:34 (4)	20:33	19:21	17:16
30	05:55	20:15 (4)	06:44		07:35	08:27
	21:31	19	20:34 (4)	20:31	19:19	17:15
31	05:57	20:14 (4)	06:46		07:29	15:55 (17)
	21:30	20	20:34 (4)	20:28	17:13	16:20 (17)
Potential sun hours	502		454		381	331
Total, worst case	678		161		455	1261
Sun reduction	0.27		0.30		0.24	0.18
Oper. time red.	1.00		1.00		1.00	1.00
Wind dir. red.	0.68		0.68		0.63	0.60
Total reduction	0.18		0.20		0.15	0.11
Total, real	122		32		67	139

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: AZ - H52

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec. Values range from 1.06 to 2.89.

Operational time

Table with 13 columns: N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum. Values range from 194 to 8,760.

Main shadow calculation table with columns for months (Jan-Dec) and rows for each day (1-31), including sunrise/sunset times, shadow duration, and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix with 4 columns: Day in month, Sun rise/set (hh:mm), Minutes with flicker, First/Last time (hh:mm) with flicker (WTG causing flicker).

Project:

6225Gortyrahill_ShadofFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: BB - H54

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec. Values range from 1.06 to 2.89.

Operational time

Table with 13 columns: N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum. Values range from 194 to 1,318.

Main shadow calculation table with columns for months (January to December) and rows for each day (1-31) showing sun rise/set times, shadow times, and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix with 4 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time).



SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: BD - H56

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-June) and rows for each day of the month, listing sun rise/set times and shadow reduction metrics.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 1 **Shadow receptor:** BD - H56

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:21 22:00	05:58 21:28	06:48 20:26	07:37 19:17	07:30 17:11	16:04 (13) 08:21 15:11 (14)
2	05:22 22:00	05:59 21:27	06:49 20:24	07:38 19:14	07:32 17:09	16:04 (13) 08:23 15:11 (14)
3	05:23 21:59	06:01 21:25	06:51 20:22	07:40 19:12	07:34 17:07	16:05 (13) 08:24 15:11 (14)
4	05:24 21:59	06:03 21:23	06:53 20:19	07:42 19:10	07:36 17:05	16:05 (13) 08:25 15:12 (14)
5	05:24 21:59	06:04 21:21	06:54 20:17	07:43 19:08	07:38 17:03	16:05 (13) 08:27 15:12 (14)
6	05:25 21:58	06:06 21:20	06:56 20:15	07:45 19:05	07:39 17:02	16:06 (13) 08:28 15:13 (14)
7	05:26 21:57	06:07 21:18	06:57 20:13	07:47 19:03	07:41 17:00	16:07 (13) 08:29 15:13 (14)
8	05:27 21:57	06:09 21:16	06:59 20:10	07:48 19:01	07:43 16:58	16:08 (13) 08:31 15:13 (14)
9	05:28 21:56	06:10 21:14	07:01 20:08	07:50 18:59	07:45 16:57	16:09 (13) 08:32 15:13 (14)
10	05:29 21:55	06:12 21:12	07:02 20:06	07:52 18:56	07:46 16:55	16:11 (13) 08:33 15:14 (14)
11	05:30 21:55	06:14 21:10	07:04 20:03	07:53 18:54	07:48 16:54	16:13 (13) 08:34 15:15 (14)
12	05:31 21:54	06:15 21:08	07:05 20:01	07:55 18:52	07:50 16:52	16:21 (13) 08:35 15:15 (14)
13	05:32 21:53	06:17 21:07	07:07 19:59	07:57 18:50	07:52 16:51	08:36 15:16 (14)
14	05:33 21:52	06:18 21:05	07:09 19:56	07:59 18:47	07:54 16:49	08:37 15:16 (14)
15	05:35 21:51	06:20 21:03	07:10 19:54	08:00 18:45	07:55 16:48	08:38 15:17 (14)
16	05:36 21:50	06:22 21:01	07:12 19:52	08:02 18:43	07:57 16:46	08:39 15:16 (14)
17	05:37 21:49	06:23 20:59	07:14 19:49	08:04 18:41	07:59 16:45	08:40 15:17 (14)
18	05:38 21:48	06:25 20:56	07:15 19:47	08:06 18:39	08:01 16:44	08:40 15:18 (14)
19	05:39 21:47	06:27 20:54	07:17 19:45	08:07 18:37	08:02 16:42	08:41 15:19 (14)
20	05:41 21:45	06:28 20:52	07:18 19:42	08:09 18:35	08:04 16:41	08:42 15:18 (14)
21	05:42 21:44	06:30 20:50	07:20 19:40	08:11 18:32	08:06 16:40	08:42 15:19 (14)
22	05:43 21:43	06:31 20:48	07:22 19:38	08:13 18:30	08:07 16:39	08:43 15:19 (14)
23	05:45 21:42	06:33 20:46	07:23 19:35	08:14 18:28	08:09 16:38	08:43 15:20 (14)
24	05:46 21:40	06:35 20:44	07:25 19:33	08:16 18:26	08:11 16:36	08:44 15:20 (14)
25	05:48 21:39	06:36 20:42	07:27 19:31	08:18 18:24	08:12 16:35	08:44 15:21 (14)
26	05:49 21:38	06:38 20:40	07:28 19:28	08:20 18:22	08:14 16:35	08:44 15:22 (14)
27	05:50 21:36	06:40 20:37	07:30 19:26	08:21 18:20	08:15 16:34	08:45 15:22 (14)
28	05:52 21:35	06:41 20:35	07:32 19:24	08:23 18:18	08:17 16:33	08:45 15:22 (14)
29	05:53 21:33	06:43 20:33	07:33 19:21	08:25 18:16	08:18 16:32	08:45 15:23 (14)
30	05:55 21:31	06:44 20:31	07:35 19:19	08:27 18:14	08:20 16:31	08:45 15:23 (14)
31	05:56 21:30	06:46 20:28	07:37 19:17	08:29 18:13	08:21 16:30	08:45 15:24 (14)
Potential sun hours	502	454	381	331	266	244
Total, worst case				322	414	850
Sun reduction				0.24	0.18	0.13
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.63	0.61	0.59
Total reduction				0.15	0.11	0.08
Total, real				48	46	67

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: BE - H57

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 16:37	08:18 17:24	07:25 18:16	07:15 20:10	07:53 (17) 06:10	05:25 06:43 (15)
2	08:45 16:38	08:17 17:26	07:23 18:18	07:12 20:11	07:55 (17) 06:08	05:24 06:44 (15)
3	08:45 16:39	08:15 17:28	07:21 18:19	07:10 20:13	07:57 (17) 06:06	05:23 06:44 (15)
4	08:45 16:40	08:14 17:30	07:18 18:21	07:08 20:15	07:08 21:06	05:22 06:44 (15)
5	08:44 16:41	08:12 17:32	07:16 18:23	07:05 20:17	06:02 21:07	05:22 06:45 (15)
6	08:44 16:42	08:10 17:34	07:14 18:25	07:03 20:18	06:01 21:09	05:21 06:45 (15)
7	08:44 16:44	08:09 17:35	07:12 18:27	07:01 20:20	05:59 21:10	05:20 06:45 (15)
8	08:43 16:45	08:07 17:37	07:10 18:28	06:59 20:22	05:57 21:12	05:20 06:45 (15)
9	08:43 16:46	08:05 17:39	07:07 18:30	06:56 20:23	07:21 (16) 05:55	05:19 06:46 (15)
10	08:42 16:48	08:03 17:41	07:05 18:32	06:54 20:25	07:18 (16) 05:54	05:19 06:46 (15)
11	08:42 16:49	08:01 17:43	07:03 18:34	06:52 20:27	07:16 (16) 05:52	05:19 06:46 (15)
12	08:41 16:50	08:00 17:45	07:01 18:35	06:50 20:28	07:15 (16) 05:50	05:18 06:46 (15)
13	08:40 16:52	07:58 17:47	06:58 18:37	06:47 20:30	07:13 (16) 05:49	05:18 06:47 (15)
14	08:40 16:53	07:56 17:48	06:56 18:39	06:45 20:32	07:12 (16) 05:47	05:18 06:47 (15)
15	08:39 16:55	07:54 17:50	06:54 18:41	06:43 20:34	07:11 (16) 05:45	05:18 06:48 (15)
16	08:38 16:57	07:52 17:52	06:51 18:42	06:41 20:35	07:10 (16) 05:44	05:17 06:48 (15)
17	08:37 16:58	07:50 17:54	06:49 18:44	06:39 20:37	07:10 (16) 05:42	05:17 06:48 (15)
18	08:36 17:00	07:48 17:56	06:47 18:46	06:36 20:39	07:09 (16) 05:41	05:17 06:49 (15)
19	08:35 17:01	07:46 17:58	06:45 18:47	06:34 20:40	07:09 (16) 05:40	05:17 06:49 (15)
20	08:34 17:03	07:44 17:59	06:42 18:49	06:32 20:42	07:09 (16) 05:38	05:18 06:49 (15)
21	08:33 17:05	07:42 18:01	06:40 18:51	06:30 20:44	07:09 (16) 05:37	05:18 06:49 (15)
22	08:32 17:06	07:40 18:03	06:38 18:53	06:28 20:45	07:09 (16) 05:35	05:18 06:49 (15)
23	08:31 17:08	07:38 18:05	06:35 18:54	06:26 20:47	07:10 (16) 05:34	05:18 06:50 (15)
24	08:30 17:10	07:36 18:07	06:33 18:56	06:24 20:49	07:10 (16) 05:33	05:18 06:50 (15)
25	08:28 17:12	07:34 18:09	06:31 18:58	06:22 20:50	07:11 (16) 05:32	05:19 06:49 (15)
26	08:27 17:13	07:31 18:10	06:28 18:59	06:20 20:52	07:11 (16) 05:31	05:19 06:50 (15)
27	08:26 17:15	07:29 18:12	06:26 19:01	06:18 20:54	07:12 (16) 05:30	05:20 06:50 (15)
28	08:24 17:17	07:27 18:14	06:24 19:03	06:16 20:56	07:14 (16) 05:28	05:20 06:51 (15)
29	08:23 17:19	07:21 20:05	07:21 20:05	06:14 20:57	07:15 (16) 05:27	05:21 06:50 (15)
30	08:21 17:21	07:19 20:06	07:19 20:06	06:12 20:59	07:29 (16) 21:43	05:21 06:51 (15)
31	08:20 17:22	07:17 20:08	07:17 20:08	06:11 20:59	07:26 (16) 21:44	05:21 06:51 (15)
Potential sun hours	259	278	367	416	485	499
Total, worst case			225	585	1084	1299
Sun reduction			0.24	0.35	0.37	0.30
Oper. time red.			1.00	1.00	1.00	1.00
Wind dir. red.			0.68	0.66	0.64	0.64
Total reduction			0.17	0.24	0.24	0.19
Total, real			37	138	258	251

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: BE - H57

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Table with columns for months (July to December) and rows for each day (1-31) showing sun rise, sun set, and shadow reduction data. Includes summary rows for potential sun hours and various reduction metrics.

Table layout: For each day in each month the following matrix apply

Matrix table with columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: BF - H58

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times, flicker times, and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix table with 2 rows: Day in month, Sun rise/set, Minutes with flicker, First/Last time with flicker, and (WTG causing flicker first/last time).



Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: BG - H59

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec. Values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 14 columns: N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum. Values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January to December) and rows for each day (1-31) and summary rows (Potential sun hours, Total, worst case, Sun reduction, Oper. time red., Wind dir. red., Total reduction, Total, real).

Table layout: For each day in each month the following matrix apply

Day in month Sun rise (hh:mm) Sun set (hh:mm) Minutes with flicker First time (hh:mm) with flicker Last time (hh:mm) with flicker (WTG causing flicker first time) (WTG causing flicker last time)

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: BI - H61

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec. Values range from 1.06 to 2.89.

Operational time

Table with 14 columns: N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum. Values range from 194 to 1,318.

Main shadow calculation table with columns for months (January to June) and rows for each day (1-31) showing sun rise/set times, shadow reduction percentages, and total real sun hours.

Table layout: For each day in each month the following matrix apply

Matrix table with 4 columns: Day in month, Sun rise/set times, Minutes with flicker, and First/Last time with flicker (WTG causing flicker).



SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: BI - H61

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22 22:00	20:15 (5) 20:39 (5)	05:58 21:28	20:13 (4) 20:30 (4)	06:48 19:17	07:37 17:11
2	05:22 22:00	20:16 (5) 20:40 (5)	06:00 21:27	20:12 (4) 20:30 (4)	06:49 20:24	07:38 19:15
3	05:23 21:59	20:16 (5) 20:41 (5)	06:01 21:25	20:12 (4) 20:31 (4)	06:51 20:22	07:40 19:12
4	05:24 21:59	20:15 (5) 20:40 (5)	06:03 21:23	20:11 (4) 20:30 (4)	06:53 20:19	07:42 19:10
5	05:25 21:58	20:15 (5) 20:41 (5)	06:04 21:21	20:11 (4) 20:31 (4)	06:54 20:17	07:43 19:08
6	05:25 21:58	20:16 (5) 20:41 (5)	06:06 21:20	20:11 (4) 20:30 (4)	06:56 20:15	07:45 19:05
7	05:26 21:57	20:16 (5) 20:42 (5)	06:07 21:18	20:11 (4) 20:29 (4)	06:57 20:13	07:47 19:03
8	05:27 21:57	20:16 (5) 20:42 (5)	06:09 21:16	20:11 (4) 20:29 (4)	06:59 20:10	07:48 19:01
9	05:28 21:56	20:16 (5) 20:43 (5)	06:11 21:14	20:11 (4) 20:28 (4)	07:01 20:08	07:50 18:59
10	05:29 21:55	20:16 (5) 20:43 (5)	06:12 21:12	20:12 (4) 20:28 (4)	07:02 20:06	07:52 18:56
11	05:30 21:54	20:16 (5) 20:43 (5)	06:14 21:10	20:13 (4) 20:26 (4)	07:04 20:03	07:53 18:54
12	05:31 21:54	20:16 (5) 20:43 (5)	06:15 21:08	20:15 (4) 20:25 (4)	07:06 20:01	07:55 18:52
13	05:32 21:53	20:16 (5) 20:43 (5)	06:17 21:06	20:17 (4) 20:21 (4)	07:07 19:59	07:57 18:50
14	05:34 21:52	20:16 (5) 20:43 (5)	06:19 21:05	20:17 (4) 20:21 (4)	07:09 19:56	07:59 18:48
15	05:35 21:51	20:17 (5) 20:43 (5)	06:20 21:03	20:17 (4) 20:26 (4)	07:10 19:54	08:00 18:45
16	05:36 21:50	20:17 (5) 20:43 (5)	06:22 21:01	20:17 (4) 20:26 (4)	07:12 19:52	08:02 18:43
17	05:37 21:49	20:17 (5) 20:43 (5)	06:23 20:59	20:17 (4) 20:26 (4)	07:14 19:49	08:04 18:41
18	05:38 21:48	20:17 (5) 20:43 (5)	06:25 20:56	20:17 (4) 20:26 (4)	07:15 19:47	08:06 18:39
19	05:40 21:47	20:17 (5) 20:43 (5)	06:27 20:54	20:17 (4) 20:26 (4)	07:17 19:45	08:07 18:37
20	05:41 21:45	20:18 (5) 20:43 (5)	06:28 20:52	20:18 (5) 20:26 (4)	07:19 19:42	08:09 18:35
21	05:42 21:44	20:18 (5) 20:43 (5)	06:30 20:50	20:18 (5) 20:26 (4)	07:20 19:40	08:11 18:33
22	05:44 21:43	20:18 (5) 20:42 (5)	06:31 20:48	20:18 (5) 20:26 (4)	07:22 19:38	08:13 18:30
23	05:45 21:42	20:19 (5) 20:41 (5)	06:33 20:46	20:19 (5) 20:26 (4)	07:23 19:35	08:14 18:28
24	05:46 21:40	20:20 (5) 20:41 (5)	06:35 20:44	20:20 (5) 20:26 (4)	07:25 19:33	08:16 18:26
25	05:48 21:39	20:20 (5) 20:40 (5)	06:36 20:42	20:20 (5) 20:26 (4)	07:27 19:31	08:18 18:24
26	05:49 21:37	20:21 (5) 20:39 (5)	06:38 20:39	20:21 (5) 20:26 (4)	07:28 19:28	08:19 18:22
27	05:51 21:36	20:20 (4) 20:38 (5)	06:40 20:37	20:20 (4) 20:26 (4)	07:30 19:26	08:21 18:20
28	05:52 21:34	20:17 (4) 20:37 (5)	06:41 20:35	20:17 (4) 20:26 (4)	07:32 19:24	08:23 18:18
29	05:54 21:33	20:16 (4) 20:35 (5)	06:43 20:33	20:16 (4) 20:26 (4)	07:33 19:21	08:25 18:16
30	05:55 21:31	20:14 (4) 20:28 (4)	06:44 20:31	20:14 (4) 20:26 (4)	07:35 19:19	08:27 18:15
31	05:57 21:30	20:13 (4) 20:29 (4)	06:46 20:28	20:13 (4) 20:26 (4)	07:29 19:13	08:29 18:13
Potential sun hours	502	454		381	331	266
Total, worst case	735	208			426	1161
Sun reduction	0.27	0.30			0.24	0.18
Oper. time red.	1.00	1.00			1.00	1.00
Wind dir. red.	0.68	0.67			0.63	0.60
Total reduction	0.18	0.20			0.15	0.11
Total, real	132	41			63	74

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)



SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: BK - H63

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for days (1-31) and summary rows (Potential sun hours, Total, worst case, etc.)

Table layout: For each day in each month the following matrix apply

Summary table with 4 columns: Day in month, Sun rise/set, Minutes with flicker, First/Last time with flicker (WTG causing flicker)

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: BM - H65

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45	14:44 (14) 08:18	15:56 (13) 07:25	16:53 (12) 07:14	06:10	05:24
	16:36	17 15:01 (14) 17:24	24 16:20 (13) 18:16	9 17:02 (12) 20:10	21:00	21:46
2	08:45	14:44 (14) 08:17	15:56 (13) 07:23	07:12	06:08	05:24
	16:37	16 15:00 (14) 17:26	23 16:19 (13) 18:17	20:11	21:02	21:47
3	08:45	14:46 (14) 08:15	15:57 (13) 07:21	07:10	06:06	05:23
	16:38	14 15:00 (14) 17:28	21 16:18 (13) 18:19	20:13	21:04	21:48
4	08:45	14:47 (14) 08:14	15:58 (13) 07:18	07:07	06:04	05:22
	16:40	13 15:00 (14) 17:30	19 16:17 (13) 18:21	20:15	21:05	21:49
5	08:44	14:48 (14) 08:12	16:00 (13) 07:16	07:05	06:02	05:21
	16:41	11 14:59 (14) 17:31	17 16:17 (13) 18:23	20:16	21:07	21:50
6	08:44	14:51 (14) 08:10	16:01 (13) 07:14	07:03	06:00	05:21
	16:42	7 14:58 (14) 17:33	15 16:16 (13) 18:25	20:18	21:09	21:51
7	08:44	08:08	16:03 (13) 07:12	07:01	05:58	05:20
	16:43	17:35	10 16:13 (13) 18:26	20:20	21:10	21:52
8	08:43	08:07	07:09	06:58	05:57	05:20
	16:45	17:37	18:28	20:22	21:12	21:53
9	08:43	08:05	07:07	06:56	05:55	05:19
	16:46	17:39	18:30	20:23	21:14	21:54
10	08:42	08:03	07:05	06:54	05:53	05:19
	16:47	17:41	18:32	20:25	21:15	21:55
11	08:42	08:01	07:03	06:52	05:52	05:18
	16:49	17:43	18:33	20:27	21:17	21:56
12	08:41	07:59	07:00	06:49	05:50	05:18
	16:50	17:44	18:35	20:28	21:18	21:56
13	08:40	07:58	06:58	06:47	05:48	05:18
	16:52	17:46	18:37	20:30	21:20	21:57
14	08:40	07:56	06:56	06:45	05:47	05:17
	16:53	17:48	18:39	20:32	21:22	21:58
15	08:39	07:54	06:54	06:43	05:45	05:17
	16:55	17:50	18:40	20:33	21:23	21:58
16	08:38	07:52	16:54 (12) 06:51	06:41	05:44	05:17
	16:56	17:52	9 17:03 (12) 18:42	20:35	21:25	21:59
17	08:37	16:00 (13) 07:50	16:52 (12) 06:49	06:38	05:42	05:17
	16:58	8 16:08 (13) 17:54	14 17:06 (12) 18:44	20:37	21:26	21:59
18	08:36	15:58 (13) 07:48	16:50 (12) 06:47	06:36	05:41	05:17
	16:59	12 16:10 (13) 17:56	17 17:07 (12) 18:46	20:39	21:28	22:00
19	08:35	15:56 (13) 07:46	16:49 (12) 06:44	06:34	05:39	05:17
	17:01	15 16:11 (13) 17:57	19 17:08 (12) 18:47	20:40	21:29	22:00
20	08:34	15:56 (13) 07:44	16:49 (12) 06:42	06:32	05:38	05:17
	17:03	17 16:13 (13) 17:59	20 17:09 (12) 18:49	20:42	21:31	22:00
21	08:33	15:55 (13) 07:42	16:48 (12) 06:40	06:30	05:36	05:17
	17:04	19 16:14 (13) 18:01	21 17:09 (12) 18:51	20:44	21:32	22:00
22	08:32	15:55 (13) 07:40	16:48 (12) 06:37	06:28	05:35	05:17
	17:06	20 16:15 (13) 18:03	21 17:09 (12) 18:52	20:45	21:33	22:01
23	08:31	15:54 (13) 07:38	16:48 (12) 06:35	06:26	05:34	05:18
	17:08	22 16:16 (13) 18:05	22 17:10 (12) 18:54	20:47	21:35	22:01
24	08:29	15:54 (13) 07:36	16:47 (12) 06:33	06:24	05:33	05:18
	17:10	23 16:17 (13) 18:07	21 17:08 (12) 18:56	20:49	21:36	22:01
25	08:28	15:55 (13) 07:33	16:48 (12) 06:30	06:22	05:31	05:18
	17:11	23 16:18 (13) 18:08	20 17:08 (12) 18:58	20:50	21:38	22:01
26	08:27	15:54 (13) 07:31	16:49 (12) 06:28	06:19	05:30	05:19
	17:13	24 16:18 (13) 18:10	18 17:07 (12) 18:59	20:52	21:39	22:01
27	08:26	15:55 (13) 07:29	16:50 (12) 06:26	06:17	05:29	05:19
	17:15	24 16:19 (13) 18:12	16 17:06 (12) 19:01	20:54	21:40	22:01
28	08:24	15:54 (13) 07:27	16:52 (12) 06:24	06:15	05:28	05:20
	17:17	25 16:19 (13) 18:14	13 17:05 (12) 19:03	20:55	21:41	22:01
29	08:23	15:54 (13) 07:25	07:21	06:13	05:27	05:20
	17:19	25 16:19 (13) 18:14	20:04	20:57	21:43	22:01
30	08:21	15:55 (13) 07:23	07:19	06:12	05:26	05:21
	17:20	24 16:19 (13) 18:12	20:06	20:59	21:44	22:00
31	08:20	15:55 (13) 07:21	07:17		05:25	
	17:22	24 16:19 (13) 18:10	20:08		21:45	
Potential sun hours	259	278	367	416	485	499
Total, worst case	383	360	9			
Sun reduction	0.16	0.21	0.24			
Oper. time red.	1.00	1.00	1.00			
Wind dir. red.	0.59	0.62	0.63			
Total reduction	0.09	0.13	0.15			
Total, real	35	46	1			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: BM - H65

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:21	05:58	06:48	07:37	07:30	08:21
	22:00	21:28	20:26	19:17	17:11	16:30
2	05:22	05:59	06:49	07:38	07:32	08:23
	22:00	21:27	20:24	19:14	17:09	16:30
3	05:23	06:01	06:51	07:40	07:34	08:24
	21:59	21:25	20:22	19:12	17:07	16:29
4	05:24	06:03	06:53	07:42	07:36	08:26
	21:59	21:23	20:19	19:10	17:05	16:29
5	05:24	06:04	06:54	07:43	07:38	08:27
	21:59	21:21	20:17	19:08	17:04	16:28
6	05:25	06:06	06:56	07:45	07:39	08:28
	21:58	21:20	20:15	19:05	17:02	16:28
7	05:26	06:07	06:57	07:47	07:41	08:29
	21:57	21:18	20:13	19:03	17:00	16:27
8	05:27	06:09	06:59	07:48	07:43	08:31
	21:57	21:16	20:10	19:01	16:58	16:27
9	05:28	06:10	07:01	07:50	07:45	08:32
	21:56	21:14	20:08	18:59	16:57	16:27
10	05:29	06:12	07:02	07:52	07:47	08:33
	21:55	21:12	20:06	18:56	16:55	16:26
11	05:30	06:14	07:04	07:53	07:48	08:34
	21:55	21:10	20:03	18:54	16:54	16:26
12	05:31	06:15	07:06	07:55	07:50	08:35
	21:54	21:09	20:01	18:52	16:52	16:26
13	05:32	06:17	07:07	07:57	07:52	08:36
	21:53	21:07	19:59	18:50	11 17:25 (12)	16:26
14	05:33	06:18	07:09	07:59	07:54	08:37
	21:52	21:05	19:56	18:47	15 17:38 (12)	16:26
15	05:35	06:20	07:10	08:00	07:55	08:38
	21:51	21:03	19:54	18:45	17 17:39 (12)	16:26
16	05:36	06:22	07:12	08:02	07:57	08:39
	21:50	21:01	19:52	18:43	19 17:40 (12)	16:26
17	05:37	06:23	07:14	08:04	07:59	08:40
	21:49	20:59	19:49	18:41	20 17:40 (12)	16:26
18	05:38	06:25	07:15	08:06	08:01	08:40
	21:48	20:57	19:47	18:39	21 17:41 (12)	16:27
19	05:39	06:27	07:17	08:07	08:02	08:41
	21:47	20:54	19:45	18:37	22 17:40 (12)	16:27
20	05:41	06:28	07:19	08:09	08:04	08:42
	21:46	20:52	19:42	18:35	21 17:40 (12)	16:27
21	05:42	06:30	07:20	08:11	08:06	08:42
	21:44	20:50	19:40	18:32	20 17:39 (12)	16:28
22	05:43	06:31	07:22	08:13	08:07	08:43
	21:43	20:48	19:38	18:30	20 17:39 (12)	16:28
23	05:45	06:33	07:23	08:14	08:09	08:43
	21:42	20:46	19:35	18:28	18 17:38 (12)	16:29
24	05:46	06:35	07:25	08:16	08:11	08:44
	21:40	20:44	19:33	18:26	16 17:37 (12)	16:29
25	05:48	06:36	07:27	07:18	08:12	08:44
	21:39	20:42	19:31	17:24	14 16:36 (12)	16:30
26	05:49	06:38	07:28	07:20	08:14	08:44
	21:38	20:40	19:28	17:22	8 16:33 (12)	16:31
27	05:50	06:40	07:30	07:21	08:15	08:45
	21:36	20:37	19:26	17:20	16:34	16:31
28	05:52	06:41	07:32	07:23	08:17	08:45
	21:35	20:35	19:24	17:18	16:33	16:32
29	05:53	06:43	07:33	07:25	08:18	08:45
	21:33	20:33	19:21	17:16	16:32	16:33
30	05:55	06:44	07:35	07:27	08:20	08:45
	21:31	20:31	19:19	17:14	16:31	16:34
31	05:56	06:46		07:29		08:45
	21:30	20:28		17:13		16:35
Potential sun hours	502	454	381	331	266	244
Total, worst case				242	436	470
Sun reduction				0.24	0.18	0.13
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.63	0.59	0.60
Total reduction				0.15	0.11	0.08
Total, real				36	47	38

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

6225Gortyrahyilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: BN - H66

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Assumptions for shadow calculations

Table with 12 columns (Jan to Dec) and 1 row of values: 1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

Table with 13 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of values: 357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Main shadow calculation table with columns for months (January to December) and rows for each day of the month, including sun rise/set times and shadow reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix with 4 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: BO - H67

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction factors.

Table layout: For each day in each month the following matrix apply

Matrix with 4 columns: Day in month, Sun rise/set, Minutes with flicker, First/Last time with flicker.



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: BP - H68

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January		February		March	April	May	June
1	08:45	15:08 (13)	08:18		07:25	07:14	06:10	05:24
	16:36	25 15:33 (13)	17:24		18:16	20:10	21:00	21:46
2	08:45	15:07 (13)	08:17		07:23	07:12	06:08	05:24
	16:37	26 15:33 (13)	17:26		18:17	20:11	21:02	21:47
3	08:45	15:08 (13)	08:15	16:27 (12)	07:21	07:10	06:06	05:23
	16:38	26 15:34 (13)	17:28	5 16:32 (12)	18:19	20:13	21:04	21:48
4	08:45	15:09 (13)	08:14	16:24 (12)	07:18	07:07	06:04	05:22
	16:40	26 15:35 (13)	17:30	11 16:35 (12)	18:21	20:15	21:05	21:49
5	08:44	15:09 (13)	08:12	16:23 (12)	07:16	07:05	06:02	05:21
	16:41	25 15:34 (13)	17:31	15 16:38 (12)	18:23	20:16	21:07	21:50
6	08:44	15:09 (13)	08:10	16:21 (12)	07:14	07:03	06:00	05:21
	16:42	26 15:35 (13)	17:33	18 16:39 (12)	18:25	20:18	21:09	21:51
7	08:44	15:09 (13)	08:08	16:20 (12)	07:12	07:01	05:58	05:20
	16:43	26 15:35 (13)	17:35	20 16:40 (12)	18:26	20:20	21:10	21:52
8	08:43	15:10 (13)	08:07	16:20 (12)	07:09	06:58	05:57	05:20
	16:45	27 15:37 (13)	17:37	21 16:41 (12)	18:28	20:22	21:12	21:53
9	08:43	15:10 (13)	08:05	16:19 (12)	07:07	06:56	05:55	05:19
	16:46	27 15:37 (13)	17:39	22 16:41 (12)	18:30	20:23	21:14	21:54
10	08:42	15:10 (13)	08:03	16:19 (12)	07:05	06:54	05:53	05:19
	16:47	27 15:37 (13)	17:41	22 16:41 (12)	18:32	20:25	21:15	21:55
11	08:42	15:11 (13)	08:01	16:18 (12)	07:03	06:52	05:52	05:18
	16:49	26 15:37 (13)	17:43	24 16:42 (12)	18:33	20:27	21:17	21:56
12	08:41	15:12 (13)	08:00	16:18 (12)	07:00	06:49	05:50	05:18
	16:50	26 15:38 (13)	17:44	24 16:42 (12)	18:35	20:28	21:18	21:56
13	08:40	15:12 (13)	07:58	16:18 (12)	06:58	06:47	05:48	05:18
	16:52	26 15:38 (13)	17:46	24 16:42 (12)	18:37	20:30	21:20	21:57
14	08:40	15:13 (13)	07:56	16:19 (12)	06:56	06:45	05:47	05:17
	16:53	25 15:38 (13)	17:48	22 16:41 (12)	18:39	20:32	21:22	21:58
15	08:39	15:13 (13)	07:54	16:19 (12)	06:54	06:43	05:45	05:17
	16:55	25 15:38 (13)	17:50	22 16:41 (12)	18:40	20:33	21:23	21:58
16	08:38	15:14 (13)	07:52	16:20 (12)	06:51	06:41	05:44	05:17
	16:56	24 15:38 (13)	17:52	20 16:40 (12)	18:42	20:35	21:25	21:59
17	08:37	15:15 (13)	07:50	16:21 (12)	06:49	06:38	05:42	05:17
	16:58	23 15:38 (13)	17:54	18 16:39 (12)	18:44	20:37	21:26	21:59
18	08:36	15:16 (13)	07:48	16:23 (12)	06:47	06:36	05:41	05:17
	16:59	22 15:38 (13)	17:56	15 16:38 (12)	18:46	20:39	21:28	22:00
19	08:35	15:16 (13)	07:46	16:25 (12)	06:44	06:34	05:39	05:17
	17:01	21 15:37 (13)	17:57	11 16:36 (12)	18:47	20:40	21:29	22:00
20	08:34	15:17 (13)	07:44		06:42	06:32	05:38	05:17
	17:03	20 15:37 (13)	17:59		18:49	20:42	21:31	22:00
21	08:33	15:19 (13)	07:42		06:40	06:30	05:36	05:17
	17:04	18 15:37 (13)	18:01		18:51	20:44	21:32	22:00
22	08:32	15:20 (13)	07:40		06:37	06:28	05:35	05:17
	17:06	17 15:37 (13)	18:03		18:52	20:45	21:33	22:01
23	08:31	15:21 (13)	07:38		06:35	06:26	05:34	05:18
	17:08	14 15:35 (13)	18:05		18:54	20:47	21:35	22:01
24	08:29	15:24 (13)	07:36		06:33	06:24	05:33	05:18
	17:10	9 15:33 (13)	18:07		18:56	20:49	21:36	22:01
25	08:28		07:34		06:30	06:22	05:31	05:18
	17:11		18:08		18:58	20:50	21:38	22:01
26	08:27		07:31		06:28	06:19	05:30	05:19
	17:13		18:10		18:59	20:52	21:39	22:01
27	08:26		07:29		06:26	06:17	05:29	05:19
	17:15		18:12		19:01	20:54	21:40	22:01
28	08:24		07:27		06:24	06:15	05:28	05:20
	17:17		18:14		19:03	20:55	21:41	22:01
29	08:23				07:21	06:13	05:27	05:20
	17:19				20:04	20:57	21:43	22:01
30	08:21				07:19	06:12	05:26	05:21
	17:20				20:06	20:59	21:44	22:00
31	08:20				07:17		05:25	
	17:22				20:08		21:45	
Potential sun hours	259		278		367	416	485	499
Total, worst case		557		314				
Sun reduction		0.16		0.21				
Oper. time red.		1.00		1.00				
Wind dir. red.		0.59		0.61				
Total reduction		0.09		0.13				
Total, real		51		39				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: BP - H68

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:21	05:58	06:48	07:37	07:30	15:48 (12) 08:21 14:53 (13)
	22:00	21:28	20:26	19:17	17:11	23 16:11 (12) 16:30 26 15:19 (13)
2	05:22	05:59	06:49	07:38	07:32	15:49 (12) 08:23 14:53 (13)
	22:00	21:27	20:24	19:15	17:09	22 16:11 (12) 16:30 27 15:20 (13)
3	05:23	06:01	06:51	07:40	07:34	15:49 (12) 08:24 14:53 (13)
	21:59	21:25	20:22	19:12	17:07	21 16:10 (12) 16:29 27 15:20 (13)
4	05:24	06:03	06:53	07:42	07:36	15:50 (12) 08:26 14:54 (13)
	21:59	21:23	20:19	19:10	17:05	20 16:10 (12) 16:29 27 15:21 (13)
5	05:24	06:04	06:54	07:43	07:38	15:51 (12) 08:27 14:54 (13)
	21:59	21:21	20:17	19:08	17:04	18 16:09 (12) 16:28 27 15:21 (13)
6	05:25	06:06	06:56	07:45	07:39	15:53 (12) 08:28 14:55 (13)
	21:58	21:20	20:15	19:05	17:02	14 16:07 (12) 16:28 27 15:22 (13)
7	05:26	06:07	06:57	07:47	07:41	15:55 (12) 08:29 14:56 (13)
	21:57	21:18	20:13	19:03	17:00	11 16:06 (12) 16:27 26 15:22 (13)
8	05:27	06:09	06:59	07:48	07:43	15:58 (12) 08:31 14:56 (13)
	21:57	21:16	20:10	19:01	16:58	4 16:02 (12) 16:27 26 15:22 (13)
9	05:28	06:10	07:01	07:50	07:45	15:59 (12) 08:32 14:56 (13)
	21:56	21:14	20:08	18:59	16:57	16:27 26 15:22 (13)
10	05:29	06:12	07:02	07:52	07:47	15:59 (12) 08:33 14:57 (13)
	21:55	21:12	20:06	18:56	16:55	16:26 26 15:23 (13)
11	05:30	06:14	07:04	07:53	07:48	15:59 (12) 08:34 14:58 (13)
	21:55	21:10	20:03	18:54	16:54	16:26 25 15:23 (13)
12	05:31	06:15	07:06	07:55	07:50	15:59 (12) 08:35 14:58 (13)
	21:54	21:09	20:01	18:52	16:52	16:26 25 15:23 (13)
13	05:32	06:17	07:07	07:57	07:52	15:59 (12) 08:36 14:59 (13)
	21:53	21:07	19:59	18:50	16:51	16:26 25 15:24 (13)
14	05:33	06:18	07:09	07:59	07:54	15:59 (12) 08:37 15:00 (13)
	21:52	21:05	19:56	18:47	16:49	16:26 24 15:24 (13)
15	05:35	06:20	07:10	08:00	07:55	15:59 (12) 08:38 15:00 (13)
	21:51	21:03	19:54	18:45	16:48	16:26 24 15:24 (13)
16	05:36	06:22	07:12	08:02	07:57	15:59 (12) 08:39 15:01 (13)
	21:50	21:01	19:52	18:43	16:46	16:26 24 15:25 (13)
17	05:37	06:23	07:14	08:04	07:59	15:59 (12) 08:40 15:01 (13)
	21:49	20:59	19:49	18:41	16:45	16:26 24 15:25 (13)
18	05:38	06:25	07:15	08:06	08:01	14:58 (13) 08:40 15:01 (13)
	21:48	20:57	19:47	18:39	16:44	9 15:07 (13) 16:27 24 15:25 (13)
19	05:39	06:27	07:17	08:07	08:02	14:56 (13) 08:41 15:02 (13)
	21:47	20:54	19:45	18:37	16:42	14 15:10 (13) 16:27 24 15:26 (13)
20	05:41	06:28	07:19	08:09	08:04	14:55 (13) 08:42 15:02 (13)
	21:46	20:52	19:42	18:35	16:41	17 15:12 (13) 16:27 24 15:26 (13)
21	05:42	06:30	07:20	08:11	08:06	14:54 (13) 08:42 15:03 (13)
	21:44	20:50	19:40	18:32	16:40	18 15:12 (13) 16:28 24 15:27 (13)
22	05:43	06:31	07:22	08:13	08:07	14:53 (13) 08:43 15:03 (13)
	21:43	20:48	19:38	18:30	5 17:03 (12) 16:39 20 15:13 (13) 16:28 24 15:27 (13)	
23	05:45	06:33	07:23	08:14	08:09	14:53 (13) 08:43 15:04 (13)
	21:42	20:46	19:35	18:28	12 17:07 (12) 16:38 21 15:14 (13) 16:29 24 15:28 (13)	
24	05:46	06:35	07:25	08:16	08:11	14:53 (13) 08:44 15:04 (13)
	21:40	20:44	19:33	18:26	16 17:09 (12) 16:37 23 15:16 (13) 16:29 24 15:28 (13)	
25	05:48	06:36	07:27	07:18	08:12	14:53 (13) 08:44 15:04 (13)
	21:39	20:42	19:31	17:24	19 16:10 (12) 16:35 24 15:17 (13) 16:30 24 15:28 (13)	
26	05:49	06:38	07:28	07:20	08:14	14:52 (13) 08:44 15:06 (13)
	21:38	20:40	19:28	17:22	21 16:11 (12) 16:35 24 15:16 (13) 16:31 23 15:29 (13)	
27	05:50	06:40	07:30	07:21	08:15	14:52 (13) 08:45 15:06 (13)
	21:36	20:37	19:26	17:20	21 16:10 (12) 16:34 25 15:17 (13) 16:31 24 15:30 (13)	
28	05:52	06:41	07:32	07:23	08:17	14:53 (13) 08:45 15:06 (13)
	21:35	20:35	19:24	17:18	23 16:11 (12) 16:33 25 15:18 (13) 16:32 24 15:30 (13)	
29	05:53	06:43	07:33	07:25	08:18	14:52 (13) 08:45 15:06 (13)
	21:33	20:33	19:21	17:16	23 16:11 (12) 16:32 26 15:18 (13) 16:33 25 15:31 (13)	
30	05:55	06:44	07:35	07:27	08:20	14:53 (13) 08:45 15:07 (13)
	21:32	20:31	19:19	17:14	23 16:11 (12) 16:31 26 15:19 (13) 16:34 24 15:31 (13)	
31	05:56	06:46	07:37	07:29	08:21	14:53 (13) 08:45 15:07 (13)
	21:30	20:28	19:17	17:13	23 16:11 (12) 16:30 25 15:32 (13)	
Potential sun hours	502	454	381	331	266	244
Total, worst case				186	405	773
Sun reduction				0.24	0.18	0.13
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.61	0.60	0.59
Total reduction				0.15	0.11	0.08
Total, real				27	45	62

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: BQ - H69

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 14 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times, flicker times, and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix with 4 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: BR - H70

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main calendar table with columns for months (January-December) and rows for days (1-31). Includes sub-totals for potential sun hours, worst case, and real conditions.

Table layout: For each day in each month the following matrix apply

Day in month Sun rise (hh:mm) Sun set (hh:mm) Minutes with flicker First time (hh:mm) with flicker Last time (hh:mm) with flicker (WTG causing flicker first time) (WTG causing flicker last time)

Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: BS - H71

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times, potential sun hours, and various reduction factors.

Table layout: For each day in each month the following matrix apply

Matrix with 4 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: BU - H73

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec. Values range from 1.06 to 2.89.

Operational time

Table with 13 columns: N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum. Values range from 194 to 1,318.

Main shadow calculation table with columns for months (January to December) and rows for each day (1-31). Includes potential sun hours, total worst case, and various reduction factors.

Table layout: For each day in each month the following matrix apply

Matrix defining table layout: Day in month, Sun rise/set, Minutes with flicker, First/Last time with flicker, and WTG causing flicker first/last time.



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: BV - H74

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 16:36	15:11 (13) 15:36 (13)	08:18 17:24	16:26 (12) 16:34 (12)	07:25 18:16	07:14 20:10
2	08:45 16:37	15:11 (13) 15:36 (13)	08:17 17:26	16:24 (12) 16:36 (12)	07:23 18:17	07:12 20:11
3	08:45 16:38	15:12 (13) 15:37 (13)	08:15 17:28	16:22 (12) 16:38 (12)	07:21 18:19	07:10 20:13
4	08:45 16:40	15:13 (13) 15:38 (13)	08:14 17:30	16:21 (12) 16:39 (12)	07:18 18:21	07:07 20:15
5	08:44 16:41	15:12 (13) 15:37 (13)	08:12 17:31	16:21 (12) 16:41 (12)	07:16 18:23	07:05 20:16
6	08:44 16:42	15:13 (13) 15:38 (13)	08:10 17:33	16:20 (12) 16:41 (12)	07:14 18:25	07:03 20:18
7	08:44 16:43	15:13 (13) 15:38 (13)	08:08 17:35	16:20 (12) 16:41 (12)	07:12 18:26	07:01 20:20
8	08:43 16:45	15:14 (13) 15:39 (13)	08:07 17:37	16:20 (12) 16:42 (12)	07:09 18:28	06:58 20:22
9	08:43 16:46	15:15 (13) 15:39 (13)	08:05 17:39	16:19 (12) 16:42 (12)	07:07 18:30	06:56 20:23
10	08:42 16:47	15:15 (13) 15:39 (13)	08:03 17:41	16:19 (12) 16:42 (12)	07:05 18:32	06:54 20:25
11	08:42 16:49	15:15 (13) 15:39 (13)	08:01 17:43	16:20 (12) 16:41 (12)	07:03 18:33	06:52 20:27
12	08:41 16:50	15:17 (13) 15:40 (13)	08:00 17:44	16:20 (12) 16:41 (12)	07:00 18:35	06:49 20:28
13	08:40 16:52	15:17 (13) 15:40 (13)	07:58 17:46	16:21 (12) 16:40 (12)	06:58 18:37	06:47 20:30
14	08:40 16:53	15:18 (13) 15:40 (13)	07:56 17:48	16:22 (12) 16:39 (12)	06:56 18:39	06:45 20:32
15	08:39 16:55	15:18 (13) 15:40 (13)	07:54 17:50	16:23 (12) 16:38 (12)	06:54 18:40	06:43 20:33
16	08:38 16:56	15:19 (13) 15:40 (13)	07:52 17:52	16:25 (12) 16:37 (12)	06:51 18:42	06:41 20:35
17	08:37 16:58	15:20 (13) 15:40 (13)	07:50 17:54	16:28 (12) 16:33 (12)	06:49 18:44	06:38 20:37
18	08:36 16:59	15:22 (13) 15:40 (13)	07:48 17:56	06:47 18:46	06:36 20:39	06:41 21:28
19	08:35 17:01	15:22 (13) 15:38 (13)	07:46 17:57	06:44 18:47	06:34 20:40	06:39 21:29
20	08:34 17:03	15:24 (13) 15:37 (13)	07:44 17:59	06:42 18:49	06:32 20:42	06:38 21:31
21	08:33 17:04	15:27 (13) 15:36 (13)	07:42 18:01	06:40 18:51	06:30 20:44	06:36 21:32
22	08:32 17:06	07:40 18:03	07:40 18:03	06:37 18:52	06:28 20:45	06:35 21:33
23	08:31 17:08	07:38 18:05	07:38 18:05	06:35 18:54	06:26 20:47	06:34 21:35
24	08:29 17:10	07:36 18:07	07:36 18:07	06:33 18:56	06:24 20:49	06:33 21:36
25	08:28 17:11	07:33 18:08	07:33 18:08	06:30 18:58	06:22 20:50	06:31 21:38
26	08:27 17:13	07:31 18:10	07:31 18:10	06:28 18:59	06:19 20:52	06:30 21:39
27	08:26 17:15	07:29 18:12	07:29 18:12	06:26 19:01	06:17 20:54	06:29 21:40
28	08:24 17:17	07:27 18:14	07:27 18:14	06:24 19:03	06:15 20:55	06:28 21:41
29	08:23 17:19	07:25 18:16	07:25 18:16	06:21 20:04	06:13 20:57	06:27 21:43
30	08:21 17:20	07:23 18:18	07:23 18:18	06:19 20:06	06:12 20:59	06:26 21:44
31	08:20 17:22	07:21 18:20	07:21 18:20	06:17 20:08	06:11 20:58	06:25 21:45
Potential sun hours	259	278	367	416	485	499
Total, worst case	459	294				
Sun reduction	0.16	0.21				
Oper. time red.	1.00	1.00				
Wind dir. red.	0.59	0.61				
Total reduction	0.09	0.13				
Total, real	42	37				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: BV - H74

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:21	05:58	06:48	07:37	07:30	15:49 (12) 08:21 14:57 (13)
	22:00	21:28	20:26	19:17	17:11	22 16:11 (12) 16:30 24 15:21 (13)
2	05:22	05:59	06:49	07:38	07:32	15:49 (12) 08:23 14:58 (13)
	22:00	21:27	20:24	19:14	17:09	22 16:11 (12) 16:30 24 15:22 (13)
3	05:23	06:01	06:51	07:40	07:34	15:49 (12) 08:24 14:58 (13)
	21:59	21:25	20:22	19:12	17:07	22 16:11 (12) 16:29 24 15:22 (13)
4	05:24	06:03	06:53	07:42	07:36	15:50 (12) 08:26 14:58 (13)
	21:59	21:23	20:19	19:10	17:05	21 16:11 (12) 16:29 25 15:23 (13)
5	05:24	06:04	06:54	07:43	07:38	15:50 (12) 08:27 14:58 (13)
	21:59	21:21	20:17	19:08	17:04	21 16:11 (12) 16:28 25 15:23 (13)
6	05:25	06:06	06:56	07:45	07:39	15:51 (12) 08:28 14:59 (13)
	21:58	21:20	20:15	19:05	17:02	19 16:10 (12) 16:28 25 15:24 (13)
7	05:26	06:07	06:57	07:47	07:41	15:52 (12) 08:29 14:59 (13)
	21:57	21:18	20:13	19:03	17:00	17 16:09 (12) 16:27 26 15:25 (13)
8	05:27	06:09	06:59	07:48	07:43	15:53 (12) 08:31 15:00 (13)
	21:57	21:16	20:10	19:01	16:58	15 16:08 (12) 16:27 25 15:25 (13)
9	05:28	06:10	07:01	07:50	07:45	15:55 (12) 08:32 15:00 (13)
	21:56	21:14	20:08	18:59	16:57	12 16:07 (12) 16:27 25 15:25 (13)
10	05:29	06:12	07:02	07:52	07:47	15:57 (12) 08:33 15:01 (13)
	21:55	21:12	20:06	18:56	16:55	8 16:05 (12) 16:26 25 15:26 (13)
11	05:30	06:14	07:04	07:53	07:48	08:34 15:01 (13)
	21:55	21:10	20:03	18:54	16:54	16:26 25 15:26 (13)
12	05:31	06:15	07:06	07:55	07:50	08:35 15:02 (13)
	21:54	21:09	20:01	18:52	16:52	25 15:27 (13)
13	05:32	06:17	07:07	07:57	07:52	08:36 15:02 (13)
	21:53	21:07	19:59	18:50	16:51	25 15:27 (13)
14	05:33	06:18	07:09	07:59	07:54	08:37 15:03 (13)
	21:52	21:05	19:56	18:47	16:49	24 15:27 (13)
15	05:35	06:20	07:10	08:00	07:55	08:38 15:04 (13)
	21:51	21:03	19:54	18:45	16:48	16:26 24 15:28 (13)
16	05:36	06:22	07:12	08:02	07:57	08:39 15:04 (13)
	21:50	21:01	19:52	18:43	16:46	24 15:28 (13)
17	05:37	06:23	07:14	08:04	07:59	08:40 15:04 (13)
	21:49	20:59	19:49	18:41	16:45	24 15:28 (13)
18	05:38	06:25	07:15	08:06	08:01	08:40 15:05 (13)
	21:48	20:57	19:47	18:39	16:44	24 15:29 (13)
19	05:39	06:27	07:17	08:07	08:02	08:41 15:06 (13)
	21:47	20:54	19:45	18:37	16:42	24 15:30 (13)
20	05:41	06:28	07:19	08:09	08:04	08:42 15:05 (13)
	21:46	20:52	19:42	18:35	16:41	24 15:29 (13)
21	05:42	06:30	07:20	08:11	08:06	15:02 (13) 08:42 15:06 (13)
	21:44	20:50	19:40	18:32	16:40	9 15:11 (13) 16:28 24 15:30 (13)
22	05:43	06:31	07:22	08:13	08:07	15:00 (13) 08:43 15:06 (13)
	21:43	20:48	19:38	18:30	16:39	13 15:13 (13) 16:28 24 15:30 (13)
23	05:45	06:33	07:23	08:14	08:09	14:59 (13) 08:43 15:07 (13)
	21:42	20:46	19:35	18:28	16:38	16 15:15 (13) 16:29 24 15:31 (13)
24	05:46	06:35	07:25	08:16	08:11	14:59 (13) 08:44 15:07 (13)
	21:40	20:44	19:33	18:26	16:37	18 15:17 (13) 16:29 25 15:32 (13)
25	05:48	06:36	07:27	07:18	15:58 (12) 08:12	14:59 (13) 08:44 15:08 (13)
	21:39	20:42	19:31	17:24	7 16:05 (12) 16:35	19 15:18 (13) 16:30 24 15:32 (13)
26	05:49	06:38	07:28	07:20	15:55 (12) 08:14	14:57 (13) 08:44 15:09 (13)
	21:38	20:40	19:28	17:22	13 16:08 (12) 16:35	21 15:18 (13) 16:31 24 15:33 (13)
27	05:50	06:40	07:30	07:21	15:52 (12) 08:15	14:58 (13) 08:45 15:09 (13)
	21:36	20:37	19:26	17:20	16 16:08 (12) 16:34	21 15:19 (13) 16:31 24 15:33 (13)
28	05:52	06:41	07:32	07:23	15:51 (12) 08:17	14:58 (13) 08:45 15:09 (13)
	21:35	20:35	19:24	17:18	18 16:09 (12) 16:33	22 15:20 (13) 16:32 25 15:34 (13)
29	05:53	06:43	07:33	07:25	15:50 (12) 08:18	14:57 (13) 08:45 15:10 (13)
	21:33	20:33	19:21	17:16	20 16:10 (12) 16:32	23 15:20 (13) 16:33 24 15:34 (13)
30	05:55	06:44	07:35	07:27	15:50 (12) 08:20	14:58 (13) 08:45 15:10 (13)
	21:32	20:31	19:19	17:14	21 16:11 (12) 16:31	23 15:21 (13) 16:34 25 15:35 (13)
31	05:56	06:46		07:29	15:49 (12)	08:45 15:11 (13)
	21:30	20:28		17:13	22 16:11 (12)	16:35 24 15:35 (13)
Potential sun hours	502	454	381	331	266	244
Total, worst case				117	364	758
Sun reduction				0.24	0.18	0.13
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.61	0.60	0.59
Total reduction				0.14	0.11	0.08
Total, real				17	40	61

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: BW - H75

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

Project:

6225Gortyrahill_ShadovFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: BX - H76

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix with 2 rows: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: BY - H77

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day of the year, including sun rise/set times, shadow reduction percentages, and operational hours.

Table layout: For each day in each month the following matrix apply

Matrix table with columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 **Shadow receptor:** CB - H80

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1 08:45	15:00 (13) 08:18	16:04 (12) 07:25	07:14 06:10	05:24 05:21	05:58 06:48	07:37 07:30	08:21					
2 08:45	15:01 (13) 08:17	16:04 (12) 07:23	07:12 06:08	05:24 05:22	05:59 06:49	07:38 07:32	08:23					
3 08:45	15:02 (13) 08:15	16:05 (12) 07:21	07:10 06:06	05:23 05:23	06:01 06:51	07:40 07:34	15:44 (12) 08:24					
4 08:45	15:04 (13) 08:14	16:05 (12) 07:18	07:07 06:04	05:22 05:24	06:03 06:53	07:42 07:36	15:40 (12) 08:26					
5 08:44	15:05 (13) 08:12	16:07 (12) 07:16	07:05 06:02	05:21 05:24	06:04 06:54	07:43 07:38	15:38 (12) 08:27					
6 08:44	15:11 (13) 08:10	16:09 (12) 07:14	07:03 06:00	05:21 05:25	06:06 06:56	07:45 07:39	15:37 (12) 08:28					
7 08:44	17:33 08:08	16:22 (12) 18:25	20:18 07:01	05:58 05:20	06:07 06:57	07:47 07:41	15:54 (12) 08:28					
8 08:43	17:35 08:07	16:20 (12) 18:26	20:20 07:09	05:58 05:20	06:09 06:59	07:48 07:43	15:53 (12) 08:31					
9 08:43	17:37 08:05	18:28 07:07	20:22 06:56	05:55 05:19	06:10 07:01	07:50 07:45	15:52 (12) 08:32					
10 08:42	17:39 08:03	18:30 07:05	20:23 06:54	05:53 05:19	06:12 07:02	07:52 07:47	15:52 (12) 08:33					
11 08:42	17:41 08:01	18:32 07:03	20:25 06:52	05:52 05:18	06:14 07:04	07:53 07:48	15:52 (12) 08:34					
12 08:41	17:43 08:00	18:33 07:03	20:27 06:52	05:52 05:18	06:15 07:05	07:53 07:48	15:52 (12) 08:35					
13 08:40	17:44 08:00	18:35 07:00	20:28 06:49	05:50 05:18	06:16 07:06	07:55 07:50	15:52 (12) 08:35					
14 08:40	17:46 07:58	18:37 06:58	20:30 06:47	05:48 05:18	06:17 07:07	07:57 07:52	15:52 (12) 08:36					
15 08:39	17:48 07:56	18:39 06:56	20:32 06:45	05:47 05:17	06:18 07:09	07:59 07:54	15:52 (12) 08:37					
16 08:38	17:50 07:54	18:40 06:54	20:33 06:43	05:45 05:17	06:20 07:10	08:00 07:55	15:52 (12) 08:38					
17 08:37	17:52 07:52	18:42 06:51	20:35 06:41	05:44 05:17	06:22 07:12	08:02 07:57	15:52 (12) 08:39					
18 08:36	17:54 07:50	18:44 06:49	20:37 06:38	05:42 05:17	06:23 07:14	08:04 07:59	15:52 (12) 08:40					
19 08:35	17:56 07:48	18:46 06:47	20:39 06:36	05:41 05:17	06:25 07:15	08:06 08:01	15:52 (12) 08:41					
20 08:34	16:09 (12) 17:57	18:47 06:44	20:40 06:34	05:39 05:17	06:27 07:17	08:07 08:02	15:52 (12) 08:42					
21 08:33	16:10 (12) 17:59	18:49 06:42	20:42 06:32	05:38 05:17	06:28 07:19	08:09 08:04	15:52 (12) 08:43					
22 08:32	16:12 (12) 18:01	18:51 06:40	20:44 06:30	05:36 05:17	06:30 07:20	08:11 08:06	15:52 (12) 08:44					
23 08:31	16:14 (12) 18:03	18:53 06:38	20:46 06:28	05:35 05:17	06:31 07:22	08:13 08:08	15:52 (12) 08:45					
24 08:29	16:16 (12) 18:05	18:55 06:36	20:48 06:26	05:34 05:18	06:33 07:23	08:14 08:09	15:52 (12) 08:46					
25 08:28	16:18 (12) 18:07	18:57 06:34	20:50 06:24	05:32 05:18	06:34 07:24	08:15 08:10	15:52 (12) 08:47					
26 08:27	16:20 (12) 18:10	18:59 06:32	20:52 06:22	05:31 05:18	06:35 07:25	08:16 08:11	15:52 (12) 08:48					
27 08:26	16:22 (12) 18:12	19:01 06:30	20:54 06:20	05:29 05:19	06:36 07:26	08:17 08:12	15:52 (12) 08:49					
28 08:24	16:24 (12) 18:14	19:03 06:28	20:56 06:18	05:27 05:20	06:37 07:27	08:18 08:13	15:52 (12) 08:50					
29 08:23	16:26 (12) 18:16	19:05 06:26	20:58 06:16	05:25 05:21	06:38 07:28	08:19 08:14	15:52 (12) 08:51					
30 08:21	16:28 (12) 18:18	19:07 06:24	21:00 06:14	05:23 05:22	06:39 07:29	08:20 08:15	15:52 (12) 08:52					
31 08:20	16:30 (12) 18:20	19:09 06:22	21:02 06:12	05:21 05:25	06:40 07:30	08:21 08:16	15:52 (12) 08:53					
Potential sun hours	259	278	367	416	485	499	502	454	381	331	266	244
Total, worst case	279	312	416	485	499	502	454	381	331	266	244	395
Sun reduction	0.16	0.21	0.21							0.18		0.13
Oper. time red.	1.00	1.00	1.00							1.00		1.00
Wind dir. red.	0.59	0.59	0.59							0.59		0.60
Total reduction	0.09	0.12								0.11		0.08
Total, real	26	15								39		32

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)



SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: CD - H82

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (Jan-Dec) and rows for day numbers (1-31). Includes summary rows for 'Potential sun hours', 'Total, worst case', and 'Total, real'.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: CE - H83

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan to Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 14 columns (N to Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January to December) and rows for each day of the year (1 to 31), showing sun rise/set times and shadow reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix table with 2 rows: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: CG - H85

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main data table with columns for months (January-June) and rows for each day of the month, including sunrise/set times and shadow reduction metrics.

Table layout: For each day in each month the following matrix apply

Summary table with 4 columns: Day in month, Sun rise/set, Minutes with flicker, First/Last time with flicker.



SHADOW - Calendar

Calculation: Alternative Scenario 1 **Shadow receptor:** CG - H85

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22 22:00	05:58 21:28	06:38 (16) 07:02 (16)	06:48 20:26	07:15 (17) 07:24 (17)	07:30 17:11
2	05:23 22:00	06:00 21:27	06:38 (16) 07:02 (16)	06:50 20:24	07:38 19:15	08:23 16:30
3	05:23 21:59	06:01 21:25	06:38 (16) 07:02 (16)	06:51 20:22	07:40 19:12	08:24 16:30
4	05:24 21:59	06:03 21:23	06:38 (16) 07:01 (16)	06:53 20:20	07:42 19:10	08:26 16:29
5	05:25 21:59	06:04 21:22	06:39 (16) 07:01 (16)	06:54 20:17	07:43 19:08	08:27 16:28
6	05:26 21:58	06:06 21:20	06:39 (16) 07:00 (16)	06:56 20:15	07:45 19:06	08:28 16:28
7	05:27 21:57	06:08 21:18	06:41 (16) 06:59 (16)	06:58 20:13	07:47 19:03	08:29 16:28
8	05:27 21:57	06:09 21:16	06:41 (16) 06:57 (16)	06:59 20:10	07:49 19:01	08:31 16:27
9	05:28 21:56	06:11 21:14	06:43 (16) 06:56 (16)	07:01 20:08	07:50 18:59	08:32 16:27
10	05:29 21:55	06:12 21:12	06:45 (16) 06:53 (16)	07:02 20:06	07:52 18:57	08:33 16:27
11	05:30 21:55	06:14 21:11	07:04	20:04	07:54 18:54	08:34 16:27
12	05:32 21:54	06:16 21:09	07:06	20:01	07:55 18:52	08:35 16:26
13	05:33 21:53	06:17 21:07	07:07	19:59	07:57 18:50	08:36 16:26
14	05:34 21:52	06:19 21:05	07:09	19:57	07:59 18:48	08:37 16:26
15	05:35 21:51	06:20 21:03	07:11	19:54	08:00 18:46	08:38 16:27
16	05:36 21:50	06:22 21:01	07:12	19:52	08:02 18:43	08:39 16:27
17	05:37 21:49	06:24 20:59	07:14	19:50	08:04 18:41	08:40 16:27
18	05:39 21:48	06:25 06:53 (16)	07:15	19:47	08:06 18:39	08:40 16:27
19	05:40 21:47	06:27 06:56 (16)	07:17	19:45	08:07 18:37	08:41 16:27
20	05:41 21:46	06:28 06:57 (16)	07:19	19:43	08:09 18:35	08:42 16:28
21	05:42 21:44	06:30 06:58 (16)	07:20	19:40	08:11 18:33	08:42 16:28
22	05:44 21:43	06:32 06:58 (16)	07:22	19:38	08:13 18:31	08:43 16:29
23	05:45 21:42	06:33 07:00 (16)	07:24	19:36	08:14 18:29	08:43 16:29
24	05:47 21:40	06:35 07:00 (16)	07:25	19:33	08:16 18:27	08:44 16:30
25	05:48 21:39	06:37 07:00 (16)	07:27	19:31	08:18 18:25	08:44 16:30
26	05:49 21:38	06:38 07:02 (16)	07:29	19:29	08:20 18:23	08:44 16:31
27	05:51 21:36	06:40 07:02 (16)	07:30	19:26	08:22 18:21	08:45 16:32
28	05:52 21:35	06:41 07:02 (16)	07:32	19:24	08:23 18:19	08:45 16:33
29	05:54 21:33	06:43 07:02 (16)	07:33	19:22	08:25 18:17	08:45 16:33
30	05:55 21:32	06:45 07:02 (16)	07:35	19:19	08:27 18:15	08:45 16:34
31	05:57 21:30	06:46 07:03 (16)	07:37	19:17	08:29 18:13	08:45 16:35
Potential sun hours	502	454	381	331	266	244
Total, worst case	270	408	9			
Sun reduction	0.27	0.30	0.28			
Oper. time red.	1.00	1.00	1.00			
Wind dir. red.	0.64	0.65	0.66			
Total reduction	0.17	0.19	0.19			
Total, real	46	79	2			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: CH - H86

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for days (1-31) and summary rows (Potential sun hours, Total, worst case, etc.)

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: CI - H87

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: CJ - H88

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for days (1-31) and summary rows (Potential sun hours, Total, worst case, etc.)

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: CK - H89

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Table with columns for months (January to December) and rows for shadow calculations including sun rise/set times, minutes with flicker, and total reduction. Includes summary rows for 'Total, worst case', 'Sun reduction', 'Oper. time red.', 'Wind dir. red.', 'Total reduction', and 'Total, real'.

Table layout: For each day in each month the following matrix apply

Matrix with columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: CL - H90

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for days (1-31) and summary rows (Potential sun hours, Total, worst case, etc.)

Table layout: For each day in each month the following matrix apply

Matrix with 4 columns: Day in month, Sun rise/set, Minutes with flicker, First/Last time with flicker (WTG causing flicker)



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: CM - H91

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec. Values range from 1.06 to 2.89.

Operational time

Table with 13 columns: N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum. Values range from 194 to 8,760.

Main shadow calculation table with columns for months (January to December) and rows for each day of the month (1-31). Includes a summary row at the bottom for potential sun hours and various reduction factors.

Table layout: For each day in each month the following matrix apply

Matrix defining table layout with columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time).



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: CN - H92

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day of the year (1-31), including potential sun hours and reduction factors.

Table layout: For each day in each month the following matrix apply

Matrix with 4 columns: Day in month, Sun rise/set, Minutes with flicker, and Last time with flicker.



SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: CO - H93

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining table layout: Day in month, Sun rise/set, Minutes with flicker, First/Last time with flicker, and WTG causing flicker first/last time.

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: CP - H94

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for days (1-31) and summary rows (Potential sun hours, Total, worst case, etc.)

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: CR - H96

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 16:37	08:18 17:24	07:25 18:16	07:14 20:10	06:10 21:00	07:15 (19) 21:46 30
2	08:45 16:38	08:17 17:26	07:23 18:18	07:12 20:11	06:08 21:02	07:15 (19) 21:47 30
3	08:45 16:39	08:15 17:28	07:21 18:19	07:10 20:13	06:06 21:04	07:17 (19) 21:48 30
4	08:45 16:40	08:14 17:30	07:18 18:21	07:08 20:15	06:04 21:05	07:17 (19) 21:49 29
5	08:44 16:41	08:12 17:32	07:16 18:23	07:05 20:16	06:02 21:07	07:18 (19) 21:50 29
6	08:44 16:42	08:10 17:33	07:14 18:25	07:03 20:18	06:00 21:09	07:19 (19) 21:51 28
7	08:44 16:44	08:08 17:35	07:12 18:26	07:01 20:20	05:59 21:10	07:20 (19) 21:52 27
8	08:43 16:45	08:07 17:37	07:10 18:28	06:59 20:22	05:57 21:12	07:21 (19) 21:53 28
9	08:43 16:46	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	06:37 (18) 21:54 27
10	08:42 16:48	08:03 17:41	07:05 18:32	06:54 20:25	07:32 (19) 07:47 (19)	05:53 21:15 28
11	08:42 16:49	08:01 17:43	07:03 18:34	06:52 20:27	07:29 (19) 07:50 (19)	05:52 21:17 24
12	08:41 16:50	08:00 17:45	07:00 18:35	07:23 (20) 07:29 (20)	06:50 20:28	07:26 (19) 07:51 (19)
13	08:40 16:52	07:58 17:47	06:58 18:37	06:47 07:32 (20)	06:47 20:30	07:24 (19) 07:53 (19)
14	08:40 16:53	07:56 17:48	06:56 18:39	06:45 07:19 (20)	06:45 20:32	07:22 (19) 07:54 (19)
15	08:39 16:55	07:54 17:50	06:54 18:41	06:43 07:35 (20)	06:43 20:33	07:21 (19) 07:55 (19)
16	08:38 16:57	07:52 17:52	06:51 18:42	06:41 07:14 (20)	06:41 20:35	07:20 (19) 07:56 (19)
17	08:37 16:58	07:50 17:54	06:49 18:44	06:39 07:12 (20)	06:39 20:37	07:19 (19) 07:57 (19)
18	08:36 17:00	07:48 17:56	06:47 18:46	06:36 07:10 (20)	06:36 20:39	07:18 (19) 07:57 (19)
19	08:35 17:01	07:46 17:58	06:44 18:47	06:34 07:07 (20)	06:34 20:40	07:17 (19) 07:57 (19)
20	08:34 17:03	07:44 17:59	06:42 18:49	06:32 07:05 (20)	06:32 20:42	07:17 (19) 07:58 (19)
21	08:33 17:05	07:42 18:01	06:40 18:51	06:30 07:04 (20)	06:30 20:44	07:16 (19) 07:58 (19)
22	08:32 17:06	07:40 18:03	06:38 18:53	06:28 07:04 (20)	06:28 20:45	07:15 (19) 07:57 (19)
23	08:31 17:08	07:38 18:05	06:35 18:54	06:26 07:04 (20)	06:26 20:47	07:14 (19) 07:57 (19)
24	08:29 17:10	07:36 18:07	06:33 18:56	06:24 07:05 (20)	06:24 20:49	07:14 (19) 07:57 (19)
25	08:28 17:12	07:34 18:09	06:31 18:58	06:22 07:04 (20)	06:22 20:50	07:15 (19) 07:57 (19)
26	08:27 17:13	07:31 18:10	06:28 18:59	06:20 07:05 (20)	06:20 20:52	07:15 (19) 07:57 (19)
27	08:26 17:15	07:29 18:12	06:26 19:01	06:18 07:31 (20)	06:18 20:54	07:15 (19) 07:56 (19)
28	08:24 17:17	07:27 18:14	06:24 19:03	06:16 07:06 (20)	06:16 20:55	07:15 (19) 07:56 (19)
29	08:23 17:19	07:21 18:05	06:14 19:05	06:14 08:08 (20)	06:14 20:57	07:15 (19) 07:55 (19)
30	08:21 17:21	07:19 18:06	06:12 19:06	06:12 08:11 (20)	06:12 20:59	07:15 (19) 07:54 (19)
31	08:20 17:22	07:17 18:08	06:11 19:08	06:11 08:24 (20)	06:11 21:00	07:15 (19) 07:54 (19)
Potential sun hours	259	278	367	416	485	499
Total, worst case			438	765	914	776
Sun reduction			0.24	0.35	0.37	0.30
Oper. time red.			1.00	1.00	1.00	1.00
Wind dir. red.			0.68	0.66	0.65	0.64
Total reduction			0.17	0.24	0.24	0.19
Total, real			72	180	219	149

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: CS - H97

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45	08:18	07:25	07:15	06:10	06:54 (17) 05:25
	16:37	17:24	18:16	20:10	21:01	17 07:11 (17) 21:46
2	08:45	08:17	07:23	07:12	06:08	06:55 (17) 05:24
	16:38	17:26	18:18	20:11	21:02	14 07:09 (17) 21:47
3	08:45	08:15	07:21	07:10	06:06	06:58 (17) 05:23
	16:39	17:28	18:19	20:13	21:04	9 07:07 (17) 21:48
4	08:45	08:14	07:18	07:08	06:04	05:22
	16:40	17:30	18:21	20:15	21:06	21:49
5	08:44	08:12	07:16	07:05	06:02	05:22
	16:41	17:32	18:23	20:17	21:07	21:50
6	08:44	08:10	07:14	07:03	06:01	05:21
	16:42	17:34	18:25	20:18	21:09	21:51
7	08:44	08:09	07:12	07:01	05:59	05:20
	16:44	17:35	18:27	20:20	21:10	21:52
8	08:43	08:07	07:10	06:59	05:57	05:20
	16:45	17:37	18:28	20:22	21:12	21:53
9	08:43	08:05	07:07	06:56	05:55	05:19
	16:46	17:39	18:30	20:23	21:14	21:54
10	08:42	08:03	07:05	06:54	05:54	05:19
	16:48	17:41	18:32	20:25	21:15	21:55
11	08:42	08:01	07:03	06:52	05:52	05:19
	16:49	17:43	18:34	20:27	21:17	21:56
12	08:41	08:00	07:01	06:50	05:50	05:18
	16:50	17:45	18:35	20:28	21:18	21:56
13	08:40	07:58	06:58	06:47	05:49	05:18
	16:52	17:47	18:37	20:30	21:20	21:57
14	08:40	07:56	06:56	06:45	05:47	05:18
	16:53	17:48	18:39	20:32	21:22	21:58
15	08:39	07:54	06:54	06:43	05:45	05:18
	16:55	17:50	18:41	20:34	21:23	21:58
16	08:38	07:52	06:51	06:41	05:44	05:18
	16:57	17:52	18:42	20:35	21:25	21:59
17	08:37	07:50	06:49	06:39	07:02 (17) 05:42	06:12 (16) 05:17
	16:58	17:54	18:44	20:37	9 07:11 (17) 21:26	8 06:20 (16) 21:59
18	08:36	07:48	06:47	06:36	07:00 (17) 05:41	06:10 (16) 05:17
	17:00	17:56	18:46	20:39	13 07:13 (17) 21:28	13 06:23 (16) 21:59
19	08:35	07:46	06:45	06:34	06:58 (17) 05:40	06:07 (16) 05:17
	17:01	17:58	18:47	20:40	16 07:14 (17) 21:29	16 06:23 (16) 22:00
20	08:34	07:44	06:42	06:32	06:56 (17) 05:38	06:06 (16) 05:18
	17:03	17:59	18:49	20:42	19 07:15 (17) 21:31	19 06:25 (16) 22:00
21	08:33	07:42	06:40	06:30	06:54 (17) 05:37	06:06 (16) 05:18
	17:05	18:01	18:51	20:44	22 07:16 (17) 21:32	20 06:26 (16) 22:00
22	08:32	07:40	06:38	06:28	06:53 (17) 05:35	06:05 (16) 05:18
	17:06	18:03	18:53	20:45	23 07:16 (17) 21:33	22 06:27 (16) 22:01
23	08:31	07:38	06:35	06:26	06:53 (17) 05:34	06:04 (16) 05:18
	17:08	18:05	18:54	20:47	23 07:16 (17) 21:35	24 06:28 (16) 22:01
24	08:29	07:36	06:33	06:24	06:52 (17) 05:33	06:03 (16) 05:18
	17:10	18:07	18:56	20:49	24 07:16 (17) 21:36	25 06:28 (16) 22:01
25	08:28	07:34	06:31	06:22	06:52 (17) 05:32	06:03 (16) 05:19
	17:12	18:09	18:58	20:50	24 07:16 (17) 21:38	25 06:28 (16) 22:01
26	08:27	07:31	06:28	06:20	06:52 (17) 05:31	06:02 (16) 05:19
	17:13	18:10	18:59	20:52	23 07:15 (17) 21:39	27 06:29 (16) 22:01
27	08:26	07:29	06:26	06:18	06:52 (17) 05:30	06:02 (16) 05:20
	17:15	18:12	19:01	20:54	23 07:15 (17) 21:40	27 06:29 (16) 22:01
28	08:24	07:27	06:24	06:16	06:52 (17) 05:29	06:03 (16) 05:20
	17:17	18:14	19:03	20:56	22 07:14 (17) 21:41	28 06:31 (16) 22:01
29	08:23	07:21	06:14	06:14	06:53 (17) 05:27	06:03 (16) 05:21
	17:19	18:09	18:58	20:57	20 07:13 (17) 21:43	28 06:31 (16) 22:01
30	08:21	07:19	06:12	06:12	06:53 (17) 05:27	06:02 (16) 05:21
	17:21	18:09	18:59	20:59	19 07:12 (17) 21:44	29 06:31 (16) 22:00
31	08:20	07:17	06:11	06:11	06:52 (17) 05:26	06:02 (16) 05:21
	17:22	18:09	18:59	20:58	29 07:12 (17) 21:45	29 06:31 (16) 22:00
Potential sun hours	259	278	367	416	485	499
Total, worst case				280	380	873
Sun reduction				0.35	0.37	0.30
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.65	0.63	0.63
Total reduction				0.23	0.23	0.19
Total, real				64	89	166

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 1 **Shadow receptor:** CS - H97

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December				
1	05:22	06:08 (16)	05:58	06:48	07:37	07:30	08:21			
	22:00	29	06:37 (16)	21:28	20:26	19:17	17:11	16:31		
2	05:22	06:08 (16)	06:00	06:50	07:38	07:32	08:23			
	22:00	30	06:38 (16)	21:27	20:24	19:15	17:09	16:30		
3	05:23	06:09 (16)	06:01	06:51	07:40	07:34	08:24			
	21:59	29	06:38 (16)	21:25	20:22	19:12	17:07	16:29		
4	05:24	06:09 (16)	06:03	06:53	07:42	07:36	08:26			
	21:59	30	06:39 (16)	21:23	20:20	19:10	17:06	16:29		
5	05:25	06:09 (16)	06:04	06:54	07:43	07:38	08:27			
	21:59	29	06:38 (16)	21:22	20:17	19:08	17:04	16:28		
6	05:26	06:09 (16)	06:06	06:56	07:45	07:39	08:28			
	21:58	29	06:38 (16)	21:20	20:15	19:06	17:02	16:28		
7	05:27	06:09 (16)	06:08	06:58	07:47	07:41	08:29			
	21:57	30	06:39 (16)	21:18	20:13	19:03	17:00	16:28		
8	05:27	06:10 (16)	06:09	06:59	07:49	07:43	08:31			
	21:57	29	06:39 (16)	21:16	20:10	19:01	16:59	16:27		
9	05:28	06:10 (16)	06:11	07:09 (17)	07:01	07:50	07:45	08:32		
	21:56	29	06:39 (16)	21:14	5	07:14 (17)	20:08	18:59	16:57	16:27
10	05:29	06:10 (16)	06:12	07:05 (17)	07:02	07:52	07:47	08:33		
	21:55	29	06:39 (16)	21:12	12	07:17 (17)	20:06	18:57	16:55	16:27
11	05:30	06:10 (16)	06:14	07:04 (17)	07:04	07:54	07:48	08:34		
	21:55	30	06:40 (16)	21:10	15	07:19 (17)	20:04	18:54	16:54	16:27
12	05:31	06:11 (16)	06:16	07:02 (17)	07:06	07:55	07:50	08:35		
	21:54	29	06:40 (16)	21:09	18	07:20 (17)	20:01	18:52	16:52	16:26
13	05:33	06:11 (16)	06:17	07:01 (17)	07:07	07:57	07:52	08:36		
	21:53	29	06:40 (16)	21:07	20	07:21 (17)	19:59	18:50	16:51	16:26
14	05:34	06:11 (16)	06:19	07:00 (17)	07:09	07:59	07:54	08:37		
	21:52	28	06:39 (16)	21:05	21	07:21 (17)	19:57	18:48	16:49	16:26
15	05:35	06:11 (16)	06:20	07:00 (17)	07:11	08:00	07:55	08:38		
	21:51	28	06:39 (16)	21:03	22	07:22 (17)	19:54	18:45	16:48	16:27
16	05:36	06:11 (16)	06:22	06:59 (17)	07:12	08:02	07:57	08:39		
	21:50	28	06:39 (16)	21:01	23	07:22 (17)	19:52	18:43	16:47	16:27
17	05:37	06:12 (16)	06:24	06:59 (17)	07:14	08:04	07:59	08:40		
	21:49	27	06:39 (16)	20:59	23	07:22 (17)	19:50	18:41	16:45	16:27
18	05:39	06:12 (16)	06:25	06:58 (17)	07:15	08:06	08:01	08:40		
	21:48	26	06:38 (16)	20:57	23	07:21 (17)	19:47	18:39	16:44	16:27
19	05:40	06:13 (16)	06:27	06:58 (17)	07:17	08:07	08:02	08:41		
	21:47	26	06:39 (16)	20:55	24	07:22 (17)	19:45	18:37	16:43	16:27
20	05:41	06:14 (16)	06:28	06:57 (17)	07:19	08:09	08:04	08:42		
	21:46	24	06:38 (16)	20:52	24	07:21 (17)	19:43	18:35	16:41	16:28
21	05:42	06:14 (16)	06:30	06:58 (17)	07:20	08:11	08:06	08:42		
	21:44	23	06:37 (16)	20:50	23	07:21 (17)	19:40	18:33	16:40	16:28
22	05:44	06:15 (16)	06:32	06:58 (17)	07:22	08:13	08:07	08:43		
	21:43	21	06:36 (16)	20:48	21	07:19 (17)	19:38	18:31	16:39	16:29
23	05:45	06:16 (16)	06:33	07:00 (17)	07:24	08:14	08:09	08:43		
	21:42	20	06:36 (16)	20:46	19	07:19 (17)	19:36	18:29	16:38	16:29
24	05:47	06:17 (16)	06:35	07:01 (17)	07:25	08:16	08:11	08:44		
	21:40	18	06:35 (16)	20:44	16	07:17 (17)	19:33	18:27	16:37	16:30
25	05:48	06:18 (16)	06:37	07:03 (17)	07:27	07:18	08:12	08:44		
	21:39	15	06:33 (16)	20:42	12	07:15 (17)	19:31	17:25	16:36	16:30
26	05:49	06:21 (16)	06:38	07:05 (17)	07:29	07:20	08:14	08:44		
	21:38	11	06:32 (16)	20:40	8	07:13 (17)	19:29	17:23	16:35	16:31
27	05:51	06:24 (16)	06:40	07:30	07:21	08:15	08:45			
	21:36	4	06:28 (16)	20:37	19:26	17:21	16:34	16:32		
28	05:52		06:41	07:32	07:23	08:17	08:45			
	21:35		20:35	19:24	17:19	16:33	16:33			
29	05:54		06:43	07:33	07:25	08:18	08:45			
	21:33		20:33	19:22	17:17	16:32	16:33			
30	05:55		06:45	07:35	07:27	08:20	08:45			
	21:32		20:31	19:19	17:15	16:31	16:34			
31	05:57		06:46	07:39	07:29	08:15	08:45			
	21:30		20:29	19:17	17:13	16:35	16:35			
Potential sun hours	502	454		381	331	266	244			
Total, worst case	680		329							
Sun reduction	0.27		0.30							
Oper. time red.	1.00		1.00							
Wind dir. red.	0.63		0.65							
Total reduction	0.17		0.19							
Total, real	115		63							

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: CT - H98

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row showing sunshine probability values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row showing operational time values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main data table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and potential sun hours.

Table layout: For each day in each month the following matrix apply

Summary table with 4 columns: Day in month, Sun rise/set times, Minutes with flicker, First/Last time with flicker (WTG causing flicker).

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: CU - H99

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for days (1-31) and summary rows (Potential sun hours, Total, worst case, etc.)

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: CW - H101

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31), including sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining day in month, sun rise/set times, minutes with flicker, and first/last times with flicker.



Project:

6225Gortyrahill_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: CX - H102

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day of the year (1-31), including sunrise/set times and shadow reduction factors.

Table layout: For each day in each month the following matrix apply

Matrix defining terms for shadow calculation: Day in month, Sun rise/set (hh:mm), Minutes with flicker, First/Last time with flicker, and WTG causing flicker first/last time.



SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: CY - H103

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with 13 columns (January-December) and 33 rows of data including sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:33/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 1 Shadow receptor: DB - H106

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and shadow reduction factors.

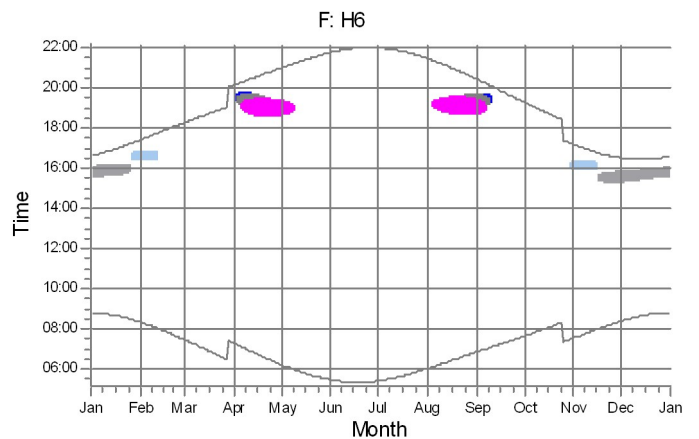
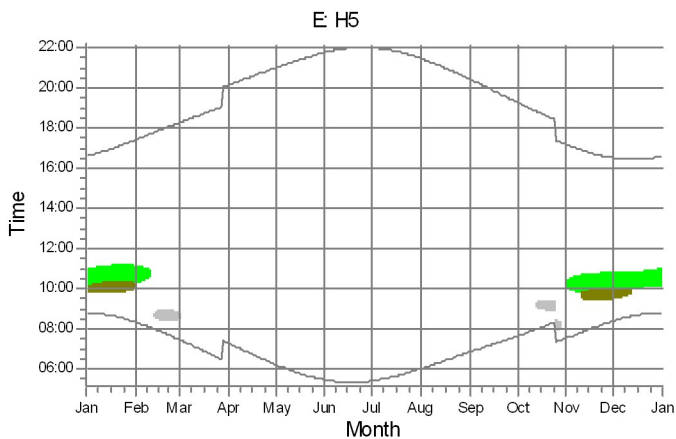
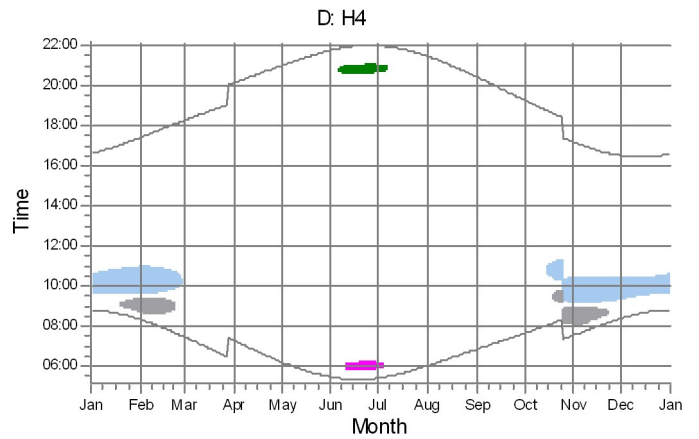
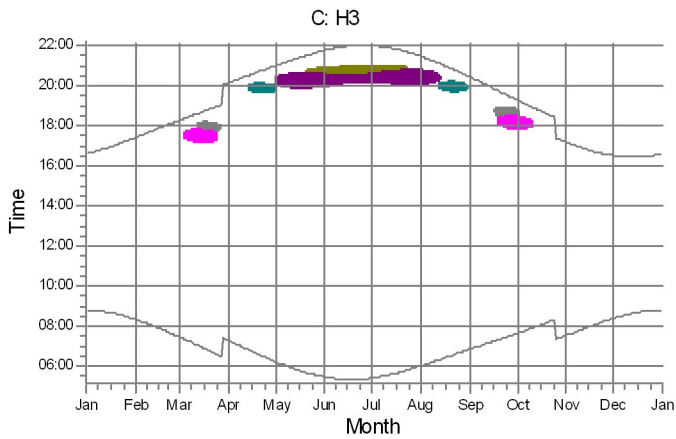
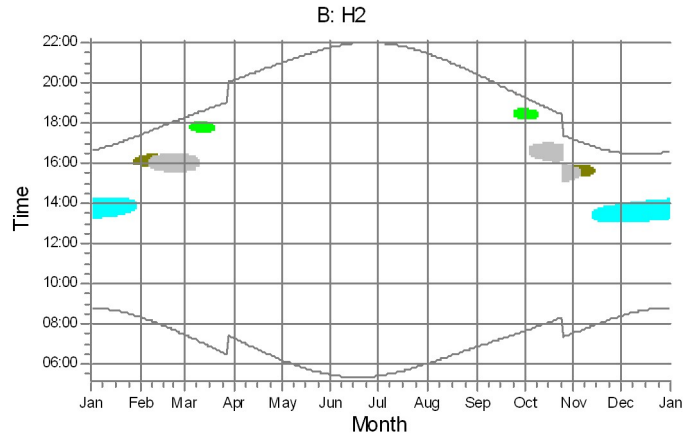
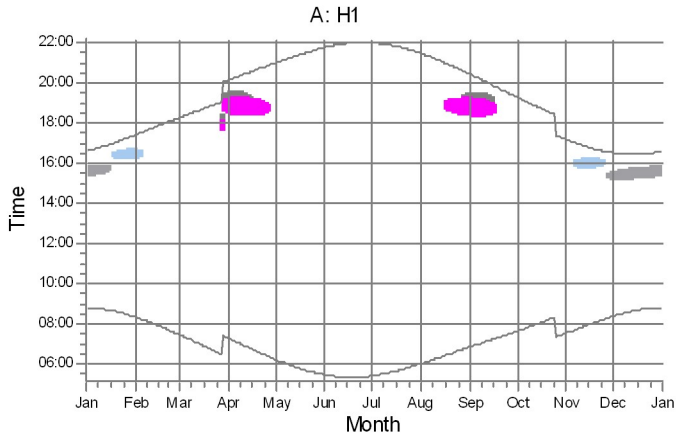
Table layout: For each day in each month the following matrix apply

Matrix defining Day in month, Sun rise/set, Minutes with flicker, and First/Last time with flicker (WTG causing flicker).



SHADOW - Calendar, graphical

Calculation: Alternative Scenario 1

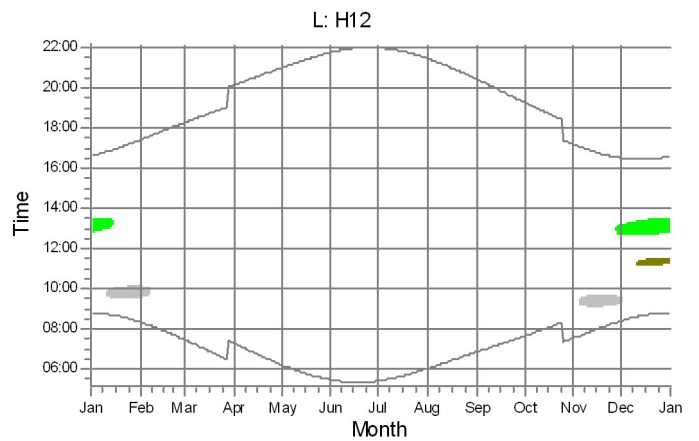
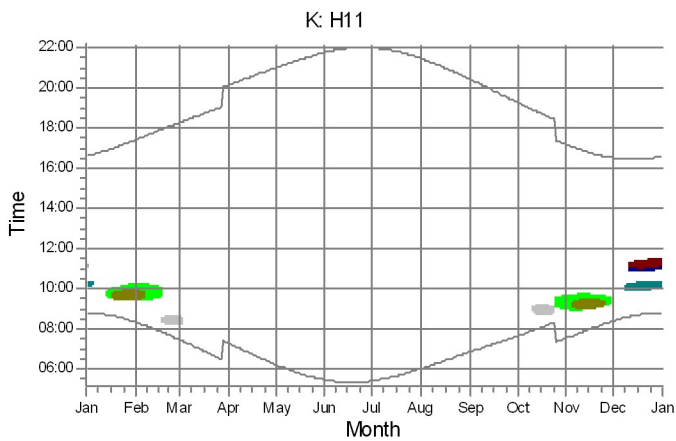
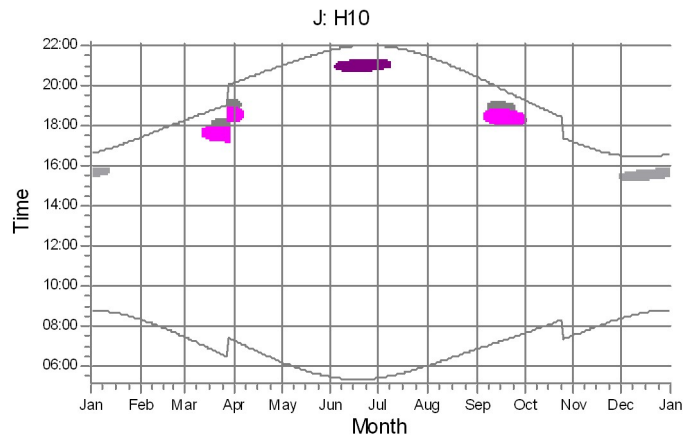
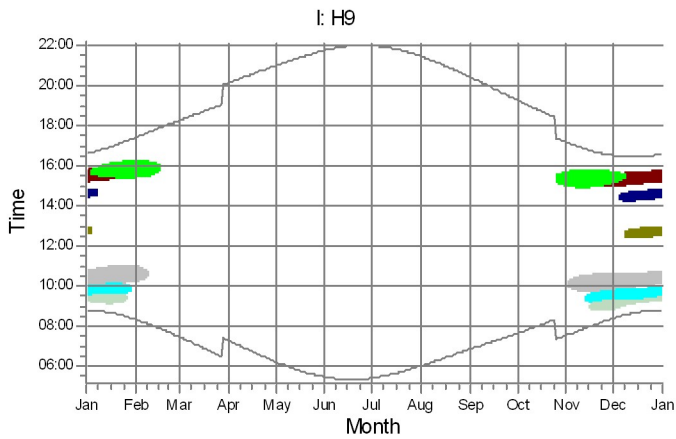
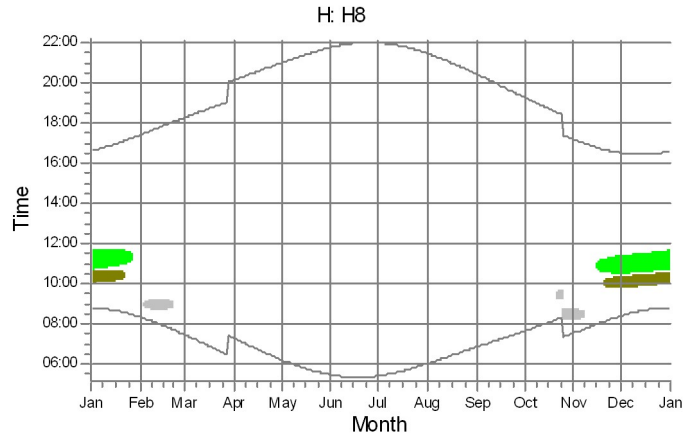
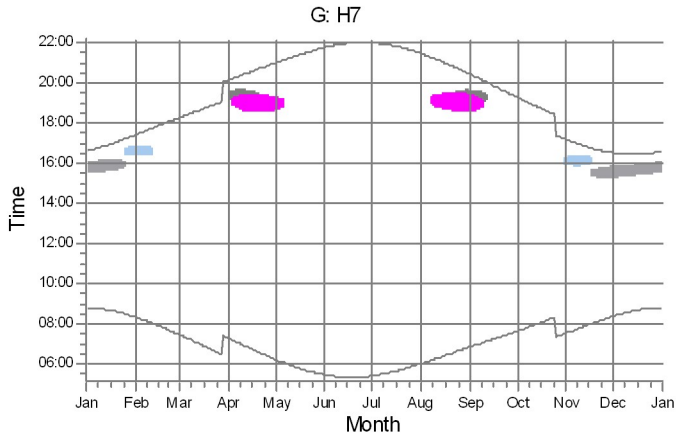


WTGs














	1: T1		5: T5		10: T10		13: T13
	3: T3		6: T6		11: T11		15: Derragh
	4: T4		9: T9		12: T12		16: Derragh

SHADOW - Calendar, graphical

Calculation: Alternative Scenario 1

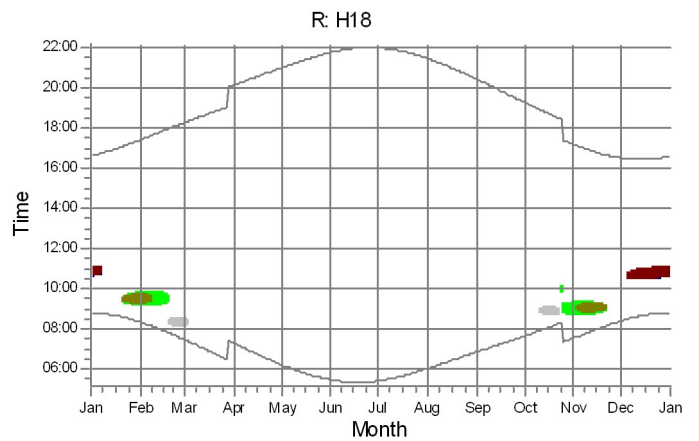
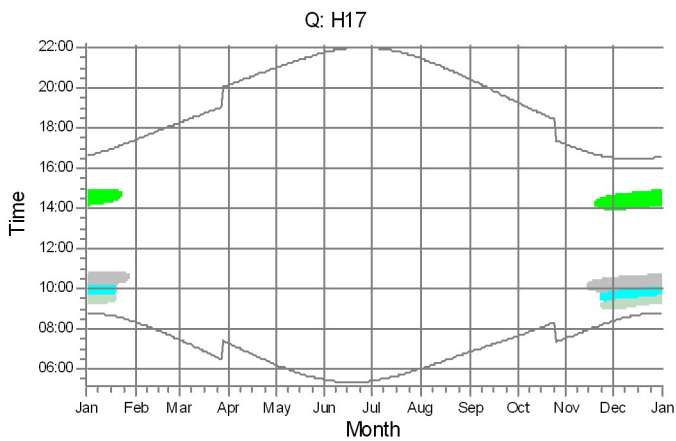
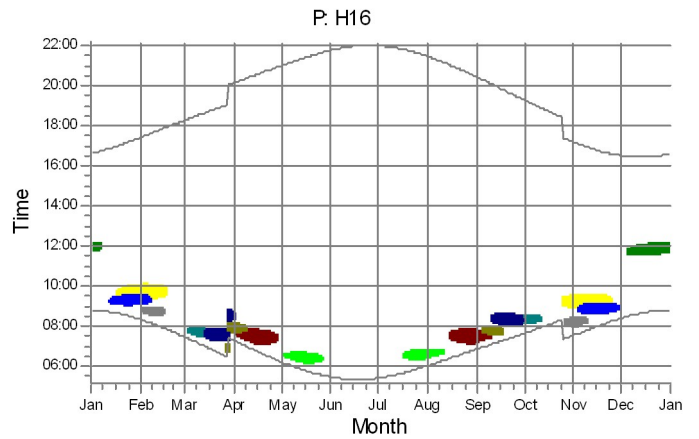
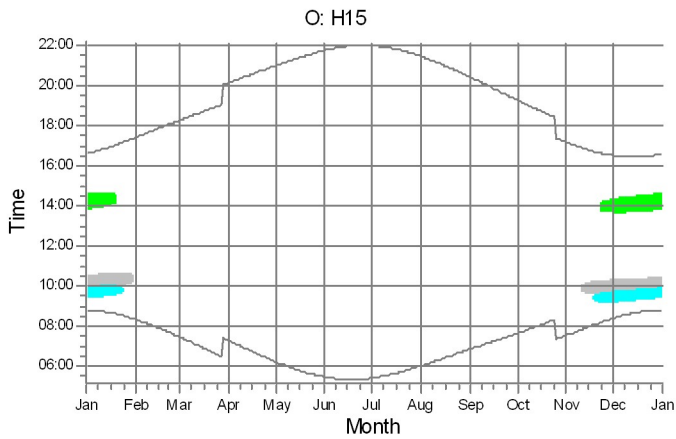
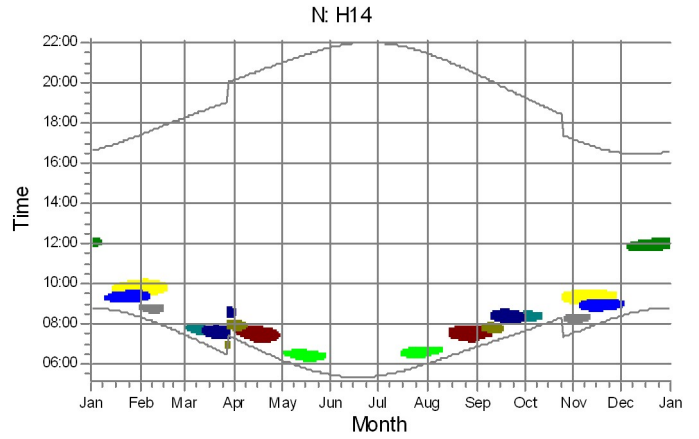
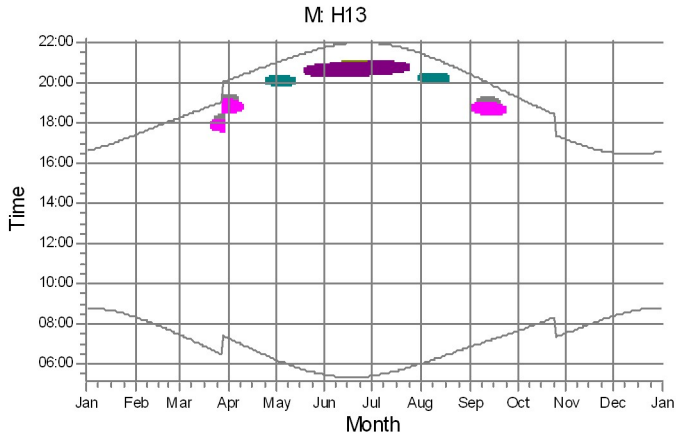


WTGs















	4: T4		8: T8		12: T12		16: Derragh
	5: T5		9: T9		13: T13		
	6: T6		10: T10		14: T14		
	7: T7		11: T11		15: Derragh		

SHADOW - Calendar, graphical

Calculation: Alternative Scenario 1

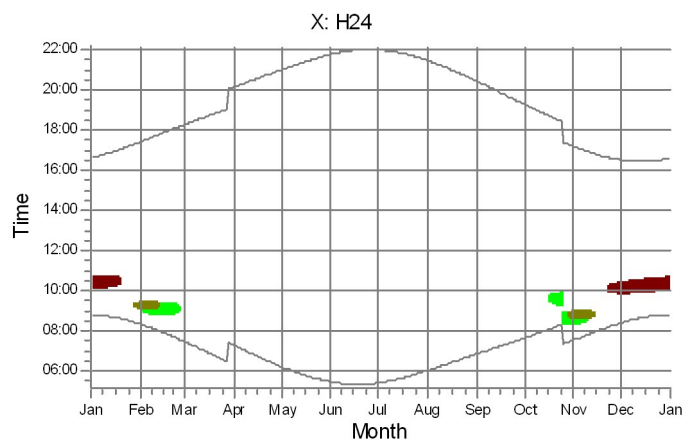
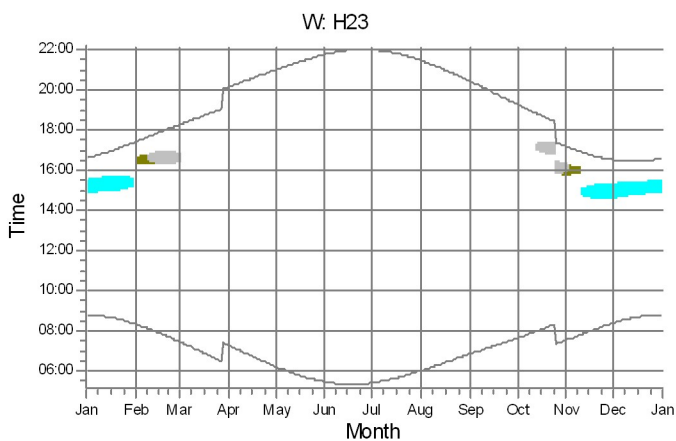
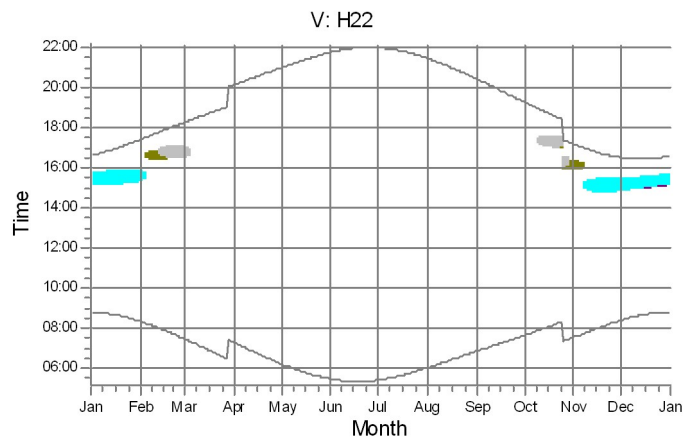
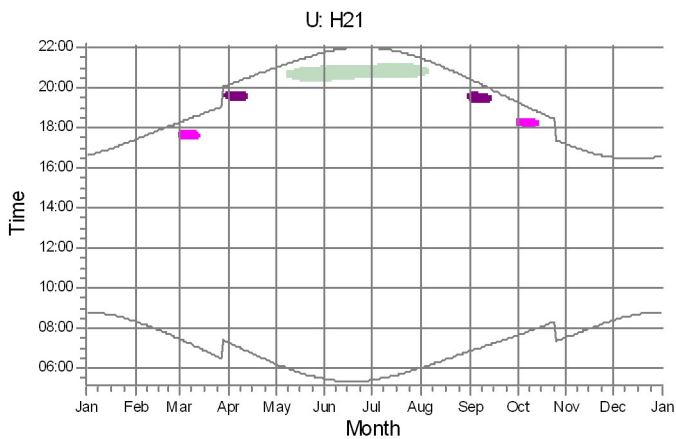
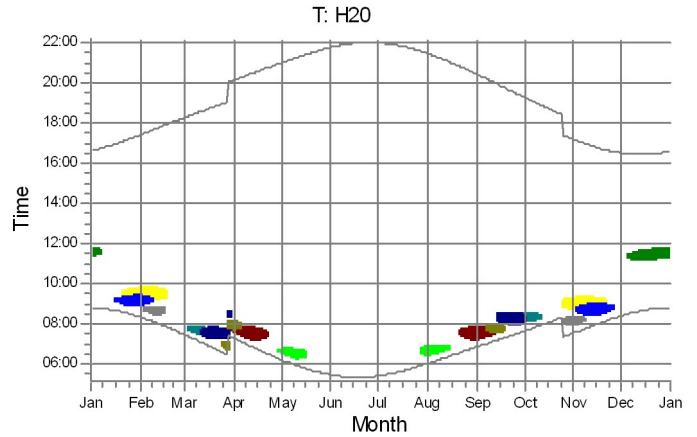
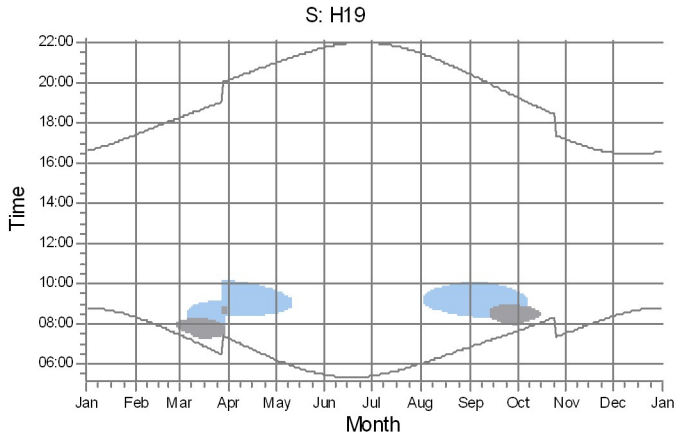


WTGs

	1: T1		5: T5		9: T9		13: T13
	2: T2		6: T6		10: T10		14: T14
	3: T3		7: T7		11: T11		
	4: T4		8: T8		12: T12		

SHADOW - Calendar, graphical

Calculation: Alternative Scenario 1

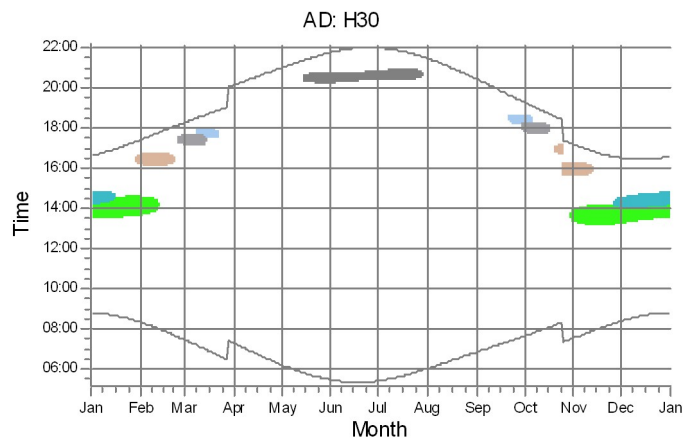
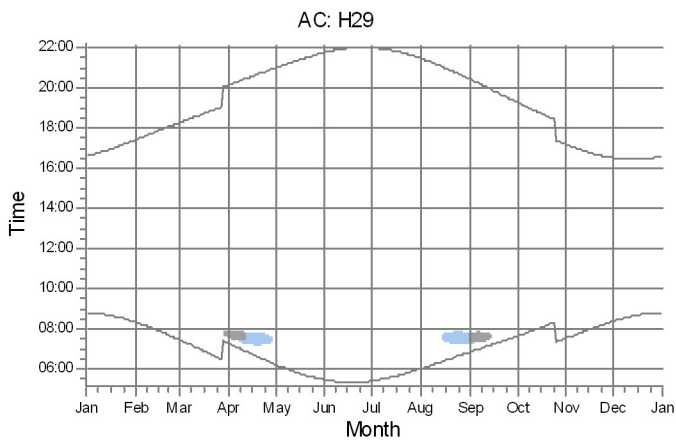
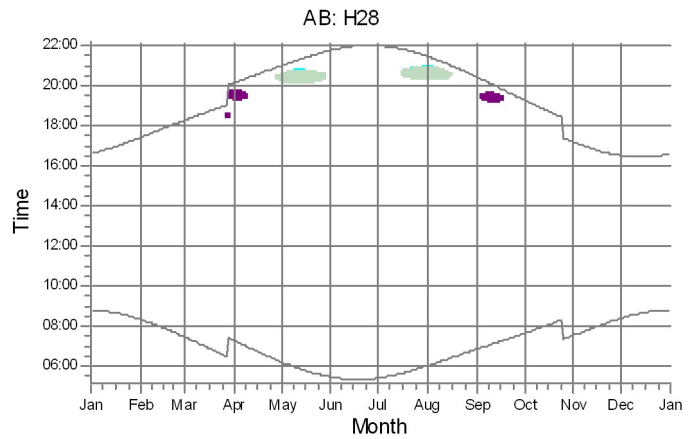
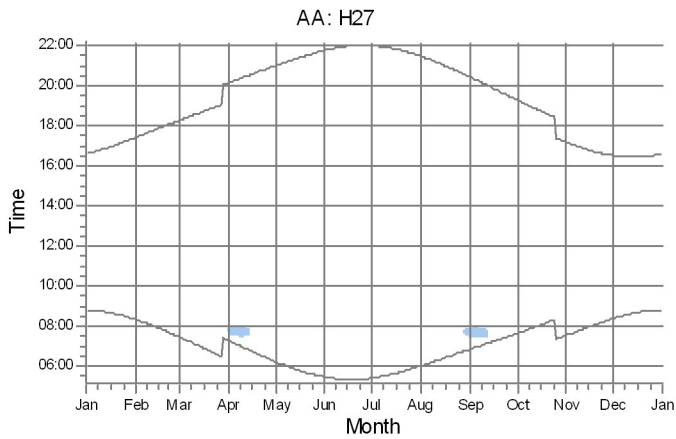
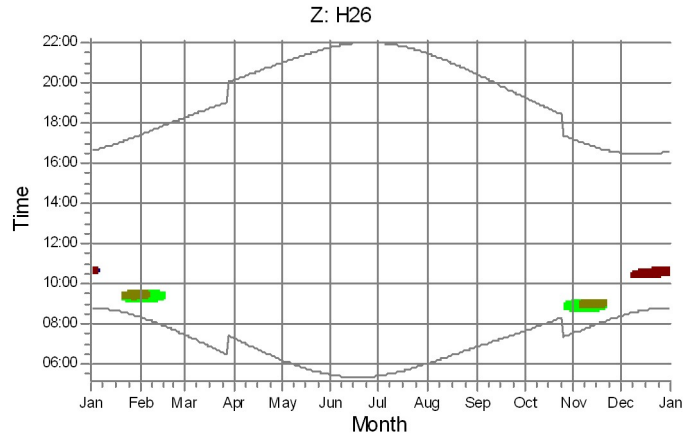
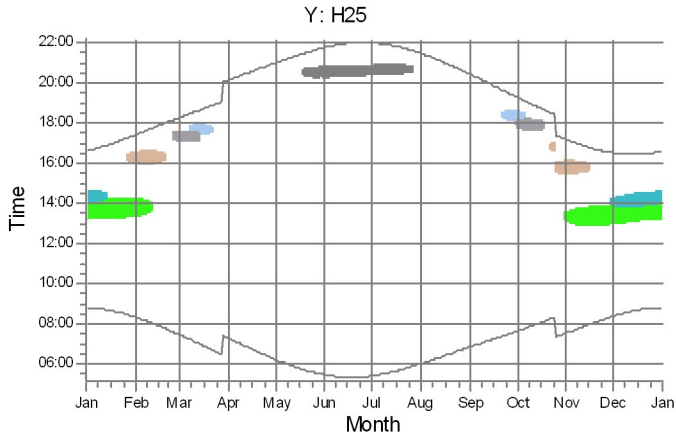


WTGs



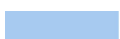










	1: T1		5: T5		9: T9		13: T13
	2: T2		6: T6		10: T10		14: T14
	3: T3		7: T7		11: T11		15: Derragh
	4: T4		8: T8		12: T12		16: Derragh

SHADOW - Calendar, graphical

Calculation: Alternative Scenario 1

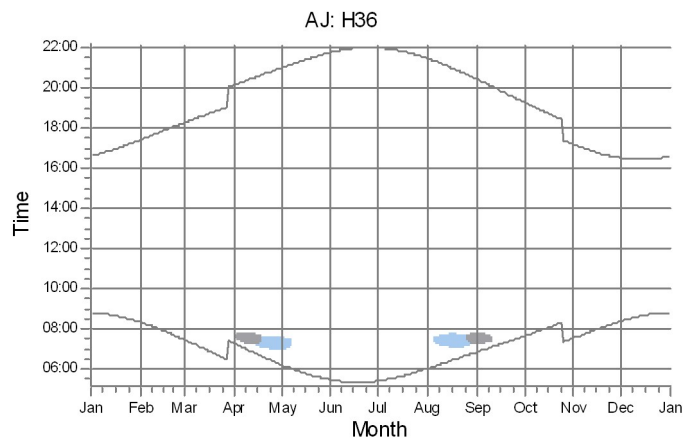
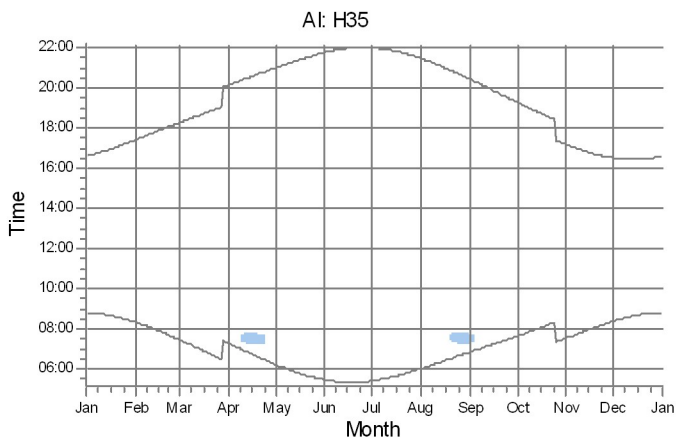
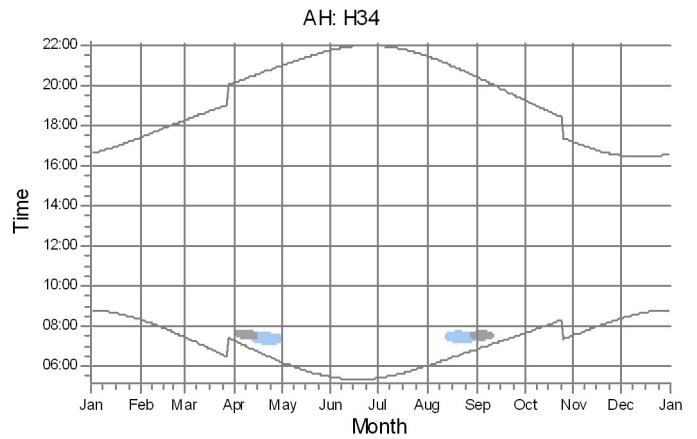
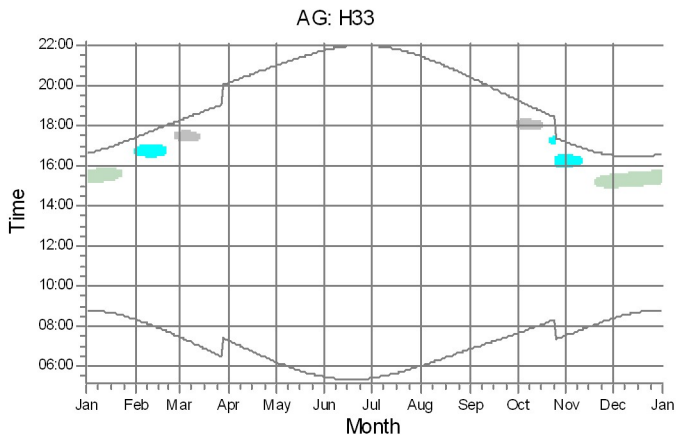
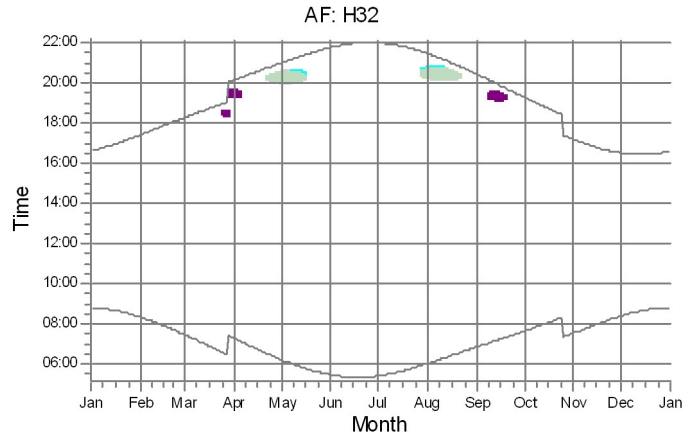
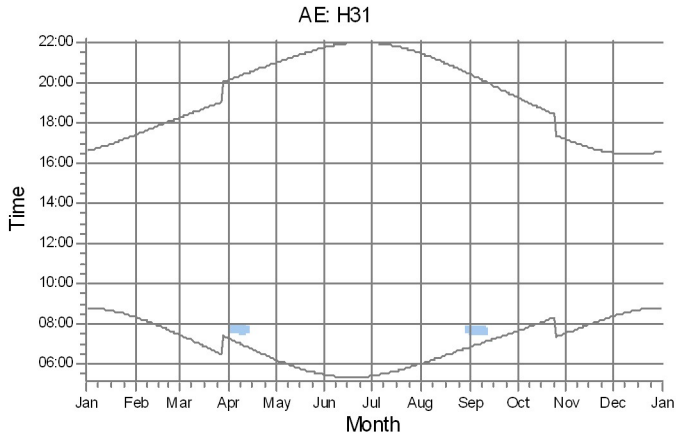


WTGs



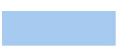



 4: T4	 10: T10	 15: Derragh	 19: Derragh
 7: T7	 11: T11	 16: Derragh	
 8: T8	 13: T13	 17: Derragh	
 9: T9	 14: T14	 18: Derragh	

SHADOW - Calendar, graphical

Calculation: Alternative Scenario 1

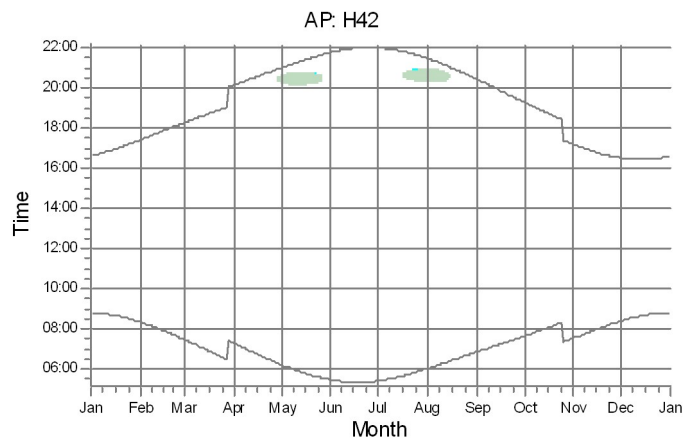
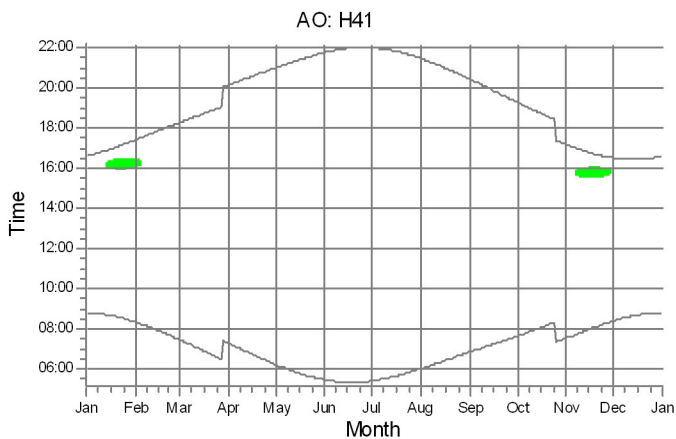
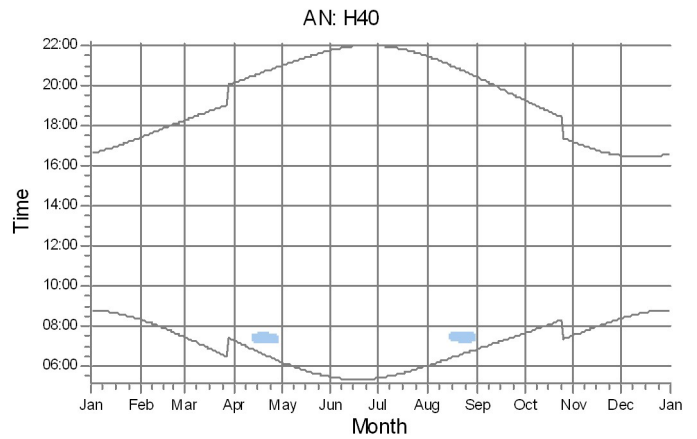
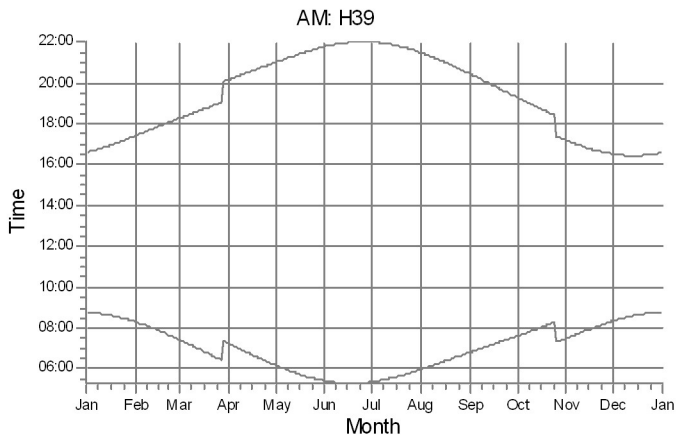
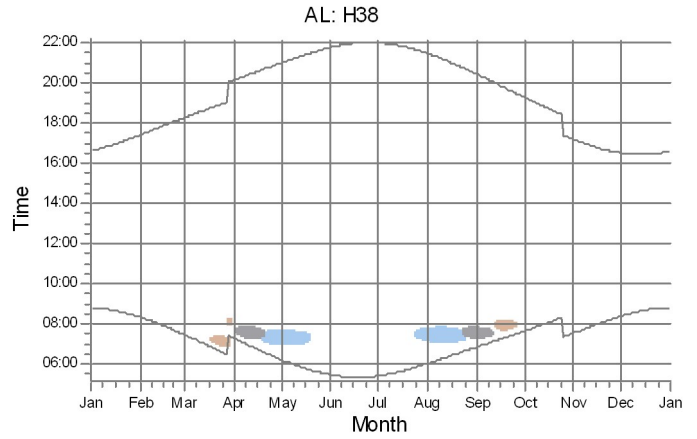
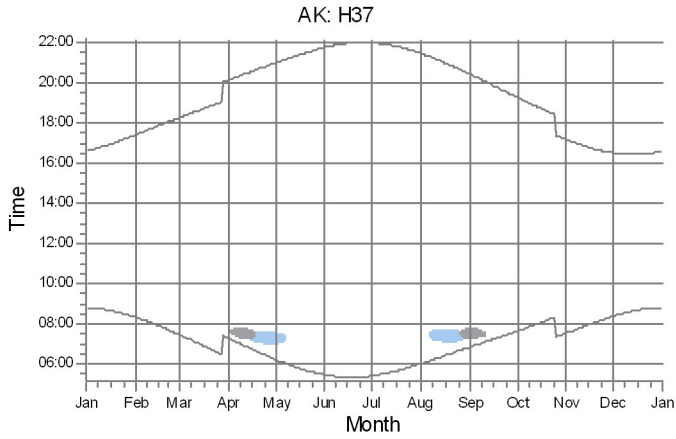


WTGs

	11: T11		13: T13		15: Derragh
	12: T12		14: T14		16: Derragh

SHADOW - Calendar, graphical

Calculation: Alternative Scenario 1

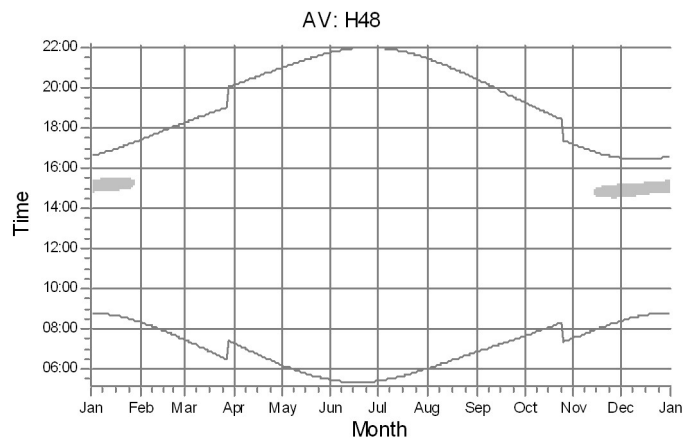
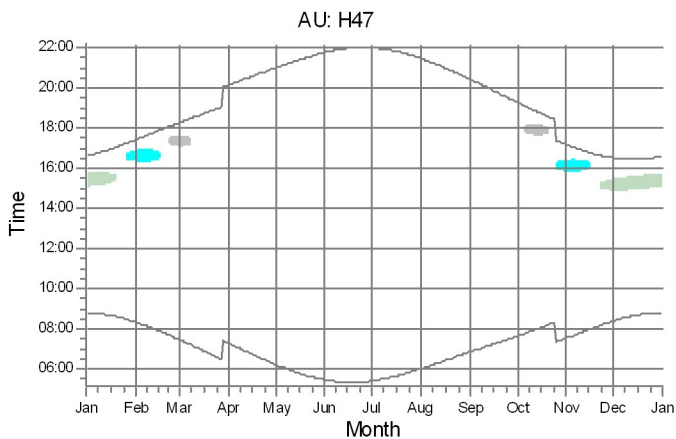
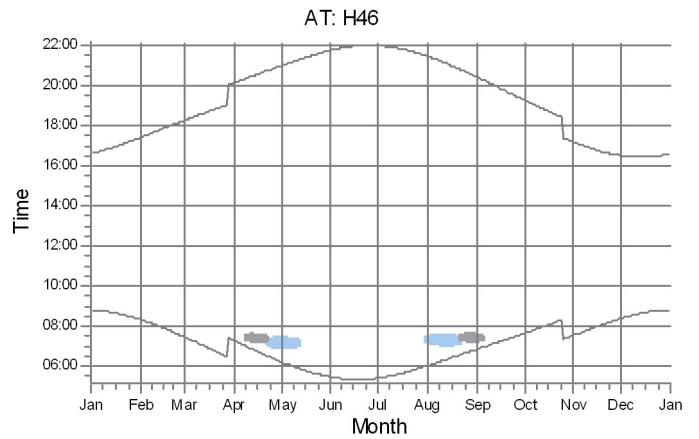
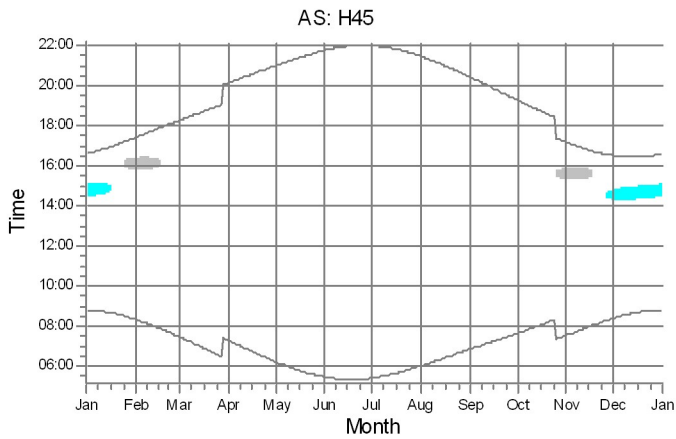
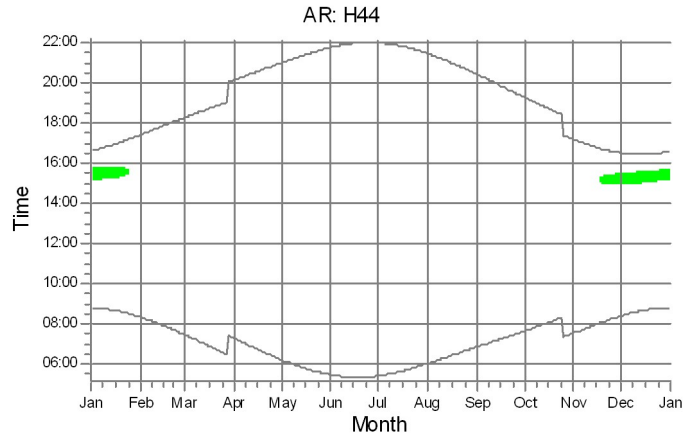
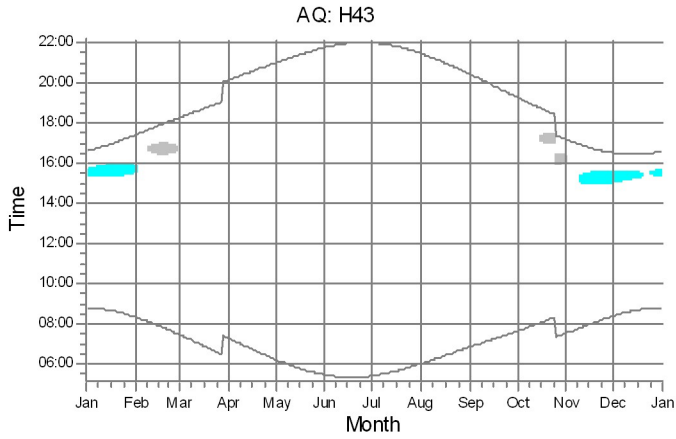


WTGs



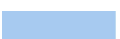



	9: T9		14: T14		16: Derragh
	13: T13		15: Derragh		17: Derragh

SHADOW - Calendar, graphical

Calculation: Alternative Scenario 1

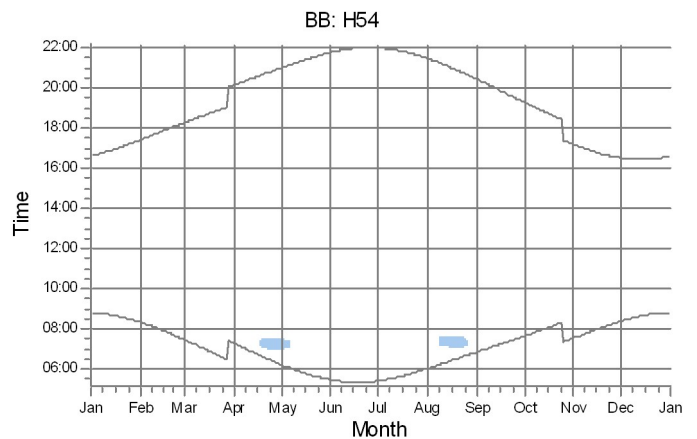
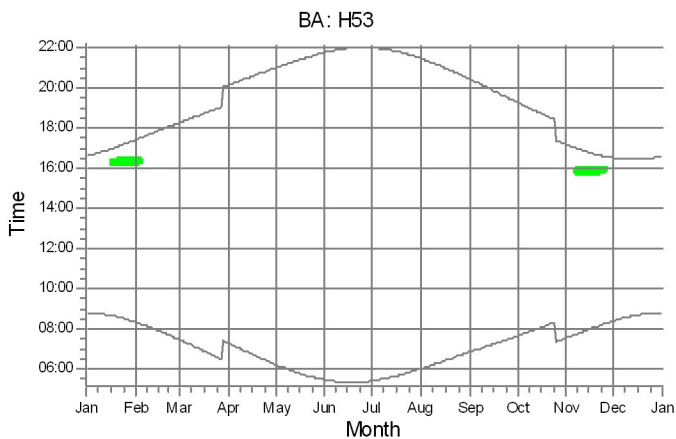
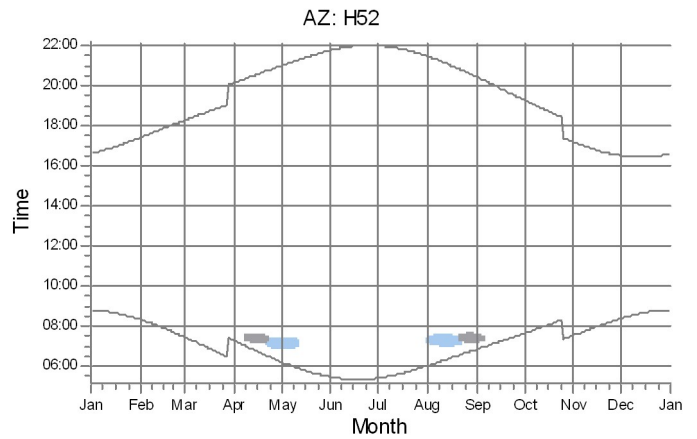
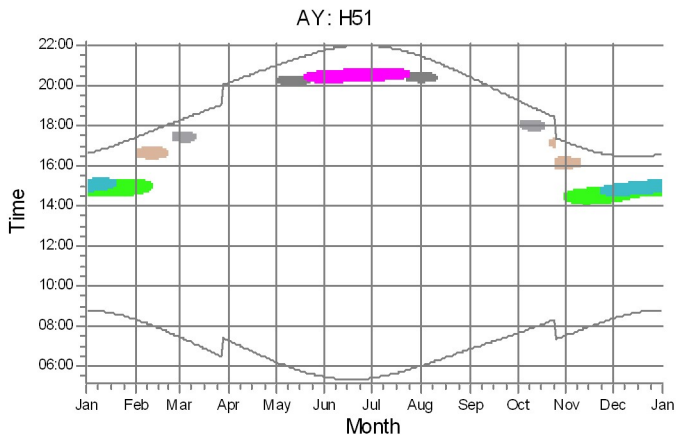
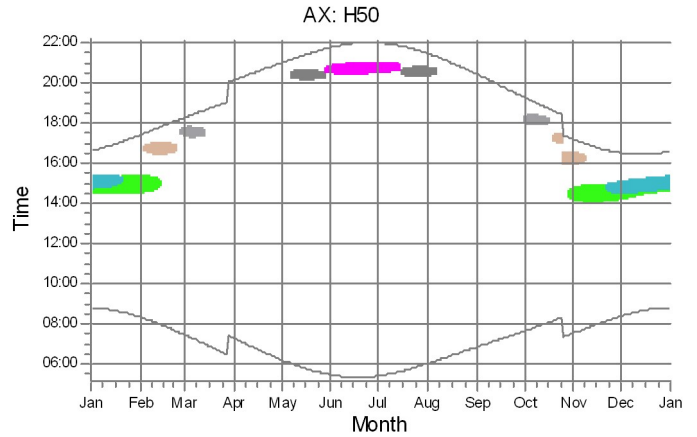
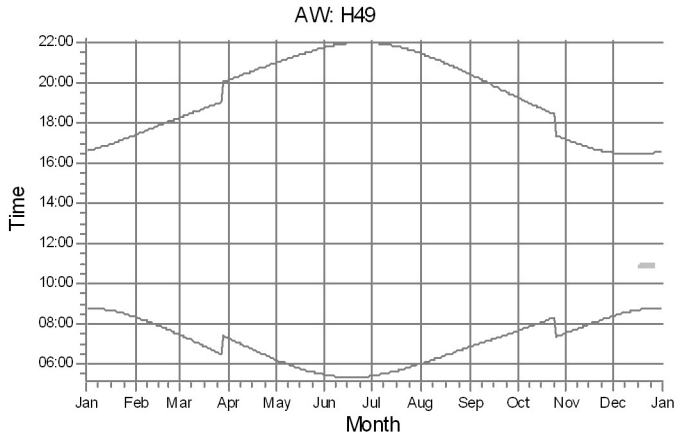


WTGs





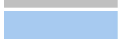




	9: T9		13: T13		15: Derragh
	12: T12		14: T14		16: Derragh

SHADOW - Calendar, graphical

Calculation: Alternative Scenario 1

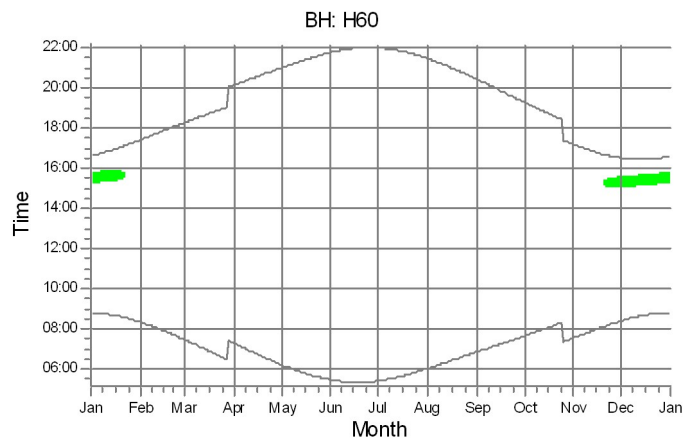
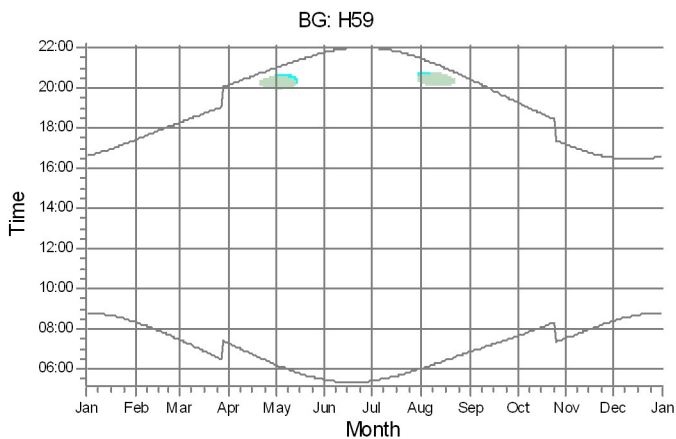
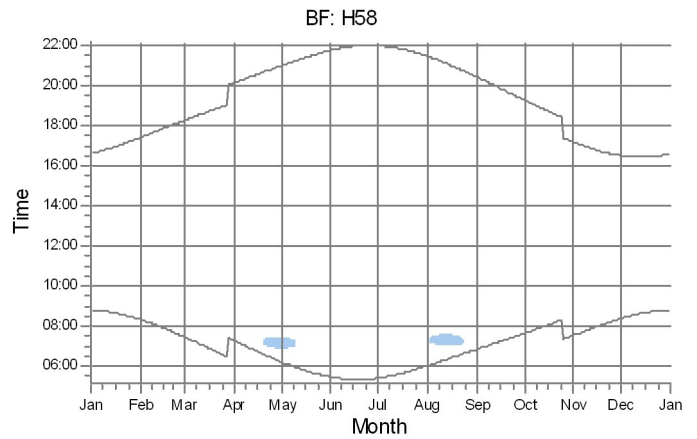
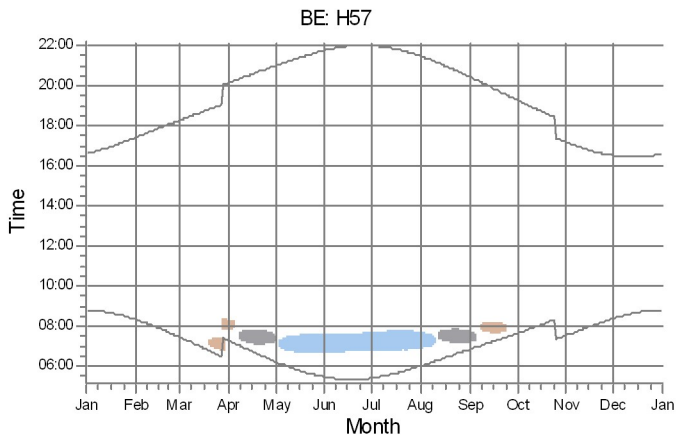
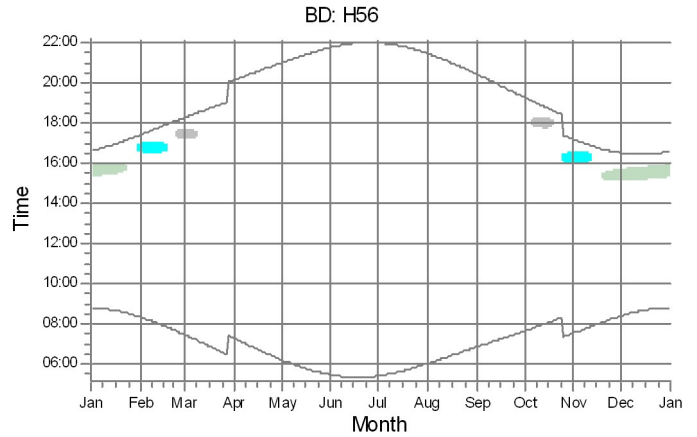
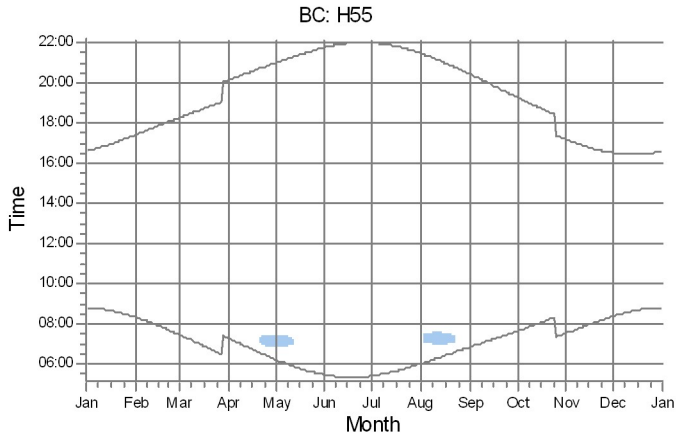


WTGs

	4: T4		12: T12		17: Derragh
	5: T5		15: Derragh		18: Derragh
	9: T9		16: Derragh		19: Derragh

SHADOW - Calendar, graphical

Calculation: Alternative Scenario 1

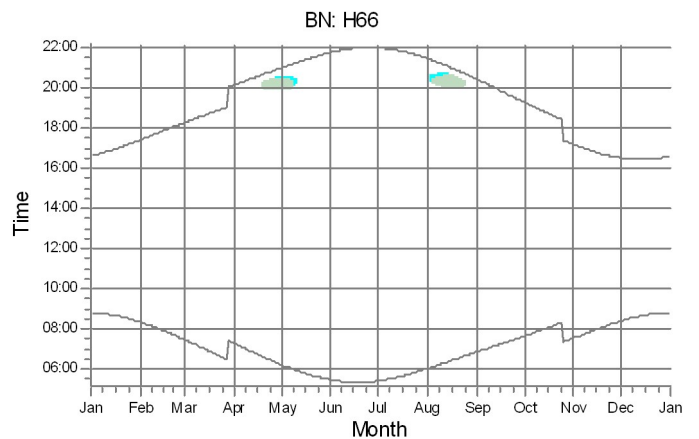
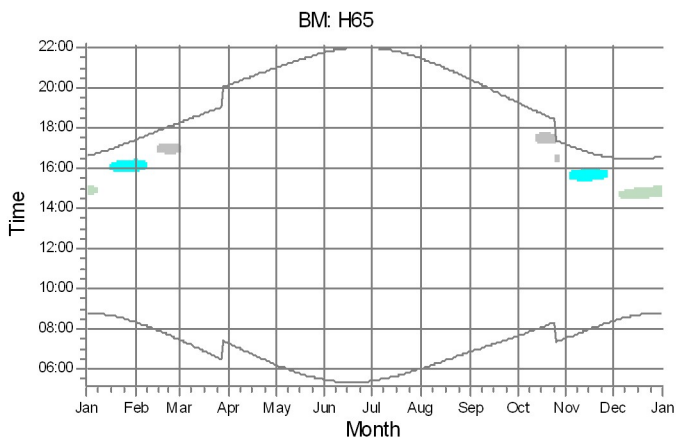
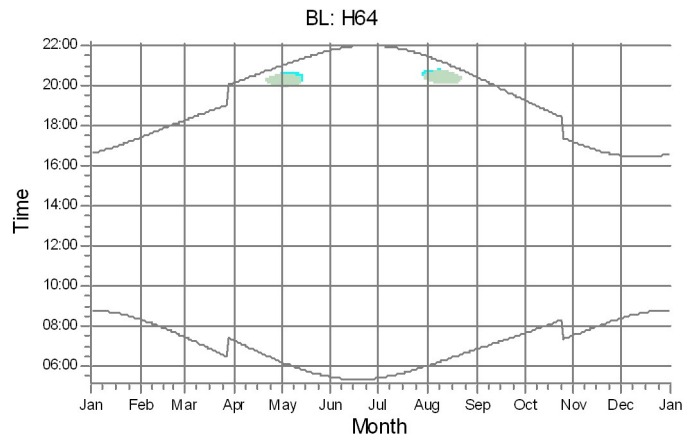
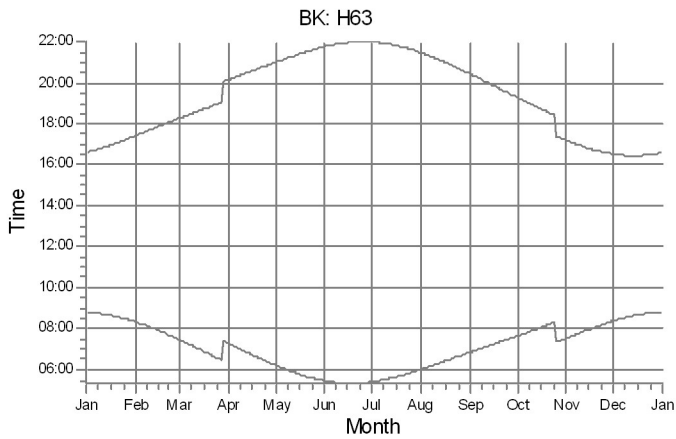
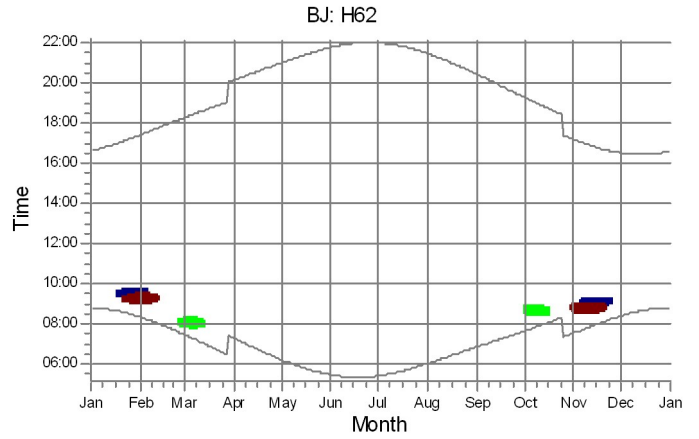
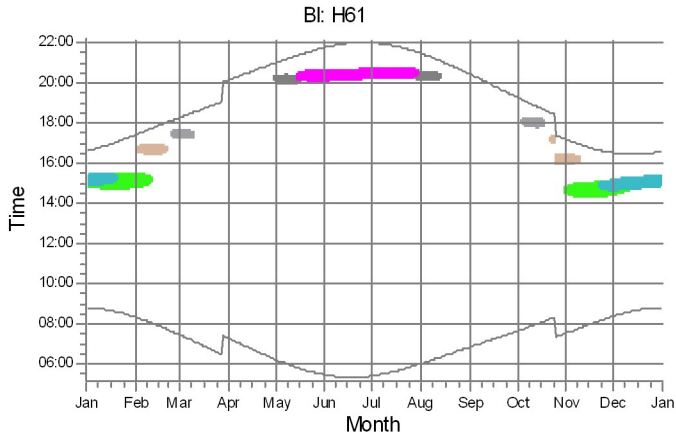


WTGs

	9: T9		13: T13		15: Derragh		17: Derragh
	12: T12		14: T14		16: Derragh		

SHADOW - Calendar, graphical

Calculation: Alternative Scenario 1

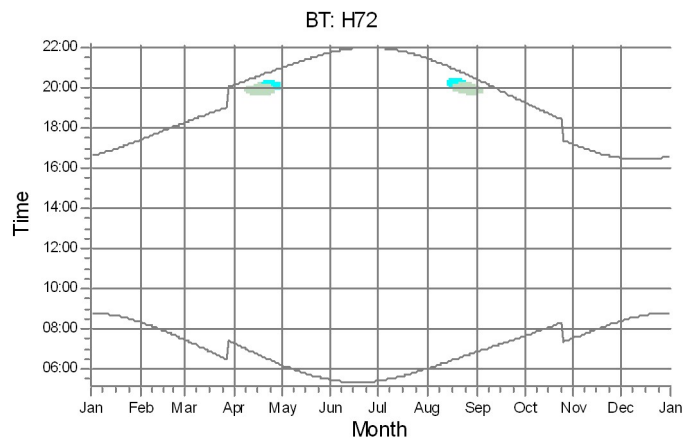
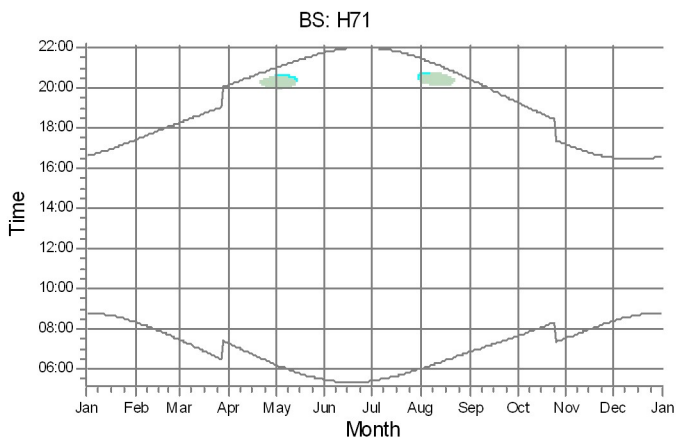
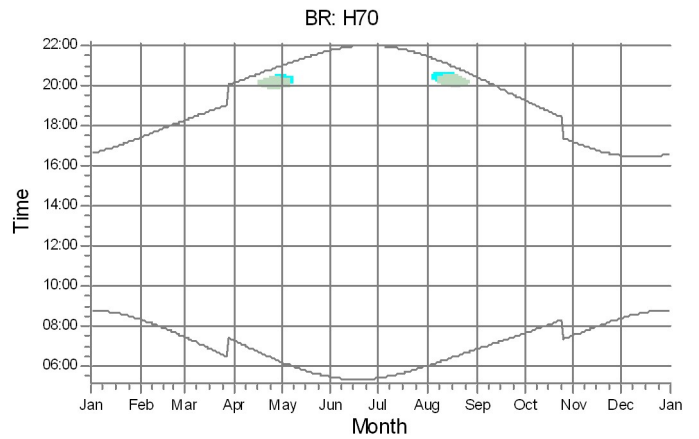
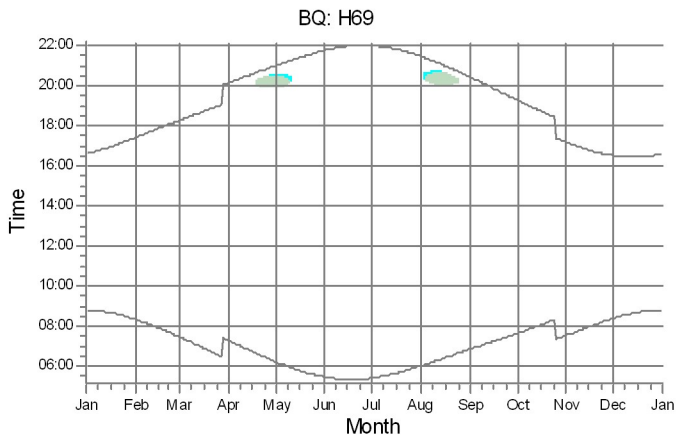
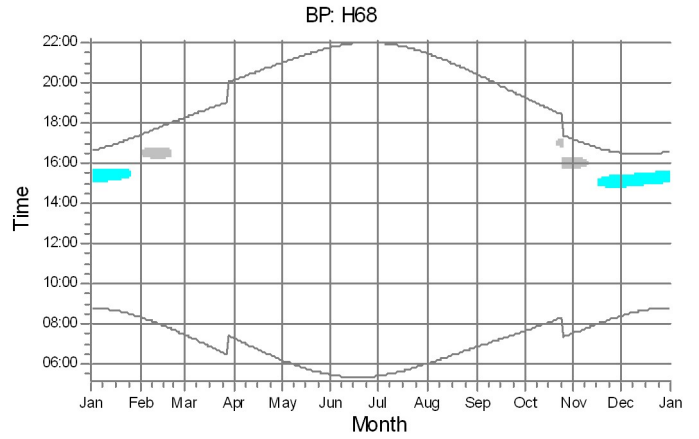
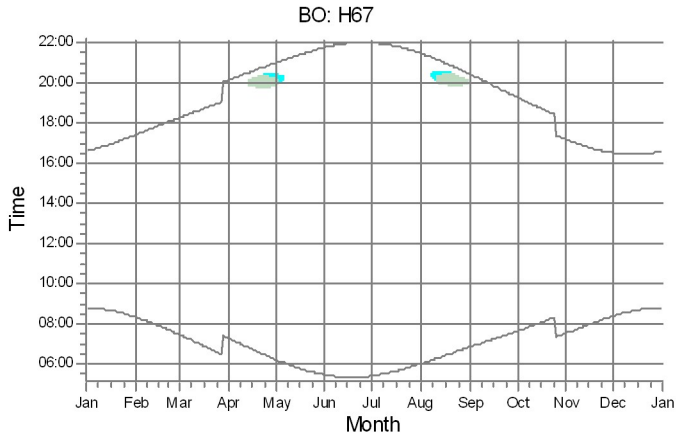


WTGs

 4: T4	 8: T8	 13: T13	 17: Derragh
 5: T5	 9: T9	 14: T14	 18: Derragh
 7: T7	 12: T12	 16: Derragh	 19: Derragh

SHADOW - Calendar, graphical

Calculation: Alternative Scenario 1

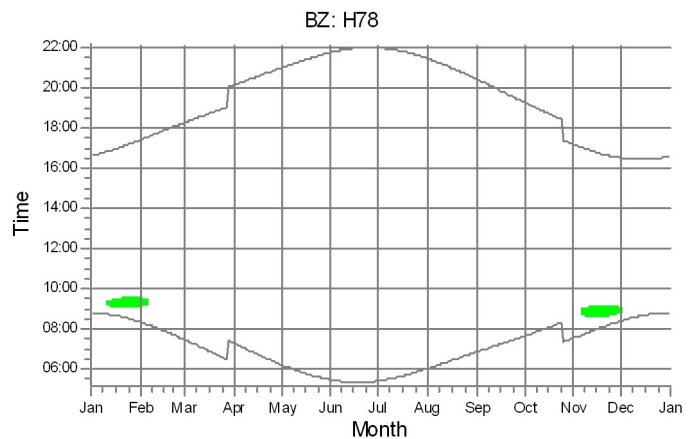
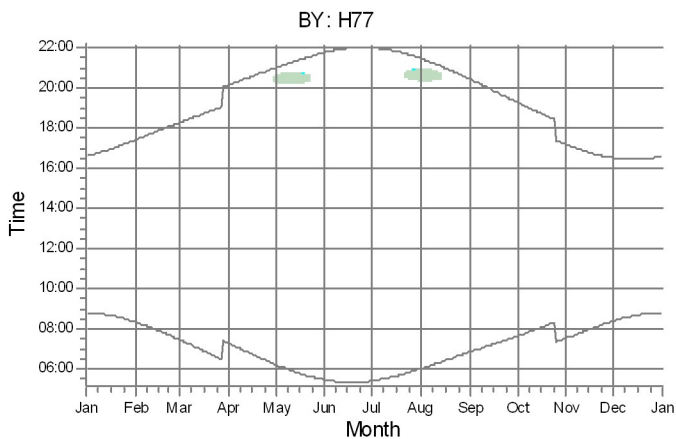
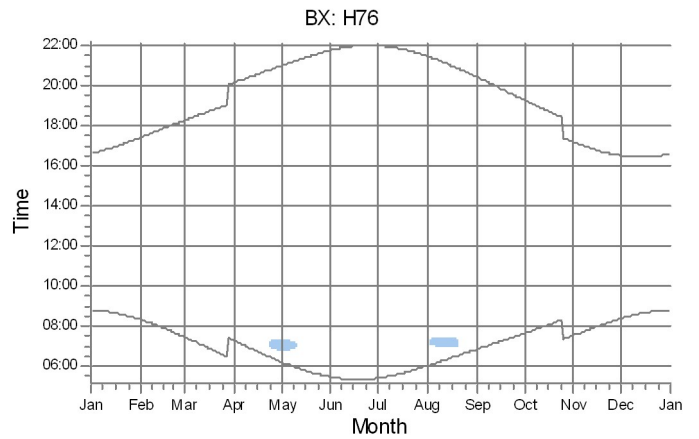
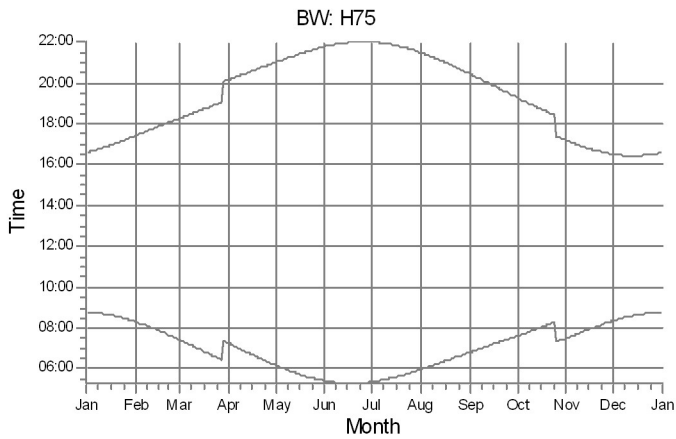
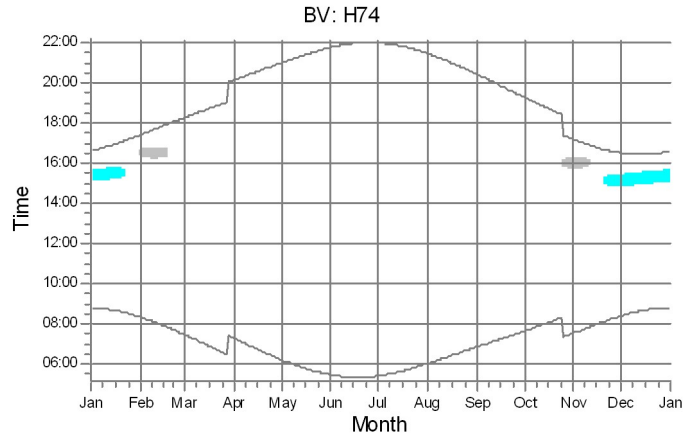
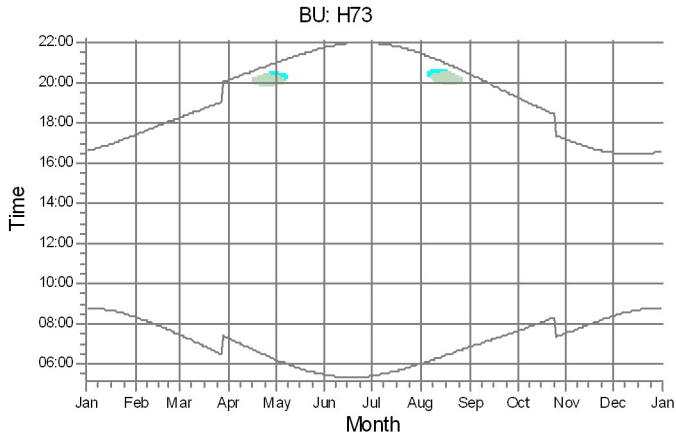


WTGs

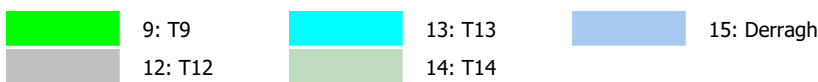


SHADOW - Calendar, graphical

Calculation: Alternative Scenario 1

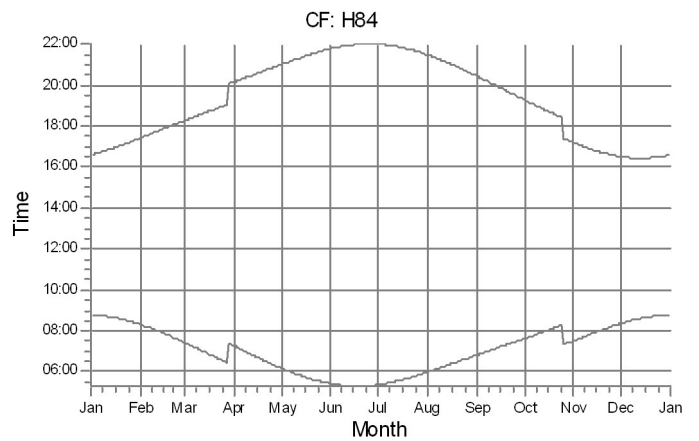
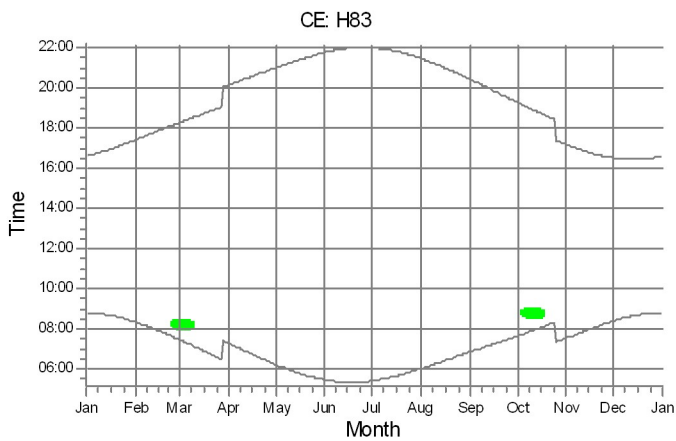
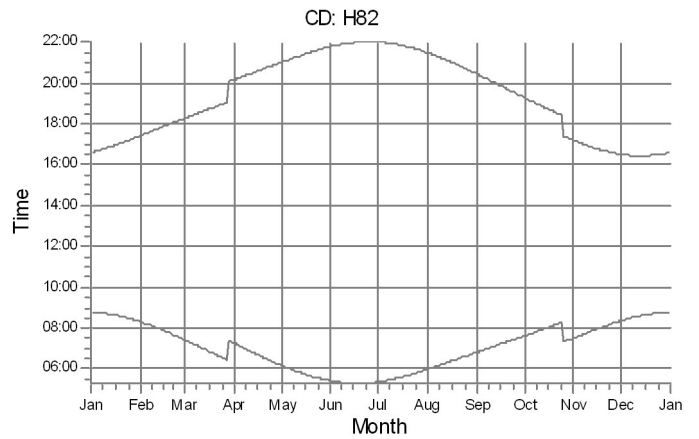
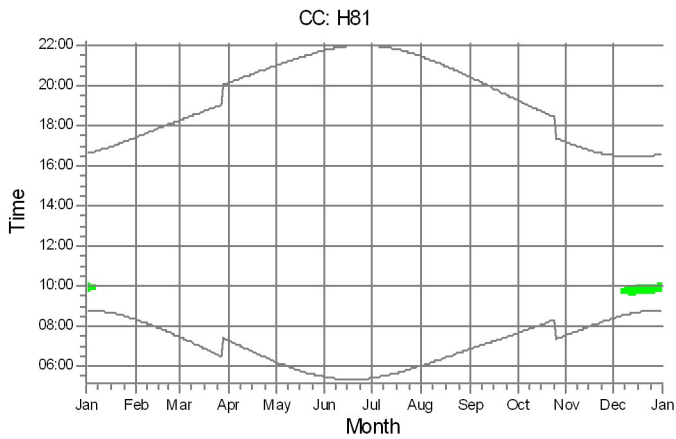
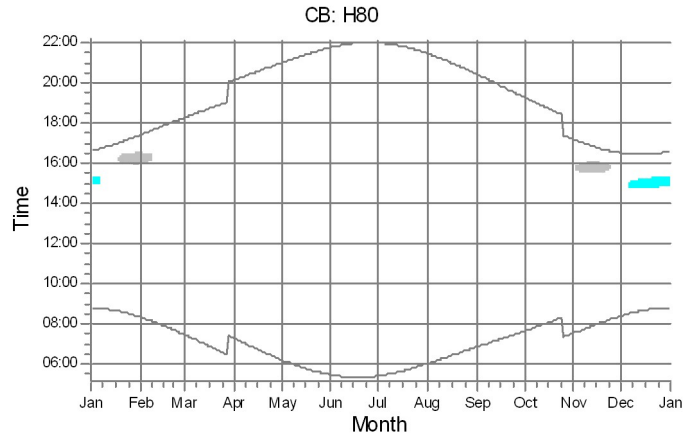
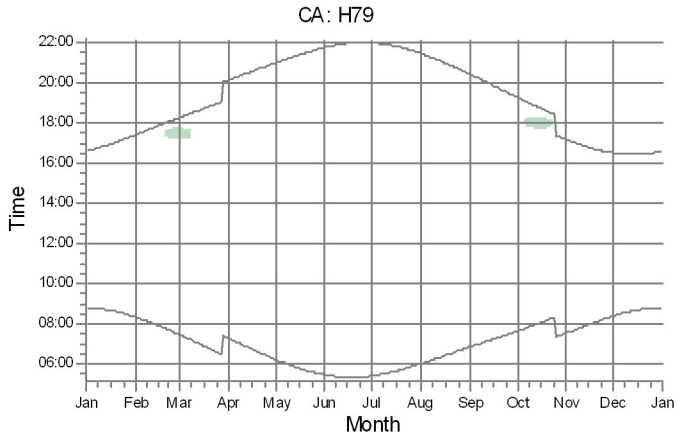


WTGs



SHADOW - Calendar, graphical

Calculation: Alternative Scenario 1

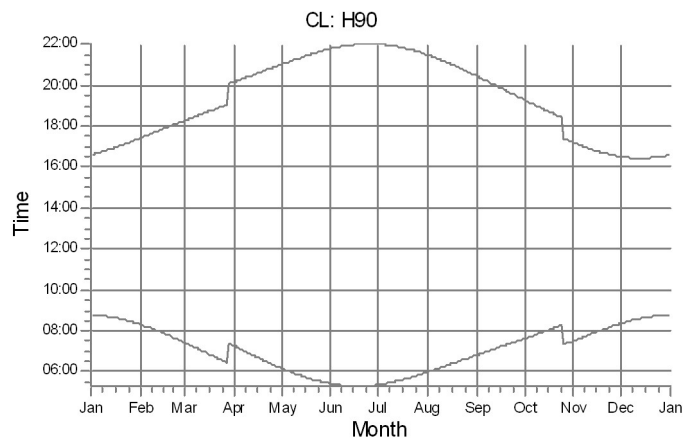
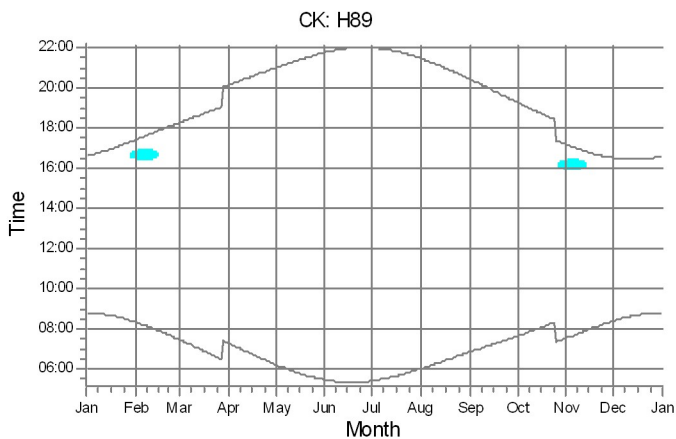
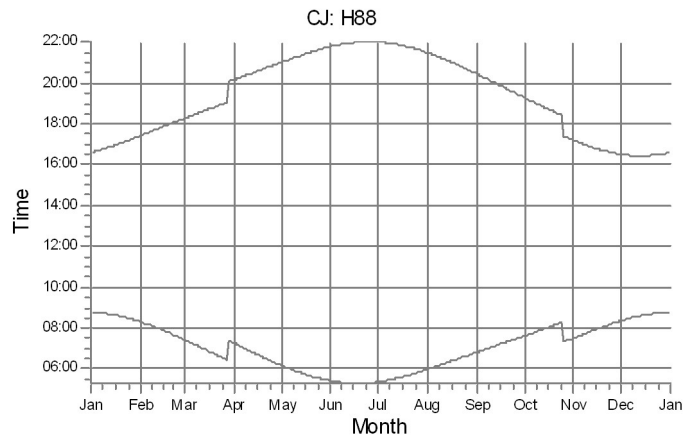
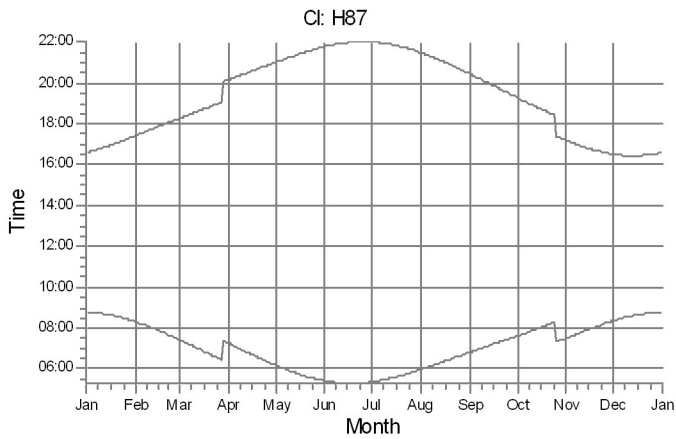
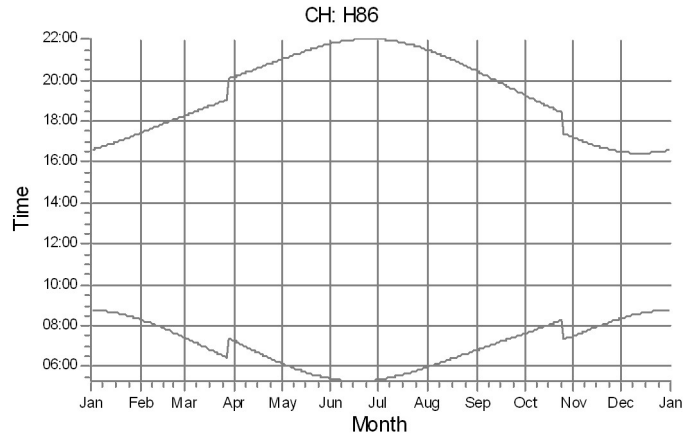
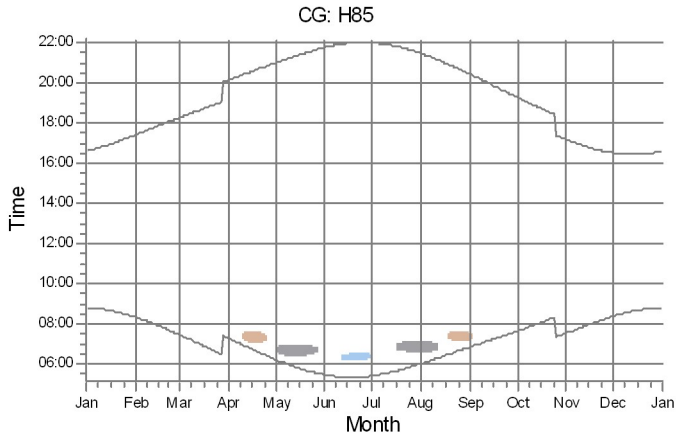


WTGs

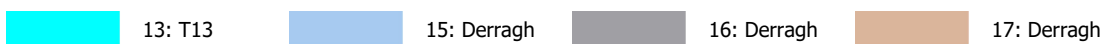


SHADOW - Calendar, graphical

Calculation: Alternative Scenario 1

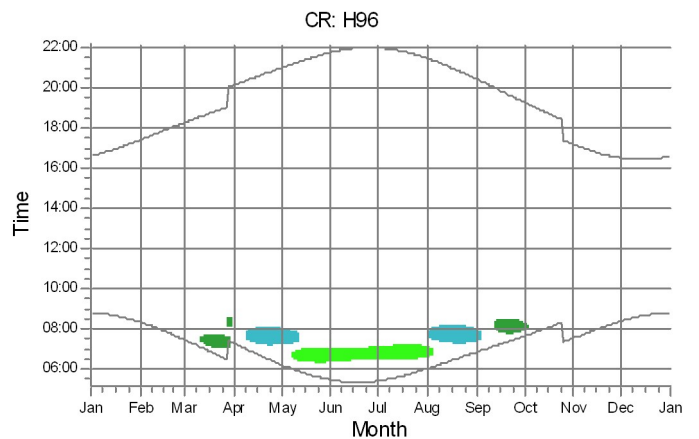
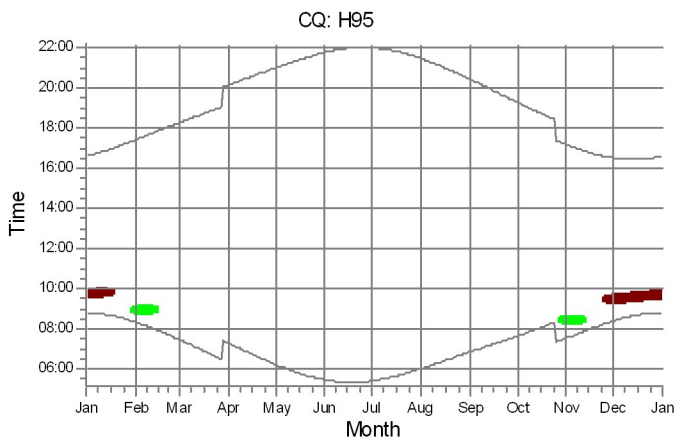
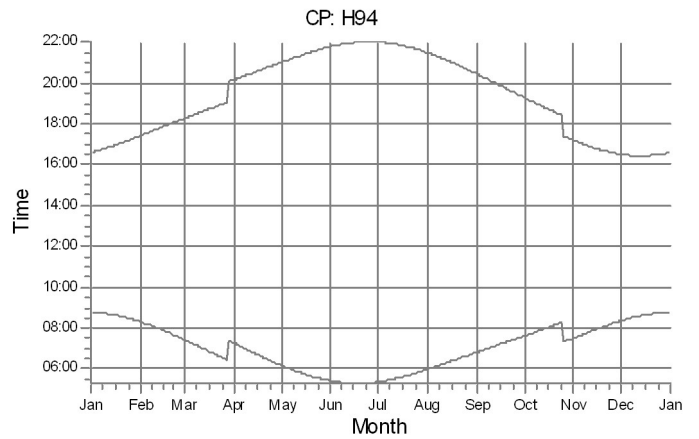
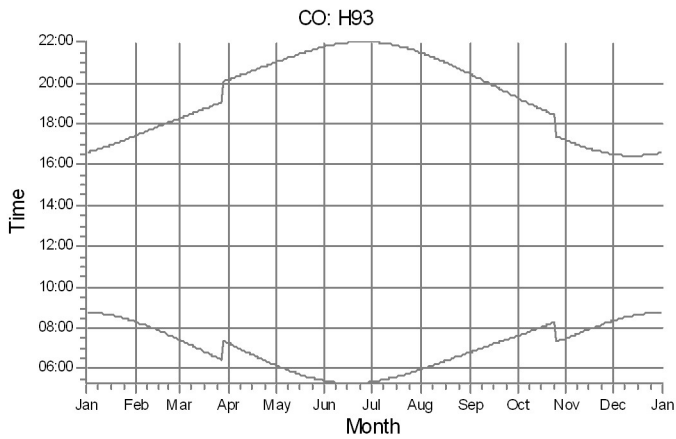
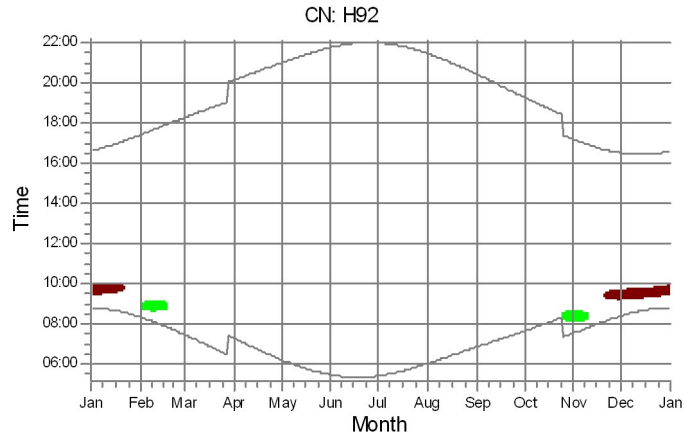
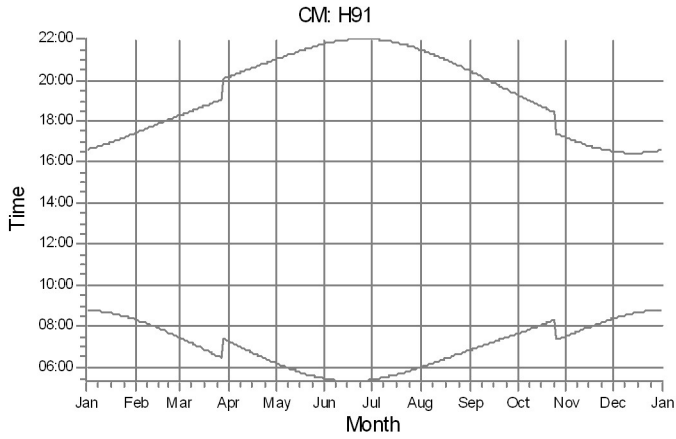


WTGs

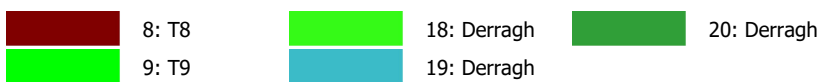


SHADOW - Calendar, graphical

Calculation: Alternative Scenario 1

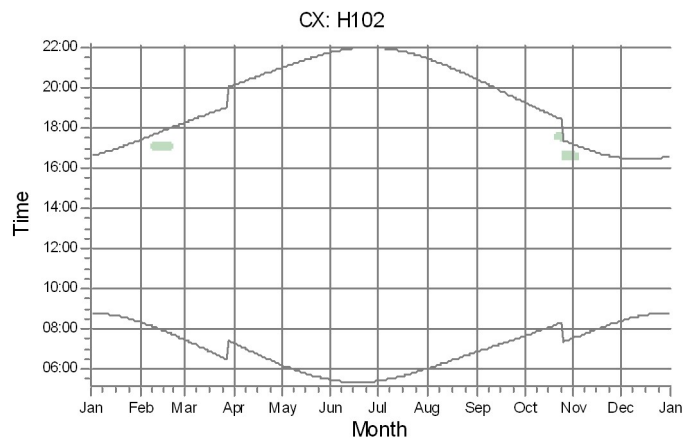
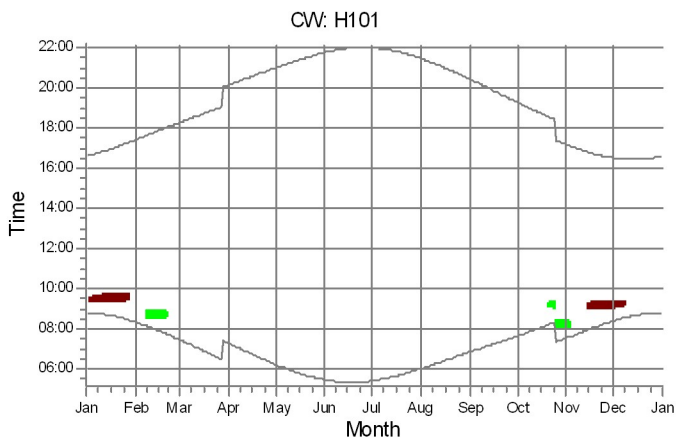
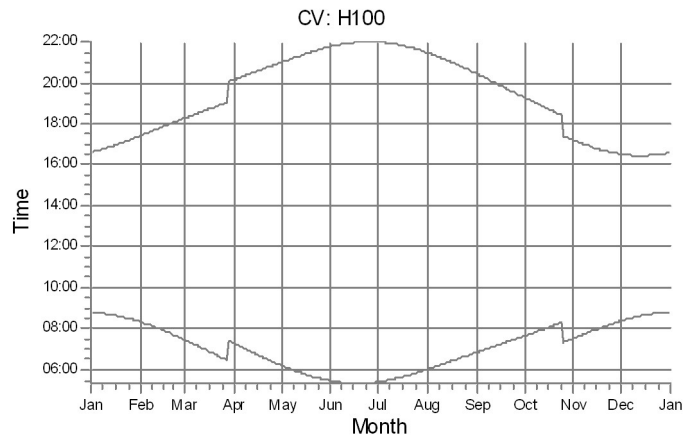
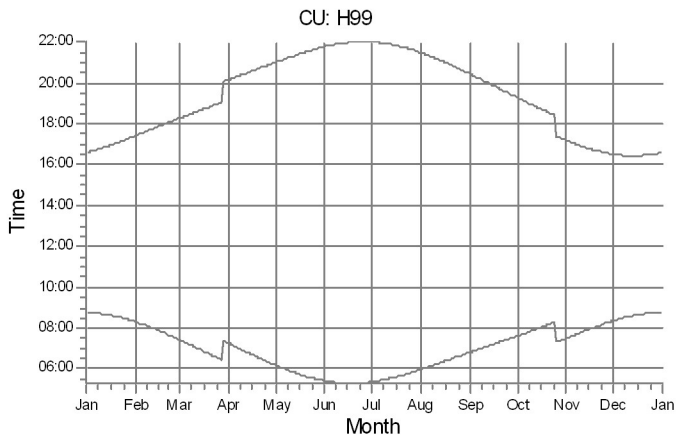
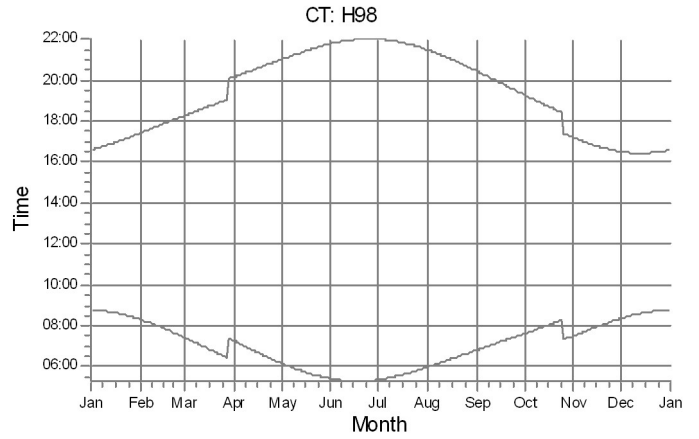
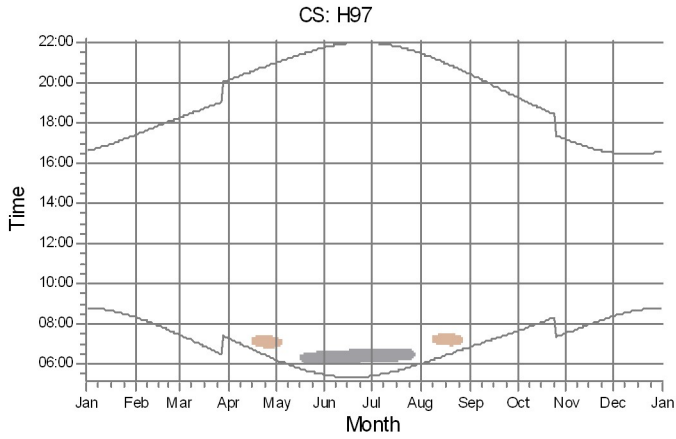


WTGs



SHADOW - Calendar, graphical

Calculation: Alternative Scenario 1

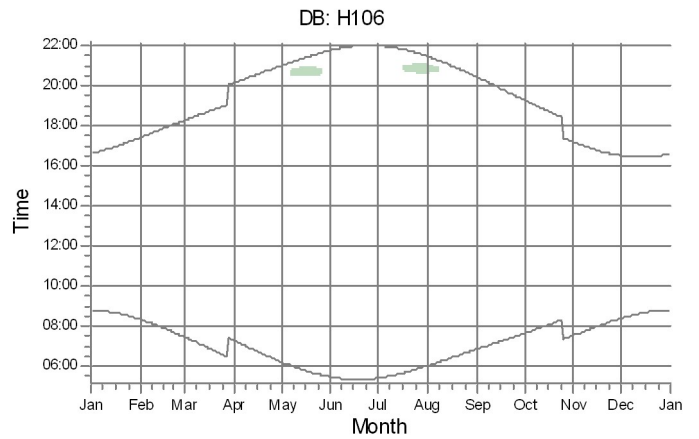
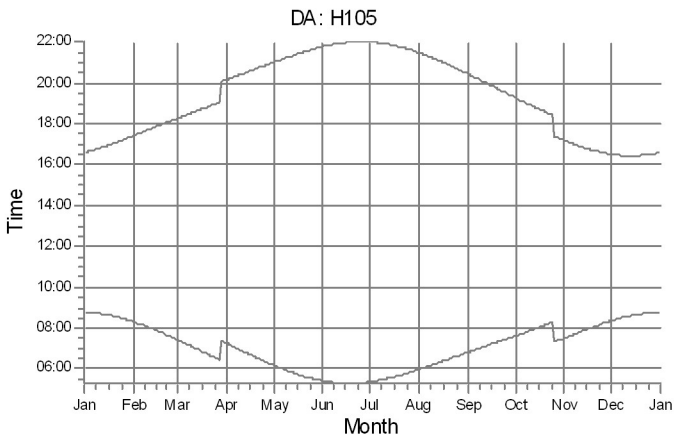
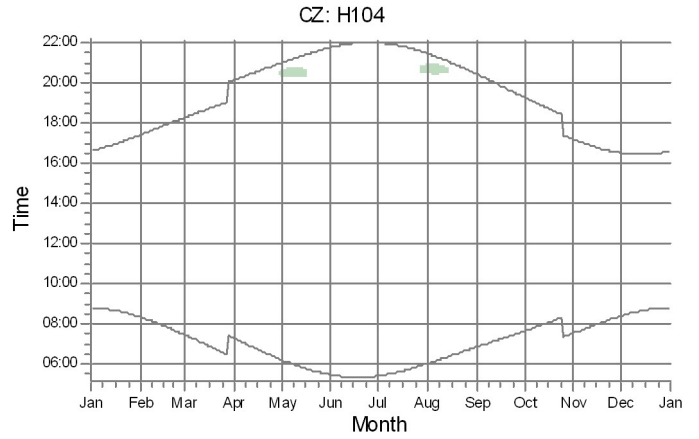
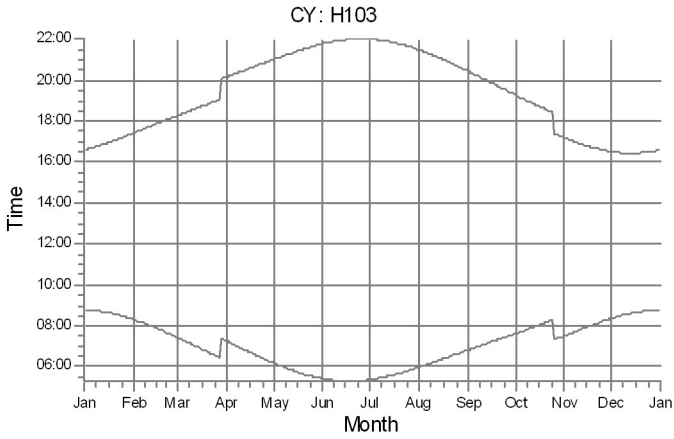


WTGs

	8: T8		14: T14		17: Derragh
	9: T9		16: Derragh		

SHADOW - Calendar, graphical

Calculation: Alternative Scenario 1



WTGs

14: T14

Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:33/3.5.584

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 1 WTG: 1 - T1
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

	January	February	March	April	May	June	July	August	September	October	November	December												
1	08:45 11:24-11:42/18 16:37 11:44-12:10/26	08:18 07:25 07:15 06:10 05:25 05:22 20:45-20:59/14	17:24 18:16 20:10 21:01 21:46 22:00 20:26 19:17 17:11 16:31	08:17 07:23 07:12 06:08 05:24 05:22 20:47-20:59/12	17:26 18:18 20:11 21:02 21:47 22:00 20:24 19:15 17:09 16:30	08:15 07:21 07:10 06:06 05:23 05:23 20:48-20:59/11	17:28 18:19 20:13 21:04 21:49 22:00 20:24 19:15 17:09 16:30	08:14 07:19 07:08 06:04 05:22 05:24 20:49-20:57/8	17:30 18:21 20:15 21:06 21:50 21:59 20:20 19:10 17:06 16:29	08:12 07:16 07:05 06:02 05:22 05:25 20:51-20:56/5	17:32 18:23 20:17 21:07 21:51 21:59 20:20 19:10 17:06 16:29	08:10 07:14 07:03 06:01 05:21 05:26 20:20 19:10 17:06 16:29	16:41 11:49-12:08/19 08:44 11:32-11:37/5	17:32 18:23 20:17 21:07 21:51 21:59 20:20 19:10 17:06 16:29	17:32 18:23 20:17 21:07 21:51 21:59 20:20 19:10 17:06 16:29	16:41 11:49-12:08/19 08:44 11:32-11:37/5	17:32 18:23 20:17 21:07 21:51 21:59 20:20 19:10 17:06 16:29	17:32 18:23 20:17 21:07 21:51 21:59 20:20 19:10 17:06 16:29	16:41 11:49-12:08/19 08:44 11:32-11:37/5	17:32 18:23 20:17 21:07 21:51 21:59 20:20 19:10 17:06 16:29	17:32 18:23 20:17 21:07 21:51 21:59 20:20 19:10 17:06 16:29	16:41 11:49-12:08/19 08:44 11:32-11:37/5	17:32 18:23 20:17 21:07 21:51 21:59 20:20 19:10 17:06 16:29	17:32 18:23 20:17 21:07 21:51 21:59 20:20 19:10 17:06 16:29

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker



Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:33/3.5.584

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 1 WTG: 2 - T2
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Table with columns for months (January to December) and rows for days (1 to 31). Each cell contains a time range (hh:mm) and a numerical value. Includes summary rows for 'Potential sun hours' and 'Sum of minutes with flicker'.

Table layout: For each day in each month the following matrix apply

Day in month Sun rise (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 1 WTG: 3 - T3

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 16:36	08:58-09:33/35 17:24	07:25 18:16	07:14 20:10	06:10 21:01	05:25 21:46
2	08:45 16:38	08:17 08:58-09:32/34 17:26	07:23 18:18	07:12 20:11	06:08 21:02	05:24 21:47
3	08:45 16:39	08:15 08:59-09:31/32 17:28	07:21 18:19	07:10 19:28-19:38/10 20:13	06:06 21:04	05:23 21:48
4	08:45 16:40	08:14 09:00-09:30/30 17:30	07:18 18:21	07:08 19:26-19:40/14 20:15	06:04 21:06	05:22 21:50
5	08:45 16:41	08:12 09:01-09:28/27 17:32	07:16 18:23	07:05 19:25-19:41/16 20:17	06:02 21:07	05:22 21:51
6	08:44 16:42	08:10 09:02-09:25/23 17:33	07:14 18:25	07:03 19:24-19:42/18 20:18	06:00 21:09	05:21 21:51
7	08:44 16:43	08:09 09:04-09:21/17 17:35	07:12 18:27	07:01 19:23-19:41/18 20:20	05:59 21:10	05:20 21:52
8	08:43 16:45	08:07 09:09-09:10/1 17:37	07:10 18:28	06:59 19:22-19:41/19 20:22	05:57 21:12	05:20 21:53
9	08:43 16:46	08:05 17:39	07:07 18:30	06:56 19:22-19:41/19 20:23	05:55 21:14	05:19 21:54
10	08:42 16:48	08:03 17:41	07:05 18:32	06:54 19:22-19:41/19 20:25	05:53 21:15	05:19 21:55
11	08:42 09:14-09:18/4 16:49	08:01 17:43	07:03 18:34	06:52 19:23-19:40/17 20:27	05:52 21:17	05:19 21:56
12	08:41 09:11-09:21/10 16:50	08:00 17:45	07:01 18:35	06:50 19:23-19:38/15 20:28	05:50 21:19	05:18 21:56
13	08:40 09:10-09:22/12 16:52	07:58 17:47	06:58 18:37	06:47 19:24-19:37/13 20:30	05:48 21:20	05:18 21:57
14	08:40 09:09-09:24/15 16:53	07:56 17:48	06:56 18:39	06:45 19:26-19:35/9 20:32	05:47 21:22	05:18 21:58
15	08:39 09:08-09:25/17 16:55	07:54 17:50	06:54 18:41	06:43 20:34	05:45 21:23	05:18 21:58
16	08:38 09:07-09:27/20 16:57	07:52 17:52	06:51 18:42	06:41 20:35	05:44 21:25	05:17 21:59
17	08:37 09:06-09:28/22 16:58	07:50 17:54	06:49 18:44	06:39 20:37	05:42 21:26	05:17 21:59
18	08:36 09:05-09:29/24 17:00	07:48 17:56	06:47 18:46	06:36 20:39	05:41 21:28	05:17 22:00
19	08:35 09:04-09:30/26 17:01	07:46 17:58	06:44 18:47	06:34 20:40	05:39 21:29	05:17 22:00
20	08:34 09:02-09:30/28 17:03	07:44 17:59	06:42 18:49	06:32 20:42	05:38 21:31	05:17 22:00
21	08:33 09:01-09:31/30 17:05	07:42 18:01	06:40 18:51	06:30 20:44	05:37 21:32	05:18 22:00
22	08:32 09:00-09:32/32 17:06	07:40 18:03	06:38 18:53	06:28 20:45	05:35 21:34	05:18 22:01
23	08:31 08:58-09:32/34 17:08	07:38 18:05	06:35 18:54	06:26 20:47	05:34 21:35	05:18 22:01
24	08:30 08:57-09:33/36 17:10	07:36 18:07	06:33 18:56	06:24 20:49	05:33 21:36	05:18 22:01
25	08:28 08:57-09:33/36 17:12	07:34 18:09	06:31 18:58	06:22 20:50	05:32 21:38	05:19 22:01
26	08:27 08:56-09:33/37 17:13	07:31 18:10	06:28 18:59	06:20 20:52	05:31 21:39	05:19 22:01
27	08:26 08:56-09:34/38 17:15	07:29 18:12	06:26 19:01	06:18 20:54	05:29 21:40	05:19 22:01
28	08:24 08:56-09:33/37 17:17	07:27 18:14	06:24 19:03	06:16 20:56	05:28 21:42	05:20 22:01
29	08:23 08:57-09:34/37 17:19		07:21 20:05	06:14 20:57	05:27 21:43	05:20 22:01
30	08:21 08:57-09:33/36 17:21		07:19 20:06	06:12 20:59	05:26 21:44	05:21 22:00
31	08:20 08:57-09:33/36 17:22		07:17 20:08		05:26 21:45	
Potential sun hours	259	278	367	416	485	499
Sum of minutes with flicker	567	199	0	187	0	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 1 **WTG:** 3 - T3
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December	
1	05:22 22:00	05:58 21:28	06:48 20:26	19:22-19:39/17 19:17	07:37 17:11	08:21 16:31	08:55-09:00/5
2	05:22 22:00	06:00 21:27	06:49 20:24	19:20-19:39/19 19:15	07:38 17:09	08:23 16:30	
3	05:23 21:59	06:01 21:25	06:51 20:22	19:20-19:39/19 19:12	07:40 17:07	08:24 16:29	
4	05:24 21:59	06:03 21:23	06:53 20:20	19:19-19:38/19 19:10	07:42 17:05	08:26 16:29	
5	05:25 21:59	06:04 21:22	06:54 20:17	19:20-19:38/18 19:08	07:43 17:04	08:27 16:28	
6	05:26 21:58	06:06 21:20	06:56 20:15	19:20-19:38/18 19:06	07:45 17:02	08:28 16:28	
7	05:26 21:57	06:07 21:18	06:58 20:13	19:20-19:36/16 19:03	07:47 17:00	08:29 16:28	
8	05:27 21:57	06:09 21:16	06:59 20:10	19:21-19:35/14 19:01	07:48 16:59	08:31 16:27	
9	05:28 21:56	06:11 21:14	07:01 20:08	19:22-19:32/10 18:59	07:50 16:57	08:32 16:27	
10	05:29 21:55	06:12 21:12	07:02 20:06	19:22-19:32/10 18:56	07:52 16:55	08:33 16:27	
11	05:30 21:55	06:14 21:11	07:04 20:04	19:22-19:32/10 18:54	07:54 16:54	08:34 16:26	
12	05:31 21:54	06:15 21:09	07:06 20:01	19:22-19:32/10 18:52	07:55 16:52	08:35 16:26	
13	05:32 21:53	06:17 21:07	07:07 19:59	19:22-19:32/10 18:50	07:57 16:51	08:36 16:26	
14	05:34 21:52	06:19 21:05	07:09 19:57	19:22-19:32/10 18:48	07:59 16:49	08:37 16:26	
15	05:35 21:51	06:20 21:03	07:11 19:54	19:22-19:32/10 18:45	08:00 16:48	08:38 16:26	
16	05:36 21:50	06:22 21:01	07:12 19:52	19:22-19:32/10 18:43	08:02 16:46	08:39 16:27	
17	05:37 21:49	06:23 20:59	07:14 19:50	19:22-19:32/10 18:41	08:04 16:45	08:40 16:27	
18	05:38 21:48	06:25 20:57	07:15 19:47	19:22-19:32/10 18:39	08:06 16:44	08:40 16:27	
19	05:40 21:47	06:27 20:55	07:17 19:45	19:22-19:32/10 18:37	08:07 16:42	08:41 16:27	
20	05:41 21:46	06:28 20:52	07:19 19:43	19:22-19:32/10 18:35	08:09 16:41	08:42 16:28	
21	05:42 21:44	06:30 20:50	07:20 19:40	19:22-19:32/10 18:33	08:11 16:40	08:42 16:28	
22	05:44 21:43	06:32 20:48	07:22 19:38	19:22-19:32/10 18:31	08:13 16:39	08:43 16:28	
23	05:45 21:42	06:33 20:46	07:24 19:36	19:22-19:32/10 18:29	08:14 16:38	08:43 16:29	
24	05:46 21:40	06:35 20:44	07:25 19:33	19:22-19:32/10 18:26	08:16 16:37	08:44 16:30	
25	05:48 21:39	06:36 20:42	07:27 19:31	19:22-19:32/10 18:24	08:18 16:36	08:44 16:30	
26	05:49 21:38	06:38 20:40	07:28 19:29	19:22-19:32/10 18:22	08:14 16:35	08:44 16:31	
27	05:51 21:36	06:40 20:37	07:30 19:26	19:22-19:32/10 18:20	08:15 16:34	08:45 16:32	
28	05:52 21:35	06:41 20:35	07:32 19:24	19:22-19:32/10 18:19	08:17 16:33	08:45 16:32	
29	05:54 21:33	06:43 20:33	19:26-19:36/10 19:22	19:22-19:32/10 18:17	08:18 16:32	08:45 16:33	
30	05:55 21:32	06:45 20:31	19:25-19:38/13 19:19	19:22-19:32/10 18:15	08:20 16:31	08:45 16:34	
31	05:57 21:30	06:46 20:29	19:23-19:38/15 19:17	19:22-19:32/10 18:13	08:20 16:30	08:45 16:35	
Potential sun hours	502	454	381	331	266	244	5
Sum of minutes with flicker	0	38	150	0	770		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:33/3.5.584

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 1 WTG: 4 - T4
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 16:36	08:18 17:24	08:45-08:47/2 07:25 18:16	07:14 20:10	18:54-19:30/36 06:10 20:06-20:17/11	21:01 05:25 20:20-20:44/24
2	08:45 16:37	08:17 17:26	08:43-08:49/6 07:23 18:18	07:12 20:11	18:56-19:30/34 06:08 20:04-20:18/14	21:02 05:24 20:20-20:43/23
3	08:45 16:39	08:15 17:28	08:41-08:49/8 07:21 18:19	07:10 20:13	18:57-19:30/33 06:06 20:03-20:19/16	21:04 05:23 20:21-20:44/23
4	08:45 16:40	08:14 17:30	08:40-08:51/11 07:18 18:21	07:08 20:15	19:02-19:32/30 06:04 20:03-20:21/18	21:06 05:22 20:21-20:44/23
5	08:44 16:41	08:12 17:32	08:38-08:52/14 07:16 18:23	07:05 20:17	19:03-19:33/30 06:02 20:02-20:22/20	21:07 05:22 20:22-20:45/23
6	08:44 16:42	08:10 17:33	08:36-08:52/16 07:14 18:25	07:03 20:18	19:03-19:35/32 06:00 20:01-20:22/21	21:09 05:21 20:21-20:44/23
7	08:44 16:43	08:09 17:35	08:34-08:52/18 07:12 18:26	07:01 20:20	19:02-19:35/33 05:59 20:01-20:27/26	21:10 05:20 20:22-20:45/23
8	08:43 16:45	08:07 17:37	08:32-08:52/20 07:10 18:28	06:59 20:22	19:02-19:36/34 05:57 20:01-20:29/28	21:12 05:20 20:22-20:44/22
9	08:43 16:46	08:05 17:39	08:30-08:52/22 07:07 18:30	06:56 20:23	19:02-19:37/35 05:55 20:01-20:30/29	21:14 05:19 20:23-20:45/22
10	08:42 16:47	08:03 17:41	08:28-08:52/24 07:05 18:32	06:54 20:25	19:03-19:37/34 05:53 20:02-20:32/30	21:15 05:19 20:22-20:44/22
11	08:42 16:49	08:01 17:43	08:27-08:52/25 07:03 18:34	06:52 20:27	19:04-19:37/33 05:52 20:01-20:32/31	21:17 05:19 20:23-20:45/22
12	08:41 16:50	08:00 17:45	08:28-08:51/23 07:01 18:35	06:50 20:28	19:04-19:36/32 05:50 20:02-20:33/31	21:18 05:18 20:23-20:45/22
13	08:40 16:52	07:58 17:46	08:29-08:50/21 06:58 17:54-18:04/10	06:47 20:30	19:05-19:36/31 05:48 20:03-20:33/30	21:20 05:18 20:24-20:45/21
14	08:40 16:53	07:56 17:48	08:30-08:48/18 06:56 17:52-18:06/14	06:45 20:32	19:07-19:36/29 05:47 20:04-20:34/30	21:22 05:18 20:24-20:45/21
15	08:39 16:55	07:54 17:50	08:32-08:45/13 06:54 17:49-18:07/18	06:43 20:34	19:09-19:35/26 05:45 20:05-20:33/28	21:23 05:17 20:25-20:46/21
16	08:38 16:56	07:52 17:52	08:38-08:48/20 06:51 17:48-18:08/20	06:41 20:35	19:10-19:34/24 05:44 20:05-20:34/29	21:25 05:17 20:24-20:45/21
17	08:37 16:58	07:50 17:54	08:37-08:49/18 06:49 17:48-18:09/21	06:39 20:37	19:11-19:34/23 05:42 20:07-20:36/29	21:26 05:17 20:24-20:45/21
18	08:36 17:00	07:48 17:56	08:36-08:48/22 06:47 17:46-18:08/22	06:36 20:39	19:12-19:32/20 05:41 20:07-20:37/30	21:28 05:17 20:26-20:46/20
19	08:35 17:01	07:46 17:58	08:35-08:47/24 06:44 17:46-18:10/24	06:34 20:40	19:13-19:31/18 05:39 20:08-20:38/30	21:29 05:17 20:26-20:46/20
20	08:34 17:03	07:44 17:59	08:34-08:46/26 06:42 17:46-18:14/28	06:32 20:42	19:14-19:28/14 05:38 20:10-20:39/29	21:31 05:17 20:26-20:46/20
21	08:33 17:05	07:42 18:01	08:33-08:45/28 06:40 17:46-18:15/29	06:30 20:44	19:16-19:25/9 05:37 20:12-20:40/28	21:32 05:18 20:26-20:46/20
22	08:32 17:06	07:40 18:03	08:32-08:44/30 06:38 17:46-18:17/31	06:28 20:45	06:28 05:35 20:15-20:41/26	21:33 05:18 20:26-20:46/20
23	08:31 17:08	07:38 18:05	08:31-08:43/32 06:35 17:47-18:18/31	06:26 20:47	06:26 05:34 20:16-20:41/25	21:35 05:18 20:26-20:46/20
24	08:30 17:10	07:36 18:07	08:30-08:42/34 06:33 17:48-18:19/31	06:24 20:49	06:24 05:33 20:16-20:41/25	21:36 05:18 20:27-20:47/20
25	08:28 17:12	07:34 18:09	08:28-08:40/36 06:31 17:49-18:19/30	06:22 20:50	06:22 05:32 20:17-20:41/24	21:38 05:19 20:26-20:47/21
26	08:27 17:13	07:31 18:10	08:27-08:39/38 06:28 17:53-18:21/28	06:20 20:52	06:20 05:31 20:19-20:42/23	21:39 05:19 20:27-20:48/21
27	08:26 17:15	07:29 18:12	08:26-08:38/40 06:26 17:53-18:22/29	06:18 20:54	06:18 05:29 20:19-20:42/23	21:40 05:19 20:27-20:48/21
28	08:24 17:17	07:27 18:14	08:24-08:36/42 06:24 17:52-18:22/30	06:16 20:56	06:16 05:28 20:19-20:42/23	21:41 05:20 20:27-20:49/22
29	08:23 17:19		08:23-08:35/44 07:21 18:53-19:26/33	06:14 20:57	06:14 05:27 20:19-20:44/25	21:43 05:20 20:27-20:48/21
30	08:21 17:21		08:21-08:33/46 07:19 18:53-19:28/35	06:12 20:59	06:12 20:09-20:15/6	05:26 20:20-20:44/24
31	08:20 17:22		08:20-08:32/48 07:17 18:53-19:28/35			05:25 20:20-20:44/24
Potential sun hours	259	278	367	416	485	499
Sum of minutes with flicker	0	241	499	596	780	644

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 1 **WTG:** 4 - T4
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22 20:27-20:49/22 22:00	05:58 20:13-20:43/30 21:28	06:48 19:03-19:36/33 20:26	07:37 18:37-18:41/4 19:17	07:30 07:58-08:21/23 17:11	08:21 16:31
2	05:22 20:27-20:49/22 22:00	06:00 20:12-20:42/30 21:27	06:49 19:01-19:35/34 20:24	07:38 19:15	07:32 08:00-08:22/22 17:09	08:23 16:30
3	05:23 20:28-20:50/22 21:59	06:01 20:12-20:42/30 21:25	06:51 19:00-19:35/35 20:22	07:40 19:12	07:34 08:02-08:22/20 17:07	08:24 16:29
4	05:24 20:27-20:50/23 21:59	06:03 20:11-20:40/29 21:23	06:53 18:59-19:33/34 20:20	07:42 19:10	07:36 08:04-08:22/18 17:05	08:26 16:29
5	05:25 20:27-20:50/23 21:59	06:04 20:11-20:39/28 21:22	06:54 18:59-19:32/33 20:17	07:43 19:08	07:38 08:06-08:22/16 17:04	08:27 16:28
6	05:25 20:28-20:51/23 21:58	06:06 20:11-20:33/22 21:20	06:56 18:59-19:31/32 20:15	07:45 19:05	07:39 08:08-08:21/13 17:02	08:28 16:28
7	05:26 20:28-20:51/23 21:57	06:07 20:11-20:31/20 21:18	06:58 18:58-19:29/31 20:13	07:47 19:03	07:41 08:10-08:21/11 17:00	08:29 16:27
8	05:27 20:28-20:51/23 21:57	06:09 20:11-20:31/20 21:16	06:59 18:57-19:27/30 20:10	07:48 19:01	07:43 08:12-08:20/8 16:59	08:31 16:27
9	05:28 20:28-20:52/24 21:56	06:11 20:11-20:29/18 21:14	07:01 18:51-19:24/33 20:08	07:50 18:59	07:45 08:14-08:19/5 16:57	08:32 16:27
10	05:29 20:29-20:52/23 21:55	06:12 20:12-20:28/16 21:12	07:02 18:49-19:24/35 20:06	07:52 18:56	07:47 08:16-08:18/2 16:55	08:33 16:27
11	05:30 20:29-20:52/23 21:55	06:14 20:13-20:26/13 21:10	07:04 18:47-19:22/35 20:03	07:54 18:54	07:48 16:54	08:34 16:26
12	05:31 20:29-20:52/23 21:54	06:15 20:15-20:25/10 21:09	07:06 18:45-19:21/36 20:01	07:55 18:52	07:50 16:52	08:35 16:26
13	05:32 20:29-20:52/23 21:53	06:17 20:17-20:21/4 21:07	07:07 18:44-19:18/34 19:59	07:57 18:50	07:52 16:51	08:36 16:26
14	05:34 20:29-20:52/23 21:52	06:19 21:05	07:09 18:43-19:16/33 19:57	07:59 18:48	07:54 16:49	08:37 16:26
15	05:35 20:29-20:52/23 21:51	06:20 21:03	07:11 18:43-19:13/30 19:54	08:00 18:45	07:55 16:48	08:38 16:26
16	05:36 20:29-20:52/23 21:50	06:22 21:01	07:12 18:42-19:11/29 19:52	08:02 18:43	07:57 16:46	08:39 16:26
17	05:37 20:29-20:51/22 21:49	06:23 20:59	07:14 18:42-19:09/27 19:50	08:04 18:41	07:59 16:45	08:40 16:27
18	05:38 20:27-20:51/24 21:48	06:25 20:57	07:15 18:37-19:07/30 19:47	08:06 18:39	08:01 16:44	08:40 16:27
19	05:40 20:26-20:51/25 21:47	06:27 20:55	07:17 18:35-19:05/30 19:45	08:07 18:37	08:02 16:42	08:41 16:27
20	05:41 20:26-20:51/25 21:46	06:28 20:52	07:19 18:34-19:05/31 19:43	08:09 18:35	08:04 16:41	08:42 16:28
21	05:42 20:26-20:51/25 21:44	06:30 20:50	07:20 18:32-19:03/31 19:40	08:11 18:33	08:06 16:40	08:42 16:28
22	05:44 20:25-20:50/25 21:43	06:32 19:21-19:30/9 20:48	07:22 18:31-19:01/30 19:38	08:13 18:31	08:07 16:39	08:43 16:28
23	05:45 20:20-20:49/29 21:42	06:33 19:18-19:33/15 20:46	07:24 18:30-18:59/29 19:35	08:14 18:28	08:09 16:38	08:43 16:29
24	05:46 20:20-20:50/30 21:40	06:35 19:16-19:34/18 20:44	07:25 18:30-18:56/26 19:33	08:16 18:26	08:11 16:37	08:44 16:30
25	05:48 20:18-20:48/30 21:39	06:36 19:14-19:35/21 20:42	07:27 18:30-18:52/22 19:31	07:18 17:24	08:12 16:36	08:44 16:30
26	05:49 20:17-20:47/30 21:38	06:38 19:12-19:35/23 20:40	07:28 18:29-18:51/22 19:29	07:20 08:04-08:07/3 17:22	08:14 16:35	08:44 16:31
27	05:51 20:17-20:46/29 21:36	06:40 19:11-19:36/25 20:37	07:30 18:30-18:50/20 19:26	07:21 08:01-08:15/14 17:20	08:15 16:34	08:45 16:32
28	05:52 20:16-20:44/28 21:35	06:41 19:11-19:37/26 20:35	07:32 18:31-18:49/18 19:24	07:23 07:59-08:18/19 17:18	08:17 16:33	08:45 16:32
29	05:54 20:16-20:45/29 21:33	06:43 19:08-19:37/29 20:33	07:33 18:31-18:47/16 19:22	07:25 07:57-08:19/22 17:17	08:18 16:32	08:45 16:33
30	05:55 20:14-20:44/30 21:32	06:45 19:06-19:37/31 20:31	07:35 18:33-18:45/12 19:19	07:27 07:56-08:20/24 17:15	08:20 16:31	08:45 16:34
31	05:57 20:13-20:43/30 21:30	06:46 19:04-19:36/32 20:29		07:29 07:56-08:21/25 17:13		08:45 16:35
Potential sun hours	502	454	381	331	266	244
Sum of minutes with flicker	777	499	871	111	138	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 1 WTG: 5 - T5
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-June) and rows for days (1-31). Includes columns for sun rise, set, and shadow times.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), First time (hh:mm) with flicker, Last time (hh:mm) with flicker, Minutes with flicker.

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 1 **WTG: 5 - T5**
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22 20:15-20:58/43	05:58	06:48 18:26-19:21/55	07:37 17:55-18:26/31	07:30	08:21
	22:00 05:57-06:04/7	21:28	20:26	19:17	17:11	16:31
2	05:22 20:16-20:59/43	06:00	06:49 18:25-19:18/53	07:38 17:54-18:25/31	07:32	08:23
	22:00 05:59-06:03/4	21:27	20:24	19:15	17:09	16:30
3	05:23 20:16-20:59/43	06:01	06:51 18:25-19:17/52	07:40 17:54-18:24/30	07:34	08:24
	21:59	21:25	20:22	19:12	17:07	16:29
4	05:24 20:15-20:58/43	06:03	06:53 18:24-19:15/51	07:42 17:55-18:24/29	07:36	08:25
	21:59	21:23	20:20	19:10	17:05	16:29
5	05:25 20:15-20:58/43	06:04 19:06-19:17/11	06:54 18:24-19:13/49	07:43 17:55-18:24/29	07:38	08:27
	21:59	21:21	20:17	19:08	17:04	16:28
6	05:25 20:16-20:58/42	06:06 19:02-19:19/17	06:56 18:25-19:11/46	07:45 17:56-18:25/29	07:39	08:28
	21:58	21:20	20:15	19:05	17:02	16:28
7	05:26 20:16-20:58/42	06:07 19:01-19:22/21	06:58 18:20-19:08/48	07:47 17:58-18:25/27	07:41	08:29
	21:57	21:18	20:13	19:03	17:00	16:27
8	05:27 20:16-20:58/42	06:09 18:58-19:23/25	06:59 18:18-19:08/50	07:48 18:00-18:25/25	07:43	08:31
	21:57	21:16	20:10	19:01	16:59	16:27
9	05:28 20:16-20:58/42	06:11 18:56-19:24/28	07:01 18:15-19:06/51	07:50 18:02-18:23/21	07:45	08:32
	21:56	21:14	20:08	18:59	16:57	16:27
10	05:29 20:16-20:57/41	06:12 18:55-19:25/30	07:02 18:13-19:05/52	07:52 18:06-18:23/17	07:47	08:33
	21:55	21:12	20:06	18:56	16:55	16:27
11	05:30 20:16-20:56/40	06:14 18:53-19:26/33	07:04 18:11-19:03/52	07:54 18:07-18:22/15	07:48	08:34
	21:55	21:10	20:03	18:54	16:54	16:26
12	05:31 20:16-20:56/40	06:15 18:52-19:27/35	07:06 18:10-19:02/52	07:55 18:09-18:20/11	07:50	08:35
	21:54	21:09	20:01	18:52	16:52	16:26
13	05:32 20:16-20:54/38	06:17 18:52-19:28/36	07:07 18:08-18:59/51	07:57 18:11-18:16/5	07:52	08:36
	21:53	21:07	19:59	18:50	16:51	16:26
14	05:34 20:16-20:53/37	06:19 18:50-19:28/38	07:09 18:07-18:58/51	07:59	07:54	08:37
	21:52	21:05	19:56	18:48	16:49	16:26
15	05:35 20:17-20:47/30	06:20 18:49-19:29/40	07:10 18:07-18:57/50	08:00	07:55	08:38
	21:51	21:03	19:54	18:45	16:48	16:26
16	05:36 20:17-20:47/30	06:22 18:47-19:29/42	07:12 18:05-18:56/51	08:02	07:57	08:39
	21:50	21:01	19:52	18:43	16:46	16:26
17	05:37 20:17-20:46/29	06:23 18:47-19:30/43	07:14 18:05-18:55/50	08:04	07:59	08:40
	21:49	20:59	19:49	18:41	16:45	16:27
18	05:38 20:17-20:46/29	06:25 18:43-19:29/46	07:15 18:04-18:53/49	08:06	08:01	08:40
	21:48	20:57	19:47	18:39	16:44	16:27
19	05:40 20:17-20:45/28	06:27 18:41-19:30/49	07:17 18:04-18:52/48	08:07	08:02	08:41
	21:47	20:54	19:45	18:37	16:42	16:27
20	05:41 20:18-20:45/27	06:28 18:38-19:29/51	07:19 18:04-18:50/46	08:09	08:04	08:42
	21:45	20:52	19:42	18:35	16:41	16:28
21	05:42 20:18-20:43/25	06:30 18:37-19:29/52	07:20 18:03-18:47/44	08:11	08:06	08:42
	21:44	20:50	19:40	18:33	16:40	16:28
22	05:44 20:18-20:42/24	06:32 18:35-19:29/54	07:22 18:03-18:44/41	08:13	08:07	08:43
	21:43	20:48	19:38	18:31	16:39	16:28
23	05:45 20:19-20:41/22	06:33 18:33-19:29/56	07:24 18:00-18:40/40	08:14	08:09	08:43
	21:42	20:46	19:35	18:28	16:38	16:29
24	05:46 20:20-20:41/21	06:35 18:32-19:28/56	07:25 17:59-18:39/40	08:16	08:11	08:44
	21:40	20:44	19:33	18:26	16:37	16:30
25	05:48 20:20-20:40/20	06:36 18:31-19:28/57	07:27 17:58-18:39/41	08:18	08:12	08:44
	21:39	20:42	19:31	17:24	16:36	16:30
26	05:49 20:21-20:39/18	06:38 18:29-19:27/58	07:28 17:56-18:36/40	08:20	08:14	08:44
	21:38	20:40	19:28	17:22	16:35	16:31
27	05:51 20:23-20:38/15	06:40 18:29-19:26/57	07:30 17:56-18:35/39	08:21	08:15	08:45
	21:36	20:37	19:26	17:20	16:34	16:32
28	05:52 20:24-20:37/13	06:41 18:28-19:26/58	07:32 17:56-18:33/37	08:23	08:17	08:45
	21:35	20:35	19:24	17:18	16:33	16:32
29	05:54 20:27-20:35/8	06:43 18:27-19:24/57	07:33 17:54-18:30/36	08:25	08:18	08:45
	21:33	20:33	19:22	17:17	16:32	16:33
30	05:55	06:45 18:27-19:24/57	07:35 17:54-18:27/33	08:27	08:20	08:45
	21:32	20:31	19:19	17:15	16:31	16:34
31	05:57	06:46 18:26-19:22/56		08:29		08:45
	21:30	20:29		17:13		16:35
Potential sun hours	502	454	381	331	266	244
Sum of minutes with flicker	929	1163	1398	300	0	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:33/3.5.584

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 1 WTG: 6 - T6

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 10:08-10:18/10 16:36	08:18 17:24	07:25 18:16	07:14 20:10	06:10 19:56-20:17/21 21:01	05:25 21:46
2	08:45 10:09-10:17/8 16:37	08:17 17:26	07:23 07:46-07:47/1 18:18	07:12 20:11	06:08 19:55-20:16/21 21:02	05:24 21:47
3	08:45 10:11-10:17/6 16:39	08:15 17:28	07:21 07:44-07:50/6 18:19	07:10 20:13	06:06 19:55-20:16/21 21:04	05:23 21:48
4	08:45 10:14-10:15/1 16:40	08:14 17:30	07:18 07:42-07:51/9 18:21	07:08 20:15	06:04 19:55-20:17/22 21:06	05:22 21:49
5	08:45 16:41	08:12 17:32	07:16 07:40-07:53/13 18:23	07:05 20:17	06:02 19:55-20:16/21 21:07	05:22 21:50
6	08:44 16:42	08:10 17:33	07:14 07:37-07:52/15 18:25	07:03 20:18	06:00 19:55-20:16/21 21:09	05:21 21:51
7	08:44 16:43	08:09 17:35	07:12 07:35-07:53/18 18:26	07:01 20:20	05:59 19:56-20:16/20 21:10	05:20 21:52
8	08:43 16:45	08:07 17:37	07:10 07:33-07:53/20 18:28	06:58 20:22	05:57 19:56-20:15/19 21:12	05:20 21:53
9	08:43 16:46	08:05 17:39	07:07 07:31-07:53/22 18:30	06:56 20:23	05:55 19:57-20:14/17 21:14	05:19 21:54
10	08:42 16:47	08:03 17:41	07:05 07:29-07:52/23 18:32	06:54 20:25	05:53 19:58-20:13/15 21:15	05:19 21:55
11	08:42 16:49	08:01 17:43	07:03 07:29-07:52/23 18:34	06:52 20:27	05:52 19:59-20:11/12 21:17	05:18 21:56
12	08:41 16:50	08:00 17:45	07:01 07:30-07:51/21 18:35	06:50 20:28	05:50 20:01-20:10/9 21:19	05:18 21:56
13	08:40 16:52	07:58 17:46	06:58 07:31-07:49/18 18:37	06:47 20:30	05:48 21:20	05:18 21:57
14	08:40 16:53	07:56 17:48	06:56 07:33-07:47/14 18:39	06:45 19:53-19:56/3 20:32	05:47 21:22	05:18 21:58
15	08:39 16:55	07:54 17:50	06:54 07:35-07:44/9 18:41	06:43 19:49-20:00/11 20:34	05:45 21:23	05:17 21:58
16	08:38 16:56	07:52 17:52	06:51 18:42	06:41 19:47-20:02/15 20:35	05:44 21:25	05:17 21:59
17	08:37 16:58	07:50 17:54	06:49 18:44	06:39 19:45-20:03/18 20:37	05:42 21:26	05:17 21:59
18	08:36 17:00	07:48 17:56	06:47 18:46	06:36 19:44-20:04/20 20:39	05:41 21:28	05:17 22:00
19	08:35 17:01	07:46 17:58	06:44 18:47	06:34 19:43-20:05/22 20:40	05:39 21:29	05:17 22:00
20	08:34 17:03	07:44 17:59	06:42 18:49	06:32 19:42-20:04/22 20:42	05:38 21:31	05:17 22:00
21	08:33 17:05	07:42 18:01	06:40 18:51	06:30 19:41-20:04/23 20:44	05:37 21:32	05:18 22:00
22	08:32 17:06	07:40 18:03	06:38 18:53	06:28 19:41-20:04/23 20:45	05:35 21:34	05:18 22:01
23	08:31 17:08	07:38 18:05	06:35 18:54	06:26 19:41-20:04/23 20:47	05:34 21:35	05:18 22:01
24	08:30 17:10	07:36 18:07	06:33 18:56	06:24 19:41-20:03/22 20:49	05:33 21:36	05:18 22:01
25	08:28 17:12	07:34 18:09	06:31 18:58	06:22 20:05-20:08/3 20:50	05:32 21:38	05:19 22:01
26	08:27 17:13	07:31 18:10	06:28 18:59	06:20 19:42-20:12/30 20:52	05:31 21:39	05:19 22:01
27	08:26 17:15	07:29 18:12	06:26 19:01	06:18 19:43-20:14/31 20:54	05:29 21:40	05:19 22:01
28	08:24 17:17	07:27 18:14	06:24 19:03	06:16 19:44-20:15/31 20:56	05:28 21:42	05:20 22:01
29	08:23 17:19		07:21 20:05	06:14 19:45-20:16/31 20:57	05:27 21:43	05:20 22:01
30	08:21 17:21		07:19 20:06	06:12 19:47-20:16/29 20:59	05:26 21:44	05:21 22:00
31	08:20 17:22		07:17 20:08		05:25 21:45	
Potential sun hours	259	278	367	416	485	499
Sum of minutes with flicker	25	0	212	378	219	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 1 **WTG:** 6 - T6
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22 22:00	05:58 20:11-20:21/10 21:28	06:48 20:26	07:37 08:10-08:29/19 19:17	07:30 17:11	08:21 16:31
2	05:22 22:00	06:00 20:09-20:22/13 21:27	06:49 20:24	07:38 08:09-08:30/21 19:15	07:32 17:09	08:23 16:30
3	05:23 21:59	06:01 20:08-20:24/16 21:25	06:51 20:22	07:40 08:07-08:30/23 19:12	07:34 17:07	08:24 16:29
4	05:24 21:59	06:03 20:07-20:24/17 21:23	06:53 20:20	07:42 08:07-08:30/23 19:10	07:36 17:05	08:26 16:29
5	05:25 21:59	06:04 20:06-20:25/19 21:22	06:54 20:17	07:43 08:09-08:30/21 19:08	07:38 17:04	08:27 16:28
6	05:25 21:58	06:06 20:05-20:25/20 21:20	06:56 20:15	07:45 08:10-08:29/19 19:05	07:39 17:02	08:28 16:28
7	05:26 21:57	06:07 20:04-20:25/21 21:18	06:58 20:13	07:47 08:12-08:29/17 19:03	07:41 17:00	08:29 16:27
8	05:27 21:57	06:09 20:05-20:26/21 21:16	06:59 20:10	07:48 08:14-08:28/14 19:01	07:43 16:59	08:31 16:27
9	05:28 21:56	06:11 20:04-20:25/21 21:14	07:01 20:08	07:50 08:16-08:27/11 18:59	07:45 16:57	08:32 10:00-10:05/5 16:27
10	05:29 21:55	06:12 20:04-20:26/22 21:12	07:02 20:06	07:52 08:17-08:25/8 18:56	07:47 16:55	08:33 09:59-10:07/8 16:27
11	05:30 21:55	06:14 20:04-20:25/21 21:11	07:04 20:03	07:54 08:19-08:23/4 18:54	07:48 16:54	08:34 09:58-10:08/10 16:26
12	05:31 21:54	06:15 20:04-20:25/21 21:09	07:06 20:01	07:55 18:52	07:50 16:52	08:35 09:58-10:09/11 16:26
13	05:32 21:53	06:17 19:54-20:24/30 21:07	07:07 19:59	07:57 18:50	07:52 16:51	08:36 09:58-10:10/12 16:26
14	05:34 21:52	06:19 19:52-20:23/31 21:05	07:09 19:57	07:59 18:48	07:54 16:49	08:37 09:58-10:11/13 16:26
15	05:35 21:51	06:20 19:51-20:23/32 21:03	07:11 19:54	08:00 18:45	07:55 16:48	08:38 09:59-10:12/13 16:26
16	05:36 21:50	06:22 19:50-20:21/31 21:01	07:12 19:52	08:02 18:43	07:57 16:46	08:39 09:59-10:13/14 16:26
17	05:37 21:49	06:23 19:49-20:19/30 20:59	07:14 19:50	08:04 18:41	07:59 16:45	08:40 09:58-10:12/14 16:27
18	05:38 21:48	06:25 19:48-20:09/21 20:57	07:15 19:47	08:06 18:39	08:01 16:44	08:40 09:59-10:13/14 16:27
19	05:40 21:47	06:27 19:47-20:10/23 20:55	07:17 19:45	08:07 18:37	08:02 16:42	08:41 10:00-10:14/14 16:27
20	05:41 21:46	06:28 19:46-20:09/23 20:52	07:19 19:43	08:09 18:35	08:04 16:41	08:42 09:59-10:14/15 16:28
21	05:42 21:44	06:30 19:47-20:10/23 20:50	07:20 19:40	08:11 18:33	08:06 16:40	08:42 10:00-10:15/15 16:28
22	05:44 21:43	06:32 19:46-20:09/23 20:48	07:22 19:38	08:13 18:31	08:07 16:39	08:43 10:00-10:15/15 16:28
23	05:45 21:42	06:33 19:46-20:09/23 20:46	07:24 19:35	08:14 18:28	08:09 16:38	08:43 10:01-10:16/15 16:29
24	05:46 21:40	06:35 19:46-20:07/21 20:44	07:25 19:33	08:16 18:26	08:11 16:37	08:44 10:02-10:16/14 16:30
25	05:48 21:39	06:36 19:47-20:07/20 20:42	07:27 19:31	07:18 17:24	08:12 16:36	08:44 10:03-10:17/14 16:30
26	05:49 21:38	06:38 19:47-20:05/18 20:40	07:28 19:29	07:20 17:22	08:14 16:35	08:44 10:03-10:17/14 16:31
27	05:51 21:36	06:40 19:49-20:04/15 20:37	07:30 19:26	07:21 17:20	08:15 16:34	08:45 10:04-10:17/13 16:32
28	05:52 21:35	06:41 19:51-20:02/11 20:35	07:32 08:18-08:23/5 19:24	07:23 17:18	08:17 16:33	08:45 10:04-10:18/14 16:32
29	05:54 21:33	06:43 19:55-19:56/1 20:33	07:33 08:14-08:27/13 19:22	07:25 17:17	08:18 16:32	08:45 10:05-10:18/13 16:33
30	05:55 21:32	06:45 20:31	07:35 08:11-08:28/17 19:19	07:27 17:15	08:20 16:31	08:45 10:06-10:18/12 16:34
31	05:57 20:13-20:18/5 21:30	06:46 20:29		07:29 17:13		08:45 10:07-10:18/11 16:35
Potential sun hours	502	454	381	331	266	244
Sum of minutes with flicker	5	598	35	180	0	293

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:33/3.5.584

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 1 WTG: 7 - T7
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 10:14-10:57/43 14:29-14:46/17 16:36 11:06-11:10/4	08:18 09:23-09:42/19 17:24	07:25 18:16	07:14 08:22-08:36/14 20:10	06:10 21:01	05:25 21:46
2	08:45 10:13-10:56/43 16:37 14:29-14:45/16	08:17 09:23-09:41/18 17:26	07:23 18:18	07:12 20:11	06:08 21:02	05:24 21:47
3	08:45 10:14-10:56/42 16:39 14:31-14:45/14	08:15 09:24-09:40/16 17:28	07:21 18:19	07:10 20:13	06:06 21:04	05:23 21:49
4	08:45 10:15-10:42/27 14:32-14:45/13 16:40 10:44-10:56/12	08:14 09:26-09:40/14 17:30	07:18 18:21	07:08 20:15	06:04 21:06	05:22 21:50
5	08:45 10:15-10:39/24 14:33-14:45/12 16:41 10:45-10:55/10	08:12 09:28-09:38/10 17:32	07:16 18:23	07:05 20:17	06:02 21:07	05:22 21:51
6	08:44 10:16-10:38/22 14:35-14:44/9 16:42 10:47-10:55/8	08:10 17:33	07:14 18:25	07:03 20:18	06:00 21:09	05:21 21:51
7	08:44 10:16-10:38/22 14:37-14:43/6 16:43 10:49-10:52/3	08:09 17:35	07:12 18:27	07:01 20:20	05:59 21:11	05:20 21:52
8	08:43 10:17-10:39/22 16:45	08:07 17:37	07:10 18:28	06:59 20:22	05:57 21:12	05:20 21:53
9	08:43 10:18-10:39/21 16:46	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	05:19 21:54
10	08:42 10:18-10:38/20 16:47	08:03 17:41	07:05 18:32	06:54 20:25	05:53 21:15	05:19 21:55
11	08:42 10:20-10:39/19 16:49	08:01 17:43	07:03 18:34	06:52 20:27	05:52 21:17	05:18 21:56
12	08:41 10:21-10:39/18 16:50	08:00 17:45	07:01 07:32-07:34/2 18:35	06:50 20:28	05:50 21:19	05:18 21:56
13	08:40 10:21-10:38/17 16:52	07:58 17:46	06:58 07:25-07:39/14 18:37	06:47 20:30	05:48 21:20	05:18 21:57
14	08:40 10:23-10:38/15 16:53	07:56 17:48	06:56 07:23-07:44/21 18:39	06:45 20:32	05:47 21:22	05:18 21:58
15	08:39 10:24-10:37/13 16:55	07:54 17:50	06:54 07:21-07:46/25 18:41	06:43 20:34	05:45 21:23	05:17 21:58
16	08:38 10:26-10:36/10 16:56	07:52 17:52	06:51 07:19-07:47/28 18:42	06:41 20:35	05:44 21:25	05:17 21:59
17	08:37 10:28-10:34/6 16:58	07:50 17:54	06:49 07:18-07:48/30 18:44	06:39 20:37	05:42 21:26	05:17 21:59
18	08:36 09:25-09:33/8 17:00	07:48 17:56	06:47 07:18-07:49/31 18:46	06:36 20:39	05:41 21:28	05:17 22:00
19	08:35 09:24-09:35/11 17:01	07:46 17:58	06:44 07:16-07:49/33 18:47	06:34 20:40	05:39 21:29	05:17 22:00
20	08:34 09:22-09:36/14 17:03	07:44 17:59	06:42 07:16-07:50/34 18:49	06:32 20:42	05:38 21:31	05:17 22:00
21	08:33 09:22-09:37/15 17:05	07:42 18:01	06:40 07:16-07:50/34 18:51	06:30 20:44	05:37 21:32	05:18 22:01
22	08:32 09:22-09:39/17 17:06	07:40 18:03	06:38 07:15-07:49/34 18:53	06:28 20:45	05:35 21:34	05:18 22:01
23	08:31 09:22-09:40/18 17:08	07:38 18:05	06:35 07:15-07:49/34 18:54	06:26 20:47	05:34 21:35	05:18 22:01
24	08:30 09:21-09:40/19 17:10	07:36 18:07	06:33 07:16-07:49/33 18:56	06:24 20:49	05:33 21:36	05:18 22:01
25	08:28 09:21-09:41/20 17:12	07:34 18:09	06:31 07:15-07:48/33 18:58	06:22 20:51	05:32 21:38	05:19 22:01
26	08:27 09:20-09:41/21 17:13	07:31 18:10	06:28 07:16-07:47/31 18:59	06:20 20:52	05:31 21:39	05:19 22:01
27	08:26 09:21-09:42/21 17:15	07:29 18:12	06:26 07:16-07:47/31 19:01	06:18 20:54	05:29 21:40	05:19 22:01
28	08:24 09:21-09:42/21 17:17	07:27 18:14	06:24 07:16-07:45/29 19:03	06:16 20:56	05:28 21:42	05:20 22:01
29	08:23 09:21-09:43/22 17:19		07:21 08:17-08:44/27 20:05	06:14 20:57	05:27 21:43	05:20 22:01
30	08:21 09:21-09:42/21 17:21		07:19 08:19-08:42/23 20:06	06:12 20:59	05:26 21:44	05:21 22:00
31	08:20 09:22-09:42/20 17:22		07:17 08:20-08:40/20 20:08		05:25 21:45	
Potential sun hours	259	278	367	416	485	499
Sum of minutes with flicker	756	77	547	14	0	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:33/3.5.584

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 1 WTG: 7 - T7

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22 22:00	05:58 21:28	06:48 20:26	07:37 19:17	08:07-08:16/9 17:11	07:30 16:31
2	05:22 22:00	06:00 21:27	06:49 20:24	07:38 19:15	07:32 17:09	08:23 16:30
3	05:23 22:00	06:01 21:25	06:51 20:22	07:40 19:12	07:34 17:07	08:24 16:29
4	05:24 21:59	06:03 21:23	06:53 20:20	07:42 19:10	07:36 17:05	08:26 16:29
5	05:25 21:59	06:04 21:22	06:54 20:17	07:43 19:08	07:38 17:04	08:27 16:28
6	05:25 21:58	06:06 21:20	06:56 20:15	07:45 19:06	07:39 17:02	08:28 16:28
7	05:26 21:58	06:07 21:18	06:58 20:13	07:47 19:03	07:41 17:00	08:29 16:27
8	05:27 21:57	06:09 21:16	06:59 20:10	07:49 19:01	07:43 16:59	08:31 16:27
9	05:28 21:56	06:11 21:14	07:01 20:08	07:50 18:59	07:45 16:57	08:32 16:27
10	05:29 21:55	06:12 21:12	07:02 20:06	07:52 18:56	07:47 16:55	08:33 16:27
11	05:30 21:55	06:14 21:11	07:04 20:04	07:54 18:54	07:48 16:54	08:34 16:26
12	05:31 21:54	06:15 21:09	07:06 20:01	07:55 18:52	07:50 16:52	08:35 16:26
13	05:32 21:53	06:17 21:07	07:07 19:59	07:57 18:50	07:52 16:51	08:36 16:26
14	05:34 21:52	06:19 21:05	07:09 19:57	08:00 18:48	07:54 16:49	08:37 16:26
15	05:35 21:51	06:20 21:03	07:11 19:54	08:00 18:45	07:55 16:48	08:38 16:26
16	05:36 21:50	06:22 21:01	07:12 19:52	08:02 18:43	07:57 16:46	08:39 16:26
17	05:37 21:49	06:23 20:59	07:14 19:50	08:04 18:41	07:59 16:45	08:40 16:27
18	05:38 21:48	06:25 20:57	07:15 19:47	08:04 18:39	08:01 16:44	08:40 16:27
19	05:40 21:47	06:27 20:55	07:17 19:45	08:07 18:37	08:02 16:42	08:41 16:27
20	05:41 21:46	06:28 20:52	07:19 19:43	08:08 18:35	08:04 16:41	08:42 16:28
21	05:42 21:44	06:30 20:50	07:20 19:40	08:08 18:33	08:06 16:40	08:42 16:28
22	05:44 21:43	06:32 20:48	07:22 19:38	08:13 18:31	08:07 16:39	08:43 16:28
23	05:45 21:42	06:33 20:46	07:24 19:36	08:14 18:29	08:09 16:38	08:43 16:29
24	05:46 21:40	06:35 20:44	07:25 19:33	08:16 18:26	08:11 16:37	08:44 16:30
25	05:48 21:39	06:36 20:42	07:27 19:31	08:18 17:24	08:12 16:36	08:44 16:30
26	05:49 21:38	06:38 20:40	07:28 19:29	08:20 17:22	08:14 16:35	08:44 16:31
27	05:51 21:36	06:40 20:37	07:30 19:26	08:22 17:20	08:15 16:34	08:45 16:32
28	05:52 21:35	06:41 20:35	07:32 19:24	08:23 17:19	08:17 16:33	08:45 16:32
29	05:54 21:33	06:43 20:33	07:33 19:22	08:26 17:17	08:18 16:32	08:45 16:33
30	05:55 21:32	06:45 20:31	07:35 19:19	08:27 17:15	08:20 16:31	08:45 16:34
31	05:57 21:30	06:46 20:29		07:29 17:13		08:45 16:35
Potential sun hours	502	454	381	331	266	244
Sum of minutes with flicker	0	0	564	9	406	1948

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 1 **WTG:** 8 - T8
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 09:30-09:54/24 15:17-15:44/27 16:36 10:07-11:02/55	08:18 09:01-09:28/27 17:24	07:25 18:16	07:14 07:37-07:43/6 20:10	06:10 21:01	05:25 21:46
2	08:45 09:31-09:54/23 15:16-15:44/28 16:37 10:07-11:01/54	08:17 09:01-09:28/27 17:26	07:23 18:18	07:12 07:35-07:44/9 20:11	06:08 21:02	05:24 21:47
3	08:45 09:30-09:54/24 10:45-11:01/16 16:39 10:08-10:42/34 15:17-15:45/28	08:15 09:01-09:27/26 17:28	07:21 18:19	07:10 07:33-07:45/12 20:13	06:06 21:04	05:23 21:49
4	08:45 09:25-09:30/5 10:09-10:42/33 15:18-15:46/28 16:40 09:31-09:55/24 10:46-11:01/15	08:14 09:02-09:28/26 17:30	07:18 18:21	07:08 07:30-07:45/15 20:15	06:04 21:06	05:22 21:50
5	08:45 09:23-09:55/32 10:47-11:00/13 16:41 10:09-10:38/29 15:17-15:45/28	08:12 09:02-09:28/26 17:32	07:16 18:23	07:05 07:28-07:46/18 20:17	06:02 21:07	05:22 21:51
6	08:44 09:23-09:55/32 10:49-11:00/11 16:42 10:10-10:38/28 15:18-15:46/28	08:10 09:03-09:27/24 17:33	07:14 18:25	07:03 07:26-07:47/21 20:18	06:00 21:09	05:21 21:52
7	08:44 09:22-09:55/33 10:51-10:58/7 16:43 10:10-10:38/28 15:18-15:46/28	08:09 09:03-09:26/23 17:35	07:12 18:27	07:01 07:24-07:47/23 20:20	05:59 21:11	05:20 21:52
8	08:43 09:23-09:56/33 15:19-15:47/28 16:45 10:11-10:39/28	08:07 09:04-09:25/21 17:37	07:10 18:28	06:59 07:21-07:46/25 20:22	05:57 21:12	05:20 21:53
9	08:43 09:22-09:56/34 15:19-15:47/28 16:46 10:11-10:39/28	08:05 09:05-09:24/19 17:39	07:07 18:30	06:56 07:19-07:46/27 20:23	05:55 21:14	05:19 21:54
10	08:42 09:22-09:56/34 15:20-15:48/28 16:47 10:12-10:38/26	08:03 09:07-09:24/17 17:41	07:05 18:32	06:54 07:17-07:46/29 20:25	05:53 21:15	05:19 21:55
11	08:42 09:22-09:56/34 15:21-15:49/28 16:49 10:13-10:39/26	08:01 09:09-09:22/13 17:43	07:03 18:34	06:52 07:15-07:46/31 20:27	05:52 21:17	05:18 21:56
12	08:41 09:22-09:56/34 15:21-15:49/28 16:50 10:14-10:39/25	08:00 09:13-09:18/5 17:45	07:01 18:35	06:50 07:13-07:46/33 20:28	05:50 21:19	05:18 21:56
13	08:40 09:22-09:56/34 15:22-15:49/27 16:52 10:15-10:39/24	07:58 17:46	06:58 18:37	06:47 07:10-07:45/35 20:30	05:48 21:20	05:18 21:57
14	08:40 09:22-09:55/33 15:22-15:49/27 16:53 10:16-10:38/22	07:56 17:48	06:56 18:39	06:45 07:08-07:45/37 20:32	05:47 21:22	05:18 21:58
15	08:39 09:22-09:55/33 15:23-15:49/26 16:55 10:17-10:38/21	07:54 17:50	06:54 18:41	06:43 07:06-07:45/39 20:34	05:45 21:23	05:17 21:58
16	08:38 09:22-09:55/33 15:23-15:49/26 16:56 10:18-10:37/19	07:52 17:52	06:51 18:42	06:41 07:07-07:45/38 20:35	05:44 21:25	05:17 21:59
17	08:37 09:22-09:55/33 15:24-15:49/25 16:58 10:19-10:36/17	07:50 17:54	06:49 18:44	06:39 07:07-07:44/37 20:37	05:42 21:26	05:17 21:59
18	08:36 09:23-09:54/31 15:25-15:49/24 17:00 10:21-10:35/14	07:48 17:56	06:47 18:46	06:36 07:07-07:44/37 20:39	05:41 21:28	05:17 22:00
19	08:35 09:23-09:53/30 15:26-15:49/23 17:01 10:24-10:34/10	07:46 17:58	06:45 18:47	06:34 07:07-07:43/36 20:40	05:39 21:29	05:17 22:00
20	08:34 09:23-09:51/28 17:03 15:27-15:48/21	07:44 17:59	06:42 18:49	06:32 07:08-07:42/34 20:42	05:38 21:31	05:17 22:00
21	08:33 09:24-09:43/19 09:10-09:13/3 17:05 09:46-09:49/3 15:28-15:47/19	07:42 18:01	06:40 18:51	06:30 07:08-07:42/34 20:44	05:37 21:32	05:18 22:01
22	08:32 09:25-09:43/18 15:30-15:47/17 17:06 09:07-09:17/10	07:40 18:03	06:38 18:53	06:28 07:09-07:40/31 20:45	05:35 21:34	05:18 22:01
23	08:31 09:26-09:43/17 15:31-15:45/14 17:08 09:06-09:20/14	07:38 18:05	06:35 18:54	06:26 07:10-07:39/29 20:47	05:34 21:35	05:18 22:01
24	08:30 09:26-09:42/16 15:34-15:44/10 17:10 09:04-09:21/17	07:36 18:07	06:33 18:56	06:24 07:11-07:38/27 20:49	05:33 21:36	05:18 22:01
25	08:28 09:28-09:42/14 17:12 09:04-09:23/19	07:34 18:09	06:31 18:58	06:22 07:12-07:36/24 20:51	05:32 21:38	05:19 22:01
26	08:27 09:28-09:40/12 17:13 09:02-09:23/21	07:32 18:10	06:28 18:59	06:20 07:14-07:34/20 20:52	05:31 21:39	05:19 22:01
27	08:26 09:31-09:39/8 17:15 09:02-09:25/23	07:29 18:12	06:26 19:01	06:18 07:16-07:31/15 20:54	05:29 21:40	05:19 22:01
28	08:24 09:01-09:25/24 17:17	07:27 18:14	06:24 19:03	06:16 07:21-07:26/5 20:56	05:28 21:42	05:20 22:01
29	08:23 09:02-09:26/24 17:19			06:14 20:57	05:27 21:43	05:20 22:01
30	08:21 09:01-09:27/26 17:21			06:12 20:59	05:26 21:44	05:21 22:01
31	08:20 09:01-09:27/26 17:22			07:17 07:40-07:41/1 20:08	05:25 21:45	
Potential sun hours	259	278	367	416	727	485
Sum of minutes with flicker	2112	254	1			0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:33/3.5.584

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 1 WTG: 8 - T8
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Table with columns for months (July to December) and rows for each day (1-31). Each cell contains time ranges for sunrise and sunset, and minutes with flicker. Summary rows at the bottom show total potential sun hours and minutes with flicker for each month.

Table layout: For each day in each month the following matrix apply

Day in month Sun rise (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:33/3.5.584

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 1 WTG: 9 - T9
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 09:48-10:02/14 13:55-14:51/56 10:12-11:33/81 16:36 15:15-15:43/28 12:53-13:27/34 08:45 09:49-10:02/13 13:55-14:51/56 10:12-11:33/81 16:37 15:14-15:43/29 12:53-13:26/33	08:18 08:46-09:01/15 15:29-16:29/60 17:24 09:06-10:08/62 10:23-11:04/41 08:17 08:45-09:02/17 15:29-16:28/59 07:23 07:50-08:20/30 07:12 17:26 09:05-10:08/63 10:23-11:03/40 18:18 20:11	07:25 07:52-08:21/29 07:14 18:16 20:10 07:23 07:50-08:20/30 07:12 18:18 20:11	07:14 20:10 07:12 20:11 07:10 20:13 07:08 20:13	06:10 06:34-06:40/6 05:25 21:01 21:46 06:08 06:32-06:40/8 05:24 21:02 21:47 06:06 06:31-06:41/10 05:23 21:04 21:49 06:04 06:29-06:41/12 05:22 21:06 21:50 06:02 06:27-06:41/14 05:22 21:07 21:51 06:00 06:25-06:40/15 05:21 21:09 21:52 05:59 06:24-06:41/17 05:20 21:11 21:52 05:57 06:22-06:40/18 05:20 21:12 21:53 05:55 06:21-06:40/19 05:19 21:14 21:54 05:53 06:19-06:39/20 05:19 21:15 21:55 05:52 06:17-06:38/21 05:18 21:17 21:56 05:50 06:16-06:37/21 05:18 21:19 21:56 05:48 06:14-06:36/22 05:18 21:20 21:57 05:47 06:13-06:35/22 05:18 21:22 21:58 05:45 06:12-06:35/23 05:17 21:23 21:58 05:44 06:10-06:34/24 05:17 21:25 21:59 05:42 06:09-06:34/25 05:17 21:26 21:59 05:41 06:09-06:34/25 05:17 21:28 22:00 05:39 06:09-06:33/24 05:17 21:29 22:00 05:38 06:10-06:33/23 05:17 21:31 22:00 05:37 06:11-06:32/21 05:17 21:32 22:01 05:35 06:12-06:32/20 05:18 21:34 22:01 05:34 06:13-06:31/18 05:18 21:35 22:01 05:33 06:13-06:29/16 05:18 21:36 22:01 05:32 06:14-06:28/14 05:19 21:38 22:01 05:31 06:16-06:27/11 05:19 21:39 22:01 05:29 06:18-06:25/7 05:19 21:40 22:01 05:28 05:20 21:42 22:01 06:14 06:38-06:40/2 05:27 21:43 22:01 06:12 06:36-06:40/4 05:26 21:44 22:01 05:25 21:45 05:25	
Potential sun hours	259	278	367	416	485	499
Sum of minutes with flicker	6042	2623	542	6	476	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:33/3.5.584

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 1 WTG: 9 - T9
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (July-December) and rows for each day of the month, including sunrise/set times and flicker minutes.

Table layout: For each day in each month the following matrix apply

Day in month Sun rise (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:33/3.5.584

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 1 WTG: 10 - T10
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec. Values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns: N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum. Values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January to June) and rows for each day of the year (1-31). Includes potential sun hours and sum of minutes with flicker.

Table layout: For each day in each month the following matrix apply

Matrix with 2 rows: Day in month, Sun rise (hh:mm), Sun set (hh:mm); and 2 columns: First time (hh:mm) with flicker, Last time (hh:mm) with flicker/Minutes with flicker.



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:33/3.5.584

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 1 WTG: 10 - T10
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 12 rows of sunshine probability values.

Operational time

Table with 13 columns (N-Sum) and 2 rows of operational time values.

Main shadow calculation table with columns for months (July-December) and rows for each day of the year, including start/end times and minutes with flicker.

Table layout: For each day in each month the following matrix apply

Matrix with 2 rows and 3 columns: Day in month, Sun rise/set times, and First/Last time with flicker/Minutes with flicker.



SHADOW - Calendar per WTG

Calculation: Alternative Scenario 1 **WTG:** 11 - T11
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

	January	February	March	April	May	June
1	08:45 15:06-15:33/27 16:36	08:18 17:24 18:16		07:14 19:20-19:44/24 20:10	06:10 20:12-20:20/8 21:01	05:25 20:02-20:53/51 21:46
2	08:45 15:06-15:32/26 16:37	08:17 17:26 18:18		07:12 19:21-19:45/24 20:11	06:08 20:08-20:23/15 21:02	05:24 20:02-20:53/51 21:47
3	08:45 15:07-15:33/26 16:39	08:15 17:28 18:19		07:10 19:21-19:45/24 20:13	06:06 20:05-20:25/20 21:04	05:23 20:04-20:54/50 21:48
4	08:45 15:09-15:34/25 16:40	08:14 17:30 18:21		07:08 19:23-19:45/22 20:15	06:04 20:04-20:28/24 21:06	05:22 20:04-20:54/50 21:49 20:56-21:00/4
5	08:44 15:09-15:33/24 16:41	08:12 17:32 18:23		07:05 19:23-19:45/22 20:16	06:02 20:03-20:29/26 21:07	05:21 20:05-21:04/59 21:50
6	08:44 15:10-15:34/24 16:42	08:10 17:33 18:25		07:03 19:24-19:45/21 20:18	06:00 20:01-20:29/28 21:09	05:21 20:05-21:05/60 21:51
7	08:44 15:11-15:33/22 16:43	08:09 17:35 18:26		07:01 19:24-19:44/20 20:20	05:59 20:01-20:31/30 21:10	05:20 20:06-21:07/61 21:52
8	08:43 15:13-15:34/21 16:45	08:07 17:37 18:28		06:58 19:24-19:43/19 20:22	05:57 19:59-20:31/32 21:12	05:20 20:07-21:08/61 21:53
9	08:43 15:15-15:33/18 16:46	08:05 17:39 18:30		06:56 19:25-19:43/18 20:23	05:55 19:58-20:31/33 21:14	05:19 20:08-21:09/61 21:54
10	08:42 15:19-15:33/14 16:47	08:03 17:41 18:32		06:54 19:26-19:41/15 20:25	05:53 19:58-20:33/35 21:15	05:19 20:08-21:09/61 21:55
11	08:42 15:20-15:32/12 16:49	08:01 17:43 18:34		06:52 19:28-19:40/12 20:27	05:52 19:57-20:32/35 21:17	05:18 20:09-21:10/61 21:56
12	08:41 15:23-15:32/9 16:50	08:00 17:45 18:35		06:49 19:29-19:36/7 20:28	05:50 19:58-20:33/35 21:18	05:18 20:10-21:11/61 21:56
13	08:40 15:25-15:31/6 16:52	07:58 17:46 18:37		06:47 20:30 20:30	05:48 19:57-20:33/36 21:20	05:18 20:10-21:12/62 21:57
14	08:40 16:53 17:48	07:56 17:48 18:39		06:45 20:32 20:32	05:47 19:57-20:34/37 21:22	05:18 20:11-21:13/62 21:58
15	08:39 16:55 17:50	07:54 17:50 18:40		06:43 20:33 20:33	05:45 19:56-20:33/37 21:23	05:17 20:11-21:13/62 21:58
16	08:38 16:56 17:52	07:52 17:52 18:42		06:41 20:35 20:35	05:44 19:56-20:34/38 21:25	05:17 20:11-21:13/62 21:59
17	08:37 16:58 17:54	07:50 17:54 18:44		06:39 20:37 20:37	05:42 19:57-20:34/37 21:26	05:17 20:12-21:13/61 21:59
18	08:36 17:00 17:56	07:48 17:56 18:46		06:36 20:39 20:39	05:41 19:56-20:34/38 21:28	05:17 20:12-21:15/63 22:00
19	08:35 17:01 17:58	07:46 17:58 18:47		06:34 20:40 20:40	05:39 19:57-20:34/37 21:29	05:17 20:14-21:15/61 22:00
20	08:34 17:03 17:59	07:44 17:59 18:49		06:32 20:42 20:42	05:38 19:57-20:40/43 21:31	05:17 20:14-21:15/61 22:00
21	08:33 17:05 18:01	07:42 18:01 18:51		06:30 20:44 20:44	05:37 19:57-20:43/46 21:32	05:17 20:14-21:15/61 22:00
22	08:32 17:06 18:03	07:40 18:03 18:53		06:28 20:45 20:45	05:35 19:57-20:44/47 21:33	05:18 20:14-21:15/61 22:01
23	08:31 17:08 18:05	07:38 18:05 18:54		06:26 20:47 20:47	05:34 19:57-20:46/49 21:35	05:18 20:14-21:15/61 22:01
24	08:29 17:10 18:07	07:36 18:07 18:56		06:24 20:49 20:49	05:33 19:58-20:47/49 21:36	05:18 20:15-21:16/61 22:01
25	08:28 17:12 18:09	07:34 18:09 18:58	18:26-18:32/6	06:22 20:50 20:50	05:32 19:58-20:48/50 21:38	05:19 20:14-21:15/61 22:01
26	08:27 17:13 18:10	07:31 18:10 18:59	18:24-18:34/10	06:20 20:52 20:52	05:30 19:59-20:49/50 21:39	05:19 20:15-21:16/61 22:01
27	08:26 17:15 18:12	07:29 18:12 19:01	18:22-18:35/13	06:18 20:54 20:54	05:29 19:59-20:50/51 21:40	05:19 20:14-21:16/62 22:01
28	08:24 17:17 18:14	07:27 18:14 19:03	18:21-18:37/16	06:16 20:55 20:55	05:28 19:59-20:50/51 21:41	05:20 20:13-21:15/62 22:01
29	08:23 17:19 18:11	07:21 19:01 19:05	19:21-19:39/18	06:14 20:57 20:57	05:27 20:00-20:51/51 21:43	05:20 20:14-21:15/61 22:01
30	08:21 17:21 18:13	07:19 19:01 19:05	19:21-19:41/20	06:12 20:59 20:59	05:26 20:01-20:52/51 21:44	05:21 20:14-21:16/62 22:00
31	08:20 17:22 18:15	07:17 19:01 19:05	19:20-19:42/22		05:25 20:02-20:52/50 21:45	
Potential sun hours	259	278	367	416	485	499
Sum of minutes with flicker	254	0	105	228	1169	1798

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 1 **WTG:** 11 - T11
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22 20:13-21:15/62 22:00	05:58 20:08-20:44/36 21:28	06:48 19:27-19:39/12 20:26	07:37 19:17	07:30 17:11	08:21 15:03-15:14/11 16:31
2	05:22 20:13-21:15/62 22:00	06:00 20:08-20:43/35 21:27	06:49 19:24-19:39/15 20:24	07:38 19:15	07:32 17:09	08:23 15:02-15:16/14 16:30
3	05:23 20:13-21:15/62 21:59	06:01 20:09-20:43/34 21:25	06:51 19:23-19:41/18 20:22	07:40 19:12	07:34 17:07	08:24 14:58-15:16/18 16:29
4	05:24 20:12-21:13/61 21:59	06:03 20:09-20:42/33 21:23	06:53 19:21-19:40/19 20:20	07:42 19:10	07:36 17:05	08:26 14:57-15:18/21 16:29
5	05:25 20:12-21:13/61 21:59	06:04 20:10-20:41/31 21:21	06:54 19:21-19:41/20 20:17	07:43 19:08	07:38 17:04	08:27 14:56-15:18/22 16:28
6	05:25 20:12-21:12/60 21:58	06:06 20:10-20:40/30 21:20	06:56 19:19-19:40/21 20:15	07:45 19:05	07:39 17:02	08:28 14:57-15:20/23 16:28
7	05:26 20:12-21:11/59 21:57	06:07 20:11-20:38/27 21:18	06:58 19:18-19:40/22 20:13	07:47 19:03	07:41 17:00	08:29 14:56-15:20/24 16:27
8	05:27 20:11-21:09/58 21:57	06:09 20:12-20:38/26 21:16	06:59 19:18-19:40/22 20:10	07:48 19:01	07:43 16:59	08:31 14:56-15:21/25 16:27
9	05:28 20:11-21:01/50 21:56	06:11 20:13-20:36/23 21:14	07:01 19:15-19:39/24 20:08	07:50 18:59	07:45 16:57	08:32 14:55-15:21/26 16:27
10	05:29 20:11-21:01/50 21:55	06:12 20:15-20:34/19 21:12	07:02 19:14-19:38/24 20:06	07:52 18:56	07:47 16:55	08:33 14:56-15:22/26 16:27
11	05:30 20:10-21:01/51 21:55	06:14 20:17-20:31/14 21:10	07:04 19:12-19:36/24 20:03	07:54 18:54	07:48 16:54	08:34 14:56-15:23/27 16:26
12	05:31 20:10-21:01/51 21:54	06:15 20:22-20:26/4 21:09	07:06 19:12-19:34/22 20:01	07:55 18:52	07:50 16:52	08:35 14:56-15:23/27 16:26
13	05:32 20:10-21:01/51 21:53	06:17 21:07	07:07 19:11-19:31/20 19:59	07:57 18:50	07:52 16:51	08:36 14:57-15:24/27 16:26
14	05:34 20:09-21:00/51 21:52	06:19 21:05	07:09 19:11-19:30/19 19:56	07:59 18:48	07:54 16:49	08:37 14:57-15:24/27 16:26
15	05:35 20:09-21:00/51 21:51	06:20 21:03	07:10 19:11-19:28/17 19:54	08:00 18:45	07:55 16:48	08:38 14:57-15:25/28 16:26
16	05:36 20:09-20:59/50 21:50	06:22 21:01	07:12 19:11-19:25/14 19:52	08:02 18:43	07:57 16:46	08:39 14:58-15:26/28 16:26
17	05:37 20:08-20:59/51 21:49	06:23 20:59	07:14 19:12-19:23/11 19:49	08:04 18:41	07:59 16:45	08:40 14:57-15:25/28 16:27
18	05:38 20:08-20:58/50 21:48	06:25 20:57	07:15 19:13-19:20/7 19:47	08:06 18:39	08:01 16:44	08:40 14:58-15:26/28 16:27
19	05:40 20:07-20:57/50 21:47	06:27 20:54	07:17 19:17-19:18/1 19:45	08:07 18:37	08:02 16:42	08:41 14:59-15:27/28 16:27
20	05:41 20:08-20:57/49 21:46	06:28 20:52	07:19 19:42	08:09 18:35	08:04 16:41	08:42 14:59-15:27/28 16:28
21	05:42 20:08-20:56/48 21:44	06:30 20:50	07:20 19:40	08:11 18:33	08:06 16:40	08:42 15:00-15:28/28 16:28
22	05:44 20:07-20:54/47 21:43	06:32 20:48	07:22 19:38	08:13 18:31	08:07 16:39	08:43 15:00-15:28/28 16:28
23	05:45 20:07-20:52/45 21:42	06:33 20:46	07:23 19:35	08:14 18:28	08:09 16:38	08:43 15:01-15:29/28 16:29
24	05:46 20:07-20:45/38 21:40	06:35 20:44	07:25 19:33	08:16 18:26	08:11 16:37	08:44 15:01-15:29/28 16:29
25	05:48 20:07-20:44/37 21:39	06:36 20:42	07:27 19:31	08:18 17:24	08:12 16:36	08:44 15:01-15:29/28 16:30
26	05:49 20:07-20:44/37 21:38	06:38 20:40	07:28 19:28	08:20 17:22	08:14 16:35	08:44 15:02-15:30/28 16:31
27	05:51 20:07-20:45/38 21:36	06:40 20:37	07:30 19:26	08:21 17:20	08:15 16:34	08:45 15:03-15:31/28 16:32
28	05:52 20:07-20:44/37 21:35	06:41 20:35	07:32 19:24	08:23 17:18	08:17 16:33	08:45 15:03-15:31/28 16:32
29	05:54 20:07-20:44/37 21:33	06:43 20:33	07:33 19:22	08:25 17:17	08:18 16:32	08:45 15:04-15:31/27 16:33
30	05:55 20:07-20:44/37 21:32	06:45 20:31	07:35 19:19	08:27 17:15	08:20 16:31	08:45 15:04-15:32/28 16:34
31	05:57 20:07-20:43/36 21:30	06:46 19:29-19:36/7 20:29		08:29 17:13		08:45 15:05-15:32/27 16:35
Potential sun hours	502	454	381	331	266	244
Sum of minutes with flicker	1527	319	332	0	14	792

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:33/3.5.584

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 1 WTG: 12 - T12
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Table with columns for months (January to June) and rows for each day (1 to 31), showing sunrise and sunset times for each day.

Table layout: For each day in each month the following matrix apply

Day in month Sun rise (hh:mm) Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker



SHADOW - Calendar per WTG

Calculation: Alternative Scenario 1 WTG: 12 - T12
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (July-December) and rows for each day, including sunrise/set times and minutes with flicker.

Table layout: For each day in each month the following matrix apply

Matrix with 2 rows: Day in month, Sun rise/set times, and First/Last time with flicker/Minutes with flicker.

Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
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+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:33/3.5.584

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 1 WTG: 13 - T13
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Table with columns for months (January to June) and rows for days (1 to 31). Each cell contains a grid of sun rise and set times (hh:mm) and a final row for 'Potential sun hours' and 'Sum of minutes with flicker'.

Table layout: For each day in each month the following matrix apply

Day in month Sun rise (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker



Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

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Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:33/3.5.584

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 1 WTG: 13 - T13
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Table with columns for months (July to December) and rows for each day of the month, showing sun rise/set times and minutes with flicker.

Table layout: For each day in each month the following matrix apply

Day in month Sun rise (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker



SHADOW - Calendar per WTG

Calculation: Alternative Scenario 1 WTG: 14 - T14
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time
N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Table with columns for months (January to June) and rows for each day (1-31) showing sun rise/set times and minutes with flicker. Includes summary rows for Potential sun hours and Sum of minutes with flicker.

Table layout: For each day in each month the following matrix apply

Matrix with 2 rows: Day in month, Sun rise (hh:mm), Sun set (hh:mm); and 2 columns: First time (hh:mm) with flicker, Last time (hh:mm) with flicker/Minutes with flicker.

Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
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+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:33/3.5.584

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 1 WTG: 14 - T14
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec. Values range from 1.06 to 3.60.

Operational time

Table with 13 columns: N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum. Values range from 194 to 1,318.

Main shadow calculation table with columns for months (July to December) and rows for each day. Includes columns for sun rise, sun set, and minutes with flicker.

Table layout: For each day in each month the following matrix apply

Matrix with 2 rows and 3 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm); First time (hh:mm) with flicker, Last time (hh:mm) with flicker, Minutes with flicker.



SHADOW - Calendar per WTG

Calculation: Alternative Scenario 1 WTG: 15 - Derragh
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Table with columns for months (January to June) and rows for days (1 to 31). Each cell contains sun rise and set times (hh:mm) and minutes with flicker. Summary rows at the bottom show Potential sun hours and Sum of minutes with flicker for each month.

Table layout: For each day in each month the following matrix apply

Day in month Sun rise (hh:mm) Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Project:

6225Gortyrahill_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

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Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:33/3.5.584

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 1 WTG: 15 - Derragh
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December	
1	05:22 06:50-07:33/43	05:58 06:57-07:41/44	06:48 07:19-07:49/30	07:37 18:12-18:35/23	07:30 16:00-16:14/14	08:21 09:24-10:21/57	
2	05:22 06:51-07:34/43	06:00 06:58-07:41/43	06:49 07:20-07:49/29	07:38 18:12-18:33/21	07:32 15:59-16:15/16	08:23 09:26-10:22/56	
3	05:23 06:51-07:35/44	06:01 06:59-07:42/43	06:51 07:23-07:49/26	07:40 18:13-18:32/19	07:34 15:58-16:16/18	08:24 09:26-10:21/55	
4	05:24 06:51-07:35/44	06:03 07:00-07:42/42	06:53 07:30-07:50/20	07:42 18:14-18:30/16	07:36 15:57-16:17/20	08:25 09:28-10:21/53	
5	05:25 06:51-07:35/44	06:04 07:02-07:43/41	06:54 07:29-07:49/20	07:43 18:16-18:24/8	07:38 15:57-16:17/20	08:27 09:28-10:21/53	
6	05:26 06:51-07:35/44	06:06 07:03-07:43/40	06:56 07:29-07:49/20	07:45 08:49-09:10/21	07:39 15:55-16:18/23	08:28 09:30-10:21/51	
7	05:26 06:51-07:36/45	06:08 07:03-07:44/41	06:58 07:29-07:47/18	07:47	07:41 15:52-16:18/26	08:29 09:30-10:21/51	
8	05:27 06:51-07:36/45	06:09 07:02-07:44/42	06:59 07:30-07:47/17	07:48	07:43 15:51-16:18/27	08:31 09:31-10:21/50	
9	05:28 06:51-07:37/46	06:11 07:02-07:44/42	07:01 07:30-07:45/15	07:50	07:45 15:50-16:18/28	08:32 09:31-10:20/49	
10	05:29 06:52-07:37/45	06:12 07:01-07:44/43	07:02 07:32-07:43/11	07:52	07:47 15:50-16:17/27	08:33 09:33-10:21/48	
11	05:30 06:52-07:37/45	06:14 07:01-07:44/43	07:04 07:36-07:40/4	07:54	07:48 15:49-16:17/28	08:34 09:34-10:21/47	
12	05:31 06:52-07:38/46	06:15 07:00-07:43/43	07:06 08:21-09:54/93	07:55	07:50 15:48-16:15/27	08:35 09:35-10:21/46	
13	05:33 06:52-07:38/46	06:17 07:00-07:43/43	07:07 08:22-09:54/92	07:57	07:52 15:48-16:15/27	08:36 09:35-10:21/46	
14	05:34 06:52-07:38/46	06:19 07:00-07:43/43	07:09 08:21-09:53/92	07:59	07:54 15:48-16:14/26	08:37 09:36-10:21/45	
15	05:35 06:52-07:38/46	06:20 07:01-07:43/42	07:11 08:22-09:53/91	08:00	07:55 15:48-16:13/25	08:38 09:37-10:22/45	
16	05:36 06:52-07:38/46	06:22 07:01-07:41/40	07:12 08:21-09:51/90	08:02	07:57 15:49-16:11/22	08:39 09:37-10:21/44	
17	05:37 06:52-07:38/46	06:23 07:02-07:41/39	07:14 08:22-09:51/89	08:04	07:59 09:15-10:23/68	08:40 09:38-10:21/43	
18	05:38 06:52-07:38/46	06:25 07:03-07:40/37	07:15 08:23-09:50/87	08:06	08:01 09:16-10:23/67	08:40 09:39-10:22/43	
19	05:40 06:53-07:39/46	06:27 07:05-07:42/37	07:17 08:22-09:49/87	08:07	08:02 09:16-10:23/67	08:41 09:40-10:23/43	
20	05:41 06:53-07:39/46	06:28 07:06-07:42/36	07:19 08:23-09:48/85	08:09	08:04 09:17-10:23/66	08:42 09:40-10:22/42	
21	05:42 06:53-07:38/45	06:30 07:09-07:43/34	07:20 08:23-09:46/83	08:11	08:06 09:17-10:22/65	08:42 09:41-10:23/42	
22	05:44 06:52-07:38/46	06:32 07:09-07:43/34	07:22 18:25-18:32/7	08:13	08:07 09:18-10:23/65	08:43 09:41-10:23/42	
23	05:45 06:53-07:39/46	06:33 07:10-07:44/34	07:24 18:19-18:34/15	08:14	08:09 09:19-10:23/64	08:43 09:42-10:24/42	
24	05:46 06:53-07:38/45	06:35 07:11-07:44/33	07:25 18:17-18:36/19	08:16	08:11 09:19-10:23/64	08:44 09:42-10:25/43	
25	05:48 06:53-07:38/45	06:36 07:11-07:44/33	07:27 18:15-18:37/22	08:18	08:12 09:20-10:23/63	08:44 09:42-10:25/43	
26	05:49 06:54-07:38/44	06:38 07:13-07:44/31	07:28 18:14-18:36/22	08:20	08:14 09:20-10:22/62	08:44 09:43-10:26/43	
27	05:51 06:54-07:37/43	06:40 07:14-07:43/29	07:30 18:13-18:37/24	08:21	08:15 09:22-10:22/60	08:45 09:43-10:27/44	
28	05:52 06:55-07:36/41	06:41 07:15-07:43/28	07:32 18:13-18:37/24	08:23	08:17 09:23-10:22/59	08:45 09:43-10:27/44	
29	05:54 06:56-07:38/42	06:43 07:16-07:42/26	07:33 18:12-18:36/24	08:25	08:18 09:23-10:22/59	08:45 09:43-10:28/45	
30	05:55 06:56-07:38/42	06:45 07:18-07:46/28	07:35 18:12-18:36/24	08:27	08:20 09:24-10:22/58	08:45 09:43-10:29/46	
31	05:57 06:56-07:40/44	06:46 07:18-07:47/29		08:29	08:21 09:25-10:22/57	08:45 09:44-10:30/46	
	Potential sun hours	502	454	381	331	266	244
	Sum of minutes with flicker	1385	3033	2952	1130	2492	1447

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 1 **WTG: 16** - Derragh
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 15:25-15:59/34 16:36	08:18 08:45-09:19/34 17:24	07:25 17:09-17:43/34 18:16 07:49-08:00/11	07:14 07:37-07:48/11 20:10	06:10 21:00	05:25 06:02-06:31/29 21:46
2	08:45 15:26-16:00/34 16:38	08:17 08:43-09:19/36 17:26	07:23 17:08-17:44/36 18:18 07:46-08:01/15	07:12 07:35-07:48/13 20:11	06:08 21:02	05:24 06:03-06:32/29 21:47
3	08:45 15:27-16:01/34 16:39	08:15 08:41-09:19/38 17:28	07:21 17:08-17:45/37 18:19 07:44-08:03/19	07:10 07:33-07:49/16 20:13	06:06 06:36-06:46/10 21:04	05:23 06:02-06:32/30 21:48
4	08:45 15:28-16:02/34 16:40	08:14 08:39-09:19/40 17:30	07:18 17:07-17:46/39 18:21 07:42-08:04/22	07:08 07:30-07:48/18 20:15	06:04 06:33-06:47/14 21:05	05:22 06:02-06:32/30 21:49
5	08:44 15:28-16:02/34 16:41	08:12 08:38-09:20/42 17:32	07:16 17:06-17:45/39 18:23 07:40-08:06/26	07:05 07:28-07:48/20 20:16	06:02 06:31-06:48/17 21:07	05:22 06:03-06:32/29 21:50
6	08:44 15:29-16:03/34 16:42	08:10 08:37-09:20/43 17:33	07:14 17:07-17:45/38 18:25 07:37-08:06/29	07:03 07:26-07:48/22 20:18	06:00 06:31-06:50/19 21:09	05:21 06:03-06:32/29 21:51
7	08:44 15:29-16:03/34 16:43	08:08 08:37-09:20/43 17:35	07:12 17:07-17:45/38 18:26 07:35-08:07/32	07:01 07:24-07:47/23 20:20	05:59 06:30-06:50/20 21:10	05:20 06:03-06:33/30 21:52
8	08:43 15:30-16:03/33 16:45	08:07 08:37-09:20/43 17:37	07:10 17:08-17:45/37 18:28 07:33-08:08/35	06:59 07:21-07:45/24 20:22	05:57 06:29-06:51/22 21:12	05:20 06:03-06:32/29 21:53
9	08:43 15:31-16:04/33 16:46	08:05 08:37-09:20/43 17:39	07:07 17:07-17:43/36 18:30 07:30-08:07/37	06:56 07:19-07:45/26 20:23	05:55 06:29-06:52/23 21:14	05:19 06:03-06:33/30 21:54
10	08:42 15:32-16:04/32 16:48	08:03 08:37-09:19/42 17:41	07:05 17:09-17:43/34 18:32 07:28-08:08/40	06:54 07:17-07:45/28 20:25	05:53 06:28-06:52/24 21:15	05:19 06:04-06:33/29 21:55
11	08:42 15:33-16:05/32 16:49	08:01 08:37-09:19/42 17:43	07:03 17:10-17:41/31 18:34 07:26-08:08/42	06:52 07:15-07:45/30 20:27	05:52 06:27-06:51/24 21:17	05:19 06:04-06:33/29 21:56
12	08:41 15:35-16:06/31 16:50	08:00 08:38-09:19/41 17:45	07:00 17:11-17:39/28 18:35 07:23-08:08/45	06:50 07:13-07:45/32 20:28	05:50 06:27-06:52/25 21:18	05:18 06:04-06:33/29 21:56
13	08:40 15:36-16:06/30 16:52	07:58 08:38-09:18/40 17:46	06:58 17:14-17:35/21 18:37 07:21-08:08/47	06:47 07:11-07:44/33 20:30	05:48 06:27-06:51/24 21:20	05:18 06:04-06:34/30 21:57
14	08:40 15:38-16:06/28 16:53	07:56 08:39-09:17/38 17:48	06:56 17:23-17:25/2 18:39 07:20-08:08/48	06:45 07:10-07:43/33 20:32	05:47 06:27-06:52/25 21:22	05:18 06:05-06:34/29 21:57
15	08:39 15:41-16:06/25 16:55	07:54 08:40-09:16/36 17:50	06:54 07:20-08:08/48 18:41	06:43 07:10-07:42/32 20:33	05:45 06:28-06:52/24 21:23	05:18 06:05-06:34/29 21:58
16	08:38 15:43-16:07/24 16:57	07:52 08:41-09:15/34 17:52	06:51 07:20-08:07/47 18:42	06:41 07:10-07:41/31 20:35	05:44 06:28-06:51/23 21:25	05:17 06:06-06:34/28 21:59
17	08:37 15:43-16:07/24 16:58	07:50 08:42-09:14/32 17:54	06:49 07:20-08:07/47 18:44	06:39 07:10-07:41/31 20:37	05:42 06:12-06:20/8 21:26	05:17 06:06-06:35/29 21:59
18	08:36 15:44-16:07/23 17:00	07:48 08:43-09:13/30 17:56	06:47 07:20-08:06/46 18:46	06:36 07:09-07:41/32 20:39	05:41 06:10-06:23/13 21:28	05:17 06:06-06:35/29 21:59
19	08:35 15:44-16:06/22 17:01	07:46 08:45-09:11/26 17:58	06:44 07:20-08:05/45 18:47	06:34 07:09-07:40/31 20:40	05:39 06:07-06:23/16 21:29	05:17 06:06-06:35/29 22:00
20	08:34 15:45-16:06/21 17:03	07:44 08:47-09:09/22 17:59	06:42 07:20-08:04/44 18:49	06:32 07:09-07:40/31 20:42	05:38 06:06-06:25/19 21:31	05:17 06:06-06:35/29 22:00
21	08:33 15:47-16:06/19 17:05	07:42 08:50-09:06/16 18:01	06:40 07:21-08:03/42 18:51	06:30 07:09-07:40/31 20:44	05:37 06:06-06:26/20 21:32	05:18 06:06-06:35/29 22:00
22	08:32 15:48-16:06/18 17:06	07:40 09:00-09:08/8 18:03	06:38 07:21-08:01/40 18:53	06:28 07:09-07:39/30 20:45	05:35 06:05-06:27/22 21:33	05:18 06:06-06:35/29 22:01
23	08:31 15:49-16:04/15 17:08	07:38 08:58-09:09/11 18:05	06:35 07:22-08:00/38 18:54	06:26 07:10-07:38/28 20:47	05:34 06:04-06:28/24 21:35	05:18 06:07-06:36/29 22:01
24	08:29 15:51-16:03/12 17:10	07:36 17:26-17:31/5 18:07	06:33 07:23-07:59/36 18:56	06:24 07:10-07:38/28 20:49	05:33 06:03-06:28/25 21:36	05:18 06:07-06:36/29 22:01
25	08:28 15:53-16:01/8 17:12	07:34 17:16-17:34/18 18:09	06:31 07:24-07:56/32 18:58	06:22 07:11-07:36/25 20:50	05:32 06:03-06:28/25 21:38	05:19 06:07-06:36/29 22:01
26	08:27 08:54-09:13/19 17:13	07:31 17:13-17:36/23 18:10	06:28 07:26-07:54/28 18:59	06:20 07:11-07:35/24 20:52	05:31 06:02-06:29/27 21:39	05:19 06:08-06:36/28 22:01
27	08:26 08:53-09:15/22 17:15	07:29 17:12-17:39/27 18:12	06:26 07:28-07:52/24 19:01	06:18 07:12-07:34/22 20:54	05:29 06:02-06:29/27 21:40	05:19 06:07-06:36/29 22:01
28	08:24 08:51-09:15/24 17:17	07:27 17:11-17:42/31 18:14	06:24 07:30-07:48/18 19:03	06:16 07:14-07:32/18 20:55	05:28 06:03-06:31/28 21:41	05:20 06:08-06:37/29 22:01
29	08:23 08:49-09:16/27 17:19					
30	08:21 08:48-09:17/29 17:21					
31	08:20 08:46-09:17/31 17:22					
Potential sun hours	259	278	367	416	485	499
Sum of minutes with flicker	877	871	1451	745	796	873

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 1 WTG: 16 - Derragh
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time
N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Table with columns for months (July to December) and rows for days (1 to 31). Each cell contains a time range (e.g., 05:22 06:08-06:37/29) and a potential sun hour value. Summary rows at the bottom show total potential sun hours and minutes with flicker for each month.

Table layout: For each day in each month the following matrix apply

Matrix with 2 rows and 3 columns: Day in month, Sun rise (hh:mm) / Sun set (hh:mm), and First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker.

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:33/3.5.584

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 1 WTG: 17 - Derragh
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June	
1	08:45 16:36	08:18 16:04-16:34/30 17:24	07:25 18:16	07:14 20:10	07:53-08:11/18 21:00	06:10 21:00	06:54-07:11/17 21:46
2	08:45 16:38	08:17 16:04-16:42/38 17:26	07:23 18:18	07:12 20:11	07:55-08:10/15 21:02	06:08 21:02	06:55-07:09/14 21:47
3	08:45 16:39	08:15 16:03-16:45/42 17:28	07:21 18:19	07:10 20:13	07:57-08:07/10 21:04	06:06 21:04	06:58-07:07/9 21:48
4	08:45 16:40	08:14 16:02-16:48/46 17:30	07:18 18:21	07:08 20:15	07:08 21:05	06:04 21:05	06:58-07:07/9 21:49
5	08:44 16:41	08:12 16:02-16:51/49 17:32	07:16 18:23	07:05 20:16	07:05 21:07	06:02 21:07	06:58-07:07/9 21:50
6	08:44 16:42	08:10 16:02-16:53/51 17:33	07:14 18:25	07:03 20:18	07:03 21:09	06:00 21:09	06:58-07:07/9 21:51
7	08:44 16:43	08:08 16:02-16:54/52 17:35	07:12 18:26	07:01 20:20	07:01 21:10	05:59 21:10	06:58-07:07/9 21:52
8	08:43 16:45	08:07 16:02-16:55/53 17:37	07:09 18:28	06:58 20:22	06:58 21:12	05:57 21:12	06:58-07:07/9 21:53
9	08:43 16:46	08:05 16:02-16:56/54 17:39	07:07 18:30	06:56 20:23	06:56 21:14	05:55 21:14	06:58-07:07/9 21:54
10	08:42 16:48	08:03 16:02-16:57/55 17:41	07:05 18:32	06:54 20:25	06:54 21:15	05:53 21:15	06:58-07:07/9 21:55
11	08:42 16:49	08:01 16:02-16:57/55 17:43	07:03 18:34	06:52 20:27	07:16-07:25/9 21:17	05:52 21:17	06:58-07:07/9 21:55
12	08:41 16:50	07:59 16:02-16:57/55 17:45	07:00 18:35	06:50 20:28	07:13-07:27/14 21:18	05:50 21:18	06:58-07:07/9 21:56
13	08:40 16:52	07:58 16:03-16:57/54 17:46	06:58 18:37	06:47 20:30	07:11-07:27/16 21:20	05:48 21:20	06:58-07:07/9 21:57
14	08:40 16:53	07:56 16:03-16:57/54 17:48	06:56 18:39	06:45 20:32	07:10-07:28/18 21:22	05:47 21:22	06:58-07:07/9 21:57
15	08:39 16:55	07:54 16:04-16:57/53 17:50	06:54 18:40	06:43 20:33	07:09-07:28/19 21:23	05:45 21:23	06:58-07:07/9 21:58
16	08:38 16:56	07:52 16:05-16:57/52 17:52	06:51 18:42	06:41 20:35	07:09-07:29/20 21:25	05:44 21:25	06:58-07:07/9 21:59
17	08:37 16:58	07:50 16:07-16:57/50 17:54	06:49 18:44	06:39 20:37	07:02-07:29/27 21:26	05:42 21:26	06:58-07:07/9 21:59
18	08:36 17:00	07:48 16:09-16:56/47 17:56	06:47 18:46	06:36 20:39	07:00-07:28/28 21:28	05:41 21:28	06:58-07:07/9 21:59
19	08:35 17:01	07:46 16:12-16:55/43 17:58	06:44 18:47	06:34 20:40	06:58-07:28/30 21:29	05:39 21:29	06:58-07:07/9 22:00
20	08:34 17:03	07:44 16:35-16:54/19 17:59	06:42 18:49	06:32 20:42	06:56-07:27/31 21:31	05:38 21:31	06:58-07:07/9 22:00
21	08:33 17:05	07:42 16:36-16:52/16 18:01	06:40 18:51	06:30 20:44	06:54-07:26/32 21:32	05:37 21:32	06:58-07:07/9 22:00
22	08:32 17:06	07:40 16:39-16:50/11 18:03	06:38 18:53	06:28 20:45	06:53-07:25/32 21:33	05:35 21:33	06:58-07:07/9 22:01
23	08:31 17:08	07:38 18:05	06:35 18:54	06:26 20:47	06:53-07:23/30 21:35	05:34 21:35	06:58-07:07/9 22:01
24	08:29 17:10	07:36 18:07	06:33 18:56	06:24 20:49	06:52-07:20/28 21:36	05:33 21:36	06:58-07:07/9 22:01
25	08:28 17:12	07:34 18:09	06:31 18:58	06:22 20:50	06:52-07:16/24 21:38	05:32 21:38	06:58-07:07/9 22:01
26	08:27 17:13	07:31 18:10	06:28 18:59	06:20 20:52	06:52-07:15/23 21:39	05:31 21:39	06:58-07:07/9 22:01
27	08:26 17:15	16:11-16:19/8 18:12	06:26 19:01	06:18 20:54	06:52-07:15/23 21:40	05:29 21:40	06:58-07:07/9 22:01
28	08:24 17:17	16:09-16:22/13 18:14	06:24 19:03	06:16 20:55	06:52-07:14/22 21:41	05:28 21:41	06:58-07:07/9 22:01
29	08:23 17:19	16:07-16:24/17 18:15	06:21 19:05	06:14 20:57	06:53-07:13/20 21:43	05:27 21:43	06:58-07:07/9 22:01
30	08:21 17:21	16:06-16:29/23 18:16	06:19 19:07	06:12 20:59	06:53-07:12/19 21:44	05:26 21:44	06:58-07:07/9 22:01
31	08:20 17:22	16:05-16:32/27 18:17	06:17 19:08	06:11 21:00	06:52-07:11/18 21:45	05:25 21:45	06:58-07:07/9 22:00
Potential sun hours	259	278	367	416	485	499	0
Sum of minutes with flicker	88	1002	246	508	40		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:33/3.5.584

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 1 WTG: 17 - Derragh

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22 22:00	05:58 21:28	06:48 07:15-07:24/9 20:26	07:37 19:17	07:30 15:31-16:26/55 17:11	08:21 16:31
2	05:22 22:00	06:00 21:27	06:49 20:24	07:38 19:15	07:32 15:31-16:26/55 17:09	08:23 16:30
3	05:23 21:59	06:01 21:25	06:51 20:22	07:40 19:12	07:34 15:31-16:25/54 17:07	08:24 16:29
4	05:24 21:59	06:03 21:23	06:53 20:19	07:42 19:10	07:36 15:31-16:24/53 17:05	08:25 16:29
5	05:25 21:58	06:04 21:21	06:54 20:17	07:43 19:08	07:38 15:32-16:23/51 17:04	08:27 16:28
6	05:26 21:58	06:06 21:20	06:56 20:15	07:45 19:05	07:39 15:32-16:21/49 17:02	08:28 16:28
7	05:26 21:57	06:07 21:18	06:58 20:13	07:47 19:03	07:41 15:33-16:18/45 17:00	08:29 16:27
8	05:27 21:57	06:09 21:16	06:59 20:10	07:48 19:01	07:43 15:34-16:16/42 16:59	08:31 16:27
9	05:28 21:56	06:11 07:09-07:14/5 21:14	07:01 07:50-08:00/10 20:08	07:50 18:59	07:45 15:34-16:12/38 16:57	08:32 16:27
10	05:29 21:55	06:12 07:05-07:17/12 21:12	07:02 07:48-08:03/15 20:06	07:52 18:56	07:46 15:35-16:06/31 16:55	08:33 16:27
11	05:30 21:55	06:14 07:04-07:19/15 21:10	07:04 07:45-08:03/18 20:03	07:54 18:54	07:48 15:36-16:03/27 16:54	08:34 16:26
12	05:31 21:54	06:15 07:02-07:20/18 21:08	07:06 07:44-08:05/21 20:01	07:55 18:52	07:50 15:37-16:00/23 16:52	08:35 16:26
13	05:32 21:53	06:17 07:01-07:21/20 21:07	07:07 07:44-08:06/22 19:59	07:57 18:50	07:52 15:39-15:56/17 16:51	08:36 16:26
14	05:34 21:52	06:19 07:00-07:21/21 21:05	07:09 07:42-08:05/23 19:56	07:59 18:48	07:54 15:41-15:54/13 16:49	08:37 16:26
15	05:35 21:51	06:20 07:00-07:22/22 21:03	07:10 07:42-08:05/23 19:54	08:00 18:45	07:55 15:44-15:51/7 16:48	08:38 16:26
16	05:36 21:50	06:22 06:59-07:22/23 21:01	07:12 07:41-08:05/24 19:52	08:02 18:43	07:57 16:46	08:39 16:27
17	05:37 21:49	06:23 06:59-07:22/23 20:59	07:14 07:41-08:05/24 19:49	08:04 18:41	07:59 16:45	08:39 16:27
18	05:38 21:48	06:25 06:58-07:21/23 20:57	07:15 07:41-08:04/23 19:47	08:06 18:39	08:00 16:44	08:40 16:27
19	05:40 21:47	06:27 06:58-07:26/28 20:54	07:17 07:42-08:03/21 19:45	08:07 17:13-17:17/4 18:37	08:02 16:42	08:41 16:27
20	05:41 21:45	06:28 06:57-07:28/31 20:52	07:19 07:44-08:02/18 19:42	08:09 17:08-17:21/13 18:35	08:04 16:41	08:42 16:28
21	05:42 21:44	06:30 06:58-07:30/32 20:50	07:20 07:45-08:01/16 19:40	08:11 17:06-17:23/17 18:33 16:52-17:03/11	08:06 16:40	08:42 16:28
22	05:44 21:43	06:32 06:58-07:30/32 20:48	07:22 07:47-08:01/14 19:38	08:13 16:45-17:25/40 18:31	08:07 16:39	08:43 16:28
23	05:45 21:42	06:33 07:00-07:31/31 20:46	07:24 07:49-08:00/11 19:35	08:14 16:41-17:26/45 18:28	08:09 16:38	08:43 16:29
24	05:46 21:40	06:35 07:01-07:32/31 20:44	07:25 07:50-07:58/8 19:33	08:16 16:39-17:27/48 18:26	08:11 16:37	08:44 16:30
25	05:48 21:39	06:36 07:03-07:31/28 20:42	07:27 07:52-07:56/4 19:31	07:18 15:37-16:27/50 17:24	08:12 16:36	08:44 16:30
26	05:49 21:37	06:38 07:05-07:31/26 20:40	07:28 19:28	07:20 15:36-16:27/51 17:22	08:14 16:35	08:44 16:31
27	05:51 21:36	06:40 07:11-07:30/19 20:37	07:30 19:26	07:21 15:34-16:27/53 17:20	08:15 16:34	08:45 16:32
28	05:52 21:35	06:41 07:11-07:30/19 20:35	07:32 19:24	07:23 15:33-16:27/54 17:18	08:17 16:33	08:45 16:32
29	05:54 21:33	06:43 07:11-07:29/18 20:33	07:33 19:22	07:25 15:32-16:27/55 17:17	08:18 16:32	08:45 16:33
30	05:55 21:31	06:45 07:12-07:28/16 20:31	07:35 19:19	07:27 15:32-16:27/55 17:15	08:20 16:31	08:45 16:34
31	05:57 21:30	06:46 07:12-07:26/14 20:29		07:29 15:31-16:27/56 17:13		08:45 16:35
Potential sun hours	502	454	381	331	266	244
Sum of minutes with flicker	0	507	304	552	560	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 1 WTG: 18 - Derragh
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main data table with columns for months (January to June) and rows for days (1-31). Each cell contains time ranges and potential sun hours. Summary rows at the bottom show total potential sun hours and minutes with flicker for each month.

Table layout: For each day in each month the following matrix apply

Matrix with 2 rows and 3 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm); First time (hh:mm) with flicker, Last time (hh:mm) with flicker, Minutes with flicker



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:33/3.5.584

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 1 WTG: 19 - Derragh

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
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1	08:45 14:46-15:22/36 16:36 14:04-14:45/41	08:18 17:24 18:16 20:10	07:25 18:16 18:16 20:10	07:14 20:10 18:16 20:10	06:10 07:15-07:53/38 21:00 21:46	05:25 21:46 21:46 21:46
2	08:45 14:47-15:22/35 16:38 14:05-14:45/40	08:17 17:26 18:18 20:11	07:23 18:18 18:18 20:11	07:12 20:11 18:18 20:11	06:08 07:15-07:52/37 21:02 21:47	05:24 21:47 21:47 21:47
3	08:45 14:48-15:23/35 16:39 14:06-14:46/40	08:15 17:28 18:19 20:13	07:21 18:19 18:19 20:13	07:10 20:13 18:19 20:13	06:06 07:17-07:52/35 21:04 21:48	05:23 21:48 21:48 21:48
4	08:45 14:47-15:23/36 16:40 14:06-14:45/39	08:13 17:30 18:21 20:15	07:18 18:21 18:21 20:15	07:08 20:15 18:21 20:15	06:04 07:17-07:51/34 21:05 21:49	05:22 21:49 21:49 21:49
5	08:44 14:48-15:23/35 16:41 14:07-14:46/39	08:12 17:32 18:23 20:16	07:16 18:23 18:23 20:16	07:05 20:16 18:23 20:16	06:02 07:18-07:49/31 21:07 21:50	05:22 21:50 21:50 21:50
6	08:44 14:50-15:24/34 16:42 14:09-14:46/37	08:10 17:33 18:25 20:18	07:14 18:25 18:25 20:18	07:03 20:18 18:25 20:18	06:00 07:19-07:48/29 21:09 21:51	05:21 21:51 21:51 21:51
7	08:44 14:50-15:24/34 16:43 14:09-14:46/37	08:08 17:35 18:26 20:20	07:12 18:26 18:26 20:20	07:01 20:20 18:26 20:20	05:59 07:20-07:47/27 21:10 21:52	05:20 21:52 21:52 21:52
8	08:43 14:50-15:24/34 16:45 14:10-14:45/35	08:07 17:37 18:28 20:22	07:09 18:28 18:28 20:22	06:58 20:22 18:28 20:22	05:57 07:21-07:45/24 21:12 21:53	05:20 21:53 21:53 21:53
9	08:43 14:51-15:25/34 16:46 14:12-14:46/34	08:05 17:39 18:30 20:23	07:07 18:30 18:30 20:23	06:56 20:23 18:30 20:23	05:55 07:24-07:44/20 21:14 21:54	05:19 21:54 21:54 21:54
10	08:42 14:52-15:25/33 16:47 14:13-14:45/32	08:03 17:41 18:32 20:25	07:05 18:32 18:32 20:25	06:54 07:32-07:47/15 20:25 20:25	05:53 07:26-07:41/15 21:15 21:55	05:19 21:55 21:55 21:55
11	08:42 14:52-15:24/32 16:49 14:15-14:45/30	08:01 17:43 18:33 20:27	07:03 18:33 18:33 20:27	06:52 07:29-07:50/21 20:27 20:27	05:52 07:29-07:36/7 21:17 21:55	05:19 21:55 21:55 21:55
12	08:41 14:53-15:24/31 16:50 14:17-14:44/27	07:59 17:45 18:35 20:28	07:00 18:35 18:35 20:28	06:50 07:26-07:51/25 20:28 20:28	05:50 07:26-07:51/25 21:18 21:56	05:18 21:56 21:56 21:56
13	08:40 14:55-15:25/30 16:52 14:28-14:44/16	07:58 17:46 18:37 20:30	06:58 18:37 18:37 20:30	06:47 07:24-07:53/29 20:30 20:30	05:48 07:24-07:53/29 21:20 21:57	05:18 21:57 21:57 21:57
14	08:40 14:56-15:25/29 16:53 14:30-14:42/12	07:56 17:48 18:39 20:32	06:56 18:39 18:39 20:32	06:45 07:22-07:54/32 20:32 20:32	05:47 07:22-07:54/32 21:22 21:57	05:18 21:57 21:57 21:57
15	08:39 14:57-15:25/28 16:55 14:33-14:40/7	07:54 17:50 18:40 20:33	06:54 18:40 18:40 20:33	06:43 07:21-07:55/34 20:33 20:33	05:45 07:21-07:55/34 21:23 21:58	05:18 21:58 21:58 21:58
16	08:38 14:58-15:24/26 16:56 17:52	07:52 17:52 18:42 20:35	06:51 18:42 18:42 20:35	06:41 07:20-07:56/36 20:35 20:35	05:44 07:20-07:56/36 21:25 21:58	05:17 21:58 21:58 21:58
17	08:37 15:00-15:24/24 16:58 17:54	07:50 17:54 18:44 20:37	06:49 18:44 18:44 20:37	06:39 07:19-07:57/38 20:37 20:37	05:42 07:19-07:57/38 21:26 21:59	05:17 21:59 21:59 21:59
18	08:36 15:01-15:22/21 17:00 17:56	07:48 17:56 18:46 20:39	06:47 18:46 18:46 20:39	06:36 07:18-07:57/39 20:39 20:39	05:41 07:18-07:57/39 21:28 21:59	05:17 21:59 21:59 21:59
19	08:35 15:03-15:21/18 17:01 17:58	07:46 17:58 18:47 20:40	06:44 18:47 18:47 20:40	06:34 07:17-07:57/40 20:40 20:40	05:39 07:17-07:57/40 21:29 22:00	05:17 22:00 22:00 22:00
20	08:34 15:06-15:18/12 17:03 17:59	07:44 17:59 18:49 20:42	06:42 18:49 18:49 20:42	06:32 07:17-07:58/41 20:42 20:42	05:38 07:17-07:58/41 21:31 22:00	05:17 22:00 22:00 22:00
21	08:33 17:05 17:05 18:01	07:42 18:01 18:51 20:44	06:40 18:51 18:51 20:44	06:30 07:16-07:58/42 20:44 20:44	05:37 07:16-07:58/42 21:32 22:00	05:18 22:00 22:00 22:00
22	08:32 17:06 17:06 18:03	07:40 18:03 18:53 20:45	06:37 18:53 18:53 20:45	06:28 07:15-07:57/42 20:45 20:45	05:35 07:15-07:57/42 21:33 22:00	05:18 22:00 22:00 22:00
23	08:31 17:08 17:08 18:05	07:38 18:05 18:54 20:47	06:35 18:54 18:54 20:47	06:26 07:14-07:57/43 20:47 20:47	05:34 07:14-07:57/43 21:35 22:01	05:18 22:01 22:01 22:01
24	08:29 17:10 17:10 18:07	07:36 18:07 18:56 20:49	06:33 18:56 18:56 20:49	06:24 07:14-07:57/43 20:49 20:49	05:33 07:14-07:57/43 21:36 22:01	05:18 22:01 22:01 22:01
25	08:28 17:12 17:12 18:09	07:33 18:09 18:58 20:50	06:31 18:58 18:58 20:50	06:22 07:15-07:57/42 20:50 20:50	05:32 07:15-07:57/42 21:37 22:01	05:19 22:01 22:01 22:01
26	08:27 17:13 17:13 18:10	07:31 18:10 18:59 20:52	06:28 18:59 18:59 20:52	06:20 07:15-07:57/42 20:52 20:52	05:31 07:15-07:57/42 21:39 22:01	05:19 22:01 22:01 22:01
27	08:25 17:15 17:15 18:12	07:29 18:12 19:01 20:54	06:26 19:01 19:01 20:54	06:18 07:15-07:56/41 20:54 20:54	05:29 07:15-07:56/41 21:40 22:01	05:19 22:01 22:01 22:01
28	08:24 17:17 17:17 18:14	07:27 18:14 19:03 20:55	06:24 19:03 19:03 20:55	06:16 07:15-07:56/41 20:55 20:55	05:28 07:15-07:56/41 21:41 22:01	05:20 22:01 22:01 22:01
29	08:23 17:19 17:19 18:19	07:25 18:19 19:04 20:56	06:22 19:04 19:04 20:56	06:14 07:15-07:55/40 20:56 20:56	05:27 07:15-07:55/40 21:43 22:00	05:20 22:00 22:00 22:00
30	08:21 17:21 17:21 18:21	07:23 18:21 19:06 20:57	06:20 19:06 19:06 20:57	06:12 07:15-07:54/39 20:57 20:57	05:26 07:15-07:54/39 21:44 22:00	05:21 22:00 22:00 22:00
31	08:20 17:22 17:22 18:22	07:21 18:22 19:08 20:58	06:18 19:08 19:08 20:58	06:10 07:15-07:54/39 20:58 20:58	05:25 07:15-07:54/39 21:45 22:00	05:21 22:00 22:00 22:00
Potential sun hours	259	278	367	416	485	499
Sum of minutes with flicker	1063	0	0	765	297	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 1 **WTG:** 19 - Derragh
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22 22:00	05:58 21:28	06:48 20:26	07:28-07:49/21 07:37 19:17	07:30 17:11	08:21 16:31
2	05:22 22:00	06:00 21:27	07:37-07:49/12 20:24	06:49 07:30-07:45/15 07:38 19:15	07:32 17:09	08:23 16:30
3	05:23 21:59	06:01 21:25	07:35-07:52/17 20:22	06:51 19:12	07:34 17:07	08:24 16:29
4	05:24 21:59	06:03 21:23	07:33-07:54/21 20:19	06:53 20:19	07:36 17:05	08:25 16:29
5	05:25 21:58	06:04 21:21	07:31-07:56/25 20:17	06:54 20:17	07:38 17:04	08:27 16:28
6	05:26 21:58	06:06 21:20	07:29-07:57/28 20:15	06:56 20:15	07:39 17:02	08:28 16:28
7	05:26 21:57	06:07 21:18	07:29-07:59/30 20:13	06:58 20:13	07:41 17:00	08:29 16:27
8	05:27 21:57	06:09 21:16	07:27-07:59/32 20:10	06:59 20:10	07:43 16:59	08:30 16:27
9	05:28 21:56	06:11 21:14	07:27-08:01/34 20:08	07:01 20:08	07:45 16:57	08:32 16:27
10	05:29 21:55	06:12 21:12	07:25-08:01/36 20:06	07:02 20:06	07:46 16:55	08:33 16:27
11	05:30 21:54	06:14 21:10	07:25-08:02/37 20:03	07:04 20:03	07:48 16:54	08:34 16:26
12	05:31 21:54	06:15 21:08	07:24-08:02/38 20:01	07:06 20:01	07:50 16:52	08:35 16:26
13	05:32 21:53	06:17 21:07	07:23-08:03/40 19:59	07:07 19:59	07:52 16:51	08:36 16:26
14	05:34 21:52	06:19 21:05	07:22-08:03/41 19:56	07:09 19:56	07:54 16:49	08:37 16:26
15	05:35 21:51	06:20 21:03	07:22-08:03/41 19:54	07:10 19:54	07:55 16:48	08:38 16:26
16	05:36 21:50	06:22 21:01	07:21-08:03/42 19:52	07:12 19:52	07:57 16:46	08:39 16:27
17	05:37 21:49	06:23 20:59	07:21-08:04/43 19:49	07:14 19:49	07:59 16:45	08:39 16:27
18	05:38 21:48	06:25 20:56	07:20-08:03/43 19:47	07:15 19:47	08:00 16:44	08:40 16:27
19	05:40 21:47	06:27 20:54	07:21-08:03/42 19:45	07:17 19:45	08:02 16:42	08:41 16:27
20	05:41 21:45	06:28 20:52	07:20-08:02/42 19:42	07:19 19:42	08:04 16:41	08:42 16:28
21	05:42 21:44	06:30 20:50	07:20-08:03/43 19:40	07:20 19:40	08:06 16:40	08:42 16:28
22	05:44 21:43	06:32 20:48	07:20-08:02/42 19:38	07:22 19:38	08:13 16:39	08:43 16:28
23	05:45 21:42	06:33 20:46	07:20-08:01/41 19:35	07:23 19:35	08:14 16:38	08:43 16:29
24	05:46 21:40	06:35 20:44	07:20-08:00/40 19:33	07:25 19:33	08:16 16:37	08:44 16:30
25	05:48 21:39	06:36 20:42	07:21-08:00/39 19:31	07:27 19:31	08:18 16:36	08:44 16:30
26	05:49 21:37	06:38 20:40	07:22-07:59/37 19:28	07:28 19:28	08:14 16:35	08:44 16:31
27	05:51 21:36	06:40 20:37	07:22-07:58/36 19:26	07:30 19:26	08:15 16:34	08:45 16:32
28	05:52 21:34	06:41 20:35	07:23-07:57/34 19:24	07:32 19:24	08:17 16:33	08:45 16:32
29	05:54 21:33	06:43 20:33	07:23-07:55/32 19:21	07:33 19:21	08:18 16:32	08:45 16:33
30	05:55 21:31	06:45 20:31	07:25-07:54/29 19:19	07:35 19:19	08:20 16:31	08:45 16:34
31	05:57 21:30	06:46 20:28	07:26-07:51/25 19:19	07:35 19:19	08:20 16:31	08:45 16:34
Potential sun hours	502	454	381	331	266	244
Sum of minutes with flicker	0	1042	36	0	279	2347

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:33/3.5.584

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 1 WTG: 20 - Derragh
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June	July	August	September	October	November	December	
1	08:45	08:18	07:25	07:14	06:10	05:25	05:22	05:58	06:48	07:37	08:02-08:10/8	07:30	08:21
	16:36	17:24	18:16	20:10	21:00	21:46	22:00	21:28	20:26	19:17		17:11	16:31
2	08:45	08:17	07:23	07:12	06:08	05:24	05:22	06:00	06:49	07:38	08:03-08:06/3	07:32	08:23
	16:38	17:26	18:18	20:11	21:02	21:47	22:00	21:27	20:24	19:15		17:09	16:30
3	08:45	08:15	07:21	07:10	06:06	05:23	05:23	06:01	06:51	07:40		07:34	08:24
	16:39	17:28	18:19	20:13	21:04	21:48	21:59	21:25	20:22	19:12		17:07	16:29
4	08:45	08:13	07:18	07:08	06:04	05:22	05:24	06:03	06:53	07:42		07:36	08:25
	16:40	17:30	18:21	20:15	21:05	21:49	21:59	21:23	20:19	19:10		17:05	16:29
5	08:44	08:12	07:16	07:05	06:02	05:22	05:25	06:04	06:54	07:43		07:37	08:27
	16:41	17:32	18:23	20:16	21:07	21:50	21:58	21:21	20:17	19:08		17:04	16:28
6	08:44	08:10	07:14	07:03	06:00	05:21	05:26	06:06	06:56	07:45		07:39	08:28
	16:42	17:33	18:25	20:18	21:09	21:51	21:58	21:20	20:15	19:05		17:02	16:28
7	08:44	08:08	07:12	07:01	05:59	05:20	05:26	06:07	06:57	07:47		07:41	08:29
	16:43	17:35	18:26	20:20	21:10	21:52	21:57	21:18	20:13	19:03		17:00	16:27
8	08:43	08:07	07:09	06:58	05:57	05:20	05:27	06:09	06:59	07:48		07:43	08:30
	16:45	17:37	18:28	20:22	21:12	21:53	21:57	21:16	20:10	19:01		16:59	16:27
9	08:43	08:05	07:07	06:56	05:55	05:19	05:28	06:11	07:01	07:50		07:45	08:32
	16:46	17:39	18:30	20:23	21:14	21:54	21:56	21:14	20:08	18:59		16:57	16:27
10	08:42	08:03	07:05	06:54	05:53	05:19	05:29	06:12	07:02	07:52		07:46	08:33
	16:47	17:41	18:32	20:25	21:15	21:55	21:55	21:12	20:06	18:56		16:55	16:27
11	08:42	08:01	07:03	06:52	05:52	05:19	05:30	06:14	07:04	07:53		07:48	08:34
	16:49	17:43	18:33	20:27	21:17	21:55	21:54	21:10	20:03	18:54		16:54	16:26
12	08:41	07:59	07:00	06:49	05:50	06:49	05:31	06:15	07:06	07:55		07:50	08:35
	16:50	17:45	18:35	20:28	21:18	21:56	21:54	21:08	20:01	18:52		16:52	16:26
13	08:40	07:58	06:58	06:47	05:48	05:18	05:32	06:17	07:07	07:57	08:03-08:15/12	07:52	08:36
	16:52	17:46	18:37	20:30	21:20	21:57	21:53	21:06	19:59	18:50		16:51	16:26
14	08:39	07:56	06:56	06:45	05:47	05:18	05:34	06:19	07:09	07:59	07:59-08:16/17	07:59	08:37
	16:53	17:48	18:39	20:32	21:21	21:57	21:52	21:05	19:56	18:48		16:49	16:26
15	08:39	07:54	06:54	06:43	05:45	05:18	05:35	06:20	07:10	07:57	07:57-08:18/21	08:00	08:38
	16:55	17:50	18:40	20:33	21:23	21:58	21:51	21:03	19:54	18:45		16:48	16:26
16	08:38	07:52	06:51	06:41	05:44	05:17	05:36	06:22	07:12	07:55	07:55-08:19/24	08:02	08:39
	16:56	17:52	18:42	20:35	21:25	21:58	21:50	21:01	19:52	18:43		16:46	16:27
17	08:37	07:50	06:49	06:39	05:42	05:17	05:37	06:23	07:14	07:54	07:54-08:20/26	08:04	08:39
	16:58	17:54	18:44	20:37	21:26	21:59	21:49	20:58	19:49	18:41		16:45	16:27
18	08:36	07:48	06:47	06:36	05:41	05:17	05:38	06:25	07:15	07:52	07:52-08:20/28	08:06	08:40
	17:00	17:56	18:46	20:38	21:28	21:59	21:48	20:56	19:47	18:39		16:44	16:27
19	08:35	07:46	06:44	06:34	05:39	05:17	05:40	06:27	07:17	07:51	07:51-08:21/30	08:07	08:41
	17:01	17:58	18:47	20:40	21:29	22:00	21:47	20:54	19:45	18:37		16:42	16:27
20	08:34	07:44	06:42	06:32	05:38	05:17	05:41	06:28	07:19	07:51	07:51-08:21/30	08:09	08:41
	17:03	17:59	18:49	20:42	21:30	22:00	21:45	20:52	19:42	18:35		16:41	16:28
21	08:33	07:42	06:40	06:30	05:37	05:18	05:42	06:30	07:20	07:49	07:49-08:21/32	08:11	08:42
	17:05	18:01	18:51	20:44	21:32	22:00	21:44	20:50	19:40	18:33		16:40	16:28
22	08:32	07:40	06:37	06:28	05:35	05:18	05:44	06:32	07:22	07:49	07:49-08:21/32	08:13	08:43
	17:06	18:03	18:53	20:45	21:33	22:00	21:43	20:48	19:38	18:31		16:39	16:28
23	08:31	07:38	06:35	06:26	05:34	05:18	05:45	06:33	07:23	07:49	07:49-08:21/32	08:14	08:43
	17:08	18:05	18:54	20:47	21:35	22:01	21:42	20:46	19:35	18:28		16:38	16:29
24	08:29	07:36	06:33	06:24	05:33	05:18	05:46	06:35	07:25	07:50	07:50-08:20/30	08:16	08:44
	17:10	18:07	18:56	20:49	21:36	22:01	21:40	20:44	19:33	18:26		16:37	16:30
25	08:28	07:33	06:31	06:22	05:32	05:19	05:48	06:36	07:27	07:52	07:52-08:19/27	07:18	08:44
	17:12	18:08	18:58	20:50	21:37	22:01	21:39	20:42	19:31	18:24		16:36	16:30
26	08:27	07:31	06:28	06:20	05:31	05:19	05:49	06:38	07:28	07:53	07:53-08:18/25	07:20	08:44
	17:13	18:10	18:59	20:52	21:39	22:01	21:37	20:39	19:28	18:22		16:35	16:31
27	08:25	07:29	06:26	06:18	05:29	05:19	05:51	06:40	07:30	07:55	07:55-08:17/22	07:21	08:45
	17:15	18:12	19:01	20:54	21:40	22:01	21:36	20:37	19:26	18:20		16:34	16:32
28	08:24	07:27	06:24	06:16	05:28	05:20	05:52	06:41	07:32	07:57	07:57-08:16/19	07:23	08:45
	17:17	18:14	19:03	20:55	21:41	22:01	21:34	20:35	19:24	18:18		16:33	16:32
29	08:23	07:21	06:18	06:14	05:27	05:20	05:54	06:43	07:33	07:58	07:58-08:14/16	07:25	08:45
	17:19	18:16	19:04	20:57	21:43	22:00	21:33	20:33	19:21	18:15		16:32	16:33
30	08:21	07:19	06:16	06:12	05:26	05:21	05:55	06:45	07:35	08:00	08:00-08:12/12	07:27	08:45
	17:21	18:18	19:06	20:59	21:44	22:00	21:31	20:31	19:19	18:13		16:31	16:34
31	08:20	07:17	06:14	06:10	05:25	05:20	05:57	06:46	07:36	08:01		07:29	08:45
	17:22	18:19	19:08	20:58	21:45	22:00	21:30	20:28	19:16	18:10		17:13	16:35
Potential sun hours	259	278	367	416	485	499	502	454	381	331		266	244
Sum of minutes with flicker	0	0	438	0	0	0	0	0	435	11		0	0

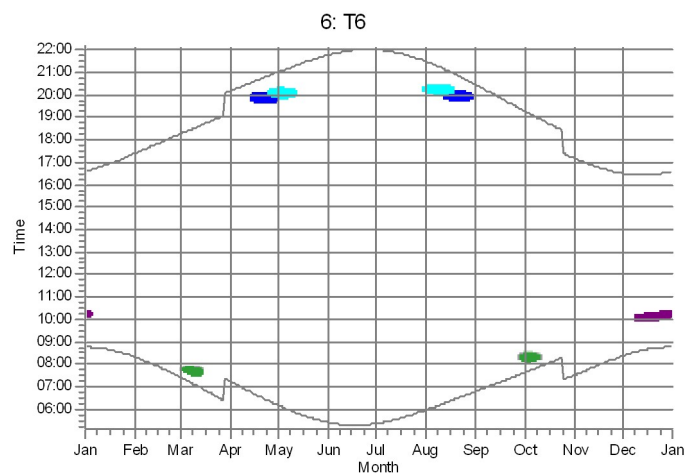
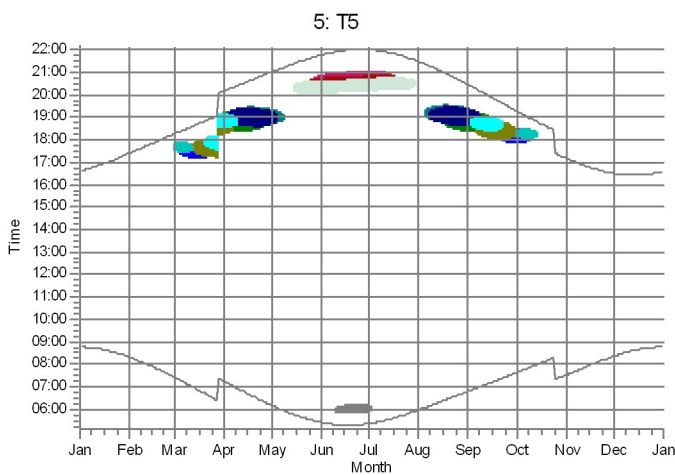
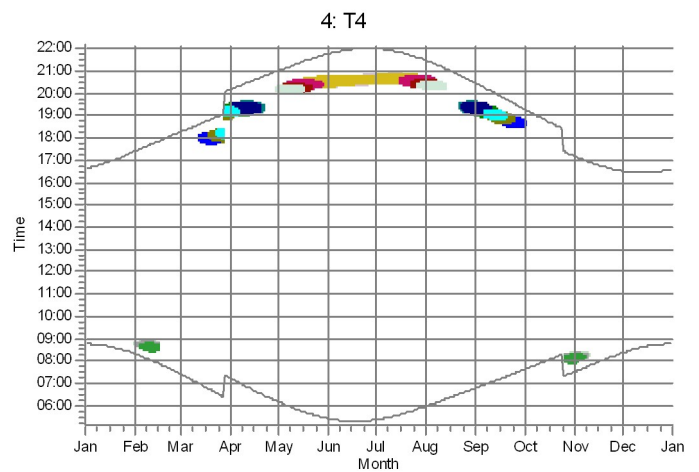
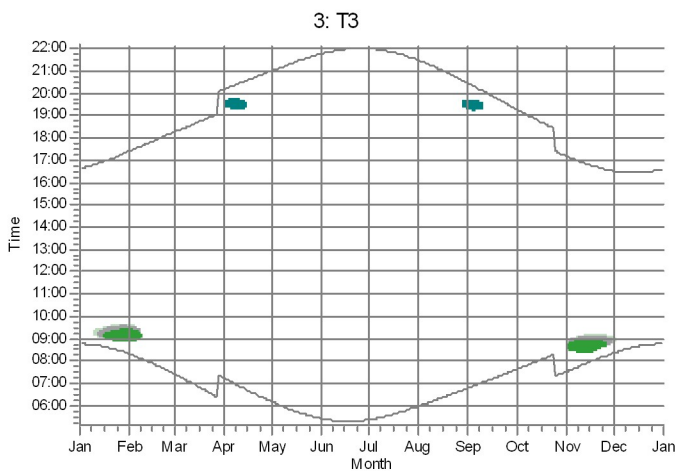
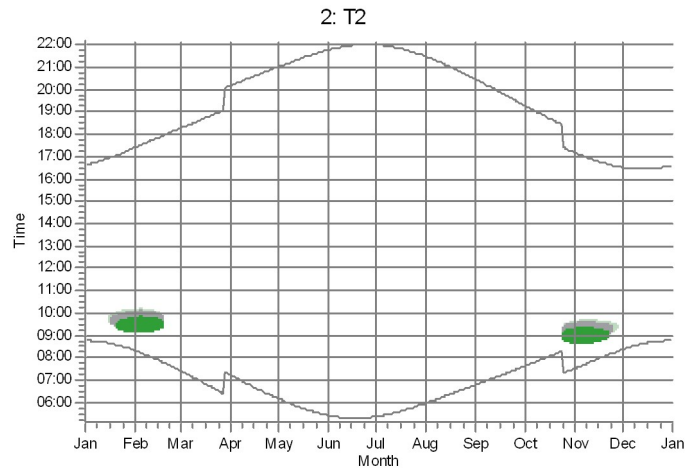
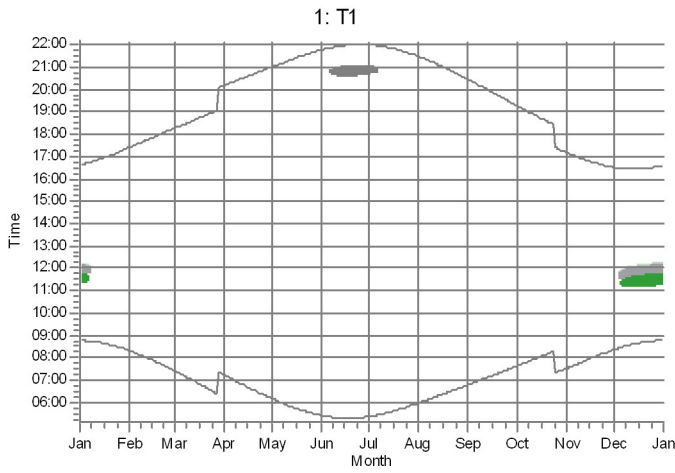
Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker



SHADOW - Calendar per WTG, graphical

Calculation: Alternative Scenario 1

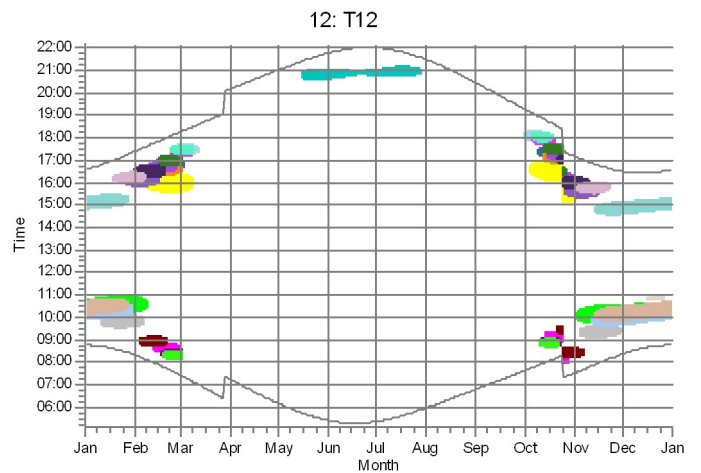
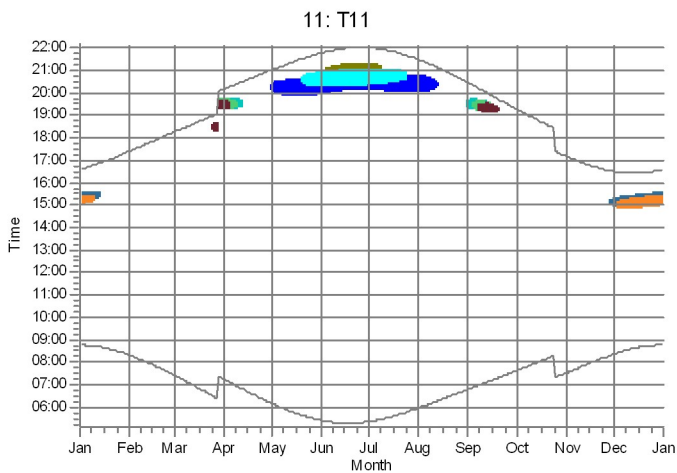
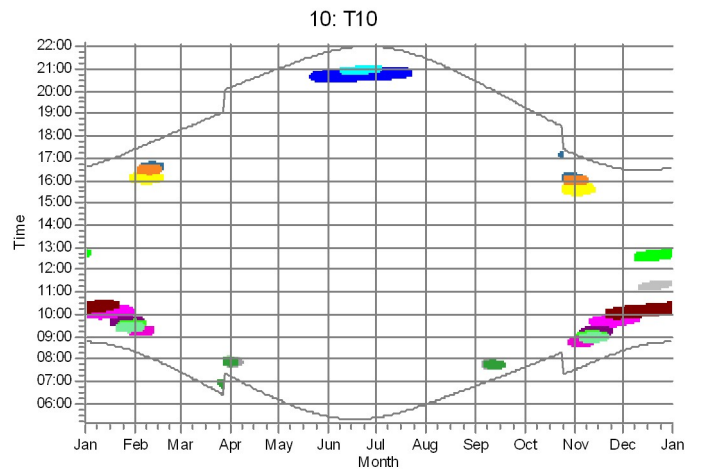
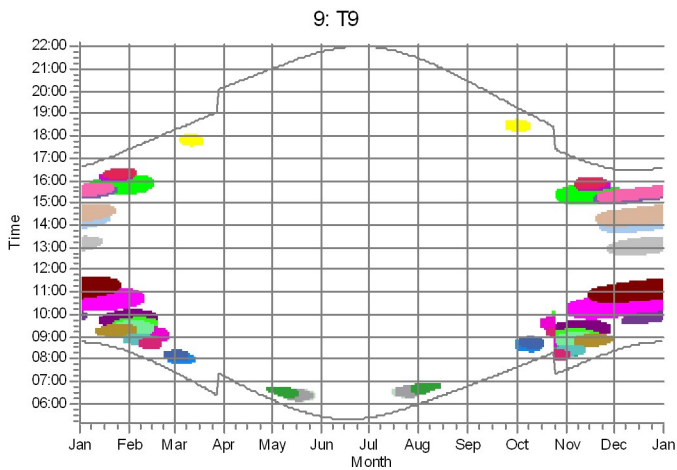
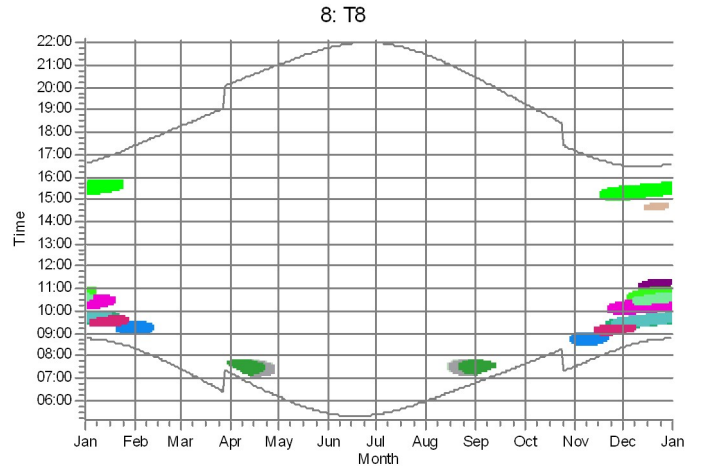
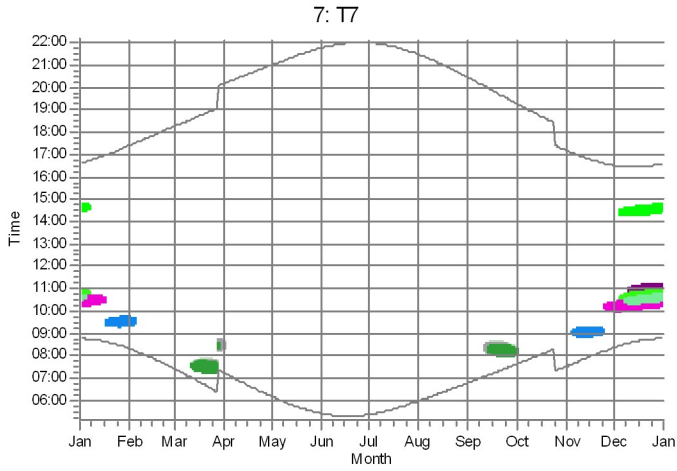


Shadow receptors



SHADOW - Calendar per WTG, graphical

Calculation: Alternative Scenario 1

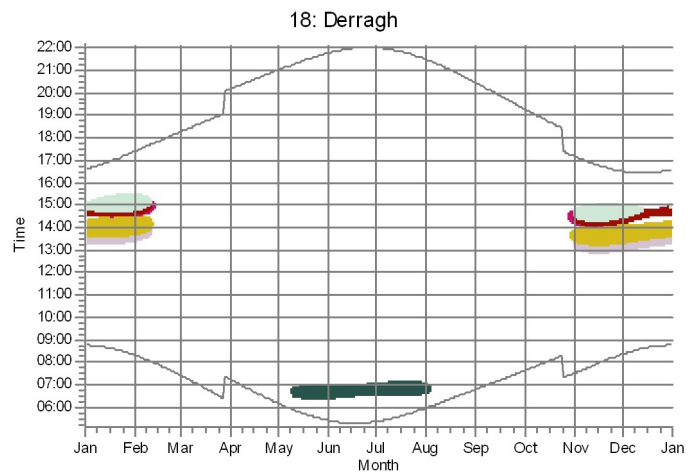
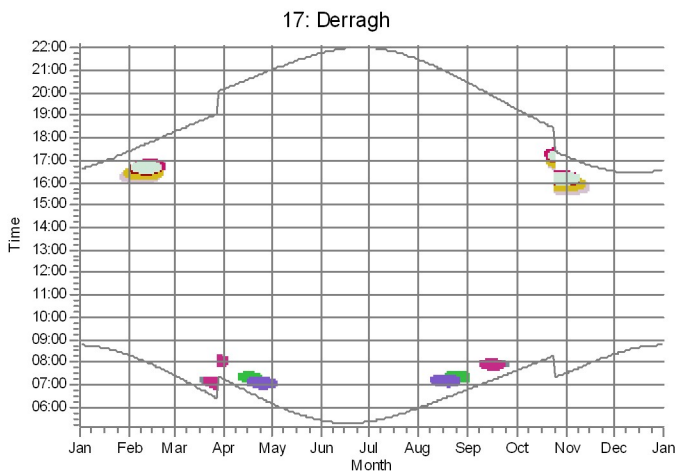
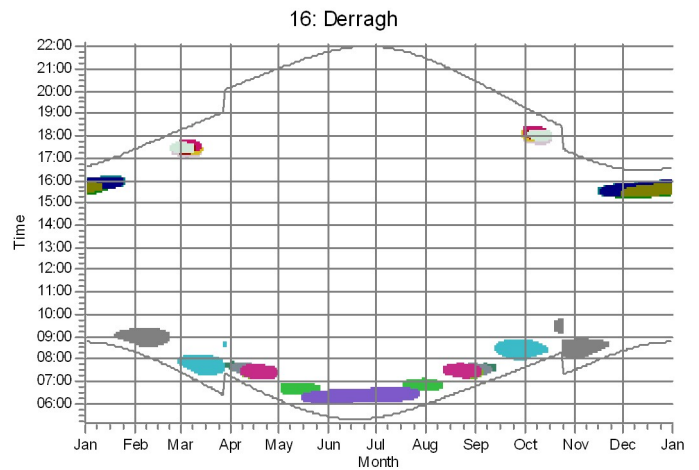
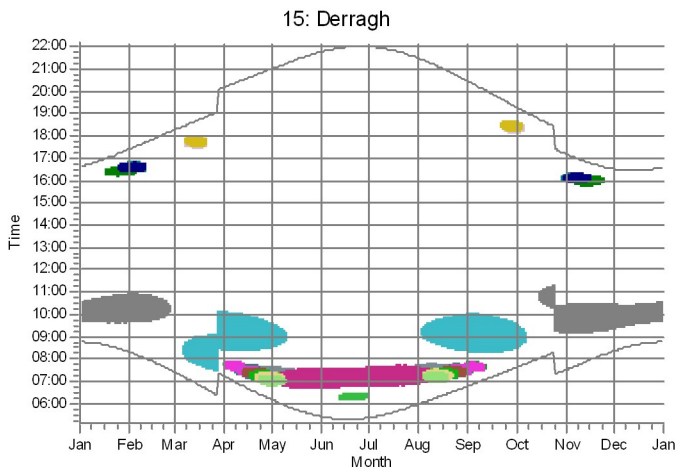
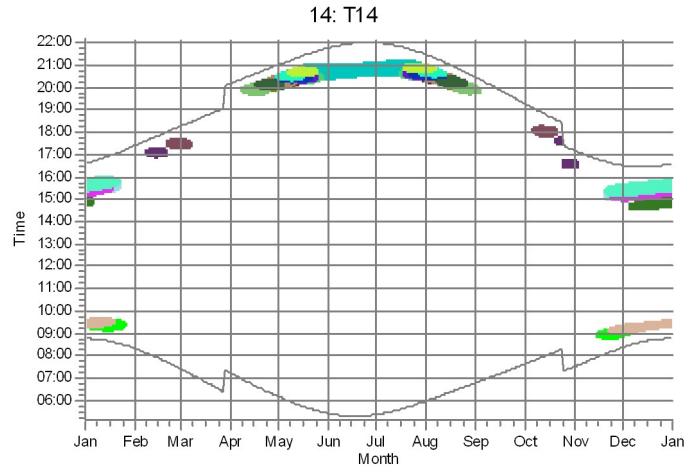
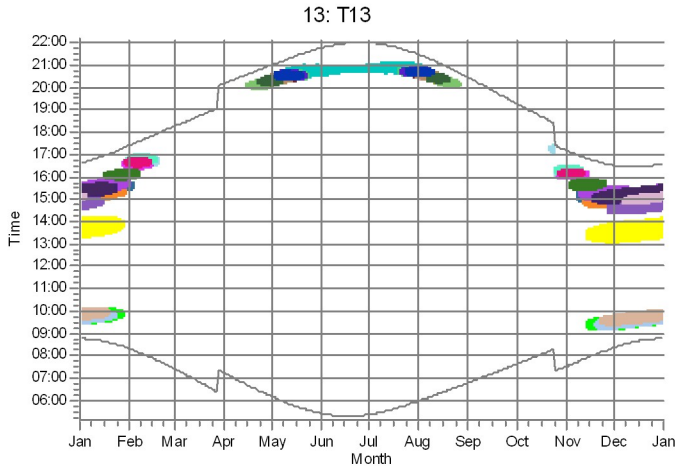


Shadow receptors

B: H2	J: H10	O: H15	U: H21	AB: H28	AR: H44	BA: H53	BP: H68	CE: H83
C: H3	K: H11	P: H16	V: H22	AF: H32	AS: H45	BD: H56	BV: H74	CN: H92
E: H5	L: H12	Q: H17	W: H23	AG: H33	AU: H47	BH: H60	BZ: H78	CQ: H95
H: H8	M: H13	R: H18	X: H24	AO: H41	AV: H48	BJ: H62	CB: H80	CW: H101
I: H9	N: H14	T: H20	Z: H26	AQ: H43	AW: H49	BM: H65	CC: H81	

SHADOW - Calendar per WTG, graphical

Calculation: Alternative Scenario 1

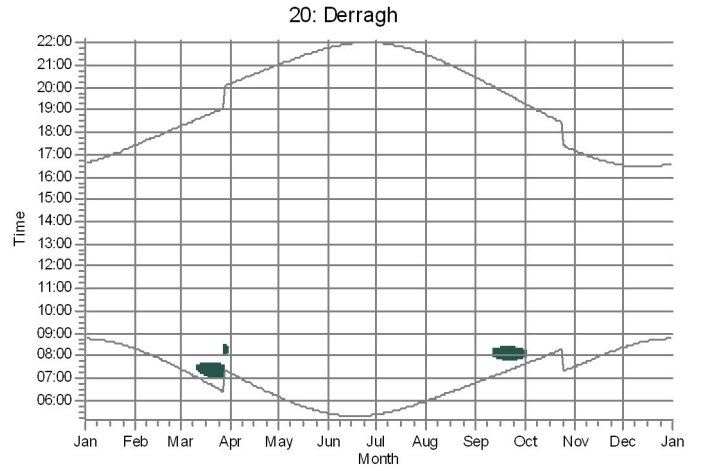
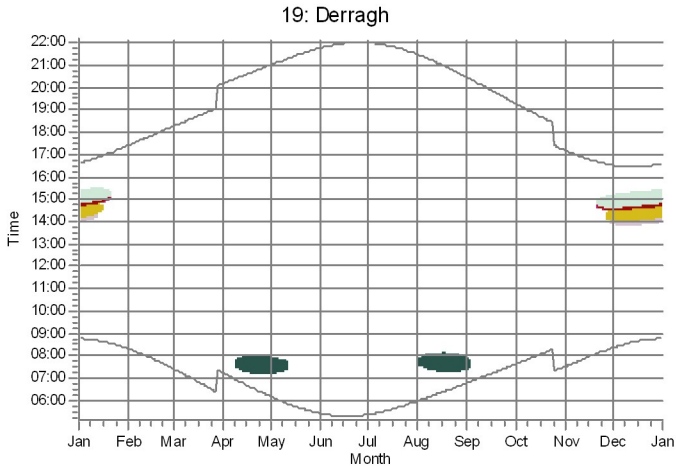


Shadow receptors

A: H1	Q: H17	AC: H29	AK: H37	AX: H50	BG: H59	BR: H70	CB: H80
B: H2	S: H19	AD: H30	AL: H38	AY: H51	BI: H61	BS: H71	CG: H85
D: H4	U: H21	AE: H31	AN: H40	AZ: H52	BL: H64	BT: H72	CK: H89
F: H6	V: H22	AF: H32	AP: H42	BB: H54	BM: H65	BU: H73	CR: H96
G: H7	W: H23	AG: H33	AQ: H43	BC: H55	BN: H66	BV: H74	CS: H97
I: H9	Y: H25	AH: H34	AS: H45	BD: H56	BO: H67	BX: H76	CX: H102
J: H10	AA: H27	AI: H35	AT: H46	BE: H57	BP: H68	BY: H77	CZ: H104
O: H15	AB: H28	AJ: H36	AU: H47	BF: H58	BQ: H69	CA: H79	DB: H106

SHADOW - Calendar per WTG, graphical

Calculation: Alternative Scenario 1

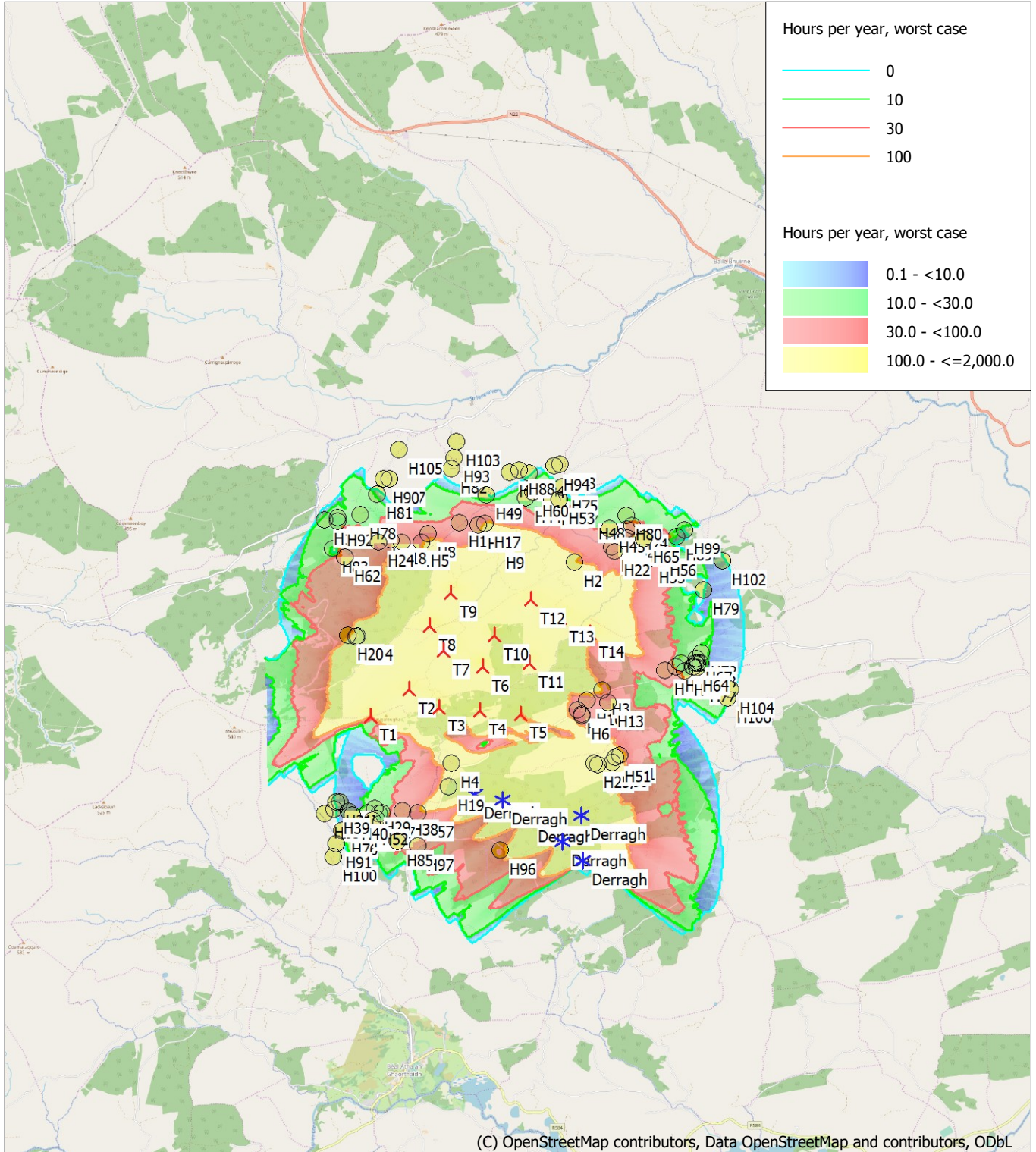


Shadow receptors

- Y: H25
- AD: H30
- AX: H50
- AY: H51
- BI: H61
- CR: H96

SHADOW - Map

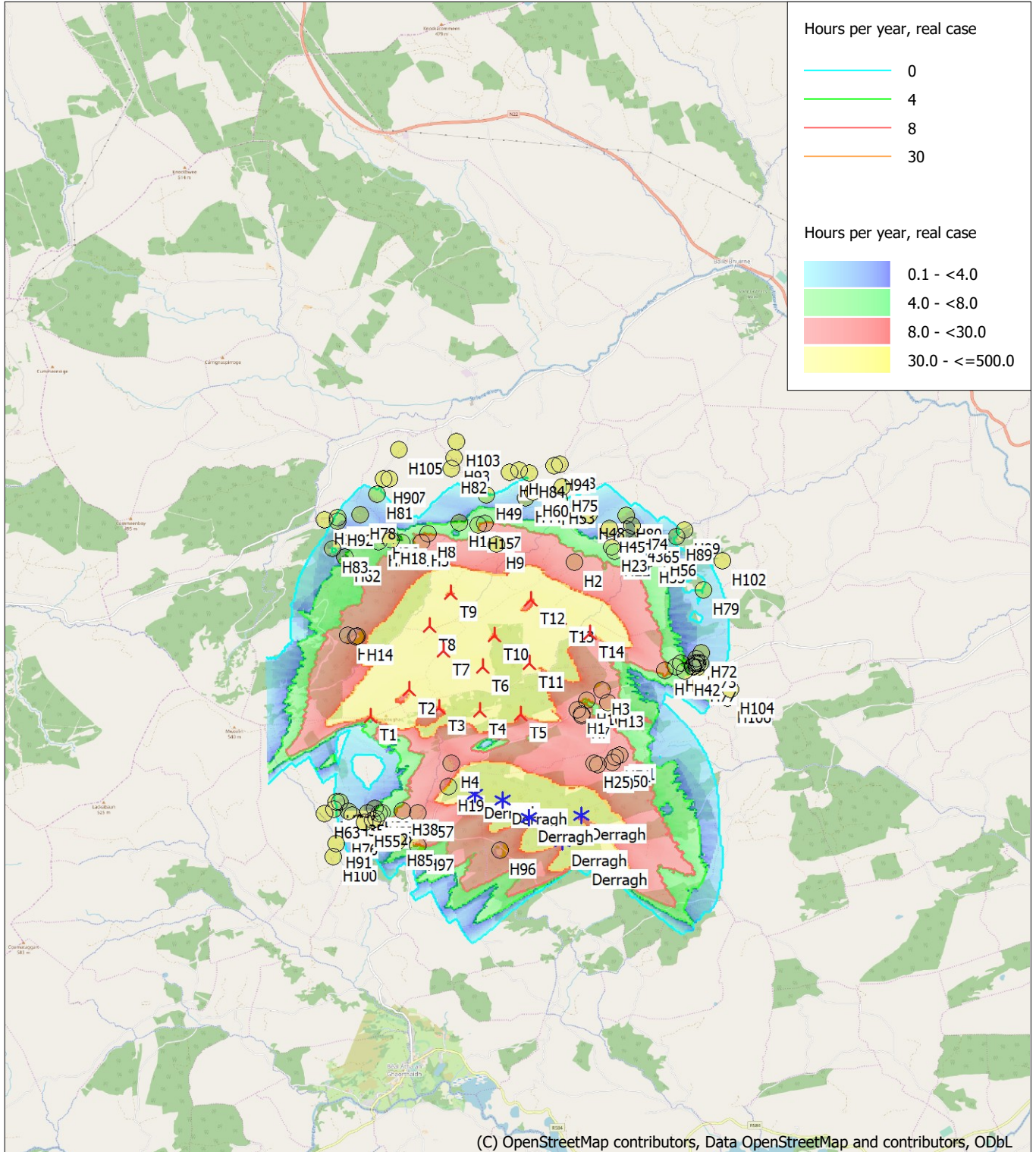
Calculation: Alternative Scenario 1



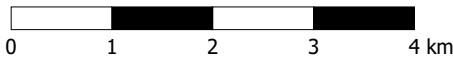
Map: EMD OpenStreetMap , Print scale 1:75,000, Map center Irish ITM-IRENET95 (IE), geocentric, GRS80 East: 516,660 North: 573,620
 New WTG Existing WTG Shadow receptor
 Flicker map level: Elevation Grid Data Object: Gortyrahill_ShadowFlicker_12042022_EMDGrid_0.wpg (1)
 Time step: 3 minutes, Day step: 7 days, Map resolution: 20 m, Visibility resolution: 10 m, Eye height: 1.5 m

SHADOW - Map

Calculation: Alternative Scenario 2 - Real Case



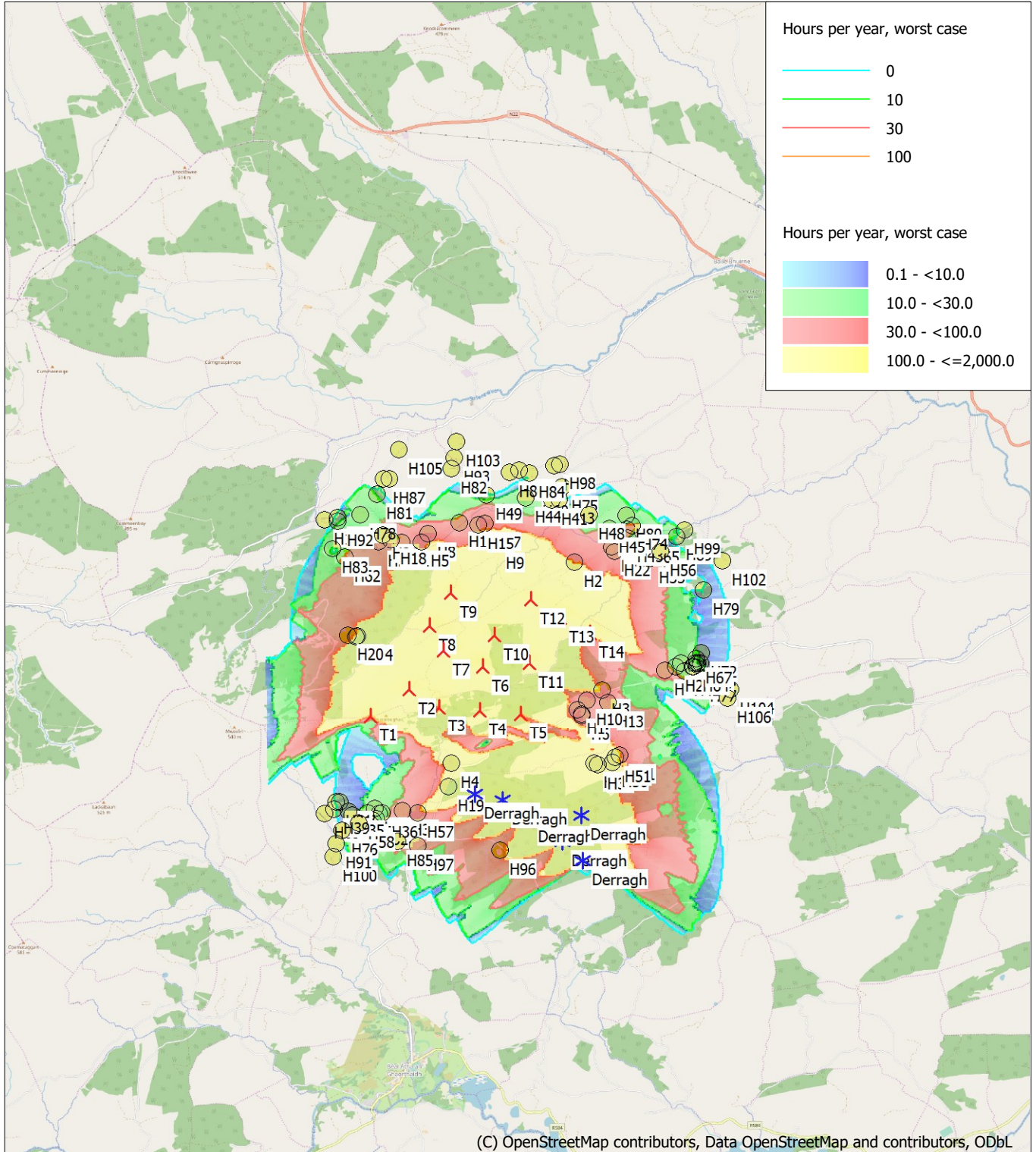
(C) OpenStreetMap contributors, Data OpenStreetMap and contributors, ODbL



Map: EMD OpenStreetMap , Print scale 1:75,000, Map center Irish ITM-IRENET95 (IE), geocentric, GRS80 East: 516,660 North: 573,620
 New WTG Existing WTG Shadow receptor
 Flicker map level: Elevation Grid Data Object: Gortyrahill_ShadowFlicker_12042022_EMDGrid_0.wpg (1)
 Time step: 3 minutes, Day step: 7 days, Map resolution: 20 m, Visibility resolution: 10 m, Eye height: 1.5 m

SHADOW - Map

Calculation: Alternative Scenario 2 - Worst Case



Map: EMD OpenStreetMap , Print scale 1:75,000, Map center Irish ITM-IRENET95 (IE), geocentric, GRS80 East: 516,660 North: 573,620
 New WTG Existing WTG Shadow receptor
 Flicker map level: Elevation Grid Data Object: Gortyrahill_ShadowFlicker_12042022_EMDGrid_0.wpg (1)
 Time step: 3 minutes, Day step: 7 days, Map resolution: 20 m, Visibility resolution: 10 m, Eye height: 1.5 m

SHADOW - Main Result

Calculation: Alternative Scenario 2

Assumptions for shadow calculations

Maximum distance for influence

Calculate only when more than 20 % of sun is covered by the blade

Please look in WTG table

Minimum sun height over horizon for influence 3 °

Day step for calculation 1 days

Time step for calculation 1 minutes

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

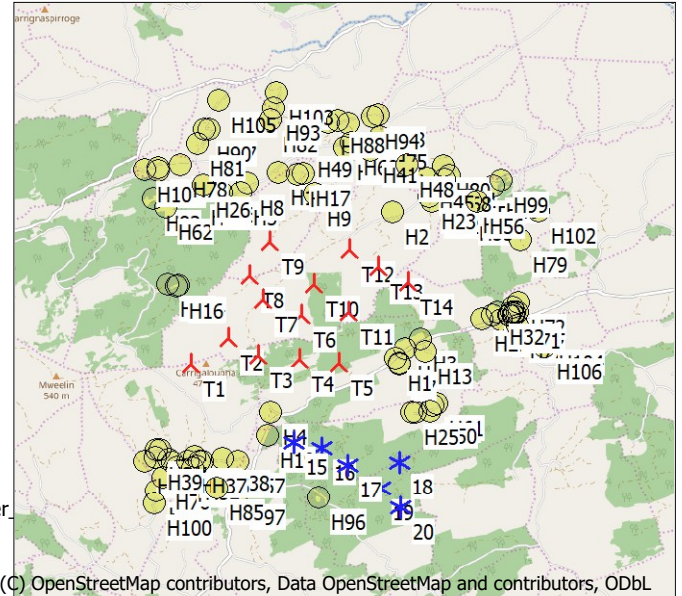
N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

A ZVI (Zones of Visual Influence) calculation is performed before flicker calculation so non visible WTG do not contribute to calculated flicker values. A WTG will be visible if it is visible from any part of the receiver window. The ZVI calculation is based on the following assumptions:

Height contours used: Elevation Grid Data Object: Gortyrahilly_ShadowFlicker

Obstacles used in calculation

Receptor grid resolution: 1.0 m



All coordinates are in

Irish ITM-IRENET95 (IE), geocentric, GRS80

Scale 1:100,000

▲ New WTG

★ Existing WTG

● Shadow receptor

WTGs

Row	Easting	Northing	Z	Row data/Description	WTG type			Shadow data				
					Valid	Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Calculation distance [m]	RPM [RPM]
1	514,680	571,824	415.3	T1	Yes	NORDEX	N149/5.X-5,700	5,700	149.0	110.5	1,809	10.7
2	515,203	572,167	392.1	T2	Yes	NORDEX	N149/5.X-5,700	5,700	149.0	110.5	1,809	10.7
3	515,580	571,929	356.7	T3	Yes	NORDEX	N149/5.X-5,700	5,700	149.0	110.5	1,809	10.7
4	516,129	571,873	345.9	T4	Yes	NORDEX	N149/5.X-5,700	5,700	149.0	110.5	1,809	10.7
5	516,658	571,817	338.6	T5	Yes	NORDEX	N149/5.X-5,700	5,700	149.0	110.5	1,809	10.7
6	516,169	572,451	340.7	T6	Yes	NORDEX	N149/5.X-5,700	5,700	149.0	110.5	1,809	10.7
7	515,652	572,675	372.3	T7	Yes	NORDEX	N149/5.X-5,700	5,700	149.0	110.5	1,809	10.7
8	515,484	572,994	303.0	T8	Yes	NORDEX	N149/5.X-5,700	5,700	149.0	110.5	1,809	10.7
9	515,769	573,427	291.1	T9	Yes	NORDEX	N149/5.X-5,700	5,700	149.0	110.5	1,809	10.7
10	516,329	572,863	380.0	T10	Yes	NORDEX	N149/5.X-5,700	5,700	149.0	110.5	1,809	10.7
11	516,794	572,484	305.5	T11	Yes	NORDEX	N149/5.X-5,700	5,700	149.0	110.5	1,809	10.7
12	516,819	573,308	326.4	T12	Yes	NORDEX	N149/5.X-5,700	5,700	149.0	110.5	1,809	10.7
13	517,195	573,067	286.5	T13	Yes	NORDEX	N149/5.X-5,700	5,700	149.0	110.5	1,809	10.7
14	517,592	572,862	257.9	T14	Yes	NORDEX	N149/5.X-5,700	5,700	149.0	110.5	1,809	10.7
15	516,034	570,784	321.2	Derragh	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	100.0	1,823	10.7
16	516,405	570,706	285.7	Derragh	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	100.0	1,823	10.7
17	516,741	570,457	285.6	Derragh	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	100.0	1,823	10.7
18	517,429	570,484	311.2	Derragh	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	100.0	1,823	10.7
19	517,175	570,142	285.9	Derragh	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	100.0	1,823	10.7
20	517,446	569,894	246.0	Derragh	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	100.0	1,823	10.7

Shadow receptor-Input

No.	Name	Easting	Northing	Z	Width [m]	Height [m]	Elevation a.g.l. [m]	Slope of window [°]	Direction mode	Eye height (ZVI) a.g.l. [m]
A	H1	517,410	571,864	254.5	2.0	2.0	0.5	90.0	"Green house mode"	2.5
B	H2	517,402	573,794	210.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
C	H3	517,734	572,119	250.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
D	H4	515,736	571,186	296.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
E	H5	515,395	574,092	216.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
F	H6	517,462	571,790	234.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
G	H7	517,467	571,806	236.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
H	H8	515,487	574,211	217.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
I	H9	516,372	574,046	234.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5

To be continued on next page...

SHADOW - Main Result

Calculation: Alternative Scenario 2

...continued from previous page

No.	Name	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
				[m]	[m]	[m]	[m]	[°]		[m]
J	H10	517,533	571,990	257.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
K	H11	515,143	574,094	215.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
L	H12	515,896	574,342	196.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
M	H13	517,811	571,946	218.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
N	H14	514,534	572,878	305.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
O	H15	516,142	574,318	209.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
P	H16	514,510	572,872	306.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
Q	H17	516,223	574,321	211.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
R	H18	514,997	574,130	212.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
S	H19	515,702	570,880	296.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
T	H20	514,411	572,890	315.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
U	H21	518,556	572,363	233.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
V	H22	517,923	573,934	204.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
W	H23	517,883	573,984	196.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
X	H24	514,830	574,098	207.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
Y	H25	517,613	571,154	192.5	2.0	2.0	0.5	90.0	"Green house mode"	2.5
Z	H26	514,887	574,194	223.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AA	H27	514,265	570,703	232.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AB	H28	518,705	572,403	235.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AC	H29	514,728	570,617	256.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AD	H30	517,670	571,142	196.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AE	H31	514,223	570,697	230.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AF	H32	518,774	572,454	239.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AG	H33	518,384	573,830	215.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AH	H34	514,633	570,556	244.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AI	H35	514,379	570,581	225.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AJ	H36	514,814	570,551	250.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AK	H37	514,777	570,545	248.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AL	H38	515,088	570,586	257.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AM	H39	514,187	570,609	220.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AN	H40	514,433	570,535	223.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AO	H41	517,124	574,610	192.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AP	H42	518,824	572,353	223.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AQ	H43	518,107	574,098	177.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AR	H44	516,773	574,652	186.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AS	H45	517,869	574,232	179.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AT	H46	514,750	570,477	235.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AU	H47	518,434	573,927	210.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AV	H48	517,605	574,420	191.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AW	H49	516,256	574,698	198.5	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AX	H50	517,850	571,155	205.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AY	H51	517,890	571,229	190.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AZ	H52	514,698	570,464	232.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BA	H53	517,210	574,625	194.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BB	H54	514,485	570,469	217.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BC	H55	514,590	570,438	221.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BD	H56	518,528	573,917	219.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BE	H57	515,290	570,548	246.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BF	H58	514,512	570,431	214.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BG	H59	518,930	572,410	225.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BH	H60	516,878	574,725	190.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BI	H61	517,955	571,250	190.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BJ	H62	514,394	573,903	230.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BK	H63	514,059	570,556	212.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BL	H64	518,941	572,403	223.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BM	H65	518,321	574,087	175.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BN	H66	518,957	572,447	229.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BO	H67	518,976	572,514	232.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BP	H68	518,097	574,217	178.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BQ	H69	518,989	572,432	225.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BR	H70	519,003	572,456	227.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BS	H71	518,987	572,390	220.5	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BT	H72	519,042	572,577	229.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BU	H73	519,032	572,454	225.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5

To be continued on next page...

SHADOW - Main Result

Calculation: Alternative Scenario 2

...continued from previous page

No.	Name	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
				[m]	[m]	[m]	[m]	[°]		[m]
BV	H74	518,159	574,273	188.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BW	H75	517,248	574,791	194.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BX	H76	514,292	570,334	200.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BY	H77	519,031	572,269	210.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BZ	H78	514,600	574,467	239.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CA	H79	519,083	573,399	197.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CB	H80	518,088	574,393	211.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CC	H81	514,828	574,738	256.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CD	H82	515,800	575,045	228.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CE	H83	514,232	574,023	197.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CF	H84	516,832	574,974	226.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CG	H85	515,011	570,183	215.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CH	H86	516,572	574,987	243.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CI	H87	514,991	574,930	242.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CJ	H88	516,684	575,011	243.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CK	H89	518,743	574,118	179.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CL	H90	514,914	574,938	236.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CM	H91	514,204	570,162	194.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CN	H92	514,308	574,396	209.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CO	H93	515,847	575,193	208.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CP	H94	517,147	575,057	191.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CQ	H95	514,310	574,440	217.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CR	H96	516,360	570,045	235.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CS	H97	515,285	570,118	238.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CT	H98	517,237	575,083	187.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CU	H99	518,853	574,198	159.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CV	H100	514,172	569,993	196.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CW	H101	514,126	574,409	191.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CX	H102	519,337	573,772	183.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CY	H103	515,882	575,406	186.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CZ	H104	519,423	572,097	200.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
DA	H105	515,128	575,313	171.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
DB	H106	519,384	571,987	200.5	2.0	2.0	0.5	90.0	"Green house mode"	2.5

Calculation Results

Shadow receptor

No.	Name	Shadow, worst case		Shadow, expected values	
		Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
A	H1	72:41	149	1:01	11:58
B	H2	104:08	173	0:49	11:32
C	H3	98:11	177	0:50	19:38
D	H4	161:22	152	1:53	19:47
E	H5	90:55	131	1:10	10:04
F	H6	76:05	172	0:51	12:18
G	H7	74:04	168	0:52	11:53
H	H8	78:41	105	1:08	7:56
I	H9	178:12	114	2:06	18:00
J	H10	51:11	113	1:01	8:04
K	H11	42:39	92	0:39	4:55
L	H12	46:11	96	0:52	4:27
M	H13	58:16	133	0:45	11:51
N	H14	121:13	271	0:56	19:15
O	H15	87:40	82	1:24	8:27
P	H16	109:47	264	0:54	17:05
Q	H17	90:34	76	1:30	8:36
R	H18	36:38	91	0:34	4:15
S	H19	175:36	144	1:39	34:31
T	H20	81:30	214	0:47	12:28
U	H21	48:55	110	0:35	10:14
V	H22	48:18	125	0:33	5:09
W	H23	50:28	120	0:32	5:16

To be continued on next page...

SHADOW - Main Result

Calculation: Alternative Scenario 2

...continued from previous page

No.	Name	Shadow, worst case		Shadow, expected values	
		Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
X	H24	42:51	103	0:31	4:58
Y	H25	153:44	238	1:11	18:22
Z	H26	28:26	82	0:31	3:19
AA	H27	6:41	27	0:20	1:26
AB	H28	24:04	60	0:33	5:19
AC	H29	18:35	58	0:27	3:59
AD	H30	152:52	245	1:08	18:27
AE	H31	6:21	24	0:19	1:21
AF	H32	19:55	48	0:34	4:26
AG	H33	49:08	131	0:30	5:18
AH	H34	17:22	58	0:25	3:43
AI	H35	8:01	28	0:21	1:43
AJ	H36	23:30	69	0:29	5:01
AK	H37	22:08	68	0:28	4:44
AL	H38	46:39	121	0:37	9:46
AM	H39	0:00	0	0:00	0:00
AN	H40	8:53	31	0:22	1:54
AO	H41	10:13	38	0:21	1:02
AP	H42	19:48	53	0:30	4:23
AQ	H43	30:38	95	0:27	3:21
AR	H44	22:35	66	0:24	2:00
AS	H45	32:54	92	0:28	3:14
AT	H46	22:56	71	0:27	4:53
AU	H47	41:32	122	0:28	4:25
AV	H48	28:14	76	0:27	2:36
AW	H49	2:24	17	0:11	0:12
AX	H50	107:55	199	0:56	12:48
AY	H51	108:27	211	0:51	13:44
AZ	H52	21:17	69	0:26	4:32
BA	H53	0:00	0	0:00	0:00
BB	H54	9:54	34	0:23	2:06
BC	H55	12:01	38	0:24	2:33
BD	H56	35:24	98	0:27	3:29
BE	H57	93:36	172	0:46	18:42
BF	H58	10:40	37	0:23	2:15
BG	H59	13:34	42	0:26	3:01
BH	H60	20:15	64	0:22	1:47
BI	H61	102:20	223	0:48	13:34
BJ	H62	32:34	81	0:40	4:22
BK	H63	0:00	0	0:00	0:00
BL	H64	13:22	42	0:25	2:58
BM	H65	30:50	105	0:24	3:16
BN	H66	12:05	39	0:25	2:39
BO	H67	10:59	37	0:25	2:23
BP	H68	35:12	103	0:26	3:33
BQ	H69	11:41	38	0:25	2:34
BR	H70	11:10	37	0:25	2:26
BS	H71	12:27	41	0:25	2:46
BT	H72	9:42	34	0:24	2:07
BU	H73	10:41	36	0:24	2:19
BV	H74	31:55	96	0:24	3:09
BW	H75	0:00	0	0:00	0:00
BX	H76	8:11	32	0:20	1:43
BY	H77	13:19	44	0:23	2:57
BZ	H78	13:43	46	0:24	1:36
CA	H79	8:22	29	0:22	1:14
CB	H80	18:50	70	0:22	1:49
CC	H81	8:14	33	0:19	0:44
CD	H82	0:00	0	0:00	0:00
CE	H83	7:28	27	0:21	1:11
CF	H84	0:00	0	0:00	0:00
CG	H85	25:18	93	0:25	5:15
CH	H86	0:00	0	0:00	0:00

To be continued on next page...

SHADOW - Main Result

Calculation: Alternative Scenario 2

...continued from previous page

No.	Name	Shadow, worst case		Shadow, expected values	
		Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
CI	H87	0:00	0	0:00	0:00
CJ	H88	0:00	0	0:00	0:00
CK	H89	20:36	66	0:22	1:48
CL	H90	0:00	0	0:00	0:00
CM	H91	0:00	0	0:00	0:00
CN	H92	8:06	31	0:21	1:09
CO	H93	0:00	0	0:00	0:00
CP	H94	0:00	0	0:00	0:00
CQ	H95	8:10	31	0:21	1:07
CR	H96	89:23	185	0:43	18:02
CS	H97	42:22	107	0:30	8:17
CT	H98	0:00	0	0:00	0:00
CU	H99	0:00	0	0:00	0:00
CV	H100	0:00	0	0:00	0:00
CW	H101	0:00	0	0:00	0:00
CX	H102	0:00	0	0:00	0:00
CY	H103	0:00	0	0:00	0:00
CZ	H104	0:00	0	0:00	0:00
DA	H105	0:00	0	0:00	0:00
DB	H106	0:00	0	0:00	0:00

Total amount of flickering on the shadow receptors caused by each WTG

No.	Name	Worst case [h/year]	Expected [h/year]
1	T1	30:25	2:51
2	T2	43:09	5:33
3	T3	23:57	2:52
4	T4	58:35	11:51
5	T5	127:32	25:48
6	T6	25:52	5:18
7	T7	73:22	8:27
8	T8	116:01	14:05
9	T9	381:03	42:45
10	T10	102:30	13:31
11	T11	78:13	16:25
12	T12	224:09	26:40
13	T13	240:04	27:48
14	T14	155:58	24:48
15	Derragh	413:34	70:50
16	Derragh	190:14	30:31
17	Derragh	63:27	10:04
18	Derragh	212:54	24:52
19	Derragh	97:09	13:06
20	Derragh	14:44	2:37

Total times in Receptor wise and WTG wise tables can differ, as a WTG can lead to flicker at 2 or more receptors simultaneously and/or receptors may receive flicker from 2 or more WTGs simultaneously.

The calculation of the total expected values for a given receptor assumes a weighted average directional reduction for all WTGs contributing to shadow flicker within the same day. In the case where shadow flicker from different WTGs is not concurrent within the day, the total expected time at a given receptor may deviate marginally from the individual flicker time caused by each turbine separately.

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:58/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: A - H1

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 16:36	15:25 (16) 15:48 (16)	08:18 17:24	16:19 (15) 16:37 (15)	07:25 18:16	07:14 20:10
2	08:45 16:37	15:26 (16) 15:49 (16)	08:17 17:26	16:19 (15) 16:36 (15)	07:23 18:18	07:12 20:11
3	08:45 16:39	15:27 (16) 15:49 (16)	08:15 17:28	16:20 (15) 16:35 (15)	07:21 18:19	07:10 20:13
4	08:45 16:40	15:28 (16) 15:50 (16)	08:14 17:30	16:22 (15) 16:33 (15)	07:18 18:21	07:08 20:15
5	08:44 16:41	15:28 (16) 15:50 (16)	08:12 17:32	16:25 (15) 16:32 (15)	07:16 18:23	07:05 20:16
6	08:44 16:42	15:29 (16) 15:50 (16)	08:10 17:33	07:14 18:25	07:03 18:29	06:00 20:18
7	08:44 16:43	15:29 (16) 15:50 (16)	08:08 17:35	07:12 18:26	07:01 18:27	05:59 20:20
8	08:43 16:45	15:30 (16) 15:50 (16)	08:07 17:37	07:09 18:28	06:58 18:27	05:57 20:22
9	08:43 16:46	15:31 (16) 15:50 (16)	08:05 17:39	07:07 18:30	06:56 18:26	05:55 20:23
10	08:42 16:47	15:32 (16) 15:50 (16)	08:03 17:41	07:05 18:32	06:54 18:26	05:53 20:25
11	08:42 16:49	15:33 (16) 15:49 (16)	08:01 17:43	07:03 18:33	06:52 18:26	05:52 20:27
12	08:41 16:50	15:35 (16) 15:50 (16)	07:59 17:45	07:00 18:35	06:49 18:25	05:50 20:28
13	08:40 16:52	15:36 (16) 15:49 (16)	07:58 17:46	06:58 18:37	06:47 18:25	05:48 20:30
14	08:40 16:53	15:38 (16) 15:48 (16)	07:56 17:48	06:56 18:39	06:45 18:25	05:47 20:32
15	08:39 16:55	15:41 (16) 15:46 (16)	07:54 17:50	06:54 18:40	06:43 18:25	05:45 20:33
16	08:38 16:56	15:46 (16) 17:52	07:52 17:52	06:51 18:42	06:41 20:35	05:44 19:08
17	08:37 16:58	17:52 17:54	07:50 17:54	06:49 18:44	06:38 20:37	05:42 19:08
18	08:36 17:00	16:20 (15) 16:27 (15)	07:48 17:56	06:47 18:46	06:36 20:39	05:41 19:07
19	08:35 17:01	16:18 (15) 16:28 (15)	07:46 17:58	06:44 18:47	06:34 20:40	05:39 19:06
20	08:34 17:03	16:18 (15) 16:30 (15)	07:44 17:59	06:42 18:49	06:32 20:42	05:38 19:04
21	08:33 17:05	16:17 (15) 16:33 (15)	07:42 18:01	06:40 18:51	06:30 20:44	05:37 19:03
22	08:32 17:06	16:17 (15) 16:34 (15)	07:40 18:03	06:37 18:53	06:28 20:45	05:35 19:02
23	08:31 17:08	16:16 (15) 16:34 (15)	07:38 18:05	06:35 18:54	06:26 20:47	05:34 19:00
24	08:29 17:10	16:16 (15) 16:35 (15)	07:36 18:07	06:33 18:56	06:24 20:49	05:33 18:32
25	08:28 17:12	16:15 (15) 16:35 (15)	07:34 18:08	06:31 18:58	06:22 20:50	05:32 18:34
26	08:27 17:13	16:16 (15) 16:36 (15)	07:31 18:10	06:28 18:59	06:20 20:52	05:30 18:36
27	08:26 17:15	16:17 (15) 16:37 (15)	07:29 18:12	06:26 19:01	06:18 20:54	05:29 18:34
28	08:24 17:17	16:16 (15) 16:37 (15)	07:27 18:14	06:24 19:03	06:16 20:55	05:28 21:41
29	08:23 17:19	16:16 (15) 16:37 (15)	07:21 18:14	07:21 20:04	18:43 (5) 19:20 (4)	06:14 20:57
30	08:21 17:20	16:17 (15) 16:37 (15)	07:19 18:10	07:19 20:06	18:40 (5) 19:25 (4)	06:12 20:59
31	08:20 17:22	16:17 (15) 16:37 (15)	07:17 18:12	07:17 20:08	18:37 (5) 19:26 (4)	05:25 21:45
Potential sun hours	259	278	367	416	485	499
Total, worst case	511	68	104	1245		
Sun reduction	0.16	0.21	0.24	0.35		
Oper. time red.	1.00	1.00	1.00	1.00		
Wind dir. red.	0.60	0.60	0.67	0.67		
Total reduction	0.09	0.12	0.16	0.23		
Total, real	46	8	17	292		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)



SHADOW - Calendar

Calculation: Alternative Scenario 2 Shadow receptor: A - H1

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December	
1	05:22 22:00	05:58 21:28	06:48 20:26	18:25 (5) 07:37 19:17	07:30 17:11	08:21 15:15 (16) 16:31 15:31 (16)	
2	05:22 22:00	06:00 21:27	06:49 20:24	18:24 (5) 07:38 19:15	07:32 17:09	08:23 15:15 (16) 16:30 15:33 (16)	
3	05:23 21:59	06:01 21:25	06:51 20:22	18:24 (5) 07:40 19:12	07:34 17:07	08:24 15:14 (16) 16:29 15:33 (16)	
4	05:24 21:59	06:03 21:23	06:53 20:19	18:24 (5) 07:42 19:10	07:36 17:05	08:25 15:15 (16) 16:29 15:35 (16)	
5	05:25 21:58	06:04 21:21	06:54 20:17	18:24 (5) 07:43 19:08	07:38 17:04	08:27 15:14 (16) 16:28 15:35 (16)	
6	05:25 21:58	06:06 21:20	06:56 20:15	18:25 (5) 07:45 19:05	07:39 17:02	15:55 (15) 08:28 15:15 (16) 16:28 15:36 (16)	
7	05:26 21:57	06:07 21:18	06:57 20:13	18:25 (5) 07:47 19:03	07:41 17:00	15:52 (15) 08:29 15:15 (16) 16:27 15:37 (16)	
8	05:27 21:57	06:09 21:16	06:59 20:10	18:25 (5) 07:48 19:01	07:43 16:59	15:51 (15) 08:31 15:15 (16) 16:27 15:37 (16)	
9	05:28 21:56	06:11 21:14	07:01 20:08	18:26 (5) 07:50 18:59	07:45 16:57	15:50 (15) 08:32 15:15 (16) 16:27 15:38 (16)	
10	05:29 21:55	06:12 21:12	07:02 20:06	18:27 (5) 07:52 18:56	07:46 16:55	15:50 (15) 08:33 15:16 (16) 16:27 15:39 (16)	
11	05:30 21:55	06:14 21:10	07:04 20:03	18:27 (5) 07:53 18:54	07:48 16:54	15:49 (15) 08:34 15:16 (16) 16:26 15:39 (16)	
12	05:31 21:54	06:15 21:08	07:06 20:01	18:29 (5) 07:55 18:52	07:50 16:52	15:48 (15) 08:35 15:16 (16) 16:26 15:40 (16)	
13	05:32 21:53	06:17 21:07	07:07 19:59	18:30 (5) 07:57 18:50	07:52 16:51	15:48 (15) 08:36 15:17 (16) 16:26 15:40 (16)	
14	05:34 21:52	06:19 21:05	07:09 19:56	18:33 (5) 07:59 18:48	07:54 16:49	15:48 (15) 08:37 15:17 (16) 16:26 15:41 (16)	
15	05:35 21:51	06:20 21:03	07:10 19:54	18:39 (5) 08:00 18:45	07:55 16:48	15:48 (15) 08:38 15:18 (16) 16:26 15:42 (16)	
16	05:36 21:50	06:22 21:01	18:46 (5) 07:12 19:52	18:45 (5) 08:02 18:43	16:48 16:46	15:49 (15) 08:39 15:17 (16) 16:26 15:41 (16)	
17	05:37 21:49	06:23 20:59	18:43 (5) 07:14 19:49	18:43 (5) 08:04 18:41	16:46 16:45	15:49 (15) 08:39 15:18 (16) 16:27 15:42 (16)	
18	05:38 21:48	06:25 20:57	18:40 (5) 07:15 19:47	18:41 (5) 08:06 18:39	16:45 16:44	15:50 (15) 08:40 15:18 (16) 16:27 15:43 (16)	
19	05:40 21:47	06:27 20:54	18:38 (5) 07:17 19:45	18:39 (5) 08:07 18:37	16:44 16:42	15:51 (15) 08:41 15:19 (16) 16:27 15:44 (16)	
20	05:41 21:45	06:28 20:52	18:36 (5) 07:19 19:42	18:37 (5) 08:09 18:35	16:42 16:41	15:52 (15) 08:42 15:19 (16) 16:27 15:43 (16)	
21	05:42 21:44	06:30 20:50	18:35 (5) 07:20 19:40	18:35 (5) 08:11 18:33	16:41 16:40	15:52 (15) 08:42 15:20 (16) 16:28 15:44 (16)	
22	05:44 21:43	06:31 20:48	18:33 (5) 07:22 19:38	18:33 (5) 08:13 18:30	16:40 16:39	15:54 (15) 08:43 15:20 (16) 16:28 15:44 (16)	
23	05:45 21:42	06:33 20:46	18:32 (5) 07:23 19:35	18:30 (5) 08:14 18:28	16:39 16:38	15:55 (15) 08:43 15:21 (16) 16:29 15:45 (16)	
24	05:46 21:40	06:35 20:44	18:30 (5) 07:25 19:33	18:28 (5) 08:16 18:26	16:38 16:37	15:55 (15) 08:44 15:21 (16) 16:29 15:45 (16)	
25	05:48 21:39	06:36 20:42	18:29 (5) 07:27 19:31	18:26 (5) 08:18 18:25	16:37 16:36	15:57 (15) 08:44 15:21 (16) 16:29 15:46 (16)	
26	05:49 21:37	06:38 20:40	18:28 (5) 07:28 19:28	18:25 (5) 08:20 18:24	16:36 16:35	16:00 (15) 08:45 15:22 (16) 16:30 15:46 (16)	
27	05:51 21:36	06:40 20:37	18:28 (5) 07:30 19:26	18:24 (5) 08:21 18:23	16:35 16:34	16:31 16:32	15:23 (16) 16:32 15:47 (16)
28	05:52 21:35	06:41 20:35	18:27 (5) 07:32 19:24	18:23 (5) 08:23 18:22	16:34 16:33	15:25 (16) 08:45 15:23 (16) 16:32 15:47 (16)	
29	05:54 21:33	06:43 20:33	18:26 (5) 07:33 19:21	18:22 (5) 08:25 18:21	16:33 16:32	15:28 (16) 08:45 15:24 (16) 16:32 15:48 (16)	
30	05:55 21:31	06:44 20:31	18:26 (5) 07:35 19:19	18:21 (5) 08:27 18:20	16:32 16:31	15:29 (16) 08:45 15:24 (16) 16:33 15:48 (16)	
31	05:57 21:30	06:46 20:28	18:25 (5) 07:37 19:17	18:20 (5) 08:29 18:19	16:31 16:30	15:31 (16) 08:45 15:25 (16) 16:34 15:49 (16)	
Potential sun hours	502	454	381	331	266	244	
Total, worst case		608	761		354	710	
Sun reduction		0.30	0.28		0.18	0.13	
Oper. time red.		1.00	1.00		1.00	1.00	
Wind dir. red.		0.67	0.67		0.60	0.59	
Total reduction		0.20	0.19		0.11	0.08	
Total, real		119	143		39	55	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: B - H2**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1 05:22 05:58 06:48 07:37 18:17 (9) 07:30 15:21 (12) 08:21 13:05 (13)						
22:00 21:28 20:26 19:17 21 18:38 (9) 17:11 27 15:48 (10) 16:30 47 13:52 (13)						
2 05:22 06:00 06:49 07:38 18:16 (9) 07:32 15:24 (10) 08:23 13:05 (13)						
22:00 21:27 20:24 19:15 21 18:37 (9) 17:09 24 15:48 (10) 16:30 48 13:53 (13)						
3 05:23 06:01 06:51 07:40 18:16 (9) 07:34 15:24 (10) 08:24 13:05 (13)						
21:59 21:25 20:22 19:12 20 18:36 (9) 17:07 24 15:48 (10) 16:29 48 13:53 (13)						
4 05:24 06:03 06:53 07:42 16:30 (12) 07:36 15:24 (10) 08:26 13:06 (13)						
21:59 21:23 20:20 19:10 31 18:36 (9) 17:05 24 15:48 (10) 16:29 48 13:54 (13)						
5 05:24 06:04 06:54 07:43 16:26 (12) 07:38 15:25 (10) 08:27 13:06 (13)						
21:59 21:22 20:17 19:08 37 18:35 (9) 17:04 23 15:48 (10) 16:28 48 13:54 (13)						
6 05:25 06:06 06:56 07:45 16:22 (12) 07:39 15:25 (10) 08:28 13:07 (13)						
21:58 21:20 20:15 19:05 39 18:32 (9) 17:02 22 15:47 (10) 16:28 48 13:55 (13)						
7 05:26 06:07 06:57 07:47 16:20 (12) 07:41 15:26 (10) 08:29 13:07 (13)						
21:57 21:18 20:13 19:03 38 18:30 (9) 17:00 21 15:47 (10) 16:27 48 13:55 (13)						
8 05:27 06:09 06:59 07:48 16:18 (12) 07:43 15:27 (10) 08:31 13:07 (13)						
21:57 21:16 20:10 19:01 33 16:51 (12) 16:58 19 15:46 (10) 16:27 48 13:55 (13)						
9 05:28 06:11 07:01 07:50 16:16 (12) 07:45 15:28 (10) 08:32 13:07 (13)						
21:56 21:14 20:08 18:59 35 16:51 (12) 16:57 17 15:45 (10) 16:27 49 13:56 (13)						
10 05:29 06:12 07:02 07:52 16:14 (12) 07:47 15:30 (10) 08:33 13:08 (13)						
21:55 21:12 20:06 18:56 38 16:52 (12) 16:55 13 15:43 (10) 16:26 49 13:57 (13)						
11 05:30 06:14 07:04 07:54 16:13 (12) 07:48 15:32 (10) 08:34 13:09 (13)						
21:55 21:10 20:03 18:54 39 16:52 (12) 16:54 9 15:41 (10) 16:26 48 13:57 (13)						
12 05:31 06:15 07:06 07:55 16:13 (12) 07:50 13:09 (13)						
21:54 21:09 20:01 18:52 40 16:53 (12) 16:52 16:26 49 13:58 (13)						
13 05:32 06:17 07:07 07:57 16:12 (12) 07:52 13:18 (13) 08:36 13:09 (13)						
21:53 21:07 19:59 18:50 42 16:54 (12) 16:51 13 13:31 (13) 16:26 49 13:58 (13)						
14 05:33 06:19 07:09 07:59 16:10 (12) 07:54 13:14 (13) 08:37 13:10 (13)						
21:52 21:05 19:56 18:48 43 16:53 (12) 16:49 20 13:34 (13) 16:26 48 13:58 (13)						
15 05:35 06:20 07:10 08:00 16:10 (12) 07:55 13:12 (13) 08:38 13:11 (13)						
21:51 21:03 19:54 18:45 43 16:53 (12) 16:48 25 13:37 (13) 16:26 48 13:59 (13)						
16 05:36 06:22 07:12 08:02 16:09 (12) 07:57 13:11 (13) 08:39 13:11 (13)						
21:50 21:01 19:52 18:43 44 16:53 (12) 16:46 28 13:39 (13) 16:26 49 14:00 (13)						
17 05:37 06:23 07:14 08:04 16:09 (12) 07:59 13:09 (13) 08:40 13:11 (13)						
21:49 20:59 19:49 18:41 44 16:53 (12) 16:45 32 13:41 (13) 16:27 48 13:59 (13)						
18 05:38 06:25 07:15 08:06 16:09 (12) 08:01 13:09 (13) 08:40 13:12 (13)						
21:48 20:57 19:47 18:39 44 16:53 (12) 16:44 33 13:42 (13) 16:27 48 14:00 (13)						
19 05:40 06:27 07:17 08:07 16:08 (12) 08:02 13:08 (13) 08:41 13:12 (13)						
21:47 20:54 19:45 18:37 44 16:52 (12) 16:42 35 13:43 (13) 16:27 49 14:01 (13)						
20 05:41 06:28 07:19 08:09 16:08 (12) 08:04 13:07 (13) 08:42 13:12 (13)						
21:46 20:52 19:42 18:35 44 16:52 (12) 16:41 38 13:45 (13) 16:27 49 14:01 (13)						
21 05:42 06:30 07:20 08:11 16:09 (12) 08:06 13:06 (13) 08:42 13:13 (13)						
21:44 20:50 19:40 18:33 43 16:52 (12) 16:40 39 13:45 (13) 16:28 49 14:02 (13)						
22 05:44 06:31 07:22 08:13 16:09 (12) 08:07 13:06 (13) 08:43 13:13 (13)						
21:43 20:48 19:38 18:30 42 16:51 (12) 16:39 40 13:46 (13) 16:28 49 14:02 (13)						
23 05:45 06:33 07:23 08:14 16:10 (12) 08:09 13:05 (13) 08:43 13:14 (13)						
21:42 20:46 19:35 18:28 41 16:51 (12) 16:38 42 13:47 (13) 16:29 49 14:03 (13)						
24 05:46 06:35 07:25 08:16 16:10 (12) 08:11 13:05 (13) 08:44 13:14 (13)						
21:40 20:44 19:33 18:26 40 16:50 (12) 16:37 43 13:48 (13) 16:29 49 14:03 (13)						
25 05:48 06:36 07:27 18:25 (9) 07:18 15:11 (12) 08:12 13:05 (13) 08:44 13:14 (13)						
21:39 20:42 19:31 9 18:34 (9) 17:24 38 15:49 (12) 16:36 44 13:49 (13) 16:30 49 14:03 (13)						
26 05:49 06:38 07:28 18:22 (9) 07:20 15:12 (12) 08:14 13:05 (13) 08:44 13:16 (13)						
21:38 20:40 19:28 13 18:35 (9) 17:22 36 15:48 (12) 16:35 44 13:49 (13) 16:31 48 14:04 (13)						
27 05:51 06:40 07:30 18:20 (9) 07:21 15:12 (12) 08:15 13:05 (13) 08:45 13:16 (13)						
21:36 20:37 19:26 17 18:37 (9) 17:20 34 15:46 (12) 16:34 45 13:50 (13) 16:31 48 14:04 (13)						
28 05:52 06:41 07:32 18:19 (9) 07:23 15:13 (12) 08:17 13:05 (13) 08:45 13:16 (13)						
21:35 20:35 19:24 19 18:38 (9) 17:18 33 15:46 (10) 16:33 46 13:51 (13) 16:32 49 14:05 (13)						
29 05:53 06:43 07:33 18:18 (9) 07:25 15:14 (12) 08:18 13:05 (13) 08:45 13:17 (13)						
21:33 20:33 19:21 19 18:37 (9) 17:16 33 15:47 (10) 16:32 46 13:51 (13) 16:33 48 14:05 (13)						
30 05:55 06:44 07:35 18:17 (9) 07:27 15:16 (12) 08:20 13:05 (13) 08:45 13:17 (13)						
21:32 20:31 19:19 21 18:38 (9) 17:15 32 15:48 (10) 16:31 47 13:52 (13) 16:34 49 14:06 (13)						
31 05:56 06:46 07:29 15:18 (12) 08:45 13:18 (13)						
21:30 20:29 17:13 30 15:48 (10) 16:35 48 14:06 (13)						
Potential sun hours 502 454 381 331 266 244						
Total, worst case 98 1142 883 1501						
Sun reduction 0.28 0.24 0.18 0.13						
Oper. time red. 1.00 1.00 1.00 1.00						
Wind dir. red. 0.65 0.60 0.59 0.59						
Total reduction 0.18 0.14 0.11 0.08						
Total, real 18 163 96 119						

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: C - H3

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 16:36	08:18 17:24	07:25 18:16	07:14 20:10	06:10 21:00	19:50 (6) 21:46
2	08:45 16:37	08:17 17:26	07:23 18:17	07:12 20:11	06:08 21:02	19:51 (6) 21:47
3	08:45 16:38	08:15 17:28	07:21 18:19	07:10 20:13	06:06 21:04	20:09 (11) 21:48
4	08:45 16:40	08:14 17:30	07:18 18:21	07:07 20:15	06:04 21:05	20:07 (11) 21:49
5	08:44 16:41	08:12 17:31	07:16 18:23	07:05 20:16	06:02 21:07	20:04 (11) 21:50
6	08:44 16:42	08:10 17:33	07:14 18:25	17:26 (5) 20:18	07:03 21:09	20:02 (11) 21:51
7	08:44 16:43	08:08 17:35	07:12 18:26	17:23 (5) 20:20	07:01 21:10	20:02 (11) 21:52
8	08:43 16:45	08:07 17:37	07:09 18:28	17:21 (5) 20:22	06:58 21:12	20:00 (11) 21:53
9	08:43 16:46	08:05 17:39	07:07 18:30	17:18 (5) 20:23	06:56 21:14	19:59 (11) 21:54
10	08:42 16:47	08:03 17:41	07:05 18:32	17:17 (5) 20:25	06:54 21:15	19:59 (11) 21:55
11	08:42 16:49	08:01 17:43	07:03 18:33	17:15 (5) 20:27	06:52 21:17	19:58 (11) 21:56
12	08:41 16:50	07:59 17:45	07:00 18:35	17:15 (5) 20:28	06:49 21:18	19:58 (11) 21:56
13	08:40 16:52	07:58 17:46	06:58 18:37	17:15 (5) 20:30	06:47 21:20	19:57 (11) 21:57
14	08:40 16:53	07:56 17:48	06:56 18:39	17:14 (5) 20:32	06:45 21:22	19:57 (11) 21:57
15	08:39 16:55	07:54 17:50	06:54 18:40	17:13 (5) 20:33	06:43 19:51 (6)	19:56 (11) 21:58
16	08:38 16:56	07:52 17:52	06:51 18:42	17:14 (5) 20:35	06:41 19:59 (6)	19:56 (11) 21:59
17	08:37 16:58	07:50 17:54	06:49 18:44	17:14 (5) 20:37	06:38 19:46 (6)	19:56 (11) 21:59
18	08:36 17:00	07:48 17:56	06:47 18:46	17:13 (5) 20:39	06:36 19:44 (6)	19:56 (11) 21:59
19	08:35 17:01	07:46 17:57	06:44 18:47	17:14 (5) 20:40	06:34 19:43 (6)	19:56 (11) 22:00
20	08:34 17:03	07:44 17:59	06:42 18:49	17:15 (5) 20:42	06:32 20:02 (6)	19:56 (11) 22:00
21	08:33 17:05	07:42 18:01	06:40 18:51	17:15 (5) 20:44	06:30 20:03 (6)	19:57 (11) 22:00
22	08:32 17:06	07:40 18:03	06:37 18:53	17:17 (5) 20:45	06:28 20:03 (6)	19:56 (11) 22:01
23	08:31 17:08	07:38 18:05	06:35 18:54	17:19 (5) 20:47	06:26 20:02 (6)	19:56 (11) 22:01
24	08:29 17:10	07:36 18:07	06:33 18:56	17:22 (5) 20:49	06:24 20:02 (6)	19:57 (11) 22:01
25	08:28 17:11	07:33 18:08	06:31 18:58	17:48 (4) 20:50	06:22 20:02 (6)	19:57 (11) 22:01
26	08:27 17:13	07:31 18:10	06:28 18:59	17:51 (4) 20:52	06:20 20:01 (6)	19:57 (11) 22:01
27	08:26 17:15	07:29 18:12	06:26 19:01	17:59 (4) 20:54	06:18 20:01 (6)	19:58 (11) 22:01
28	08:24 17:17	07:27 18:14	06:24 19:03	06:16 20:55	19:43 (6) 20:00 (6)	19:58 (11) 22:01
29	08:23 17:19	07:25 19:04	06:21 20:04	06:14 20:57	19:44 (6) 19:58 (6)	19:59 (11) 22:01
30	08:21 17:20	07:23 20:06	06:19 20:12	06:12 20:59	19:46 (6) 19:56 (6)	20:00 (11) 22:00
31	08:20 17:22	07:21 20:08	06:17 20:10	06:10 20:59	19:45 (6) 21:45	20:00 (11) 20:50 (10)
Potential sun hours	259	278	367	416	485	499
Total, worst case			684	278	1039	1313
Sun reduction			0.24	0.35	0.37	0.30
Oper. time red.			1.00	1.00	1.00	1.00
Wind dir. red.			0.65	0.67	0.68	0.68
Total reduction			0.16	0.24	0.25	0.20
Total, real			108	66	261	269

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: D - H4

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 14 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-June) and rows for each day. Includes sub-totals for potential sun hours and various reduction factors.

Table layout: For each day in each month the following matrix apply

Matrix with 2 columns: Day in month and values for Sun rise/set, minutes with flicker, and WTG causing flicker first/last time.

SHADOW - Calendar

Calculation: Alternative Scenario 2 **Shadow receptor:** D - H4

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December	
1	05:22	05:58	06:48	07:37	07:30	08:07 (16) 08:21	
	22:00	21:28	20:26	19:17	17:11	109 10:21 (15) 16:31	
2	05:22	06:00	06:49	07:38	07:32	08:06 (16) 08:23	
	22:00	21:27	20:24	19:15	17:09	111 10:21 (15) 16:30	
3	05:23	06:01	06:51	07:40	07:34	08:06 (16) 08:24	
	21:59	21:25	20:22	19:12	17:07	113 10:22 (15) 16:29	
4	05:24	06:03	06:53	07:42	07:36	08:06 (16) 08:26	
	21:59	21:23	20:20	19:10	17:05	113 10:22 (15) 16:29	
5	05:25	06:04	06:54	07:43	07:38	08:06 (16) 08:27	
	21:59	21:22	20:17	19:08	17:04	113 10:22 (15) 16:28	
6	05:26	06:06	06:56	07:45	07:39	08:08 (16) 08:28	
	21:58	21:20	20:15	19:06	17:02	112 10:23 (15) 16:28	
7	05:26	06:08	06:58	07:47	07:41	08:10 (16) 08:29	
	21:57	21:18	20:13	19:03	17:00	110 10:23 (15) 16:28	
8	05:27	06:09	06:59	07:48	07:43	08:12 (16) 08:31	
	21:57	21:16	20:10	19:01	16:59	108 10:23 (15) 16:27	
9	05:28	06:11	07:01	07:50	07:45	08:14 (16) 08:32	
	21:56	21:14	20:08	18:59	16:57	106 10:23 (15) 16:27	
10	05:29	06:12	07:02	07:52	07:47	08:16 (16) 08:33	
	21:55	21:12	20:06	18:56	16:55	104 10:24 (15) 16:27	
11	05:30	06:14	07:04	07:54	07:48	08:18 (16) 08:34	
	21:55	21:10	20:03	18:54	16:54	102 10:24 (15) 16:27	
12	05:31	06:15	07:06	07:55	07:50	08:20 (16) 08:35	
	21:54	21:09	20:01	18:52	16:52	99 10:24 (15) 16:26	
13	05:33	06:17	07:07	07:57	07:52	08:21 (16) 08:36	
	21:53	21:07	19:59	18:50	16:51	97 10:23 (15) 16:26	
14	05:34	06:19	07:09	07:59	07:54	08:23 (16) 08:37	
	21:52	21:05	19:57	18:48	16:49	94 10:23 (15) 16:26	
15	05:35	06:20	07:11	08:00	07:55	08:25 (16) 08:38	
	21:51	21:03	19:54	18:45	16:48	91 10:23 (15) 16:26	
16	05:36	06:22	07:12	08:02	10:39 (15) 07:57	08:27 (16) 08:39	
	21:50	21:01	19:52	18:43	15 10:54 (15) 16:46	88 10:23 (15) 16:27	
17	05:37	06:24	07:14	08:04	10:34 (15) 07:59	08:29 (16) 08:40	
	21:49	20:59	19:50	18:41	26 11:00 (15) 16:45	85 10:23 (15) 16:27	
18	05:38	06:25	07:15	08:06	10:31 (15) 08:01	08:31 (16) 08:40	
	21:48	20:57	19:47	18:39	32 11:03 (15) 16:44	81 10:23 (15) 16:27	
19	05:40	06:27	07:17	08:07	10:28 (15) 08:02	08:33 (16) 08:41	
	21:47	20:55	19:45	18:37	37 11:05 (15) 16:42	78 10:23 (15) 16:27	
20	05:41	06:28	07:19	08:09	09:24 (16) 08:04	08:35 (16) 08:42	
	21:46	20:52	19:43	18:35	50 11:08 (15) 16:41	75 10:23 (15) 16:28	
21	05:42	06:30	07:20	08:11	09:20 (16) 08:06	08:36 (16) 08:42	
	21:44	20:50	19:40	18:33	63 11:10 (15) 16:40	71 10:22 (15) 16:28	
22	05:44	06:32	07:22	08:13	09:17 (16) 08:07	08:38 (16) 08:43	
	21:43	20:48	19:38	18:31	72 11:11 (15) 16:39	67 10:23 (15) 16:29	
23	05:45	06:33	07:24	08:14	09:15 (16) 08:09	09:19 (15) 08:43	
	21:42	20:46	19:36	18:29	79 11:13 (15) 16:38	64 10:23 (15) 16:29	
24	05:46	06:35	07:25	08:16	09:13 (16) 08:11	09:19 (15) 08:44	
	21:40	20:44	19:33	18:26	86 11:15 (15) 16:37	64 10:23 (15) 16:30	
25	05:48	06:36	07:27	07:18	08:12 (16) 08:12	09:20 (15) 08:44	
	21:39	20:42	19:31	17:24	90 10:16 (15) 16:36	63 10:23 (15) 16:30	
26	05:49	06:38	07:28	07:20	08:11 (16) 08:14	09:20 (15) 08:44	
	21:38	20:40	19:29	17:22	94 10:17 (15) 16:35	62 10:22 (15) 16:31	
27	05:51	06:40	07:30	07:21	08:10 (16) 08:15	09:22 (15) 08:45	
	21:36	20:37	19:26	17:20	98 10:18 (15) 16:34	60 10:22 (15) 16:32	
28	05:52	06:41	07:32	07:23	08:08 (16) 08:17	09:23 (15) 08:45	
	21:35	20:35	19:24	17:19	101 10:18 (15) 16:33	59 10:22 (15) 16:32	
29	05:54	06:43	07:33	07:25	08:08 (16) 08:18	09:23 (15) 08:45	
	21:33	20:33	19:22	17:17	104 10:19 (15) 16:32	59 10:22 (15) 16:33	
30	05:55	06:45	07:35	07:27	08:07 (16) 08:20	09:24 (15) 08:45	
	21:32	20:31	19:19	17:15	105 10:19 (15) 16:31	58 10:22 (15) 16:34	
31	05:57	06:46		07:29	08:07 (16)		08:45
	21:30	20:29		17:13	108 10:20 (15)		16:35
Potential sun hours	502	454	381	331	266	244	
Total, worst case				1160	2616	1447	
Sun reduction				0.24	0.18	0.13	
Oper. time red.				1.00	1.00	1.00	
Wind dir. red.				0.67	0.67	0.66	
Total reduction				0.16	0.12	0.09	
Total, real				184	322	129	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: E - H5

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45	10:16 (9)	08:18	10:23 (9)	07:25	07:14
	16:36	36 10:52 (9)	17:24	42 11:05 (9)	18:16	20:10
2	08:45	10:16 (9)	08:17	10:24 (9)	07:23	07:12
	16:37	36 10:52 (9)	17:26	40 11:04 (9)	18:18	20:11
3	08:45	10:16 (9)	08:15	10:24 (9)	07:21	07:10
	16:39	37 10:53 (9)	17:28	39 11:03 (9)	18:19	20:13
4	08:45	10:16 (9)	08:14	10:26 (9)	07:19	07:08
	16:40	39 10:55 (9)	17:30	37 11:03 (9)	18:21	20:15
5	08:45	09:58 (10)	08:12	10:27 (9)	07:16	07:05
	16:41	42 10:55 (9)	17:32	35 11:02 (9)	18:23	20:17
6	08:44	09:57 (10)	08:10	10:28 (9)	07:14	07:03
	16:42	46 10:56 (9)	17:33	32 11:00 (9)	18:25	20:18
7	08:44	09:55 (10)	08:09	10:30 (9)	07:12	07:01
	16:43	50 10:56 (9)	17:35	29 10:59 (9)	18:27	20:20
8	08:43	09:55 (10)	08:07	10:31 (9)	07:10	06:59
	16:45	53 10:58 (9)	17:37	26 10:57 (9)	18:28	20:22
9	08:43	09:54 (10)	08:05	10:34 (9)	07:07	06:56
	16:46	55 10:58 (9)	17:39	20 10:54 (9)	18:30	20:23
10	08:42	09:54 (10)	08:03	10:37 (9)	07:05	06:54
	16:47	57 10:58 (9)	17:41	13 10:50 (9)	18:32	20:25
11	08:42	09:54 (10)	08:02		07:03	06:52
	16:49	60 11:00 (9)	17:43		18:34	20:27
12	08:41	09:54 (10)	08:00		07:01	06:50
	16:50	61 11:00 (9)	17:45		18:35	20:28
13	08:41	09:53 (10)	07:58		06:58	06:47
	16:52	64 11:01 (9)	17:46		18:37	20:30
14	08:40	09:53 (10)	07:56	08:38 (12)	06:56	06:45
	16:53	64 11:01 (9)	17:48	2 08:40 (12)	18:39	20:32
15	08:39	09:53 (10)	07:54	08:34 (12)	06:54	06:43
	16:55	66 11:02 (9)	17:50	11 08:45 (12)	18:41	20:34
16	08:38	09:53 (10)	07:52	08:32 (12)	06:51	06:41
	16:56	68 11:03 (9)	17:52	15 08:47 (12)	18:42	20:35
17	08:37	09:53 (10)	07:50	08:30 (12)	06:49	06:39
	16:58	68 11:03 (9)	17:54	17 08:47 (12)	18:44	20:37
18	08:36	09:53 (10)	07:48	08:29 (12)	06:47	06:36
	17:00	69 11:04 (9)	17:56	19 08:48 (12)	18:46	20:39
19	08:35	09:54 (10)	07:46	08:28 (12)	06:45	06:34
	17:01	70 11:05 (9)	17:58	21 08:49 (12)	18:47	20:40
20	08:34	09:53 (10)	07:44	08:28 (12)	06:42	06:32
	17:03	70 11:04 (9)	17:59	21 08:49 (12)	18:49	20:42
21	08:33	09:54 (10)	07:42	08:28 (12)	06:40	06:30
	17:05	70 11:05 (9)	18:01	21 08:49 (12)	18:51	20:44
22	08:32	09:54 (10)	07:40	08:28 (12)	06:38	06:28
	17:06	70 11:05 (9)	18:03	21 08:49 (12)	18:53	20:45
23	08:31	09:54 (10)	07:38	08:28 (12)	06:35	06:26
	17:08	70 11:05 (9)	18:05	21 08:49 (12)	18:54	20:47
24	08:30	09:55 (10)	07:36	08:29 (12)	06:33	06:24
	17:10	70 11:06 (9)	18:07	20 08:49 (12)	18:56	20:49
25	08:28	09:56 (10)	07:34	08:28 (12)	06:31	06:22
	17:12	68 11:06 (9)	18:09	19 08:47 (12)	18:58	20:51
26	08:27	09:56 (10)	07:32	08:29 (12)	06:28	06:20
	17:13	67 11:06 (9)	18:10	17 08:46 (12)	19:00	20:52
27	08:26	09:57 (10)	07:29	08:31 (12)	06:26	06:18
	17:15	66 11:06 (9)	18:12	13 08:44 (12)	19:01	20:54
28	08:24	09:58 (10)	07:27	08:34 (12)	06:24	06:16
	17:17	64 11:06 (9)	18:14	8 08:42 (12)	19:03	20:56
29	08:23	10:00 (10)			07:21	06:14
	17:19	60 11:06 (9)			20:05	20:57
30	08:21	10:01 (10)			07:19	06:12
	17:21	57 11:06 (9)			20:06	20:59
31	08:20	10:03 (10)			07:17	05:25
	17:22	52 11:05 (9)			20:08	21:45
Potential sun hours	259		278		367	416
Total, worst case	1825		559			485
Sun reduction	0.16		0.21			
Oper. time red.	1.00		1.00			
Wind dir. red.	0.65		0.67			
Total reduction	0.10		0.14			
Total, real	186		77			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 2 Shadow receptor: E - H5

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22 22:00	05:58 21:28	06:48 20:26	07:37 19:17	07:31 17:11	10:06 (9) 16:31
2	05:22 22:00	06:00 21:27	06:49 20:24	07:38 19:15	07:32 17:09	10:03 (9) 16:30
3	05:23 22:00	06:01 21:25	06:51 20:22	07:40 19:12	07:34 17:07	10:01 (9) 16:29
4	05:24 21:59	06:03 21:23	06:53 20:20	07:42 19:10	07:36 17:05	10:27 (9) 16:29
5	05:25 21:59	06:04 21:22	06:54 20:17	07:43 19:08	07:38 17:04	10:58 (9) 16:28
6	05:25 21:58	06:06 21:20	06:56 20:15	07:45 19:06	07:40 17:02	10:57 (9) 16:28
7	05:26 21:58	06:07 21:18	06:58 20:13	07:47 19:03	07:41 17:00	10:56 (9) 16:27
8	05:27 21:57	06:09 21:16	06:59 20:10	07:49 19:01	07:43 16:59	10:55 (9) 16:27
9	05:28 21:56	06:11 21:14	07:01 20:08	07:50 18:59	07:45 16:57	10:55 (9) 16:27
10	05:29 21:56	06:12 21:12	07:02 20:06	07:52 18:56	07:47 16:55	10:54 (9) 16:27
11	05:30 21:55	06:14 21:11	07:04 20:04	07:54 18:54	07:48 16:54	10:54 (9) 16:26
12	05:31 21:54	06:15 21:09	07:06 20:01	07:55 18:52	07:50 16:52	10:53 (9) 16:26
13	05:32 21:53	06:17 21:07	07:07 19:59	07:57 18:50	07:52 16:51	10:52 (9) 16:26
14	05:34 21:52	06:19 21:05	07:09 19:57	07:59 18:48	07:54 16:49	10:51 (9) 16:26
15	05:35 21:51	06:20 21:03	07:11 19:54	08:00 18:45	07:56 16:48	10:50 (9) 16:26
16	05:36 21:50	06:22 21:01	07:12 19:52	08:02 18:43	07:57 16:46	10:49 (9) 16:26
17	05:37 21:49	06:23 20:59	07:14 19:50	08:04 18:41	07:59 16:45	10:48 (9) 16:27
18	05:38 21:48	06:25 20:57	07:15 19:47	08:06 18:39	08:01 16:44	10:47 (9) 16:27
19	05:40 21:47	06:27 20:55	07:17 19:45	08:07 18:37	08:02 16:42	10:46 (9) 16:27
20	05:41 21:46	06:28 20:53	07:19 19:43	08:09 18:35	08:04 16:41	10:45 (9) 16:28
21	05:42 21:44	06:30 20:50	07:20 19:40	08:11 18:33	08:06 16:40	10:44 (9) 16:28
22	05:44 21:43	06:32 20:48	07:22 19:38	08:13 18:31	08:07 16:39	10:43 (9) 16:28
23	05:45 21:42	06:33 20:46	07:24 19:36	08:14 18:29	08:09 16:38	10:42 (9) 16:29
24	05:46 21:41	06:35 20:44	07:25 19:33	08:16 18:26	08:11 16:37	10:41 (9) 16:30
25	05:48 21:39	06:36 20:42	07:27 19:31	08:18 18:24	08:12 16:36	10:40 (9) 16:30
26	05:49 21:38	06:38 20:40	07:29 19:29	08:20 18:22	08:14 16:35	10:39 (9) 16:31
27	05:51 21:36	06:40 20:38	07:30 19:26	08:22 18:20	08:15 16:34	10:38 (9) 16:32
28	05:52 21:35	06:41 20:35	07:32 19:24	08:23 18:18	08:17 16:33	10:37 (9) 16:32
29	05:54 21:33	06:43 20:33	07:33 19:22	08:25 18:17	08:19 16:32	10:36 (9) 16:33
30	05:55 21:32	06:45 20:31	07:35 19:19	08:27 18:15	08:20 16:31	10:35 (9) 16:34
31	05:57 21:30	06:46 20:29		08:29 18:13		10:34 (9) 16:35
Potential sun hours	502	454	381	331	266	244
Total, worst case				249	1634	1188
Sun reduction				0.24	0.18	0.13
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.69	0.65	0.65
Total reduction				0.16	0.12	0.09
Total, real				41	197	104

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: F - H6

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January to June) and rows for 31 days. Includes potential sun hours and various reduction factors.

Table layout: For each day in each month the following matrix apply

Matrix for table layout with columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 2 Shadow receptor: F - H6

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22 22:00	05:58 21:28	06:48 20:26	18:49 (5) 07:37	07:30 17:11	16:00 (15) 08:21
2	05:22 22:00	06:00 21:27	06:49 20:24	18:50 (5) 07:38	07:32 17:09	15:59 (15) 08:23
3	05:23 21:59	06:01 21:25	06:51 20:22	18:53 (5) 07:40	07:34 17:07	15:58 (15) 08:24
4	05:24 21:59	06:03 21:23	19:06 (5) 20:19	18:56 (5) 07:42	07:36 17:05	15:57 (15) 08:25
5	05:25 21:58	06:04 21:21	19:03 (5) 20:17	19:11 (4) 07:43	07:38 17:04	16:17 (15) 08:27
6	05:25 21:58	06:06 21:20	19:00 (5) 20:15	19:12 (4) 07:45	07:39 17:02	15:57 (15) 08:28
7	05:26 21:57	06:07 21:18	18:58 (5) 20:13	19:28 (4) 07:47	07:41 17:00	16:18 (15) 08:29
8	05:27 21:57	06:09 21:16	18:56 (5) 20:10	19:25 (4) 07:48	07:43 16:59	15:57 (15) 08:31
9	05:28 21:56	06:11 21:14	18:54 (5) 20:08	19:05 07:50	07:45 16:57	16:18 (15) 08:32
10	05:29 21:55	06:12 21:12	18:53 (5) 20:06	18:59 07:52	07:46 16:55	16:18 (15) 08:33
11	05:30 21:55	06:14 21:10	18:51 (5) 20:03	18:56 07:53	07:48 16:54	15:59 (15) 08:34
12	05:31 21:54	06:15 21:08	18:51 (5) 20:01	18:54 07:55	07:50 16:52	16:17 (15) 08:35
13	05:32 21:53	06:17 21:07	18:50 (5) 19:59	18:52 07:57	07:52 16:51	16:15 (15) 08:36
14	05:34 21:52	06:19 21:05	18:49 (5) 19:56	18:50 07:59	07:54 16:49	16:15 (15) 08:37
15	05:35 21:51	06:20 21:03	18:48 (5) 19:54	18:48 08:00	07:55 16:47	16:13 (15) 08:38
16	05:36 21:50	06:22 21:01	18:47 (5) 19:52	18:45 08:02	07:57 16:45	16:04 (15) 08:39
17	05:37 21:49	06:23 20:59	18:47 (5) 19:49	18:42 08:04	07:59 16:43	16:02 (15) 08:40
18	05:38 21:48	06:25 20:56	18:46 (5) 19:47	18:41 08:06	08:01 16:41	15:27 (16) 08:41
19	05:40 21:47	06:27 20:54	18:46 (5) 19:45	18:40 08:07	08:02 16:39	15:24 (16) 08:42
20	05:41 21:45	06:28 20:52	18:45 (5) 19:42	18:37 08:09	08:04 16:37	15:39 (16) 08:43
21	05:42 21:44	06:30 20:50	18:45 (5) 19:40	18:35 08:11	08:06 16:35	15:23 (16) 08:44
22	05:44 21:43	06:31 20:48	19:27 (4) 19:38	18:33 08:13	08:08 16:33	15:22 (16) 08:45
23	05:45 21:42	06:33 20:46	18:44 (5) 19:35	18:31 08:14	08:09 16:31	15:41 (16) 08:46
24	05:46 21:40	06:35 20:44	19:33 (4) 19:33	18:28 08:16	08:11 16:29	15:43 (16) 08:47
25	05:48 21:39	06:36 20:42	18:44 (5) 19:31	18:26 08:18	08:13 16:27	15:21 (16) 08:48
26	05:49 21:37	06:38 20:40	19:35 (4) 19:28	18:24 08:20	08:14 16:25	15:44 (16) 08:49
27	05:51 21:36	06:40 20:37	18:44 (5) 19:26	18:22 08:22	08:16 16:23	15:41 (16) 08:50
28	05:52 21:35	06:41 20:35	19:35 (4) 19:24	18:20 08:23	08:17 16:21	15:45 (16) 08:51
29	05:54 21:33	06:43 20:33	18:46 (5) 19:21	18:18 08:25	08:19 16:19	15:22 (16) 08:52
30	05:55 21:31	06:44 20:31	19:35 (4) 19:19	18:16 08:27	08:21 16:17	15:46 (16) 08:53
31	05:57 21:30	06:46 20:28	18:47 (5) 19:17	18:14 08:29	08:23 16:15	15:44 (16) 08:54
Potential sun hours	502	454	381	331	266	244
Total, worst case		1073	206	14	540	659
Sun reduction		0.30	0.28	0.24	0.18	0.13
Oper. time red.		1.00	1.00	1.00	1.00	1.00
Wind dir. red.		0.68	0.68	0.61	0.60	0.58
Total reduction		0.20	0.19	0.14	0.11	0.08
Total, real		211	39	2	58	50

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: G - H7

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N to Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main data table with columns for months (January to June) and rows for each day of the month, showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix table with 4 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 2**Shadow receptor:** G - H7**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December		
1	05:22	05:58	06:48	18:43 (5) 07:37	07:30	16:00 (15) 08:21	15:21 (16)	
	22:00	21:28	20:26	50 19:33 (4) 19:17	17:11	12 16:12 (15) 16:31	25 15:46 (16)	
2	05:22	06:00	06:49	18:43 (5) 07:38	07:32	15:59 (15) 08:23	15:22 (16)	
	22:00	21:27	20:24	49 19:32 (4) 19:15	17:09	14 16:13 (15) 16:30	25 15:47 (16)	
3	05:23	06:01	06:51	18:45 (5) 07:40	07:34	15:58 (15) 08:24	15:22 (16)	
	21:59	21:25	20:22	47 19:32 (4) 19:12	17:07	16 16:14 (15) 16:29	24 15:46 (16)	
4	05:24	06:03	06:53	18:46 (5) 07:42	07:36	15:57 (15) 08:25	15:23 (16)	
	21:59	21:23	20:19	44 19:30 (4) 19:10	17:05	18 16:15 (15) 16:29	24 15:47 (16)	
5	05:25	06:04	06:54	18:48 (5) 07:43	07:38	15:57 (15) 08:27	15:23 (16)	
	21:58	21:21	20:17	41 19:29 (4) 19:08	17:04	19 16:16 (15) 16:28	24 15:47 (16)	
6	05:25	06:06	06:56	18:52 (5) 07:45	07:39	15:56 (15) 08:28	15:24 (16)	
	21:58	21:20	20:15	31 19:28 (4) 19:05	17:02	20 16:16 (15) 16:28	24 15:48 (16)	
7	05:26	06:07	06:57	19:09 (4) 07:47	07:41	15:56 (15) 08:29	15:24 (16)	
	21:57	21:18	20:13	17 19:26 (4) 19:03	17:00	21 16:17 (15) 16:27	24 15:48 (16)	
8	05:27	06:09	19:00 (5) 06:59	19:11 (4) 07:48	07:43	15:56 (15) 08:31	15:25 (16)	
	21:57	21:16	13 19:13 (5) 20:10	13 19:24 (4) 19:01	16:59	21 16:17 (15) 16:27	23 15:48 (16)	
9	05:28	06:11	18:56 (5) 07:01	19:14 (4) 07:50	07:45	15:57 (15) 08:32	15:25 (16)	
	21:56	21:14	19 19:15 (5) 20:08	5 19:19 (4) 18:59	16:57	20 16:17 (15) 16:27	23 15:48 (16)	
10	05:29	06:12	18:55 (5) 07:02	07:52	07:46	15:57 (15) 08:33	15:26 (16)	
	21:55	21:12	22 19:17 (5) 20:06	18:56	16:55	20 16:17 (15) 16:27	23 15:49 (16)	
11	05:30	06:14	18:52 (5) 07:04	07:53	07:48	15:58 (15) 08:34	15:27 (16)	
	21:55	21:10	26 19:18 (5) 20:03	18:54	16:54	19 16:17 (15) 16:26	22 15:49 (16)	
12	05:31	06:15	18:51 (5) 07:06	07:55	07:50	15:58 (15) 08:35	15:27 (16)	
	21:54	21:08	29 19:20 (5) 20:01	18:52	16:52	17 16:15 (15) 16:26	23 15:50 (16)	
13	05:32	06:17	18:50 (5) 07:07	07:57	07:52	15:58 (15) 08:36	15:28 (16)	
	21:53	21:07	31 19:21 (5) 19:59	18:50	16:51	17 16:15 (15) 16:26	22 15:50 (16)	
14	05:34	06:19	18:48 (5) 07:09	07:59	07:54	16:00 (15) 08:37	15:29 (16)	
	21:52	21:05	34 19:22 (5) 19:56	18:48	16:49	14 16:14 (15) 16:26	21 15:50 (16)	
15	05:35	06:20	18:48 (5) 07:10	08:00	07:55	16:01 (15) 08:38	15:29 (16)	
	21:51	21:03	35 19:23 (5) 19:54	18:45	16:48	12 16:13 (15) 16:26	22 15:51 (16)	
16	05:36	06:22	18:46 (5) 07:12	08:02	07:57	16:04 (15) 08:39	15:29 (16)	
	21:50	21:01	37 19:23 (5) 19:52	18:43	16:46	7 16:11 (15) 16:26	21 15:50 (16)	
17	05:37	06:23	18:46 (5) 07:14	08:04	07:59	08:39	15:30 (16)	
	21:49	20:59	38 19:24 (5) 19:49	18:41	16:45	16:27	21 15:51 (16)	
18	05:38	06:25	18:44 (5) 07:15	08:06	08:01	15:27 (16) 08:40	15:31 (16)	
	21:48	20:57	39 19:23 (5) 19:47	18:39	16:44	7 15:34 (16) 16:27	20 15:51 (16)	
19	05:40	06:27	18:44 (5) 07:17	08:07	08:02	15:25 (16) 08:41	15:31 (16)	
	21:47	20:54	40 19:24 (5) 19:45	18:37	16:42	12 15:37 (16) 16:27	21 15:52 (16)	
20	05:41	06:28	18:43 (5) 07:19	08:09	08:04	15:24 (16) 08:42	15:31 (16)	
	21:45	20:52	41 19:24 (5) 19:42	18:35	16:41	14 15:38 (16) 16:27	21 15:52 (16)	
21	05:42	06:30	18:43 (5) 07:20	08:11	08:06	15:22 (16) 08:42	15:32 (16)	
	21:44	20:50	41 19:24 (5) 19:40	18:33	16:40	17 15:39 (16) 16:28	21 15:53 (16)	
22	05:44	06:31	18:42 (5) 07:22	08:13	08:07	15:22 (16) 08:43	15:32 (16)	
	21:43	20:48	41 19:23 (5) 19:38	18:30	16:39	18 15:40 (16) 16:28	21 15:53 (16)	
23	05:45	06:33	18:42 (5) 07:23	08:14	08:09	15:21 (16) 08:43	15:33 (16)	
	21:42	20:46	45 19:27 (4) 19:35	18:28	16:38	20 15:41 (16) 16:29	21 15:54 (16)	
24	05:46	06:35	18:41 (5) 07:25	08:16	08:11	15:21 (16) 08:44	15:33 (16)	
	21:40	20:44	48 19:29 (4) 19:33	18:26	16:37	21 15:42 (16) 16:29	21 15:54 (16)	
25	05:48	06:36	18:41 (5) 07:27	07:18	08:12	15:20 (16) 08:44	15:34 (16)	
	21:39	20:42	50 19:31 (4) 19:31	17:24	16:36	22 15:42 (16) 16:30	20 15:54 (16)	
26	05:49	06:38	18:40 (5) 07:28	07:20	08:14	15:21 (16) 08:44	15:34 (16)	
	21:37	20:40	51 19:31 (4) 19:28	17:22	16:35	22 15:43 (16) 16:31	21 15:55 (16)	
27	05:51	06:40	18:41 (5) 07:30	07:21	08:15	15:21 (16) 08:45	15:35 (16)	
	21:36	20:37	51 19:32 (4) 19:26	17:20	16:34	23 15:44 (16) 16:32	21 15:56 (16)	
28	05:52	06:41	18:41 (5) 07:32	07:23	08:17	15:21 (16) 08:45	15:35 (16)	
	21:35	20:35	52 19:33 (4) 19:24	17:18	16:33	24 15:45 (16) 16:32	22 15:57 (16)	
29	05:54	06:43	18:41 (5) 07:33	07:25	08:18	15:21 (16) 08:45	15:36 (16)	
	21:33	20:33	52 19:33 (4) 19:21	17:16	16:32	24 15:45 (16) 16:33	21 15:57 (16)	
30	05:55	06:44	18:42 (5) 07:35	07:27	08:20	15:22 (16) 08:45	15:36 (16)	
	21:31	20:31	51 19:33 (4) 19:19	17:15	16:31	24 15:46 (16) 16:34	22 15:58 (16)	
31	05:57	06:46	18:42 (5) 07:36	07:29	07:29	08:45	15:36 (16)	
	21:30	20:28	51 19:33 (4) 19:15	17:13	6 16:03 (15) 16:09 (15)	16:35	22 15:58 (16)	
Potential sun hours	502	454	381	331	266	244		
Total, worst case			937	297	6		515	686
Sun reduction			0.30	0.28	0.24		0.18	0.13
Oper. time red.			1.00	1.00	1.00			1.00
Wind dir. red.			0.68	0.68	0.61		0.60	0.58
Total reduction			0.20	0.19	0.14		0.11	0.08
Total, real			184	56	1		56	53

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 2 **Shadow receptor:** H - H8

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June		
1	08:45	10:07 (10)	08:18	07:25	07:14	06:10	05:25	
	16:36	66 11:33 (9)	17:24	18:16	20:10	21:01	21:46	
2	08:45	10:07 (10)	08:17	07:23	07:12	06:08	05:24	
	16:37	66 11:33 (9)	17:26	18:18	20:11	21:02	21:48	
3	08:45	10:07 (10)	08:15	07:21	07:10	06:06	05:23	
	16:39	67 11:34 (9)	17:28	18:19	20:13	21:04	21:49	
4	08:45	10:08 (10)	08:14	07:19	07:08	06:04	05:22	
	16:40	67 11:34 (9)	17:30	18:21	20:15	21:06	21:50	
5	08:45	10:08 (10)	08:12	07:16	07:05	06:02	05:21	
	16:41	67 11:34 (9)	17:32	18:23	20:17	21:07	21:51	
6	08:44	10:09 (10)	08:10	08:52 (12)	07:14	07:03	06:00	05:21
	16:42	67 11:35 (9)	17:33	9 09:01 (12)	18:25	20:18	21:09	21:52
7	08:44	10:08 (10)	08:09	08:50 (12)	07:12	07:01	05:59	05:20
	16:43	68 11:35 (9)	17:35	13 09:03 (12)	18:27	20:20	21:11	21:53
8	08:43	10:09 (10)	08:07	08:48 (12)	07:10	06:59	05:57	05:20
	16:45	68 11:36 (9)	17:37	17 09:05 (12)	18:28	20:22	21:12	21:53
9	08:43	10:10 (10)	08:05	08:47 (12)	07:07	06:56	05:55	05:19
	16:46	66 11:36 (9)	17:39	19 09:06 (12)	18:30	20:23	21:14	21:54
10	08:42	10:10 (10)	08:03	08:46 (12)	07:05	06:54	05:53	05:19
	16:47	66 11:36 (9)	17:41	20 09:06 (12)	18:32	20:25	21:15	21:55
11	08:42	10:11 (10)	08:02	08:47 (12)	07:03	06:52	05:52	05:18
	16:49	65 11:36 (9)	17:43	21 09:08 (12)	18:34	20:27	21:17	21:56
12	08:41	10:11 (10)	08:00	08:47 (12)	07:01	06:50	05:50	05:18
	16:50	64 11:36 (9)	17:45	21 09:08 (12)	18:35	20:28	21:19	21:56
13	08:41	10:12 (10)	07:58	08:46 (12)	06:58	06:47	05:48	05:18
	16:52	63 11:36 (9)	17:46	22 09:08 (12)	18:37	20:30	21:20	21:57
14	08:40	10:12 (10)	07:56	08:46 (12)	06:56	06:45	05:47	05:18
	16:53	62 11:36 (9)	17:48	22 09:08 (12)	18:39	20:32	21:22	21:58
15	08:39	10:13 (10)	07:54	08:47 (12)	06:54	06:43	05:45	05:17
	16:55	60 11:36 (9)	17:50	21 09:08 (12)	18:41	20:34	21:23	21:58
16	08:38	10:14 (10)	07:52	08:47 (12)	06:51	06:41	05:44	05:17
	16:56	59 11:36 (9)	17:52	21 09:08 (12)	18:42	20:35	21:25	21:59
17	08:37	10:15 (10)	07:50	08:47 (12)	06:49	06:39	05:42	05:17
	16:58	57 11:36 (9)	17:54	19 09:06 (12)	18:44	20:37	21:26	21:59
18	08:36	10:16 (10)	07:48	08:48 (12)	06:47	06:36	05:41	05:17
	17:00	55 11:36 (9)	17:56	17 09:05 (12)	18:46	20:39	21:28	22:00
19	08:35	10:17 (10)	07:46	08:49 (12)	06:45	06:34	05:39	05:17
	17:01	52 11:36 (9)	17:58	15 09:04 (12)	18:47	20:40	21:29	22:00
20	08:34	10:17 (10)	07:44	08:51 (12)	06:42	06:32	05:38	05:17
	17:03	49 11:35 (9)	17:59	11 09:02 (12)	18:49	20:42	21:31	22:00
21	08:33	10:19 (10)	07:42	06:40	06:30	06:30	05:37	05:17
	17:05	44 11:34 (9)	18:01	18:51	20:44	21:32	22:01	
22	08:32	10:22 (10)	07:40	06:38	06:28	06:28	05:35	05:18
	17:06	37 11:34 (9)	18:03	18:53	20:45	21:34	22:01	
23	08:31	11:04 (9)	07:38	06:35	06:26	06:26	05:34	05:18
	17:08	28 11:32 (9)	18:05	18:54	20:47	21:35	22:01	
24	08:30	11:06 (9)	07:36	06:33	06:24	06:24	05:33	05:18
	17:10	25 11:31 (9)	18:07	18:56	20:49	21:36	22:01	
25	08:28	11:09 (9)	07:34	06:31	06:22	06:22	05:32	05:19
	17:12	21 11:30 (9)	18:09	18:58	20:51	21:38	22:01	
26	08:27	11:11 (9)	07:32	06:28	06:20	06:20	05:30	05:19
	17:13	16 11:27 (9)	18:10	19:00	20:52	21:39	22:01	
27	08:26	11:15 (9)	07:29	06:26	06:18	06:18	05:29	05:19
	17:15	9 11:24 (9)	18:12	19:01	20:54	21:40	22:01	
28	08:24		07:27	06:24	06:16	06:16	05:28	05:20
	17:17		18:14	19:03	20:56	21:42	22:01	
29	08:23			07:21	06:14	06:14	05:27	05:20
	17:19			20:05	20:57	21:43	22:01	
30	08:21			07:19	06:12	06:12	05:26	05:21
	17:21			20:06	20:59	21:44	22:01	
31	08:20			07:17		06:10	05:25	
	17:22			20:08		21:45		
Potential sun hours	259	278	367	416	485	499		
Total, worst case	1434	268						
Sun reduction	0.16	0.21						
Oper. time red.	1.00	1.00						
Wind dir. red.	0.63	0.68						
Total reduction	0.10	0.14						
Total, real	141	38						

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 2 Shadow receptor: H - H8

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (July-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Summary table with 4 columns: Day in month, Sun rise/set, Minutes with flicker, and WTG causing flicker times.

Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:58/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: I - H9
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Table with columns for months (January to December) and rows for each day of the year (1 to 365). Each cell contains a time range (hh:mm) and a probability value. Summary statistics are provided at the bottom of the table.

Table layout: For each day in each month the following matrix apply

Matrix with 4 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time).



SHADOW - Calendar

Calculation: Alternative Scenario 2 Shadow receptor: J - H10

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

January		February		March		April		May		June		
1	08:45	15:29 (16)	08:18	07:25		07:14		18:17 (5)	06:10		05:25	
	16:36	20	15:49 (16)	17:24		20:10	53	19:13 (4)	21:00		21:46	
2	08:45		15:30 (16)	08:17		07:12		18:18 (5)	06:08		05:24	
	16:37	19	15:49 (16)	17:26		20:11	48	19:12 (4)	21:02		21:47	
3	08:45		15:31 (16)	08:15		07:10		18:19 (5)	06:06		05:23	
	16:39	19	15:50 (16)	17:28		20:13	41	19:09 (4)	21:04		21:48	
4	08:45		15:33 (16)	08:14		07:08		18:20 (5)	06:04		05:22	
	16:40	17	15:50 (16)	17:30		20:15	32	19:06 (4)	21:05		21:49	
5	08:44		15:33 (16)	08:12		07:05		18:22 (5)	06:02		05:21	
	16:41	17	15:50 (16)	17:32		20:16	21	18:43 (5)	21:07		21:50	
6	08:44		15:34 (16)	08:10		07:03		18:25 (5)	06:00		05:21	
	16:42	16	15:50 (16)	17:33		20:18	15	18:40 (5)	21:09		21:51	
7	08:44		15:35 (16)	08:08		07:01		18:30 (5)	05:59		05:20	
	16:43	15	15:50 (16)	17:35		20:20	3	18:33 (5)	21:10		21:52	
8	08:43		15:35 (16)	08:07		06:58			05:57		05:20	
	16:45	14	15:49 (16)	17:37		20:22			21:12		21:53	
9	08:43		15:37 (16)	08:05		06:56			05:55		05:19	
	16:46	12	15:49 (16)	17:39		20:23			21:14		21:54	
10	08:42		15:39 (16)	08:03		06:54			05:53		05:19	
	16:47	9	15:48 (16)	17:41		20:25			21:15		21:55	
11	08:42		15:41 (16)	08:01		06:52			05:52		05:18	
	16:49	5	15:46 (16)	17:43		20:27			21:17	7	21:01 (11)	
12	08:41			07:59		06:49			05:50		05:18	
	16:50			17:45		20:28			21:18	10	21:03 (11)	
13	08:40			06:58		06:47			05:48		05:18	
	16:52			17:46		20:30			21:20	12	21:05 (11)	
14	08:40			06:56	5	17:36 (5)			05:47		05:18	
	16:53			17:48		20:32			21:22	14	21:06 (11)	
15	08:39			06:54		17:30 (5)			05:45		05:17	
	16:55			17:50	16	17:46 (5)			21:23	15	21:07 (11)	
16	08:38			06:51		17:27 (5)			05:44		05:17	
	16:56			17:52	21	17:48 (5)			21:25	15	21:06 (11)	
17	08:37			06:49		17:25 (5)			05:42		05:17	
	16:58			17:54	25	17:50 (5)			21:26	16	21:07 (11)	
18	08:36			06:47		17:23 (5)			05:41		05:17	
	17:00			18:46	28	17:51 (5)			21:28	16	21:08 (11)	
19	08:35			06:44		17:21 (5)			05:39		05:17	
	17:01			17:57	31	17:52 (5)			21:29	17	21:09 (11)	
20	08:34			06:42		17:20 (5)			05:38		05:17	
	17:03			18:49	39	18:10 (4)			21:31	18	21:09 (11)	
21	08:33			06:40		17:19 (5)			05:37		05:17	
	17:05			18:01	47	18:12 (4)			21:32	18	21:09 (11)	
22	08:32			06:37		17:18 (5)			05:35		05:18	
	17:06			18:03	53	18:15 (4)			21:33	18	21:09 (11)	
23	08:31			06:35		17:18 (5)			05:34		05:18	
	17:08			18:05	56	18:16 (4)			21:35	17	21:09 (11)	
24	08:29			06:33		17:17 (5)			05:33		05:18	
	17:10			18:07	60	18:17 (4)			21:36	17	21:10 (11)	
25	08:28			06:31		17:16 (5)			05:32		05:19	
	17:12			18:08	61	18:17 (4)			21:38	16	21:09 (11)	
26	08:27			06:28		17:16 (5)			05:30		05:19	
	17:13			18:10	61	18:17 (4)			21:39	16	21:10 (11)	
27	08:26			06:26		17:16 (5)			05:29		05:19	
	17:15			18:12	61	18:17 (4)			21:40	15	21:09 (11)	
28	08:24			06:24		17:16 (5)			05:28		05:20	
	17:17			18:14	60	18:16 (4)			21:41	14	21:08 (11)	
29	08:23			06:21		18:16 (5)			05:27		05:20	
	17:19				60	19:16 (4)			21:43	12	21:08 (11)	
30	08:21			06:19		18:17 (5)			05:26		05:21	
	17:20			20:06	58	19:16 (4)			21:44	11	21:08 (11)	
31	08:20			06:17		18:16 (5)			05:25			
	17:22			20:08	56	19:14 (4)			21:45			
Potential sun hours	259		278	367		416		485		499		
Total, worst case	163			798		213				294		
Sun reduction	0.16			0.24		0.35				0.30		
Oper. time red.	1.00			1.00		1.00				1.00		
Wind dir. red.	0.59			0.66		0.66				0.69		
Total reduction	0.09			0.16		0.23				0.20		
Total, real	15			126		49				60		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 2 Shadow receptor: J - H10

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December					
1	05:22	20:58 (11)	05:58	06:48	07:37	07:30	08:21	15:23 (16)			
	22:00	8 21:06 (11)	21:28	20:26	19:17	17:11	16:31	5 15:28 (16)			
2	05:22	21:00 (11)	06:00	06:49	07:38	07:32	08:23	15:22 (16)			
	22:00	5 21:05 (11)	21:27	20:24	19:15	17:09	16:30	9 15:31 (16)			
3	05:23		06:01	06:51	07:40	07:34	08:24	15:21 (16)			
	21:59		21:25	20:22	19:12	17:07	16:29	11 15:32 (16)			
4	05:24		06:03	06:53	07:42	07:36	08:25	15:21 (16)			
	21:59		21:23	20:19	19:10	17:05	16:29	13 15:34 (16)			
5	05:25		06:04	06:54	07:43	07:38	08:27	15:20 (16)			
	21:58		21:21	20:17	19:08	17:04	16:28	15 15:35 (16)			
6	05:25		06:06	06:56	18:21 (5)	07:45	07:39	08:28	15:20 (16)		
	21:58		21:20	20:15	15 18:36 (5)	19:05	17:02	16:28	16 15:36 (16)		
7	05:26		06:07	06:57	18:18 (5)	07:47	07:41	08:29	15:20 (16)		
	21:57		21:18	20:13	20 18:38 (5)	19:03	17:00	16:27	17 15:37 (16)		
8	05:27		06:09	06:59	18:16 (5)	07:48	07:43	08:31	15:20 (16)		
	21:57		21:16	20:10	31 19:01 (4)	19:01	16:58	16:27	17 15:37 (16)		
9	05:28		06:11	07:01	18:13 (5)	07:50	07:45	08:32	15:20 (16)		
	21:56		21:14	20:08	40 19:03 (4)	18:59	16:57	16:27	18 15:38 (16)		
10	05:29		06:12	07:02	18:12 (5)	07:52	07:46	08:33	15:21 (16)		
	21:55		21:12	20:06	47 19:05 (4)	18:56	16:55	16:27	18 15:39 (16)		
11	05:30		06:14	07:04	18:10 (5)	07:53	07:48	08:34	15:21 (16)		
	21:55		21:10	20:03	51 19:05 (4)	18:54	16:54	16:26	19 15:40 (16)		
12	05:31		06:15	07:06	18:09 (5)	07:55	07:50	08:35	15:21 (16)		
	21:54		21:08	20:01	55 19:06 (4)	18:52	16:52	16:26	19 15:40 (16)		
13	05:32		06:17	07:07	18:07 (5)	07:57	07:52	08:36	15:21 (16)		
	21:53		21:07	19:59	58 19:06 (4)	18:50	16:51	16:26	20 15:41 (16)		
14	05:34		06:19	07:09	18:06 (5)	07:59	07:54	08:37	15:21 (16)		
	21:52		21:05	19:56	60 19:06 (4)	18:48	16:49	16:26	21 15:42 (16)		
15	05:35		06:20	07:10	18:06 (5)	08:00	07:55	08:38	15:22 (16)		
	21:51		21:03	19:54	61 19:07 (4)	18:45	16:48	16:26	20 15:42 (16)		
16	05:36		06:22	07:12	18:05 (5)	08:02	07:57	08:39	15:21 (16)		
	21:50		21:01	19:52	61 19:06 (4)	18:43	16:46	16:26	21 15:42 (16)		
17	05:37		06:23	07:14	18:05 (5)	08:04	07:59	08:39	15:22 (16)		
	21:49		20:59	19:49	61 19:06 (4)	18:41	16:45	16:27	21 15:43 (16)		
18	05:38		06:25	07:15	18:04 (5)	08:06	08:01	08:40	15:23 (16)		
	21:48		20:57	19:47	60 19:04 (4)	18:39	16:44	16:27	20 15:43 (16)		
19	05:40		06:27	07:17	18:04 (5)	08:07	08:02	08:41	15:23 (16)		
	21:47		20:54	19:45	59 19:04 (4)	18:37	16:42	16:27	21 15:44 (16)		
20	05:41		06:28	07:19	18:04 (5)	08:09	08:04	08:42	15:23 (16)		
	21:45		20:52	19:42	58 19:03 (4)	18:35	16:41	16:27	21 15:44 (16)		
21	05:42		06:30	07:20	18:03 (5)	08:11	08:06	08:42	15:24 (16)		
	21:44		20:50	19:40	54 19:00 (4)	18:33	16:40	16:28	21 15:45 (16)		
22	05:44		06:31	07:22	18:04 (5)	08:13	08:07	08:43	15:24 (16)		
	21:43		20:48	19:38	50 18:59 (4)	18:30	16:39	16:28	21 15:45 (16)		
23	05:45		06:33	07:23	18:04 (5)	08:14	08:09	08:43	15:25 (16)		
	21:42		20:46	19:35	42 18:55 (4)	18:28	16:38	16:29	21 15:46 (16)		
24	05:46		06:35	07:25	18:05 (5)	08:16	08:11	08:44	15:25 (16)		
	21:40		20:44	19:33	31 18:36 (5)	18:26	16:37	16:29	21 15:46 (16)		
25	05:48		06:36	07:27	18:06 (5)	07:18	08:12	08:44	15:26 (16)		
	21:39		20:42	19:31	29 18:35 (5)	17:24	16:36	16:30	20 15:46 (16)		
26	05:49		06:38	07:28	18:06 (5)	07:20	08:14	08:44	15:26 (16)		
	21:37		20:40	19:28	27 18:33 (5)	17:22	16:35	16:31	21 15:47 (16)		
27	05:51		06:40	07:30	18:08 (5)	07:21	08:15	08:45	15:27 (16)		
	21:36		20:37	19:26	23 18:31 (5)	17:20	16:34	16:32	21 15:48 (16)		
28	05:52		06:41	07:32	18:10 (5)	07:23	08:17	08:45	15:28 (16)		
	21:35		20:35	19:24	18 18:28 (5)	17:18	16:33	16:32	20 15:48 (16)		
29	05:54		06:43	07:33	18:13 (5)	07:25	08:18	08:45	15:28 (16)		
	21:33		20:33	19:21	11 18:24 (5)	17:16	16:32	16:33	20 15:48 (16)		
30	05:55		06:44	07:35		07:27	08:20	08:45	15:29 (16)		
	21:31		20:31	19:19		17:15	16:31	16:34	20 15:49 (16)		
31	05:57		06:46			07:29		08:45	15:29 (16)		
	21:30		20:28			17:13		16:35	20 15:49 (16)		
Potential sun hours	502	454	381		331	266	244				
Total, worst case	13			1022						568	
Sun reduction	0.27			0.28						0.13	
Oper. time red.	1.00			1.00						1.00	
Wind dir. red.	0.69			0.66						0.59	
Total reduction	0.18			0.18						0.08	
Total, real	2			188						45	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

6225Gortyrally_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:58/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: K - H11

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Table with columns for months (January to December) and rows for each day from 1 to 31, showing sunrise/sunset times and shadow reduction metrics.

Table layout: For each day in each month the following matrix apply

Matrix with 4 columns: Day in month, Sun rise/set, Minutes with flicker, and (WTG causing flicker first/last time).



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:58/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: L - H12

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June	July	August	September	October	November	December	
1	08:45	11:20 (10) 08:18	09:39 (12) 07:25	07:14	06:10	05:25	05:22	05:58	06:48	07:37	07:31	08:21	12:44 (9)
2	08:45	11:22 (10) 08:17	09:39 (12) 07:23	07:12	06:08	05:24	05:22	06:00	06:49	07:38	07:32	08:23	12:43 (9)
3	08:45	12:54 (9) 08:15	09:40 (12) 07:21	07:11	06:06	05:23	05:23	06:01	06:51	07:40	07:34	08:24	12:43 (9)
4	08:45	12:55 (9) 08:14	09:42 (12) 07:18	07:08	06:04	05:22	05:24	06:03	06:53	07:42	07:36	08:25	12:43 (9)
5	08:45	12:55 (9) 08:12	09:43 (12) 07:16	07:05	06:02	05:21	05:25	06:04	06:54	07:43	07:38	08:26	12:43 (9)
6	08:44	12:56 (9) 08:10	09:45 (12) 07:14	07:03	06:00	05:21	05:25	06:06	06:56	07:45	07:40	08:27	12:43 (9)
7	08:44	12:57 (9) 08:09	09:48 (12) 07:12	07:01	05:59	05:20	05:26	06:07	06:58	07:47	07:41	08:28	12:43 (9)
8	08:43	12:59 (9) 08:07	09:54 (12) 07:10	06:58	05:57	05:20	05:27	06:09	06:59	07:49	07:43	08:29	12:42 (9)
9	08:43	12:59 (9) 08:05	07:07	06:56	05:55	05:19	05:28	06:11	07:01	07:50	07:45	08:30	12:42 (9)
10	08:42	13:00 (9) 08:03	07:05	06:54	05:53	05:19	05:29	06:12	07:02	07:52	07:47	08:31	11:13 (10)
11	08:42	13:02 (9) 08:01	07:03	06:52	05:52	05:18	05:30	06:14	07:04	07:54	07:48	08:32	11:11 (10)
12	08:41	13:04 (9) 08:00	07:01	06:50	05:50	05:18	05:31	06:15	07:06	07:55	07:50	08:33	11:10 (10)
13	08:41	13:05 (9) 07:58	06:58	06:47	05:48	05:18	05:32	06:17	07:07	07:57	07:52	08:34	11:10 (10)
14	08:40	09:45 (12) 07:56	06:56	06:45	05:47	05:18	05:33	06:19	07:09	07:59	07:54	08:35	11:10 (10)
15	08:39	09:42 (12) 07:54	06:54	06:43	05:45	05:17	05:35	06:20	07:11	08:00	07:55	08:36	11:10 (10)
16	08:38	09:40 (12) 07:52	06:51	06:41	05:44	05:17	05:36	06:22	07:12	08:02	07:57	08:37	11:10 (10)
17	08:37	09:39 (12) 07:50	06:49	06:39	05:42	05:17	05:37	06:23	07:14	08:04	07:59	08:38	11:09 (10)
18	08:36	09:39 (12) 07:48	06:47	06:36	05:41	05:17	05:38	06:25	07:15	08:06	08:01	08:39	11:10 (10)
19	08:35	09:38 (12) 07:46	06:44	06:34	05:39	05:17	05:40	06:27	07:17	08:07	08:02	08:40	11:10 (10)
20	08:34	09:37 (12) 07:44	06:42	06:32	05:38	05:17	05:41	06:28	07:19	08:09	08:04	08:41	11:10 (10)
21	08:33	09:37 (12) 07:42	06:40	06:30	05:37	05:17	05:42	06:30	07:20	08:11	08:06	08:42	11:11 (10)
22	08:32	09:37 (12) 07:40	06:38	06:28	05:35	05:18	05:44	06:32	07:22	08:13	08:07	08:43	11:11 (10)
23	08:31	09:36 (12) 07:38	06:35	06:26	05:34	05:18	05:45	06:33	07:24	08:14	08:09	08:44	11:12 (10)
24	08:30	09:36 (12) 07:36	06:33	06:24	05:33	05:18	05:46	06:35	07:25	08:16	08:11	08:44	11:12 (10)
25	08:28	09:37 (12) 07:34	06:31	06:22	05:32	05:18	05:48	06:36	07:27	08:18	08:12	08:44	11:14 (10)
26	08:27	09:36 (12) 07:32	06:28	06:20	05:30	05:19	05:49	06:38	07:28	08:20	08:14	08:45	11:14 (10)
27	08:26	09:37 (12) 07:29	06:26	06:18	05:29	05:19	05:51	06:40	07:30	08:22	08:15	08:45	11:15 (10)
28	08:24	09:37 (12) 07:27	06:24	06:16	05:28	05:20	05:52	06:41	07:32	08:23	08:17	08:45	11:15 (10)
29	08:23	09:38 (12)	07:21	06:14	05:27	05:20	05:54	06:43	07:33	08:25	08:19	08:45	11:16 (10)
30	08:21	09:37 (12)	07:19	06:12	05:26	05:21	05:55	06:45	07:35	08:27	08:20	08:45	11:17 (10)
31	08:20	09:38 (12)	07:17	06:11	05:25	05:21	05:57	06:46	07:37	08:29	08:21	08:45	11:18 (10)
Potential sun hours	259	278	367	416	485	499	502	454	381	331	266	244	1311
Total, worst case	775	122									563		1311
Sun reduction	0.16	0.21									0.18		0.13
Oper. time red.	1.00	1.00									1.00		1.00
Wind dir. red.	0.63	0.66									0.66		0.61
Total reduction	0.10	0.14									0.12		0.08
Total, real	76	17									68		107

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)



SHADOW - Calendar

Calculation: Alternative Scenario 2 Shadow receptor: M - H13

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 12 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main table showing shadow calculations for each day in each month. Columns: January, February, March, April, May, June. Rows: 1-31 with sun rise/set times, potential sun hours, and various reduction metrics.

Table layout: For each day in each month the following matrix apply

Matrix table with 2 rows: Day in month, Sun rise/set; and 4 columns: Sun reduction, Minutes with flicker, First/Last time with flicker, (WTG causing flicker first/last time)



SHADOW - Calendar

Calculation: Alternative Scenario 2 **Shadow receptor:** M - H13

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December						
1	05:22	20:27 (11)	05:58	20:10 (6)	06:48	07:37	07:30	08:21				
	22:00	31	20:58 (11)	21:28	11	20:21 (6)	20:26	19:17	17:11	16:31		
2	05:22	20:27 (11)	06:00	20:08 (6)	06:49	07:38	07:32	08:23				
	22:00	32	20:59 (11)	21:27	14	20:22 (6)	20:24	19:15	17:09	16:30		
3	05:23	20:28 (11)	06:01	20:07 (6)	06:51	18:40 (5)	07:40	07:34	08:24			
	21:59	31	20:59 (11)	21:25	16	20:23 (6)	20:22	12	18:52 (5)	19:12	17:07	16:29
4	05:24	20:28 (11)	06:03	20:06 (6)	06:53	18:37 (5)	07:42	07:36	08:25			
	21:59	30	20:58 (11)	21:23	18	20:24 (6)	20:19	17	18:54 (5)	19:10	17:05	16:29
5	05:25	20:28 (11)	06:04	20:06 (6)	06:54	18:35 (5)	07:43	07:38	08:27			
	21:58	31	20:59 (11)	21:21	19	20:25 (6)	20:17	21	18:56 (5)	19:08	17:04	16:28
6	05:25	20:29 (11)	06:06	20:05 (6)	06:56	18:33 (5)	07:45	07:39	08:28			
	21:58	30	20:59 (11)	21:20	20	20:25 (6)	20:15	32	19:09 (4)	19:05	17:02	16:28
7	05:26	20:29 (11)	06:07	20:04 (6)	06:57	18:32 (5)	07:47	07:41	08:29			
	21:57	30	20:59 (11)	21:18	20	20:24 (6)	20:13	38	19:11 (4)	19:03	17:00	16:27
8	05:27	20:30 (11)	06:09	20:04 (6)	06:59	18:31 (5)	07:48	07:43	08:31			
	21:57	29	20:59 (11)	21:16	21	20:25 (6)	20:10	41	19:12 (4)	19:01	16:58	16:27
9	05:28	20:30 (11)	06:11	20:04 (6)	07:01	18:29 (5)	07:50	07:45	08:32			
	21:56	29	20:59 (11)	21:14	20	20:24 (6)	20:08	43	19:12 (4)	18:59	16:57	16:27
10	05:29	20:31 (11)	06:12	20:04 (6)	07:02	18:29 (5)	07:52	07:46	08:33			
	21:55	28	20:59 (11)	21:12	21	20:25 (6)	20:06	44	19:13 (4)	18:56	16:55	16:27
11	05:30	20:31 (11)	06:14	20:04 (6)	07:04	18:28 (5)	07:53	07:48	08:34			
	21:55	28	20:59 (11)	21:10	20	20:24 (6)	20:03	45	19:13 (4)	18:54	16:54	16:26
12	05:31	20:32 (11)	06:15	20:04 (6)	07:06	18:28 (5)	07:55	07:50	08:35			
	21:54	26	20:58 (11)	21:08	20	20:24 (6)	20:01	45	19:13 (4)	18:52	16:52	16:26
13	05:32	20:32 (11)	06:17	20:04 (6)	07:07	18:27 (5)	07:57	07:52	08:36			
	21:53	26	20:58 (11)	21:07	18	20:22 (6)	19:59	45	19:12 (4)	18:50	16:51	16:26
14	05:33	20:33 (11)	06:19	20:06 (6)	07:09	18:27 (5)	07:59	07:54	08:37			
	21:52	25	20:58 (11)	21:05	16	20:22 (6)	19:56	44	19:11 (4)	18:48	16:49	16:26
15	05:35	20:33 (11)	06:20	20:07 (6)	07:10	18:28 (5)	08:00	07:55	08:38			
	21:51	24	20:57 (11)	21:03	14	20:21 (6)	19:54	43	19:11 (4)	18:45	16:48	16:26
16	05:36	20:34 (11)	06:22	20:08 (6)	07:12	18:28 (5)	08:02	07:57	08:39			
	21:50	22	20:56 (11)	21:01	10	20:18 (6)	19:52	41	19:09 (4)	18:43	16:46	16:26
17	05:37	20:35 (11)	06:23	07:14	38	19:07 (4)	18:41	16:45	16:27			
	21:49	20	20:55 (11)	20:59		19:49		08:00	08:40			
18	05:38	20:36 (11)	06:25	07:15	31	18:29 (5)	08:06	08:00	08:40			
	21:48	18	20:54 (11)	20:56		19:47	18:39	16:44	16:27			
19	05:40	20:37 (11)	06:27	07:17	19	18:30 (5)	08:07	08:02	08:41			
	21:47	16	20:53 (11)	20:54		19:45	18:37	16:42	16:27			
20	05:41	20:39 (11)	06:28	07:19	14	18:33 (5)	08:09	08:04	08:42			
	21:45	13	20:52 (11)	20:52		19:42	18:35	16:41	16:27			
21	05:42	20:41 (11)	06:30	07:20	5	18:36 (5)	08:11	08:06	08:42			
	21:44	9	20:50 (11)	20:50		19:40	18:33	16:40	16:28			
22	05:44		06:31	07:22		08:13	08:07	08:43				
	21:43		20:48	19:38		18:30	16:39	16:28				
23	05:45		06:33	07:23		08:14	08:09	08:43				
	21:42		20:46	19:35		18:28	16:38	16:29				
24	05:46		06:35	07:25		08:16	08:11	08:44				
	21:40		20:44	19:33		18:26	16:37	16:29				
25	05:48		06:36	07:27		07:18	08:12	08:44				
	21:39		20:42	19:31		17:24	16:36	16:30				
26	05:49		06:38	07:28		07:20	08:14	08:44				
	21:37		20:40	19:28		17:22	16:35	16:31				
27	05:51		06:40	07:30		07:21	08:15	08:45				
	21:36		20:37	19:26		17:20	16:34	16:32				
28	05:52		06:41	07:32		07:23	08:17	08:45				
	21:35		20:35	19:24		17:18	16:33	16:32				
29	05:54		06:43	07:33		07:25	08:18	08:45				
	21:33		20:33	19:21		17:16	16:32	16:33				
30	05:55		06:44	07:35		07:27	08:20	08:45				
	21:31		20:31	19:19		17:15	16:31	16:34				
31	05:57	20:11 (6)	06:46			07:29		08:45				
	21:30	8	20:19 (6)	20:28		17:13		16:35				
Potential sun hours	502		454	381		331	266	244				
Total, worst case	536		278	618								
Sun reduction	0.27		0.30	0.28								
Oper. time red.	1.00		1.00	1.00								
Wind dir. red.	0.69		0.67	0.67								
Total reduction	0.18		0.20	0.19								
Total, real	98		55	117								

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: N - H14

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45	11:50 (1)	08:18	09:11 (3)	07:25	07:15
	16:36	22 12:12 (1)	17:24	55 10:06 (2)	18:16	33 08:38 (7)
2	08:45	11:50 (1)	08:17	09:11 (3)	07:23	07:12
	16:38	21 12:11 (1)	17:26	55 10:06 (2)	18:18	25 20:11
3	08:45	11:51 (1)	08:15	09:12 (3)	07:21	07:10
	16:39	20 12:11 (1)	17:28	54 10:06 (2)	18:19	19 07:44 (6)
4	08:45	11:53 (1)	08:14	09:14 (3)	07:19	4 07:48 (6)
	16:40	18 12:11 (1)	17:30	53 10:07 (2)	18:21	26 20:15
5	08:45	11:54 (1)	08:12	09:15 (3)	07:16	9 07:51 (6)
	16:41	16 12:10 (1)	17:32	51 10:07 (2)	18:23	29 07:05
6	08:44	11:56 (1)	08:10	09:17 (3)	07:14	12 07:52 (6)
	16:42	14 12:10 (1)	17:34	47 10:07 (2)	18:25	31 07:03
7	08:44	11:57 (1)	08:09	09:31 (2)	07:12	18 07:35 (6)
	16:43	12 12:09 (1)	17:35	35 10:06 (2)	18:27	31 07:53 (6)
8	08:43	12:00 (1)	08:07	09:31 (2)	07:10	18 07:33 (6)
	16:45	7 12:07 (1)	17:37	35 10:06 (2)	18:28	29 06:59
9	08:43		08:05	09:32 (2)	07:07	20 07:53 (6)
	16:46		17:39	33 10:05 (2)	18:30	29 07:33 (6)
10	08:42		08:03	09:32 (2)	07:05	26 07:45 (8)
	16:48		17:41	33 10:05 (2)	18:32	26 07:45 (8)
11	08:42		08:02	09:34 (2)	07:03	28 07:17 (8)
	16:49		17:43	31 10:05 (2)	18:34	16 07:45 (8)
12	08:41		08:00	09:35 (2)	07:01	18 07:52 (6)
	16:50		17:45	29 10:04 (2)	18:35	31 07:13 (8)
13	08:41		07:58	09:36 (2)	06:58	33 07:46 (8)
	16:52		17:47	26 10:02 (2)	18:37	19 07:10 (8)
14	08:40	09:13 (3)	07:56	09:37 (2)	06:56	36 07:46 (8)
	16:53	8 09:21 (3)	17:48	24 10:01 (2)	18:39	21 07:09 (8)
15	08:39	09:12 (3)	07:54	09:39 (2)	06:54	37 07:46 (8)
	16:55	11 09:23 (3)	17:50	20 09:59 (2)	18:41	22 07:09 (8)
16	08:38	09:11 (3)	07:52	09:41 (2)	06:51	37 07:46 (8)
	16:57	14 09:25 (3)	17:52	15 09:56 (2)	18:42	24 07:09 (8)
17	08:37	09:10 (3)	07:50	09:45 (2)	06:49	25 07:45 (8)
	16:58	16 09:26 (3)	17:54	5 09:50 (2)	18:44	25 07:09 (8)
18	08:36	09:09 (3)	07:48		06:47	36 07:45 (8)
	17:00	19 09:28 (3)	17:56		18:46	26 07:09 (8)
19	08:35	09:09 (3)	07:46		06:45	36 07:45 (8)
	17:01	31 09:51 (2)	17:58		18:48	25 07:45 (8)
20	08:34	09:08 (3)	07:44		06:42	35 07:44 (8)
	17:03	37 09:53 (2)	17:59		18:49	24 07:09 (8)
21	08:33	09:08 (3)	07:42		06:40	35 07:44 (8)
	17:05	41 09:55 (2)	18:01		18:51	24 07:10 (8)
22	08:32	09:08 (3)	07:40		06:38	33 07:43 (8)
	17:06	45 09:57 (2)	18:03		18:53	22 07:10 (8)
23	08:31	09:07 (3)	07:38		06:35	32 07:42 (8)
	17:08	49 09:58 (2)	18:05		18:54	21 07:11 (8)
24	08:30	09:08 (3)	07:36		06:33	30 07:41 (8)
	17:10	50 09:59 (2)	18:07		18:56	19 07:12 (8)
25	08:28	09:08 (3)	07:34		06:31	27 07:39 (8)
	17:12	53 10:01 (2)	18:09		18:58	18 07:13 (8)
26	08:27	09:08 (3)	07:32		06:28	25 07:38 (8)
	17:13	53 10:01 (2)	18:10		19:00	16 07:38 (8)
27	08:26	09:08 (3)	07:29		06:26	22 07:14 (8)
	17:15	55 10:03 (2)	18:12		19:01	14 07:36 (8)
28	08:24	09:08 (3)	07:27		06:24	29 07:16 (8)
	17:17	55 10:03 (2)	18:14		19:03	10 07:33 (8)
29	08:23	09:09 (3)			07:21	6 07:30 (8)
	17:19	55 10:04 (2)			20:05	21:42
30	08:21	09:09 (3)			07:19	05:27
	17:21	56 10:05 (2)			20:06	21:43
31	08:20	09:09 (3)			07:17	05:26
	17:22	56 10:05 (2)			20:08	21:44
Potential sun hours	259	278	367	416	485	499
Total, worst case	834	601	687	826	422	
Sun reduction	0.16	0.21	0.24	0.35	0.37	
Oper. time red.	1.00	1.00	1.00	1.00	1.00	
Wind dir. red.	0.66	0.66	0.67	0.67	0.64	
Total reduction	0.10	0.14	0.16	0.24	0.24	
Total, real	85	82	113	195	99	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 2**Shadow receptor:** N - H14

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22 22:00	05:58 21:28	06:27 (9) 20:26	06:48 19:17	07:14 (8) 08:13 (6)	07:37 09:02 (2)
2	05:22 22:00	06:00 21:27	06:28 (9) 20:24	06:50 19:15	07:15 (8) 08:12 (6)	07:32 09:01 (2)
3	05:23 22:00	06:01 21:25	06:30 (9) 20:22	06:51 19:12	07:17 (8) 08:10 (6)	07:40 09:01 (2)
4	05:24 21:59	06:03 21:23	06:31 (9) 20:20	06:53 19:10	07:19 (8) 08:10 (6)	07:42 08:51 (3)
5	05:25 21:59	06:04 21:22	06:33 (9) 20:17	06:54 19:08	07:20 (8) 08:10 (6)	07:44 09:36 (2)
6	05:26 21:58	06:06 21:20	06:34 (9) 20:15	06:56 19:06	07:22 (8) 08:29 (6)	07:45 17:02
7	05:26 21:58	06:08 21:18	06:36 (9) 20:13	06:58 19:03	07:23 (8) 08:12 (6)	07:47 07:41
8	05:27 21:57	06:09 21:16	06:37 (9) 20:11	06:59 19:01	07:25 (8) 08:14 (6)	07:49 07:43
9	05:28 21:56	06:11 21:14	06:39 (9) 20:08	07:01 18:59	07:37 (10) 08:16 (6)	07:50 08:42 (3)
10	05:29 21:56	06:12 21:13	06:41 (9) 20:06	07:03 18:57	07:37 (10) 08:26 (7)	07:52 18:57
11	05:30 21:55	06:14 21:11	07:04 20:04	07:04 18:54	07:36 (10) 08:30 (7)	07:54 18:54
12	05:31 21:54	06:15 21:09	07:06 20:01	07:06 18:52	07:37 (10) 08:33 (7)	07:55 16:52
13	05:33 21:53	06:17 21:07	07:07 19:59	07:07 18:50	07:37 (10) 08:34 (7)	07:57 16:51
14	05:34 21:52	06:19 21:05	07:09 19:57	07:09 18:48	07:37 (10) 08:35 (7)	07:59 16:49
15	05:35 21:51	06:20 21:03	07:11 19:54	07:11 18:46	07:39 (10) 08:36 (7)	08:01 16:48
16	05:36 21:50	06:22 21:01	07:12 19:52	07:12 18:43	07:40 (10) 08:36 (7)	08:02 16:46
17	05:37 21:49	06:24 20:59	07:14 19:50	07:14 18:41	08:08 (7) 08:37 (7)	08:04 16:45
18	05:38 21:48	06:24 (9) 20:57	07:15 (8) 19:47	07:15 (8) 18:39	08:07 (7) 08:37 (7)	08:06 16:44
19	05:40 21:47	06:24 (9) 20:55	07:17 (8) 19:45	07:17 (8) 18:37	08:06 (7) 08:36 (7)	08:07 16:43
20	05:41 21:46	06:23 (9) 20:53	07:18 (8) 19:43	07:18 (8) 18:35	08:06 (7) 08:36 (7)	08:09 16:41
21	05:42 21:44	06:22 (9) 20:50	07:19 (8) 19:40	07:19 (8) 18:33	08:05 (7) 08:35 (7)	08:11 16:40
22	05:44 21:43	06:21 (9) 20:48	07:20 (8) 19:38	07:20 (8) 18:31	08:05 (7) 08:35 (7)	08:13 16:39
23	05:45 21:42	06:21 (9) 20:46	07:21 (8) 19:36	07:21 (8) 18:29	08:06 (7) 08:34 (7)	08:14 16:38
24	05:46 21:41	06:21 (9) 20:44	07:22 (8) 19:33	07:22 (8) 18:27	08:06 (7) 08:33 (7)	08:16 16:37
25	05:48 21:39	06:20 (9) 20:42	07:23 (8) 19:31	07:23 (8) 18:25	08:07 (7) 08:32 (7)	07:18 17:25
26	05:49 21:38	06:20 (9) 20:40	07:24 (8) 19:29	07:24 (8) 18:23	08:08 (7) 08:31 (7)	07:20 17:23
27	05:51 21:36	06:20 (9) 20:38	07:25 (8) 19:27	07:25 (8) 18:21	08:08 (7) 08:28 (7)	07:22 17:21
28	05:52 21:35	06:21 (9) 20:35	07:26 (8) 19:24	07:26 (8) 18:19	08:11 (7) 08:26 (7)	07:23 17:19
29	05:54 21:33	06:23 (9) 20:33	07:27 (8) 19:22	07:27 (8) 18:17	08:12 (7) 08:28 (6)	07:25 17:17
30	05:55 21:32	06:24 (9) 20:31	07:28 (8) 19:19	07:28 (8) 18:15	08:14 (6) 08:29 (6)	07:27 17:15
31	05:57 21:30	06:25 (9) 20:29	07:29 (8) 19:17	07:29 (8) 18:13	08:15 (6) 09:14 (2)	07:29 17:13
Potential sun hours	502	454	381	331	266	244
Total, worst case	322	619	838	327	1162	635
Sun reduction	0.27	0.30	0.28	0.24	0.18	0.13
Oper. time red.	1.00	1.00	1.00	1.00	1.00	1.00
Wind dir. red.	0.64	0.66	0.67	0.66	0.66	0.61
Total reduction	0.17	0.20	0.19	0.16	0.12	0.08
Total, real	55	121	160	52	142	52

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: P - H16

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (July-December) and rows for each day (1-31) showing sun rise/set times, minutes with flicker, and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix table with 4 columns: Day in month, Sun rise/set, Minutes with flicker, and First/Last time with flicker (WTG causing flicker).

Project:

6225Gortyrahyilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:58/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: R - H18

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 14 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day of the year, including sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix with 4 columns: Day in month, Sun rise (hh:mm) / Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker / Last time (hh:mm) with flicker. Includes notes about WTG causing flicker first/last time.

SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: S - H19

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 16:37	08:18 17:24	07:25 18:16	07:49 (16) 08:00 (16)	07:14 20:10	08:29 (15) 21:01
2	08:45 16:38	08:17 17:26	07:23 18:18	07:46 (16) 08:01 (16)	07:12 20:11	08:29 (15) 21:02
3	08:45 16:39	08:15 17:28	07:21 18:19	07:44 (16) 08:03 (16)	07:10 20:13	08:28 (15) 21:04
4	08:45 16:40	08:14 17:30	07:18 18:21	07:42 (16) 08:04 (16)	07:08 20:15	08:27 (15) 21:06
5	08:44 16:41	08:12 17:32	07:16 18:23	07:40 (16) 08:06 (16)	07:05 20:17	08:27 (15) 21:07
6	08:44 16:42	08:10 17:34	07:14 18:25	07:37 (16) 08:06 (16)	07:03 20:18	08:27 (15) 21:09
7	08:44 16:44	08:09 17:35	07:12 18:27	07:35 (16) 08:30 (15)	07:01 20:20	08:27 (15) 21:10
8	08:43 16:45	08:07 17:37	07:10 18:28	07:33 (16) 08:37 (15)	06:59 20:22	08:26 (15) 21:12
9	08:43 16:46	08:05 17:39	07:07 18:30	07:30 (16) 08:41 (15)	06:56 20:23	08:26 (15) 21:14
10	08:42 16:48	08:03 17:41	07:05 18:32	07:28 (16) 08:44 (15)	06:54 20:25	08:26 (15) 21:15
11	08:42 16:49	08:01 17:43	07:03 18:34	07:26 (16) 08:47 (15)	06:52 20:27	08:26 (15) 21:17
12	08:41 16:50	08:00 17:45	07:01 18:35	07:23 (16) 08:49 (15)	06:50 20:28	08:26 (15) 21:18
13	08:40 16:52	07:58 17:47	06:58 18:37	07:21 (16) 08:51 (15)	06:47 20:30	08:25 (15) 21:20
14	08:40 16:53	07:56 17:48	06:56 18:39	07:20 (16) 08:53 (15)	06:45 20:32	08:26 (15) 21:22
15	08:39 16:55	07:54 17:50	06:54 18:41	07:20 (16) 08:55 (15)	06:43 20:34	08:26 (15) 21:23
16	08:38 16:57	07:52 17:52	06:51 18:42	07:20 (16) 08:55 (15)	06:41 20:35	08:26 (15) 21:25
17	08:37 16:58	07:50 17:54	06:49 18:44	07:20 (16) 08:57 (15)	06:39 20:37	08:26 (15) 21:26
18	08:36 17:00	07:48 17:56	06:47 18:46	07:20 (16) 08:58 (15)	06:36 20:39	08:27 (15) 21:28
19	08:35 17:01	07:46 17:58	06:44 18:47	07:20 (16) 08:58 (15)	06:34 20:40	08:27 (15) 21:29
20	08:34 17:03	07:44 17:59	06:42 18:49	07:20 (16) 08:59 (15)	06:32 20:42	08:28 (15) 21:31
21	08:33 17:05	07:42 18:01	06:40 18:51	07:21 (16) 09:00 (15)	06:30 20:44	08:28 (15) 21:32
22	08:32 17:06	07:40 18:03	06:38 18:53	07:21 (16) 09:00 (15)	06:28 20:45	08:29 (15) 21:33
23	08:31 17:08	07:38 18:05	06:35 18:54	07:22 (16) 09:01 (15)	06:26 20:47	08:29 (15) 21:35
24	08:29 17:10	07:36 18:07	06:33 18:56	07:23 (16) 09:02 (15)	06:24 20:49	09:45 (15) 21:36
25	08:28 17:12	07:34 18:09	06:31 18:58	07:24 (16) 09:02 (15)	06:22 20:50	08:30 (15) 21:38
26	08:27 17:13	07:31 18:10	06:28 18:59	07:26 (16) 09:02 (15)	06:20 20:52	08:31 (15) 21:39
27	08:26 17:15	07:29 18:12	06:26 19:01	07:28 (16) 09:03 (15)	06:18 20:54	08:32 (15) 21:40
28	08:24 17:17	07:27 18:14	07:51 (16) 07:57 (16)	06:24 19:03	07:30 (16) 20:56	08:33 (15) 21:41
29	08:23 17:19			07:21 20:05	08:31 (15) 20:57	08:33 (15) 21:43
30	08:21 17:21			07:19 20:06	08:31 (15) 20:59	08:34 (15) 21:44
31	08:20 17:22			07:17 20:08	08:29 (15) 21:02 (15)	08:33 (15) 21:45
Potential sun hours	259	278	367	416	485	499
Total, worst case		6	2362	2504	359	
Sun reduction		0.21	0.24	0.35	0.37	
Oper. time red.		1.00	1.00	1.00	1.00	
Wind dir. red.		0.67	0.67	0.67	0.67	
Total reduction		0.14	0.16	0.24	0.25	
Total, real		1	385	593	89	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 2**Shadow receptor:** S - H19

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22 22:00	05:58 21:28	06:48 20:26	08:25 (15) 09:57 (15)	07:37 19:17	08:02 (16) 17:11
2	05:22 22:00	06:00 21:27	06:49 20:24	08:24 (15) 09:56 (15)	07:38 19:15	08:03 (16) 17:09
3	05:23 21:59	06:01 21:25	09:06 (15) 20:22	08:24 (15) 09:57 (15)	07:40 19:12	08:05 (16) 17:07
4	05:24 21:59	06:03 21:23	09:00 (15) 20:20	08:23 (15) 09:56 (15)	07:42 19:10	08:07 (16) 17:05
5	05:25 21:59	06:04 21:22	08:57 (15) 20:17	08:23 (15) 09:57 (15)	07:43 19:08	08:09 (16) 17:04
6	05:26 21:58	06:06 21:20	08:54 (15) 20:15	08:23 (15) 09:57 (15)	07:45 19:06	08:10 (16) 17:02
7	05:26 21:57	06:08 21:18	08:52 (15) 20:13	08:22 (15) 09:56 (15)	07:47 19:03	08:12 (16) 17:00
8	05:27 21:57	06:09 21:16	08:50 (15) 20:10	08:22 (15) 09:56 (15)	07:48 19:01	08:14 (16) 16:59
9	05:28 21:56	06:11 21:14	08:49 (15) 20:08	08:22 (15) 09:56 (15)	07:50 18:59	08:15 (16) 16:57
10	05:29 21:55	06:12 21:12	08:46 (15) 20:06	08:22 (15) 09:56 (15)	07:52 18:56	08:17 (16) 16:55
11	05:30 21:55	06:14 21:10	08:45 (15) 20:03	08:21 (15) 09:55 (15)	07:54 18:54	08:19 (16) 16:54
12	05:31 21:54	06:15 21:09	08:43 (15) 20:01	08:21 (15) 09:54 (15)	07:55 18:52	08:21 (16) 16:52
13	05:33 21:53	06:17 21:07	08:42 (15) 19:59	08:22 (15) 09:54 (15)	07:57 18:50	08:23 (16) 16:51
14	05:34 21:52	06:19 21:05	08:41 (15) 19:57	08:21 (15) 09:53 (15)	07:59 18:48	08:24 (16) 16:49
15	05:35 21:51	06:20 21:03	08:40 (15) 19:54	08:21 (16) 09:53 (15)	08:00 18:45	07:55 16:48
16	05:36 21:50	06:22 21:01	08:38 (15) 19:52	08:17 (16) 09:51 (15)	08:02 18:43	07:57 16:46
17	05:37 21:49	06:24 20:59	08:37 (15) 19:50	08:14 (16) 09:51 (15)	08:04 18:41	07:59 16:45
18	05:38 21:48	06:25 20:57	08:36 (15) 19:47	08:13 (16) 09:50 (15)	08:06 18:39	08:01 16:44
19	05:40 21:47	06:27 20:55	08:35 (15) 19:45	08:10 (16) 09:49 (15)	08:07 18:37	08:02 16:43
20	05:41 21:46	06:28 20:52	08:34 (15) 19:43	08:09 (16) 09:48 (15)	08:09 18:35	08:04 16:41
21	05:42 21:44	06:30 20:50	08:33 (15) 19:40	08:07 (16) 09:46 (15)	08:11 18:33	08:06 16:40
22	05:44 21:43	06:32 20:48	08:32 (15) 19:38	08:06 (16) 09:45 (15)	08:13 18:31	08:07 16:39
23	05:45 21:42	06:33 20:46	08:31 (15) 19:36	08:05 (16) 09:44 (15)	08:14 18:29	08:09 16:38
24	05:46 21:40	06:35 20:44	08:30 (15) 19:33	08:04 (16) 09:42 (15)	08:16 18:26	08:11 16:37
25	05:48 21:39	06:36 20:42	08:29 (15) 19:31	08:03 (16) 09:41 (15)	07:18 17:24	08:12 16:36
26	05:49 21:38	06:38 20:40	08:29 (15) 19:29	08:02 (16) 09:39 (15)	07:20 17:22	08:14 16:35
27	05:51 21:36	06:40 20:37	08:28 (15) 19:26	08:01 (16) 09:38 (15)	07:21 17:21	08:15 16:34
28	05:52 21:35	06:41 20:35	08:28 (15) 19:24	08:01 (16) 09:36 (15)	07:23 17:19	08:17 16:33
29	05:54 21:33	06:43 20:33	08:26 (15) 19:22	08:00 (16) 09:33 (15)	07:25 17:17	08:18 16:32
30	05:55 21:32	06:45 20:31	08:26 (15) 19:19	08:00 (16) 09:31 (15)	07:27 17:15	08:20 16:31
31	05:57 21:30	06:46 20:29	08:25 (15) 09:56 (15)	07:29 17:13		08:45 16:35
Potential sun hours	502	454	381	331	266	244
Total, worst case		1870	2849	586		
Sun reduction		0.30	0.28	0.24		
Oper. time red.		1.00	1.00	1.00		
Wind dir. red.		0.67	0.67	0.67		
Total reduction		0.20	0.19	0.16		
Total, real		371	540	93		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: T - H20

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-June) and rows for each day (1-31) showing sun rise/set times, potential sun hours, and reduction factors.

Table layout: For each day in each month the following matrix apply

Matrix table with 4 columns: Day in month, Sun rise/set, Minutes with flicker, and First/Last time with flicker (WTG causing flicker).

SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: U - H21

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 16:36	08:18 17:24	07:25 18:16	07:14 20:10	19:30 (11) 06:10	05:24 20:25 (14)
2	08:45 16:37	08:17 17:26	07:23 18:17	07:12 20:11	19:28 (11) 06:08	05:24 20:25 (14)
3	08:45 16:38	08:15 17:28	07:21 18:19	07:10 20:13	19:26 (11) 06:06	05:23 20:26 (14)
4	08:45 16:40	08:13 17:30	07:18 18:21	07:07 20:15	19:25 (11) 06:04	05:22 20:25 (14)
5	08:44 16:41	08:12 17:31	07:16 18:23	07:05 20:16	19:25 (11) 06:02	05:21 20:26 (14)
6	08:44 16:42	08:10 17:33	07:14 18:25	07:03 20:18	19:24 (11) 06:00	05:21 20:26 (14)
7	08:44 16:43	08:08 17:35	07:12 18:26	07:01 20:20	19:24 (11) 05:58	05:20 20:27 (14)
8	08:43 16:45	08:07 17:37	07:09 18:28	06:58 20:21	19:24 (11) 05:57	05:20 20:27 (14)
9	08:43 16:46	08:05 17:39	07:07 18:30	06:56 20:23	19:24 (11) 05:55	05:19 20:27 (14)
10	08:42 16:47	08:03 17:41	07:05 18:32	06:54 20:25	19:25 (11) 05:53	05:19 20:27 (14)
11	08:42 16:49	08:01 17:43	07:03 18:33	06:52 20:27	19:27 (11) 05:52	05:18 20:28 (14)
12	08:41 16:50	07:59 17:44	07:00 18:35	06:49 20:28	19:28 (11) 05:50	05:18 20:28 (14)
13	08:40 16:52	07:58 17:46	06:58 18:37	06:47 20:30	19:36 (11) 05:48	05:18 20:29 (14)
14	08:40 16:53	07:56 17:48	06:56 18:39	06:45 20:32	19:36 (11) 05:47	05:18 20:29 (14)
15	08:39 16:55	07:54 17:50	06:54 18:40	06:43 20:33	20:32 05:45	21:22 05:17
16	08:38 16:56	07:52 17:52	06:51 18:42	06:41 20:35	20:33 05:44	21:23 05:17
17	08:37 16:58	07:50 17:54	06:49 18:44	06:38 20:37	20:34 05:42	21:24 05:17
18	08:36 17:00	07:48 17:56	06:47 18:46	06:36 20:38	20:35 05:41	21:25 05:17
19	08:35 17:01	07:46 17:57	06:44 18:47	06:34 20:40	20:36 05:39	21:26 05:17
20	08:34 17:03	07:44 17:59	06:42 18:49	06:32 20:42	20:37 05:38	21:27 05:17
21	08:33 17:05	07:42 18:01	06:40 18:51	06:30 20:44	20:38 05:37	21:28 05:17
22	08:32 17:06	07:40 18:03	06:37 18:52	06:28 20:45	20:39 05:35	21:29 05:18
23	08:31 17:08	07:38 18:05	06:35 18:54	06:26 20:47	20:40 05:34	21:30 05:18
24	08:29 17:10	07:36 18:07	06:33 18:56	06:24 20:49	20:41 05:33	21:31 05:18
25	08:28 17:11	07:33 18:08	06:30 18:58	06:22 20:50	20:42 05:32	21:32 05:18
26	08:27 17:13	07:31 18:10	06:28 18:59	06:19 20:52	20:43 05:30	21:33 05:19
27	08:25 17:15	07:29 18:12	06:26 19:01	06:17 20:54	20:44 05:29	21:34 05:19
28	08:24 17:17	07:27 18:14	06:24 19:03	06:15 20:55	20:45 05:28	21:35 05:20
29	08:23 17:19	07:25 20:04	06:22 20:04	06:13 20:57	20:46 05:27	21:36 05:20
30	08:21 17:20	07:19 20:06	06:19 20:06	06:12 20:59	20:47 05:26	21:37 05:21
31	08:20 17:22	07:17 20:08	06:17 20:08	06:11 19:32 (11) 19:39 (11)	20:48 05:25 21:45	21:38 05:22 20:25 (14) 20:59 (14)
Potential sun hours	259	278	367	416	485	499
Total, worst case			7	193	599	951
Sun reduction			0.24	0.35	0.37	0.30
Oper. time red.			1.00	1.00	1.00	1.00
Wind dir. red.			0.68	0.68	0.69	0.69
Total reduction			0.17	0.24	0.25	0.21
Total, real			1	46	152	196

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 2 **Shadow receptor:** U - H21

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22 22:00	20:32 (14) 21:04 (14)	05:58 21:28	20:44 (14) 20:58 (14)	06:48 20:26	19:26 (11) 19:38 (11)
2	05:22 22:00	20:32 (14) 21:04 (14)	06:00 21:27	20:47 (14) 20:24 (14)	06:49 06:51	19:23 (11) 19:22 (11)
3	05:23 21:59	20:33 (14) 21:05 (14)	06:01 21:25	06:51 20:22	19:22 (11) 19:40 (11)	07:37 19:12
4	05:24 21:59	20:32 (14) 21:04 (14)	06:03 21:23	06:53 20:19	19:21 (11) 19:40 (11)	07:38 19:10
5	05:24 21:58	20:32 (14) 21:05 (14)	06:04 21:21	06:54 20:17	19:21 (11) 19:40 (11)	07:37 19:08
6	05:25 21:58	20:32 (14) 21:05 (14)	06:06 21:20	06:56 20:15	19:20 (11) 19:39 (11)	07:39 19:05
7	05:26 21:57	20:33 (14) 21:06 (14)	06:07 21:18	06:57 20:13	19:20 (11) 19:39 (11)	07:41 19:03
8	05:27 21:57	20:33 (14) 21:06 (14)	06:09 21:16	06:59 20:10	19:20 (11) 19:39 (11)	07:48 19:01
9	05:28 21:56	20:33 (14) 21:07 (14)	06:10 21:14	07:01 20:08	19:20 (11) 19:37 (11)	07:50 18:59
10	05:29 21:55	20:32 (14) 21:06 (14)	06:12 21:12	07:02 20:06	19:21 (11) 19:36 (11)	07:52 18:56
11	05:30 21:55	20:32 (14) 21:06 (14)	06:14 21:10	07:04 20:03	19:22 (11) 19:34 (11)	07:53 18:54
12	05:31 21:54	20:32 (14) 21:06 (14)	06:15 21:08	07:06 20:01	19:24 (11) 19:31 (11)	07:55 18:52
13	05:32 21:53	20:33 (14) 21:07 (14)	06:17 21:06	07:07 19:59	19:31 (11)	07:57 18:50
14	05:33 21:52	20:33 (14) 21:08 (14)	06:18 21:05	07:09 19:56	18:47	07:54 16:49
15	05:35 21:51	20:33 (14) 21:08 (14)	06:20 21:03	07:10 19:54	08:00	07:55 16:48
16	05:36 21:50	20:33 (14) 21:07 (14)	06:22 21:01	07:12 19:52	18:45	16:48 16:26
17	05:37 21:49	20:33 (14) 21:07 (14)	06:23 20:58	07:14 19:49	08:04	07:59 16:27
18	05:38 21:48	20:33 (14) 21:07 (14)	06:25 20:56	07:15 19:47	18:41	16:45 16:27
19	05:40 21:47	20:33 (14) 21:07 (14)	06:27 20:54	07:17 19:45	08:07	08:02 16:27
20	05:41 21:45	20:35 (14) 21:08 (14)	06:28 20:52	07:18 19:42	18:37	16:42 16:27
21	05:42 21:44	20:35 (14) 21:07 (14)	06:30 20:50	07:20 19:40	08:09	08:04 16:28
22	05:44 21:43	20:35 (14) 21:07 (14)	06:31 20:48	07:22 19:38	18:35	16:40 16:28
23	05:45 21:42	20:35 (14) 21:06 (14)	06:33 20:46	07:23 19:35	18:31	16:41 16:29
24	05:46 21:40	20:36 (14) 21:06 (14)	06:35 20:44	07:25 19:33	18:28	16:38 16:29
25	05:48 21:39	20:36 (14) 21:06 (14)	06:36 20:42	07:27 19:31	18:26	16:37 16:30
26	05:49 21:37	20:37 (14) 21:05 (14)	06:38 20:39	07:28 19:28	17:24	16:36 16:31
27	05:51 21:36	20:38 (14) 21:05 (14)	06:40 20:37	07:30 19:26	17:22	16:35 16:31
28	05:52 21:35	20:38 (14) 21:03 (14)	06:41 20:35	07:32 19:24	17:20	16:34 16:32
29	05:53 21:33	20:39 (14) 21:02 (14)	06:43 20:33	07:33 19:21	17:18	16:33 16:33
30	05:55 21:31	20:41 (14) 21:01 (14)	06:44 20:31	07:35 19:19	17:16	16:32 16:34
31	05:56 21:30	20:42 (14) 20:59 (14)	06:46 20:28	19:28 (11) 19:36 (11)	17:14	16:31 16:35
Potential sun hours	502	454	8	381	331	244
Total, worst case	964	29		192		
Sun reduction	0.27	0.30		0.28		
Oper. time red.	1.00	1.00		1.00		
Wind dir. red.	0.69	0.68		0.68		
Total reduction	0.18	0.20		0.19		
Total, real	177	6		37		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: V - H22

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-June) and rows for each day (1-31) showing sun rise/set times, potential sun hours, and various reduction factors.

Table layout: For each day in each month the following matrix apply

Summary matrix table with 4 columns: Day in month, Sun rise/set, Minutes with flicker, and WTG causing flicker times.

SHADOW - Calendar

Calculation: Alternative Scenario 2**Shadow receptor:** V - H22

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:21	05:58	06:48	07:37	07:30	08:21
	22:00	21:28	20:26	19:17	17:11	16:30
2	05:22	06:00	06:49	07:38	07:32	08:23
	22:00	21:27	20:24	19:15	17:09	16:30
3	05:23	06:01	06:51	07:40	07:34	08:24
	21:59	21:25	20:22	19:12	17:07	16:29
4	05:24	06:03	06:53	07:42	07:36	08:26
	21:59	21:23	20:19	19:10	17:05	16:29
5	05:24	06:04	06:54	07:43	07:38	08:27
	21:59	21:21	20:17	19:08	17:04	16:28
6	05:25	06:06	06:56	07:45	07:39	08:28
	21:58	21:20	20:15	19:05	17:02	16:28
7	05:26	06:07	06:57	07:47	07:41	08:29
	21:57	21:18	20:13	19:03	17:00	16:27
8	05:27	06:09	06:59	07:48	07:43	08:31
	21:57	21:16	20:10	19:01	16:58	16:27
9	05:28	06:10	07:01	07:50	07:45	08:32
	21:56	21:14	20:08	18:59	16:57	16:27
10	05:29	06:12	07:02	07:52	17:15 (12)	07:47
	21:55	21:12	20:06	18:56	17:10 (12)	16:55
11	05:30	06:14	07:04	07:53	17:12 (12)	07:48
	21:55	21:10	20:03	18:54	17:29 (12)	16:54
12	05:31	06:15	07:06	07:55	17:10 (12)	07:50
	21:54	21:09	20:01	18:52	20 17:30 (12)	16:52
13	05:32	06:17	07:07	07:57	17:09 (12)	07:52
	21:53	21:07	19:59	18:50	22 17:31 (12)	16:51
14	05:33	06:18	07:09	07:59	17:07 (12)	07:54
	21:52	21:05	19:56	18:47	24 17:31 (12)	16:49
15	05:35	06:20	07:10	08:00	17:06 (12)	07:55
	21:51	21:03	19:54	18:45	26 17:32 (12)	16:48
16	05:36	06:22	07:12	08:02	17:06 (12)	07:57
	21:50	21:01	19:52	18:43	26 17:32 (12)	16:46
17	05:37	06:23	07:14	08:04	17:05 (12)	07:59
	21:49	20:59	19:49	18:41	27 17:32 (12)	16:45
18	05:38	06:25	07:15	08:06	17:05 (12)	08:01
	21:48	20:57	19:47	18:39	28 17:33 (12)	16:44
19	05:40	06:27	07:17	08:07	17:04 (12)	08:02
	21:47	20:54	19:45	18:37	27 17:31 (12)	16:42
20	05:41	06:28	07:19	08:09	17:05 (12)	08:04
	21:46	20:52	19:42	18:35	26 17:31 (12)	16:41
21	05:42	06:30	07:20	08:11	17:05 (12)	08:06
	21:44	20:50	19:40	18:32	26 17:31 (12)	16:40
22	05:43	06:31	07:22	08:13	17:05 (12)	08:07
	21:43	20:48	19:38	18:30	25 17:30 (12)	16:39
23	05:45	06:33	07:23	08:14	17:06 (12)	08:09
	21:42	20:46	19:35	18:28	23 17:29 (12)	16:38
24	05:46	06:35	07:25	08:16	17:07 (12)	08:11
	21:40	20:44	19:33	18:26	21 17:28 (12)	16:37
25	05:48	06:36	07:27	08:18	16:09 (12)	08:12
	21:39	20:42	19:31	17:24	18 16:27 (12)	16:36
26	05:49	06:38	07:28	08:20	16:10 (12)	08:14
	21:38	20:40	19:28	17:22	15 16:25 (12)	16:35
27	05:51	06:40	07:30	08:21	16:12 (12)	08:15
	21:36	20:37	19:26	17:20	9 16:21 (12)	16:34
28	05:52	06:41	07:32	08:23	08:17	14:55 (13)
	21:35	20:35	19:24	17:18	16:33	15:25 (13)
29	05:53	06:43	07:33	08:25	08:18	14:55 (13)
	21:33	20:33	19:21	17:16	16:32	15:25 (13)
30	05:55	06:44	07:35	08:27	08:20	14:56 (13)
	21:32	20:31	19:19	17:14	16:31	15:25 (13)
31	05:56	06:46	07:37	08:29	08:21	14:57 (13)
	21:30	20:29	19:17	17:13	16:30	15:25 (13)
Potential sun hours	502	454	381	331	266	244
Total, worst case				391	652	552
Sun reduction				0.24	0.18	0.13
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.63	0.59	0.59
Total reduction				0.15	0.11	0.08
Total, real				58	71	44

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 2**Shadow receptor:** W - H23

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 16:36	14:59 (13) 15:26 (13)	08:18 17:24	07:25 18:16	16:31 (12) 16:40 (12)	07:14 20:10
2	08:45 16:37	14:59 (13) 15:26 (13)	08:17 17:26	07:23 18:17	07:12 20:11	06:08 21:02
3	08:45 16:38	14:59 (13) 15:27 (13)	08:15 17:28	07:21 18:19	07:10 20:13	06:06 21:04
4	08:45 16:40	15:00 (13) 15:28 (13)	08:14 17:30	07:18 18:21	07:07 20:15	06:04 21:05
5	08:44 16:41	14:59 (13) 15:28 (13)	08:12 17:31	07:16 18:23	07:05 20:16	06:02 21:07
6	08:44 16:42	15:00 (13) 15:29 (13)	08:10 17:33	07:14 18:25	07:03 20:18	06:00 21:09
7	08:44 16:43	15:00 (13) 15:29 (13)	08:08 17:35	07:12 18:26	07:01 20:20	05:58 21:10
8	08:43 16:45	15:01 (13) 15:31 (13)	08:07 17:37	07:09 18:28	06:58 20:22	05:57 21:12
9	08:43 16:46	15:01 (13) 15:31 (13)	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14
10	08:42 16:47	15:00 (13) 15:31 (13)	08:03 17:41	07:05 18:32	06:54 20:25	05:53 21:15
11	08:42 16:49	15:00 (13) 15:32 (13)	08:01 17:43	07:03 16:33 (12)	06:52 20:27	05:52 21:17
12	08:41 16:50	15:01 (13) 15:33 (13)	08:00 17:44	07:00 16:30 (12)	06:49 20:28	05:50 21:18
13	08:40 16:52	15:02 (13) 15:33 (13)	07:58 17:46	16:28 (12) 16:45 (12)	06:58 18:37	05:48 21:20
14	08:40 16:53	15:02 (13) 15:34 (13)	07:56 17:48	16:26 (12) 16:47 (12)	06:56 18:39	05:47 21:22
15	08:39 16:55	15:02 (13) 15:34 (13)	07:54 17:50	16:25 (12) 16:48 (12)	06:54 18:40	05:45 21:23
16	08:38 16:56	15:02 (13) 15:34 (13)	07:52 17:52	16:24 (12) 16:49 (12)	06:51 18:42	05:44 21:25
17	08:37 16:58	15:03 (13) 15:35 (13)	07:50 17:54	16:24 (12) 16:49 (12)	06:49 18:44	05:42 21:26
18	08:36 17:00	15:03 (13) 15:35 (13)	07:48 17:56	16:23 (12) 16:50 (12)	06:47 18:46	05:41 21:28
19	08:35 17:01	15:03 (13) 15:35 (13)	07:46 17:57	16:23 (12) 16:50 (12)	06:44 18:47	05:39 21:29
20	08:34 17:03	15:04 (13) 15:35 (13)	07:44 17:59	16:23 (12) 16:51 (12)	06:42 18:49	05:38 21:31
21	08:33 17:05	15:05 (13) 15:35 (13)	07:42 18:01	16:23 (12) 16:51 (12)	06:40 18:51	05:36 21:32
22	08:32 17:06	15:06 (13) 15:35 (13)	07:40 18:03	16:23 (12) 16:50 (12)	06:37 18:53	05:35 21:33
23	08:31 17:08	15:06 (13) 15:35 (13)	07:38 18:05	16:24 (12) 16:50 (12)	06:35 18:54	05:34 21:35
24	08:29 17:10	15:07 (13) 15:35 (13)	07:36 18:07	16:23 (12) 16:49 (12)	06:33 18:56	05:33 21:36
25	08:28 17:11	15:08 (13) 15:35 (13)	07:34 18:08	16:24 (12) 16:48 (12)	06:30 18:58	05:31 21:38
26	08:27 17:13	15:09 (13) 15:34 (13)	07:31 18:10	16:25 (12) 16:47 (12)	06:28 18:59	05:28 21:39
27	08:26 17:15	15:10 (13) 15:34 (13)	07:29 18:12	16:27 (12) 16:46 (12)	06:26 19:01	05:29 21:40
28	08:24 17:17	15:11 (13) 15:32 (13)	07:27 18:14	16:29 (12) 16:44 (12)	06:24 19:03	05:28 21:41
29	08:23 17:19	15:13 (13) 15:31 (13)		07:21 20:04	06:13 20:57	05:27 21:43
30	08:21 17:20	15:15 (13) 15:30 (13)		07:19 20:06	06:12 20:59	05:26 21:44
31	08:20 17:22	15:18 (13) 15:27 (13)		07:17 20:08		05:25 21:45
Potential sun hours	259	278	367	416	485	499
Total, worst case	861	400	9			
Sun reduction	0.16	0.21	0.24			
Oper. time red.	1.00	1.00	1.00			
Wind dir. red.	0.60	0.62	0.62			
Total reduction	0.09	0.13	0.15			
Total, real	80	51	1			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 2 Shadow receptor: W - H23

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:21	05:58	06:48	07:37	07:30	08:21
	22:00	21:28	20:26	19:17	17:11	16:30
2	05:22	06:00	06:49	07:38	07:32	08:23
	22:00	21:27	20:24	19:15	17:09	16:30
3	05:23	06:01	06:51	07:40	07:34	08:24
	21:59	21:25	20:22	19:12	17:07	16:29
4	05:24	06:03	06:53	07:42	07:36	08:26
	21:59	21:23	20:19	19:10	17:05	16:29
5	05:24	06:04	06:54	07:43	07:38	08:27
	21:59	21:21	20:17	19:08	17:04	16:28
6	05:25	06:06	06:56	07:45	07:39	08:28
	21:58	21:20	20:15	19:05	17:02	16:28
7	05:26	06:07	06:57	07:47	07:41	08:29
	21:57	21:18	20:13	19:03	17:00	16:27
8	05:27	06:09	06:59	07:48	07:43	08:31
	21:57	21:16	20:10	19:01	16:58	16:27
9	05:28	06:10	07:01	07:50	07:45	08:32
	21:56	21:14	20:08	18:59	16:57	16:27
10	05:29	06:12	07:02	07:52	07:47	08:33
	21:55	21:12	20:06	18:56	16:55	16:26
11	05:30	06:14	07:04	07:53	07:48	08:34
	21:55	21:10	20:03	18:54	16:54	16:26
12	05:31	06:15	07:06	07:55	07:50	08:35
	21:54	21:09	20:01	18:52	16:52	16:26
13	05:32	06:17	07:07	07:57	07:52	08:36
	21:53	21:07	19:59	18:50	17:04 (12)	14:51 (13)
14	05:33	06:18	07:09	07:59	07:54	08:37
	21:52	21:05	19:56	18:47	17:17 (12)	14:43 (13)
15	05:35	06:20	07:10	08:00	07:55	08:38
	21:51	21:03	19:54	18:45	16:59 (12)	14:42 (13)
16	05:36	06:22	07:12	08:02	07:57	08:39
	21:50	21:01	19:52	18:43	17:19 (12)	14:42 (13)
17	05:37	06:23	07:14	08:04	07:59	08:40
	21:49	20:59	19:49	18:41	16:56 (12)	14:41 (13)
18	05:38	06:25	07:15	08:06	08:01	08:40
	21:48	20:57	19:47	18:39	17:21 (12)	14:41 (13)
19	05:40	06:27	07:17	08:07	08:02	08:41
	21:47	20:54	19:45	18:37	16:54 (12)	14:41 (13)
20	05:41	06:28	07:19	08:09	08:04	08:42
	21:46	20:52	19:42	18:35	17:21 (12)	14:41 (13)
21	05:42	06:30	07:20	08:11	08:06	08:42
	21:44	20:50	19:40	18:32	16:53 (12)	14:40 (13)
22	05:43	06:31	07:22	08:13	08:07	08:43
	21:43	20:48	19:38	18:30	17:21 (12)	14:40 (13)
23	05:45	06:33	07:23	08:14	08:09	08:43
	21:42	20:46	19:35	18:28	16:54 (12)	14:40 (13)
24	05:46	06:35	07:25	08:16	08:11	08:44
	21:40	20:44	19:33	18:26	17:21 (12)	14:41 (13)
25	05:48	06:36	07:27	08:18	08:12	08:44
	21:39	20:42	19:31	17:24	15:54 (12)	14:41 (13)
26	05:49	06:38	07:28	08:20	08:14	08:44
	21:38	20:40	19:28	17:22	16:20 (12)	14:41 (13)
27	05:51	06:40	07:30	08:21	08:15	08:45
	21:36	20:37	19:26	17:20	16:19 (12)	14:41 (13)
28	05:52	06:41	07:32	08:23	08:17	08:45
	21:35	20:35	19:24	17:18	16:17 (12)	14:42 (13)
29	05:53	06:43	07:33	08:25	08:18	08:45
	21:33	20:33	19:21	17:16	16:16 (12)	14:42 (13)
30	05:55	06:44	07:35	08:27	08:20	08:45
	21:32	20:31	19:19	17:14	16:14 (12)	14:43 (13)
31	05:56	06:46		08:29	08:21	08:45
	21:30	20:29		17:13	16:12 (12)	14:43 (13)
Potential sun hours	502	454	381	331	266	244
Total, worst case				408	539	811
Sun reduction				0.24	0.18	0.13
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.62	0.60	0.60
Total reduction				0.15	0.11	0.08
Total, real				60	59	65

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:58/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 2 Shadow receptor: X - H24

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Table with columns for months (January to December) and rows for each day of the month, showing sun rise/set times and shadow data.

Table layout: For each day in each month the following matrix apply

Day in month Sun rise (hh:mm) Sun set (hh:mm) Minutes with flicker First time (hh:mm) with flicker Last time (hh:mm) with flicker (WTG causing flicker first time) (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 2 Shadow receptor: Y - H25

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (July-December) and rows for each day (1-31) showing sun rise/set times, potential sun hours, and various reduction factors.

Table layout: For each day in each month the following matrix apply

Summary table with 4 columns: Day in month, Sun rise/set, Minutes with flicker, and (WTG causing flicker first/last time)



Project:

6225Gortyrahyilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
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Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:58/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 2 Shadow receptor: Z - H26

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day of the year (1-31), including sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix table with 2 rows: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: AC - H29

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 14 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for time intervals (08:45 to 17:23), including potential sun hours and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix with 4 columns: Day in month, Sun rise/set times, Minutes with flicker, and First/Last times with flicker.

Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
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+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:58/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 2 Shadow receptor: AD - H30

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main table with columns for months (January-June) and rows for each day of the month, including sunrise/set times, shadow reduction, and operational time. Includes a summary row at the bottom.

Table layout: For each day in each month the following matrix apply

Matrix with 4 columns: Day in month, Sun rise/set, Minutes with flicker, First/Last time with flicker (WTG causing flicker).



Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
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+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:58/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 2 Shadow receptor: AD - H30

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main data table with columns for months (July-December) and rows for days and time intervals (05:22-21:30). Includes summary rows for Potential sun hours, Total, worst case, Sun reduction, Oper. time red., Wind dir. red., Total reduction, and Total, real.

Table layout: For each day in each month the following matrix apply

Table with 4 columns: Day in month, Sun rise/set (hh:mm), Minutes with flicker, and First/Last time (hh:mm) with flicker (WTG causing flicker).



Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:58/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 2 Shadow receptor: AE - H31

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times, minutes with flicker, and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix table with 4 columns: Day in month, Sun rise/set times, Minutes with flicker, and Last time with flicker.



SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: AG - H33

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 16:36	15:11 (14) 15:41 (14)	08:18 17:24	07:25 18:16	17:22 (12) 20:10	06:10 21:00
2	08:45 16:37	15:12 (14) 15:42 (14)	08:17 17:26	16:40 (13) 07:23 18:17	17:20 (12) 07:12 20:11	06:08 21:02
3	08:45 16:38	15:13 (14) 15:43 (14)	08:15 17:28	16:37 (13) 07:21 18:19	17:19 (12) 07:10 20:13	06:06 21:04
4	08:45 16:40	15:14 (14) 15:43 (14)	08:14 17:30	16:35 (13) 07:18 18:21	17:19 (12) 07:07 20:15	06:04 21:05
5	08:44 16:41	15:13 (14) 15:43 (14)	08:12 17:31	16:34 (13) 07:16 18:23	17:18 (12) 07:05 20:16	06:02 21:07
6	08:44 16:42	15:14 (14) 15:44 (14)	08:10 17:33	16:33 (13) 07:14 18:25	17:18 (12) 07:03 20:18	06:00 21:09
7	08:44 16:43	15:14 (14) 15:44 (14)	08:08 17:35	16:32 (13) 07:12 18:26	17:18 (12) 07:01 20:20	05:58 21:10
8	08:43 16:45	15:15 (14) 15:45 (14)	08:07 17:37	16:32 (13) 07:09 18:28	17:18 (12) 06:58 20:22	05:57 21:12
9	08:43 16:46	15:16 (14) 15:45 (14)	08:05 17:39	16:31 (13) 07:07 18:30	17:18 (12) 06:56 20:23	05:55 21:14
10	08:42 16:47	15:16 (14) 15:46 (14)	08:03 17:41	16:31 (13) 07:05 18:32	17:19 (12) 06:54 20:25	05:53 21:15
11	08:42 16:49	15:16 (14) 15:46 (14)	08:01 17:43	16:31 (13) 07:03 18:33	17:21 (12) 06:52 20:27	05:52 21:17
12	08:41 16:50	15:18 (14) 15:46 (14)	07:59 17:44	16:31 (13) 07:00 18:35	17:22 (12) 06:49 20:28	05:50 21:18
13	08:40 16:52	15:18 (14) 15:46 (14)	07:58 17:46	16:31 (13) 06:58 18:37	17:31 (12) 06:47 20:30	05:48 21:20
14	08:40 16:53	15:19 (14) 15:46 (14)	07:56 17:48	16:31 (13) 06:56 18:39	06:45 20:32	05:47 21:22
15	08:39 16:55	15:19 (14) 15:46 (14)	07:54 17:50	16:32 (13) 06:54 18:40	06:43 20:33	05:45 21:23
16	08:38 16:56	15:20 (14) 15:46 (14)	07:52 17:52	16:33 (13) 06:51 18:42	06:41 20:35	05:44 21:25
17	08:37 16:58	15:21 (14) 15:46 (14)	07:50 17:54	16:34 (13) 06:49 18:44	06:38 20:37	05:42 21:26
18	08:36 16:59	15:22 (14) 15:46 (14)	07:48 17:56	16:35 (13) 06:47 18:46	06:36 20:39	05:41 21:28
19	08:35 17:01	15:23 (14) 15:44 (14)	07:46 17:57	16:37 (13) 06:44 18:47	06:34 20:40	05:39 21:29
20	08:34 17:03	15:24 (14) 15:44 (14)	07:44 17:59	16:40 (13) 06:42 18:49	06:32 20:42	05:38 21:31
21	08:33 17:04	15:26 (14) 15:43 (14)	07:42 18:01	16:47 (13) 18:49	06:40 20:44	05:36 21:32
22	08:32 17:06	15:28 (14) 15:42 (14)	07:40 18:03	06:37 18:52	06:28 20:45	05:35 21:33
23	08:31 17:08	15:30 (14) 15:40 (14)	07:38 18:05	06:35 18:54	06:26 20:47	05:34 21:35
24	08:29 17:10	18:07	07:36	06:33	06:24	05:33
25	08:28 17:11	18:08	07:33	06:30	06:22	05:31
26	08:27 17:13	18:10	07:31	06:28	06:19	05:30
27	08:26 17:15	18:12	07:29	06:26	06:17	05:29
28	08:24 17:17	18:14	07:27	17:25 (12) 06:24	19:01 20:54	21:40
29	08:23 17:19		07:21	17:35 (12) 19:03	20:55	21:41
30	08:21 17:20		07:19	20:04	20:57	21:43
31	08:20 17:22		07:17	20:06	20:59	21:44
Potential sun hours	259	278	367	416	485	499
Total, worst case	593	376	209			
Sun reduction	0.16	0.21	0.24			
Oper. time red.	1.00	1.00	1.00			
Wind dir. red.	0.59	0.62	0.64			
Total reduction	0.09	0.13	0.16			
Total, real	54	48	33			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 2 **Shadow receptor:** AG - H33

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:21	05:58	06:48	07:37	18:04 (12)	07:30
	22:00	21:28	20:26	19:17	5	18:09 (12)
2	05:22	05:59	06:49	07:38	17:59 (12)	07:32
	22:00	21:27	20:24	19:14	12	18:11 (12)
3	05:23	06:01	06:51	07:40	17:58 (12)	07:34
	21:59	21:25	20:22	19:12	15	18:13 (12)
4	05:24	06:03	06:53	07:42	17:56 (12)	07:36
	21:59	21:23	20:19	19:10	18	18:14 (12)
5	05:24	06:04	06:54	07:43	17:54 (12)	07:38
	21:59	21:21	20:17	19:08	20	18:14 (12)
6	05:25	06:06	06:56	07:45	17:54 (12)	07:39
	21:58	21:20	20:15	19:05	20	18:14 (12)
7	05:26	06:07	06:57	07:47	17:54 (12)	07:41
	21:57	21:18	20:13	19:03	20	18:14 (12)
8	05:27	06:09	06:59	07:48	17:54 (12)	07:43
	21:57	21:16	20:10	19:01	20	18:14 (12)
9	05:28	06:10	07:01	07:50	17:53 (12)	07:45
	21:56	21:14	20:08	18:59	20	18:13 (12)
10	05:29	06:12	07:02	07:52	17:53 (12)	07:47
	21:55	21:12	20:06	18:56	20	18:13 (12)
11	05:30	06:14	07:04	07:53	17:54 (12)	07:48
	21:55	21:10	20:03	18:54	18	18:12 (12)
12	05:31	06:15	07:06	07:55	17:55 (12)	07:50
	21:54	21:08	20:01	18:52	16	18:11 (12)
13	05:32	06:17	07:07	07:57	17:56 (12)	07:52
	21:53	21:07	19:59	18:50	12	18:08 (12)
14	05:33	06:18	07:09	07:59	17:58 (12)	07:54
	21:52	21:05	19:56	18:47	7	18:05 (12)
15	05:35	06:20	07:10	08:00	07:55	08:38
	21:51	21:03	19:54	18:45	16:48	16:26
16	05:36	06:22	07:12	08:02	07:57	08:39
	21:50	21:01	19:52	18:43	16:46	16:26
17	05:37	06:23	07:14	08:04	07:59	08:40
	21:49	20:59	19:49	18:41	16:45	16:26
18	05:38	06:25	07:15	08:06	08:01	08:40
	21:48	20:56	19:47	18:39	16:44	16:27
19	05:39	06:27	07:17	08:07	08:02	15:05 (14)
	21:47	20:54	19:45	18:37	16:42	10
20	05:41	06:28	07:19	08:09	08:04	15:03 (14)
	21:45	20:52	19:42	18:35	16:41	14
21	05:42	06:30	07:20	08:11	08:06	15:01 (14)
	21:44	20:50	19:40	18:32	16:40	17
22	05:43	06:31	07:22	08:13	17:10 (13)	08:07
	21:43	20:48	19:38	18:30	9	17:19 (13)
23	05:45	06:33	07:23	08:14	17:07 (13)	08:09
	21:42	20:46	19:35	18:28	14	17:21 (13)
24	05:46	06:35	07:25	08:16	17:05 (13)	08:11
	21:40	20:44	19:33	18:26	18	17:23 (13)
25	05:48	06:36	07:27	08:18	16:04 (13)	08:12
	21:39	20:42	19:31	17:24	20	16:24 (13)
26	05:49	06:38	07:28	08:20	16:03 (13)	08:14
	21:38	20:40	19:28	17:22	22	16:25 (13)
27	05:50	06:40	07:30	08:21	16:01 (13)	08:15
	21:36	20:37	19:26	17:20	24	16:25 (13)
28	05:52	06:41	07:32	08:23	16:01 (13)	08:17
	21:35	20:35	19:24	17:18	24	16:25 (13)
29	05:53	06:43	07:33	08:25	16:00 (13)	08:18
	21:33	20:33	19:21	17:16	25	16:25 (13)
30	05:55	06:44	07:35	08:27	16:00 (13)	08:20
	21:31	20:31	19:19	17:14	25	16:25 (13)
31	05:56	06:46	07:37	08:29	16:00 (13)	08:21
	21:30	20:28	19:17	17:13	25	16:25 (13)
Potential sun hours	502	454	381	331	266	244
Total, worst case				429		914
Sun reduction				0.24		0.18
Oper. time red.				1.00		1.00
Wind dir. red.				0.63		0.59
Total reduction				0.15		0.11
Total, real				64		73

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:58/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: AH - H34

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 2 rows of values: 1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

Table with 14 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 2 rows of values: 357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise, set, and operational time.

Table layout: For each day in each month the following matrix apply

Matrix with 4 columns: Day in month, Sun rise/set, Minutes with flicker, First/Last time with flicker.

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:58/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: AJ - H36

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Table with columns for months (January to December) and rows for time slots (08:45 to 17:23). Includes summary rows for 'Potential sun hours', 'Sun reduction', 'Oper. time red.', 'Wind dir. red.', 'Total reduction', and 'Total, real'.

Table layout: For each day in each month the following matrix apply

Day in month Sun rise (hh:mm) Sun set (hh:mm) Minutes with flicker First time (hh:mm) with flicker Last time (hh:mm) with flicker (WTG causing flicker first time) (WTG causing flicker last time)



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
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+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:58/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: AK - H37

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for time intervals (08:45-17:23) and summary rows (Potential sun hours, Total, worst case, Sun reduction, Oper. time red., Wind dir. red., Total reduction, Total, real).

Table layout: For each day in each month the following matrix apply

Table with 4 columns: Day in month, Sun rise (hh:mm) / Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker / Last time (hh:mm) with flicker, and (WTG causing flicker first time) / (WTG causing flicker last time).

SHADOW - Calendar

Calculation: Alternative Scenario 2 **Shadow receptor:** AL - H38

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 16:37	08:18 17:24	07:25 18:16	07:15 20:10	06:10 21:01	05:25 21:46
2	08:45 16:38	08:17 17:26	07:23 18:18	07:12 20:11	06:08 21:02	05:24 21:47
3	08:45 16:39	08:15 17:28	07:21 18:19	07:10 20:13	06:06 21:04	05:23 21:48
4	08:45 16:40	08:14 17:30	07:18 18:21	07:08 20:15	06:04 21:06	05:22 21:49
5	08:44 16:41	08:12 17:32	07:16 18:23	07:05 20:17	06:02 21:07	05:22 21:50
6	08:44 16:42	08:10 17:34	07:14 18:25	07:03 20:18	06:01 21:09	05:21 21:51
7	08:44 16:44	08:09 17:35	07:12 18:27	07:01 20:20	05:59 21:10	05:20 21:52
8	08:43 16:45	08:07 17:37	07:10 18:28	06:59 20:22	05:57 21:12	05:20 21:53
9	08:43 16:46	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	05:19 21:54
10	08:42 16:48	08:03 17:41	07:05 18:32	06:54 20:25	05:54 21:15	05:19 21:55
11	08:42 16:49	08:01 17:43	07:03 18:34	06:52 20:27	05:52 21:17	05:19 21:56
12	08:41 16:50	08:00 17:45	07:01 18:35	06:50 20:28	05:50 21:19	05:18 21:56
13	08:40 16:52	07:58 17:47	06:58 18:37	06:47 20:30	05:49 21:20	05:18 21:57
14	08:40 16:53	07:56 17:48	06:56 18:39	06:45 20:32	05:47 21:22	05:18 21:58
15	08:39 16:55	07:54 17:50	06:54 18:41	06:43 20:34	05:45 21:23	05:18 21:58
16	08:38 16:57	07:52 17:52	06:51 18:42	06:41 20:35	05:44 21:25	05:17 21:59
17	08:37 16:58	07:50 17:54	06:49 18:44	06:39 20:37	05:42 21:26	05:17 21:59
18	08:36 17:00	07:48 17:56	06:47 18:46	06:36 20:39	05:41 21:28	05:17 22:00
19	08:35 17:01	07:46 17:58	06:45 18:48	06:34 20:40	05:40 21:29	05:17 22:00
20	08:34 17:03	07:44 17:59	06:42 18:49	06:32 20:42	05:38 21:31	05:18 22:00
21	08:33 17:05	07:42 18:01	06:40 18:51	06:30 20:44	05:37 21:32	05:18 22:00
22	08:32 17:06	07:40 18:03	06:38 18:53	06:28 20:45	05:35 21:33	05:18 22:01
23	08:31 17:08	07:38 18:05	06:35 18:54	06:26 20:47	05:34 21:35	05:18 22:01
24	08:30 17:10	07:36 18:07	06:33 18:56	06:24 20:49	05:33 21:36	05:18 22:01
25	08:28 17:12	07:34 18:09	06:31 18:58	06:22 20:50	05:32 21:38	05:19 22:01
26	08:27 17:13	07:31 18:10	06:28 19:00	06:20 20:52	05:31 21:39	05:19 22:01
27	08:26 17:15	07:29 18:12	06:26 19:01	06:18 20:54	05:30 21:40	05:20 22:01
28	08:24 17:17	07:27 18:14	06:24 19:03	06:16 20:56	05:29 21:41	05:20 22:01
29	08:23 17:19	07:25 18:16	06:22 19:05	06:14 20:57	05:27 21:43	05:21 22:01
30	08:21 17:21	07:23 18:18	06:20 19:07	06:12 20:59	05:27 21:44	05:21 22:01
31	08:20 17:22	07:21 18:20	06:18 19:08	06:10 20:59	05:26 21:45	05:21 22:01
Potential sun hours	259	278	367	416	485	499
Total, worst case			180	685	523	
Sun reduction			0.24	0.35	0.37	
Oper. time red.			1.00	1.00	1.00	
Wind dir. red.			0.68	0.66	0.65	
Total reduction			0.17	0.23	0.24	
Total, real			30	160	126	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: AL - H38

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22	05:58	07:12 (15)	06:48	07:18 (16)	07:37
	22:00	21:28	29 07:41 (15)	20:26	26 07:44 (16)	19:17
2	05:22	06:00	07:10 (15)	06:50	07:17 (16)	07:38
	22:00	21:27	31 07:41 (15)	20:24	26 07:43 (16)	19:15
3	05:23	06:01	07:10 (15)	06:51	07:17 (16)	07:40
	21:59	21:25	32 07:42 (15)	20:22	26 07:43 (16)	19:12
4	05:24	06:03	07:09 (15)	06:53	07:19 (16)	07:42
	21:59	21:23	33 07:42 (15)	20:20	24 07:43 (16)	19:10
5	05:25	06:04	07:09 (15)	06:54	07:20 (16)	07:43
	21:59	21:22	34 07:43 (15)	20:17	22 07:42 (16)	19:08
6	05:26	06:06	07:08 (15)	06:56	07:22 (16)	07:45
	21:58	21:20	35 07:43 (15)	20:15	19 07:41 (16)	19:06
7	05:26	06:08	07:08 (15)	06:58	07:23 (16)	07:47
	21:57	21:18	36 07:44 (15)	20:13	16 07:39 (16)	19:03
8	05:27	06:09	07:08 (15)	06:59	07:25 (16)	07:49
	21:57	21:16	36 07:44 (15)	20:10	13 07:38 (16)	19:01
9	05:28	06:11	07:08 (15)	07:01	07:26 (16)	07:50
	21:56	21:14	36 07:44 (15)	20:08	9 07:35 (16)	18:59
10	05:29	06:12	07:07 (15)	07:02	07:28 (16)	07:52
	21:55	21:12	37 07:44 (15)	20:06	4 07:32 (16)	18:57
11	05:30	06:14	07:07 (15)	07:04		07:54
	21:55	21:11	37 07:44 (15)	20:04		18:54
12	05:31	06:16	07:07 (15)	07:06		07:55
	21:54	21:09	36 07:43 (15)	20:01		18:52
13	05:33	06:17	07:07 (15)	07:07	07:52 (17)	07:57
	21:53	21:07	36 07:43 (15)	19:59	5 07:57 (17)	18:50
14	05:34	06:19	07:07 (15)	07:09	07:48 (17)	07:59
	21:52	21:05	36 07:43 (15)	19:57	11 07:59 (17)	18:48
15	05:35	06:20	07:07 (15)	07:11	07:46 (17)	08:00
	21:51	21:03	36 07:43 (15)	19:54	15 08:01 (17)	18:46
16	05:36	06:22	07:07 (15)	07:12	07:44 (17)	08:02
	21:50	21:01	34 07:41 (15)	19:52	18 08:02 (17)	18:43
17	05:37	06:24	07:08 (15)	07:14	07:43 (17)	08:04
	21:49	20:59	33 07:41 (15)	19:50	19 08:02 (17)	18:41
18	05:39	06:25	07:08 (15)	07:15	07:43 (17)	08:06
	21:48	20:57	32 07:40 (15)	19:47	20 08:03 (17)	18:39
19	05:40	06:27	07:09 (15)	07:17	07:42 (17)	08:07
	21:47	20:55	30 07:39 (15)	19:45	20 08:02 (17)	18:37
20	05:41	06:28	07:10 (15)	07:19	07:44 (17)	08:09
	21:46	20:52	27 07:37 (15)	19:43	18 08:02 (17)	18:35
21	05:42	06:30	07:11 (15)	07:20	07:45 (17)	08:11
	21:44	20:50	25 07:36 (15)	19:40	16 08:01 (17)	18:33
22	05:44	06:32	07:12 (15)	07:22	07:47 (17)	08:13
	21:43	20:48	22 07:34 (15)	19:38	14 08:01 (17)	18:31
23	05:45	06:33	07:14 (15)	07:24	07:49 (17)	08:14
	21:42	20:46	18 07:32 (15)	19:36	11 08:00 (17)	18:29
24	05:47	06:35	07:18 (15)	07:25	07:50 (17)	08:16
	21:40	20:44	21 07:39 (16)	19:33	8 07:58 (17)	18:27
25	05:48	07:22 (15)	06:37	07:25 (16)	07:27	07:52 (17)
	21:39	7 07:29 (15)	20:42	15 07:40 (16)	19:31	4 07:56 (17)
26	05:49	07:20 (15)	06:38	07:24 (16)	07:29	07:20
	21:38	13 07:33 (15)	20:40	18 07:42 (16)	19:29	17:23
27	05:51	07:17 (15)	06:40	07:22 (16)	07:30	07:22
	21:36	17 07:34 (15)	20:37	21 07:43 (16)	19:26	17:21
28	05:52	07:16 (15)	06:41	07:21 (16)	07:32	07:23
	21:35	20 07:36 (15)	20:35	23 07:44 (16)	19:24	17:19
29	05:54	07:15 (15)	06:43	07:19 (16)	07:33	07:25
	21:33	23 07:38 (15)	20:33	25 07:44 (16)	19:22	17:17
30	05:55	07:13 (15)	06:45	07:19 (16)	07:35	07:27
	21:32	25 07:38 (15)	20:31	25 07:44 (16)	19:19	17:15
31	05:57	07:13 (15)	06:46	07:18 (16)		07:29
	21:30	27 07:40 (15)	20:29	26 07:44 (16)		17:13
Potential sun hours	502	454		381	331	266
Total, worst case	132		915		364	
Sun reduction	0.27		0.30		0.28	
Oper. time red.	1.00		1.00		1.00	
Wind dir. red.	0.65		0.65		0.67	
Total reduction	0.17		0.19		0.19	
Total, real	23		178		70	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 2 Shadow receptor: AM - H39

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



Project:

6225Gortyrahillay_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park
IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:58/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: AN - H40

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June	July	August	September	October	November	December																																																																																								
1	08:45 08:18 07:25 07:15 06:10 05:25 05:22 05:58 06:48 07:37 07:31 08:21	16:37 17:24 18:16 20:10 21:01 21:46 22:00 21:28 20:26 19:17 17:11 16:31	2	08:45 08:17 07:23 07:12 06:08 05:24 05:23 06:00 06:50 07:38 07:32 08:23	16:38 17:26 18:18 20:11 21:02 21:47 22:00 21:27 20:24 19:15 17:09 16:30	3	08:45 08:15 07:21 07:10 06:06 05:23 05:23 06:01 06:51 07:40 07:34 08:24	16:39 17:28 18:19 20:13 21:04 21:48 21:59 21:25 20:22 19:12 17:07 16:30	4	08:45 08:14 07:19 07:08 06:04 05:22 05:24 06:03 06:53 07:42 07:36 08:26	16:40 17:30 18:21 20:15 21:06 21:50 21:59 21:23 20:20 19:10 17:06 16:29	5	08:45 08:12 07:16 07:05 06:02 05:22 05:25 06:04 06:54 07:44 07:38 08:27	16:41 17:32 18:23 20:17 21:07 21:51 21:59 21:22 20:17 19:08 17:04 16:28	6	08:44 08:10 07:14 07:03 06:01 05:21 05:26 06:06 06:56 07:45 07:39 08:28	16:42 17:34 18:25 20:18 21:09 21:51 21:58 21:20 20:15 19:06 17:02 16:28	7	08:44 08:09 07:12 07:01 05:59 05:21 05:27 06:08 06:58 07:47 07:41 08:29	16:44 17:35 18:27 20:20 21:11 21:52 21:57 21:18 20:13 19:03 17:00 16:28	8	08:43 08:07 07:10 06:59 05:57 05:20 05:27 06:09 06:59 07:49 07:43 08:31	16:45 17:37 18:28 20:22 21:12 21:53 21:57 21:16 20:10 19:01 16:59 16:27	9	08:43 08:05 07:07 06:56 05:55 05:19 05:28 06:11 07:01 07:50 07:45 08:32	16:46 17:39 18:30 20:23 21:14 21:54 21:56 21:14 20:08 18:59 16:57 16:27	10	08:42 08:03 07:05 06:54 05:54 05:19 05:29 06:12 07:03 07:52 07:47 08:33	16:48 17:41 18:32 20:25 21:15 21:55 21:55 21:12 20:06 18:57 16:55 16:27	11	08:42 08:01 07:03 06:52 05:52 05:19 05:30 06:14 07:04 07:54 07:48 08:34	16:49 17:43 18:34 20:27 21:17 21:56 21:55 21:11 20:04 18:54 16:54 16:27	12	08:41 08:00 07:01 06:50 05:50 05:18 05:32 06:16 07:06 07:55 07:50 08:35	16:51 17:45 18:35 20:28 21:19 21:56 21:54 21:09 20:01 18:52 16:52 16:27	13	08:40 07:58 06:58 06:47 8 07:19 (15) 05:49 05:18 05:33 06:17 07:07 07:57 07:52 08:36	16:52 17:47 18:37 20:30 21:20 21:57 21:53 21:07 19:59 18:50 16:51 16:26	14	08:40 07:56 06:56 06:45 14 07:16 (15) 05:47 05:18 05:34 06:19 07:09 07:59 07:54 08:37	16:54 17:48 18:39 20:32 21:22 21:58 21:52 21:05 19:57 18:48 16:49 16:26	15	08:39 07:54 06:54 06:43 14 07:30 (15) 05:45 05:18 05:35 06:20 07:11 08:00 07:55 08:38	16:55 17:50 18:41 20:34 16 07:31 (15) 21:23 21:58 21:51 21:03 5 07:30 (15) 19:54 18:46 16:48 16:27	16	08:38 07:52 06:51 06:41 19 07:13 (15) 05:44 05:18 05:36 06:22 07:21 (15) 07:12 08:02 07:57 08:39	16:57 17:52 18:42 20:35 19 07:32 (15) 21:25 21:59 21:50 21:01 11 07:32 (15) 19:52 18:43 16:47 16:27	17	08:37 07:50 06:49 06:39 20 07:13 (15) 05:42 05:17 05:37 06:24 07:20 (15) 07:14 08:04 07:59 08:40	16:58 17:54 18:44 20:37 20 07:33 (15) 21:26 21:59 21:49 20:59 15 07:35 (15) 19:50 18:41 16:45 16:27	18	08:36 07:48 06:47 06:37 21 07:12 (15) 05:41 05:17 05:39 06:25 07:18 (15) 07:15 08:06 08:01 08:40	17:00 17:56 18:46 20:39 21 07:33 (15) 21:28 22:00 21:48 20:57 17 07:35 (15) 19:47 18:39 16:44 16:27	19	08:35 07:46 06:45 06:34 22 07:11 (15) 05:40 05:17 05:40 06:27 07:17 (15) 07:17 08:07 08:02 08:41	17:01 17:58 18:48 20:40 22 07:33 (15) 21:29 22:00 21:47 20:55 19 07:36 (15) 19:45 18:37 16:43 16:27	20	08:34 07:44 06:42 06:32 20 07:11 (15) 05:38 05:18 05:41 06:28 07:16 (15) 07:19 08:09 08:04 08:42	17:03 18:00 18:49 20:42 22 07:33 (15) 21:31 22:00 21:46 20:52 20 07:36 (15) 19:43 18:35 16:41 16:28	21	08:33 07:42 06:40 06:30 22 07:11 (15) 05:37 05:18 05:42 06:30 07:16 (15) 07:20 08:11 08:06 08:42	17:05 18:01 18:51 20:44 22 07:33 (15) 21:32 22:00 21:44 20:50 21 07:37 (15) 19:40 18:33 16:40 16:28	22	08:32 07:40 06:38 06:28 21 07:11 (15) 05:36 05:18 05:44 06:32 07:15 (15) 07:22 08:13 08:07 08:43	17:07 18:03 18:53 20:45 21 07:32 (15) 21:34 22:01 21:43 20:48 21 07:36 (15) 19:38 18:31 16:39 16:29	23	08:31 07:38 06:35 06:26 20 07:11 (15) 05:34 05:18 05:45 06:33 07:15 (15) 07:24 08:14 08:09 08:43	17:08 18:05 18:54 20:47 20 07:31 (15) 21:35 22:01 21:42 20:46 22 07:37 (15) 19:36 18:29 16:38 16:29	24	08:30 07:36 06:33 06:24 18 07:12 (15) 05:33 05:18 05:47 06:35 07:15 (15) 07:25 08:16 08:11 08:44	17:10 18:07 18:56 20:49 18 07:30 (15) 21:36 22:01 21:40 20:44 22 07:37 (15) 19:33 18:27 16:37 16:30	25	08:28 07:34 06:31 06:22 16 07:13 (15) 05:32 05:19 05:48 06:37 07:15 (15) 07:27 08:18 08:12 08:44	17:12 18:09 18:58 20:51 16 07:29 (15) 21:38 22:01 21:39 20:42 21 07:36 (15) 19:31 17:25 16:36 16:30	26	08:27 07:32 06:28 06:20 14 07:14 (15) 05:31 05:19 05:49 06:38 07:15 (15) 07:29 08:20 16:35 16:31	17:14 18:10 19:00 20:52 14 07:28 (15) 21:39 22:01 21:38 20:40 20 07:35 (15) 19:29 17:23 16:35 16:31	27	08:26 07:29 06:26 06:18 10 07:15 (15) 05:30 05:20 05:51 06:40 07:15 (15) 07:30 07:22 08:15 08:45	17:15 18:12 19:01 20:54 10 07:25 (15) 21:40 22:01 21:36 20:38 19 07:34 (15) 19:26 17:21 16:34 16:32	28	08:24 07:27 06:24 06:16 10 07:17 (15) 05:29 05:20 05:52 06:41 07:17 (15) 07:32 07:23 08:17 08:45	17:17 18:14 19:03 20:56 21:42 22:01 21:35 20:35 16 07:33 (15) 19:24 17:19 16:33 16:33	29	08:23 07:21 06:14 06:06 21:43 22:01 21:33 20:33 13 07:17 (15) 07:34 07:25 08:18 08:45	17:19 18:05 18:54 20:47 20 07:35 (15) 21:41 22:02 21:34 20:34 13 07:30 (15) 19:22 17:17 16:32 16:33	30	08:21 07:19 06:12 06:04 05:27 05:21 05:55 06:45 07:20 (15) 07:35 07:27 08:20 08:45	17:21 18:06 18:55 20:49 21:44 22:00 21:32 20:31 8 07:28 (15) 19:19 17:15 16:32 16:34	31	08:20 07:17 06:06 06:00 05:26 05:20 05:57 06:46 17:23 18:12 19:01 19:50 07:29 08:45	17:23 18:11 19:00 20:48 21:45 22:01 21:30 20:29 17:13 18:03 18:52 19:41 07:29 08:45	17:23 18:11 19:00 20:48 21:45 22:01 21:30 20:29 17:13 18:03 18:52 19:41 07:29 08:45	Potential sun hours 259 278 367 416 485 499 502 454 381 331 266 244	Total, worst case 263	Sun reduction 0.35	Oper. time red. 1.00	Wind dir. red. 0.66	Total reduction 0.23	Total, real 61

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:58/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: AQ - H43

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45	08:18	15:37 (13)	07:25	07:14	06:10
	16:36	17:24	11 15:48 (13)	18:16	20:10	21:00
2	08:45	15:29 (13)	08:17	15:41 (13)	07:23	07:12
	16:37	5 15:34 (13)	17:26	3 15:44 (13)	18:17	20:11
3	08:45	15:28 (13)	08:15		07:21	07:10
	16:38	8 15:36 (13)	17:28		18:19	20:13
4	08:45	15:28 (13)	08:14		07:18	07:07
	16:40	10 15:38 (13)	17:30		18:21	20:15
5	08:44	15:27 (13)	08:12		07:16	07:05
	16:41	12 15:39 (13)	17:31		18:23	20:16
6	08:44	15:27 (13)	08:10		07:14	07:03
	16:42	14 15:41 (13)	17:33		18:25	20:18
7	08:44	15:26 (13)	08:08		07:12	07:01
	16:43	16 15:42 (13)	17:35		18:26	20:20
8	08:43	15:26 (13)	08:07		07:09	06:58
	16:45	17 15:43 (13)	17:37		18:28	20:22
9	08:43	15:26 (13)	08:05		07:07	06:56
	16:46	18 15:44 (13)	17:39		18:30	20:23
10	08:42	15:25 (13)	08:03		07:05	06:54
	16:47	20 15:45 (13)	17:41		18:32	20:25
11	08:42	15:25 (13)	08:01		07:03	06:52
	16:49	21 15:46 (13)	17:43		18:33	20:27
12	08:41	15:26 (13)	08:00		07:00	06:49
	16:50	21 15:47 (13)	17:44	10 16:47 (12)	18:35	20:28
13	08:40	15:25 (13)	07:58		16:35 (12)	06:58
	16:52	23 15:48 (13)	17:46	14 16:49 (12)	18:37	20:30
14	08:40	15:25 (13)	07:56		16:33 (12)	06:56
	16:53	24 15:49 (13)	17:48	18 16:51 (12)	18:39	20:32
15	08:39	15:25 (13)	07:54		16:32 (12)	06:54
	16:55	25 15:50 (13)	17:50	20 16:52 (12)	18:40	20:33
16	08:38	15:25 (13)	07:52		16:32 (12)	06:51
	16:56	25 15:50 (13)	17:52	21 16:53 (12)	18:42	20:35
17	08:37	15:25 (13)	07:50		16:31 (12)	06:49
	16:58	26 15:51 (13)	17:54	22 16:53 (12)	18:44	20:37
18	08:36	15:26 (13)	07:48		16:31 (12)	06:47
	16:59	26 15:52 (13)	17:56	23 16:54 (12)	18:46	20:39
19	08:35	15:25 (13)	07:46		16:31 (12)	06:44
	17:01	26 15:51 (13)	17:57	23 16:54 (12)	18:47	20:40
20	08:34	15:25 (13)	07:44		16:31 (12)	06:42
	17:03	27 15:52 (13)	17:59	23 16:54 (12)	18:49	20:42
21	08:33	15:26 (13)	07:42		16:31 (12)	06:40
	17:04	26 15:52 (13)	18:01	22 16:53 (12)	18:51	20:44
22	08:32	15:27 (13)	07:40		16:32 (12)	06:37
	17:06	26 15:53 (13)	18:03	21 16:53 (12)	18:52	20:45
23	08:31	15:26 (13)	07:38		16:32 (12)	06:35
	17:08	27 15:53 (13)	18:05	20 16:52 (12)	18:54	20:47
24	08:29	15:27 (13)	07:36		16:33 (12)	06:33
	17:10	26 15:53 (13)	18:07	17 16:50 (12)	18:56	20:49
25	08:28	15:28 (13)	07:34		16:34 (12)	06:30
	17:11	25 15:53 (13)	18:08	15 16:49 (12)	18:58	20:50
26	08:27	15:28 (13)	07:31		16:36 (12)	06:28
	17:13	25 15:53 (13)	18:10	11 16:47 (12)	18:59	20:52
27	08:26	15:30 (13)	07:29		06:26	06:17
	17:15	23 15:53 (13)	18:12		19:01	20:54
28	08:24	15:30 (13)	07:27		06:24	06:15
	17:17	22 15:52 (13)	18:14		19:03	20:55
29	08:23	15:31 (13)			07:21	06:13
	17:19	20 15:51 (13)			20:04	20:57
30	08:21	15:33 (13)			07:19	06:12
	17:20	18 15:51 (13)			20:06	20:59
31	08:20	15:34 (13)			07:17	06:11
	17:22	15 15:49 (13)			20:08	21:45
Potential sun hours	259	278	367	416	485	499
Total, worst case	617	294				
Sun reduction	0.16	0.21				
Oper. time red.	1.00	1.00				
Wind dir. red.	0.59	0.62				
Total reduction	0.09	0.13				
Total, real	56	38				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)



SHADOW - Calendar

Calculation: Alternative Scenario 2 Shadow receptor: AQ - H43

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:21	05:58	06:48	07:37	07:30	08:21
	22:00	21:28	20:26	19:17	17:11	16:30
2	05:22	05:59	06:49	07:38	07:32	08:23
	22:00	21:27	20:24	19:15	17:09	16:30
3	05:23	06:01	06:51	07:40	07:34	08:24
	21:59	21:25	20:22	19:12	17:07	16:29
4	05:24	06:03	06:53	07:42	07:36	08:26
	21:59	21:23	20:19	19:10	17:05	16:29
5	05:24	06:04	06:54	07:43	07:38	08:27
	21:59	21:21	20:17	19:08	17:04	16:28
6	05:25	06:06	06:56	07:45	07:39	08:28
	21:58	21:20	20:15	19:05	17:02	16:28
7	05:26	06:07	06:57	07:47	07:41	08:29
	21:57	21:18	20:13	19:03	17:00	16:27
8	05:27	06:09	06:59	07:48	07:43	08:31
	21:57	21:16	20:10	19:01	16:58	16:27
9	05:28	06:10	07:01	07:50	07:45	15:11 (13) 08:32
	21:56	21:14	20:08	18:59	16:57	4 15:15 (13) 16:27
10	05:29	06:12	07:02	07:52	07:47	15:07 (13) 08:33
	21:55	21:12	20:06	18:56	16:55	12 15:19 (13) 16:26
11	05:30	06:14	07:04	07:53	07:48	15:06 (13) 08:34
	21:55	21:10	20:03	18:54	16:54	15 15:21 (13) 16:26
12	05:31	06:15	07:06	07:55	07:50	15:03 (13) 08:35
	21:54	21:09	20:01	18:52	16:52	19 15:22 (13) 16:26
13	05:32	06:17	07:07	07:57	07:52	15:02 (13) 08:36
	21:53	21:07	19:59	18:50	16:51	21 15:23 (13) 16:26
14	05:33	06:18	07:09	07:59	07:54	15:02 (13) 08:37
	21:52	21:05	19:56	18:47	16:49	22 15:24 (13) 16:26
15	05:35	06:20	07:10	08:00	17:11 (12) 07:55	15:01 (13) 08:38
	21:51	21:03	19:54	18:45	6 17:17 (12) 16:48	24 15:25 (13) 16:26
16	05:36	06:22	07:12	08:02	17:08 (12) 07:57	15:01 (13) 08:39
	21:50	21:01	19:52	18:43	12 17:20 (12) 16:46	25 15:26 (13) 16:26
17	05:37	06:23	07:14	08:04	17:06 (12) 07:59	15:01 (13) 08:40
	21:49	20:59	19:49	18:41	16 17:22 (12) 16:45	25 15:26 (13) 16:26
18	05:38	06:25	07:15	08:06	17:04 (12) 08:01	15:01 (13) 08:40
	21:48	20:57	19:47	18:39	19 17:23 (12) 16:44	26 15:27 (13) 16:27
19	05:39	06:27	07:17	08:07	17:02 (12) 08:02	15:01 (13) 08:41
	21:47	20:54	19:45	18:37	21 17:23 (12) 16:42	27 15:28 (13) 16:27
20	05:41	06:28	07:19	08:09	17:02 (12) 08:04	15:02 (13) 08:42
	21:46	20:52	19:42	18:35	22 17:24 (12) 16:41	26 15:28 (13) 16:27
21	05:42	06:30	07:20	08:11	17:01 (12) 08:06	15:01 (13) 08:42
	21:44	20:50	19:40	18:32	23 17:24 (12) 16:40	26 15:27 (13) 16:28
22	05:43	06:31	07:22	08:13	17:01 (12) 08:07	15:01 (13) 08:43
	21:43	20:48	19:38	18:30	23 17:24 (12) 16:39	27 15:28 (13) 16:28
23	05:45	06:33	07:23	08:14	17:01 (12) 08:09	15:02 (13) 08:43
	21:42	20:46	19:35	18:28	23 17:24 (12) 16:38	26 15:28 (13) 16:29
24	05:46	06:35	07:25	08:16	17:01 (12) 08:11	15:03 (13) 08:44
	21:40	20:44	19:33	18:26	23 17:24 (12) 16:37	26 15:29 (13) 16:29
25	05:48	06:36	07:27	07:18	16:02 (12) 08:12	15:03 (13) 08:44
	21:39	20:42	19:31	17:24	22 16:24 (12) 16:36	26 15:29 (13) 16:30
26	05:49	06:38	07:28	07:20	16:02 (12) 08:14	15:03 (13) 08:44
	21:38	20:40	19:28	17:22	21 16:23 (12) 16:35	25 15:28 (13) 16:31
27	05:51	06:40	07:30	07:21	16:02 (12) 08:15	15:04 (13) 08:45
	21:36	20:37	19:26	17:20	19 16:21 (12) 16:34	25 15:29 (13) 16:31
28	05:52	06:41	07:32	07:23	16:03 (12) 08:17	15:05 (13) 08:45
	21:35	20:35	19:24	17:18	17 16:20 (12) 16:33	24 15:29 (13) 16:32
29	05:53	06:43	07:33	07:25	16:05 (12) 08:18	15:05 (13) 08:45
	21:33	20:33	19:21	17:16	13 16:18 (12) 16:32	23 15:28 (13) 16:33
30	05:55	06:44	07:35	07:27	16:07 (12) 08:20	15:07 (13) 08:45
	21:32	20:31	19:19	17:14	9 16:16 (12) 16:31	21 15:28 (13) 16:34
31	05:56	06:46		07:29		08:45
	21:30	20:28		17:13		16:35
Potential sun hours	502	454	381	331	266	244
Total, worst case				289	495	143
Sun reduction				0.24	0.18	0.13
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.62	0.59	0.59
Total reduction				0.15	0.11	0.08
Total, real				43	54	11

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 2 Shadow receptor: AR - H44

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with columns: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec. Values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with columns: N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum. Values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day from 08:45 to 17:22. Includes summary rows at the bottom for sun hours and reduction.

Table layout: For each day in each month the following matrix apply

Matrix with columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:58/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: AS - H45

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

	January		February		March		April		May		June	
1	08:45		14:33 (13)	08:18	15:55 (12)	07:25	07:14	06:10	05:24			
	16:36	27	15:00 (13)	17:24	16:17 (12)	18:16	20:10	21:01	21:46			
2	08:45		14:33 (13)	08:17	15:54 (12)	07:23	07:12	06:08	05:24			
	16:37	26	14:59 (13)	17:26	16:17 (12)	18:17	20:11	21:02	21:47			
3	08:45		14:34 (13)	08:15	15:54 (12)	07:21	07:10	06:06	05:23			
	16:38	26	15:00 (13)	17:28	16:18 (12)	18:19	20:13	21:04	21:48			
4	08:45		14:35 (13)	08:14	15:53 (12)	07:18	07:07	06:04	05:22			
	16:40	25	15:00 (13)	17:30	16:18 (12)	18:21	20:15	21:06	21:49			
5	08:44		14:35 (13)	08:12	15:54 (12)	07:16	07:05	06:02	05:21			
	16:41	25	15:00 (13)	17:31	16:19 (12)	18:23	20:16	21:07	21:50			
6	08:44		14:37 (13)	08:10	15:54 (12)	07:14	07:03	06:00	05:21			
	16:42	24	15:01 (13)	17:33	16:19 (12)	18:25	20:18	21:09	21:51			
7	08:44		14:37 (13)	08:09	15:54 (12)	07:12	07:01	05:58	05:20			
	16:43	23	15:00 (13)	17:35	16:19 (12)	18:26	20:20	21:10	21:52			
8	08:43		14:38 (13)	08:07	15:54 (12)	07:09	06:58	05:57	05:20			
	16:45	23	15:01 (13)	17:37	16:19 (12)	18:28	20:22	21:12	21:53			
9	08:43		14:39 (13)	08:05	15:54 (12)	07:07	06:56	05:55	05:19			
	16:46	22	15:01 (13)	17:39	16:18 (12)	18:30	20:23	21:14	21:54			
10	08:42		14:39 (13)	08:03	15:55 (12)	07:05	06:54	05:53	05:19			
	16:47	21	15:00 (13)	17:41	16:18 (12)	18:32	20:25	21:15	21:55			
11	08:42		14:40 (13)	08:01	15:55 (12)	07:03	06:52	05:52	05:18			
	16:49	20	15:00 (13)	17:43	16:17 (12)	18:33	20:27	21:17	21:56			
12	08:41		14:42 (13)	08:00	15:56 (12)	07:00	06:49	05:50	05:18			
	16:50	18	15:00 (13)	17:44	16:16 (12)	18:35	20:28	21:18	21:56			
13	08:40		14:44 (13)	07:58	15:57 (12)	06:58	06:47	05:48	05:18			
	16:52	16	15:00 (13)	17:46	16:15 (12)	18:37	20:30	21:20	21:57			
14	08:40		14:45 (13)	07:56	15:59 (12)	06:56	06:45	05:47	05:17			
	16:53	14	14:59 (13)	17:48	16:14 (12)	18:39	20:32	21:22	21:58			
15	08:39		14:47 (13)	07:54	16:02 (12)	06:54	06:43	05:45	05:17			
	16:55	10	14:57 (13)	17:50	16:11 (12)	18:40	20:33	21:23	21:58			
16	08:38		14:51 (13)	07:52	06:51	06:41	05:44	05:17	05:17			
	16:56	4	14:55 (13)	17:52	18:42	20:35	21:25	21:59	21:59			
17	08:37			07:50	06:49	06:38	05:42	05:17	05:17			
	16:58			17:54	18:44	20:37	21:26	21:59	21:59			
18	08:36			07:48	06:47	06:36	05:41	05:17	05:17			
	16:59			17:56	18:46	20:39	21:28	22:00	22:00			
19	08:35			07:46	06:44	06:34	05:39	05:17	05:17			
	17:01			17:57	18:47	20:40	21:29	22:00	22:00			
20	08:34			07:44	06:42	06:32	05:38	05:17	05:17			
	17:03			17:59	18:49	20:42	21:31	22:00	22:00			
21	08:33			07:42	06:40	06:30	05:36	05:17	05:17			
	17:04			18:01	18:51	20:44	21:32	22:00	22:00			
22	08:32			07:40	06:37	06:28	05:35	05:18	05:18			
	17:06			18:03	18:53	20:45	21:33	22:01	22:01			
23	08:31			07:38	06:35	06:26	05:34	05:18	05:18			
	17:08			18:05	18:54	20:47	21:35	22:01	22:01			
24	08:29			07:36	06:33	06:24	05:33	05:18	05:18			
	17:10			18:07	18:56	20:49	21:36	22:01	22:01			
25	08:28			07:34	06:30	06:22	05:31	05:18	05:18			
	17:11			18:08	18:58	20:50	21:38	22:01	22:01			
26	08:27			07:31	06:28	06:19	05:30	05:19	05:19			
	17:13			18:10	18:59	20:52	21:39	22:01	22:01			
27	08:26			07:29	06:26	06:17	05:29	05:19	05:19			
	17:15	3	16:03 (12)	18:12	19:01	20:54	21:40	22:01	22:01			
28	08:24			07:27	06:24	06:15	05:28	05:20	05:20			
	17:17	11	16:10 (12)	18:14	19:03	20:55	21:41	22:01	22:01			
29	08:23			15:57 (12)	07:21	06:13	05:27	05:20	05:20			
	17:19	15	16:12 (12)		20:04	20:57	21:43	22:01	22:01			
30	08:21			15:57 (12)	07:19	06:12	05:26	05:21	05:21			
	17:20	17	16:14 (12)		20:06	20:59	21:44	22:00	22:00			
31	08:20			15:55 (12)	07:17		05:25					
	17:22	20	16:15 (12)		20:08		21:45					
Potential sun hours	259		278		367		416		485			499
Total, worst case		390		325								
Sun reduction		0.16		0.21								
Oper. time red.		1.00		1.00								
Wind dir. red.		0.60		0.59								
Total reduction		0.09		0.12								
Total, real		37		39								

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 2 **Shadow receptor:** AS - H45

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:21 22:00	05:58 21:28	06:48 20:26	07:37 19:17	07:30 17:11	15:24 (12) 16:30 20
2	05:22 22:00	05:59 21:27	06:49 20:24	07:38 19:15	07:32 17:09	15:24 (12) 16:30 20
3	05:23 21:59	06:01 21:25	06:51 20:22	07:40 19:12	07:34 17:07	15:23 (12) 16:30 22
4	05:24 21:59	06:03 21:23	06:53 20:19	07:42 19:10	07:36 17:05	15:23 (12) 16:29 23
5	05:24 21:59	06:04 21:21	06:54 20:17	07:43 19:08	07:38 17:04	15:24 (12) 16:28 23
6	05:25 21:58	06:06 21:20	06:56 20:15	07:45 19:05	07:39 17:02	15:24 (12) 16:28 24
7	05:26 21:57	06:07 21:18	06:57 20:13	07:47 19:03	07:41 17:00	15:24 (12) 16:27 25
8	05:27 21:57	06:09 21:16	06:59 20:10	07:48 19:01	07:43 16:58	15:25 (12) 16:27 25
9	05:28 21:56	06:10 21:14	07:01 20:08	07:50 18:59	07:45 16:57	15:25 (12) 16:27 26
10	05:29 21:55	06:12 21:12	07:02 20:06	07:52 18:56	07:47 16:55	15:26 (12) 16:26 26
11	05:30 21:55	06:14 21:10	07:04 20:03	07:53 18:54	07:48 16:54	15:27 (12) 16:26 26
12	05:31 21:54	06:15 21:09	07:06 20:01	07:55 18:52	07:50 16:52	15:28 (12) 16:26 26
13	05:32 21:53	06:17 21:07	07:07 19:59	07:57 18:50	07:52 16:51	15:29 (12) 16:26 27
14	05:33 21:52	06:18 21:05	07:09 19:56	07:59 18:47	07:54 16:49	15:31 (12) 16:26 26
15	05:35 21:51	06:20 21:03	07:10 19:54	08:00 18:45	07:55 16:48	15:35 (12) 16:26 27
16	05:36 21:50	06:22 21:01	07:12 19:52	08:02 18:43	07:57 16:46	15:38 (12) 16:26 27
17	05:37 21:49	06:23 20:59	07:14 19:49	08:04 18:41	07:59 16:45	16:26 27 14:52 (13)
18	05:38 21:48	06:25 20:57	07:15 19:47	08:06 18:39	08:01 16:44	16:26 27 14:53 (13)
19	05:39 21:47	06:27 20:54	07:17 19:45	08:07 18:37	08:02 16:42	16:27 27 14:54 (13)
20	05:41 21:46	06:28 20:52	07:19 19:42	08:09 18:35	08:04 16:41	16:27 28 14:54 (13)
21	05:42 21:44	06:30 20:50	07:20 19:40	08:11 18:32	08:06 16:40	16:27 28 14:55 (13)
22	05:43 21:43	06:31 20:48	07:22 19:38	08:13 18:30	08:07 16:39	16:28 28 14:55 (13)
23	05:45 21:42	06:33 20:46	07:23 19:35	08:14 18:28	08:09 16:38	16:28 28 14:56 (13)
24	05:46 21:40	06:35 20:44	07:25 19:33	08:16 18:26	08:11 16:37	16:29 27 14:56 (13)
25	05:48 21:39	06:36 20:42	07:27 19:31	08:18 17:24	08:12 16:36	16:29 27 14:56 (13)
26	05:49 21:38	06:38 20:40	07:28 19:28	08:20 17:22	08:14 16:35	14:29 (13) 16:31 27
27	05:51 21:36	06:40 20:37	07:30 19:26	08:21 17:20	08:15 15:42 (12)	14:26 (13) 16:31 27
28	05:52 21:35	06:41 20:35	07:32 19:24	08:23 17:18	08:17 15:44 (12)	14:25 (13) 16:32 27
29	05:53 21:33	06:43 20:33	07:33 19:21	08:25 17:16	08:18 15:45 (12)	14:24 (13) 16:33 27
30	05:55 21:32	06:44 20:31	07:35 19:19	08:27 17:14	08:20 15:46 (12)	14:23 (13) 16:34 27
31	05:56 21:30	06:46 20:29	07:37 19:17	08:29 17:13	08:22 15:47 (12)	14:21 (13) 16:35 26
Potential sun hours	502	454	381	331	266	244
Total, worst case				87	371	801
Sun reduction				0.24	0.18	0.13
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.59	0.59	0.60
Total reduction				0.14	0.11	0.08
Total, real				12	41	65

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:58/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: AT - H46

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45	08:18	07:25	07:15	06:10	06:54 (15) 05:25
	16:37	17:24	18:16	20:10	21:01	27 07:21 (15) 21:46
2	08:45	08:17	07:23	07:12	06:08	06:54 (15) 05:24
	16:38	17:26	18:18	20:11	21:02	26 07:20 (15) 21:47
3	08:45	08:15	07:21	07:10	06:06	06:54 (15) 05:23
	16:39	17:28	18:19	20:13	21:04	27 07:21 (15) 21:48
4	08:45	08:14	07:19	07:08	06:04	06:54 (15) 05:22
	16:40	17:30	18:21	20:15	21:06	26 07:20 (15) 21:49
5	08:44	08:12	07:16	07:05	06:02	06:54 (15) 05:22
	16:41	17:32	18:23	20:17	21:07	26 07:20 (15) 21:50
6	08:44	08:10	07:14	07:03	06:01	06:55 (15) 05:21
	16:42	17:34	18:25	20:18	21:09	25 07:20 (15) 21:51
7	08:44	08:09	07:12	07:01	05:59	06:56 (15) 05:20
	16:44	17:35	18:27	20:20	21:10	23 07:19 (15) 21:52
8	08:43	08:07	07:10	06:59	07:21 (16) 05:57	06:56 (15) 05:20
	16:45	17:37	18:28	20:22	7 07:28 (16) 21:12	21 07:17 (15) 21:53
9	08:43	08:05	07:07	06:56	07:19 (16) 05:55	06:57 (15) 05:19
	16:46	17:39	18:30	20:23	11 07:30 (16) 21:14	20 07:17 (15) 21:54
10	08:42	08:03	07:05	06:54	07:17 (16) 05:54	06:58 (15) 05:19
	16:48	17:41	18:32	20:25	14 07:31 (16) 21:15	17 07:15 (15) 21:55
11	08:42	08:01	07:03	06:52	07:15 (16) 05:52	06:59 (15) 05:19
	16:49	17:43	18:34	20:27	17 07:32 (16) 21:17	14 07:13 (15) 21:56
12	08:41	08:00	07:01	06:50	07:13 (16) 05:50	07:01 (15) 05:18
	16:50	17:45	18:35	20:28	20 07:33 (16) 21:19	11 07:12 (15) 21:56
13	08:40	07:58	06:58	06:47	07:11 (16) 05:49	05:18
	16:52	17:47	18:37	20:30	21 07:32 (16) 21:20	21:57
14	08:40	07:56	06:56	06:45	07:11 (16) 05:47	05:18
	16:53	17:48	18:39	20:32	21 07:32 (16) 21:22	21:58
15	08:39	07:54	06:54	06:43	07:11 (16) 05:45	05:18
	16:55	17:50	18:41	20:34	21 07:32 (16) 21:23	21:58
16	08:38	07:52	06:51	06:41	07:11 (16) 05:44	05:18
	16:57	17:52	18:42	20:35	20 07:31 (16) 21:25	21:59
17	08:37	07:50	06:49	06:39	07:11 (16) 05:42	05:17
	16:58	17:54	18:44	20:37	20 07:31 (16) 21:26	21:59
18	08:36	07:48	06:47	06:37	07:12 (16) 05:41	05:17
	17:00	17:56	18:46	20:39	18 07:30 (16) 21:28	22:00
19	08:35	07:46	06:45	06:34	07:13 (16) 05:40	05:17
	17:01	17:58	18:48	20:40	16 07:29 (16) 21:29	22:00
20	08:34	07:44	06:42	06:32	07:14 (16) 05:38	05:18
	17:03	18:00	18:49	20:42	13 07:27 (16) 21:31	22:00
21	08:33	07:42	06:40	06:30	07:16 (16) 05:37	05:18
	17:05	18:01	18:51	20:44	8 07:24 (16) 21:32	22:00
22	08:32	07:40	06:38	06:28	07:04 (15) 05:36	05:18
	17:07	18:03	18:53	20:45	11 07:15 (15) 21:34	22:01
23	08:31	07:38	06:35	06:26	07:02 (15) 05:34	05:18
	17:08	18:05	18:54	20:47	15 07:17 (15) 21:35	22:01
24	08:30	07:36	06:33	06:24	07:00 (15) 05:33	05:18
	17:10	18:07	18:56	20:49	19 07:19 (15) 21:36	22:01
25	08:28	07:34	06:31	06:22	06:58 (15) 05:32	05:19
	17:12	18:09	18:58	20:50	22 07:20 (15) 21:38	22:01
26	08:27	07:32	06:28	06:20	06:57 (15) 05:31	05:19
	17:13	18:10	19:00	20:52	23 07:20 (15) 21:39	22:01
27	08:26	07:29	06:26	06:18	06:56 (15) 05:30	05:20
	17:15	18:12	19:01	20:54	25 07:21 (15) 21:40	22:01
28	08:24	07:27	06:24	06:16	06:55 (15) 05:29	05:20
	17:17	18:14	19:03	20:56	26 07:21 (15) 21:42	22:01
29	08:23		07:21	06:14	06:55 (15) 05:28	05:21
	17:19		20:05	20:57	26 07:21 (15) 21:43	22:01
30	08:21		07:19	06:12	06:54 (15) 05:27	05:21
	17:21		20:06	20:59	27 07:21 (15) 21:44	22:00
31	08:20		07:17		05:26	
	17:23		20:08		21:45	
Potential sun hours	259	278	367	416	485	499
Total, worst case				421		263
Sun reduction				0.35		0.37
Oper. time red.				1.00		1.00
Wind dir. red.				0.65		0.64
Total reduction				0.23		0.24
Total, real				98		63

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 2 Shadow receptor: AT - H46

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22 22:00	05:58 21:28	07:11 (15) 07:23 (15)	06:48 20:26	07:14 (16) 07:31 (16)	07:30 17:11
2	05:23 22:00	06:00 21:27	07:09 (15) 07:24 (15)	06:50 20:24	07:15 (16) 07:29 (16)	07:32 17:09
3	05:23 21:59	06:01 21:25	07:08 (15) 07:26 (15)	06:51 20:22	07:17 (16) 07:28 (16)	07:34 17:07
4	05:24 21:59	06:03 21:23	07:06 (15) 07:27 (15)	06:53 20:20	07:19 (16) 07:26 (16)	07:36 17:06
5	05:25 21:59	06:04 21:22	07:06 (15) 07:28 (15)	06:54 20:17	07:43 19:08	07:38 17:04
6	05:26 21:58	06:06 21:20	07:05 (15) 07:28 (15)	06:56 20:15	07:45 19:06	07:39 17:02
7	05:27 21:57	06:08 21:18	07:05 (15) 07:29 (15)	06:58 20:13	07:47 19:03	07:41 17:00
8	05:27 21:57	06:09 21:16	07:04 (15) 07:29 (15)	06:59 20:10	07:49 19:01	07:43 16:59
9	05:28 21:56	06:11 21:14	07:04 (15) 07:30 (15)	07:01 20:08	07:50 18:59	07:45 16:57
10	05:29 21:55	06:12 21:12	07:03 (15) 07:29 (15)	07:03 20:06	07:52 18:57	07:47 16:55
11	05:30 21:55	06:14 21:11	07:03 (15) 07:30 (15)	07:04 20:04	07:54 18:54	07:48 16:54
12	05:32 21:54	06:16 21:09	07:02 (15) 07:29 (15)	07:06 20:01	07:55 18:52	07:50 16:52
13	05:33 21:53	06:17 21:07	07:03 (15) 07:30 (15)	07:07 19:59	07:57 18:50	07:52 16:51
14	05:34 21:52	06:19 21:05	07:02 (15) 07:29 (15)	07:09 19:57	07:59 18:48	07:54 16:49
15	05:35 21:51	06:20 21:03	07:03 (15) 07:29 (15)	07:11 19:54	08:00 18:46	07:55 16:48
16	05:36 21:50	06:22 21:01	07:03 (15) 07:27 (15)	07:12 19:52	08:02 18:43	07:57 16:47
17	05:37 21:49	06:24 20:59	07:04 (15) 07:27 (15)	07:14 19:50	08:04 18:41	07:59 16:45
18	05:39 21:48	06:25 20:57	07:04 (15) 07:25 (15)	07:15 19:47	08:06 18:39	08:01 16:44
19	05:40 21:47	06:27 20:55	07:06 (15) 07:24 (15)	07:17 19:45	08:07 18:37	08:02 16:43
20	05:41 21:46	06:28 20:52	07:07 (15) 07:22 (15)	07:19 19:43	08:09 18:35	08:04 16:41
21	05:42 21:44	06:30 20:50	07:09 (15) 07:19 (15)	07:20 19:40	08:11 18:33	08:06 16:40
22	05:44 21:43	06:32 20:48	07:19 (16) 07:28 (16)	07:22 19:38	08:13 18:31	08:07 16:39
23	05:45 21:42	06:33 20:46	07:18 (16) 07:31 (16)	07:24 19:36	08:14 18:29	08:09 16:38
24	05:47 21:40	06:35 20:44	07:16 (16) 07:32 (16)	07:25 19:33	08:16 18:27	08:11 16:37
25	05:48 21:39	06:37 20:42	07:15 (16) 07:33 (16)	07:27 19:31	08:18 17:25	08:12 16:36
26	05:49 21:38	06:38 20:40	07:14 (16) 07:34 (16)	07:29 19:29	08:20 17:23	08:14 16:35
27	05:51 21:36	06:40 20:37	07:13 (16) 07:33 (16)	07:30 19:26	08:22 17:21	08:15 16:34
28	05:52 21:35	06:41 20:35	07:13 (16) 07:34 (16)	07:32 19:24	08:23 17:19	08:17 16:33
29	05:54 21:33	06:43 20:33	07:12 (16) 07:33 (16)	07:33 19:22	08:25 17:17	08:18 16:32
30	05:55 21:32	06:45 20:31	07:12 (16) 07:33 (16)	07:35 19:19	08:27 17:15	08:20 16:32
31	05:57 21:30	06:46 20:29	07:12 (16) 07:32 (16)	07:35 19:17	08:29 17:13	08:22 16:31
Potential sun hours	502	454	381	331	266	244
Total, worst case	7	636	49			
Sun reduction	0.27	0.30	0.28			
Oper. time red.	1.00	1.00	1.00			
Wind dir. red.	0.64	0.65	0.66			
Total reduction	0.17	0.19	0.19			
Total, real	1	123	9			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 2**Shadow receptor:** AU - H47

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January		February		March		April		May		June	
1	08:45	15:09 (14)	08:18	16:28 (13)	07:25	17:11 (12)	07:14	06:10	05:24			
	16:36	28 15:37 (14)	17:24	17:45 (13)	18:16	20 17:31 (12)	20:10	21:00	21:46			
2	08:45	15:10 (14)	08:17	16:27 (13)	07:23	17:11 (12)	07:12	06:08	05:24			
	16:37	27 15:37 (14)	17:26	16:46 (13)	18:17	20 17:31 (12)	20:11	21:02	21:47			
3	08:45	15:11 (14)	08:15	16:26 (13)	07:21	17:11 (12)	07:10	06:06	05:23			
	16:38	27 15:38 (14)	17:28	16:47 (13)	18:19	20 17:31 (12)	20:13	21:04	21:48			
4	08:45	15:12 (14)	08:14	16:25 (13)	07:18	17:12 (12)	07:07	06:04	05:22			
	16:40	27 15:39 (14)	17:30	16:47 (13)	18:21	19 17:31 (12)	20:15	21:05	21:49			
5	08:44	15:12 (14)	08:12	16:26 (13)	07:16	17:12 (12)	07:05	06:02	05:21			
	16:41	27 15:39 (14)	17:31	16:48 (13)	18:23	17 17:29 (12)	20:16	21:07	21:50			
6	08:44	15:13 (14)	08:10	16:25 (13)	07:14	17:13 (12)	07:03	06:00	05:21			
	16:42	26 15:39 (14)	17:33	16:49 (13)	18:25	15 17:28 (12)	20:18	21:09	21:51			
7	08:44	15:13 (14)	08:08	16:25 (13)	07:12	17:15 (12)	07:01	05:58	05:20			
	16:43	26 15:39 (14)	17:35	16:49 (13)	18:26	11 17:26 (12)	20:20	21:10	21:52			
8	08:43	15:14 (14)	08:07	16:25 (13)	07:09	17:18 (12)	06:58	05:57	05:20			
	16:45	26 15:40 (14)	17:37	16:49 (13)	18:28	5 17:23 (12)	20:22	21:12	21:53			
9	08:43	15:15 (14)	08:05	16:25 (13)	07:07		06:56	05:55	05:19			
	16:46	25 15:40 (14)	17:39	16:48 (13)	18:30		20:23	21:14	21:54			
10	08:42	15:15 (14)	08:03	16:25 (13)	07:05		06:54	05:53	05:19			
	16:47	24 15:39 (14)	17:41	16:48 (13)	18:32		20:25	21:15	21:55			
11	08:42	15:16 (14)	08:01	16:26 (13)	07:03		06:52	05:52	05:18			
	16:49	23 15:39 (14)	17:43	16:47 (13)	18:33		20:27	21:17	21:56			
12	08:41	15:17 (14)	07:59	16:27 (13)	07:00		06:49	05:50	05:18			
	16:50	23 15:40 (14)	17:44	16:47 (13)	18:35		20:28	21:18	21:56			
13	08:40	15:18 (14)	07:58	16:28 (13)	06:58		06:47	05:48	05:18			
	16:52	22 15:40 (14)	17:46	16:46 (13)	18:37		20:30	21:20	21:57			
14	08:40	15:19 (14)	07:56	16:29 (13)	06:56		06:45	05:47	05:17			
	16:53	21 15:40 (14)	17:48	16:44 (13)	18:39		20:32	21:22	21:58			
15	08:39	15:20 (14)	07:54	16:31 (13)	06:54		06:43	05:45	05:17			
	16:55	19 15:39 (14)	17:50	16:42 (13)	18:40		20:33	21:23	21:58			
16	08:38	15:21 (14)	07:52	16:36 (13)	06:51		06:41	05:44	05:17			
	16:56	18 15:39 (14)	17:52	2 16:38 (13)	18:42		20:35	21:25	21:59			
17	08:37	15:23 (14)	07:50		06:49		06:38	05:42	05:17			
	16:58	15 15:38 (14)	17:54		18:44		20:37	21:26	21:59			
18	08:36	15:25 (14)	07:48		06:47		06:36	05:41	05:17			
	16:59	12 15:37 (14)	17:56		18:46		20:39	21:28	21:59			
19	08:35	15:27 (14)	07:46		06:44		06:34	05:39	05:17			
	17:01	7 15:34 (14)	17:57		18:47		20:40	21:29	22:00			
20	08:34		07:44		06:42		06:32	05:38	05:17			
	17:03		17:59		18:49		20:42	21:31	22:00			
21	08:33		07:42		06:40		06:30	05:36	05:17			
	17:04		18:01		18:51		20:44	21:32	22:00			
22	08:32		07:40		06:37		06:28	05:35	05:17			
	17:06		18:03		18:52		20:45	21:33	22:01			
23	08:31		07:38		06:35		06:26	05:34	05:18			
	17:08		18:05		18:54		20:47	21:35	22:01			
24	08:29		07:36		17:17 (12)	06:33	06:24	05:33	05:18			
	17:10		18:07	9	17:26 (12)	18:56	20:49	21:36	22:01			
25	08:28		07:33		17:15 (12)	06:30	06:22	05:31	05:18			
	17:11		18:08	14	17:29 (12)	18:58	20:50	21:38	22:01			
26	08:27		07:31		17:14 (12)	06:28	06:19	05:30	05:19			
	17:13		18:10	16	17:30 (12)	18:59	20:52	21:39	22:01			
27	08:26		07:29		17:13 (12)	06:26	06:17	05:29	05:19			
	17:15		18:12	18	17:31 (12)	19:01	20:54	21:40	22:01			
28	08:24		07:27		17:12 (12)	06:24	06:15	05:28	05:20			
	17:17		18:14	20	17:32 (12)	19:03	20:55	21:41	22:01			
29	08:23		16:32 (13)			07:21	06:13	05:27	05:20			
	17:19	6	16:38 (13)			20:04	20:57	21:43	22:01			
30	08:21		16:30 (13)			07:19	06:12	05:26	05:21			
	17:20	11	16:41 (13)			20:06	20:59	21:44	22:00			
31	08:20		16:28 (13)			07:17		05:25				
	17:22	15	16:43 (13)			20:08		21:45				
Potential sun hours	259		278		367		416	485	499			
Total, worst case	455		383		127							
Sun reduction	0.16		0.21		0.24							
Oper. time red.	1.00		1.00		1.00							
Wind dir. red.	0.60		0.62		0.64							
Total reduction	0.09		0.13		0.16							
Total, real	42		49		20							

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 2 Shadow receptor: AU - H47

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (July-December) and rows for each day (1-31) showing sun rise/set times and reduction factors.

Table layout: For each day in each month the following matrix apply

Matrix table with 2 rows (Day in month, Sun rise/set) and 4 columns (Sun rise/set, Minutes with flicker, First/Last time with flicker, WTG causing flicker time).

SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: AW - H49

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for days (1-31). Includes summary rows for Potential sun hours, Total, worst case, Sun reduction, Oper. time red., Wind dir. red., Total reduction, and Total, real.

Table layout: For each day in each month the following matrix apply

Matrix with 4 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
 Finisklin Business Park
 IE-F91 RHH9 Sligo
 +353719161416
 Karen O'Neill / koneill@jodireland.com
 Calculated:
 06/07/2022 17:58/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 2 Shadow receptor: AX - H50

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

July	August	September	October	November	December		
1 05:22	20:35 (5) 05:58	06:48	07:37	18:07 (16) 07:30	14:14 (18) 08:21	14:16 (18)	
22:00	21 20:56 (5) 21:28	20:26	19:17	10 18:17 (16) 17:11	53 16:26 (17) 16:31	45 15:01 (19)	
2 05:22	20:36 (5) 06:00	06:49	07:38	18:04 (16) 07:32	14:12 (18) 08:23	14:17 (18)	
22:00	20 20:56 (5) 21:27	20:24	19:15	15 18:19 (16) 17:09	56 16:26 (17) 16:30	46 15:03 (19)	
3 05:23	20:36 (5) 06:01	06:51	07:40	18:02 (16) 07:34	14:11 (18) 08:24	14:17 (18)	
21:59	20 20:56 (5) 21:25	20:22	19:12	18 18:20 (16) 17:07	56 16:25 (17) 16:29	46 15:03 (19)	
4 05:24	20:36 (5) 06:03	06:53	07:42	18:01 (16) 07:36	14:10 (18) 08:25	14:19 (18)	
21:59	19 20:55 (5) 21:23	20:19	19:10	20 18:21 (16) 17:05	56 16:24 (17) 16:29	45 15:04 (19)	
5 05:25	20:37 (5) 06:04	06:54	07:43	17:59 (16) 07:38	14:09 (18) 08:27	14:20 (18)	
21:58	18 20:55 (5) 21:21	20:17	19:08	22 18:21 (16) 17:04	56 16:23 (17) 16:28	44 15:04 (19)	
6 05:25	20:38 (5) 06:06	06:56	07:45	17:59 (16) 07:39	14:08 (18) 08:28	14:20 (18)	
21:58	17 20:55 (5) 21:20	20:15	19:05	22 18:21 (16) 17:02	54 16:21 (17) 16:28	44 15:04 (19)	
7 05:26	20:39 (5) 06:07	06:57	07:47	17:58 (16) 07:41	14:08 (18) 08:29	14:22 (18)	
21:57	16 20:55 (5) 21:18	20:13	19:03	23 18:21 (16) 17:00	48 16:18 (17) 16:27	44 15:06 (19)	
8 05:27	20:40 (5) 06:09	06:59	07:48	17:58 (16) 07:43	14:07 (18) 08:30	14:23 (18)	
21:57	15 20:55 (5) 21:16	20:10	19:01	23 18:21 (16) 16:59	42 14:49 (18) 16:27	43 15:06 (19)	
9 05:28	20:41 (5) 06:11	07:01	07:50	17:58 (16) 07:45	14:07 (18) 08:32	14:24 (18)	
21:56	13 20:54 (5) 21:14	20:08	18:59	22 18:20 (16) 16:57	42 14:49 (18) 16:27	42 15:06 (19)	
10 05:29	20:42 (5) 06:12	07:02	07:52	17:58 (16) 07:46	14:07 (18) 08:33	14:25 (18)	
21:55	11 20:53 (5) 21:12	20:06	18:56	22 18:20 (16) 16:55	43 14:50 (18) 16:27	41 15:06 (19)	
11 05:30	20:44 (5) 06:14	07:04	07:53	17:59 (16) 07:48	14:06 (18) 08:34	14:27 (18)	
21:55	8 20:52 (5) 21:10	20:03	18:54	20 18:19 (16) 16:54	43 14:49 (18) 16:26	41 15:08 (19)	
12 05:31	20:47 (5) 06:15	07:06	07:55	18:00 (16) 07:50	14:06 (18) 08:35	14:28 (18)	
21:54	2 20:49 (5) 21:08	20:01	18:52	18 18:18 (16) 16:52	44 14:50 (18) 16:26	40 15:08 (19)	
13 05:32	06:17	07:07	07:57	18:00 (16) 07:52	14:06 (18) 08:36	14:29 (18)	
21:53	21:06	19:59	18:50	16 18:16 (16) 16:51	44 14:50 (18) 16:26	40 15:09 (19)	
14 05:34	06:19	07:09	07:59	18:02 (16) 07:54	14:06 (18) 08:37	14:30 (18)	
21:52	21:05	19:56	18:48	11 18:13 (16) 16:49	44 14:50 (18) 16:26	39 15:09 (19)	
15 05:35	06:20	07:10	08:00	18:06 (16) 07:55	14:06 (18) 08:38	14:31 (18)	
21:51	21:03	19:54	18:45	3 18:09 (16) 16:48	45 14:51 (18) 16:26	39 15:10 (19)	
16 05:36	06:22	07:12	08:02	17:57 (16) 07:57	14:06 (18) 08:39	14:31 (18)	
21:50	21:01	19:52	18:43	16:46	45 14:51 (18) 16:26	38 15:09 (19)	
17 05:37	06:23	07:14	08:04	17:59 (16) 07:59	14:07 (18) 08:39	14:33 (18)	
21:49	20:59	19:49	18:41	16:45	44 14:51 (18) 16:27	37 15:10 (19)	
18 05:38	06:25	07:15	08:06	16:44	44 14:51 (18) 16:27	37 15:11 (19)	
21:48	20:56	19:47	18:39	17:13 (17) 08:02	14:08 (18) 08:41	14:35 (18)	
19 05:40	06:27	07:17	08:07	16:42	44 14:52 (18) 16:27	37 15:12 (19)	
21:47	20:54	19:45	18:37	4 17:17 (17) 16:42	44 14:52 (18) 16:27	37 15:12 (19)	
20 05:41	06:28	07:19	08:09	17:08 (17) 08:04	14:08 (18) 08:42	14:35 (18)	
21:45	20:52	19:42	18:35	13 17:21 (17) 16:41	44 14:52 (18) 16:28	37 15:12 (19)	
21 05:42	06:30	07:20	08:11	17:06 (17) 08:06	14:08 (18) 08:42	14:36 (18)	
21:44	20:50	19:40	18:33	17 17:23 (17) 16:40	43 14:51 (18) 16:28	36 15:12 (19)	
22 05:44	06:31	07:22	08:13	17:05 (17) 08:07	14:09 (18) 08:43	14:36 (18)	
21:43	20:48	19:38	18:30	20 17:25 (17) 16:39	42 14:51 (18) 16:28	36 15:12 (19)	
23 05:45	06:33	07:23	08:14	17:03 (17) 08:09	14:10 (18) 08:43	14:37 (18)	
21:42	20:46	19:35	18:28	23 17:26 (17) 16:38	42 14:52 (19) 16:29	37 15:14 (19)	
24 05:46	06:35	07:25	08:16	17:03 (17) 08:10	14:11 (18) 08:44	14:37 (18)	
21:40	20:44	19:33	18:26	24 17:27 (17) 16:37	43 14:54 (19) 16:29	37 15:14 (19)	
25 05:48	06:36	07:27	07:18	16:02 (17) 08:12	14:10 (18) 08:44	14:37 (18)	
21:39	20:42	19:31	17:24	25 16:27 (17) 16:36	45 14:55 (19) 16:30	37 15:14 (19)	
26 05:49	06:38	07:28	07:20	16:00 (17) 08:14	14:11 (18) 08:44	14:37 (18)	
21:37	20:40	19:28	17:22	27 16:27 (17) 16:35	46 14:57 (19) 16:31	37 15:14 (19)	
27 05:51	06:40	07:30	07:21	16:00 (17) 08:15	14:13 (18) 08:45	14:37 (18)	
21:36	20:37	19:26	17:20	27 16:27 (17) 16:34	45 14:58 (19) 16:32	38 15:15 (19)	
28 05:52	06:41	07:32	07:23	16:00 (17) 08:17	14:13 (18) 08:45	14:37 (18)	
21:34	20:35	19:24	17:18	27 16:27 (17) 16:33	46 14:59 (19) 16:32	39 15:16 (19)	
29 05:54	06:43	07:33	07:25	14:23 (18) 08:18	14:14 (18) 08:45	14:37 (18)	
21:33	20:33	19:21	17:16	38 16:27 (17) 16:32	46 15:00 (19) 16:33	39 15:16 (19)	
30 05:55	06:44	07:35	07:27	14:19 (18) 08:20	14:15 (18) 08:45	14:37 (18)	
21:31	20:31	19:19	17:15	46 16:27 (17) 16:31	46 15:01 (19) 16:34	40 15:17 (19)	
31 05:57	06:46	07:29	07:29	14:16 (18) 08:45	14:37 (18)		
21:30	20:28	17:13	17:13	50 16:27 (17) 16:35	16:35	40 15:17 (19)	
Potential sun hours	502	454	381	331	266	244	241
Total, worst case	180			606	1391		1241
Sun reduction	0.27			0.24	0.18		0.13
Oper. time red.	1.00			1.00	1.00		1.00
Wind dir. red.	0.69			0.63	0.60		0.60
Total reduction	0.18			0.15	0.11		0.08
Total, real	33			90	154		100

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: AY - H51

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec. Values range from 1.06 to 2.89.

Operational time

Table with 13 columns: N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum. Values range from 194 to 8,760.

Main shadow calculation table with columns for months (January to June) and rows for each day. Includes sub-totals for potential sun hours, sun reduction, and total reduction.

Table layout: For each day in each month the following matrix apply

Matrix table with 4 columns: Day in month, Sun rise/set, First/Last time with flicker, and (WTG causing flicker) first/last time.

SHADOW - Calendar

Calculation: Alternative Scenario 2 Shadow receptor: AY - H51

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22	20:18 (5)	05:58	06:48	07:37	07:30
	22:00	27 20:45 (5)	21:28	20:26	19:17	17:11
2	05:22	20:19 (5)	06:00	06:49	07:38	07:32
	22:00	27 20:46 (5)	21:27	20:24	19:15	17:09
3	05:23	20:19 (5)	06:01	06:51	07:40	07:34
	21:59	27 20:46 (5)	21:25	20:22	19:12	17:07
4	05:24	20:19 (5)	06:03	06:53	07:42	17:58 (16)
	21:59	27 20:46 (5)	21:23	20:19	19:10	17:05
5	05:25	20:19 (5)	06:04	06:54	07:43	17:55 (16)
	21:58	27 20:46 (5)	21:21	20:17	19:08	17:04
6	05:25	20:20 (5)	06:06	06:56	07:45	17:54 (16)
	21:58	26 20:46 (5)	21:20	20:15	19:05	17:02
7	05:26	20:20 (5)	06:07	06:57	07:47	17:53 (16)
	21:57	26 20:46 (5)	21:18	20:13	19:03	17:00
8	05:27	20:21 (5)	06:09	06:59	07:48	17:52 (16)
	21:57	25 20:46 (5)	21:16	20:10	19:01	17:00
9	05:28	20:21 (5)	06:11	07:01	07:50	18:13 (16)
	21:56	26 20:47 (5)	21:14	20:08	18:59	17:50 (16)
10	05:29	20:22 (5)	06:12	07:02	07:52	17:50 (16)
	21:55	25 20:47 (5)	21:12	20:06	18:56	17:50 (16)
11	05:30	20:22 (5)	06:14	07:04	07:53	17:50 (16)
	21:55	24 20:46 (5)	21:10	20:03	18:54	17:48
12	05:31	20:22 (5)	06:15	07:06	07:55	17:51 (16)
	21:54	24 20:46 (5)	21:08	20:01	18:52	17:50 (16)
13	05:32	20:23 (5)	06:17	07:07	07:57	17:50 (16)
	21:53	23 20:46 (5)	21:06	19:59	18:50	17:50 (16)
14	05:34	20:23 (5)	06:19	07:09	07:59	17:51 (16)
	21:52	23 20:46 (5)	21:05	19:56	18:48	17:51 (16)
15	05:35	20:24 (5)	06:20	07:10	08:00	17:52 (16)
	21:51	21 20:45 (5)	21:03	19:54	18:45	17:52 (16)
16	05:36	20:24 (5)	06:22	07:12	08:02	17:53 (16)
	21:50	21 20:45 (5)	21:01	19:52	18:43	17:53 (16)
17	05:37	20:25 (5)	06:23	07:14	08:04	17:56 (16)
	21:49	19 20:44 (5)	20:59	19:49	18:41	17:56 (16)
18	05:38	20:26 (5)	06:25	07:15	08:06	18:00
	21:48	17 20:43 (5)	20:56	19:47	18:39	18:00
19	05:40	20:27 (5)	06:27	07:17	08:07	16:44
	21:47	15 20:42 (5)	20:54	19:45	18:37	16:44
20	05:41	20:29 (5)	06:28	07:19	08:09	16:42
	21:45	12 20:41 (5)	20:52	19:42	18:35	16:42
21	05:42	20:31 (5)	06:30	07:20	08:11	16:41
	21:44	8 20:39 (5)	20:50	19:40	18:33	16:41
22	05:44		06:31	07:22	08:13	16:40
	21:43		20:48	19:38	18:30	16:40
23	05:45		06:33	07:23	08:14	17:04 (17)
	21:42		20:46	19:35	18:28	17:13 (17)
24	05:46		06:35	07:25	08:16	16:39
	21:40		20:44	19:33	18:26	17:16 (17)
25	05:48		06:36	07:27	07:18	16:59 (17)
	21:39		20:42	19:31	17:24	17:17 (17)
26	05:49		06:38	07:28	07:20	15:58 (17)
	21:37		20:39	19:28	17:22	16:18 (17)
27	05:51		06:40	07:30	07:21	16:37
	21:36		20:37	19:26	17:20	16:37
28	05:52		06:41	07:32	07:23	15:55 (17)
	21:34		20:35	19:24	17:18	16:19 (17)
29	05:54		06:43	07:33	07:25	16:20 (17)
	21:33		20:33	19:21	17:16	16:33
30	05:55		06:44	07:35	07:27	15:55 (17)
	21:31		20:31	19:19	17:15	16:20 (17)
31	05:57		06:46	07:37	07:29	15:55 (17)
	21:30		20:28	19:17	17:13	16:20 (17)
Potential sun hours	502	454	381	331	266	244
Total, worst case				455	1261	1185
Sun reduction	0.27			0.24	0.18	0.13
Oper. time red.	1.00			1.00	1.00	1.00
Wind dir. red.	0.68			0.63	0.60	0.60
Total reduction	0.18			0.15	0.11	0.08
Total, real	85			67	139	95

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: BA - H53

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for days (1-31) and summary rows (Potential sun hours, Total, worst case, etc.)

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:58/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: BC - H55

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times, minutes with flicker, and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 2**Shadow receptor:** BD - H56**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45	15:24 (14)	08:18	16:42 (13)	07:25	07:14
	16:36	26 15:50 (14)	17:24	7 16:49 (13)	18:16	20:10
2	08:45	15:24 (14)	08:17	16:39 (13)	07:23	07:12
	16:37	27 15:51 (14)	17:26	12 16:51 (13)	18:17	20:11
3	08:45	15:25 (14)	08:15	16:38 (13)	07:21	07:10
	16:38	26 15:51 (14)	17:28	15 16:53 (13)	18:19	20:13
4	08:45	15:26 (14)	08:14	16:36 (13)	07:18	07:07
	16:40	26 15:52 (14)	17:30	18 16:54 (13)	18:21	20:15
5	08:44	15:26 (14)	08:12	16:36 (13)	07:16	07:05
	16:41	26 15:52 (14)	17:31	20 16:56 (13)	18:23	20:16
6	08:44	15:27 (14)	08:10	16:36 (13)	07:14	07:03
	16:42	26 15:53 (14)	17:33	20 16:56 (13)	18:25	20:18
7	08:44	15:27 (14)	08:08	16:35 (13)	07:12	07:01
	16:43	26 15:53 (14)	17:35	22 16:57 (13)	18:26	20:20
8	08:43	15:28 (14)	08:07	16:35 (13)	07:09	06:58
	16:45	26 15:54 (14)	17:37	22 16:57 (13)	18:28	20:21
9	08:43	15:28 (14)	08:05	16:35 (13)	07:07	06:56
	16:46	26 15:54 (14)	17:39	22 16:57 (13)	18:30	20:23
10	08:42	15:28 (14)	08:03	16:35 (13)	07:05	06:54
	16:47	26 15:54 (14)	17:41	22 16:57 (13)	18:32	20:25
11	08:42	15:28 (14)	08:01	16:35 (13)	07:03	06:52
	16:49	26 15:54 (14)	17:43	22 16:57 (13)	18:33	20:27
12	08:41	15:30 (14)	07:59	16:35 (13)	07:00	06:49
	16:50	25 15:55 (14)	17:44	22 16:57 (13)	18:35	20:28
13	08:40	15:30 (14)	07:58	16:36 (13)	06:58	06:47
	16:52	25 15:55 (14)	17:46	20 16:56 (13)	18:37	20:30
14	08:40	15:31 (14)	07:56	16:36 (13)	06:56	06:45
	16:53	24 15:55 (14)	17:48	19 16:55 (13)	18:39	20:32
15	08:39	15:32 (14)	07:54	16:38 (13)	06:54	06:43
	16:55	23 15:55 (14)	17:50	16 16:54 (13)	18:40	20:33
16	08:38	15:32 (14)	07:52	16:39 (13)	06:51	06:41
	16:56	23 15:55 (14)	17:52	14 16:53 (13)	18:42	20:35
17	08:37	15:33 (14)	07:50	16:42 (13)	06:49	06:38
	16:58	22 15:55 (14)	17:54	8 16:50 (13)	18:44	20:37
18	08:36	15:35 (14)	07:48		06:47	06:36
	16:59	19 15:54 (14)	17:56		18:46	20:39
19	08:35	15:35 (14)	07:46		06:44	06:34
	17:01	18 15:53 (14)	17:57		18:47	20:40
20	08:34	15:37 (14)	07:44		06:42	06:32
	17:03	16 15:53 (14)	17:59		18:49	20:42
21	08:33	15:39 (14)	07:42		06:40	06:30
	17:04	13 15:52 (14)	18:01		18:51	20:44
22	08:32	15:42 (14)	07:40		06:37	06:28
	17:06	8 15:50 (14)	18:03		18:52	20:45
23	08:31		07:38		06:35	06:26
	17:08		18:05		18:54	20:47
24	08:29		07:36		06:33	06:24
	17:10		18:07		18:56	20:49
25	08:28		07:33		06:30	06:21
	17:11		18:08		18:58	20:50
26	08:27		07:31		06:28	06:19
	17:13		18:10		18:59	20:52
27	08:26		07:29		06:26	06:17
	17:15		18:12		19:01	20:54
28	08:24		07:27		06:24	06:15
	17:17		18:14		19:03	20:55
29	08:23				07:21	06:13
	17:19				20:04	20:57
30	08:21				07:19	06:11
	17:20				20:06	20:59
31	08:20				07:17	06:09
	17:22				20:08	21:45
Potential sun hours	259	278		367	416	485
Total, worst case	503	301				
Sun reduction	0.16	0.21				
Oper. time red.	1.00	1.00				
Wind dir. red.	0.59	0.62				
Total reduction	0.09	0.13				
Total, real	46	38				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 2 **Shadow receptor:** BD - H56

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:21	05:58	06:48	07:37	07:30	16:04 (13) 08:21 15:10 (14)
	22:00	21:28	20:26	19:17	17:11	23 16:27 (13) 16:30 26 15:36 (14)
2	05:22	05:59	06:49	07:38	07:32	16:04 (13) 08:23 15:11 (14)
	22:00	21:27	20:24	19:14	17:09	23 16:27 (13) 16:30 26 15:37 (14)
3	05:23	06:01	06:51	07:40	07:34	16:05 (13) 08:24 15:11 (14)
	21:59	21:25	20:22	19:12	17:07	22 16:27 (13) 16:29 26 15:37 (14)
4	05:24	06:03	06:53	07:42	07:36	16:05 (13) 08:25 15:12 (14)
	21:59	21:23	20:19	19:10	17:05	21 16:26 (13) 16:29 26 15:38 (14)
5	05:24	06:04	06:54	07:43	07:38	16:06 (13) 08:27 15:12 (14)
	21:59	21:21	20:17	19:08	17:03	20 16:26 (13) 16:28 26 15:38 (14)
6	05:25	06:06	06:56	07:45	07:39	16:06 (13) 08:28 15:13 (14)
	21:58	21:20	20:15	19:05	17:02	19 16:25 (13) 16:28 26 15:39 (14)
7	05:26	06:07	06:57	07:47	07:41	16:07 (13) 08:29 15:13 (14)
	21:57	21:18	20:13	19:03	17:00	18 16:25 (13) 16:27 26 15:39 (14)
8	05:27	06:09	06:59	07:48	07:43	16:09 (13) 08:31 15:13 (14)
	21:57	21:16	20:10	19:01	16:58	15 16:24 (13) 16:27 26 15:39 (14)
9	05:28	06:10	07:01	07:50	07:45	16:10 (13) 08:32 15:13 (14)
	21:56	21:14	20:08	18:59	16:57	12 16:22 (13) 16:27 27 15:40 (14)
10	05:29	06:12	07:02	07:52	07:46	16:13 (13) 08:33 15:14 (14)
	21:55	21:12	20:06	18:56	16:55	7 16:20 (13) 16:26 27 15:41 (14)
11	05:30	06:14	07:04	07:53	07:48	08:34 15:15 (14)
	21:55	21:10	20:03	18:54	16:54	16:26 26 15:41 (14)
12	05:31	06:15	07:05	07:55	07:50	08:35 15:15 (14)
	21:54	21:08	20:01	18:52	16:52	16:26 26 15:41 (14)
13	05:32	06:17	07:07	07:57	07:52	08:36 15:16 (14)
	21:53	21:07	19:59	18:50	16:51	16:26 26 15:42 (14)
14	05:33	06:18	07:09	07:59	07:54	08:37 15:16 (14)
	21:52	21:05	19:56	18:47	16:49	16:26 26 15:42 (14)
15	05:35	06:20	07:10	08:00	07:55	08:38 15:17 (14)
	21:51	21:03	19:54	18:45	16:48	16:26 26 15:43 (14)
16	05:36	06:22	07:12	08:02	07:57	08:39 15:16 (14)
	21:50	21:01	19:52	18:43	16:46	16:26 26 15:42 (14)
17	05:37	06:23	07:14	08:04	07:59	08:40 15:17 (14)
	21:49	20:59	19:49	18:41	16:45	16:26 26 15:43 (14)
18	05:38	06:25	07:15	08:06	08:01	08:40 15:18 (14)
	21:48	20:56	19:47	18:39	16:44	16:27 26 15:44 (14)
19	05:39	06:27	07:17	08:07	08:02	08:41 15:19 (14)
	21:47	20:54	19:45	18:37	16:42	16:27 25 15:44 (14)
20	05:41	06:28	07:18	08:09	08:04	15:17 (14) 08:42 15:19 (14)
	21:45	20:52	19:42	18:35	16:41	8 15:25 (14) 16:27 25 15:44 (14)
21	05:42	06:30	07:20	08:11	08:06	15:14 (14) 08:42 15:20 (14)
	21:44	20:50	19:40	18:32	16:40	13 15:27 (14) 16:28 25 15:45 (14)
22	05:43	06:31	07:22	08:13	08:07	15:13 (14) 08:43 15:20 (14)
	21:43	20:48	19:38	18:30	16:39	16 15:29 (14) 16:28 25 15:45 (14)
23	05:45	06:33	07:23	08:14	08:09	15:12 (14) 08:43 15:21 (14)
	21:42	20:46	19:35	18:28	16:38	18 15:30 (14) 16:29 25 15:46 (14)
24	05:46	06:35	07:25	08:16	08:11	15:12 (14) 08:44 15:21 (14)
	21:40	20:44	19:33	18:26	16:36	19 15:31 (14) 16:29 25 15:46 (14)
25	05:48	06:36	07:27	07:18	16:12 (13) 08:12	15:12 (14) 08:44 15:21 (14)
	21:39	20:42	19:31	17:24	9 16:21 (13) 16:35	21 15:33 (14) 16:30 25 15:46 (14)
26	05:49	06:38	07:28	07:20	16:09 (13) 08:14	15:11 (14) 08:44 15:22 (14)
	21:38	20:40	19:28	17:22	15 16:24 (13) 16:35	22 15:33 (14) 16:31 26 15:48 (14)
27	05:50	06:40	07:30	07:21	16:07 (13) 08:15	15:11 (14) 08:45 15:22 (14)
	21:36	20:37	19:26	17:20	17 16:24 (13) 16:34	23 15:34 (14) 16:31 26 15:48 (14)
28	05:52	06:41	07:32	07:23	16:06 (13) 08:17	15:11 (14) 08:45 15:23 (14)
	21:35	20:35	19:24	17:18	19 16:25 (13) 16:33	24 15:35 (14) 16:32 25 15:48 (14)
29	05:53	06:43	07:33	07:25	16:05 (13) 08:18	15:10 (14) 08:45 15:23 (14)
	21:33	20:33	19:21	17:16	21 16:26 (13) 16:32	25 15:35 (14) 16:33 26 15:49 (14)
30	05:55	06:44	07:35	07:27	16:05 (13) 08:20	15:11 (14) 08:45 15:23 (14)
	21:31	20:31	19:19	17:14	21 16:26 (13) 16:31	25 15:36 (14) 16:34 27 15:50 (14)
31	05:56	06:46	07:37	07:29	16:04 (13) 08:21	08:45 15:24 (14)
	21:30	20:28	19:17	17:13	23 16:27 (13) 16:35	26 15:50 (14)
Potential sun hours	502	454	381	331	266	244
Total, worst case				125	394	801
Sun reduction				0.24	0.18	0.13
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.62	0.60	0.59
Total reduction				0.15	0.11	0.08
Total, real				18	44	63

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: BE - H57

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 16:37	08:18 17:24	07:25 18:16	07:15 20:10	07:53 (17) 06:10	05:25 06:43 (15)
2	08:45 16:38	08:17 17:26	07:23 18:18	07:12 20:11	07:55 (17) 06:08	05:24 06:44 (15)
3	08:45 16:39	08:15 17:28	07:21 18:19	07:10 20:13	07:57 (17) 06:06	05:23 06:44 (15)
4	08:45 16:40	08:14 17:30	07:18 18:21	07:08 20:15	07:08 21:06	05:22 06:44 (15)
5	08:44 16:41	08:12 17:32	07:16 18:23	07:05 20:17	06:02 21:07	05:22 06:45 (15)
6	08:44 16:42	08:10 17:34	07:14 18:25	07:03 20:18	06:01 21:09	05:21 06:45 (15)
7	08:44 16:44	08:09 17:35	07:12 18:27	07:01 20:20	05:59 21:10	05:20 06:45 (15)
8	08:43 16:45	08:07 17:37	07:10 18:28	06:59 20:22	05:57 21:12	05:20 06:45 (15)
9	08:43 16:46	08:05 17:39	07:07 18:30	06:56 20:23	07:21 (16) 05:55	05:19 06:46 (15)
10	08:42 16:48	08:03 17:41	07:05 18:32	06:54 20:25	07:18 (16) 05:54	05:19 06:46 (15)
11	08:42 16:49	08:01 17:43	07:03 18:34	06:52 20:27	07:16 (16) 05:52	05:19 06:46 (15)
12	08:41 16:50	08:00 17:45	07:01 18:35	06:50 20:28	07:15 (16) 05:50	05:18 06:46 (15)
13	08:40 16:52	07:58 17:47	06:58 18:37	06:47 20:30	07:13 (16) 05:49	05:18 06:47 (15)
14	08:40 16:53	07:56 17:48	06:56 18:39	06:45 20:32	07:12 (16) 05:47	05:18 06:47 (15)
15	08:39 16:55	07:54 17:50	06:54 18:41	06:43 20:34	07:11 (16) 05:45	05:18 06:48 (15)
16	08:38 16:57	07:52 17:52	06:51 18:42	06:41 20:35	07:10 (16) 05:44	05:17 06:48 (15)
17	08:37 16:58	07:50 17:54	06:49 18:44	06:39 20:37	07:10 (16) 05:42	05:17 06:48 (15)
18	08:36 17:00	07:48 17:56	06:47 18:46	06:36 20:39	07:09 (16) 05:41	05:17 06:49 (15)
19	08:35 17:01	07:46 17:58	06:45 18:47	06:34 20:40	07:09 (16) 05:40	05:17 06:49 (15)
20	08:34 17:03	07:44 17:59	06:42 18:49	06:32 20:42	07:09 (16) 05:38	05:18 06:49 (15)
21	08:33 17:05	07:42 18:01	06:40 18:51	06:30 20:44	07:09 (16) 05:37	05:18 06:49 (15)
22	08:32 17:06	07:40 18:03	06:38 18:53	06:28 20:45	07:09 (16) 05:35	05:18 06:49 (15)
23	08:31 17:08	07:38 18:05	06:35 18:54	06:26 20:47	07:10 (16) 05:34	05:18 06:50 (15)
24	08:30 17:10	07:36 18:07	06:33 18:56	06:24 20:49	07:10 (16) 05:33	05:18 06:50 (15)
25	08:28 17:12	07:34 18:09	06:31 18:58	06:22 20:50	07:11 (16) 05:32	05:19 06:49 (15)
26	08:27 17:13	07:31 18:10	06:28 18:59	06:20 20:52	07:11 (16) 05:31	05:19 06:50 (15)
27	08:26 17:15	07:29 18:12	06:26 19:01	06:18 20:54	07:12 (16) 05:30	05:20 06:50 (15)
28	08:24 17:17	07:27 18:14	06:24 19:03	06:16 20:56	07:14 (16) 05:28	05:20 06:51 (15)
29	08:23 17:19	07:21 20:05	07:21 20:05	06:14 20:57	07:15 (16) 05:27	05:21 06:50 (15)
30	08:21 17:21	07:19 20:06	07:19 20:06	06:12 20:59	07:29 (16) 21:43	05:21 06:51 (15)
31	08:20 17:22	07:17 20:08	07:17 20:08	06:11 20:59	07:26 (16) 21:44	05:21 06:51 (15)
Potential sun hours	259	278	367	416	485	499
Total, worst case			225	585	1084	1299
Sun reduction			0.24	0.35	0.37	0.30
Oper. time red.			1.00	1.00	1.00	1.00
Wind dir. red.			0.68	0.66	0.64	0.64
Total reduction			0.17	0.24	0.24	0.19
Total, real			37	138	258	251

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 2 Shadow receptor: BE - H57

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time
N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

	July	August	September	October	November	December
1	05:22	06:50 (15) 05:58	06:57 (15) 06:48	07:15 (16) 07:37	07:30	08:21
	22:00 43	07:33 (15) 21:28 37	07:34 (15) 20:26 22	07:37 (16) 19:17	17:11	16:31
2	05:22	06:51 (15) 06:00	06:58 (15) 06:50	07:16 (16) 07:38	07:32	08:23
	22:00 43	07:34 (15) 21:27 35	07:33 (15) 20:24 18	07:34 (16) 19:15	17:09	16:30
3	05:23	06:51 (15) 06:01	06:59 (15) 06:51	07:19 (16) 07:40	07:34	08:24
	21:59 44	07:35 (15) 21:25 33	07:32 (15) 20:22 12	07:31 (16) 19:12	17:07	16:29
4	05:24	06:51 (15) 06:03	07:00 (15) 06:53	07:42	07:36	08:26
	21:59 44	07:35 (15) 21:23 31	07:31 (15) 20:20	19:10	17:06	16:29
5	05:25	06:51 (15) 06:04	07:02 (15) 06:54	07:43	07:38	08:27
	21:59 44	07:35 (15) 21:22 28	07:30 (15) 20:17	19:08	17:04	16:28
6	05:26	06:51 (15) 06:06	07:03 (15) 06:56	07:45	07:39	08:28
	21:58 44	07:35 (15) 21:20 25	07:28 (15) 20:15	19:06	17:02	16:28
7	05:26	06:51 (15) 06:08	07:05 (15) 06:58	07:47	07:41	08:29
	21:57 45	07:36 (15) 21:18 21	07:26 (15) 20:13	19:03	17:00	16:28
8	05:27	06:51 (15) 06:09	07:08 (15) 06:59	07:49	07:43	08:31
	21:57 45	07:36 (15) 21:16 15	07:23 (15) 20:10	19:01	16:59	16:27
9	05:28	06:51 (15) 06:11	07:14 (15) 07:01	07:50 (17) 07:50	07:45	08:32
	21:56 46	07:37 (15) 21:14 3	07:17 (15) 20:08 10	08:00 (17) 18:59	16:57	16:27
10	05:29	06:52 (15) 06:12	07:02	07:48 (17) 07:52	07:47	08:33
	21:55 45	07:37 (15) 21:12 15	20:06 15	08:03 (17) 18:57	16:55	16:27
11	05:30	06:52 (15) 06:14	07:04	07:45 (17) 07:54	07:48	08:34
	21:55 45	07:37 (15) 21:10 18	20:04 18	08:03 (17) 18:54	16:54	16:27
12	05:31	06:52 (15) 06:16	07:06	07:44 (17) 07:55	07:50	08:35
	21:54 46	07:38 (15) 21:09 21	20:01 21	08:05 (17) 18:52	16:52	16:26
13	05:33	06:52 (15) 06:17	07:07	07:44 (17) 07:57	07:52	08:36
	21:53 46	07:38 (15) 21:07 9	07:35 (16) 19:59 22	08:06 (17) 18:50	16:51	16:26
14	05:34	06:52 (15) 06:19	07:09	07:42 (17) 07:59	07:54	08:37
	21:52 46	07:38 (15) 21:05 16	07:38 (16) 19:57 23	08:05 (17) 18:48	16:49	16:26
15	05:35	06:52 (15) 06:20	07:11	07:42 (17) 08:00	07:55	08:38
	21:51 46	07:38 (15) 21:03 19	07:40 (16) 19:54 23	08:05 (17) 18:45	16:48	16:26
16	05:36	06:52 (15) 06:22	07:12	07:41 (17) 08:02	07:57	08:39
	21:50 46	07:38 (15) 21:01 22	07:41 (16) 19:52 24	08:05 (17) 18:43	16:46	16:27
17	05:37	06:52 (15) 06:24	07:14	07:41 (17) 08:04	07:59	08:40
	21:49 46	07:38 (15) 20:59 24	07:42 (16) 19:50 24	08:05 (17) 18:41	16:45	16:27
18	05:39	06:52 (15) 06:25	07:15	07:41 (17) 08:06	08:01	08:40
	21:48 46	07:38 (15) 20:57 26	07:42 (16) 19:47 23	08:04 (17) 18:39	16:44	16:27
19	05:40	06:53 (15) 06:27	07:17	07:42 (17) 08:07	08:02	08:41
	21:47 46	07:39 (15) 20:55 27	07:43 (16) 19:45 21	08:03 (17) 18:37	16:43	16:27
20	05:41	06:53 (15) 06:28	07:19	07:44 (17) 08:09	08:04	08:42
	21:46 46	07:39 (15) 20:52 29	07:43 (16) 19:43 18	08:02 (17) 18:35	16:41	16:28
21	05:42	06:53 (15) 06:30	07:20	07:45 (17) 08:11	08:06	08:42
	21:44 45	07:38 (15) 20:50 30	07:44 (16) 19:40 15	08:00 (17) 18:33	16:40	16:28
22	05:44	06:52 (15) 06:32	07:22	07:47 (17) 08:13	08:07	08:43
	21:43 46	07:38 (15) 20:48 31	07:44 (16) 19:38 11	07:58 (17) 18:31	16:39	16:29
23	05:45	06:53 (15) 06:33	07:24	07:49 (17) 08:14	08:09	08:43
	21:42 46	07:39 (15) 20:46 31	07:44 (16) 19:36 7	07:56 (17) 18:29	16:38	16:29
24	05:47	06:53 (15) 06:35	07:25	08:16	08:11	08:44
	21:40 45	07:38 (15) 20:44 31	07:43 (16) 19:33	18:27	16:37	16:30
25	05:48	06:53 (15) 06:37	07:27	07:18	08:12	08:44
	21:39 45	07:38 (15) 20:42 31	07:43 (16) 19:31	17:25	16:36	16:30
26	05:49	06:54 (15) 06:38	07:29	07:20	08:14	08:44
	21:38 44	07:38 (15) 20:40 30	07:43 (16) 19:29	17:23	16:35	16:31
27	05:51	06:54 (15) 06:40	07:30	07:22	08:15	08:45
	21:36 43	07:37 (15) 20:37 30	07:42 (16) 19:26	17:21	16:34	16:32
28	05:52	06:55 (15) 06:41	07:32	07:23	08:17	08:45
	21:35 41	07:36 (15) 20:35 29	07:42 (16) 19:24	17:19	16:33	16:33
29	05:54	06:56 (15) 06:43	07:33	07:25	08:18	08:45
	21:33 41	07:37 (15) 20:33 27	07:40 (16) 19:22	17:17	16:32	16:33
30	05:55	06:56 (15) 06:45	07:35	07:27	08:20	08:45
	21:32 40	07:36 (15) 20:31 26	07:40 (16) 19:19	17:15	16:31	16:34
31	05:57	06:56 (15) 06:46	07:36	07:29	08:45	
	21:30 38	07:34 (15) 20:29 24	07:38 (16)	17:13	16:35	
Potential sun hours	502	454	381	331	266	244
Total, worst case	1376	720	327			
Sun reduction	0.27	0.30	0.28			
Oper. time red.	1.00	1.00	1.00			
Wind dir. red.	0.64	0.66	0.68			
Total reduction	0.17	0.19	0.19			
Total, real	236	140	63			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:58/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: BF - H58

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N to Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and shadow reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix with 4 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:58/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: BG - H59

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

Table with 17 columns: N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum. Values: 357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Main shadow calculation table with 17 columns (months) and 31 rows (days). Includes 'Potential sun hours' and 'Total, real' rows at the bottom.

Table layout: For each day in each month the following matrix apply

Matrix table with 2 columns: Day in month and 2 rows: Sun rise (hh:mm) / Sun set (hh:mm), First time (hh:mm) with flicker / Last time (hh:mm) with flicker. Includes (WTG causing flicker first/last time) in parentheses.



SHADOW - Calendar

Calculation: Alternative Scenario 2 Shadow receptor: BI - H61

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January to June) and rows for each day (1-31) showing sun rise/set times and shadow reduction factors.

Table layout: For each day in each month the following matrix apply

Summary table with 4 columns: Day in month, Sun rise/set, Minutes with flicker, and (WTG causing flicker first/last time).

SHADOW - Calendar

Calculation: Alternative Scenario 2 Shadow receptor: BI - H61

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22	20:14 (5)	05:58	06:48	07:37	07:30
	22:00	24 20:38 (5)	21:28	20:26	19:17	17:11
2	05:22	20:15 (5)	06:00	06:49	07:38	07:32
	22:00	24 20:39 (5)	21:27	20:24	19:15	17:09
3	05:23	20:15 (5)	06:01	06:51	07:40	07:34
	21:59	25 20:40 (5)	21:25	20:22	19:12	17:07
4	05:24	20:14 (5)	06:03	06:53	07:42	18:03 (16)
	21:59	25 20:39 (5)	21:23	20:19	19:10	17:05
5	05:25	20:15 (5)	06:04	06:54	07:43	17:58 (16)
	21:58	25 20:40 (5)	21:21	20:17	19:08	17:04
6	05:25	20:15 (5)	06:06	06:56	07:45	17:56 (16)
	21:58	25 20:40 (5)	21:20	20:15	19:05	17:02
7	05:26	20:15 (5)	06:07	06:57	07:47	17:54 (16)
	21:57	26 20:41 (5)	21:18	20:13	19:03	17:00
8	05:27	20:15 (5)	06:09	06:59	07:48	17:54 (16)
	21:57	26 20:41 (5)	21:16	20:10	19:01	17:02
9	05:28	20:16 (5)	06:11	07:01	07:50	17:52 (16)
	21:56	25 20:41 (5)	21:14	20:08	18:59	17:00
10	05:29	20:16 (5)	06:12	07:02	07:52	17:52 (16)
	21:55	26 20:42 (5)	21:12	20:06	18:56	17:52 (16)
11	05:30	20:16 (5)	06:14	07:04	07:53	17:52 (16)
	21:54	26 20:42 (5)	21:10	20:03	18:54	17:52 (16)
12	05:31	20:16 (5)	06:15	07:06	07:55	17:52 (16)
	21:54	26 20:42 (5)	21:08	20:01	18:52	17:52 (16)
13	05:32	20:16 (5)	06:17	07:07	07:57	17:51 (16)
	21:53	26 20:42 (5)	21:06	19:59	18:50	17:51 (16)
14	05:34	20:16 (5)	06:19	07:09	07:59	17:52 (16)
	21:52	26 20:42 (5)	21:05	19:56	18:48	17:51 (16)
15	05:35	20:16 (5)	06:20	07:10	08:00	17:53 (16)
	21:51	26 20:42 (5)	21:03	19:54	18:45	17:53 (16)
16	05:36	20:16 (5)	06:22	07:12	08:02	17:54 (16)
	21:50	26 20:42 (5)	21:01	19:52	18:43	17:54 (16)
17	05:37	20:17 (5)	06:23	07:14	08:04	17:56 (16)
	21:49	25 20:42 (5)	20:59	19:49	18:41	17:56 (16)
18	05:38	20:17 (5)	06:25	07:15	08:06	18:00
	21:48	24 20:41 (5)	20:56	19:47	18:39	16:44
19	05:40	20:17 (5)	06:27	07:17	08:07	16:42
	21:47	24 20:41 (5)	20:54	19:45	18:37	16:42
20	05:41	20:18 (5)	06:28	07:19	08:09	16:42
	21:45	23 20:41 (5)	20:52	19:42	18:35	16:41
21	05:42	20:18 (5)	06:30	07:20	08:11	16:40
	21:44	23 20:41 (5)	20:50	19:40	18:33	16:40
22	05:44	20:19 (5)	06:31	07:22	08:13	17:08 (17)
	21:43	21 20:40 (5)	20:48	19:38	18:30	17:16 (17)
23	05:45	20:19 (5)	06:33	07:23	08:14	17:05 (17)
	21:42	20 20:39 (5)	20:46	19:35	18:28	17:19 (17)
24	05:46	20:21 (5)	06:35	07:25	08:16	17:03 (17)
	21:40	18 20:39 (5)	20:44	19:33	18:26	17:20 (17)
25	05:48	20:21 (5)	06:36	07:27	07:18	16:02 (17)
	21:39	16 20:37 (5)	20:42	19:31	17:24	16:21 (17)
26	05:49	20:22 (5)	06:38	07:28	07:20	16:00 (17)
	21:37	14 20:36 (5)	20:39	19:28	17:22	16:21 (17)
27	05:51	20:25 (5)	06:40	07:30	07:21	15:59 (17)
	21:36	10 20:35 (5)	20:37	19:26	17:20	16:22 (17)
28	05:52		06:41	07:32	07:23	15:59 (17)
	21:34		20:35	19:24	17:18	16:22 (17)
29	05:54		06:43	07:33	07:25	15:58 (17)
	21:33		20:33	19:21	17:16	16:23 (17)
30	05:55		06:44	07:35	07:27	15:58 (17)
	21:31		20:31	19:19	17:15	16:23 (17)
31	05:57		06:46	07:37	07:29	15:58 (17)
	21:30		20:28	19:13	17:13	16:23 (17)
Potential sun hours	502	454	381	331	266	244
Total, worst case	625			426	1161	926
Sun reduction	0.27			0.24	0.18	0.13
Oper. time red.	1.00			1.00	1.00	1.00
Wind dir. red.	0.68			0.63	0.60	0.60
Total reduction	0.18			0.15	0.11	0.08
Total, real	112			63	127	74

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 2 **Shadow receptor:** BJ - H62

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 16:36	08:19 17:24	09:03 (8) 09:43 (7)	07:25 18:16	07:54 (9) 08:13 (9)	07:15 20:10
2	08:45 16:38	08:17 17:26	09:02 (8) 09:42 (7)	07:23 18:18	07:52 (9) 08:13 (9)	07:12 20:12
3	08:45 16:39	08:15 17:28	09:02 (8) 09:41 (7)	07:21 18:19	07:51 (9) 08:14 (9)	07:10 20:13
4	08:45 16:40	08:14 17:30	09:03 (8) 09:41 (7)	07:19 18:21	07:51 (9) 08:14 (9)	07:08 20:15
5	08:45 16:41	08:12 17:32	09:03 (8) 09:39 (7)	07:16 18:23	07:51 (9) 08:14 (9)	07:05 20:17
6	08:44 16:42	08:10 17:34	09:04 (8) 09:36 (7)	07:14 18:25	07:50 (9) 08:14 (9)	07:03 20:18
7	08:44 16:43	08:09 17:35	09:04 (8) 09:27 (8)	07:12 18:27	07:50 (9) 08:14 (9)	07:01 20:20
8	08:44 16:45	08:07 17:37	09:05 (8) 09:26 (8)	07:10 18:28	07:50 (9) 08:13 (9)	06:59 20:22
9	08:43 16:46	08:05 17:39	09:05 (8) 09:25 (8)	07:07 18:30	07:51 (9) 08:13 (9)	06:56 20:23
10	08:43 16:48	08:03 17:41	09:08 (8) 09:25 (8)	07:05 18:32	07:51 (9) 08:11 (9)	06:54 20:25
11	08:42 16:49	08:02 17:43	09:09 (8) 09:23 (8)	07:03 18:34	07:52 (9) 08:10 (9)	06:52 20:27
12	08:41 16:50	08:00 17:45	09:12 (8) 09:21 (8)	07:01 18:35	07:54 (9) 08:08 (9)	06:50 20:29
13	08:41 16:52	07:58 17:47	06:58 18:37	06:58 18:37	07:56 (9) 08:04 (9)	06:47 20:30
14	08:40 16:53	07:56 17:48	06:56 18:39	06:45 18:39	06:45 20:32	05:47 21:22
15	08:39 16:55	07:54 17:50	06:54 18:41	06:43 20:34	05:45 21:23	05:17 21:58
16	08:38 16:56	07:52 17:52	06:51 18:42	06:41 20:35	05:44 21:25	05:17 21:59
17	08:37 16:58	07:50 17:54	06:49 18:44	06:39 20:37	05:42 21:26	05:17 21:59
18	08:36 17:00	07:48 17:56	06:47 18:46	06:36 20:39	05:41 21:28	05:17 22:00
19	08:35 17:01	09:28 (7) 09:32 (7)	07:46 17:58	06:45 18:48	06:34 20:40	05:39 21:29
20	08:34 17:03	09:25 (7) 09:34 (7)	07:44 17:59	06:42 18:49	06:32 20:42	05:38 21:31
21	08:33 17:05	09:24 (7) 09:36 (7)	07:42 18:01	06:40 18:51	06:30 20:44	05:37 21:32
22	08:32 17:06	09:24 (7) 09:38 (7)	07:40 18:03	06:38 18:53	06:28 20:46	05:35 21:34
23	08:31 17:08	09:10 (8) 09:39 (7)	07:38 18:05	06:35 18:54	06:26 20:47	05:34 21:35
24	08:30 17:10	09:07 (8) 09:40 (7)	07:36 18:07	06:33 18:56	06:24 20:49	05:33 21:36
25	08:28 17:12	09:06 (8) 09:41 (7)	07:34 18:09	06:31 18:58	06:22 20:51	05:32 21:38
26	08:27 17:13	09:05 (8) 09:41 (7)	07:32 18:10	06:28 19:00	06:20 20:52	05:31 21:39
27	08:26 17:15	09:04 (8) 09:42 (7)	07:29 18:12	07:58 (9) 08:09 (9)	06:18 20:54	05:29 21:40
28	08:24 17:17	09:03 (8) 09:42 (7)	07:27 18:14	07:56 (9) 08:11 (9)	06:16 20:56	05:28 21:42
29	08:23 17:19	09:03 (8) 09:43 (7)	07:21 20:05	07:21 20:05	06:14 20:57	05:27 21:43
30	08:22 17:21	09:03 (8) 09:43 (7)	07:19 20:06	07:19 20:06	06:12 20:59	05:26 21:44
31	08:20 17:22	09:02 (8) 09:42 (7)	07:17 20:08	07:17 20:08	05:25 21:45	22:01 21:45
Potential sun hours	259	278	367	416	485	499
Total, worst case	359	353	262			
Sun reduction	0.16	0.21	0.24			
Oper. time red.	1.00	1.00	1.00			
Wind dir. red.	0.67	0.67	0.67			
Total reduction	0.10	0.14	0.16			
Total, real	37	49	43			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 2 **Shadow receptor:** BJ - H62

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December				
1	05:22	05:58	06:48	07:37	08:34 (9)	07:31	08:36 (8)	08:22		
	22:00	21:28	20:26	19:17	12	08:46 (9)	17:11	18	08:54 (8)	16:31
2	05:22	06:00	06:50	07:39	08:32 (9)	07:32	08:35 (8)	08:23		
	22:00	21:27	20:24	19:15	16	08:48 (9)	17:09	20	08:55 (8)	16:30
3	05:23	06:01	06:51	07:40	08:29 (9)	07:34	08:34 (8)	08:24		
	22:00	21:25	20:22	19:12	19	08:48 (9)	17:07	22	08:56 (8)	16:29
4	05:24	06:03	06:53	07:42	08:28 (9)	07:36	08:34 (8)	08:26		
	21:59	21:23	20:20	19:10	21	08:49 (9)	17:06	23	08:57 (8)	16:29
5	05:25	06:04	06:54	07:44	08:28 (9)	07:38	08:33 (8)	08:27		
	21:59	21:22	20:17	19:08	22	08:50 (9)	17:04	31	09:07 (7)	16:28
6	05:25	06:06	06:56	07:45	08:26 (9)	07:40	08:33 (8)	08:28		
	21:58	21:20	20:15	19:06	23	08:49 (9)	17:02	36	09:09 (7)	16:28
7	05:26	06:08	06:58	07:47	08:26 (9)	07:41	08:33 (8)	08:30		
	21:58	21:18	20:13	19:03	24	08:50 (9)	17:00	38	09:11 (7)	16:27
8	05:27	06:09	06:59	07:49	08:26 (9)	07:43	08:33 (8)	08:31		
	21:57	21:16	20:11	19:01	24	08:50 (9)	16:59	39	09:12 (7)	16:27
9	05:28	06:11	07:01	07:50	08:26 (9)	07:45	08:33 (8)	08:32		
	21:56	21:14	20:08	18:59	23	08:49 (9)	16:57	40	09:13 (7)	16:27
10	05:29	06:12	07:02	07:52	08:25 (9)	07:47	08:34 (8)	08:33		
	21:56	21:13	20:06	18:57	23	08:48 (9)	16:55	40	09:14 (7)	16:27
11	05:30	06:14	07:04	07:54	08:26 (9)	07:49	08:34 (8)	08:34		
	21:55	21:11	20:04	18:54	21	08:47 (9)	16:54	40	09:14 (7)	16:26
12	05:31	06:15	07:06	07:55	08:27 (9)	07:50	08:35 (8)	08:35		
	21:54	21:09	20:01	18:52	19	08:46 (9)	16:52	40	09:15 (7)	16:26
13	05:32	06:17	07:07	07:57	08:28 (9)	07:52	08:35 (8)	08:36		
	21:53	21:07	19:59	18:50	17	08:45 (9)	16:51	40	09:15 (7)	16:26
14	05:34	06:19	07:09	07:59	08:30 (9)	07:54	08:36 (8)	08:37		
	21:52	21:05	19:57	18:48	13	08:43 (9)	16:49	39	09:15 (7)	16:26
15	05:35	06:20	07:11	08:01	08:31 (9)	07:56	08:36 (8)	08:38		
	21:51	21:03	19:54	18:46	9	08:40 (9)	16:48	38	09:14 (7)	16:26
16	05:36	06:22	07:12	08:02	07:57	08:38 (8)	08:39			
	21:50	21:01	19:52	18:43	36	09:14 (7)	16:27			
17	05:37	06:24	07:14	08:04	07:59	08:39 (8)	08:40			
	21:49	20:59	19:50	18:41	34	09:14 (7)	16:27			
18	05:38	06:25	07:15	08:06	08:01	08:41 (8)	08:41			
	21:48	20:57	19:47	18:39	30	09:14 (7)	16:27			
19	05:40	06:27	07:17	08:07	08:02	08:44 (8)	08:41			
	21:47	20:55	19:45	18:37	23	09:13 (7)	16:27			
20	05:41	06:28	07:19	08:09	08:04	08:59 (7)	08:42			
	21:46	20:53	19:43	18:35	14	09:13 (7)	16:28			
21	05:42	06:30	07:20	08:11	08:06	09:00 (7)	08:42			
	21:44	20:50	19:40	18:33	12	09:12 (7)	16:28			
22	05:44	06:32	07:22	08:13	08:08	09:01 (7)	08:43			
	21:43	20:48	19:38	18:31	9	09:10 (7)	16:28			
23	05:45	06:33	07:24	08:15	08:09	09:04 (7)	08:43			
	21:42	20:46	19:36	18:29	4	09:08 (7)	16:29			
24	05:46	06:35	07:25	08:16	08:11	08:44				
	21:41	20:44	19:33	18:27	16:37	16:30				
25	05:48	06:37	07:27	07:18	08:12	08:44				
	21:39	20:42	19:31	17:25	16:36	16:30				
26	05:49	06:38	07:29	07:20	08:14	08:45				
	21:38	20:40	19:29	17:22	16:35	16:31				
27	05:51	06:40	07:30	07:22	08:16	08:45				
	21:36	20:38	19:26	17:21	16:34	16:32				
28	05:52	06:41	07:32	07:23	08:17	08:45				
	21:35	20:35	19:24	17:19	16:33	16:32				
29	05:54	06:43	07:34	07:25	08:19	08:45				
	21:33	20:33	19:22	17:17	16:32	16:33				
30	05:55	06:45	07:35	08:38 (9)	07:27	08:40 (8)	08:20	08:45		
	21:32	20:31	19:19	3	08:41 (9)	17:15	10	08:50 (8)	16:31	
31	05:57	06:46		07:29	08:37 (8)			08:45		
	21:30	20:29		17:13	15	08:52 (8)		16:35		
Potential sun hours	502	454	381	331	266	244				
Total, worst case			3	311	666					
Sun reduction			0.28	0.24	0.18					
Oper. time red.			1.00	1.00	1.00					
Wind dir. red.			0.67	0.67	0.67					
Total reduction			0.19	0.16	0.12					
Total, real			1	50	83					

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: BK - H63

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45 16:37	08:18 17:24	07:25 18:16	07:15 20:10	06:10 21:01	05:25 21:46	05:22 22:00	05:58 21:28	06:48 20:26	07:37 19:17	07:31 17:11	08:21 16:31
2	08:45 16:38	08:17 17:26	07:23 18:18	07:12 20:11	06:08 21:02	05:24 21:47	05:23 22:00	06:00 21:27	06:50 20:24	07:39 19:15	07:32 17:09	08:23 16:30
3	08:45 16:39	08:15 17:28	07:21 18:20	07:10 20:13	06:06 21:04	05:23 21:48	05:23 22:00	06:01 21:25	06:51 20:22	07:40 19:12	07:34 17:07	08:24 16:30
4	08:45 16:40	08:14 17:30	07:19 18:21	07:08 20:15	06:04 21:06	05:22 21:50	05:24 21:59	06:03 21:23	06:53 20:20	07:42 19:10	07:36 17:06	08:26 16:29
5	08:45 16:41	08:12 17:32	07:16 18:23	07:05 20:17	06:02 21:07	05:22 21:51	05:25 21:59	06:04 21:22	06:54 20:17	07:44 19:08	07:38 17:04	08:27 16:28
6	08:44 16:42	08:10 17:34	07:14 18:25	07:03 20:18	06:01 21:09	05:21 21:51	05:26 21:58	06:06 21:20	06:56 20:15	07:45 19:06	07:40 17:02	08:28 16:28
7	08:44 16:44	08:09 17:35	07:12 18:27	07:01 20:20	05:59 21:11	05:21 21:52	05:27 21:58	06:08 21:18	06:58 20:13	07:47 19:03	07:41 17:00	08:29 16:28
8	08:43 16:45	08:07 17:37	07:10 18:28	06:59 20:22	05:57 21:12	05:20 21:53	05:27 21:57	06:09 21:16	06:59 20:11	07:49 19:01	07:43 16:59	08:31 16:27
9	08:43 16:46	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	05:20 21:54	05:28 21:56	06:11 21:14	07:01 20:08	07:50 18:59	07:45 16:57	08:32 16:27
10	08:42 16:48	08:03 17:41	07:05 18:32	06:54 20:25	05:54 21:15	05:19 21:55	05:29 21:55	06:12 21:12	07:03 20:06	07:52 18:57	07:47 16:55	08:33 16:27
11	08:42 16:49	08:01 17:43	07:03 18:34	06:52 20:27	05:52 21:17	05:19 21:56	05:30 21:55	06:14 21:11	07:04 20:04	07:54 18:54	07:48 16:54	08:34 16:27
12	08:41 16:51	08:00 17:45	07:01 18:35	06:50 20:29	05:50 21:19	05:18 21:56	05:32 21:54	06:16 21:09	07:06 20:01	07:55 18:52	07:50 16:52	08:35 16:27
13	08:40 16:52	07:58 17:47	06:58 18:37	06:47 20:30	05:49 21:20	05:18 21:57	05:33 21:53	06:17 21:07	07:07 19:59	07:57 18:50	07:52 16:51	08:36 16:26
14	08:40 16:54	07:56 17:48	06:56 18:39	06:45 20:32	05:47 21:22	05:18 21:58	05:34 21:52	06:19 21:05	07:09 19:57	07:59 18:48	07:54 16:49	08:37 16:26
15	08:39 16:55	07:54 17:50	06:54 18:41	06:43 20:34	05:45 21:23	05:18 21:58	05:35 21:51	06:20 21:03	07:11 19:54	08:01 18:46	07:55 16:48	08:38 16:27
16	08:38 16:57	07:52 17:52	06:51 18:42	06:41 20:35	05:44 21:25	05:18 21:59	05:36 21:50	06:22 21:01	07:12 19:52	08:02 18:43	07:57 16:47	08:39 16:27
17	08:37 16:58	07:50 17:54	06:49 18:44	06:39 20:37	05:42 21:26	05:17 21:59	05:37 21:49	06:24 20:59	07:14 19:50	08:04 18:41	07:59 16:45	08:40 16:27
18	08:36 17:00	07:48 17:56	06:47 18:46	06:37 20:39	05:41 21:28	05:17 22:00	05:39 21:48	06:25 20:57	07:16 19:47	08:06 18:39	08:01 16:44	08:40 16:27
19	08:35 17:02	07:46 17:58	06:45 18:48	06:34 20:40	05:40 21:29	05:18 22:00	05:40 21:47	06:27 20:55	07:17 19:45	08:07 18:37	08:02 16:43	08:41 16:27
20	08:34 17:03	07:44 18:00	06:42 18:49	06:32 20:42	05:38 21:31	05:18 22:00	05:41 21:46	06:28 20:53	07:19 19:43	08:09 18:35	08:04 16:41	08:42 16:28
21	08:33 17:05	07:42 18:01	06:40 18:51	06:30 20:44	05:37 21:32	05:18 22:00	05:42 21:44	06:30 20:50	07:20 19:40	08:11 18:33	08:06 16:40	08:42 16:28
22	08:32 17:07	07:40 18:03	06:38 18:53	06:28 20:45	05:36 21:34	05:18 22:01	05:44 21:43	06:32 20:48	07:22 19:38	08:13 18:31	08:07 16:39	08:43 16:29
23	08:31 17:08	07:38 18:05	06:35 18:54	06:26 20:47	05:34 21:35	05:18 22:01	05:45 21:42	06:33 20:46	07:24 19:36	08:14 18:29	08:09 16:38	08:43 16:29
24	08:30 17:10	07:36 18:07	06:33 18:56	06:24 20:49	05:33 21:36	05:18 22:01	05:47 21:40	06:35 20:44	07:25 19:33	08:16 18:27	08:11 16:37	08:44 16:30
25	08:28 17:12	07:34 18:09	06:31 18:58	06:22 20:51	05:32 21:38	05:19 22:01	05:48 21:39	06:37 20:42	07:27 19:31	08:18 17:25	08:12 16:36	08:44 16:30
26	08:27 17:14	07:32 18:10	06:28 19:00	06:20 20:52	05:31 21:39	05:19 22:01	05:49 21:38	06:38 20:40	07:29 19:29	08:20 17:23	08:14 16:35	08:44 16:31
27	08:26 17:15	07:29 18:12	06:26 19:01	06:18 20:54	05:30 21:40	05:20 22:01	05:51 21:36	06:40 20:38	07:30 19:26	08:22 17:21	08:15 16:34	08:45 16:32
28	08:24 17:17	07:27 18:14	06:24 19:03	06:16 20:56	05:29 21:42	05:20 22:01	05:52 21:35	06:41 20:35	07:32 19:24	08:23 17:19	08:17 16:33	08:45 16:33
29	08:23 17:19	07:21 18:05	06:14 19:05	06:14 20:57	05:28 21:43	05:21 22:01	05:54 21:33	06:43 20:33	07:34 19:22	08:25 17:17	08:18 16:32	08:45 16:33
30	08:21 17:21	07:19 18:06	06:12 19:06	06:12 20:59	05:27 21:44	05:21 22:00	05:55 21:32	06:45 20:31	07:35 19:19	08:27 17:15	08:20 16:32	08:45 16:34
31	08:20 17:23	07:17 18:08	06:11 19:08	06:11 20:08	05:26 21:45	05:20 22:00	05:57 21:30	06:46 20:29	07:36 17:13	08:29 17:13	08:22 16:35	08:45 16:35
Potential sun hours	259	278	367	416	485	499	502	454	381	331	266	244
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:58/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: BL - H64

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Table with columns for months (January to December) and rows for each day of the month, showing sun rise/set times, shadow reduction percentages, and operational time. Includes summary rows at the bottom for total sun hours and reductions.

Table layout: For each day in each month the following matrix apply

Day in month Sun rise (hh:mm) Sun set (hh:mm) Minutes with flicker First time (hh:mm) with flicker Last time (hh:mm) with flicker (WTG causing flicker first time) (WTG causing flicker last time)

SHADOW - Calendar**Calculation:** Alternative Scenario 2**Shadow receptor:** BM - H65**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:21	05:58	06:48	07:37	07:30	08:21
	22:00	21:28	20:26	19:17	17:11	16:30
2	05:22	05:59	06:49	07:38	07:32	08:23
	22:00	21:27	20:24	19:14	17:09	16:30
3	05:23	06:01	06:51	07:40	07:34	15:34 (13) 08:24
	21:59	21:25	20:22	19:12	17:07	7 15:41 (13) 16:29
4	05:24	06:03	06:53	07:42	07:36	15:31 (13) 08:26
	21:59	21:23	20:19	19:10	17:05	13 15:44 (13) 16:29
5	05:24	06:04	06:54	07:43	07:38	15:30 (13) 08:27
	21:59	21:21	20:17	19:08	17:04	16 15:46 (13) 16:28
6	05:25	06:06	06:56	07:45	07:39	15:28 (13) 08:28
	21:58	21:20	20:15	19:05	17:02	19 15:47 (13) 16:28
7	05:26	06:07	06:57	07:47	07:41	15:28 (13) 08:29
	21:57	21:18	20:13	19:03	17:00	20 15:48 (13) 16:27
8	05:27	06:09	06:59	07:48	07:43	15:27 (13) 08:31
	21:57	21:16	20:10	19:01	16:58	22 15:49 (13) 16:27
9	05:28	06:10	07:01	07:50	07:45	15:27 (13) 08:32
	21:56	21:14	20:08	18:59	16:57	22 15:49 (13) 16:27
10	05:29	06:12	07:02	07:52	07:47	15:26 (13) 08:33
	21:55	21:12	20:06	18:56	16:55	24 15:50 (13) 16:26
11	05:30	06:14	07:04	07:53	07:48	15:26 (13) 08:34
	21:55	21:10	20:03	18:54	16:54	24 15:50 (13) 16:26
12	05:31	06:15	07:06	07:55	6 17:28 (12) 07:50	15:26 (13) 08:35
	21:54	21:09	20:01	18:52	17:34 (12) 16:52	23 15:49 (13) 16:26
13	05:32	06:17	07:07	07:57	7 17:24 (12) 07:52	15:26 (13) 08:36
	21:53	21:07	19:59	18:50	12 17:36 (12) 16:51	23 15:49 (13) 16:26
14	05:33	06:18	07:09	07:59	8 17:22 (12) 07:54	15:26 (13) 08:37
	21:52	21:05	19:56	18:47	15 17:37 (12) 16:49	24 15:50 (13) 16:26
15	05:35	06:20	07:10	08:00	9 17:21 (12) 07:55	15:27 (13) 08:38
	21:51	21:03	19:54	18:45	18 17:39 (12) 16:48	23 15:50 (13) 16:26
16	05:36	06:22	07:12	08:02	10 17:20 (12) 07:57	15:27 (13) 08:39
	21:50	21:01	19:52	18:43	19 17:39 (12) 16:46	23 15:50 (13) 16:26
17	05:37	06:23	07:14	08:04	11 17:20 (12) 07:59	15:28 (13) 08:40
	21:49	20:59	19:49	18:41	20 17:40 (12) 16:45	21 15:49 (13) 16:26
18	05:38	06:25	07:15	08:06	12 17:19 (12) 08:01	15:29 (13) 08:40
	21:48	20:57	19:47	18:39	21 17:40 (12) 16:44	20 15:49 (13) 16:27
19	05:39	06:27	07:17	08:07	13 17:18 (12) 08:02	15:30 (13) 08:41
	21:47	20:54	19:45	18:37	21 17:39 (12) 16:42	19 15:49 (13) 16:27
20	05:41	06:28	07:19	08:09	14 17:19 (12) 08:04	15:31 (13) 08:42
	21:46	20:52	19:42	18:35	20 17:39 (12) 16:41	17 15:48 (13) 16:27
21	05:42	06:30	07:20	08:11	15 17:19 (12) 08:06	15:32 (13) 08:42
	21:44	20:50	19:40	18:32	19 17:38 (12) 16:40	15 15:47 (13) 16:28
22	05:43	06:31	07:22	08:13	16 17:20 (12) 08:07	15:33 (13) 08:43
	21:43	20:48	19:38	18:30	17 17:37 (12) 16:39	13 15:46 (13) 16:28
23	05:45	06:33	07:23	08:14	17 17:21 (12) 08:09	15:36 (13) 08:43
	21:42	20:46	19:35	18:28	15 17:36 (12) 16:38	8 15:44 (13) 16:29
24	05:46	06:35	07:25	08:16	18 17:22 (12) 08:11	16:29
	21:40	20:44	19:33	18:26	13 17:35 (12) 16:37	16:29
25	05:48	06:36	07:27	07:18	16:24 (12) 08:12	16:29
	21:39	20:42	19:31	17:24	9 16:33 (12) 16:35	16:30
26	05:49	06:38	07:28	07:20	16:34	16:31
	21:38	20:40	19:28	17:22	16:35	16:31
27	05:50	06:40	07:30	07:21	16:36	16:32
	21:36	20:37	19:26	17:20	16:37	16:32
28	05:52	06:41	07:32	07:23	16:38	16:33
	21:35	20:35	19:24	17:18	16:39	16:33
29	05:53	06:43	07:33	07:25	16:40	16:34
	21:33	20:33	19:21	17:16	16:41	16:34
30	05:55	06:44	07:35	07:27	16:42	16:35
	21:31	20:31	19:19	17:14	16:43	16:35
31	05:56	06:46		07:29	16:44	16:36
	21:30	20:28		17:13	16:45	16:36
Potential sun hours	502	454	381	331	266	244
Total, worst case				225	396	515
Sun reduction				0.24	0.18	0.13
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.63	0.59	0.60
Total reduction				0.15	0.11	0.08
Total, real				34	43	42

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:58/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: BN - H66

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix with 4 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:58/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 2**Shadow receptor:** BP - H68

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 16:36	15:08 (13) 15:31 (13)	08:18 17:24	07:25 18:16	07:14 20:10	06:10 21:00
2	08:45 16:37	15:08 (13) 15:31 (13)	08:17 17:26	07:23 18:17	07:12 20:11	06:08 21:02
3	08:45 16:38	15:08 (13) 15:32 (13)	08:15 17:28	07:21 18:19	07:10 20:13	06:06 21:04
4	08:45 16:40	15:09 (13) 15:33 (13)	08:14 17:30	16:28 (12) 16:30 (12)	07:18 18:21	06:04 21:05
5	08:44 16:41	15:09 (13) 15:33 (13)	08:12 17:31	16:24 (12) 16:35 (12)	07:16 18:23	06:02 21:07
6	08:44 16:42	15:10 (13) 15:34 (13)	08:10 17:33	16:22 (12) 16:37 (12)	07:14 18:25	06:00 21:09
7	08:44 16:43	15:09 (13) 15:34 (13)	08:08 17:35	16:21 (12) 16:38 (12)	07:12 18:26	05:58 21:10
8	08:43 16:45	15:10 (13) 15:35 (13)	08:07 17:37	16:20 (12) 16:39 (12)	07:09 18:28	05:57 21:12
9	08:43 16:46	15:10 (13) 15:35 (13)	08:05 17:39	16:19 (12) 16:40 (12)	07:07 18:30	05:55 21:14
10	08:42 16:47	15:10 (13) 15:36 (13)	08:03 17:41	16:19 (12) 16:40 (12)	07:05 18:32	05:53 21:15
11	08:42 16:49	15:11 (13) 15:36 (13)	08:01 17:43	16:18 (12) 16:40 (12)	07:03 18:33	05:52 21:17
12	08:41 16:50	15:12 (13) 15:37 (13)	08:00 17:44	16:18 (12) 16:41 (12)	07:00 18:35	05:50 21:18
13	08:40 16:52	15:12 (13) 15:37 (13)	07:58 17:46	16:18 (12) 16:41 (12)	06:58 18:37	05:48 21:20
14	08:40 16:53	15:12 (13) 15:37 (13)	07:56 17:48	16:18 (12) 16:40 (12)	06:56 18:39	05:47 21:22
15	08:39 16:55	15:13 (13) 15:38 (13)	07:54 17:50	16:19 (12) 16:40 (12)	06:54 18:40	05:45 21:23
16	08:38 16:56	15:14 (13) 15:38 (13)	07:52 17:52	16:19 (12) 16:40 (12)	06:51 18:42	05:44 21:25
17	08:37 16:58	15:14 (13) 15:38 (13)	07:50 17:54	16:20 (12) 16:39 (12)	06:49 18:44	05:42 21:26
18	08:36 16:59	15:15 (13) 15:38 (13)	07:48 17:56	16:22 (12) 16:38 (12)	06:47 18:46	05:41 21:28
19	08:35 17:01	15:15 (13) 15:37 (13)	07:46 17:57	16:24 (12) 16:36 (12)	06:44 18:47	05:39 21:29
20	08:34 17:03	15:16 (13) 15:37 (13)	07:44 17:59	16:27 (12) 16:33 (12)	06:42 18:49	05:38 21:31
21	08:33 17:04	15:18 (13) 15:37 (13)	07:42 18:01	06:40 18:51	06:30 20:42	05:36 21:32
22	08:32 17:06	15:19 (13) 15:37 (13)	07:40 18:03	06:37 18:52	06:28 20:45	05:35 21:33
23	08:31 17:08	15:20 (13) 15:35 (13)	07:38 18:05	06:35 18:54	06:26 20:47	05:34 21:35
24	08:29 17:10	15:22 (13) 15:34 (13)	07:36 18:07	06:33 18:56	06:24 20:49	05:33 21:36
25	08:28 17:11	15:26 (13) 15:32 (13)	07:34 18:08	06:30 18:58	06:22 20:50	05:31 21:38
26	08:27 17:13	07:31 18:10		06:28 18:59	06:19 20:52	05:19 21:39
27	08:26 17:15	07:29 18:12		06:26 19:01	06:17 20:54	05:19 21:40
28	08:24 17:17	07:27 18:14		06:24 19:03	06:15 20:55	05:28 21:41
29	08:23 17:19			07:21 20:04	06:13 20:57	05:27 21:43
30	08:21 17:20			07:19 20:06	06:12 20:59	05:26 21:44
31	08:20 17:22			07:17 20:08		05:25 21:45
Potential sun hours	259	278		367	416	485
Total, worst case			291			
Sun reduction	0.16		0.21			
Oper. time red.	1.00		1.00			
Wind dir. red.	0.59		0.61			
Total reduction	0.09		0.13			
Total, real	51		37			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 2 Shadow receptor: BP - H68

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:21 22:00	05:58 21:28	06:48 20:26	07:37 19:17	07:30 17:11	15:48 (12) 08:21 14:53 (13)
2	05:22 22:00	05:59 21:27	06:49 20:24	07:38 19:15	07:32 17:09	15:49 (12) 08:23 14:53 (13)
3	05:23 21:59	06:01 21:25	06:51 20:22	07:40 19:12	07:34 17:07	15:50 (12) 08:24 14:53 (13)
4	05:24 21:59	06:03 21:23	06:53 20:19	07:42 19:10	07:36 17:05	15:51 (12) 08:26 14:54 (13)
5	05:24 21:59	06:04 21:21	06:54 20:17	07:43 19:08	07:38 17:04	15:52 (12) 08:27 14:55 (13)
6	05:25 21:58	06:06 21:20	06:56 20:15	07:45 19:05	07:39 17:02	15:54 (12) 08:28 14:56 (13)
7	05:26 21:57	06:07 21:18	06:57 20:13	07:47 19:03	07:41 17:00	16:04 (12) 08:29 14:56 (13)
8	05:27 21:57	06:09 21:16	06:59 20:10	07:48 19:01	07:43 16:58	16:27 08:31 14:56 (13)
9	05:28 21:56	06:10 21:14	07:01 20:08	07:50 18:59	07:45 16:57	16:27 08:32 14:57 (13)
10	05:29 21:55	06:12 21:12	07:02 20:06	07:52 18:56	07:47 16:55	16:27 08:33 14:58 (13)
11	05:30 21:55	06:14 21:10	07:04 20:03	07:53 18:54	07:48 16:54	16:26 08:34 14:58 (13)
12	05:31 21:54	06:15 21:09	07:06 20:01	07:55 18:52	07:50 16:52	16:26 08:35 14:59 (13)
13	05:32 21:53	06:17 21:07	07:07 19:59	07:57 18:50	07:52 16:51	16:26 08:36 15:00 (13)
14	05:33 21:52	06:18 21:05	07:09 19:56	07:59 18:47	07:54 16:49	16:26 08:37 15:00 (13)
15	05:35 21:51	06:20 21:03	07:10 19:54	08:00 18:45	07:55 16:48	16:26 08:38 15:01 (13)
16	05:36 21:50	06:22 21:01	07:12 19:52	08:02 18:43	07:57 16:46	16:26 08:39 15:02 (13)
17	05:37 21:49	06:23 20:59	07:14 19:49	08:04 18:41	07:59 16:45	14:59 (13) 08:40 15:01 (13)
18	05:38 21:48	06:25 20:57	07:15 19:47	08:06 18:39	08:01 16:44	15:05 (13) 08:40 15:02 (13)
19	05:39 21:47	06:27 20:54	07:17 19:45	08:07 18:37	08:02 16:42	15:08 (13) 08:41 15:03 (13)
20	05:41 21:46	06:28 20:52	07:19 19:42	08:09 18:35	08:04 16:41	15:10 (13) 08:42 15:04 (13)
21	05:42 21:44	06:30 20:50	07:20 19:40	08:11 18:32	08:06 16:40	15:12 (13) 08:42 15:04 (13)
22	05:43 21:43	06:31 20:48	07:22 19:38	08:13 18:30	08:07 16:39	15:12 (13) 08:43 15:04 (13)
23	05:45 21:42	06:33 20:46	07:23 19:35	08:14 18:28	08:09 16:38	15:13 (13) 08:43 15:05 (13)
24	05:46 21:40	06:35 20:44	07:25 19:33	08:16 18:26	08:11 16:37	15:14 (13) 08:44 15:05 (13)
25	05:48 21:39	06:36 20:42	07:27 19:31	08:18 18:24	08:12 16:35	15:15 (13) 08:44 15:06 (13)
26	05:49 21:38	06:38 20:40	07:28 19:28	08:20 18:22	08:14 16:34	14:52 (13) 08:44 15:06 (13)
27	05:50 21:36	06:40 20:37	07:30 19:26	08:21 18:20	08:15 16:33	15:16 (13) 08:45 15:07 (13)
28	05:52 21:35	06:41 20:35	07:32 19:24	08:23 18:18	08:17 16:32	15:17 (13) 08:45 15:07 (13)
29	05:53 21:33	06:43 20:33	07:33 19:21	08:25 18:16	08:18 16:31	15:18 (13) 08:45 15:07 (13)
30	05:55 21:32	06:44 20:31	07:35 19:19	08:27 18:14	08:20 16:30	15:19 (13) 08:45 15:08 (13)
31	05:56 21:30	06:46 20:28	07:37 19:17	08:29 18:13	08:21 16:29	15:20 (13) 08:45 15:08 (13)
Potential sun hours	502	454	381	331	266	244
Total, worst case				186	384	699
Sun reduction				0.24	0.18	0.13
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.61	0.60	0.59
Total reduction				0.15	0.11	0.08
Total, real				27	42	56

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:58/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 2 Shadow receptor: BR - H70

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and shadow reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix with 2 rows: Day in month, Sun rise/set, Minutes with flicker, First/Last time with flicker, and WTG causing flicker first/last time.



SHADOW - Calendar

Calculation: Alternative Scenario 2 Shadow receptor: BT - H72

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times, shadow reduction, and operational time.

Table layout: For each day in each month the following matrix apply

Matrix table with 4 columns: Day in month, Sun rise/set, Minutes with flicker, First/Last time with flicker (WTG causing flicker).



SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: BU - H73

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31), including sunrise/sunset times and shadow reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix with 2 rows and 4 columns: Day in month, Sun rise/set (hh:mm), Minutes with flicker, First/Last time (hh:mm) with flicker (WTG causing flicker first/last time)

SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: BV - H74

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 16:36	15:12 (13) 15:35 (13)	08:18 17:24	07:25 18:16	07:14 20:10	06:10 21:00
2	08:45 16:37	15:11 (13) 15:35 (13)	08:17 17:26	16:26 (12) 07:23	07:12 20:11	06:08 21:02
3	08:45 16:38	15:12 (13) 15:36 (13)	08:15 17:28	16:23 (12) 07:21	07:10 20:13	06:06 21:04
4	08:45 16:40	15:13 (13) 15:36 (13)	08:14 17:30	16:22 (12) 07:18	07:07 20:15	06:04 21:05
5	08:44 16:41	15:12 (13) 15:36 (13)	08:12 17:31	16:22 (12) 07:16	07:05 20:16	06:02 21:07
6	08:44 16:42	15:13 (13) 15:37 (13)	08:10 17:33	16:21 (12) 07:14	07:03 20:18	06:00 21:09
7	08:44 16:43	15:13 (13) 15:37 (13)	08:08 17:35	16:20 (12) 07:12	07:01 20:20	05:58 21:10
8	08:43 16:45	15:14 (13) 15:38 (13)	08:07 17:37	16:20 (12) 07:09	06:58 20:22	05:57 21:12
9	08:43 16:46	15:14 (13) 15:38 (13)	08:05 17:39	16:19 (12) 07:07	06:56 20:23	05:55 21:14
10	08:42 16:47	15:15 (13) 15:38 (13)	08:03 17:41	16:19 (12) 07:05	06:54 20:25	05:53 21:15
11	08:42 16:49	15:15 (13) 15:38 (13)	08:01 17:43	16:19 (12) 07:03	06:52 20:27	05:52 21:17
12	08:41 16:50	15:16 (13) 15:40 (13)	08:00 17:44	16:20 (12) 07:00	06:49 20:28	05:50 21:18
13	08:40 16:52	15:17 (13) 15:40 (13)	07:58 17:46	16:20 (12) 06:58	06:47 20:30	05:48 21:20
14	08:40 16:53	15:17 (13) 15:40 (13)	07:56 17:48	16:21 (12) 06:56	06:45 20:32	05:47 21:22
15	08:39 16:55	15:18 (13) 15:40 (13)	07:54 17:50	16:22 (12) 06:54	06:43 20:33	05:45 21:23
16	08:38 16:56	15:19 (13) 15:40 (13)	07:52 17:52	16:24 (12) 06:51	06:41 20:35	05:44 21:25
17	08:37 16:58	15:20 (13) 15:40 (13)	07:50 17:54	16:26 (12) 06:49	06:38 20:37	05:42 21:26
18	08:36 16:59	15:21 (13) 15:39 (13)	07:48 17:56	06:47 18:46	06:36 20:39	05:41 21:28
19	08:35 17:01	15:21 (13) 15:38 (13)	07:46 17:57	06:44 18:47	06:34 20:40	05:39 21:29
20	08:34 17:03	15:23 (13) 15:38 (13)	07:44 17:59	06:42 18:49	06:32 20:42	05:38 21:31
21	08:33 17:04	15:25 (13) 15:37 (13)	07:42 18:01	06:40 18:51	06:30 20:44	05:36 21:32
22	08:32 17:06	15:27 (13) 15:35 (13)	07:40 18:03	06:37 18:52	06:28 20:45	05:35 21:33
23	08:31 17:08	15:27 (13) 18:05	07:38 18:05	06:35 18:54	06:26 20:47	05:34 21:35
24	08:29 17:10	18:07 07:36	07:36 18:07	06:33 18:56	06:24 20:49	05:33 21:36
25	08:28 17:11	07:33 18:08	07:33 18:08	06:30 18:58	06:22 20:50	05:31 21:38
26	08:27 17:13	07:31 18:10	07:31 18:10	06:28 18:59	06:19 20:52	05:30 21:39
27	08:26 17:15	07:29 18:12	07:29 18:12	06:26 19:01	06:17 20:54	05:29 21:40
28	08:24 17:17	07:27 18:14	07:27 18:14	06:24 19:03	06:15 20:55	05:28 21:41
29	08:23 17:19			07:21 20:04	06:13 20:57	05:27 21:43
30	08:21 17:20			07:19 20:06	06:12 20:59	05:26 21:44
31	08:20 17:22			07:17 20:08		05:25 21:45
Potential sun hours	259	278	367	416	485	499
Total, worst case	463	271				
Sun reduction	0.16	0.21				
Oper. time red.	1.00	1.00				
Wind dir. red.	0.59	0.61				
Total reduction	0.09	0.13				
Total, real	43	34				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 2 **Shadow receptor:** BV - H74

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:21	05:58	06:48	07:37	07:30	08:21
	22:00	21:28	20:26	19:17	17:11	15:49 (12)
2	05:22	05:59	06:49	07:38	07:32	16:30 24
	22:00	21:27	20:24	19:14	17:09	15:49 (12)
3	05:23	06:01	06:51	07:40	07:34	16:30 24
	21:59	21:25	20:22	19:12	17:07	15:49 (12)
4	05:24	06:03	06:53	07:42	07:36	16:29 24
	21:59	21:23	20:19	19:10	17:05	15:50 (12)
5	05:24	06:04	06:54	07:43	07:38	16:29 24
	21:59	21:21	20:17	19:08	17:04	15:51 (12)
6	05:25	06:06	06:56	07:45	07:39	16:27 24
	21:58	21:20	20:15	19:05	17:02	15:51 (12)
7	05:26	06:07	06:57	07:47	07:41	16:28 24
	21:57	21:18	20:13	19:03	17:00	16:08 (12)
8	05:27	06:09	06:59	07:48	07:43	16:28 24
	21:57	21:16	20:10	19:01	17:02	15:54 (12)
9	05:28	06:10	07:01	07:50	07:45	16:27 24
	21:56	21:14	20:08	18:59	16:58	15:57 (12)
10	05:29	06:12	07:02	07:52	07:47	16:27 24
	21:55	21:12	20:06	18:56	16:57	16:03 (12)
11	05:30	06:14	07:04	07:53	07:48	16:27 24
	21:55	21:10	20:03	18:54	16:55	16:27 24
12	05:31	06:15	07:06	07:55	07:50	16:26 23
	21:54	21:09	20:01	18:52	16:54	16:26 23
13	05:32	06:17	07:07	07:57	07:52	16:26 23
	21:53	21:07	19:59	18:50	16:52	16:26 23
14	05:33	06:18	07:09	07:59	07:54	16:26 23
	21:52	21:05	19:56	18:47	16:49	16:26 23
15	05:35	06:20	07:10	08:00	07:55	16:26 23
	21:51	21:03	19:54	18:45	16:48	16:26 23
16	05:36	06:22	07:12	08:02	07:57	16:26 23
	21:50	21:01	19:52	18:43	16:46	16:26 22
17	05:37	06:23	07:14	08:04	07:59	16:26 22
	21:49	20:59	19:49	18:41	16:45	16:26 22
18	05:38	06:25	07:15	08:06	08:01	16:26 22
	21:48	20:57	19:47	18:39	16:44	16:26 22
19	05:39	06:27	07:17	08:07	08:02	16:26 22
	21:47	20:54	19:45	18:37	16:42	16:26 22
20	05:41	06:28	07:19	08:09	08:04	16:26 22
	21:46	20:52	19:42	18:35	16:41	15:03 (13)
21	05:42	06:30	07:20	08:11	08:06	16:27 22
	21:44	20:50	19:40	18:32	16:40	15:10 (13)
22	05:43	06:31	07:22	08:13	08:07	16:27 22
	21:43	20:48	19:38	18:30	16:39	15:12 (13)
23	05:45	06:33	07:23	08:14	08:09	16:27 22
	21:42	20:46	19:35	18:28	16:38	15:14 (13)
24	05:46	06:35	07:25	08:16	08:11	16:27 22
	21:40	20:44	19:33	18:26	16:37	14:58 (13)
25	05:48	06:36	07:27	07:18	15:56 (12)	16:29 22
	21:39	20:42	19:31	17:24	16:35	15:16 (13)
26	05:49	06:38	07:28	07:20	15:54 (12)	16:29 22
	21:38	20:40	19:28	17:22	16:35	14:57 (13)
27	05:50	06:40	07:30	07:21	15:51 (12)	16:31 23
	21:36	20:37	19:26	17:20	16:34	15:18 (13)
28	05:52	06:41	07:32	07:23	15:50 (12)	16:31 22
	21:35	20:35	19:24	17:18	16:33	14:57 (13)
29	05:53	06:43	07:33	07:25	15:50 (12)	16:32 22
	21:33	20:33	19:21	17:16	16:32	15:20 (13)
30	05:55	06:44	07:35	07:27	15:49 (12)	16:33 23
	21:32	20:31	19:19	17:14	16:31	14:57 (13)
31	05:56	06:46		07:29	15:49 (12)	16:34 22
	21:30	20:28		17:13	16:30	15:21 (13)
Potential sun hours	502	454	381	331	266	244
Total, worst case				119	352	710
Sun reduction				0.24	0.18	0.13
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.61	0.60	0.59
Total reduction				0.14	0.11	0.08
Total, real				17	39	57

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: BW - H75

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:58/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: BX - H76

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix table with 2 rows: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:58/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: BY - H77

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45 16:36	08:18 17:24	07:25 18:16	07:14 20:10	06:10 21:00	20:24 (14) 21:46	05:24 22:00	05:21 21:28	20:26 (14) 20:26	06:48 19:17	07:37 17:11	07:30 16:30
2	08:45 16:37	08:17 17:26	07:23 18:17	07:12 20:11	06:08 21:02	20:21 (14) 20:33 (14)	05:24 21:47	05:22 22:00	20:26 (14) 20:49 (14)	06:49 20:24	07:38 19:14	08:23 16:30
3	08:45 16:38	08:15 17:28	07:20 18:19	07:10 20:13	06:06 21:04	20:19 (14) 20:35 (14)	05:23 21:48	05:23 21:59	06:01 21:25	06:51 20:49 (14)	07:40 19:12	08:24 16:29
4	08:45 16:40	08:13 17:30	07:18 18:21	07:07 20:15	06:04 21:05	20:19 (14) 20:37 (14)	05:22 21:49	05:24 21:59	06:03 21:23	20:26 (14) 20:49 (14)	07:42 19:10	08:25 16:29
5	08:44 16:41	08:12 17:31	07:16 18:23	07:05 20:16	06:02 21:07	20:17 (14) 20:37 (14)	05:21 21:50	05:24 21:58	06:04 21:21	06:54 20:48 (14)	07:43 19:08	08:27 16:28
6	08:44 16:42	08:10 17:33	07:14 18:25	07:03 20:18	06:00 21:09	20:16 (14) 20:38 (14)	05:21 21:51	05:25 21:58	06:06 21:20	20:26 (14) 20:48 (14)	07:45 19:05	08:28 16:28
7	08:44 16:43	08:08 17:35	07:12 18:26	07:01 20:20	05:58 21:10	20:17 (14) 20:39 (14)	05:20 21:52	05:26 21:57	06:07 21:18	20:26 (14) 20:47 (14)	07:47 19:03	08:29 16:27
8	08:43 16:45	08:07 17:37	07:09 18:28	06:58 20:21	05:57 21:12	20:16 (14) 20:39 (14)	05:20 21:53	05:27 21:57	06:09 21:16	20:27 (14) 20:47 (14)	06:59 19:01	08:30 16:27
9	08:43 16:46	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	20:15 (14) 20:38 (14)	05:19 21:54	05:28 21:56	06:10 21:14	20:27 (14) 20:45 (14)	07:01 18:59	08:32 16:27
10	08:42 16:47	08:03 17:41	07:05 18:32	06:54 20:25	05:53 21:15	20:16 (14) 20:39 (14)	05:19 21:55	05:29 21:55	06:12 21:12	20:29 (14) 20:44 (14)	07:02 18:56	08:33 16:26
11	08:42 16:49	08:01 17:43	07:03 18:33	06:52 20:27	05:52 21:17	20:15 (14) 20:38 (14)	05:18 21:55	05:30 21:54	06:14 21:10	20:30 (14) 20:41 (14)	07:04 18:54	08:34 16:26
12	08:41 16:50	07:59 17:44	07:00 18:35	06:49 20:28	05:50 21:18	20:16 (14) 20:39 (14)	05:18 21:56	05:31 21:54	06:15 21:08	20:33 (14) 20:39 (14)	07:05 20:01	08:35 16:26
13	08:40 16:52	07:58 17:46	06:58 18:37	06:47 20:30	05:48 21:20	20:15 (14) 20:38 (14)	05:18 21:57	05:32 21:53	06:17 21:06	07:07 19:59	07:57 18:50	08:36 16:26
14	08:39 16:53	07:56 17:48	06:56 18:39	06:45 20:32	05:47 21:21	20:16 (14) 20:38 (14)	05:17 21:57	05:33 21:52	06:18 21:04	07:09 19:56	07:59 18:47	08:37 16:26
15	08:39 16:55	07:54 17:50	06:53 18:40	06:43 20:33	05:45 21:23	20:16 (14) 20:37 (14)	05:17 21:58	05:35 21:51	06:20 21:03	07:10 19:54	08:00 18:45	08:38 16:26
16	08:38 16:56	07:52 17:52	06:51 18:42	06:41 20:35	05:44 21:25	20:17 (14) 20:37 (14)	05:17 21:58	05:36 21:50	06:22 21:00	07:12 19:52	08:02 18:43	08:39 16:26
17	08:37 16:58	07:50 17:54	06:49 18:44	06:38 20:37	05:42 21:26	20:18 (14) 20:37 (14)	05:17 21:59	05:37 21:49	06:23 20:58	07:14 19:49	08:04 18:41	08:39 16:26
18	08:36 17:00	07:48 17:56	06:47 18:46	06:36 20:38	05:41 21:28	20:18 (14) 20:35 (14)	05:17 21:59	05:38 21:48	06:25 20:56	07:15 19:47	08:05 18:39	08:40 16:27
19	08:35 17:01	07:46 17:57	06:44 18:47	06:34 20:40	05:39 21:29	20:20 (14) 20:35 (14)	05:17 22:00	05:40 21:47	06:27 20:54	07:17 19:45	08:07 18:37	08:41 16:27
20	08:34 17:03	07:44 17:59	06:42 18:49	06:32 20:42	05:38 21:30	20:21 (14) 20:34 (14)	05:17 22:00	05:41 21:45	06:28 20:52	07:18 19:42	08:09 18:35	08:42 16:27
21	08:33 17:04	07:42 18:01	06:40 18:51	06:30 20:44	05:36 21:32	20:23 (14) 20:32 (14)	05:17 22:00	05:42 21:44	06:30 20:50	07:20 19:40	08:11 18:32	08:42 16:28
22	08:32 17:06	07:40 18:03	06:37 18:52	06:28 20:45	05:35 21:33	20:25 (14) 20:29 (14)	05:18 22:01	05:43 21:43	06:31 20:48	07:22 19:38	08:12 18:30	08:43 16:28
23	08:31 17:08	07:38 18:05	06:35 18:54	06:26 20:47	05:34 21:35	05:18 22:01	05:45 21:42	06:33 20:43 (14)	07:23 19:35	07:14 18:28	08:04 16:38	08:43 16:29
24	08:29 17:10	07:36 18:07	06:33 18:56	06:24 20:49	05:33 21:36	05:18 22:01	05:46 21:40	06:35 20:44 (14)	07:25 19:33	07:25 18:26	08:16 16:37	08:44 16:29
25	08:28 17:11	07:33 18:08	06:30 18:58	06:22 20:50	05:32 21:37	05:18 22:01	05:48 21:39	06:36 20:42	07:27 19:31	07:18 17:24	08:12 16:36	08:44 16:30
26	08:27 17:13	07:31 18:10	06:28 18:59	06:19 20:52	05:30 21:39	05:19 22:01	05:49 21:37	06:38 20:46 (14)	07:28 19:28	07:20 17:22	08:14 16:35	08:44 16:31
27	08:25 17:15	07:29 18:12	06:26 19:01	06:17 20:54	05:29 21:40	05:19 22:01	05:51 21:36	06:40 20:37	07:30 19:26	07:21 17:20	08:15 16:34	08:45 16:31
28	08:24 17:17	07:27 18:14	06:23 19:03	06:15 20:55	05:28 21:41	05:20 22:01	05:52 21:34	06:41 20:35	07:32 19:24	07:23 17:18	08:17 16:33	08:45 16:32
29	08:23 17:19	07:21 18:04	06:13 19:04	06:13 20:57	05:27 21:43	05:20 22:00	05:53 21:33	06:43 20:33	07:33 19:21	07:25 17:16	08:18 16:32	08:45 16:33
30	08:21 17:20	07:19 18:06	06:12 19:06	06:12 20:59	05:26 21:44	05:21 22:00	05:55 21:31	06:44 20:31	07:35 19:19	07:27 17:14	08:20 16:31	08:45 16:34
31	08:20 17:22	07:17 18:08	06:11 19:08	06:11 20:59	05:25 21:45	05:20 21:30	05:56 20:49 (14)	06:46 20:28		07:28 17:13	08:21 16:35	08:45 16:35
Potential sun hours	259	278	367	416	485	499	502	454	381	331	266	244
Total, worst case					396				228			
Sun reduction					0.37				0.30			
Oper. time red.					1.00				1.00			
Wind dir. red.					0.68				0.68			
Total reduction					0.25				0.20			
Total, real					100				46			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

6225Gortyrahill_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:58/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 2 Shadow receptor: CB - H80

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each hour of the day, showing sun rise/set times and shadow reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix with 4 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: CC - H81

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec. Values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 15 columns: N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum. Values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with 13 columns for months (January to December) and rows for each day from 1 to 31. Includes summary rows for sun hours, reduction, and real values.

Table layout: For each day in each month the following matrix apply

Matrix layout table with 4 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 2 Shadow receptor: CD - H82

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining table layout: Day in month, Sun rise/set, Minutes with flicker, First/Last time with flicker, and WTG causing flicker first/last time.

Project:

6225Gortyrahill, ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
 Finisklin Business Park
 IE-F91 RHH9 Sligo
 +353719161416
 Karen O'Neill / koneill@jodireland.com
 Calculated:
 06/07/2022 17:58/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 2 Shadow receptor: CE - H83

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June	July	August	September	October	November	December		
1	08:45 16:36	08:19 17:24	07:25 18:16	08:01 (9) 20	07:15 20:10	06:10 21:01	05:25 21:46	05:22 22:00	05:58 21:29	06:48 20:26	07:37 19:17	07:31 17:11	08:22 16:31	
2	08:45 16:38	08:17 17:26	07:23 18:18	08:00 (9) 20	07:12 20:12	06:08 21:02	05:24 21:48	05:22 22:00	06:00 21:27	06:50 20:24	07:39 19:15	07:32 17:09	08:23 16:30	
3	08:45 16:39	08:15 17:28	07:21 18:19	08:00 (9) 21	07:10 20:13	06:06 21:04	05:23 21:49	05:23 22:00	06:01 21:25	06:51 20:22	07:40 19:12	07:34 17:07	08:24 16:29	
4	08:45 16:40	08:14 17:30	07:19 18:21	08:00 (9) 21	07:08 20:15	06:04 21:06	05:22 21:50	05:24 21:59	06:03 21:23	06:52 20:20	07:42 19:10	08:41 (9) 10	07:36 17:06	08:26 16:29
5	08:45 16:41	08:12 17:32	07:16 18:23	08:00 (9) 21	07:05 20:17	06:02 21:07	05:22 21:51	05:25 21:59	06:04 21:22	06:54 20:17	07:44 19:08	08:39 (9) 14	07:38 17:04	08:27 16:28
6	08:44 16:42	08:10 17:34	07:14 18:25	08:00 (9) 19	07:03 20:18	06:00 21:09	05:21 21:52	05:25 21:58	06:06 21:20	06:56 20:15	07:45 19:06	08:37 (9) 17	07:40 17:02	08:28 16:28
7	08:44 16:43	08:09 17:35	07:12 18:27	08:00 (9) 18	07:01 20:20	05:59 21:11	05:20 21:53	05:26 21:58	06:08 21:18	06:58 20:13	07:47 19:03	08:36 (9) 19	07:41 17:00	08:30 16:27
8	08:44 16:45	08:07 17:37	07:10 18:28	08:02 (9) 15	06:59 20:22	05:57 21:12	05:20 21:53	05:27 21:57	06:09 21:16	06:59 20:11	07:49 19:01	08:35 (9) 20	07:43 16:59	08:31 16:27
9	08:43 16:46	08:05 17:39	07:07 18:30	08:03 (9) 12	06:56 20:23	05:55 21:14	05:19 21:54	05:28 21:56	06:11 21:14	07:01 20:08	07:50 18:59	08:35 (9) 21	07:45 16:57	08:32 16:27
10	08:43 16:48	08:03 17:41	07:05 18:32	08:06 (9) 5	06:54 20:25	05:53 21:15	05:19 21:55	05:29 21:56	06:12 21:13	07:03 20:06	07:52 18:57	08:34 (9) 21	07:47 16:55	08:33 16:27
11	08:42 16:49	08:02 17:43	07:03 18:34	08:11 (9) 5	06:52 20:27	05:52 21:17	05:19 21:56	05:30 21:55	06:14 21:11	07:04 20:04	07:54 18:54	08:34 (9) 21	07:49 16:54	08:34 16:26
12	08:41 16:50	08:00 17:45	07:01 18:35	08:00 (9) 20	06:50 20:29	05:50 21:19	05:18 21:57	05:31 21:54	06:15 21:09	07:06 20:01	07:55 18:52	08:34 (9) 20	07:50 16:52	08:35 16:26
13	08:41 16:52	07:58 17:47	06:58 18:37	08:00 (9) 19	06:47 20:30	05:48 21:20	05:18 21:57	05:32 21:53	06:17 21:07	07:07 19:59	07:57 18:50	08:35 (9) 19	07:52 16:51	08:36 16:26
14	08:40 16:53	07:56 17:48	06:56 18:39	08:00 (9) 18	06:45 20:32	05:47 21:22	05:18 21:58	05:34 21:52	06:19 21:05	07:09 19:57	07:59 18:48	08:36 (9) 17	07:54 16:49	08:37 16:26
15	08:39 16:55	07:54 17:50	06:54 18:41	08:00 (9) 17	06:43 20:34	05:45 21:23	05:17 21:58	05:35 21:51	06:20 21:03	07:11 19:54	08:01 18:46	08:36 (9) 14	07:56 16:48	08:38 16:26
16	08:38 16:57	07:52 17:52	06:51 18:42	08:00 (9) 16	06:41 20:35	05:44 21:25	05:17 21:59	05:36 21:50	06:22 21:01	07:12 19:52	08:02 18:43	08:38 (9) 11	07:57 16:46	08:39 16:27
17	08:37 16:58	07:50 17:54	06:49 18:44	08:00 (9) 15	06:39 20:37	05:42 21:26	05:17 21:59	05:37 21:49	06:24 20:59	07:14 19:50	08:04 18:41	08:49 (9) 11	07:59 16:45	08:40 16:27
18	08:36 17:00	07:48 17:56	06:47 18:46	08:00 (9) 14	06:36 20:39	05:41 21:28	05:17 22:00	05:38 21:48	06:25 20:57	07:15 19:47	08:06 18:39	08:00 (9) 10	08:01 16:44	08:41 16:27
19	08:35 17:01	07:46 17:58	06:45 18:48	08:00 (9) 13	06:34 20:40	05:39 21:29	05:17 22:00	05:40 21:47	06:27 20:55	07:17 19:45	08:08 18:37	08:00 (9) 9	08:02 16:42	08:41 16:27
20	08:34 17:03	07:44 17:59	06:42 18:49	08:00 (9) 12	06:32 20:42	05:38 21:31	05:17 22:00	05:41 21:46	06:28 20:53	07:19 19:43	08:09 18:35	08:00 (9) 8	08:04 16:41	08:42 16:28
21	08:33 17:05	07:42 18:01	06:40 18:51	08:00 (9) 11	06:30 20:44	05:37 21:32	05:18 22:01	05:42 21:45	06:30 20:50	07:20 19:40	08:11 18:33	08:00 (9) 7	08:06 16:40	08:42 16:28
22	08:32 17:06	07:40 18:03	06:38 18:53	08:00 (9) 10	06:28 20:46	05:35 21:34	05:18 22:01	05:44 21:43	06:32 20:48	07:22 19:38	08:13 18:31	08:00 (9) 6	08:08 16:39	08:43 16:28
23	08:31 17:08	07:38 18:05	06:35 18:54	08:00 (9) 9	06:26 20:47	05:34 21:35	05:18 22:01	05:45 21:42	06:33 20:46	07:24 19:36	08:15 18:29	08:00 (9) 5	08:09 16:38	08:44 16:29
24	08:30 17:10	07:36 18:07	06:33 18:56	08:00 (9) 8	06:24 20:49	05:33 21:36	05:18 22:01	05:46 21:41	06:35 20:44	07:25 19:33	08:16 18:27	08:00 (9) 4	08:11 16:37	08:44 16:30
25	08:28 17:12	07:34 18:09	06:31 18:58	08:00 (9) 7	06:22 20:51	05:32 21:38	05:19 22:01	05:48 21:39	06:37 20:42	07:27 19:31	08:17 17:25	08:00 (9) 3	08:12 16:36	08:44 16:30
26	08:27 17:13	07:32 18:10	06:28 19:00	08:00 (9) 6	06:20 20:52	05:31 21:39	05:19 22:01	05:49 21:38	06:38 20:40	07:29 19:29	08:18 17:23	08:00 (9) 2	08:14 16:35	08:45 16:31
27	08:26 17:15	07:29 18:12	06:26 19:01	08:00 (9) 5	06:18 20:54	05:29 21:40	05:19 22:01	05:51 21:36	06:40 20:38	07:30 19:26	08:19 17:21	08:00 (9) 1	08:16 16:34	08:45 16:32
28	08:24 17:17	07:27 18:14	06:24 19:03	08:00 (9) 4	06:16 20:56	05:28 21:42	05:20 22:01	05:52 21:35	06:41 20:35	07:32 19:24	08:20 17:19	08:00 (9) 0	08:17 16:33	08:45 16:32
29	08:23 17:19	07:25 20:05	06:23 20:05	08:00 (9) 3	06:14 20:57	05:27 21:43	05:20 22:01	05:54 21:33	06:43 20:33	07:34 19:22	08:21 17:17	08:00 (9) -1	08:19 16:32	08:45 16:33
30	08:22 17:21	07:23 20:06	06:22 20:06	08:00 (9) 2	06:12 20:59	05:26 21:44	05:21 22:01	05:55 21:32	06:45 20:31	07:35 19:19	08:22 17:15	08:00 (9) -2	08:20 16:31	08:45 16:34
31	08:20 17:22	07:21 20:08	06:21 20:08	08:00 (9) 1	06:10 21:00	05:25 21:45	05:20 22:01	05:57 21:30	06:46 20:29	07:36 17:13	08:23 16:31	08:00 (9) -3	08:21 16:35	08:45 16:35
Potential sun hours	259	278	367	416	485	499	502	454	381	331	224	266	244	
Total, worst case		52	172								224			
Sun reduction		0.21	0.24								0.24			
Oper. time red.		1.00	1.00								1.00			
Wind dir. red.		0.68	0.68								0.68			
Total reduction		0.14	0.17								0.16			
Total, real		7	28								36			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 2 Shadow receptor: CF - H84

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day of the year (1-31), including sun rise/set times and potential sun hours.

Table layout: For each day in each month the following matrix apply

Matrix defining table layout: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

Project:

6225Gortyrahill_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
 Finisklin Business Park
 IE-F91 RHH9 Sligo
 +353719161416
 Karen O'Neill / koneill@jodireland.com
 Calculated:
 06/07/2022 17:58/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: CG - H85

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June		
1	08:45	08:18	07:25	07:15	06:10	05:25		
	16:37	17:24	18:16	20:10	21:01	21:46		
2	08:45	08:17	07:23	07:12	06:08	05:24		
	16:38	17:26	18:18	20:11	21:02	21:47		
3	08:45	08:15	07:21	07:10	06:06	06:36 (16)	05:23	
	16:39	17:28	18:19	20:13	21:04	10 06:46 (16)	21:48	
4	08:45	08:14	07:18	07:08	06:04	06:33 (16)	05:22	
	16:40	17:30	18:21	20:15	21:06	14 06:47 (16)	21:49	
5	08:44	08:12	07:16	07:05	06:02	06:31 (16)	05:22	
	16:41	17:32	18:23	20:17	21:07	17 06:48 (16)	21:50	
6	08:44	08:10	07:14	07:03	06:01	06:31 (16)	05:21	
	16:42	17:34	18:25	20:18	21:09	19 06:50 (16)	21:51	
7	08:44	08:09	07:12	07:01	05:59	06:30 (16)	05:20	
	16:44	17:35	18:27	20:20	21:10	20 06:50 (16)	21:52	
8	08:43	08:07	07:10	06:59	05:57	06:29 (16)	05:20	
	16:45	17:37	18:28	20:22	21:12	22 06:51 (16)	21:53	
9	08:43	08:05	07:07	06:56	05:55	06:29 (16)	05:19	
	16:46	17:39	18:30	20:23	21:14	23 06:52 (16)	21:54	
10	08:42	08:03	07:05	06:54	05:54	06:28 (16)	05:19	
	16:48	17:41	18:32	20:25	21:15	24 06:52 (16)	21:55	
11	08:42	08:01	07:03	06:52	07:16 (17)	05:52	06:27 (16)	05:19
	16:49	17:43	18:34	20:27	9 07:25 (17)	21:17	24 06:51 (16)	21:56
12	08:41	08:00	07:01	06:50	07:13 (17)	05:50	06:27 (16)	05:18
	16:50	17:45	18:35	20:28	14 07:27 (17)	21:18	25 06:52 (16)	21:56
13	08:40	07:58	06:58	06:47	07:11 (17)	05:49	06:27 (16)	05:18
	16:52	17:47	18:37	20:30	16 07:27 (17)	21:20	24 06:51 (16)	21:57
14	08:40	07:56	06:56	06:45	07:10 (17)	05:47	06:27 (16)	05:18
	16:53	17:48	18:39	20:32	18 07:28 (17)	21:22	25 06:52 (16)	21:58
15	08:39	07:54	06:54	06:43	07:09 (17)	05:45	06:28 (16)	05:18
	16:55	17:50	18:41	20:34	19 07:28 (17)	21:23	24 06:52 (16)	21:58
16	08:38	07:52	06:51	06:41	07:09 (17)	05:44	06:28 (16)	05:18
	16:57	17:52	18:42	20:35	20 07:29 (17)	21:25	23 06:51 (16)	21:59
17	08:37	07:50	06:49	06:39	07:08 (17)	05:42	06:28 (16)	05:17
	16:58	17:54	18:44	20:37	21 07:29 (17)	21:26	23 06:51 (16)	21:59
18	08:36	07:48	06:47	06:36	07:08 (17)	05:41	06:29 (16)	05:17
	17:00	17:56	18:46	20:39	20 07:28 (17)	21:28	22 06:51 (16)	21:59
19	08:35	07:46	06:45	06:34	07:09 (17)	05:40	06:29 (16)	05:17
	17:01	17:58	18:48	20:40	19 07:28 (17)	21:29	21 06:50 (16)	22:00
20	08:34	07:44	06:42	06:32	07:09 (17)	05:38	06:30 (16)	05:18
	17:03	18:00	18:49	20:42	18 07:27 (17)	21:31	20 06:50 (16)	22:00
21	08:33	07:42	06:40	06:30	07:09 (17)	05:37	06:31 (16)	05:18
	17:05	18:01	18:51	20:44	17 07:26 (17)	21:32	18 06:49 (16)	22:00
22	08:32	07:40	06:38	06:28	07:10 (17)	05:36	06:32 (16)	05:18
	17:07	18:03	18:53	20:45	15 07:25 (17)	21:33	16 06:48 (16)	22:01
23	08:31	07:38	06:35	06:26	07:12 (17)	05:34	06:33 (16)	05:18
	17:08	18:05	18:54	20:47	11 07:23 (17)	21:35	15 06:48 (16)	22:01
24	08:30	07:36	06:33	06:24	07:14 (17)	05:33	06:33 (16)	05:18
	17:10	18:07	18:56	20:49	6 07:20 (17)	21:36	13 06:46 (16)	22:01
25	08:28	07:34	06:31	06:22		05:32	06:35 (16)	05:19
	17:12	18:09	18:58	20:50		21:38	9 06:44 (16)	22:01
26	08:27	07:31	06:28	06:20		05:31	06:37 (16)	05:19
	17:13	18:10	19:00	20:52		21:39	5 06:42 (16)	22:01
27	08:26	07:29	06:26	06:18		05:30		05:20
	17:15	18:12	19:01	20:54		21:40		22:01
28	08:24	07:27	06:24	06:16		05:29		05:20
	17:17	18:14	19:03	20:56		21:41		22:01
29	08:23		07:21	06:14		05:28		05:21
	17:19		20:05	20:57		21:43		22:01
30	08:21		07:19	06:12		05:27		05:21
	17:21		20:06	20:59		21:44		22:00
31	08:20		07:17			05:26		
	17:23		20:08			21:45		
Potential sun hours	259	278	367	416	485		499	
Total, worst case				223		456		152
Sun reduction				0.35		0.37		0.30
Oper. time red.				1.00		1.00		1.00
Wind dir. red.				0.66		0.64		0.63
Total reduction				0.23		0.24		0.19
Total, real				52		108		29

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 2 **Shadow receptor:** CG - H85

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22	05:58	06:38 (16)	06:48	07:15 (17)	07:37
	22:00	21:28	24 07:02 (16)	20:26	9 07:24 (17)	19:17
2	05:23	06:00	06:38 (16)	06:50		07:38
	22:00	21:27	24 07:02 (16)	20:24		19:15
3	05:23	06:01	06:38 (16)	06:51		07:40
	21:59	21:25	24 07:02 (16)	20:22		19:12
4	05:24	06:03	06:38 (16)	06:53		07:42
	21:59	21:23	23 07:01 (16)	20:20		19:10
5	05:25	06:04	06:39 (16)	06:54		07:43
	21:59	21:22	22 07:01 (16)	20:17		19:08
6	05:26	06:06	06:39 (16)	06:56		07:45
	21:58	21:20	21 07:00 (16)	20:15		19:06
7	05:27	06:08	06:41 (16)	06:58		07:47
	21:57	21:18	18 06:59 (16)	20:13		19:03
8	05:27	06:09	06:41 (16)	06:59		07:49
	21:57	21:16	16 06:57 (16)	20:10		19:01
9	05:28	06:11	06:43 (16)	07:01		07:50
	21:56	21:14	13 06:56 (16)	20:08		18:59
10	05:29	06:12	06:45 (16)	07:02		07:52
	21:55	21:12	8 06:53 (16)	20:06		18:57
11	05:30	06:14		07:04		07:54
	21:55	21:11		20:04		18:54
12	05:32	06:16		07:06		07:55
	21:54	21:09		20:01		18:52
13	05:33	06:17		07:07		07:57
	21:53	21:07		19:59		18:50
14	05:34	06:19		07:09		07:59
	21:52	21:05		19:57		18:48
15	05:35	06:20		07:11		08:00
	21:51	21:03		19:54		18:46
16	05:36	06:22		07:12		08:02
	21:50	21:01		19:52		18:43
17	05:37	06:24		07:14		08:04
	21:49	20:59		19:50		18:41
18	05:39	06:25		07:15		08:06
	21:48	8 06:53 (16)		19:47		18:39
19	05:40	06:27	07:19 (17)	07:17		08:07
	21:47	12 06:56 (16)	7 07:26 (17)	19:45		18:37
20	05:41	06:28	07:16 (17)	07:19		08:09
	21:46	14 06:57 (16)	12 07:28 (17)	19:43		18:35
21	05:42	06:30	07:15 (17)	07:20		08:11
	21:44	16 06:58 (16)	15 07:30 (17)	19:40		18:33
22	05:44	06:32	07:13 (17)	07:22		08:13
	21:43	17 06:58 (16)	17 07:30 (17)	19:38		18:31
23	05:45	06:33	07:13 (17)	07:24		08:14
	21:42	19 07:00 (16)	18 07:31 (17)	19:36		18:29
24	05:47	06:35	07:12 (17)	07:25		08:16
	21:40	20 07:00 (16)	20 07:32 (17)	19:33		18:27
25	05:48	06:37	07:11 (17)	07:27		07:18
	21:39	21 07:00 (16)	20 07:31 (17)	19:31		17:25
26	05:49	06:38	07:11 (17)	07:29		07:20
	21:38	23 07:02 (16)	20 07:31 (17)	19:29		17:23
27	05:51	06:40	07:11 (17)	07:30		07:22
	21:36	23 07:02 (16)	19 07:30 (17)	19:26		17:21
28	05:52	06:41	07:11 (17)	07:32		07:23
	21:35	24 07:02 (16)	19 07:30 (17)	19:24		17:19
29	05:54	06:43	07:11 (17)	07:33		07:25
	21:33	24 07:02 (16)	18 07:29 (17)	19:22		17:17
30	05:55	06:45	07:12 (17)	07:35		07:27
	21:32	24 07:02 (16)	16 07:28 (17)	19:19		17:15
31	05:57	06:46	07:12 (17)			07:29
	21:30	25 07:03 (16)	14 07:26 (17)			17:13
Potential sun hours	502	454	381	331	266	244
Total, worst case	270	408		9		
Sun reduction	0.27	0.30		0.28		
Oper. time red.	1.00	1.00		1.00		
Wind dir. red.	0.64	0.65		0.66		
Total reduction	0.17	0.19		0.19		
Total, real	46	79		2		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: CH - H86

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining table layout: Day in month, Sun rise/set, Minutes with flicker, First/Last time with flicker, and WTG causing flicker times.

SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: CI - H87

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 2**Shadow receptor:** CJ - H88

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45 16:36	08:18 17:24	07:25 18:16	07:14 20:10	06:10 21:01	05:24 21:46	05:21 22:00	05:58 21:28	06:48 20:26	07:37 19:17	07:30 17:11	08:21 16:30
2	08:45 16:37	08:17 17:26	07:23 18:18	07:12 20:11	06:08 21:02	05:24 21:47	05:22 22:00	06:00 21:27	06:49 20:24	07:38 19:15	07:32 17:09	08:23 16:30
3	08:45 16:38	08:15 17:28	07:21 18:19	07:10 20:13	06:06 21:04	05:23 21:49	05:23 22:00	06:01 21:25	06:51 20:22	07:40 19:12	07:34 17:07	08:24 16:29
4	08:45 16:40	08:14 17:30	07:18 18:21	07:08 20:15	06:04 21:06	05:22 21:50	05:24 21:59	06:03 21:23	06:53 20:20	07:42 19:10	07:36 17:05	08:26 16:29
5	08:45 16:41	08:12 17:31	07:16 18:23	07:05 20:17	06:02 21:07	05:21 21:51	05:24 21:59	06:04 21:22	06:54 20:17	07:43 19:08	07:38 17:04	08:27 16:28
6	08:44 16:42	08:10 17:33	07:14 18:25	07:03 20:18	06:00 21:09	05:21 21:52	05:25 21:58	06:06 21:20	06:56 20:15	07:45 19:05	07:39 17:02	08:28 16:28
7	08:44 16:43	08:09 17:35	07:12 18:26	07:01 20:20	05:58 21:11	05:20 21:52	05:26 21:58	06:07 21:18	06:57 20:13	07:47 19:03	07:41 17:00	08:30 16:27
8	08:43 16:45	08:07 17:37	07:10 18:28	06:58 20:22	05:57 21:12	05:20 21:53	05:27 21:57	06:09 21:16	06:59 20:10	07:48 19:01	07:43 16:58	08:31 16:27
9	08:43 16:46	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	05:19 21:54	05:28 21:56	06:11 21:14	07:01 20:08	07:50 18:59	07:45 16:57	08:32 16:27
10	08:42 16:47	08:03 17:41	07:05 18:32	06:54 20:25	05:53 21:15	05:19 21:55	05:29 21:56	06:12 21:12	07:02 20:06	07:52 18:56	07:47 16:55	08:33 16:26
11	08:42 16:49	08:01 17:43	07:03 18:33	06:52 20:27	05:52 21:17	05:18 21:56	05:30 21:55	06:14 21:11	07:04 20:03	07:54 18:54	07:48 16:54	08:34 16:26
12	08:41 16:50	08:00 17:45	07:00 18:35	06:49 20:28	05:50 21:19	05:18 21:56	05:31 21:54	06:15 21:09	07:06 20:01	07:55 18:52	07:50 16:52	08:35 16:26
13	08:40 16:52	07:58 17:46	06:58 18:37	06:47 20:30	05:48 21:20	05:18 21:57	05:32 21:53	06:17 21:07	07:07 19:59	07:57 18:50	07:52 16:51	08:36 16:26
14	08:40 16:53	07:56 17:48	06:56 18:39	06:45 20:32	05:47 21:22	05:17 21:58	05:33 21:52	06:19 21:05	07:09 19:56	07:59 18:48	07:54 16:49	08:37 16:26
15	08:39 16:55	07:54 17:50	06:54 18:40	06:43 20:34	05:45 21:23	05:17 21:58	05:35 21:51	06:20 21:03	07:10 19:54	08:00 18:45	07:55 16:48	08:38 16:26
16	08:38 16:56	07:52 17:52	06:51 18:42	06:41 20:35	05:44 21:25	05:17 21:59	05:36 21:50	06:22 21:01	07:12 19:52	08:02 18:43	07:57 16:46	08:39 16:26
17	08:37 16:58	07:50 17:54	06:49 18:44	06:38 20:37	05:42 21:26	05:17 21:59	05:37 21:49	06:23 20:59	07:14 19:49	08:04 18:41	07:59 16:45	08:40 16:27
18	08:36 17:00	07:48 17:56	06:47 18:46	06:36 20:39	05:41 21:28	05:17 22:00	05:38 21:48	06:25 20:57	07:15 19:47	08:06 18:39	08:01 16:44	08:40 16:27
19	08:35 17:01	07:46 17:57	06:44 18:47	06:34 20:40	05:39 21:29	05:17 22:00	05:40 21:47	06:27 20:55	07:17 19:45	08:07 18:37	08:02 16:42	08:41 16:27
20	08:34 17:03	07:44 17:59	06:42 18:49	06:32 20:42	05:38 21:31	05:17 22:00	05:41 21:46	06:28 20:52	07:19 19:42	08:09 18:35	08:04 16:41	08:42 16:27
21	08:33 17:05	07:42 18:01	06:40 18:51	06:30 20:44	05:37 21:32	05:17 22:01	05:42 21:44	06:30 20:50	07:20 19:40	08:11 18:33	08:06 16:40	08:42 16:28
22	08:32 17:06	07:40 18:03	06:38 18:53	06:28 20:45	05:35 21:34	05:18 22:01	05:44 21:43	06:31 20:48	07:22 19:38	08:13 18:30	08:07 16:39	08:43 16:28
23	08:31 17:08	07:38 18:05	06:35 18:54	06:26 20:47	05:34 21:35	05:18 22:01	05:45 21:42	06:33 20:46	07:24 19:35	08:14 18:28	08:09 16:38	08:43 16:29
24	08:30 17:10	07:36 18:07	06:33 18:56	06:24 20:49	05:33 21:36	05:18 22:01	05:46 21:40	06:35 20:44	07:25 19:33	08:16 18:26	08:11 16:37	08:44 16:29
25	08:28 17:11	07:34 18:08	06:31 18:58	06:22 20:51	05:32 21:38	05:18 22:01	05:48 21:39	06:36 20:42	07:27 19:31	08:18 17:24	08:12 16:36	08:44 16:30
26	08:27 17:13	07:31 18:10	06:28 18:59	06:20 20:52	05:30 21:39	05:19 22:01	05:49 21:38	06:38 20:40	07:28 19:28	08:19 17:22	08:14 16:35	08:45 16:31
27	08:26 17:15	07:29 18:12	06:26 19:01	06:18 20:54	05:29 21:40	05:19 22:01	05:51 21:36	06:40 20:37	07:30 19:26	08:20 17:20	08:15 16:34	08:45 16:31
28	08:24 17:17	07:27 18:14	06:24 19:03	06:16 20:56	05:28 21:42	05:20 22:01	05:52 21:35	06:41 20:35	07:32 19:24	08:17 17:18	08:17 16:33	08:45 16:32
29	08:23 17:19	07:21 18:05	06:14 19:05	06:14 20:57	05:27 21:43	05:20 22:01	05:53 21:33	06:43 20:33	07:33 19:22	08:19 17:16	08:19 16:32	08:45 16:33
30	08:21 17:20	07:19 18:06	06:12 19:06	06:12 20:59	05:26 21:44	05:21 22:01	05:55 21:32	06:44 20:31	07:35 19:19	08:20 17:15	08:20 16:31	08:45 16:34
31	08:20 17:22	07:17 18:08	06:11 19:08	06:11 20:08	05:25 21:45	05:21 21:45	05:56 21:30	06:46 20:29	07:36 17:13	08:21 17:13	08:21 16:35	08:45 16:35
Potential sun hours	259	278	367	416	485	499	502	454	381	331	266	244
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 2 Shadow receptor: CK - H89

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec. Values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns: N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum. Values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January to December) and rows for each day of the year (1 to 31). Includes summary rows for 'Potential sun hours', 'Total, worst case', 'Sun reduction', 'Oper. time red.', 'Wind dir. red.', 'Total reduction', and 'Total, real'.

Table layout: For each day in each month the following matrix apply

Matrix with 4 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: CL - H90

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: CM - H91

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for days (1-31) and summary rows (Potential sun hours, Total, worst case, etc.)

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: CO - H93

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining table layout: Day in month, Sun rise/set, Minutes with flicker, First/Last time with flicker, and WTG causing flicker first/last time.

SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: CP - H94

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for days (1-31) and summary rows (Potential sun hours, Total, worst case, etc.)

Table layout: For each day in each month the following matrix apply

Matrix defining table layout: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:58/3.5.584

SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: CQ - H95

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June	July	August	September	October	November	December	
1	08:45 16:36	08:19 17:24	08:48 (9) 09:00 (9)	07:25 18:16	07:15 20:10	06:10 21:01	05:25 21:46	05:22 22:00	05:58 21:29	06:48 20:26	07:37 19:17	08:22 17:11	
2	08:45 16:37	08:17 17:26	08:47 (9) 09:01 (9)	07:23 18:18	07:12 20:12	06:08 21:02	05:24 21:48	05:22 22:00	06:00 21:27	06:50 20:24	07:39 19:15	08:23 17:09	
3	08:45 16:39	08:15 17:28	08:46 (9) 09:02 (9)	07:21 18:19	07:10 20:13	06:06 21:04	05:23 21:49	05:23 22:00	06:01 21:25	06:51 20:22	07:40 19:12	08:24 17:07	
4	08:45 16:40	08:14 17:30	08:46 (9) 09:04 (9)	07:19 18:21	07:08 20:15	06:04 21:06	05:22 21:50	05:24 21:59	06:03 21:23	06:53 20:20	07:42 19:10	08:26 17:05	
5	08:45 16:41	08:12 17:32	08:45 (9) 09:04 (9)	07:16 18:23	07:05 20:17	06:02 21:07	05:22 21:51	05:25 21:59	06:04 21:22	06:54 20:17	07:44 19:08	08:27 17:04	
6	08:44 16:42	08:10 17:33	08:45 (9) 09:05 (9)	07:14 18:25	07:03 20:18	06:00 21:09	05:21 21:52	05:25 21:58	06:06 21:20	06:56 20:15	07:45 19:06	08:28 17:02	
7	08:44 16:43	08:09 17:35	08:45 (9) 09:05 (9)	07:12 18:27	07:01 20:20	05:59 21:11	05:20 21:53	05:26 21:58	06:07 21:18	06:58 20:13	07:47 19:03	08:30 17:00	
8	08:44 16:45	08:07 17:37	08:44 (9) 09:05 (9)	07:10 18:28	06:59 20:22	05:57 21:12	05:20 21:53	05:27 21:57	06:09 21:16	06:59 20:11	07:49 19:01	08:31 16:59	
9	08:43 16:46	08:05 17:39	08:45 (9) 09:04 (9)	07:07 18:30	06:56 20:23	05:55 21:14	05:19 21:54	05:28 21:56	06:11 21:14	07:01 20:08	07:50 18:59	08:32 16:57	
10	08:43 16:47	08:03 17:41	08:46 (9) 09:05 (9)	07:05 18:32	06:54 20:25	05:53 21:16	05:19 21:55	05:29 21:56	06:12 21:13	07:02 20:06	07:52 18:57	08:33 16:55	
11	08:42 16:49	08:02 17:43	08:46 (9) 09:04 (9)	07:03 18:34	06:52 20:27	05:52 21:17	05:18 21:56	05:30 21:55	06:14 21:11	07:04 20:04	07:54 18:54	08:34 16:54	
12	08:41 16:50	08:00 17:45	08:47 (9) 09:03 (9)	07:01 18:35	06:50 20:29	05:50 21:19	05:18 21:57	05:31 21:54	06:15 21:09	07:06 20:01	07:55 18:52	08:35 16:52	
13	08:41 16:52	07:58 17:47	08:49 (9) 09:02 (9)	06:58 18:37	06:47 20:30	05:48 21:20	05:18 21:57	05:32 21:53	06:17 21:07	07:07 19:59	07:57 18:50	08:36 16:51	
14	08:40 16:53	07:56 17:48	08:50 (9) 09:00 (9)	06:56 18:39	06:45 20:32	05:47 21:22	05:18 21:58	05:34 21:52	06:19 21:05	07:09 19:57	07:59 18:48	08:37 16:49	
15	08:39 16:55	07:54 17:50		06:54 18:41	06:43 20:34	05:45 21:23	05:17 21:58	05:35 21:51	06:20 21:03	07:11 19:54	07:58 18:46	08:38 16:48	
16	08:38 16:56	07:52 17:52		06:51 18:42	06:41 20:35	05:44 21:25	05:17 21:59	05:36 21:50	06:22 21:01	07:12 19:52	08:02 18:43	08:39 16:46	
17	08:37 16:58	07:50 17:54		06:49 18:44	06:39 20:37	05:42 21:26	05:17 21:59	05:37 21:59	06:24 20:59	07:14 19:50	08:04 18:41	08:40 16:45	
18	08:36 17:00	07:48 17:56		06:47 18:46	06:36 20:39	05:41 21:28	05:17 22:00	05:38 21:48	06:25 20:57	07:15 19:47	08:06 18:39	08:41 16:44	
19	08:35 17:01	07:46 17:58		06:45 18:48	06:34 20:40	05:39 21:29	05:17 22:00	05:40 21:47	06:27 20:55	07:17 19:45	08:08 18:37	08:42 16:42	
20	08:34 17:03	07:44 17:59		06:42 18:49	06:32 20:42	05:38 21:31	05:17 22:00	05:41 21:46	06:28 20:53	07:19 19:43	08:09 18:35	08:43 16:41	
21	08:33 17:05	07:42 18:01		06:40 18:51	06:30 20:44	05:37 21:32	05:18 22:01	05:42 21:45	06:30 20:50	07:20 19:40	08:11 18:33	08:44 16:40	
22	08:32 17:06	07:40 18:03		06:38 18:53	06:28 20:46	05:35 21:34	05:18 22:01	05:44 21:43	06:32 20:48	07:22 19:38	08:13 18:31	08:45 16:39	
23	08:31 17:08	07:38 18:05		06:35 18:54	06:26 20:47	05:34 21:35	05:18 22:01	05:45 21:42	06:33 20:46	07:24 19:36	08:15 18:29	08:46 16:38	
24	08:30 17:10	07:36 18:07		06:33 18:56	06:24 20:49	05:33 21:36	05:18 22:01	05:46 21:41	06:35 20:44	07:25 19:33	08:16 18:27	08:47 16:37	
25	08:28 17:12	07:34 18:09		06:31 18:58	06:22 20:51	05:32 21:38	05:19 22:01	05:48 21:39	06:36 20:42	07:27 19:31	08:18 18:24	08:48 16:36	
26	08:27 17:13	07:32 18:10		06:28 19:00	06:20 20:52	05:31 21:39	05:19 22:01	05:49 21:38	06:38 20:40	07:29 19:29	08:20 18:22	08:49 16:35	
27	08:26 17:15	07:29 18:12		06:26 19:01	06:18 20:54	05:29 21:40	05:19 22:01	05:51 21:36	06:40 20:38	07:30 19:26	08:22 18:16	08:50 16:34	
28	08:24 17:17	07:27 18:14		06:24 19:03	06:16 20:56	05:28 21:42	05:20 22:01	05:52 21:35	06:41 20:35	07:32 19:24	08:23 18:19	08:51 16:33	
29	08:23 17:19			07:21 20:05	06:14 20:57	05:27 21:43	05:20 22:01	05:54 21:33	06:43 20:33	07:34 19:22	08:25 18:17	08:52 16:32	
30	08:22 17:21			07:19 20:06	06:12 20:59	05:26 21:44	05:21 22:01	05:55 21:32	06:45 20:31	07:35 19:19	08:26 18:15	08:53 16:31	
31	08:20 17:22	08:50 (9) 08:57 (9)		07:17 20:08		05:25 21:45		05:57 21:30	06:46 20:29	07:29 17:13	08:15 (9) 08:33 (9)	08:54 16:30	
Potential sun hours	259	7	278	367	416	485	499	502	454	381	331	266	244
Total, worst case		7	235								63	185	
Sun reduction		0.16	0.21								0.24	0.18	
Oper. time red.		1.00	1.00								1.00	1.00	
Wind dir. red.		0.68	0.68								0.68	0.68	
Total reduction		0.11	0.14								0.16	0.13	
Total, real	1		33								10	23	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)



SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: CR - H96

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 16:37	08:18 17:24	07:25 18:16	07:14 20:10	06:10 21:00	07:15 (19) 21:46
2	08:45 16:38	08:17 17:26	07:23 18:18	07:12 20:11	06:08 21:02	07:15 (19) 21:47
3	08:45 16:39	08:15 17:28	07:21 18:19	07:10 20:13	06:06 21:04	07:17 (19) 21:48
4	08:45 16:40	08:14 17:30	07:18 18:21	07:08 20:15	06:04 21:05	07:17 (19) 21:49
5	08:44 16:41	08:12 17:32	07:16 18:23	07:05 20:16	06:02 21:07	07:18 (19) 21:50
6	08:44 16:42	08:10 17:33	07:14 18:25	07:03 20:18	06:00 21:09	07:19 (19) 21:51
7	08:44 16:44	08:08 17:35	07:12 18:26	07:01 20:20	05:59 21:10	07:20 (19) 21:52
8	08:43 16:45	08:07 17:37	07:10 18:28	06:59 20:22	05:57 21:12	07:21 (19) 21:53
9	08:43 16:46	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	06:37 (18) 21:54
10	08:42 16:48	08:03 17:41	07:05 18:32	06:54 20:25	07:32 (19) 21:15	05:53 21:55
11	08:42 16:49	08:01 17:43	07:03 18:34	06:52 20:27	07:29 (19) 21:17	05:52 21:56
12	08:41 16:50	08:00 17:45	07:00 18:35	07:23 (20) 20:28	06:50 21:18	05:50 21:57
13	08:40 16:52	07:58 17:47	06:58 18:37	06:47 20:30	07:24 (19) 21:20	05:49 21:57
14	08:40 16:53	07:56 17:48	06:56 18:39	06:45 20:32	07:22 (19) 21:22	05:47 21:57
15	08:39 16:55	07:54 17:50	06:54 18:41	06:43 20:33	07:21 (19) 21:23	05:45 21:58
16	08:38 16:57	07:52 17:52	06:51 18:42	06:41 20:35	07:20 (19) 21:25	05:44 21:59
17	08:37 16:58	07:50 17:54	06:49 18:44	06:39 20:37	07:19 (19) 21:26	05:42 21:59
18	08:36 17:00	07:48 17:56	06:47 18:46	06:36 20:39	07:18 (19) 21:28	05:41 21:59
19	08:35 17:01	07:46 17:58	06:44 18:47	06:34 20:40	07:17 (19) 21:29	05:39 22:00
20	08:34 17:03	07:44 17:59	06:42 18:49	06:32 20:42	07:17 (19) 21:31	05:38 22:00
21	08:33 17:05	07:42 18:01	06:40 18:51	06:30 20:44	07:16 (19) 21:32	05:37 22:00
22	08:32 17:06	07:40 18:03	06:38 18:53	06:28 20:45	07:15 (19) 21:33	05:35 22:01
23	08:31 17:08	07:38 18:05	06:35 18:54	06:26 20:47	07:14 (19) 21:35	05:34 22:01
24	08:29 17:10	07:36 18:07	06:33 18:56	06:24 20:49	07:14 (19) 21:36	05:33 22:01
25	08:28 17:12	07:34 18:09	06:31 18:58	06:22 20:50	07:15 (19) 21:38	05:32 22:01
26	08:27 17:13	07:31 18:10	06:28 18:59	06:20 20:52	07:15 (19) 21:39	05:31 22:01
27	08:26 17:15	07:29 18:12	06:26 19:01	06:18 20:54	07:15 (19) 21:40	05:30 22:01
28	08:24 17:17	07:27 18:14	06:24 19:03	06:16 20:55	07:15 (19) 21:41	05:28 22:01
29	08:23 17:19	07:21 20:05	07:21 19:08	06:14 20:57	07:15 (19) 21:43	05:27 22:01
30	08:21 17:21	07:19 20:06	07:19 19:09	06:12 20:59	07:15 (19) 21:44	05:26 22:00
31	08:20 17:22	07:17 20:08	07:17 19:10	06:10 21:00	07:15 (19) 21:45	05:25 22:00
Potential sun hours	259	278	367	416	485	499
Total, worst case			438	765		776
Sun reduction			0.24	0.35		0.30
Oper. time red.			1.00	1.00		1.00
Wind dir. red.			0.68	0.66		0.64
Total reduction			0.17	0.24		0.19
Total, real			72	180		149

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 2**Shadow receptor:** CR - H96**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December	
1	05:22 22:00	06:33 (18) 06:59 (18)	05:58 21:28	06:40 (18) 06:48 06:59 (18) 20:26	07:28 (19) 07:37 07:49 (19) 19:17	08:02 (20) 07:30 08:10 (20) 17:11	08:21 16:31
2	05:22 22:00	06:33 (18) 07:00 (18)	06:00 21:27	06:41 (18) 06:49 07:49 (19) 20:24	07:30 (19) 07:38 07:45 (19) 19:15	08:03 (20) 07:32 08:06 (20) 17:09	08:23 16:30
3	05:23 21:59	06:33 (18) 07:00 (18)	06:01 21:25	06:44 (18) 06:51 07:52 (19) 20:22	07:40 19:12 07:33 (19) 06:53	07:34 17:07 07:42 07:36	08:24 16:29 08:25
4	05:24 21:59	06:33 (18) 07:00 (18)	06:03 21:23	06:44 (18) 06:51 07:54 (19) 20:20	07:31 (19) 06:54 07:31 (19) 06:54	07:38 17:05 07:43 07:38	08:27 16:29
5	05:25 21:58	06:33 (18) 07:01 (18)	06:04 21:21	06:44 (18) 06:51 07:56 (19) 20:17	07:31 (19) 06:54 07:29 (19) 06:56	07:43 17:04 07:45 07:39	08:27 16:28
6	05:26 21:58	06:33 (18) 07:01 (18)	06:06 21:20	06:44 (18) 06:51 07:57 (19) 20:15	07:29 (19) 06:56 07:57 (19) 20:15	07:45 17:02 19:05 17:02	08:28 16:28
7	05:26 21:57	06:33 (18) 07:02 (18)	06:08 21:18	06:44 (18) 06:51 07:59 (19) 20:13	07:29 (19) 06:58 07:59 (19) 20:13	07:47 17:00 19:03 07:48	08:29 16:28
8	05:27 21:57	06:33 (18) 07:02 (18)	06:09 21:16	06:44 (18) 06:51 07:59 (19) 20:10	07:27 (19) 06:59 07:59 (19) 20:10	07:48 17:00 16:59 17:00	08:31 16:27
9	05:28 21:56	06:33 (18) 07:03 (18)	06:11 21:14	06:44 (18) 06:51 08:01 (19) 20:08	07:27 (19) 07:01 07:27 (19) 07:01	07:50 16:57 07:50 16:57	08:32 16:27
10	05:29 21:55	06:33 (18) 07:03 (18)	06:12 21:12	06:44 (18) 06:51 07:25 (19) 07:02	07:25 (19) 07:02 08:01 (19) 20:06	07:52 18:56 07:52 18:52	08:33 16:27
11	05:30 21:55	06:33 (18) 07:04 (18)	06:14 21:10	06:44 (18) 06:51 07:25 (19) 07:04	07:25 (19) 07:04 08:02 (19) 20:03	07:54 18:54 18:52 07:55	08:34 16:27
12	05:31 21:54	06:33 (18) 07:04 (18)	06:15 21:08	06:44 (18) 06:51 08:02 (19) 20:01	07:24 (19) 07:06 08:02 (19) 20:01	07:55 16:52 18:52 07:57	08:35 16:26
13	05:33 21:53	06:33 (18) 07:04 (18)	06:17 21:07	06:44 (18) 06:51 08:03 (19) 19:59	07:23 (19) 07:07 08:03 (19) 19:59	07:57 16:52 08:03 (20) 07:57	08:36 16:26
14	05:34 21:52	06:33 (18) 07:04 (18)	06:19 21:05	06:44 (18) 06:51 07:22 (19) 07:09	07:22 (19) 07:09 08:03 (19) 19:56	07:59 18:48 07:59 (20) 07:59	08:37 16:26
15	05:35 21:51	06:33 (18) 07:04 (18)	06:20 21:03	06:44 (18) 06:51 07:22 (19) 07:11	07:22 (19) 07:11 08:03 (19) 19:54	08:00 08:00 08:18 (20) 18:45	08:38 16:26
16	05:36 21:50	06:33 (18) 07:05 (18)	06:22 21:01	06:44 (18) 06:51 07:21 (19) 07:12	07:21 (19) 07:12 08:03 (19) 19:52	08:02 18:43 07:55 (20) 08:02	08:39 16:27
17	05:37 21:49	06:33 (18) 07:05 (18)	06:23 20:59	06:44 (18) 06:51 07:21 (19) 07:14	07:21 (19) 07:14 08:04 (19) 19:49	08:04 18:43 07:54 (20) 08:04	08:39 16:27
18	05:38 21:48	06:33 (18) 07:05 (18)	06:25 20:57	06:44 (18) 06:51 07:20 (19) 07:15	07:20 (19) 07:15 08:03 (19) 19:47	08:06 18:39 07:52 (20) 18:39	08:40 16:27
19	05:40 21:47	06:34 (18) 07:05 (18)	06:27 20:54	06:44 (18) 06:51 07:21 (19) 07:17	07:21 (19) 07:17 08:03 (19) 19:45	08:07 18:37 07:51 (20) 08:07	08:41 16:27
20	05:41 21:45	06:34 (18) 07:05 (18)	06:28 20:52	06:44 (18) 06:51 07:20 (19) 07:19	07:20 (19) 07:19 08:02 (19) 19:42	08:09 18:35 08:21 (20) 18:35	08:42 16:28
21	05:42 21:44	06:34 (18) 07:05 (18)	06:30 20:50	06:44 (18) 06:51 07:20 (19) 07:20	07:20 (19) 07:20 08:03 (19) 19:40	08:11 16:40 08:21 (20) 18:33	08:42 16:28
22	05:44 21:43	06:34 (18) 07:05 (18)	06:32 20:48	06:44 (18) 06:51 07:20 (19) 07:22	07:20 (19) 07:22 08:02 (19) 19:38	08:13 16:39 07:49 (20) 08:13	08:43 16:29
23	05:45 21:42	06:34 (18) 07:05 (18)	06:33 20:46	06:44 (18) 06:51 07:20 (19) 07:24	07:20 (19) 07:24 08:01 (19) 19:35	08:14 18:29 07:49 (20) 08:14	08:43 16:29
24	05:46 21:40	06:34 (18) 07:05 (18)	06:35 20:44	06:44 (18) 06:51 07:20 (19) 07:25	07:20 (19) 07:25 08:03 (19) 19:33	08:16 18:26 07:50 (20) 08:16	08:44 16:30
25	05:48 21:39	06:35 (18) 07:04 (18)	06:36 20:42	06:44 (18) 06:51 07:21 (19) 07:27	07:21 (19) 07:27 08:00 (19) 19:31	07:18 17:24 07:52 (20) 07:18	08:44 16:30
26	05:49 21:37	06:36 (18) 07:04 (18)	06:38 20:40	06:44 (18) 06:51 07:22 (19) 07:28	07:22 (19) 07:28 07:59 (19) 19:28	17:24 07:20 07:53 (20) 07:20	08:44 16:31
27	05:51 21:36	06:36 (18) 07:04 (18)	06:40 20:37	06:44 (18) 06:51 07:22 (19) 07:30	07:22 (19) 07:30 07:58 (19) 19:26	07:21 17:20 07:55 (20) 07:21	08:45 16:32
28	05:52 21:35	06:36 (18) 07:03 (18)	06:41 20:35	06:44 (18) 06:51 07:23 (19) 07:32	07:23 (19) 07:32 07:57 (19) 19:24	07:23 17:19 07:57 (20) 07:23	08:45 16:33
29	05:54 21:33	06:37 (18) 07:02 (18)	06:43 20:33	06:44 (18) 06:51 07:23 (19) 07:33	07:23 (19) 07:33 07:55 (19) 19:22	07:25 16:32 07:58 (20) 07:25	08:45 16:33
30	05:55 21:31	06:38 (18) 07:01 (18)	06:45 20:31	06:44 (18) 06:51 07:25 (19) 07:35	07:25 (19) 07:35 07:54 (19) 19:19	07:27 16:31 08:00 (20) 07:27	08:45 16:34
31	05:57 21:30	06:38 (18) 07:00 (18)	06:46 20:29	06:44 (18) 06:51 07:26 (19) 07:35	07:26 (19) 07:35 07:51 (19) 19:19	07:29 17:13 07:29 17:13	08:45 16:35
Potential sun hours	502	454	381	331	266	244	
Total, worst case	900	1088	471	11			
Sun reduction	0.27	0.30	0.28	0.24			
Oper. time red.	1.00	1.00	1.00	1.00			
Wind dir. red.	0.64	0.66	0.68	0.68			
Total reduction	0.17	0.20	0.19	0.16			
Total, real	154	215	90	2			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: CS - H97

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45	08:18	07:25	07:15	06:10	06:54 (17) 05:25
	16:37	17:24	18:16	20:10	21:01	17 07:11 (17) 21:46
2	08:45	08:17	07:23	07:12	06:08	06:55 (17) 05:24
	16:38	17:26	18:18	20:11	21:02	14 07:09 (17) 21:47
3	08:45	08:15	07:21	07:10	06:06	06:58 (17) 05:23
	16:39	17:28	18:19	20:13	21:04	9 07:07 (17) 21:48
4	08:45	08:14	07:18	07:08	06:04	05:22
	16:40	17:30	18:21	20:15	21:06	21:49
5	08:44	08:12	07:16	07:05	06:02	05:22
	16:41	17:32	18:23	20:17	21:07	21:50
6	08:44	08:10	07:14	07:03	06:01	05:21
	16:42	17:34	18:25	20:18	21:09	21:51
7	08:44	08:09	07:12	07:01	05:59	05:20
	16:44	17:35	18:27	20:20	21:10	21:52
8	08:43	08:07	07:10	06:59	05:57	05:20
	16:45	17:37	18:28	20:22	21:12	21:53
9	08:43	08:05	07:07	06:56	05:55	05:19
	16:46	17:39	18:30	20:23	21:14	21:54
10	08:42	08:03	07:05	06:54	05:54	05:19
	16:48	17:41	18:32	20:25	21:15	21:55
11	08:42	08:01	07:03	06:52	05:52	05:19
	16:49	17:43	18:34	20:27	21:17	21:56
12	08:41	08:00	07:01	06:50	05:50	05:18
	16:50	17:45	18:35	20:28	21:18	21:56
13	08:40	07:58	06:58	06:47	05:49	05:18
	16:52	17:47	18:37	20:30	21:20	21:57
14	08:40	07:56	06:56	06:45	05:47	05:18
	16:53	17:48	18:39	20:32	21:22	21:58
15	08:39	07:54	06:54	06:43	05:45	05:18
	16:55	17:50	18:41	20:34	21:23	21:58
16	08:38	07:52	06:51	06:41	05:44	05:18
	16:57	17:52	18:42	20:35	21:25	21:59
17	08:37	07:50	06:49	06:39	07:02 (17) 05:42	06:12 (16) 05:17
	16:58	17:54	18:44	20:37	9 07:11 (17) 21:26	8 06:20 (16) 21:59
18	08:36	07:48	06:47	06:36	07:00 (17) 05:41	06:10 (16) 05:17
	17:00	17:56	18:46	20:39	13 07:13 (17) 21:28	13 06:23 (16) 21:59
19	08:35	07:46	06:45	06:34	06:58 (17) 05:40	06:07 (16) 05:17
	17:01	17:58	18:47	20:40	16 07:14 (17) 21:29	16 06:23 (16) 22:00
20	08:34	07:44	06:42	06:32	06:56 (17) 05:38	06:06 (16) 05:18
	17:03	17:59	18:49	20:42	19 07:15 (17) 21:31	19 06:25 (16) 22:00
21	08:33	07:42	06:40	06:30	06:54 (17) 05:37	06:06 (16) 05:18
	17:05	18:01	18:51	20:44	22 07:16 (17) 21:32	20 06:26 (16) 22:00
22	08:32	07:40	06:38	06:28	06:53 (17) 05:35	06:05 (16) 05:18
	17:06	18:03	18:53	20:45	23 07:16 (17) 21:33	22 06:27 (16) 22:01
23	08:31	07:38	06:35	06:26	06:53 (17) 05:34	06:04 (16) 05:18
	17:08	18:05	18:54	20:47	23 07:16 (17) 21:35	24 06:28 (16) 22:01
24	08:29	07:36	06:33	06:24	06:52 (17) 05:33	06:03 (16) 05:18
	17:10	18:07	18:56	20:49	24 07:16 (17) 21:36	25 06:28 (16) 22:01
25	08:28	07:34	06:31	06:22	06:52 (17) 05:32	06:03 (16) 05:19
	17:12	18:09	18:58	20:50	24 07:16 (17) 21:38	25 06:28 (16) 22:01
26	08:27	07:31	06:28	06:20	06:52 (17) 05:31	06:02 (16) 05:19
	17:13	18:10	18:59	20:52	23 07:15 (17) 21:39	27 06:29 (16) 22:01
27	08:26	07:29	06:26	06:18	06:52 (17) 05:30	06:02 (16) 05:20
	17:15	18:12	19:01	20:54	23 07:15 (17) 21:40	27 06:29 (16) 22:01
28	08:24	07:27	06:24	06:16	06:52 (17) 05:29	06:03 (16) 05:20
	17:17	18:14	19:03	20:56	22 07:14 (17) 21:41	28 06:31 (16) 22:01
29	08:23	07:21	06:14	06:14	06:53 (17) 05:27	06:03 (16) 05:21
	17:19	18:09	18:58	20:57	20 07:13 (17) 21:43	28 06:31 (16) 22:01
30	08:21	07:19	06:12	06:12	06:53 (17) 05:27	06:02 (16) 05:21
	17:21	18:09	18:59	20:59	19 07:12 (17) 21:44	29 06:31 (16) 22:00
31	08:20	07:17	06:11	06:11	05:26	06:02 (16)
	17:22	18:08	18:58	20:58	29 21:45	06:31 (16)
Potential sun hours	259	278	367	416	485	499
Total, worst case				280	380	873
Sun reduction				0.35	0.37	0.30
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.65	0.63	0.63
Total reduction				0.23	0.23	0.19
Total, real				64	89	166

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 2 **Shadow receptor:** CS - H97

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July		August		September	October	November	December
1	05:22	06:08 (16)	05:58		06:48	07:37	07:30	08:21
	22:00	29 06:37 (16)	21:28		20:26	19:17	17:11	16:31
2	05:22	06:08 (16)	06:00		06:50	07:38	07:32	08:23
	22:00	30 06:38 (16)	21:27		20:24	19:15	17:09	16:30
3	05:23	06:09 (16)	06:01		06:51	07:40	07:34	08:24
	21:59	29 06:38 (16)	21:25		20:22	19:12	17:07	16:29
4	05:24	06:09 (16)	06:03		06:53	07:42	07:36	08:26
	21:59	30 06:39 (16)	21:23		20:20	19:10	17:06	16:29
5	05:25	06:09 (16)	06:04		06:54	07:43	07:38	08:27
	21:59	29 06:38 (16)	21:22		20:17	19:08	17:04	16:28
6	05:26	06:09 (16)	06:06		06:56	07:45	07:39	08:28
	21:58	29 06:38 (16)	21:20		20:15	19:06	17:02	16:28
7	05:27	06:09 (16)	06:08		06:58	07:47	07:41	08:29
	21:57	30 06:39 (16)	21:18		20:13	19:03	17:00	16:28
8	05:27	06:10 (16)	06:09		06:59	07:49	07:43	08:31
	21:57	29 06:39 (16)	21:16		20:10	19:01	16:59	16:27
9	05:28	06:10 (16)	06:11		07:09 (17)	07:01	07:50	08:32
	21:56	29 06:39 (16)	21:14	5	07:14 (17)	20:08	18:59	16:57
10	05:29	06:10 (16)	06:12		07:05 (17)	07:02	07:52	08:33
	21:55	29 06:39 (16)	21:12	12	07:17 (17)	20:06	18:57	16:55
11	05:30	06:10 (16)	06:14		07:04 (17)	07:04	07:54	08:34
	21:55	30 06:40 (16)	21:10	15	07:19 (17)	20:04	18:54	16:54
12	05:31	06:11 (16)	06:16		07:02 (17)	07:06	07:55	08:35
	21:54	29 06:40 (16)	21:09	18	07:20 (17)	20:01	18:52	16:52
13	05:33	06:11 (16)	06:17		07:01 (17)	07:07	07:57	08:36
	21:53	29 06:40 (16)	21:07	20	07:21 (17)	19:59	18:50	16:51
14	05:34	06:11 (16)	06:19		07:00 (17)	07:09	07:59	08:37
	21:52	28 06:39 (16)	21:05	21	07:21 (17)	19:57	18:48	16:49
15	05:35	06:11 (16)	06:20		07:00 (17)	07:11	08:00	08:38
	21:51	28 06:39 (16)	21:03	22	07:22 (17)	19:54	18:45	16:48
16	05:36	06:11 (16)	06:22		06:59 (17)	07:12	08:02	08:39
	21:50	28 06:39 (16)	21:01	23	07:22 (17)	19:52	18:43	16:47
17	05:37	06:12 (16)	06:24		06:59 (17)	07:14	08:04	08:40
	21:49	27 06:39 (16)	20:59	23	07:22 (17)	19:50	18:41	16:45
18	05:39	06:12 (16)	06:25		06:58 (17)	07:15	08:06	08:40
	21:48	26 06:38 (16)	20:57	23	07:21 (17)	19:47	18:39	16:44
19	05:40	06:13 (16)	06:27		06:58 (17)	07:17	08:07	08:41
	21:47	26 06:39 (16)	20:55	24	07:22 (17)	19:45	18:37	16:43
20	05:41	06:14 (16)	06:28		06:57 (17)	07:19	08:09	08:42
	21:46	24 06:38 (16)	20:52	24	07:21 (17)	19:43	18:35	16:41
21	05:42	06:14 (16)	06:30		06:58 (17)	07:20	08:11	08:42
	21:44	23 06:37 (16)	20:50	23	07:21 (17)	19:40	18:33	16:40
22	05:44	06:15 (16)	06:32		06:58 (17)	07:22	08:13	08:43
	21:43	21 06:36 (16)	20:48	21	07:19 (17)	19:38	18:31	16:39
23	05:45	06:16 (16)	06:33		07:00 (17)	07:24	08:14	08:09
	21:42	20 06:36 (16)	20:46	19	07:19 (17)	19:36	18:29	16:38
24	05:47	06:17 (16)	06:35		07:01 (17)	07:25	08:16	08:11
	21:40	18 06:35 (16)	20:44	16	07:17 (17)	19:33	18:27	16:37
25	05:48	06:18 (16)	06:37		07:03 (17)	07:27	07:18	08:12
	21:39	15 06:33 (16)	20:42	12	07:15 (17)	19:31	17:25	16:36
26	05:49	06:21 (16)	06:38		07:05 (17)	07:29	07:20	08:14
	21:38	11 06:32 (16)	20:40	8	07:13 (17)	19:29	17:23	16:35
27	05:51	06:24 (16)	06:40		07:30	07:21	08:15	08:45
	21:36	4 06:28 (16)	20:37		19:26	17:21	16:34	16:32
28	05:52		06:41		07:32	07:23	08:17	08:45
	21:35		20:35		19:24	17:19	16:33	16:33
29	05:54		06:43		07:33	07:25	08:18	08:45
	21:33		20:33		19:22	17:17	16:32	16:33
30	05:55		06:45		07:35	07:27	08:20	08:45
	21:32		20:31		19:19	17:15	16:31	16:34
31	05:57		06:46			07:29		08:45
	21:30		20:29			17:13		16:35
Potential sun hours	502		454		381	331	266	244
Total, worst case		680		329				
Sun reduction		0.27		0.30				
Oper. time red.		1.00		1.00				
Wind dir. red.		0.63		0.65				
Total reduction		0.17		0.19				
Total, real		115		63				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: CT - H98

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining table layout: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: CU - H99

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and potential sun hours.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



SHADOW - Calendar

Calculation: Alternative Scenario 2 Shadow receptor: CV - H100

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: CX - H102

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45 16:36	08:18 17:24	07:25 18:16	07:14 20:10	06:10 21:00	05:24 21:46	05:21 22:00	05:58 21:28	06:48 20:26	07:37 19:17	07:30 17:11	08:21 16:30
2	08:45 16:37	08:17 17:26	07:23 18:17	07:12 20:11	06:08 21:02	05:23 21:47	05:22 22:00	05:59 21:27	06:49 20:24	07:38 19:14	07:32 17:09	08:23 16:30
3	08:45 16:38	08:15 17:28	07:20 18:19	07:10 20:13	06:06 21:04	05:23 21:48	05:23 21:59	06:01 21:25	06:51 20:22	07:40 19:12	07:34 17:07	08:24 16:29
4	08:45 16:39	08:13 17:30	07:18 18:21	07:07 20:15	06:04 21:05	05:22 21:49	05:24 21:59	06:03 21:23	06:52 20:19	07:42 19:10	07:36 17:05	08:25 16:29
5	08:44 16:41	08:12 17:31	07:16 18:23	07:05 20:16	06:02 21:07	05:21 21:50	05:24 21:58	06:04 21:21	06:54 20:17	07:43 19:08	07:37 17:03	08:27 16:28
6	08:44 16:42	08:10 17:33	07:14 18:25	07:03 20:18	06:00 21:09	05:21 21:51	05:25 21:58	06:06 21:20	06:56 20:15	07:45 19:05	07:39 17:02	08:28 16:28
7	08:44 16:43	08:08 17:35	07:12 18:26	07:01 20:20	05:58 21:10	05:20 21:52	05:26 21:57	06:07 21:18	06:57 20:13	07:47 19:03	07:41 17:00	08:29 16:27
8	08:43 16:44	08:07 17:37	07:09 18:28	06:58 20:21	05:57 21:12	05:20 21:53	05:27 21:57	06:09 21:16	06:59 20:10	07:48 19:01	07:43 16:58	08:31 16:27
9	08:43 16:46	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	05:19 21:54	05:28 21:56	06:10 21:14	07:01 20:08	07:50 18:59	07:45 16:57	08:32 16:27
10	08:42 16:47	08:03 17:41	07:05 18:32	06:54 20:25	05:53 21:15	05:19 21:55	05:29 21:55	06:12 21:12	07:02 20:06	07:52 18:56	07:46 16:55	08:33 16:26
11	08:42 16:49	08:01 17:43	07:03 18:33	06:52 20:27	05:51 21:17	05:18 21:56	05:30 21:55	06:14 21:10	07:04 20:03	07:53 18:54	07:48 16:54	08:34 16:26
12	08:41 16:50	07:59 17:44	07:00 18:35	06:49 20:28	05:50 21:18	05:18 21:56	05:31 21:54	06:15 21:08	07:05 20:01	07:55 18:52	07:50 16:52	08:35 16:26
13	08:40 16:52	07:58 17:46	06:58 18:37	06:47 20:30	05:48 21:20	05:18 21:57	05:32 21:53	06:17 21:06	07:07 19:59	07:57 18:50	07:52 16:50	08:36 16:26
14	08:40 16:53	07:56 17:48	06:56 18:39	06:45 20:32	05:47 21:22	05:17 21:57	05:33 21:52	06:18 21:05	07:09 19:56	07:59 18:47	07:54 16:49	08:37 16:26
15	08:39 16:55	07:54 17:50	06:53 18:40	06:43 20:33	05:45 21:23	05:17 21:58	05:34 21:51	06:20 21:03	07:10 19:54	08:00 18:45	07:55 16:48	08:38 16:26
16	08:38 16:56	07:52 17:52	06:51 18:42	06:41 20:35	05:44 21:25	05:17 21:59	05:36 21:50	06:22 21:01	07:12 19:52	08:02 18:43	07:57 16:46	08:39 16:26
17	08:37 16:58	07:50 17:54	06:49 18:44	06:38 20:37	05:42 21:26	05:17 21:59	05:37 21:49	06:23 20:58	07:14 19:49	08:04 18:41	07:59 16:45	08:39 16:26
18	08:36 16:59	07:48 17:56	06:47 18:46	06:36 20:38	05:41 21:28	05:17 21:59	05:38 21:48	06:25 20:56	07:15 19:47	08:05 18:39	08:00 16:43	08:40 16:27
19	08:35 17:01	07:46 17:57	06:44 18:47	06:34 20:40	05:39 21:29	05:17 22:00	05:39 21:47	06:26 20:54	07:17 19:45	08:07 18:37	08:02 16:42	08:41 16:27
20	08:34 17:03	07:44 17:59	06:42 18:49	06:32 20:42	05:38 21:31	05:17 22:00	05:41 21:45	06:28 20:52	07:18 19:42	08:09 18:35	08:04 16:41	08:42 16:27
21	08:33 17:04	07:42 18:01	06:40 18:51	06:30 20:44	05:36 21:32	05:17 22:00	05:42 21:44	06:30 20:50	07:20 19:40	08:11 18:32	08:06 16:40	08:42 16:28
22	08:32 17:06	07:40 18:03	06:37 18:52	06:28 20:45	05:35 21:33	05:17 22:01	05:43 21:43	06:31 20:48	07:22 19:38	08:12 18:30	08:07 16:39	08:43 16:28
23	08:31 17:08	07:38 18:05	06:35 18:54	06:26 20:47	05:34 21:35	05:18 22:01	05:45 21:42	06:33 20:46	07:23 19:35	08:14 18:28	08:09 16:38	08:43 16:29
24	08:29 17:10	07:36 18:07	06:33 18:56	06:24 20:49	05:33 21:36	05:18 22:01	05:46 21:40	06:35 20:44	07:25 19:33	08:16 18:26	08:10 16:36	08:44 16:29
25	08:28 17:11	07:33 18:08	06:30 18:58	06:21 20:50	05:31 21:38	05:18 22:01	05:48 21:39	06:36 20:42	07:27 19:31	07:18 17:24	08:12 16:35	08:44 16:30
26	08:27 17:13	07:31 18:10	06:28 18:59	06:19 20:52	05:30 21:39	05:19 22:01	05:49 21:37	06:38 20:39	07:28 19:28	07:20 17:22	08:14 16:34	08:44 16:31
27	08:25 17:15	07:29 18:12	06:26 19:01	06:17 20:54	05:29 21:40	05:19 22:01	05:50 21:36	06:39 20:37	07:30 19:26	07:21 17:20	08:15 16:34	08:45 16:31
28	08:24 17:17	07:27 18:14	06:23 19:03	06:15 20:55	05:28 21:41	05:20 22:01	05:52 21:35	06:41 20:35	07:32 19:24	07:23 17:18	08:17 16:33	08:45 16:32
29	08:23 17:18	07:21 18:04	06:13 19:04	06:13 20:57	05:27 21:43	05:20 22:01	05:53 21:33	06:43 20:33	07:33 19:21	07:25 17:16	08:18 16:32	08:45 16:33
30	08:21 17:20	07:19 18:06	06:11 19:09	06:11 20:59	05:26 21:44	05:21 22:00	05:55 21:31	06:44 20:31	07:35 19:19	07:27 17:14	08:20 16:31	08:45 16:34
31	08:20 17:22	07:17 18:08	06:10 19:11	06:10 20:08	05:25 21:45	05:21 22:00	05:56 21:30	06:46 20:28	07:39 17:13	07:29 16:54	08:21 16:34	08:45 16:35
Potential sun hours	259	278	367	416	485	499	502	454	381	331	266	244
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: CY - H103

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for days (1-31) and summary rows (Potential sun hours, Total, worst case, etc.)

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: CZ - H104

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (Jan-Dec) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Summary table with 4 columns: Day in month, Sun rise/set (hh:mm), Minutes with flicker, and First/Last time (hh:mm) with flicker (WTG causing flicker).

SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: DA - H105

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with 13 columns (January-December) and 31 rows of daily data including sun rise/set times and potential sun hours.

Table layout: For each day in each month the following matrix apply

Matrix defining columns for Day in month, Sun rise/set, Minutes with flicker, First/Last time with flicker, and WTG causing flicker first/last time.



SHADOW - Calendar

Calculation: Alternative Scenario 2Shadow receptor: DB - H106

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

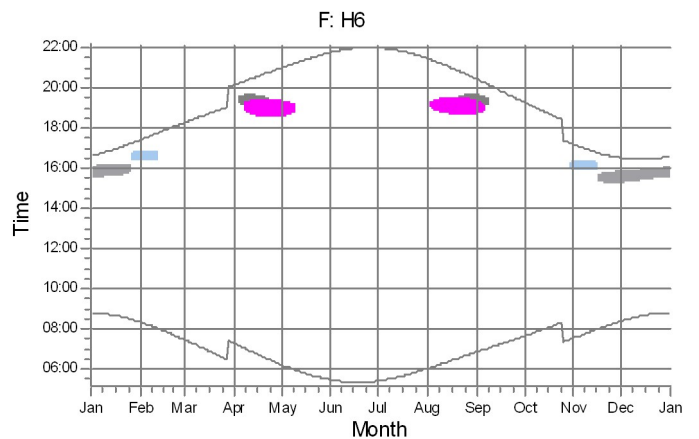
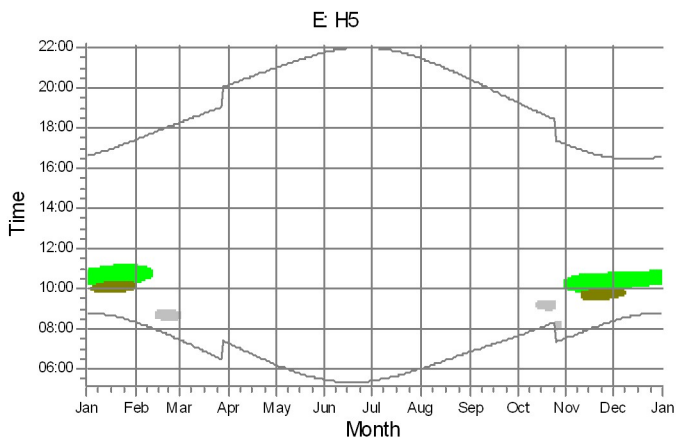
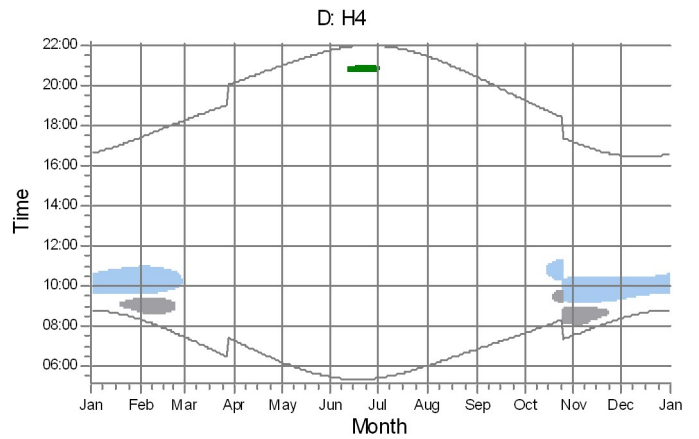
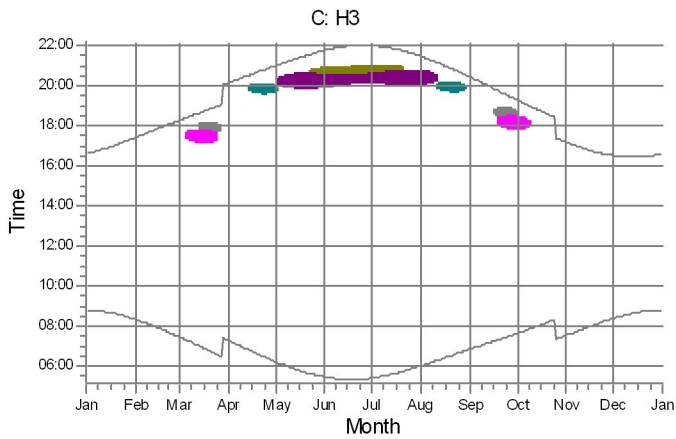
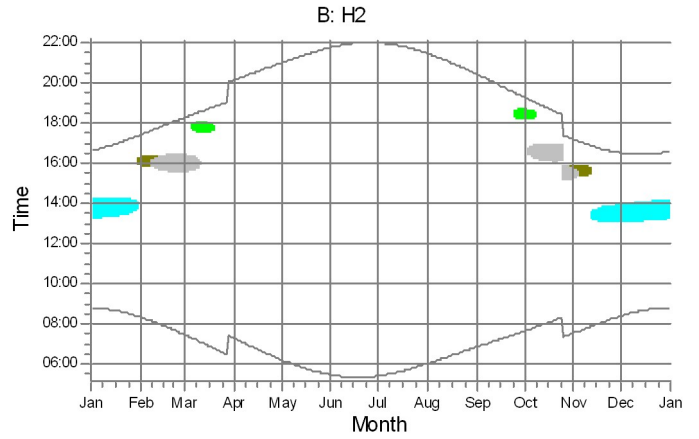
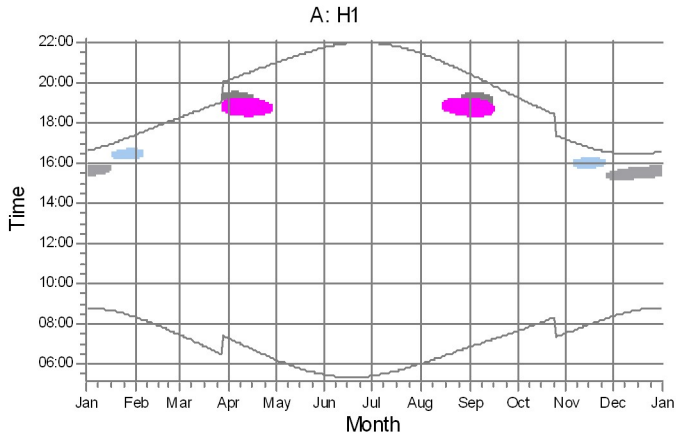
Main shadow calculation table with columns for months (January-December) and rows for days (1-31) and summary rows (Potential sun hours, Total, worst case, etc.)

Table layout: For each day in each month the following matrix apply

Matrix with 4 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar, graphical

Calculation: Alternative Scenario 2

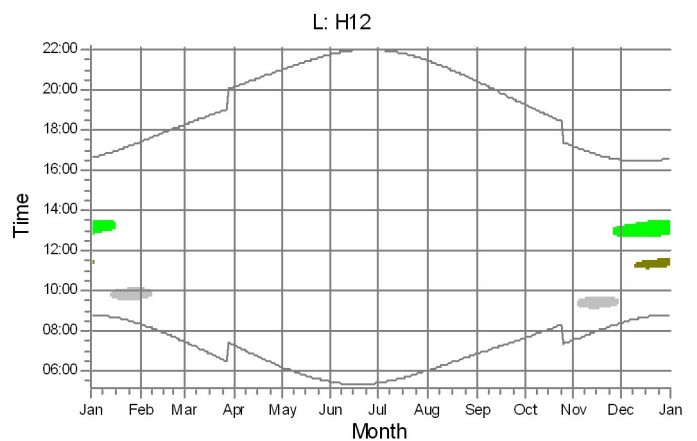
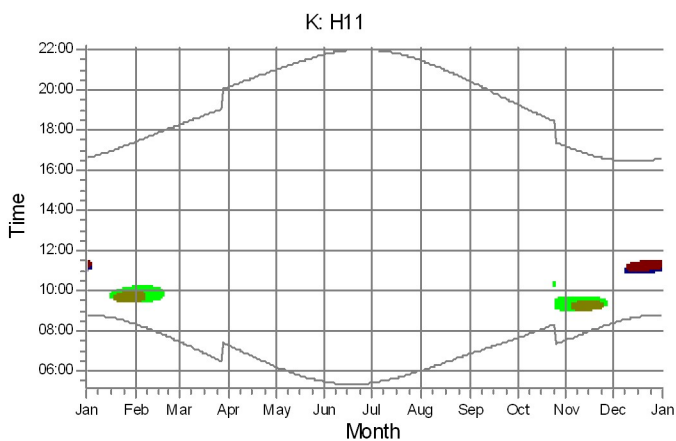
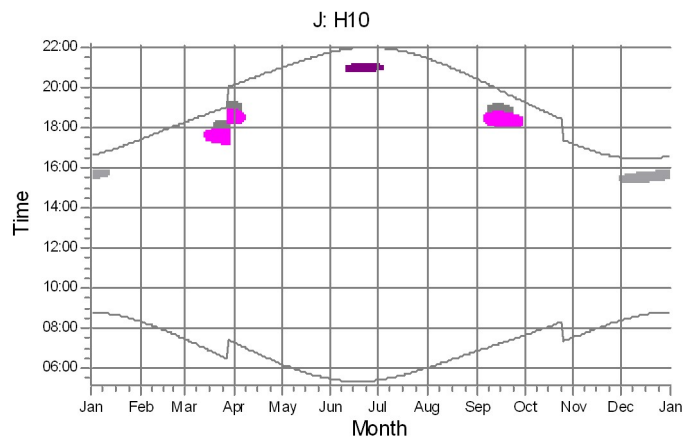
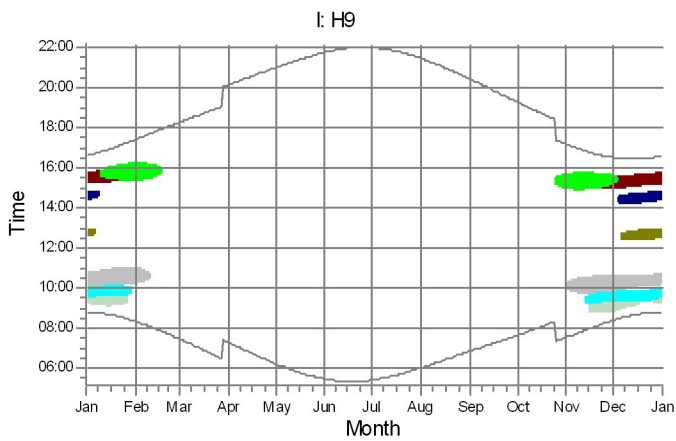
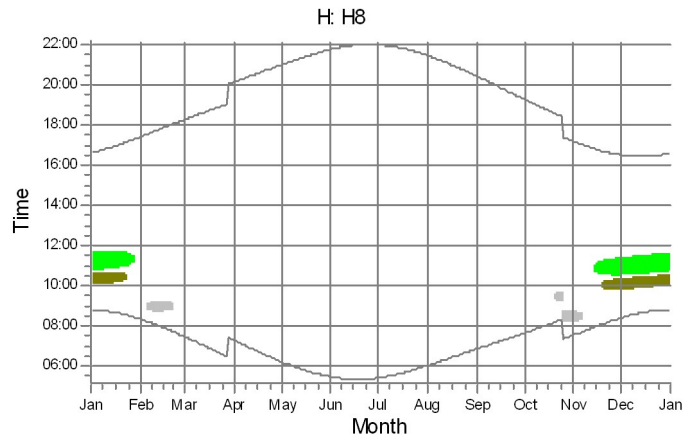
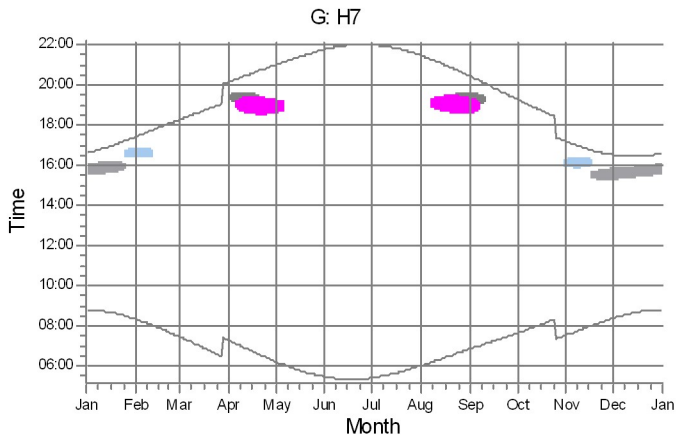


WTGs

	1: T1		6: T6		11: T11		15: Derragh
	4: T4		9: T9		12: T12		16: Derragh
	5: T5		10: T10		13: T13		

SHADOW - Calendar, graphical

Calculation: Alternative Scenario 2

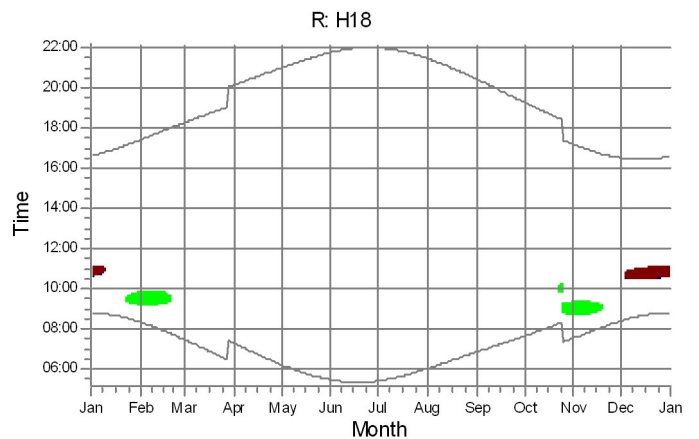
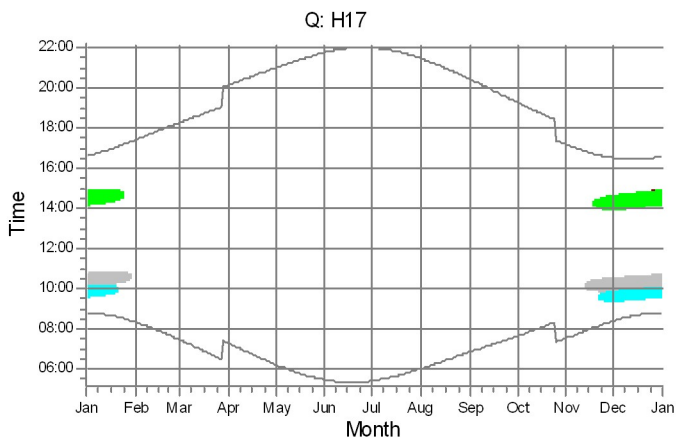
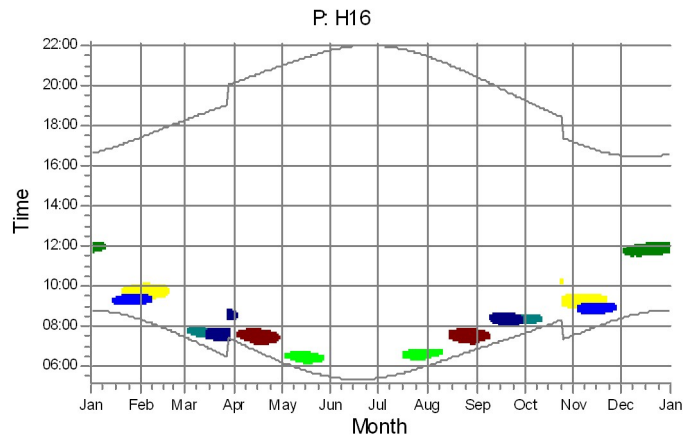
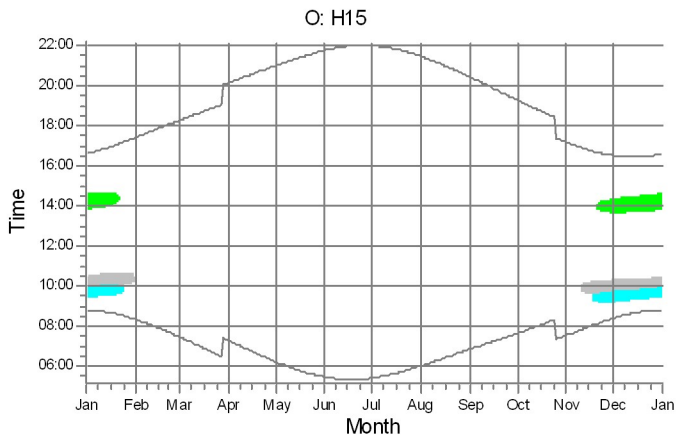
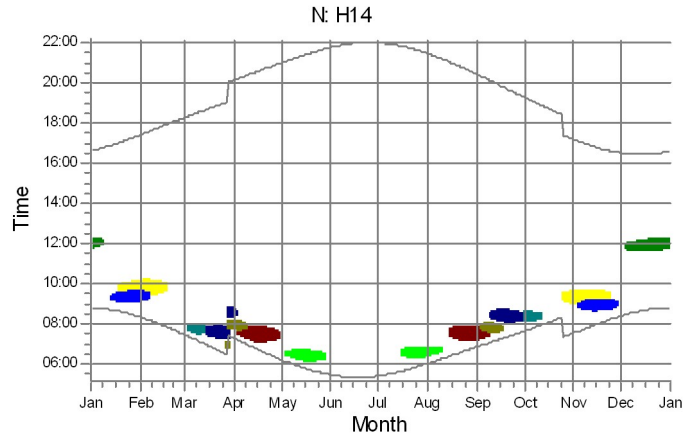
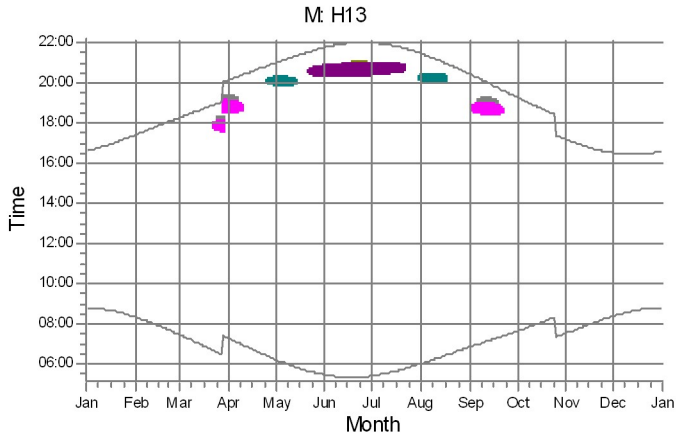


WTGs

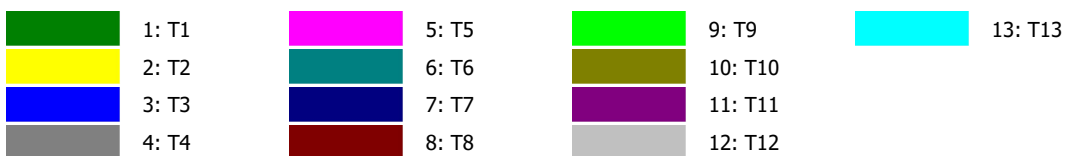
	4: T4		8: T8		11: T11		14: T14
	5: T5		9: T9		12: T12		15: Derragh
	7: T7		10: T10		13: T13		16: Derragh

SHADOW - Calendar, graphical

Calculation: Alternative Scenario 2

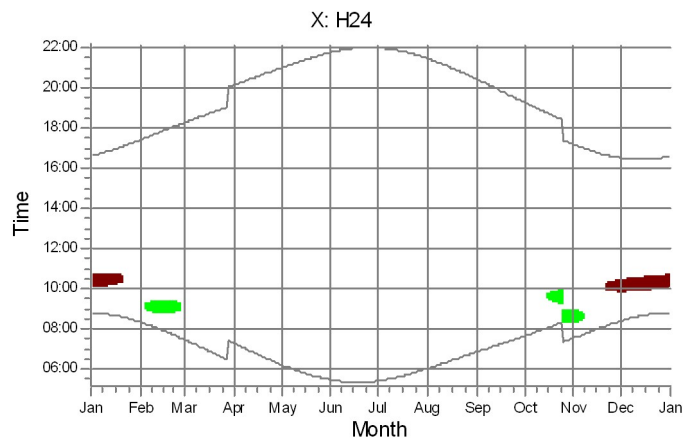
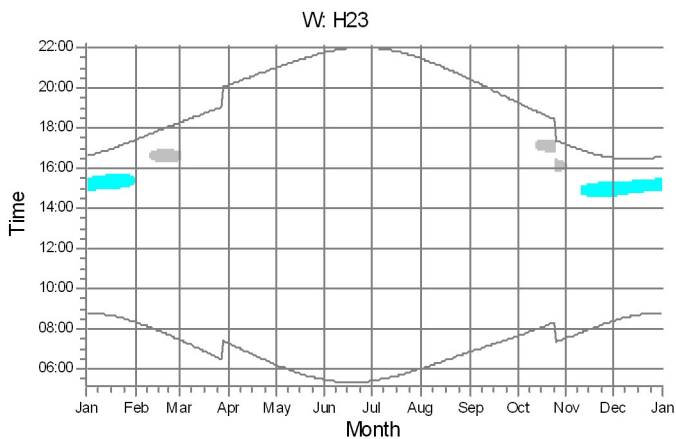
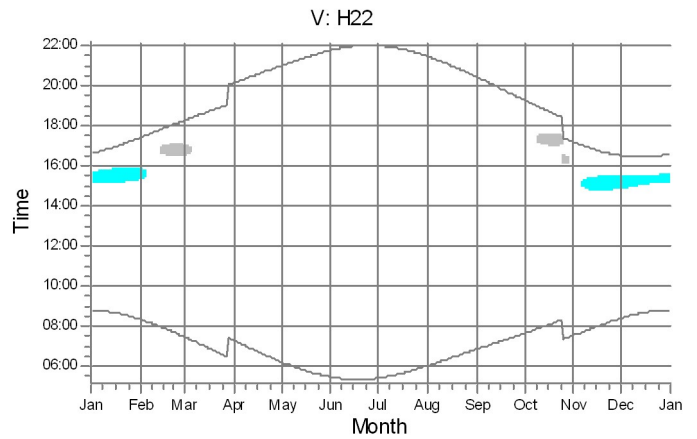
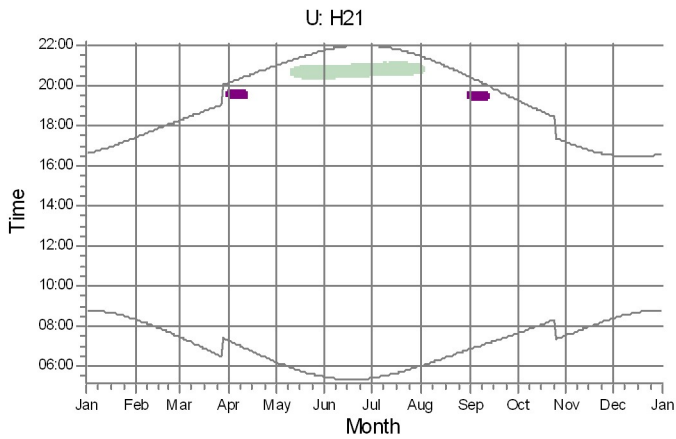
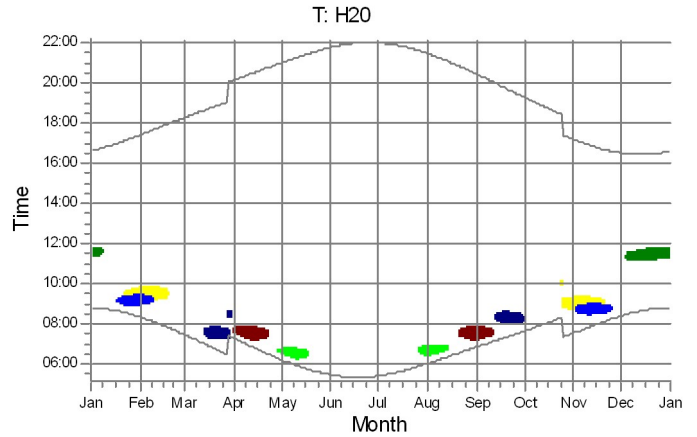
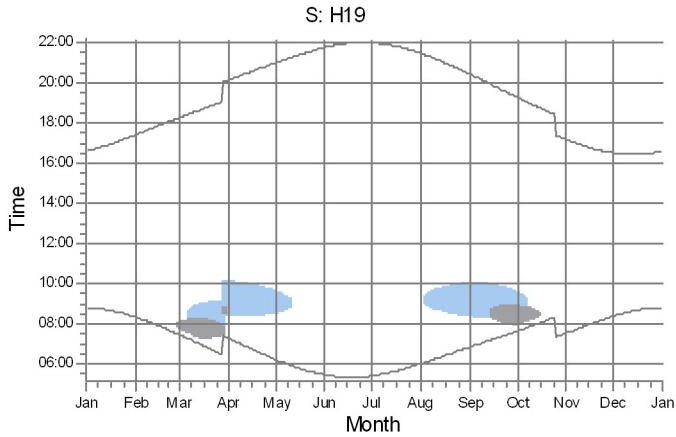


WTGs



SHADOW - Calendar, graphical

Calculation: Alternative Scenario 2

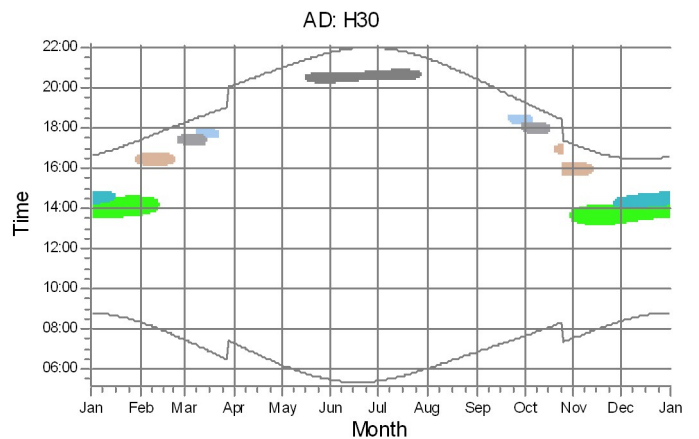
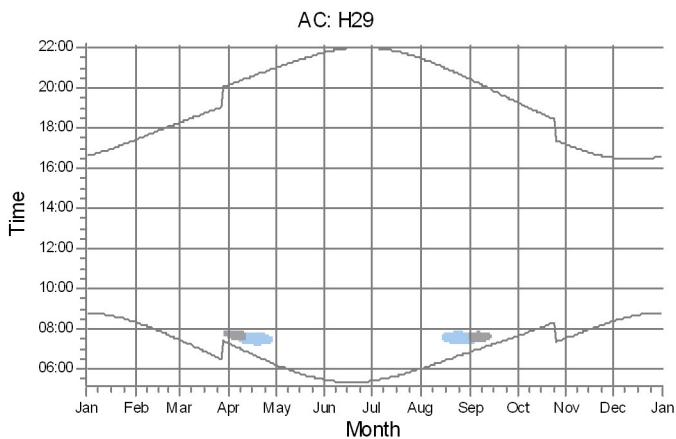
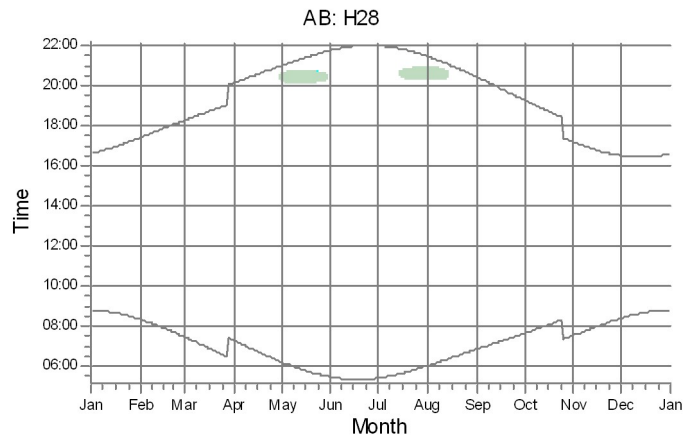
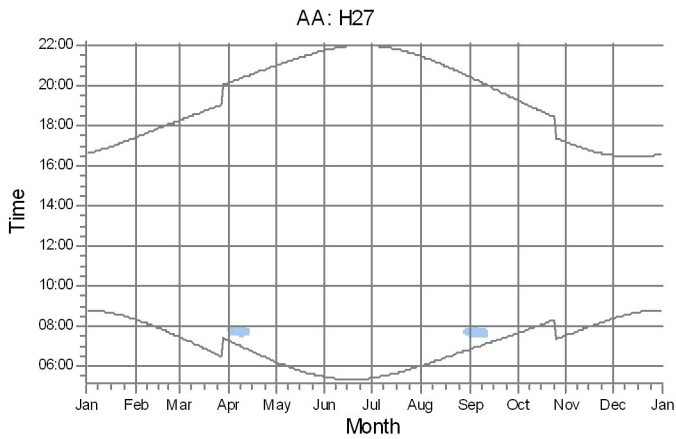
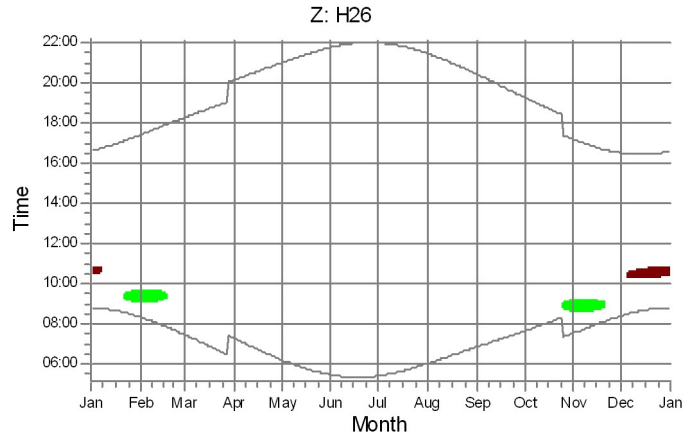
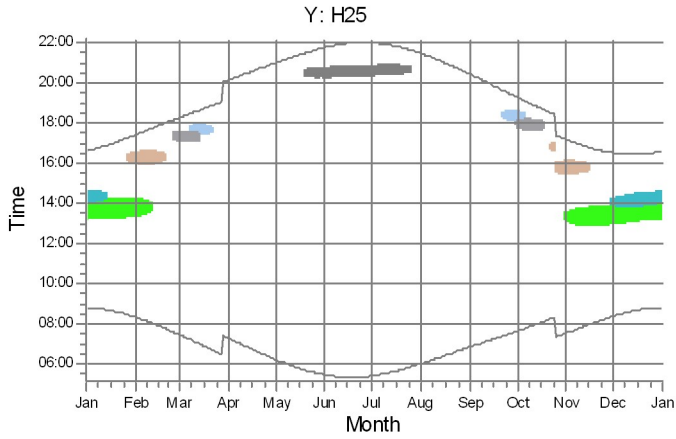


WTGs



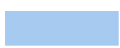








	1: T1		7: T7		11: T11		14: T14
	2: T2		8: T8		12: T12		15: Derragh
	3: T3		9: T9		13: T13		16: Derragh

SHADOW - Calendar, graphical

Calculation: Alternative Scenario 2

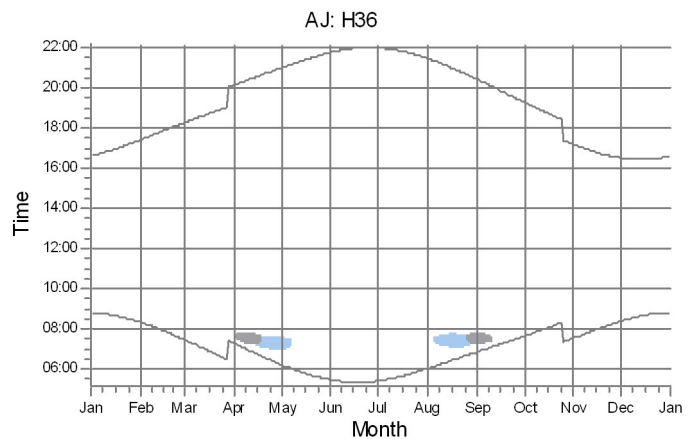
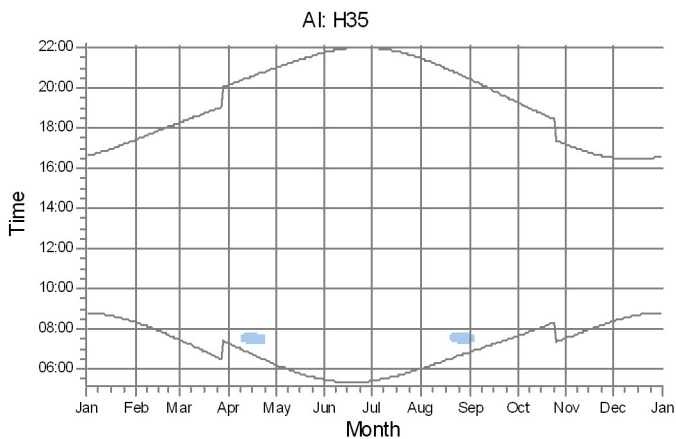
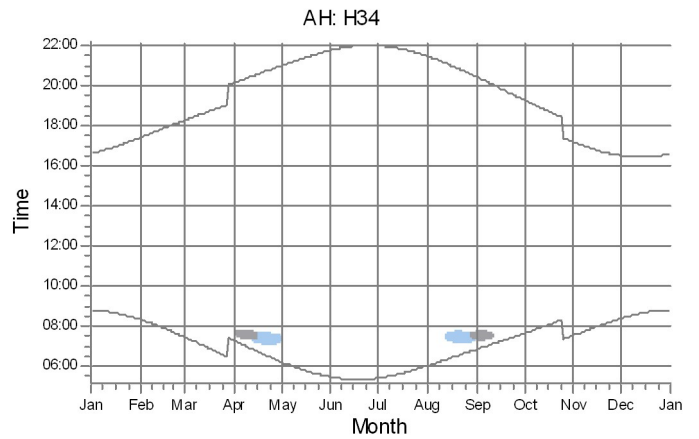
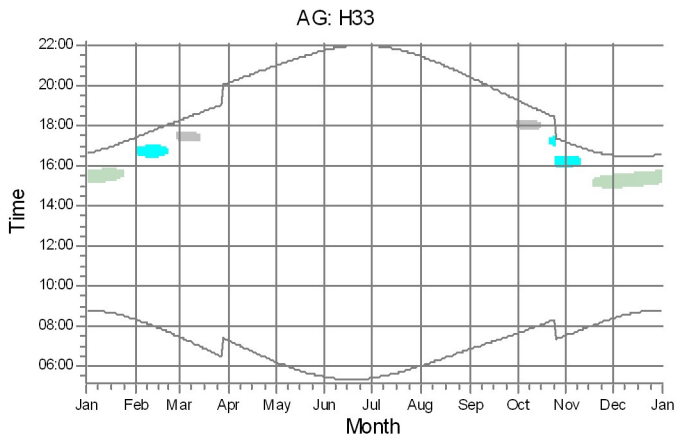
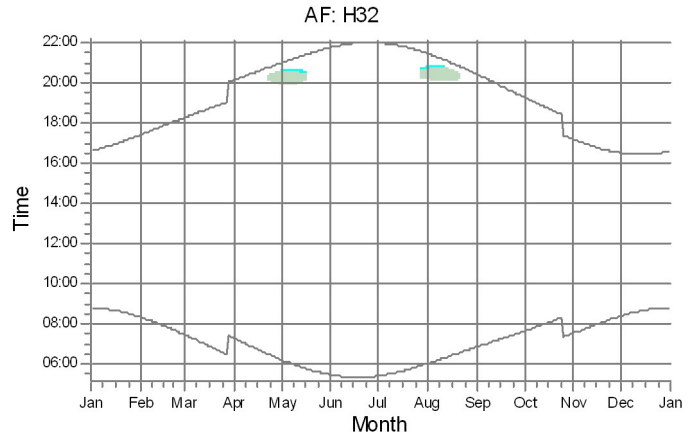
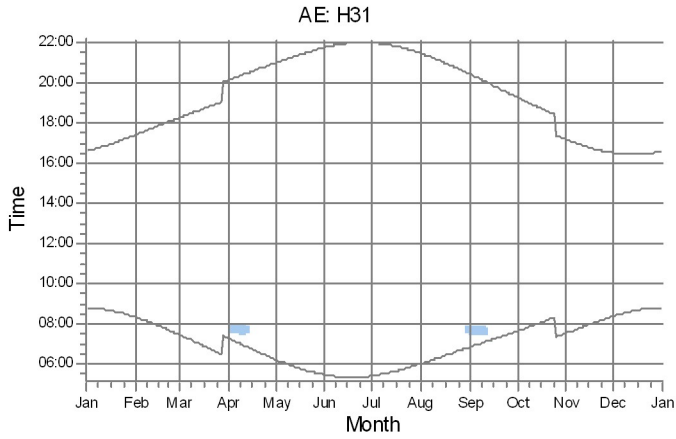


WTGs

	4: T4		9: T9		15: Derragh		18: Derragh
	7: T7		13: T13		16: Derragh		19: Derragh
	8: T8		14: T14		17: Derragh		

SHADOW - Calendar, graphical

Calculation: Alternative Scenario 2

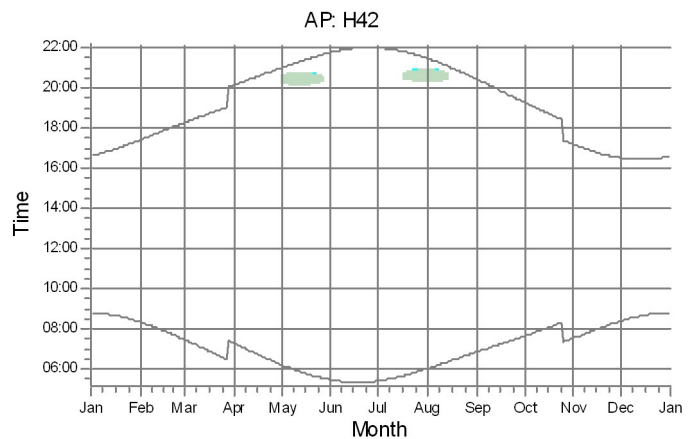
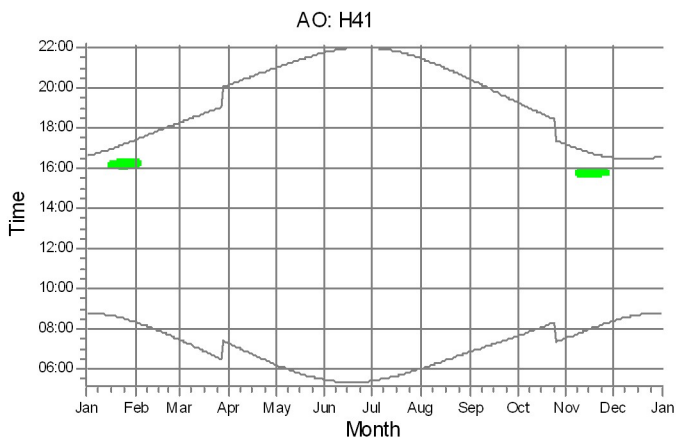
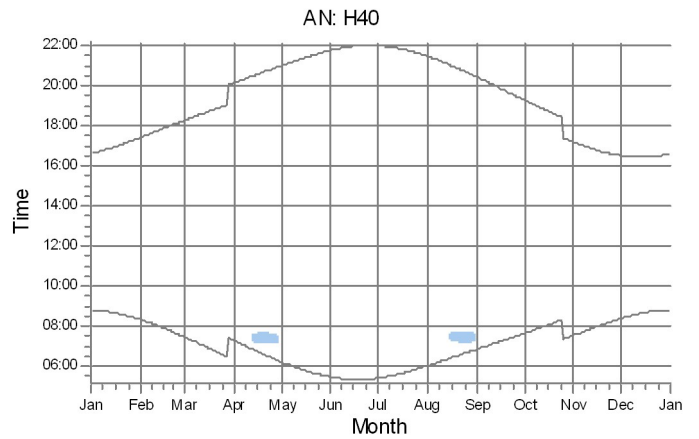
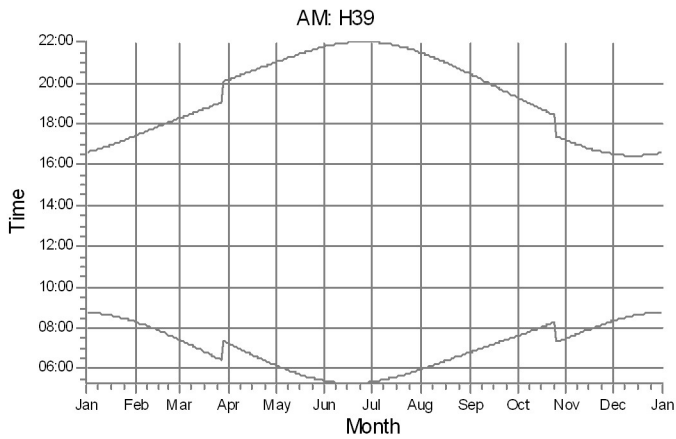
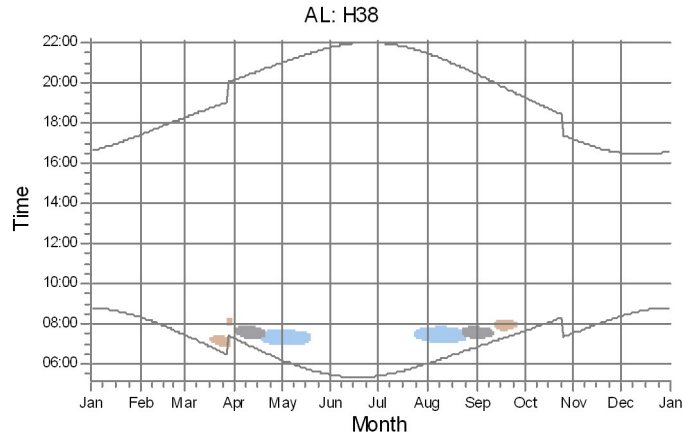
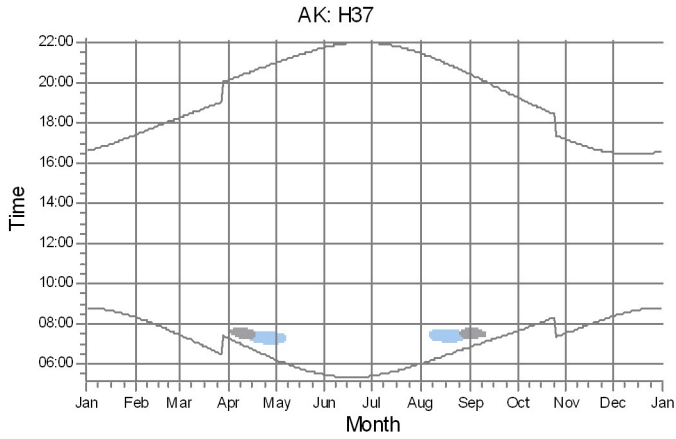


WTGs

	12: T12		14: T14		16: Derragh
	13: T13		15: Derragh		

SHADOW - Calendar, graphical

Calculation: Alternative Scenario 2

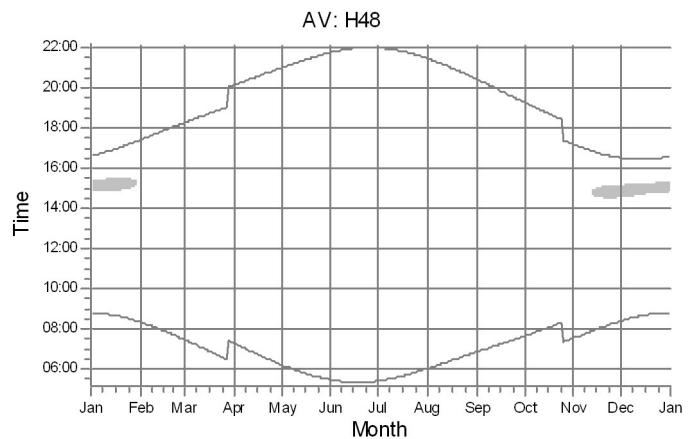
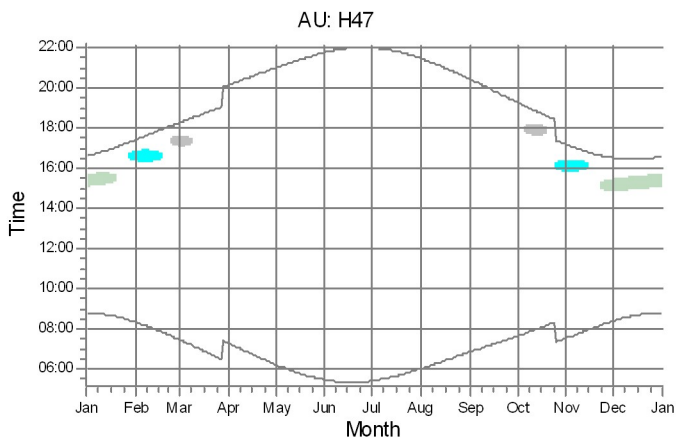
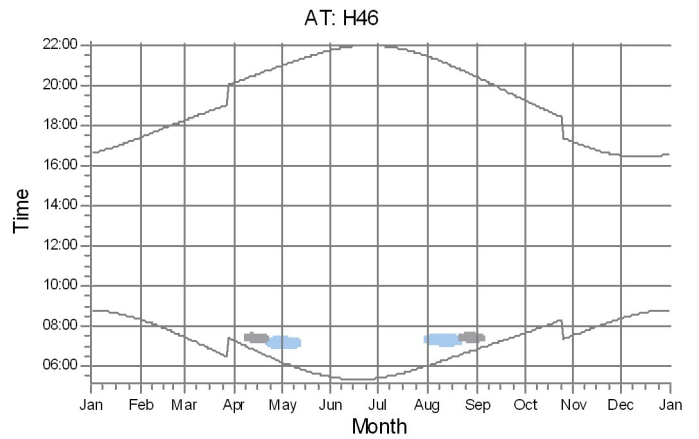
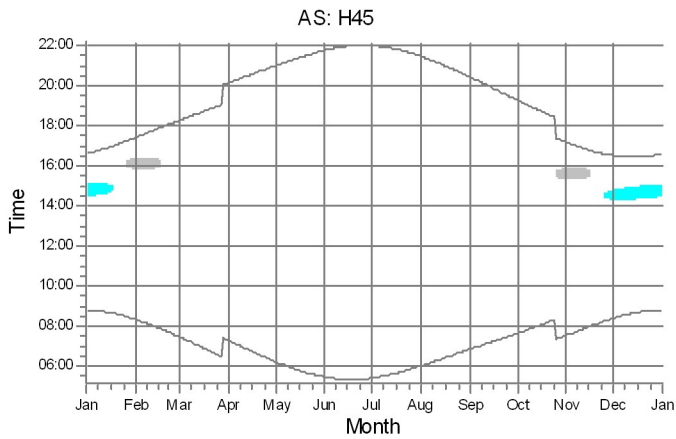
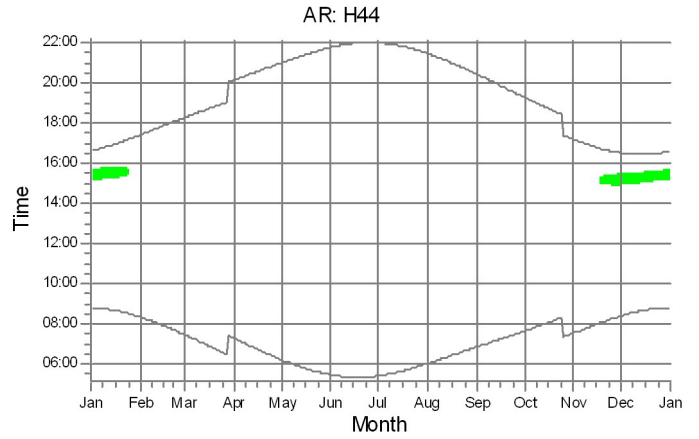
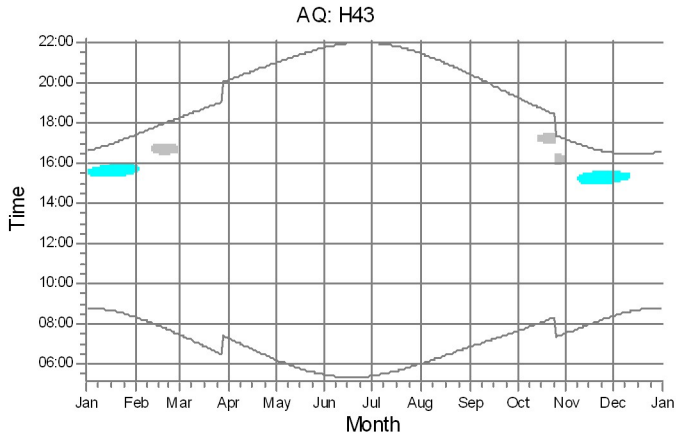


WTGs



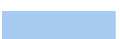



	9: T9		14: T14		16: Derragh
	13: T13		15: Derragh		17: Derragh

SHADOW - Calendar, graphical

Calculation: Alternative Scenario 2

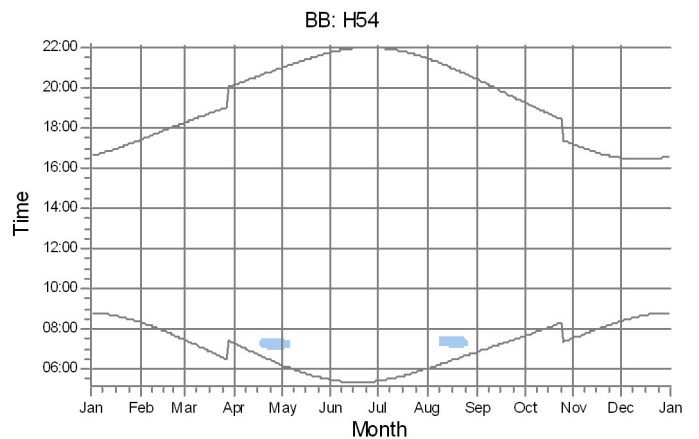
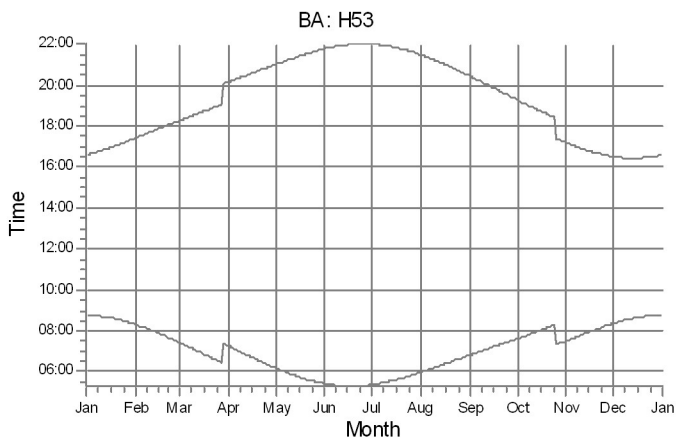
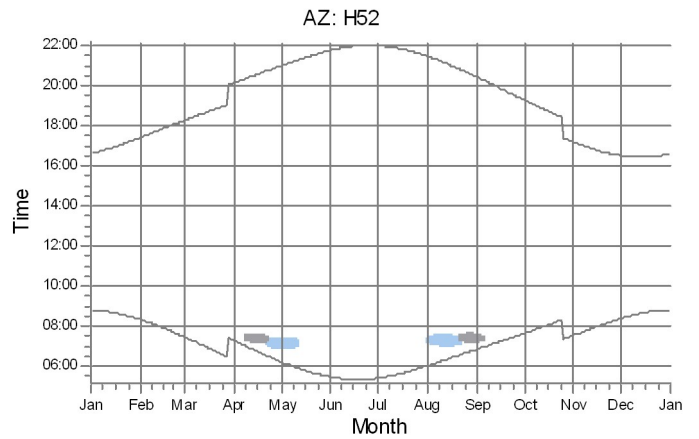
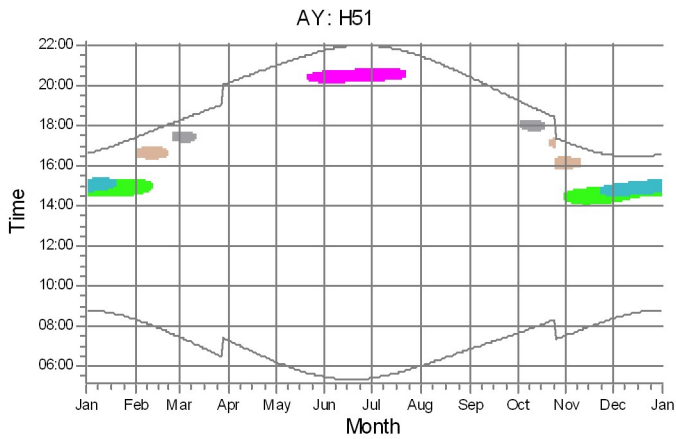
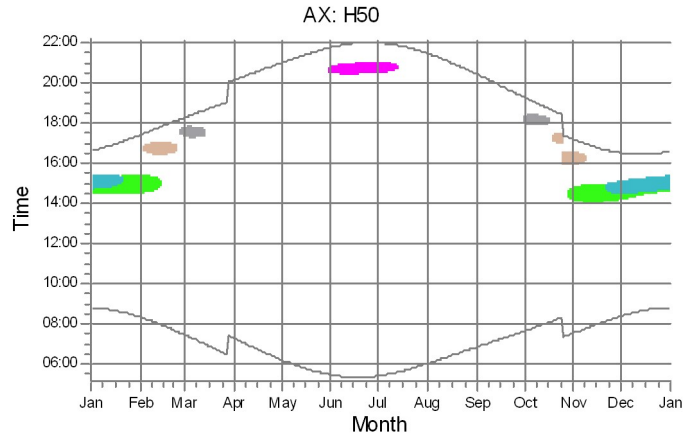
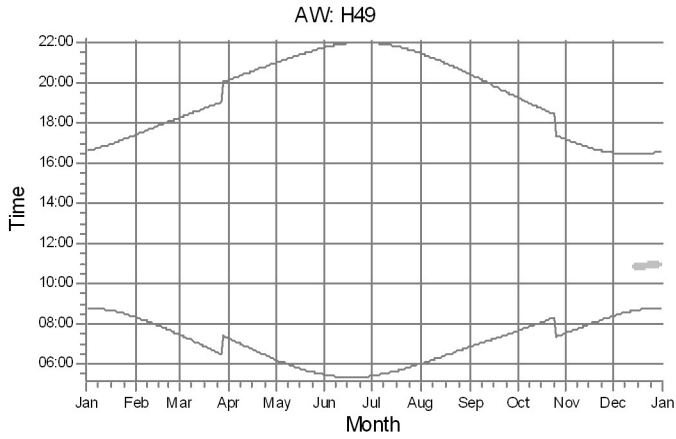


WTGs

	9: T9		13: T13		15: Derragh
	12: T12		14: T14		16: Derragh

SHADOW - Calendar, graphical

Calculation: Alternative Scenario 2

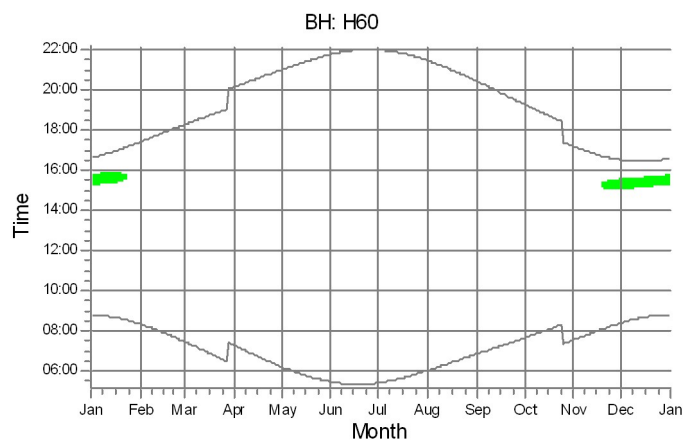
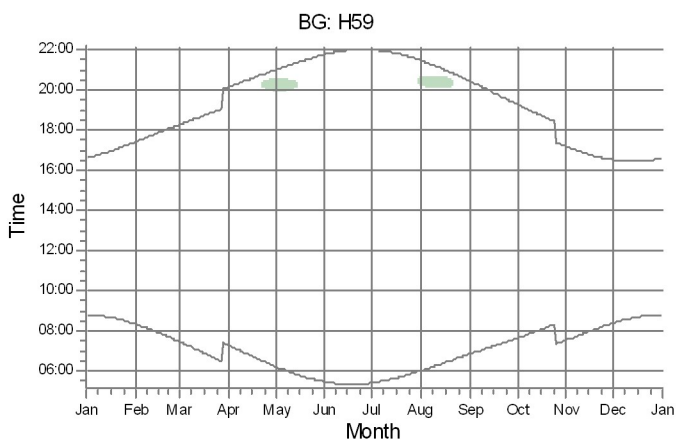
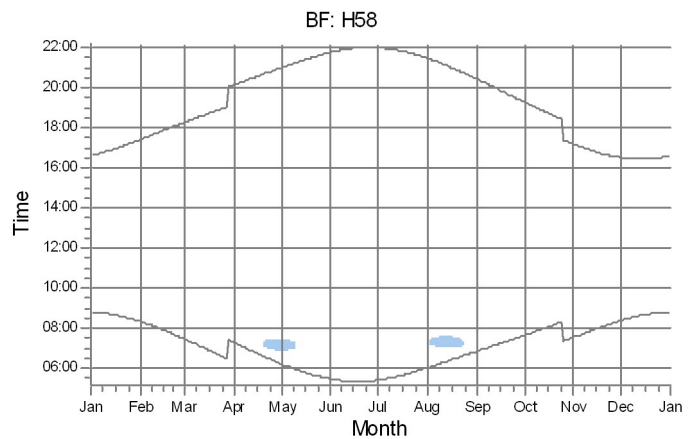
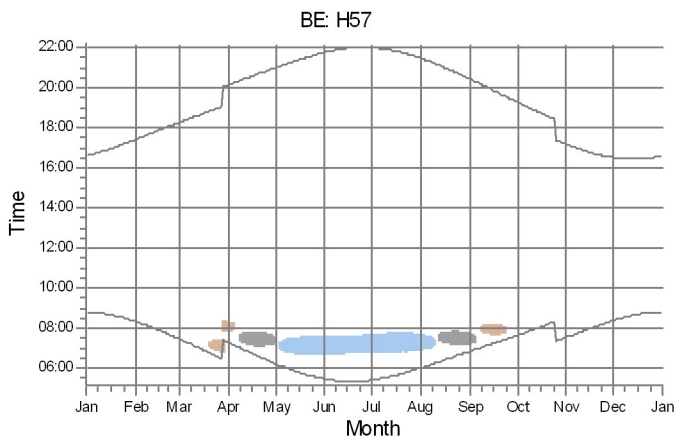
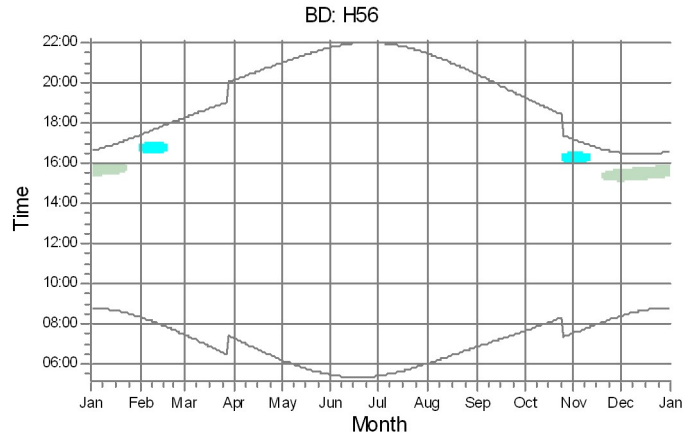
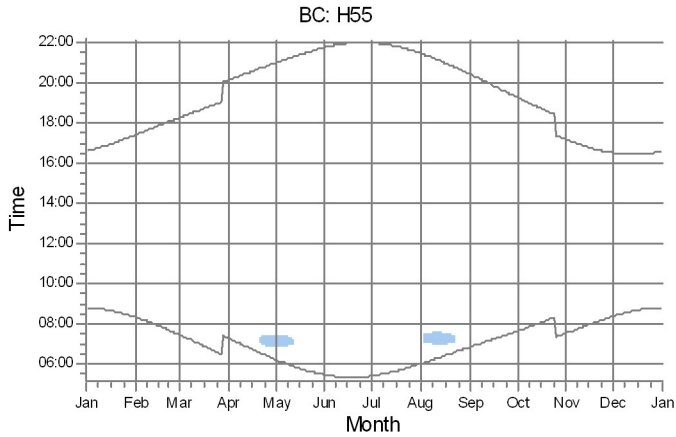


WTGs





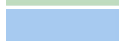

 5: T5	 15: Derragh	 17: Derragh	 19: Derragh
 12: T12	 16: Derragh	 18: Derragh	

SHADOW - Calendar, graphical

Calculation: Alternative Scenario 2

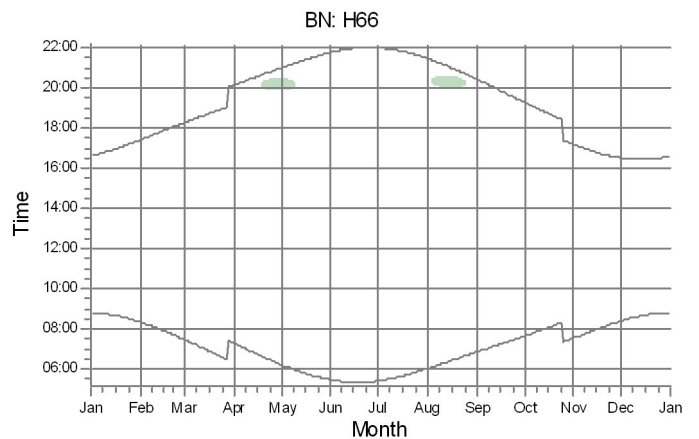
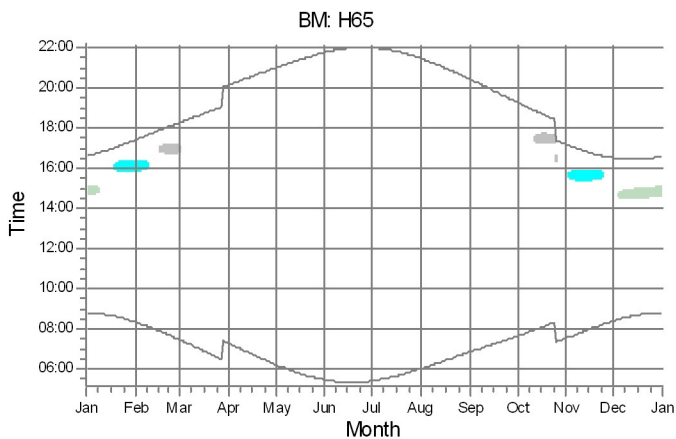
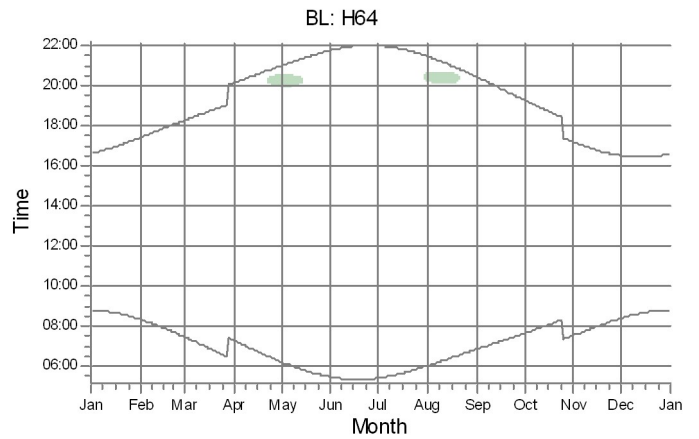
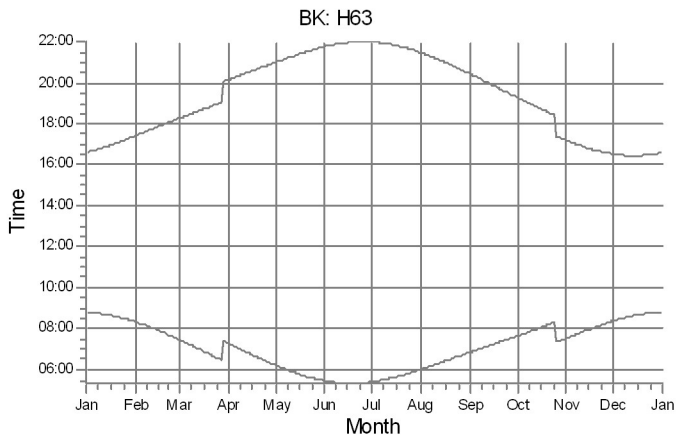
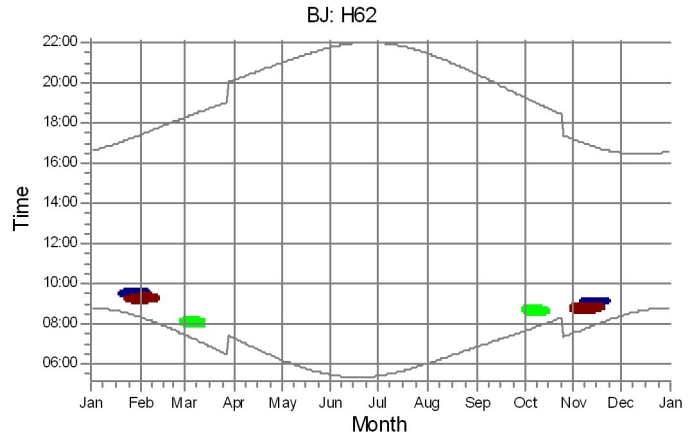
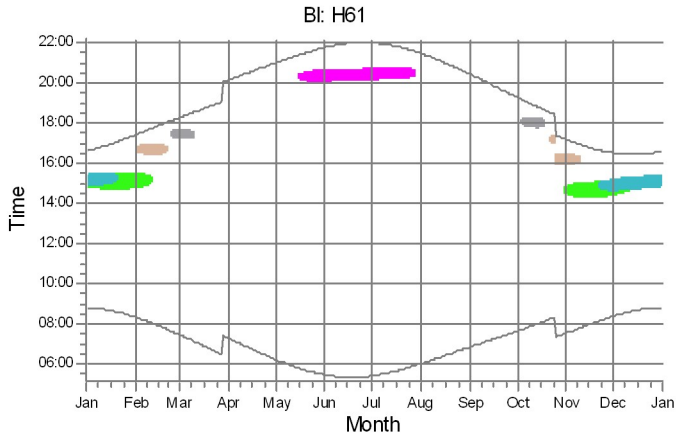


WTGs

	9: T9		14: T14		16: Derragh
	13: T13		15: Derragh		17: Derragh

SHADOW - Calendar, graphical

Calculation: Alternative Scenario 2

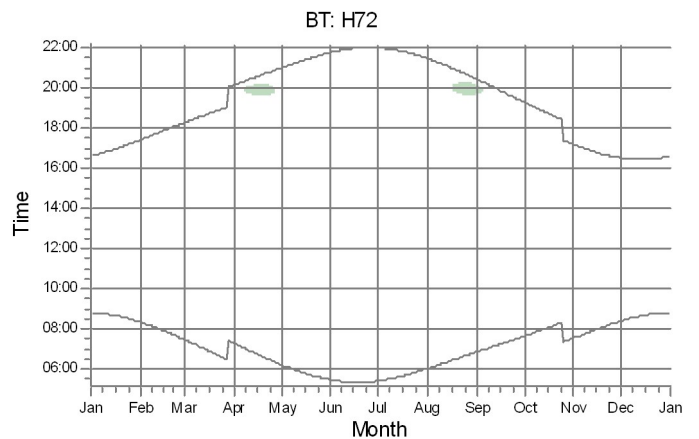
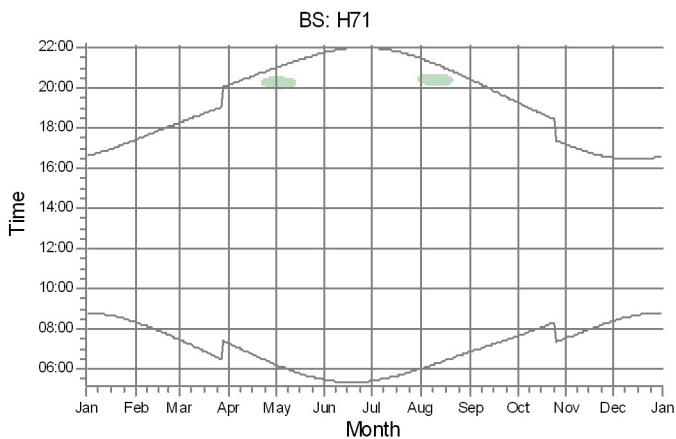
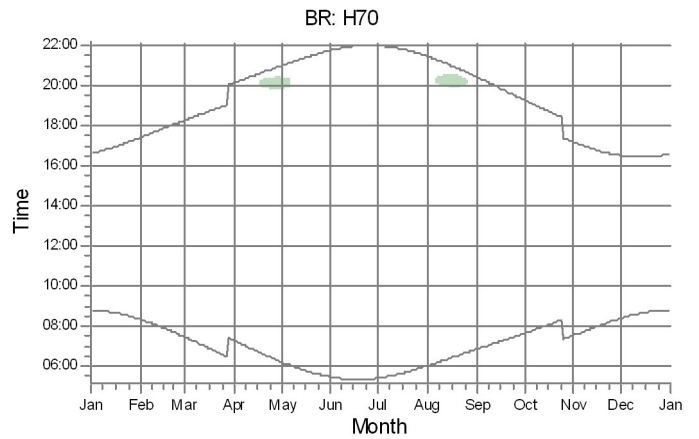
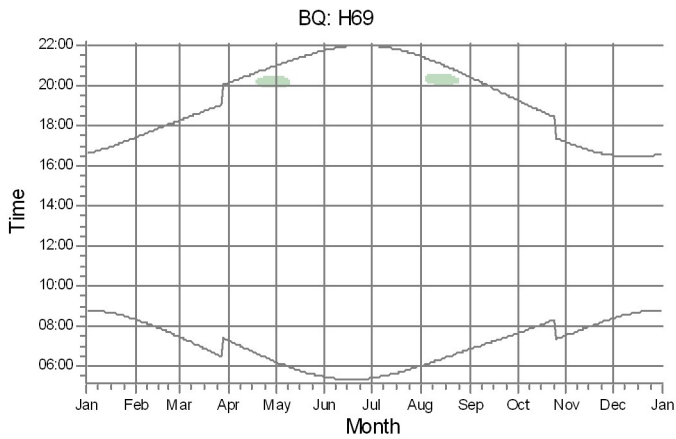
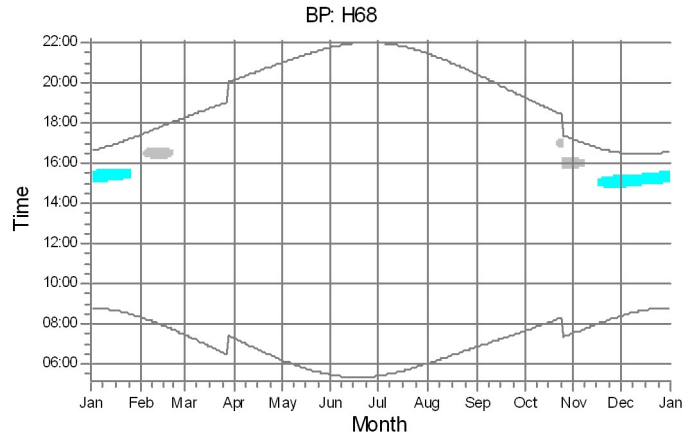
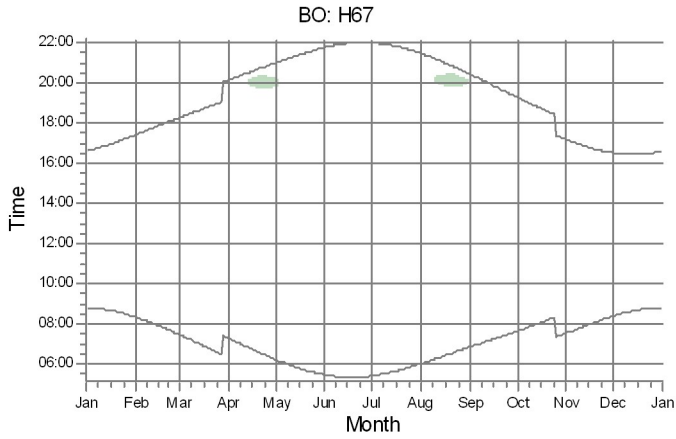


WTGs

	5: T5		9: T9		14: T14		18: Derragh
	7: T7		12: T12		16: Derragh		19: Derragh
	8: T8		13: T13		17: Derragh		

SHADOW - Calendar, graphical

Calculation: Alternative Scenario 2

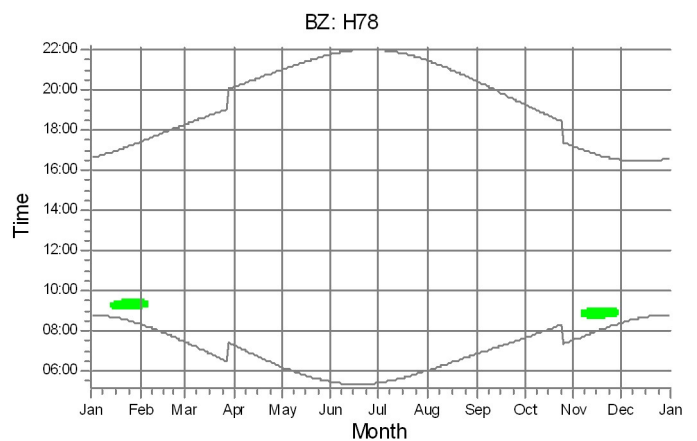
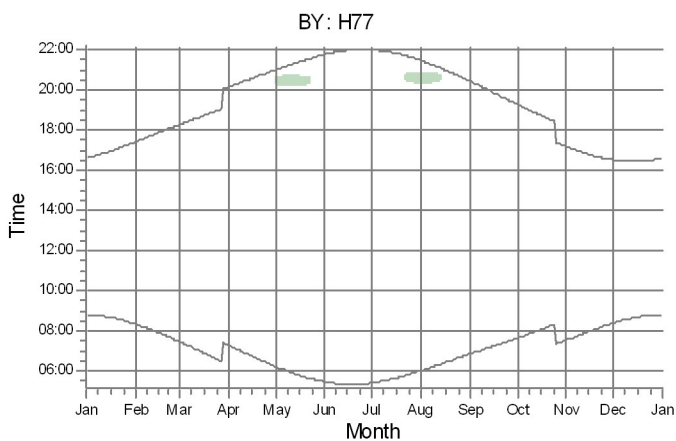
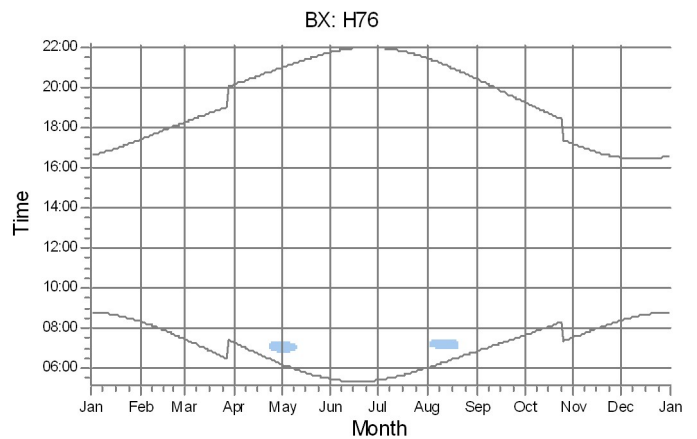
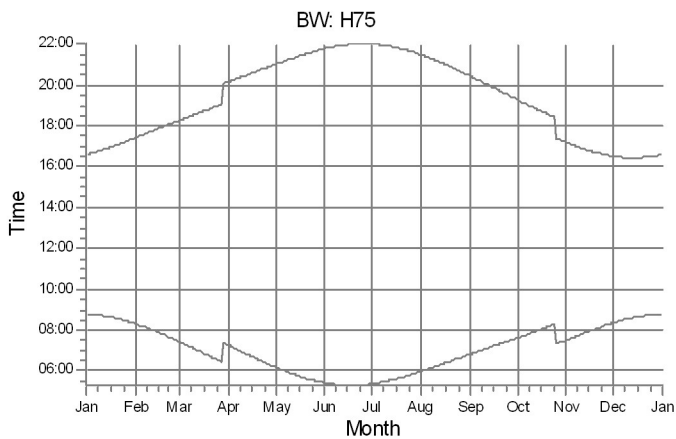
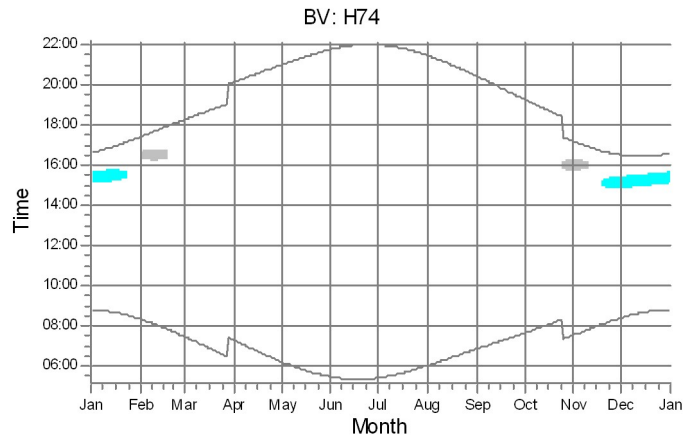
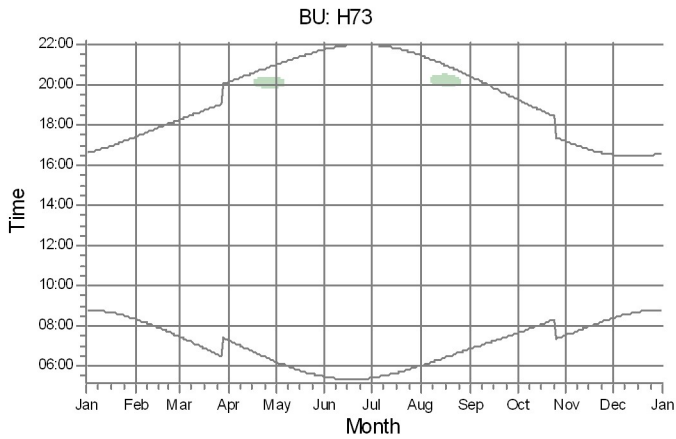


WTGs



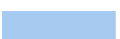




SHADOW - Calendar, graphical

Calculation: Alternative Scenario 2

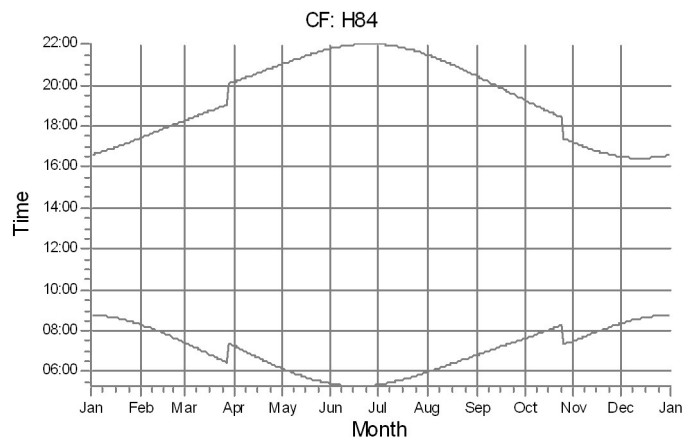
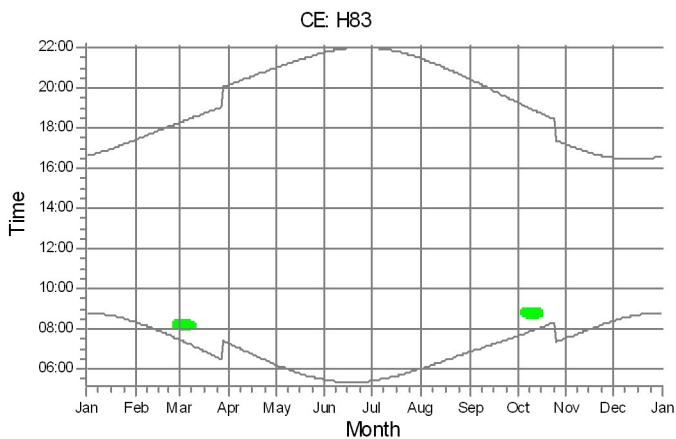
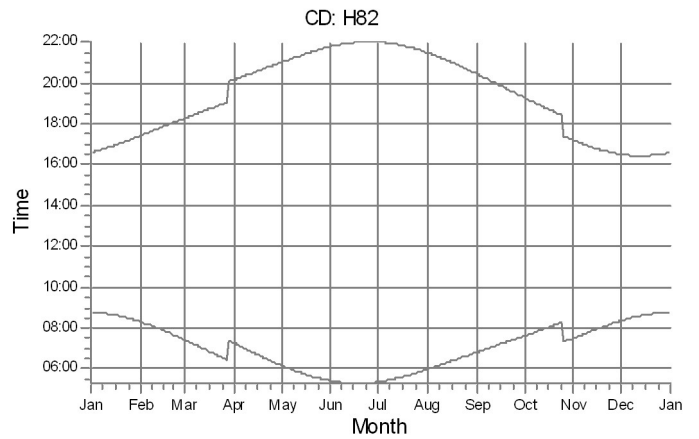
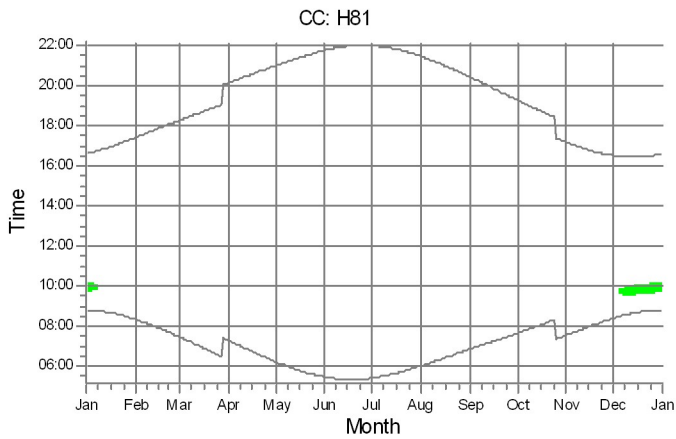
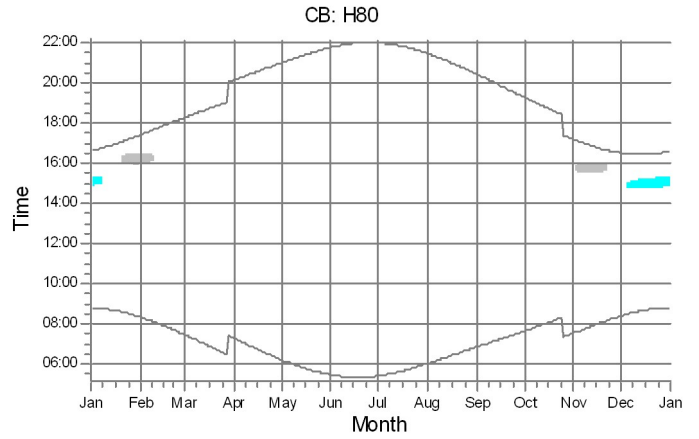
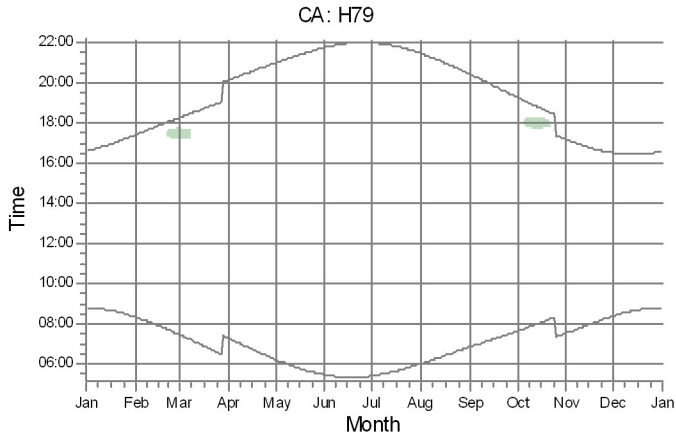


WTGs

	9: T9		13: T13		15: Derragh
	12: T12		14: T14		

SHADOW - Calendar, graphical

Calculation: Alternative Scenario 2

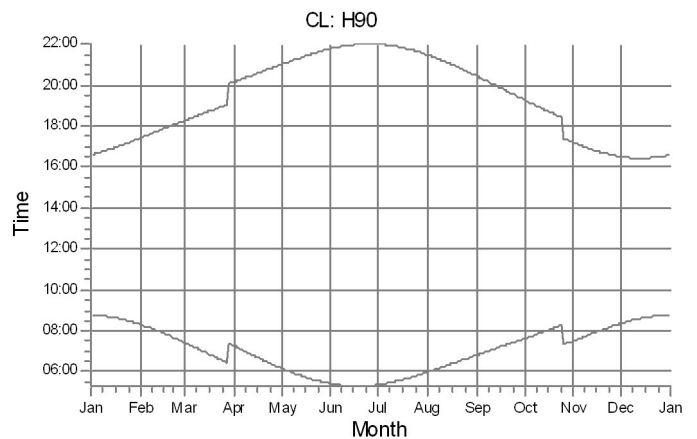
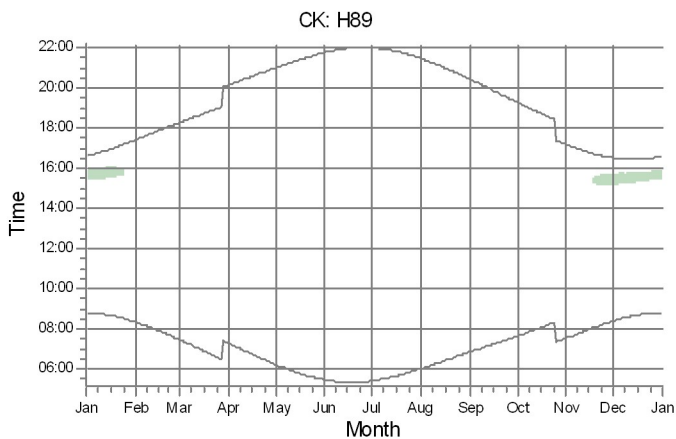
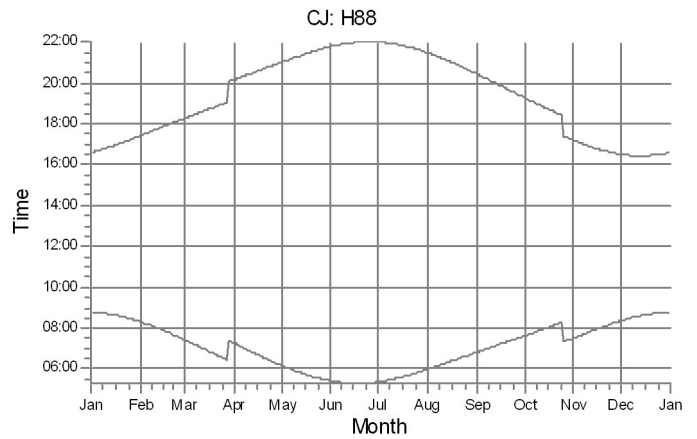
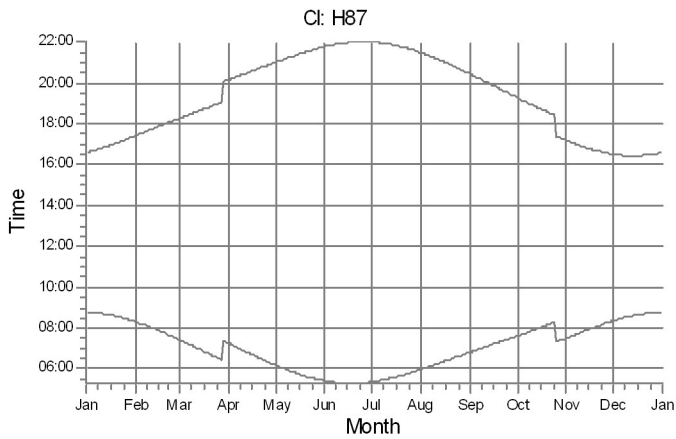
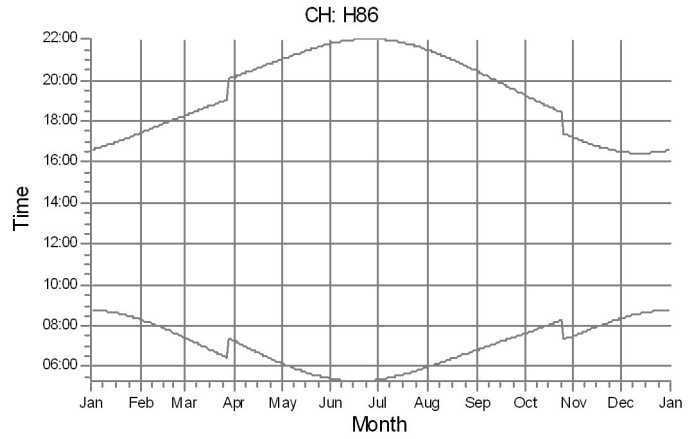
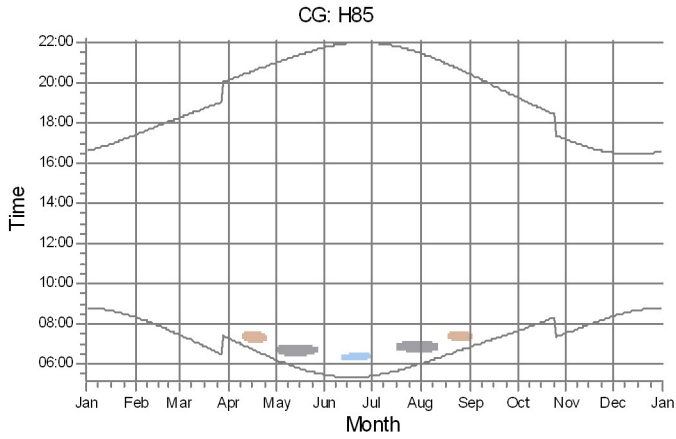


WTGs

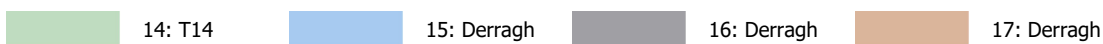


SHADOW - Calendar, graphical

Calculation: Alternative Scenario 2

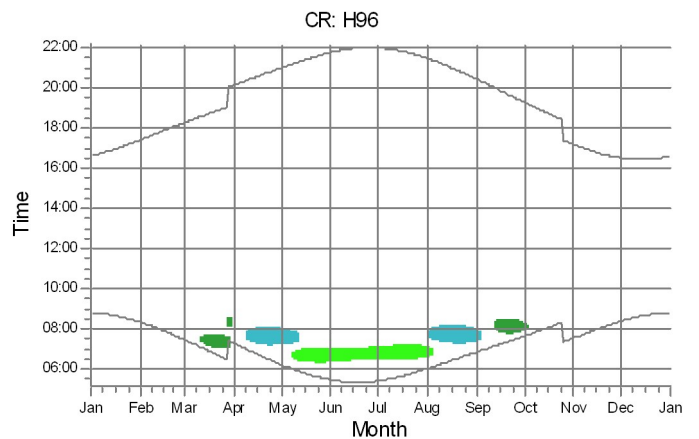
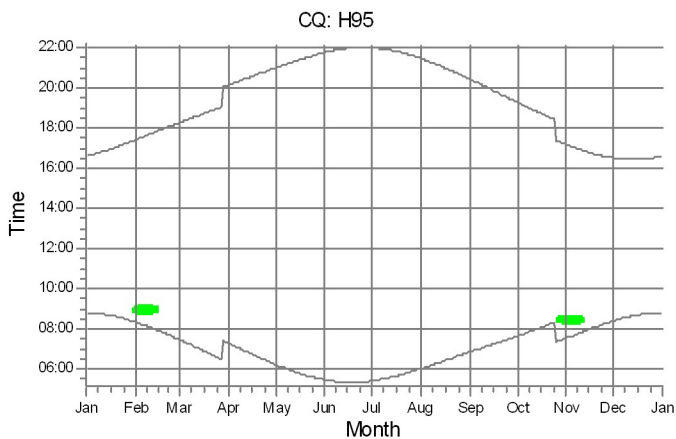
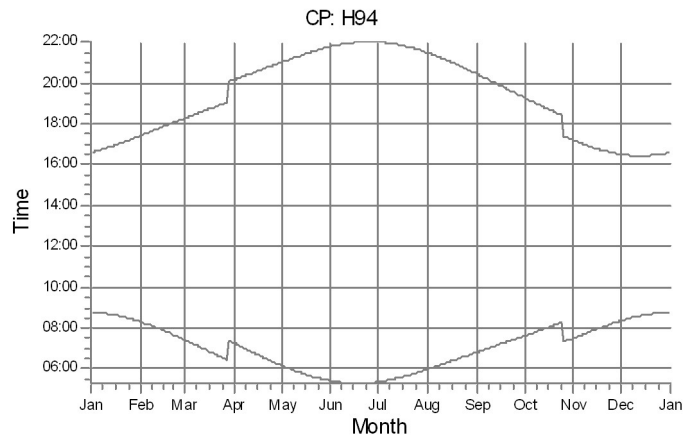
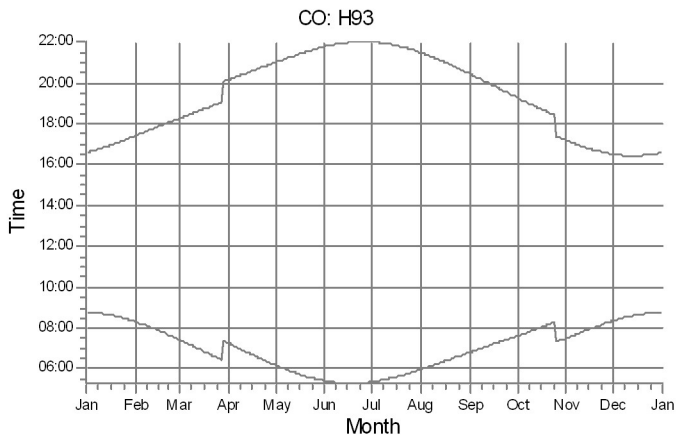
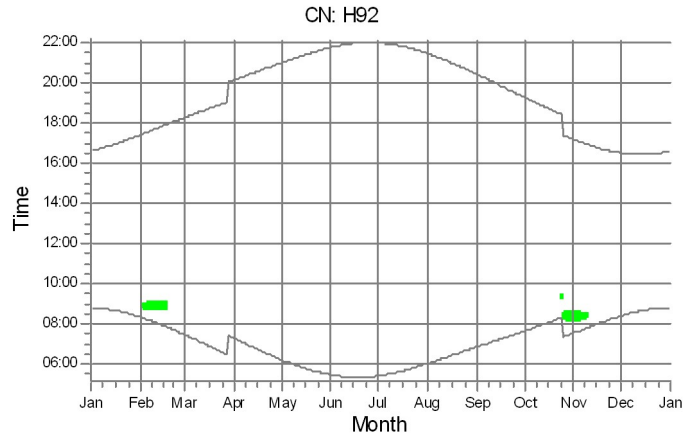
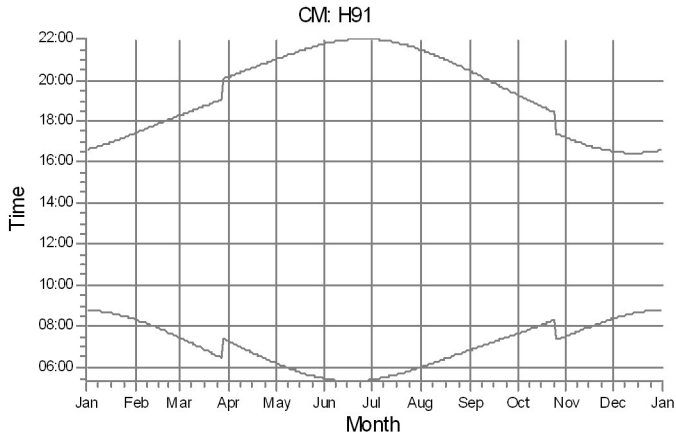


WTGs



SHADOW - Calendar, graphical

Calculation: Alternative Scenario 2

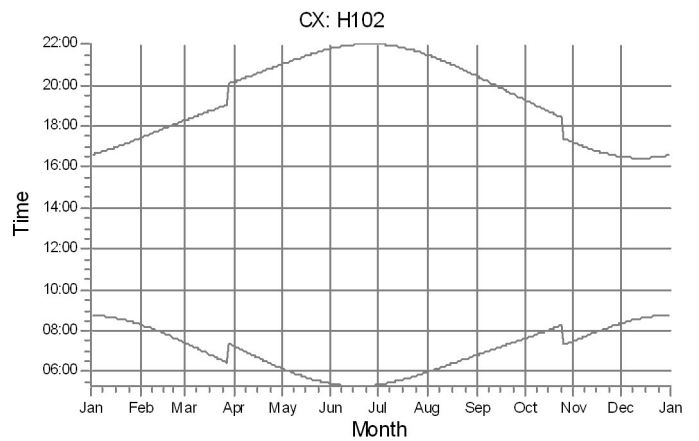
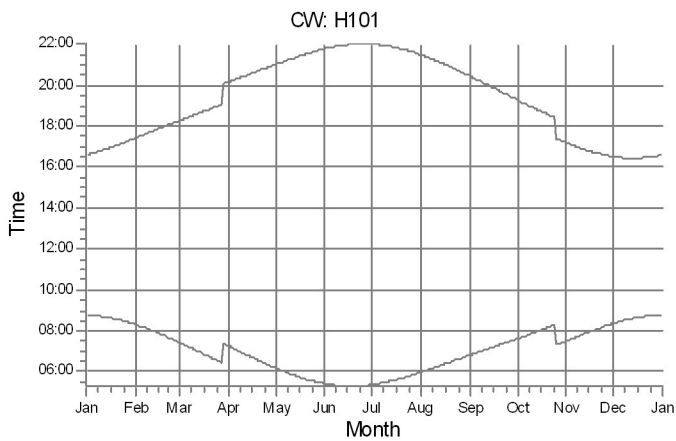
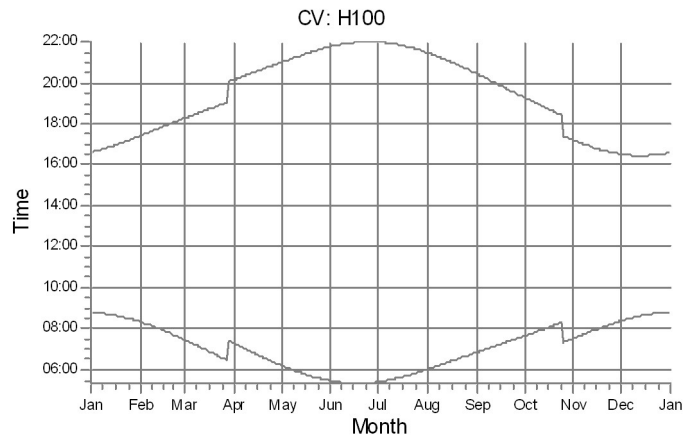
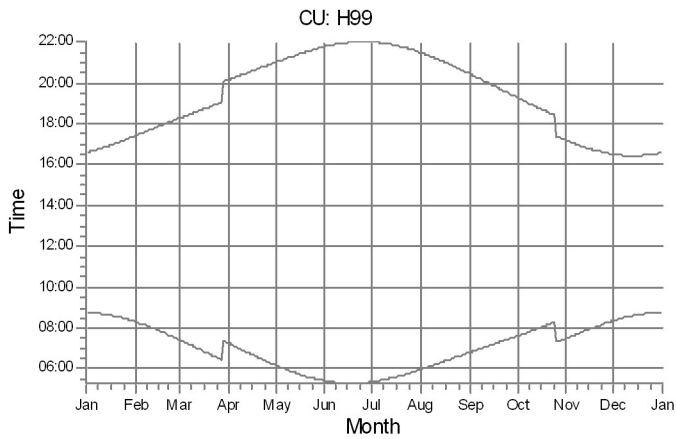
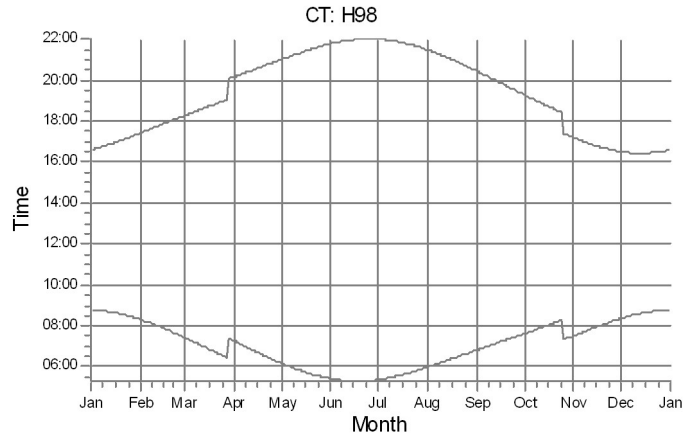
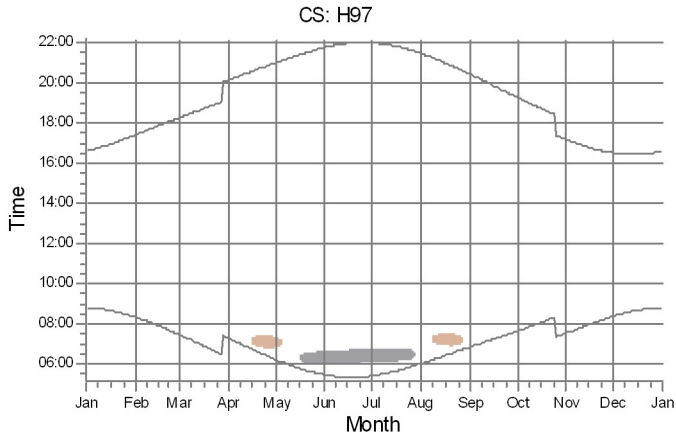


WTGs

- 9: T9
- 18: Derragh
- 19: Derragh
- 20: Derragh

SHADOW - Calendar, graphical

Calculation: Alternative Scenario 2

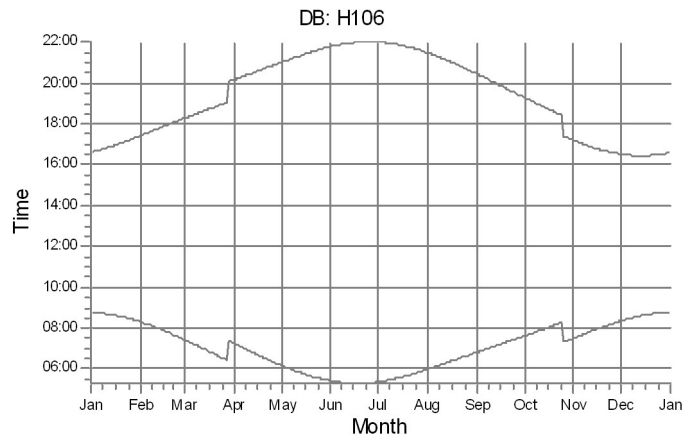
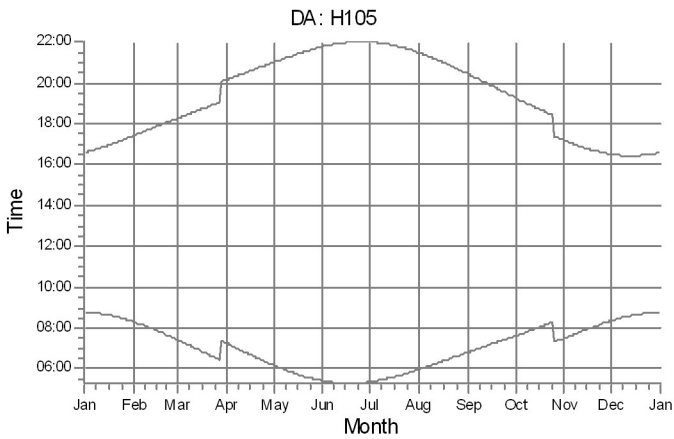
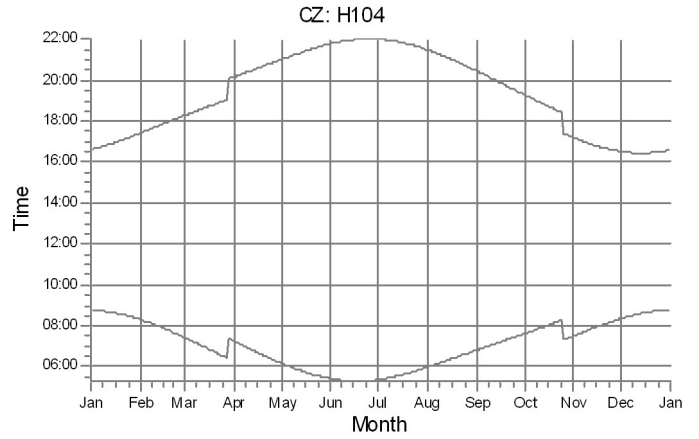
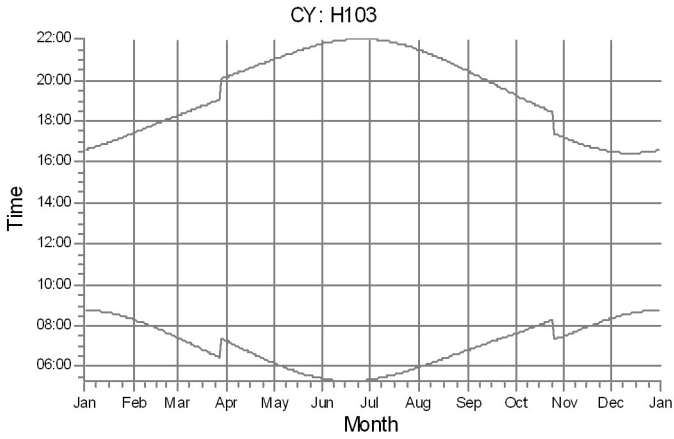


WTGs



SHADOW - Calendar, graphical

Calculation: Alternative Scenario 2



WTGs

Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:58/3.5.584

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 2WTG: 1 - T1
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45 11:23-12:12/49	08:18 17:24	07:25 18:16	07:15 20:10	06:10 21:01	05:25 21:46	05:22 22:00	05:58 21:28	06:48 20:26	07:37 19:17	07:31 17:11	08:21 16:31
2	08:45 11:23-11:43/20	08:17 17:32	07:23 18:23	07:12 20:11	06:08 21:02	05:24 21:47	05:22 22:00	06:00 21:27	06:50 20:24	07:38 19:15	07:32 17:09	08:23 16:30
3	08:45 11:24-11:43/19	08:15 17:26	07:21 18:18	07:10 20:11	06:06 21:02	05:23 21:47	05:23 22:00	06:01 21:27	06:51 20:24	07:40 19:15	07:34 17:09	08:24 16:30
4	08:45 11:26-11:43/17	08:14 17:28	07:19 18:19	07:08 20:13	06:04 21:04	05:22 21:49	05:24 22:00	06:03 21:25	06:53 20:22	07:42 19:12	07:36 17:07	08:25 16:29
5	08:45 11:27-11:42/15	08:12 17:30	07:16 18:21	07:05 20:15	06:02 21:06	05:22 21:50	05:25 21:59	06:04 21:23	06:54 20:20	07:43 19:10	07:38 17:06	08:26 16:29
6	08:44 11:29-11:42/13	08:10 17:32	07:14 18:23	07:03 20:17	06:01 21:07	05:21 21:51	05:26 21:59	06:06 21:22	06:56 20:17	07:45 19:08	07:40 17:04	08:28 16:28
7	08:44 11:29-11:40/10	08:09 17:34	07:12 18:25	07:01 20:18	05:59 21:09	05:20 21:52	05:26 21:58	06:08 21:20	06:58 20:15	07:47 19:05	07:41 17:02	08:29 16:28
8	08:43 11:30-11:40/10	08:09 17:35	07:12 18:27	07:01 20:20	05:59 21:11	05:20 21:52	05:26 21:58	06:08 21:18	06:58 20:13	07:47 19:03	07:41 17:00	08:29 16:28
9	08:43 11:34-11:38/4	08:07 17:35	07:10 18:27	06:59 20:20	05:57 21:11	05:20 21:52	05:27 21:58	06:09 21:16	06:59 20:10	07:49 19:01	07:43 16:59	08:31 16:27
10	08:43 11:34-11:38/4	08:07 17:37	07:10 18:28	06:59 20:22	05:57 21:12	05:20 21:53	05:27 21:57	06:09 21:16	06:59 20:10	07:49 19:01	07:43 16:59	08:31 16:27
11	08:42 11:35-12:01/6	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	05:19 21:54	05:28 21:56	06:11 21:14	07:01 20:08	07:50 18:59	07:45 16:57	08:32 16:27
12	08:42 11:35-12:01/6	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	05:19 21:54	05:28 21:56	06:11 21:14	07:01 20:08	07:50 18:59	07:45 16:57	08:32 16:27
13	08:42 11:35-12:01/6	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	05:19 21:54	05:28 21:56	06:11 21:14	07:01 20:08	07:50 18:59	07:45 16:57	08:32 16:27
14	08:42 11:35-12:01/6	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	05:19 21:54	05:28 21:56	06:11 21:14	07:01 20:08	07:50 18:59	07:45 16:57	08:32 16:27
15	08:42 11:35-12:01/6	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	05:19 21:54	05:28 21:56	06:11 21:14	07:01 20:08	07:50 18:59	07:45 16:57	08:32 16:27
16	08:42 11:35-12:01/6	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	05:19 21:54	05:28 21:56	06:11 21:14	07:01 20:08	07:50 18:59	07:45 16:57	08:32 16:27
17	08:42 11:35-12:01/6	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	05:19 21:54	05:28 21:56	06:11 21:14	07:01 20:08	07:50 18:59	07:45 16:57	08:32 16:27
18	08:42 11:35-12:01/6	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	05:19 21:54	05:28 21:56	06:11 21:14	07:01 20:08	07:50 18:59	07:45 16:57	08:32 16:27
19	08:42 11:35-12:01/6	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	05:19 21:54	05:28 21:56	06:11 21:14	07:01 20:08	07:50 18:59	07:45 16:57	08:32 16:27
20	08:42 11:35-12:01/6	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	05:19 21:54	05:28 21:56	06:11 21:14	07:01 20:08	07:50 18:59	07:45 16:57	08:32 16:27
21	08:42 11:35-12:01/6	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	05:19 21:54	05:28 21:56	06:11 21:14	07:01 20:08	07:50 18:59	07:45 16:57	08:32 16:27
22	08:42 11:35-12:01/6	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	05:19 21:54	05:28 21:56	06:11 21:14	07:01 20:08	07:50 18:59	07:45 16:57	08:32 16:27
23	08:42 11:35-12:01/6	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	05:19 21:54	05:28 21:56	06:11 21:14	07:01 20:08	07:50 18:59	07:45 16:57	08:32 16:27
24	08:42 11:35-12:01/6	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	05:19 21:54	05:28 21:56	06:11 21:14	07:01 20:08	07:50 18:59	07:45 16:57	08:32 16:27
25	08:42 11:35-12:01/6	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	05:19 21:54	05:28 21:56	06:11 21:14	07:01 20:08	07:50 18:59	07:45 16:57	08:32 16:27
26	08:42 11:35-12:01/6	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	05:19 21:54	05:28 21:56	06:11 21:14	07:01 20:08	07:50 18:59	07:45 16:57	08:32 16:27
27	08:42 11:35-12:01/6	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	05:19 21:54	05:28 21:56	06:11 21:14	07:01 20:08	07:50 18:59	07:45 16:57	08:32 16:27
28	08:42 11:35-12:01/6	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	05:19 21:54	05:28 21:56	06:11 21:14	07:01 20:08	07:50 18:59	07:45 16:57	08:32 16:27
29	08:42 11:35-12:01/6	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	05:19 21:54	05:28 21:56	06:11 21:14	07:01 20:08	07:50 18:59	07:45 16:57	08:32 16:27
30	08:42 11:35-12:01/6	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	05:19 21:54	05:28 21:56	06:11 21:14	07:01 20:08	07:50 18:59	07:45 16:57	08:32 16:27
31	08:42 11:35-12:01/6	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	05:19 21:54	05:28 21:56	06:11 21:14	07:01 20:08	07:50 18:59	07:45 16:57	08:32 16:27
Potential sun hours	259	278	367	416	485	499	502	454	381	331	266	244
Sum of minutes with flicker	309	0	0	0	0	160	0	0	0	0	0	1356

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker



Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:58/3.5.584

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 2WTG: 2 - T2
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45 16:36	08:18 09:14-10:06/52 17:24	07:25 07:15 18:16 20:10	06:10 05:25 21:01 21:46	05:22 05:58 22:00 21:28	06:48 07:37 20:26 19:17	07:31 08:44-09:34/50 17:11	08:21 16:31				
2	08:45 16:38	08:17 09:14-10:06/52 17:26	07:23 07:12 18:18 20:11	06:08 05:23 21:02 21:47	05:22 05:58 22:00 21:27	06:49 07:38 20:24 19:15	07:32 08:43-09:35/52 17:09	08:23 16:30				
3	08:45 16:39	08:15 09:13-10:06/53 17:28	07:21 07:10 18:19 20:13	06:06 05:23 21:04 21:49	05:23 05:59 22:00 21:25	06:51 07:40 20:22 19:12	07:34 08:43-09:36/53 17:07	08:24 16:29				
4	08:45 16:40	08:14 09:14-10:07/53 17:30	07:18 07:08 18:21 20:15	06:04 05:22 21:06 21:50	05:24 05:59 21:23 20:20	06:53 07:42 20:20 19:10	07:36 08:43-09:36/53 17:05	08:26 16:29				
5	08:45 16:41	08:12 09:14-10:07/53 17:32	07:16 07:05 18:23 20:17	06:02 05:25 21:07 21:51	05:25 05:59 21:22 20:17	06:54 07:43 19:08 18:00	07:38 08:43-09:36/53 17:04	08:27 16:28				
6	08:44 16:42	08:10 09:13-10:07/54 17:34	07:14 07:03 18:25 20:18	06:00 05:26 21:09 21:51	05:26 05:59 21:20 20:15	06:56 07:45 19:06 18:00	07:39 08:43-09:37/54 17:02	08:28 16:28				
7	08:44 16:43	08:09 09:13-10:06/53 17:35	07:12 07:01 18:27 20:20	05:59 05:27 21:11 21:52	05:26 05:59 21:18 20:13	06:58 07:47 19:03 18:00	07:41 08:44-09:37/53 17:00	08:29 16:28				
8	08:43 16:45	08:07 09:14-10:06/52 17:37	07:10 06:59 18:27 20:22	05:57 05:25 21:12 21:53	05:27 05:59 21:16 20:10	06:59 07:49 19:01 18:00	07:43 08:44-09:37/53 16:59	08:31 16:27				
9	08:43 16:46	08:05 09:14-10:05/51 17:39	07:07 06:56 18:30 20:23	05:55 05:23 21:14 21:54	05:28 05:59 21:14 20:08	06:11 07:01 18:59 18:00	07:45 08:45-09:37/52 16:57	08:32 16:27				
10	08:42 16:48	08:03 09:14-10:05/51 17:41	07:05 06:54 18:32 20:25	05:53 05:21 21:15 21:55	05:29 05:59 21:12 20:06	06:12 07:02 18:57 18:00	07:47 08:45-09:37/52 16:55	08:33 16:27				
11	08:42 16:49	08:01 09:16-10:05/49 17:43	07:03 06:52 18:34 20:27	05:52 05:19 21:17 21:56	05:30 05:59 21:11 20:04	06:14 07:04 18:54 18:00	07:48 08:46-09:37/51 16:54	08:34 16:27				
12	08:41 16:50	08:00 09:16-10:04/48 17:45	07:01 06:50 18:35 20:28	05:50 05:18 21:19 21:56	05:31 05:59 21:09 20:01	06:15 07:06 18:52 18:00	07:50 08:47-09:37/50 16:52	08:35 16:26				
13	08:40 16:52	07:58 09:17-10:02/45 17:47	06:58 06:47 18:37 20:30	05:48 05:16 21:20 21:57	05:33 05:59 21:07 19:59	06:17 07:07 18:50 18:00	07:52 08:48-09:36/48 16:51	08:36 16:26				
14	08:40 16:53	07:56 09:18-10:01/43 17:48	06:56 06:45 18:39 20:32	05:47 05:15 21:22 21:58	05:34 05:59 21:05 19:57	06:19 07:09 18:48 18:00	07:54 08:49-09:35/46 16:49	08:37 16:26				
15	08:39 16:55	07:54 09:19-09:59/40 17:50	06:54 06:43 18:41 20:34	05:45 05:13 21:23 21:58	05:35 05:59 21:03 19:54	06:20 07:11 18:45 18:00	07:55 08:49-09:35/46 16:48	08:38 16:26				
16	08:38 16:57	07:52 09:21-09:56/35 17:52	06:51 06:41 18:42 20:35	05:44 05:12 21:25 21:59	05:36 05:59 21:01 19:52	06:22 07:12 18:42 18:00	07:57 08:51-09:34/43 16:46	08:39 16:27				
17	08:37 16:58	07:50 09:23-09:50/27 17:54	06:49 06:39 18:44 20:37	05:42 05:10 21:26 21:59	05:37 05:59 20:59 19:50	06:24 07:14 18:41 18:00	07:59 08:53-09:34/41 16:45	08:40 16:27				
18	08:36 17:00	07:48 09:28-09:31/3 17:56 09:41-09:45/4	06:47 06:36 18:46 20:39	05:41 05:09 21:28 22:00	05:38 05:59 21:48 20:57	06:25 07:15 18:39 18:00	08:01 08:55-09:33/38 16:44	08:40 16:27				
19	08:35 17:01	09:40-09:51/11 17:58	06:45 06:34 18:47 20:40	05:39 05:07 21:29 22:00	05:40 05:59 21:47 20:55	06:27 07:17 18:37 18:00	08:02 08:59-09:05/6 16:42	08:41 16:27				
20	08:34 17:03	09:37-09:53/16 17:59	06:42 06:32 18:49 20:42	05:38 05:06 21:31 22:00	05:41 05:59 21:46 20:52	06:28 07:19 18:35 18:00	08:04 09:08-09:32/24 16:41	08:42 16:28				
21	08:33 17:05	09:35-09:55/20 18:01	06:40 06:30 18:51 20:44	05:37 05:05 21:32 22:01	05:42 05:59 21:44 20:50	06:30 07:20 18:33 18:00	08:06 09:11-09:31/20 16:40	08:42 16:28				
22	08:32 17:06	09:33-09:57/24 18:03	06:38 06:28 18:53 20:45	05:35 05:03 21:34 22:01	05:43 05:59 21:43 20:48	06:32 07:22 18:31 18:00	08:07 09:13-09:29/16 16:39	08:43 16:28				
23	08:31 17:08	09:24-09:30/6 09:31-09:58/27	06:35 06:26 18:54 20:47	05:34 05:02 21:35 22:01	05:44 05:59 21:42 20:46	06:33 07:24 18:29 18:00	08:09 09:16-09:27/11 16:38	08:43 16:29				
24	08:30 17:10	09:21-09:59/38 18:07	06:33 06:24 18:56 20:49	05:33 05:01 21:36 22:01	05:45 05:59 21:40 20:44	06:35 07:25 18:27 10:09-10:17/8	08:11 08:44-09:31/46 16:37	08:44 16:30				
25	08:28 17:12	09:20-10:01/41 18:09	06:31 06:22 18:58 20:51	05:32 05:00 21:38 22:01	05:46 05:59 21:39 20:42	06:36 07:27 17:24 17:24	08:12 08:44-09:33/48 16:36	08:44 16:30				
26	08:27 17:13	09:18-10:01/43 18:10	06:28 06:20 19:00 20:52	05:31 05:00 21:39 22:01	05:47 05:59 21:36 20:40	06:38 07:29 17:22 17:22	08:14 08:44-09:33/49 16:35	08:44 16:31				
27	08:26 17:15	09:17-10:03/46 18:12	06:26 06:18 19:01 20:54	05:29 05:00 21:40 22:01	05:48 05:59 21:36 20:37	06:40 07:30 17:21 17:21	08:15 08:49-09:29/40 16:34	08:45 16:32				
28	08:24 17:17	09:16-10:03/47 18:14	06:24 06:16 19:03 20:56	05:28 05:00 21:42 22:01	05:49 05:59 21:35 20:35	06:41 07:32 17:19 17:19	08:17 08:47-09:31/44 16:33	08:45 16:32				
29	08:23 17:19	09:16-10:04/48 18:19	06:21 06:14 20:05 20:57	05:27 05:00 21:43 22:01	05:50 05:59 21:33 20:33	06:43 07:33 17:17 17:17	08:18 08:45-09:31/46 16:32	08:45 16:33				
30	08:21 17:21	09:15-10:05/50 18:21	06:19 06:12 20:06 20:59	05:26 05:00 21:44 22:00	05:51 05:59 21:32 20:31	06:45 07:35 17:15 17:15	08:20 08:45-09:33/48 16:31	08:45 16:34				
31	08:20 17:22	09:14-10:05/51 18:22	06:17 06:10 20:08 21:01	05:26 05:00 21:45 22:01	05:52 05:59 21:30 20:29	06:46 07:36 17:13 17:13	08:45 08:44-09:33/49 16:35	08:45 16:35				
Potential sun hours	259	278	367	416	485	499	502	454	381	331	266	244
Sum of minutes with flicker	468	818	0	0	0	0	0	0	0	311	992	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:58/3.5.584

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 2WTG: 3 - T3

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June	July	August	September	October	November	December			
1	08:45	08:18	08:59-09:34/35	07:25	07:14	06:10	05:25	05:22	05:58	06:48	07:37	08:21			
	16:36	17:24		18:16	20:10	21:01	21:46	22:00	21:28	20:26	19:17	16:31			
2	08:45	08:17	08:59-09:33/34	07:23	07:12	06:08	05:24	05:22	06:00	06:49	07:38	08:23			
	16:38	17:26		18:18	20:11	21:02	21:47	22:00	21:27	20:24	19:15	16:30			
3	08:45	08:15	08:59-09:32/33	07:21	07:10	06:06	05:23	05:23	06:01	06:51	07:40	08:24			
	16:39	17:28		18:19	20:13	21:04	21:48	21:59	21:25	20:22	19:12	16:29			
4	08:45	08:14	09:01-09:32/31	07:18	07:08	06:04	05:22	05:24	06:03	06:53	07:42	08:26			
	16:40	17:30		18:21	20:15	21:06	21:50	21:59	21:23	20:20	19:10	16:29			
5	08:45	08:12	09:02-09:30/28	07:16	07:05	06:02	05:22	05:25	06:04	06:54	07:43	08:27			
	16:41	17:32		18:23	20:17	21:07	21:51	21:59	21:22	20:17	19:08	16:28			
6	08:44	08:10	09:03-09:28/25	07:14	07:03	06:00	05:21	05:26	06:06	06:56	07:45	08:28			
	16:42	17:33		18:25	20:18	21:09	21:51	21:58	21:20	20:15	19:06	16:28			
7	08:44	08:09	09:04-09:24/20	07:12	07:01	05:59	05:20	05:26	06:07	06:58	07:47	08:29			
	16:43	17:35		18:27	20:20	21:10	21:52	21:57	21:18	20:13	19:03	16:29			
8	08:43	08:07	09:07-09:14/7	07:10	06:59	05:57	05:20	05:27	06:09	06:59	07:48	08:31			
	16:45	17:37		18:28	20:22	21:12	21:53	21:57	21:16	20:10	19:01	16:27			
9	08:43	08:05		07:07	06:56	05:55	05:19	05:28	06:11	07:01	07:50	08:32			
	16:46	17:39		18:30	20:23	21:14	21:54	21:56	21:14	20:08	18:59	16:27			
10	08:42	08:03		07:05	06:54	05:53	05:19	05:29	06:12	07:02	07:52	08:33			
	16:48	17:41		18:32	20:25	21:15	21:55	21:55	21:12	20:06	18:56	16:27			
11	08:42	08:01		07:03	06:52	05:52	05:19	05:30	06:14	07:04	07:54	08:34			
	16:49	17:43		18:34	20:27	21:17	21:56	21:55	21:11	20:04	18:54	16:26			
12	08:41	08:00		07:01	06:50	05:50	05:18	05:31	06:15	07:06	07:55	08:35			
	16:50	17:45		18:35	20:28	21:19	21:56	21:54	21:09	20:01	18:52	16:26			
13	08:40	07:58		06:58	06:47	05:48	05:18	05:32	06:17	07:07	07:57	08:36			
	16:52	17:47		18:37	20:30	21:20	21:57	21:53	21:07	19:59	18:50	16:26			
14	08:40	09:13-09:21/8	07:56	06:56	06:45	05:47	05:18	05:34	06:19	07:09	07:59	08:37			
	16:53	17:48		18:39	20:32	21:22	21:58	21:52	21:05	19:57	18:48	16:26			
15	08:39	09:12-09:23/11	07:54	06:54	06:43	05:45	05:18	05:35	06:20	07:11	08:00	08:38			
	16:55	17:50		18:41	20:34	21:23	21:58	21:51	21:03	19:54	18:45	16:26			
16	08:38	09:10-09:25/15	07:52	06:51	06:41	05:44	05:17	05:36	06:22	07:12	08:02	08:39			
	16:57	17:52		18:42	20:35	21:25	21:59	21:50	21:01	19:52	18:43	16:27			
17	08:37	09:09-09:26/17	07:50	06:49	06:39	05:42	05:17	05:37	06:23	07:14	08:04	08:40			
	16:58	17:54		18:44	20:37	21:26	21:59	21:49	20:59	19:50	18:41	16:27			
18	08:36	09:06-09:07/1	07:48	06:47	06:36	05:41	05:17	05:38	06:25	07:15	08:06	08:40			
	17:00	09:08-09:28/20	17:56	18:46	20:39	21:28	22:00	21:48	20:57	19:47	18:39	16:27			
19	08:35	09:04-09:29/25	07:46	06:44	06:34	05:39	05:17	05:40	06:27	07:17	08:07	08:41			
	17:01	17:58		18:47	20:40	21:29	22:00	21:47	20:55	19:45	18:37	16:27			
20	08:34	09:02-09:29/27	07:44	06:42	06:32	05:38	05:17	05:41	06:28	07:19	08:09	08:42			
	17:03	17:59		18:49	20:42	21:31	22:00	21:46	20:52	19:43	18:35	16:41			
21	08:33	09:01-09:30/29	07:42	06:40	06:30	05:37	05:18	05:42	06:30	07:20	08:11	08:42			
	17:05	18:01		18:51	20:44	21:32	22:00	21:44	20:50	19:40	18:33	16:40			
22	08:32	09:00-09:31/31	07:40	06:38	06:28	05:35	05:18	05:44	06:32	07:22	08:13	08:43			
	17:06	18:03		18:53	20:45	21:34	22:01	21:43	20:48	19:38	18:31	16:39			
23	08:31	08:58-09:31/33	07:38	06:35	06:26	05:34	05:18	05:45	06:33	07:24	08:14	08:43			
	17:08	18:05		18:54	20:47	21:35	22:01	21:42	20:46	19:36	18:29	16:29			
24	08:30	08:58-09:32/34	07:36	06:33	06:24	05:33	05:18	05:46	06:35	07:25	08:16	08:44			
	17:10	18:07		18:56	20:49	21:36	22:01	21:40	20:44	19:33	18:26	16:30			
25	08:28	08:58-09:33/35	07:34	06:31	06:22	05:32	05:19	05:48	06:36	07:27	07:18	08:44			
	17:12	18:09		18:58	20:50	21:38	22:01	21:39	20:42	19:31	17:24	16:30			
26	08:27	08:57-09:33/36	07:31	06:28	06:20	05:31	05:19	05:49	06:38	07:28	07:20	08:44			
	17:13	18:10		18:59	20:52	21:39	22:01	21:38	20:40	19:29	17:22	16:31			
27	08:26	08:58-09:34/36	07:29	06:26	06:18	05:29	05:19	05:51	06:40	07:30	07:22	08:45			
	17:15	18:12		19:01	20:54	21:40	22:01	21:36	20:37	19:26	17:20	16:32			
28	08:24	08:57-09:34/37	07:27	06:24	06:16	05:28	05:20	05:52	06:41	07:32	07:23	08:45			
	17:17	18:14		19:03	20:56	21:42	22:01	21:35	20:35	19:24	17:19	16:32			
29	08:23	08:58-09:34/36		07:21	06:14	05:27	05:20	05:54	06:43	07:33	07:25	08:45			
	17:19			20:05	20:57	21:43	22:01	21:33	20:33	19:22	17:17	16:33			
30	08:21	08:58-09:34/36		07:19	06:12	05:26	05:21	05:55	06:45	07:35	07:27	08:45			
	17:21			20:06	20:59	21:44	22:00	21:32	20:31	19:19	17:15	16:34			
31	08:20	08:58-09:33/35		07:17		05:26		05:57	06:46		07:29	08:45			
	17:22			20:08		21:45		21:30	20:29		17:13	16:35			
	Potential sun hours	259													
	Sum of minutes with flicker	502	213	367	416	485	499	502	454	381	331	266	722	244	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 2WTG: 4 - T4
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of sunshine probability values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of operational time values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-June) and rows for days (1-31). Each cell contains sun rise/set times and potential sun hours.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), First time (hh:mm) with flicker, Last time (hh:mm) with flicker, Minutes with flicker



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:58/3.5.584

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 2WTG: 4 - T4

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22 20:26-20:48/22	05:58 21:28	06:48 19:02-19:35/33	07:37 19:17	07:30 17:11	08:21 16:31
2	05:22 20:27-20:49/22	06:00 21:27	06:49 19:00-19:33/33	07:38 19:15	07:32 17:09	08:23 16:30
3	05:23 20:27-20:49/22	06:01 21:25	06:51 19:00-19:33/33	07:40 19:12	07:34 17:07	08:24 16:29
4	05:24 20:27-20:49/22	06:03 21:23	06:53 18:58-19:31/33	07:42 19:10	07:36 17:05	08:26 16:29
5	05:25 20:27-20:49/22	06:04 21:22	06:54 18:58-19:30/32	07:43 19:08	07:38 17:04	08:27 16:28
6	05:25 20:27-20:50/23	06:06 21:20	06:56 18:58-19:28/30	07:45 19:08	07:39 17:04	08:28 16:28
7	05:26 20:28-20:50/22	06:07 21:18	06:58 18:58-19:26/28	07:47 19:03	07:41 17:00	08:29 16:27
8	05:27 20:28-20:50/22	06:09 21:16	06:59 18:54-19:24/30	07:48 19:01	07:43 16:59	08:31 16:27
9	05:28 20:28-20:50/22	06:11 21:14	07:01 18:50-19:22/32	07:50 18:59	07:45 16:57	08:32 16:27
10	05:29 20:28-20:51/23	06:12 21:12	07:02 18:48-19:22/34	07:52 18:56	07:47 16:55	08:33 16:27
11	05:30 20:28-20:51/23	06:14 21:10	07:04 18:46-19:20/34	07:54 18:54	07:48 16:54	08:34 16:26
12	05:31 20:29-20:51/22	06:15 21:09	07:06 18:45-19:18/33	07:55 18:52	07:50 16:52	08:35 16:26
13	05:32 20:29-20:51/22	06:17 21:07	07:07 18:43-19:15/32	07:57 18:50	07:52 16:51	08:36 16:26
14	05:34 20:29-20:51/22	06:19 21:05	07:09 18:43-19:12/29	07:59 18:48	07:54 16:49	08:37 16:26
15	05:35 20:29-20:51/22	06:20 21:03	07:11 18:42-19:11/29	08:00 18:45	07:55 16:48	08:38 16:26
16	05:36 20:29-20:50/21	06:22 21:01	07:12 18:41-19:09/28	08:02 18:43	07:57 16:46	08:39 16:26
17	05:37 20:29-20:50/21	06:23 20:59	07:14 18:40-19:07/27	08:04 18:41	07:59 16:45	08:40 16:27
18	05:38 20:29-20:50/21	06:25 20:57	07:15 18:36-19:04/28	08:06 18:39	08:01 16:44	08:40 16:27
19	05:40 20:29-20:49/20	06:27 20:55	07:17 18:34-19:04/30	08:07 18:37	08:02 16:42	08:41 16:27
20	05:41 20:30-20:50/20	06:28 20:52	07:19 18:33-19:03/30	08:09 18:35	08:04 16:41	08:42 16:28
21	05:42 20:31-20:49/18	06:30 20:50	07:20 18:31-19:00/29	08:11 18:33	08:06 16:40	08:42 16:28
22	05:44 20:31-20:48/17	06:32 20:48	07:22 18:31-18:59/28	08:13 18:31	08:07 16:39	08:43 16:28
23	05:45 20:31-20:48/17	06:33 20:46	07:24 18:30-18:55/25	08:14 18:28	08:09 16:38	08:43 16:29
24	05:46 20:33-20:47/14	06:35 20:44	07:25 18:30-18:51/21	08:16 18:26	08:11 16:37	08:44 16:30
25	05:48 20:34-20:46/12	06:36 20:42	07:27 18:30-18:51/21	08:18 18:24	08:12 16:36	08:44 16:30
26	05:49 20:35-20:44/9	06:38 20:40	07:28 18:29-18:49/20	08:20 18:22	08:14 16:35	08:44 16:31
27	05:51 20:40-20:41/1	06:40 20:37	07:30 18:30-18:48/18	08:22 18:20	08:15 16:34	08:45 16:32
28	05:52 21:35	06:41 20:35	07:32 18:31-18:47/16	08:23 18:18	08:17 16:33	08:45 16:32
29	05:54 21:33	06:43 20:33	07:33 18:32-18:44/12	08:25 18:17	08:18 16:32	08:45 16:33
30	05:55 21:32	06:45 20:31	07:35 18:35-18:41/6	08:27 18:15	08:20 16:31	08:45 16:34
31	05:57 21:30	06:46 20:29	19:03-19:35/32	08:29 18:13	08:21 16:30	08:45 16:35
Potential sun hours	502	454	381	331	266	244
Sum of minutes with flicker	524	238	814	0	0	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 2WTG: 5 - T5
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-June) and rows for days (1-31). Includes columns for sun rise, sun set, and potential sun hours.

Table layout: For each day in each month the following matrix apply

Matrix defining Day in month, Sun rise (hh:mm), Sun set (hh:mm), and First time (hh:mm) with flicker.



SHADOW - Calendar per WTG

Calculation: Alternative Scenario 2WTG: 5 - T5
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22 20:14-20:56/42	05:58	06:48 18:25-19:16/51	07:37 17:55-18:24/29	07:30	08:21
	22:00	21:28	20:26	19:17	17:11	16:31
2	05:22 20:15-20:56/41	06:00	06:49 18:24-19:14/50	07:38 17:54-18:22/28	07:32	08:23
	22:00	21:27	20:24	19:15	17:09	16:30
3	05:23 20:15-20:56/41	06:01	06:51 18:24-19:13/49	07:40 17:55-18:22/27	07:34	08:24
	21:59	21:25	20:22	19:12	17:07	16:29
4	05:24 20:14-20:55/41	06:03 19:06-19:13/7	06:53 18:24-19:10/46	07:42 17:56-18:21/25	07:36	08:25
	21:59	21:23	20:20	19:10	17:05	16:29
5	05:25 20:15-20:55/40	06:04 19:03-19:17/14	06:54 18:24-19:08/44	07:43 17:56-18:18/22	07:38	08:27
	21:59	21:21	20:17	19:08	17:04	16:28
6	05:25 20:15-20:55/40	06:06 19:00-19:19/19	06:56 18:21-19:06/45	07:45 17:58-18:17/19	07:39	08:28
	21:58	21:20	20:15	19:05	17:02	16:28
7	05:26 20:15-20:55/40	06:07 18:58-19:21/23	06:58 18:18-19:05/47	07:47 18:00-18:14/14	07:41	08:29
	21:57	21:18	20:13	19:03	17:00	16:27
8	05:27 20:15-20:55/40	06:09 18:56-19:22/26	06:59 18:16-19:04/48	07:48 18:04-18:10/6	07:43	08:31
	21:57	21:16	20:10	19:01	16:59	16:27
9	05:28 20:16-20:54/38	06:11 18:54-19:23/29	07:01 18:13-19:02/49	07:50	07:45	08:32
	21:56	21:14	20:08	18:59	16:57	16:27
10	05:29 20:16-20:53/37	06:12 18:53-19:24/31	07:02 18:12-19:01/49	07:52	07:47	08:33
	21:55	21:12	20:06	18:56	16:55	16:27
11	05:30 20:16-20:52/36	06:14 18:51-19:25/34	07:04 18:10-18:59/49	07:54	07:48	08:34
	21:55	21:10	20:03	18:54	16:54	16:26
12	05:31 20:16-20:46/30	06:15 18:51-19:26/35	07:06 18:09-18:57/48	07:55	07:50	08:35
	21:54 20:47-20:49/2	21:09	20:01	18:52	16:52	16:26
13	05:32 20:16-20:46/30	06:17 18:50-19:27/37	07:07 18:07-18:56/49	07:57	07:52	08:36
	21:53	21:07	19:59	18:50	16:51	16:26
14	05:34 20:16-20:46/30	06:19 18:48-19:27/39	07:09 18:06-18:56/50	07:59	07:54	08:37
	21:52	21:05	19:56	18:48	16:49	16:26
15	05:35 20:16-20:45/29	06:20 18:48-19:27/39	07:10 18:06-18:55/49	08:00	07:55	08:38
	21:51	21:03	19:54	18:45	16:48	16:26
16	05:36 20:16-20:45/29	06:22 18:46-19:27/41	07:12 18:05-18:54/49	08:02	07:57	08:39
	21:50	21:01	19:52	18:43	16:46	16:26
17	05:37 20:17-20:44/27	06:23 18:43-19:28/45	07:14 18:05-18:53/48	08:04	07:59	08:40
	21:49	20:59	19:49	18:41	16:45	16:27
18	05:38 20:17-20:43/26	06:25 18:40-19:27/47	07:15 18:04-18:51/47	08:06	08:01	08:40
	21:48	20:57	19:47	18:39	16:44	16:27
19	05:40 20:17-20:42/25	06:27 18:38-19:28/50	07:17 18:04-18:49/45	08:07	08:02	08:41
	21:47	20:54	19:45	18:37	16:42	16:27
20	05:41 20:18-20:41/23	06:28 18:36-19:27/51	07:19 18:04-18:47/43	08:09	08:04	08:42
	21:45	20:52	19:42	18:35	16:41	16:28
21	05:42 20:18-20:41/23	06:30 18:35-19:27/52	07:20 18:03-18:41/38	08:11	08:06	08:42
	21:44	20:50	19:40	18:33	16:40	16:28
22	05:44 20:19-20:40/21	06:32 18:33-19:26/53	07:22 18:01-18:39/38	08:13	08:07	08:43
	21:43	20:48	19:38	18:31	16:39	16:28
23	05:45 20:19-20:39/20	06:33 18:32-19:26/54	07:24 17:59-18:37/38	08:14	08:09	08:43
	21:42	20:46	19:35	18:28	16:38	16:29
24	05:46 20:21-20:39/18	06:35 18:30-19:25/55	07:25 17:58-18:36/38	08:16	08:11	08:44
	21:40	20:44	19:33	18:26	16:37	16:30
25	05:48 20:21-20:37/16	06:36 18:29-19:25/56	07:27 17:57-18:35/38	07:18	08:12	08:44
	21:39	20:42	19:31	17:24	16:36	16:30
26	05:49 20:22-20:36/14	06:38 18:28-19:24/56	07:28 17:56-18:33/37	07:20	08:14	08:44
	21:38	20:40	19:28	17:22	16:35	16:31
27	05:51 20:25-20:35/10	06:40 18:28-19:23/55	07:30 17:55-18:31/36	07:21	08:15	08:45
	21:36	20:37	19:26	17:20	16:34	16:32
28	05:52	06:41 18:27-19:23/56	07:32 17:55-18:28/33	07:23	08:17	08:45
	21:35	20:35	19:24	17:18	16:33	16:32
29	05:54	06:43 18:26-19:21/55	07:33 17:54-18:25/31	07:25	08:18	08:45
	21:33	20:33	19:22	17:17	16:32	16:33
30	05:55	06:45 18:26-19:20/54	07:35 17:54-18:24/30	07:27	08:20	08:45
	21:32	20:31	19:19	17:15	16:31	16:34
31	05:57	06:46 18:25-19:18/53		07:29		08:45
	21:30	20:29		17:13		16:35
Potential sun hours	502	454	381	331	266	244
Sum of minutes with flicker	809	1166	1312	170	0	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 2WTG: 6 - T6
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June	
1	08:45 16:36	08:18 17:24	07:25 18:16	07:14 20:10	06:10 21:01	19:56-20:15/19 19:50-19:51/1	05:25 21:46
2	08:45 16:37	08:17 17:26	07:23 18:18	07:12 20:11	06:08 21:02	19:55-20:15/20	05:24 21:47
3	08:45 16:39	08:15 17:28	07:21 18:19	07:10 20:13	06:06 21:04	19:54-20:15/21	05:23 21:48
4	08:45 16:40	08:14 17:30	07:18 18:21	07:08 20:15	06:04 21:06	19:55-20:16/21	05:22 21:49
5	08:45 16:41	08:12 17:32	07:16 18:23	07:05 20:17	06:02 21:07	19:55-20:15/20	05:22 21:50
6	08:44 16:42	08:10 17:33	07:14 18:25	07:03 20:18	06:00 21:09	19:55-20:15/20	05:21 21:51
7	08:44 16:43	08:09 17:35	07:12 18:26	07:01 20:20	05:59 21:10	19:55-20:15/20	05:20 21:52
8	08:43 16:45	08:07 17:37	07:10 18:28	06:58 20:22	05:57 21:12	19:56-20:14/18	05:20 21:53
9	08:43 16:46	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	19:56-20:13/17	05:19 21:54
10	08:42 16:47	08:03 17:41	07:05 18:32	06:54 20:25	05:53 21:15	19:57-20:13/16	05:19 21:55
11	08:42 16:49	08:01 17:43	07:03 18:34	06:52 20:27	05:52 21:17	19:58-20:11/13	05:18 21:56
12	08:41 16:50	08:00 17:45	07:01 18:35	06:50 20:28	05:50 21:19	20:00-20:10/10	05:18 21:56
13	08:40 16:52	07:58 17:46	06:58 18:37	06:47 20:30	05:48 21:20	20:02-20:07/5	05:18 21:57
14	08:40 16:53	07:56 17:48	06:56 18:39	06:45 20:32	05:47 21:22		05:18 21:58
15	08:39 16:55	07:54 17:50	06:54 18:41	06:43 20:34	19:51-19:56/5		05:17 21:58
16	08:38 16:56	07:52 17:52	06:51 18:42	06:41 20:35	19:48-19:59/11		05:17 21:59
17	08:37 16:58	07:50 17:54	06:49 18:44	06:39 20:37	19:46-20:01/15		05:17 21:59
18	08:36 17:00	07:48 17:56	06:47 18:46	06:36 20:39	19:44-20:02/18		05:17 22:00
19	08:35 17:01	07:46 17:58	06:44 18:47	06:34 20:40	19:43-20:03/20		05:17 22:00
20	08:34 17:03	07:44 17:59	06:42 18:49	06:32 20:42	19:42-20:02/20		05:17 22:00
21	08:33 17:05	07:42 18:01	06:40 18:51	06:30 20:44	19:41-20:03/22		05:18 22:00
22	08:32 17:06	07:40 18:03	06:38 18:53	06:28 20:45	19:41-20:03/22		05:18 22:01
23	08:31 17:08	07:38 18:05	06:35 18:54	06:26 20:47	19:40-20:02/22		05:18 22:01
24	08:30 17:10	07:36 18:07	06:33 18:56	06:24 20:49	19:40-20:02/22		05:18 22:01
25	08:28 17:12	07:34 18:09	06:31 18:58	06:22 20:50	19:41-20:02/21		05:19 22:01
26	08:27 17:13	07:31 18:10	06:28 18:59	06:20 20:52	20:04-20:08/4		05:19 22:01
27	08:26 17:15	07:29 18:12	06:26 19:01	06:18 20:54	19:42-20:12/30		05:19 22:01
28	08:24 17:17	07:27 18:14	06:24 19:03	06:16 20:56	19:43-20:13/30		05:20 22:01
29	08:23 17:19		07:21 20:05	06:14 20:57	19:44-20:14/30		05:20 22:01
30	08:21 17:21		07:19 20:06	06:12 20:59	19:57-20:15/18 19:46-19:56/10		05:21 22:00
31	08:20 17:22		07:17 20:08				05:25 21:45
Potential sun hours	259	278	367	416	485	499	0
Sum of minutes with flicker	0	0	207	340	221	0	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 2WTG: 6 - T6
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22 22:00	05:58 20:10-20:21/11 21:28	06:48 20:26	07:37 08:11-08:30/19 19:17	07:30 17:11	08:21 16:31
2	05:22 22:00	06:00 20:08-20:22/14 21:27	06:49 20:24	07:38 08:10-08:31/21 19:15	07:32 17:09	08:23 16:30
3	05:23 21:59	06:01 20:07-20:23/16 21:25	06:51 20:22	07:40 08:09-08:30/21 19:12	07:34 17:07	08:24 16:29
4	05:24 21:59	06:03 20:06-20:24/18 21:23	06:53 20:20	07:42 08:09-08:31/22 19:10	07:36 17:05	08:26 16:29
5	05:25 21:59	06:04 20:06-20:25/19 21:22	06:54 20:17	07:43 08:09-08:31/22 19:08	07:38 17:04	08:27 16:28
6	05:25 21:58	06:06 20:05-20:25/20 21:20	06:56 20:15	07:45 08:10-08:29/19 19:05	07:39 17:02	08:28 16:28
7	05:26 21:57	06:07 20:04-20:24/20 21:18	06:58 20:13	07:47 08:12-08:29/17 19:03	07:41 17:00	08:29 16:27
8	05:27 21:57	06:09 20:04-20:25/21 21:16	06:59 20:10	07:48 08:14-08:28/14 19:01	07:43 16:59	08:31 16:27
9	05:28 21:56	06:11 20:04-20:24/20 21:14	07:01 20:08	07:50 08:16-08:27/11 18:59	07:45 16:57	08:32 16:27
10	05:29 21:55	06:12 20:04-20:25/21 21:12	07:02 20:06	07:52 08:17-08:24/7 18:56	07:47 16:55	08:33 16:27
11	05:30 21:55	06:14 20:04-20:24/20 21:11	07:04 20:03	07:54 08:19-08:20/1 18:54	07:48 16:54	08:34 16:26
12	05:31 21:54	06:15 20:04-20:24/20 21:09 19:56-20:02/6	07:06 20:01	07:55 18:52	07:50 16:52	08:35 16:26
13	05:32 21:53	06:17 19:53-20:22/29 21:07	07:07 19:59	07:57 18:50	07:52 16:51	08:36 16:26
14	05:34 21:52	06:19 19:51-20:22/31 21:05	07:09 19:57	07:59 18:48	07:54 16:49	08:37 16:26
15	05:35 21:51	06:20 19:50-20:21/31 21:03	07:11 19:54	08:00 18:45	07:55 16:48	08:38 16:26
16	05:36 21:50	06:22 19:49-20:18/29 21:01	07:12 19:52	08:02 18:43	07:57 16:46	08:39 16:26
17	05:37 21:49	06:23 19:48-20:09/21 20:59	07:14 19:50	08:04 18:41	07:59 16:45	08:40 16:27
18	05:38 21:48	06:25 19:47-20:08/21 20:57	07:15 19:47	08:06 18:39	08:01 16:44	08:40 16:27
19	05:40 21:47	06:27 19:47-20:09/22 20:55	07:17 19:45	08:07 18:37	08:02 16:42	08:41 16:27
20	05:41 21:46	06:28 19:46-20:08/22 20:52	07:19 19:43	08:09 18:35	08:04 16:41	08:42 16:28
21	05:42 21:44	06:30 19:46-20:08/22 20:50	07:20 19:40	08:11 18:33	08:06 16:40	08:42 16:28
22	05:44 21:43	06:32 19:46-20:07/21 20:48	07:22 19:38	08:13 18:31	08:07 16:39	08:43 16:28
23	05:45 21:42	06:33 19:46-20:07/21 20:46	07:24 19:35	08:14 18:28	08:09 16:38	08:43 16:29
24	05:46 21:40	06:35 19:46-20:06/20 20:44	07:25 19:33	08:16 18:26	08:11 16:37	08:44 16:30
25	05:48 21:39	06:36 19:47-20:05/18 20:42	07:27 19:31	07:18 17:24	08:12 16:36	08:44 16:30
26	05:49 21:38	06:38 19:48-20:03/15 20:40	07:28 19:29	07:20 17:22	08:14 16:35	08:44 16:31
27	05:51 21:36	06:40 19:50-20:01/11 20:37	07:30 19:26	07:21 17:20	08:15 16:34	08:45 16:32
28	05:52 21:35	06:41 19:54-19:57/3 20:35	07:32 08:17-08:25/8 19:24	07:23 17:18	08:17 16:33	08:45 16:32
29	05:54 21:33	06:43 20:33	07:33 08:14-08:28/14 19:22	07:25 17:17	08:18 16:32	08:45 16:33
30	05:55 21:32	06:45 20:31	07:35 08:12-08:29/17 19:19	07:27 17:15	08:20 16:31	08:45 16:34
31	05:57 20:11-20:19/8 21:30	06:46 20:29		07:29 17:13		08:45 16:35
Potential sun hours	502	454	381	331	266	244
Sum of minutes with flicker	8	563	39	174	0	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:58/3.5.584

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 2WTG: 7 - T7

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 10:14-10:58/44 14:28-14:46/18 16:36 11:04-11:13/9	08:18 09:23-09:43/20 17:24	07:25 18:16	07:14 08:22-08:38/16 20:10	06:10 21:01	05:25 21:46
2	08:45 10:14-10:57/43 14:28-14:45/17 16:37 11:05-11:12/7	08:17 09:24-09:42/18 17:26	07:23 18:18	07:12 08:25-08:34/9 20:11	06:08 21:02	05:24 21:47
3	08:45 10:15-10:57/42 14:29-14:46/17 16:39 11:07-11:11/4	08:15 09:24-09:41/17 17:28	07:21 18:19	07:10 20:13	06:06 21:04	05:23 21:49
4	08:45 10:16-10:58/42 16:40 14:31-14:46/15	08:14 09:26-09:41/15 17:30	07:18 18:21	07:08 20:15	06:04 21:06	05:22 21:50
5	08:45 10:16-10:42/26 14:31-14:45/14 16:41 10:44-10:57/13	08:12 09:28-09:39/11 17:32	07:16 18:23	07:05 20:17	06:02 21:07	05:22 21:51
6	08:44 10:17-10:41/24 14:33-14:45/12 16:42 10:46-10:57/11	08:10 09:30-09:36/6 17:33	07:14 18:25	07:03 20:18	06:00 21:09	05:21 21:51
7	08:44 10:17-10:38/21 14:34-14:44/10 16:43 10:47-10:55/8	08:09 17:35	07:12 18:27	07:01 20:20	05:59 21:11	05:20 21:52
8	08:43 10:18-10:39/21 14:37-14:44/7 16:45 10:50-10:54/4	08:07 17:37	07:10 18:28	06:59 20:22	05:57 21:12	05:20 21:53
9	08:43 10:18-10:39/21 16:46	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	05:19 21:54
10	08:42 10:19-10:39/20 16:47	08:03 17:41	07:05 18:32	06:54 20:25	05:53 21:15	05:19 21:55
11	08:42 10:20-10:40/20 16:49	08:01 17:43	07:03 18:34	06:52 20:27	05:52 21:17	05:18 21:56
12	08:41 10:21-10:39/18 16:50	08:00 17:45	07:01 18:35	06:50 20:28	05:50 21:19	05:18 21:56
13	08:40 10:22-10:39/17 16:52	07:58 17:46	06:58 18:37	06:47 20:30	05:48 21:20	05:18 21:57
14	08:40 10:22-10:39/17 16:53	07:56 17:48	06:56 07:27-07:39/12 18:39	06:45 20:32	05:47 21:22	05:18 21:58
15	08:39 10:24-10:38/14 16:55	07:54 17:50	06:54 07:24-07:44/20 18:41	06:43 20:34	05:45 21:23	05:17 21:58
16	08:38 10:25-10:37/12 16:56	07:52 17:52	06:51 07:22-07:46/24 18:42	06:41 20:35	05:44 21:25	05:17 21:59
17	08:37 10:27-10:36/9 16:58	07:50 17:54	06:49 07:20-07:47/27 18:44	06:39 20:37	05:42 21:26	05:17 21:59
18	08:36 10:31-10:34/3 17:00	07:48 17:56	06:47 07:20-07:49/29 18:46	06:36 20:39	05:41 21:28	05:17 22:00
19	08:35 09:28-09:32/4 17:01	07:46 17:58	06:44 07:18-07:49/31 18:47	06:34 20:40	05:39 21:29	05:17 22:00
20	08:34 09:25-09:34/9 17:03	07:44 17:59	06:42 07:18-07:50/32 18:49	06:32 20:42	05:38 21:31	05:17 22:00
21	08:33 09:24-09:36/12 17:05	07:42 18:01	06:40 07:17-07:50/33 18:51	06:30 20:44	05:37 21:32	05:18 22:01
22	08:32 09:24-09:38/14 17:06	07:40 18:03	06:38 07:16-07:49/33 18:53	06:28 20:45	05:35 21:34	05:18 22:01
23	08:31 09:23-09:39/16 17:08	07:38 18:05	06:35 07:16-07:50/34 18:54	06:26 20:47	05:34 21:35	05:18 22:01
24	08:30 09:22-09:40/18 17:10	07:36 18:07	06:33 07:17-07:50/33 18:56	06:24 20:49	05:33 21:36	05:18 22:01
25	08:28 09:22-09:41/19 17:12	07:34 18:09	06:31 07:16-07:48/32 18:58	06:22 20:51	05:32 21:38	05:19 22:01
26	08:27 09:22-09:41/19 17:13	07:31 18:10	06:28 07:17-07:48/31 18:59	06:20 20:52	05:31 21:39	05:19 22:01
27	08:26 09:22-09:42/20 17:15	07:29 18:12	06:26 07:17-07:48/31 19:01	06:18 20:54	05:29 21:40	05:19 22:01
28	08:24 09:22-09:42/20 17:17	07:27 18:14	06:24 07:17-07:46/29 19:03	06:16 20:56	05:28 21:42	05:20 22:01
29	08:23 09:22-09:43/21 17:19		07:21 08:18-08:45/27 20:05	06:14 20:57	05:27 21:43	05:20 22:01
30	08:21 09:22-09:43/21 17:21		07:19 08:19-08:43/24 20:06	06:12 20:59	05:26 21:44	05:21 22:00
31	08:20 09:22-09:42/20 17:22		07:17 08:21-08:42/21 20:08		05:25 21:45	
Potential sun hours	259	278	367	416	485	499
Sum of minutes with flicker	793	87	503	25	0	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 2WTG: 7 - T7
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (July-December) and rows for days (1-31). Includes 'Potential sun hours' and 'Sum of minutes with flicker' at the bottom.

Table layout: For each day in each month the following matrix apply

Matrix with 2 rows and 3 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm); First time (hh:mm) with flicker, Last time (hh:mm) with flicker, Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 2WTG: 8 - T8

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 10:08-11:03/55 15:17-15:42/25 16:36 11:14-11:24/10	08:18 09:03-09:28/25 17:24	07:25 18:16	07:14 07:37-07:41/4 20:10	06:10 21:01	05:25 21:46
2	08:45 10:08-11:03/55 15:17-15:42/25 16:37 11:15-11:22/7	08:17 09:02-09:28/26 17:26	07:23 18:18	07:12 07:35-07:43/8 20:11	06:08 21:02	05:24 21:47
3	08:45 10:09-11:03/54 15:17-15:43/26 16:39 11:18-11:20/2	08:15 09:02-09:28/26 17:28	07:21 18:19	07:10 07:33-07:44/11 20:13	06:06 21:04	05:23 21:49
4	08:45 10:09-11:03/54 16:40 15:18-15:44/26	08:14 09:03-09:28/25 17:30	07:18 18:21	07:08 07:30-07:45/15 20:15	06:04 21:06	05:22 21:50
5	08:45 10:09-10:43/34 15:18-15:44/26 16:41 10:46-11:02/16	08:12 09:03-09:28/25 17:32	07:16 18:23	07:05 07:28-07:46/18 20:17	06:02 21:07	05:22 21:51
6	08:44 10:10-10:42/32 15:18-15:45/27 16:42 10:48-11:02/14	08:10 09:04-09:28/24 17:33	07:14 18:25	07:03 07:26-07:46/20 20:18	06:00 21:09	05:21 21:52
7	08:44 10:10-10:38/28 15:18-15:45/27 16:43 10:49-11:01/12	08:09 09:04-09:27/23 17:35	07:12 18:27	07:01 07:24-07:47/23 20:20	05:59 21:11	05:20 21:52
8	08:43 10:12-10:39/27 15:19-15:46/27 16:45 10:51-11:00/9	08:07 09:05-09:26/21 17:37	07:10 18:28	06:59 07:21-07:46/25 20:22	05:57 21:12	05:20 21:53
9	08:43 10:12-10:39/27 15:19-15:46/27 16:46 10:55-10:57/2	08:05 09:05-09:25/20 17:39	07:07 18:30	06:56 07:19-07:46/27 20:23	05:55 21:14	05:19 21:54
10	08:42 10:12-10:39/27 16:47 15:19-15:46/27	08:03 09:08-09:25/17 17:41	07:05 18:32	06:54 07:17-07:47/30 20:25	05:53 21:15	05:19 21:55
11	08:42 10:14-10:40/26 16:49 15:21-15:48/27	08:01 09:09-09:23/14 17:43	07:03 18:34	06:52 07:15-07:46/31 20:27	05:52 21:17	05:18 21:56
12	08:41 10:14-10:40/26 16:50 15:21-15:48/27	08:00 09:12-09:21/9 17:45	07:01 18:35	06:50 07:13-07:46/33 20:28	05:50 21:19	05:18 21:56
13	08:40 10:15-10:39/24 16:52 15:21-15:48/27	07:58 17:46	06:58 18:37	06:47 07:10-07:46/36 20:30	05:48 21:20	05:18 21:57
14	08:40 10:16-10:39/23 16:53 15:22-15:48/26	07:56 17:48	06:56 18:39	06:45 07:09-07:46/37 20:32	05:47 21:22	05:18 21:58
15	08:39 10:17-10:39/22 16:55 15:22-15:48/26	07:54 17:50	06:54 18:41	06:43 07:08-07:46/38 20:34	05:45 21:23	05:17 21:58
16	08:38 10:18-10:38/20 16:56 15:23-15:48/25	07:52 17:52	06:51 18:42	06:41 07:08-07:45/37 20:35	05:44 21:25	05:17 21:59
17	08:37 10:19-10:38/19 16:58 15:24-15:48/24	07:50 17:54	06:49 18:44	06:39 07:08-07:45/37 20:37	05:42 21:26	05:17 21:59
18	08:36 10:21-10:37/16 17:00 15:24-15:48/24	07:48 17:56	06:47 18:46	06:36 07:08-07:45/37 20:39	05:41 21:28	05:17 22:00
19	08:35 10:23-10:36/13 17:01 15:25-15:48/23	07:46 17:58	06:45 18:47	06:34 07:09-07:44/35 20:40	05:39 21:29	05:17 22:00
20	08:34 10:24-10:33/9 17:03 15:26-15:47/21	07:44 17:59	06:42 18:49	06:32 07:09-07:44/35 20:42	05:38 21:31	05:17 22:00
21	08:33 15:27-15:47/20 17:05	07:42 18:01	06:40 18:51	06:30 07:09-07:43/34 20:44	05:37 21:32	05:18 22:01
22	08:32 15:29-15:47/18 17:06	07:40 18:03	06:38 18:53	06:28 07:10-07:42/32 20:45	05:35 21:34	05:18 22:01
23	08:31 09:10-09:17/7 17:08 15:29-15:45/16	07:38 18:05	06:35 18:54	06:26 07:11-07:41/30 20:47	05:34 21:35	05:18 22:01
24	08:30 09:07-09:19/12 17:10 15:32-15:44/12	07:36 18:07	06:33 18:56	06:24 07:12-07:39/27 20:49	05:33 21:36	05:18 22:01
25	08:28 09:06-09:21/15 17:12 15:35-15:43/8	07:34 18:09	06:31 18:58	06:22 07:13-07:38/25 20:51	05:32 21:38	05:19 22:01
26	08:27 09:05-09:22/17 17:13	07:32 18:10	06:28 18:59	06:20 07:14-07:36/22 20:52	05:31 21:39	05:19 22:01
27	08:26 09:04-09:24/20 17:15	07:29 18:12	06:26 19:01	06:18 07:16-07:33/17 20:54	05:29 21:40	05:19 22:01
28	08:24 09:03-09:24/21 17:17	07:27 18:14	06:24 19:03	06:16 07:19-07:30/11 20:56	05:28 21:42	05:20 22:01
29	08:23 09:03-09:26/23 17:19	07:25 19:05	06:22 19:05	06:14 07:19-07:30/11 20:57	05:27 21:43	05:20 22:01
30	08:21 09:03-09:26/23 17:21	07:23 19:07	06:20 19:07	06:12 07:19-07:30/11 20:59	05:26 21:44	05:21 22:01
31	08:20 09:02-09:26/24 17:22	07:21 19:09	06:18 19:09	06:10 07:19-07:30/11 21:01	05:25 21:45	05:21 22:01
Potential sun hours	259	278	367	416	485	499
Sum of minutes with flicker	1412	255	0	735	0	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:58/3.5.584

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 2WTG: 8 - T8

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22 22:00	05:58 21:28	06:48 20:26	07:14-07:45/31 19:17	07:37 17:11	07:31 16:31
2	05:22 22:00	06:00 21:27	06:49 20:24	07:15-07:44/29 19:15	07:38 17:09	08:35-08:55/20 16:30
3	05:23 22:00	06:01 21:25	06:51 20:22	07:17-07:44/27 19:12	07:40 17:07	08:34-08:56/22 16:29
4	05:24 21:59	06:03 21:23	06:53 20:20	07:19-07:44/25 19:10	07:42 17:05	08:34-08:57/23 16:29
5	05:25 21:59	06:04 21:22	06:54 20:17	07:20-07:43/23 19:08	07:43 17:04	08:33-08:57/24 16:28
6	05:25 21:58	06:06 21:20	06:56 20:15	07:22-07:43/21 19:06	07:45 17:02	08:33-08:58/25 16:28
7	05:26 21:58	06:07 21:18	06:58 20:13	07:23-07:41/18 19:03	07:47 19:03	08:33-08:58/25 16:27
8	05:27 21:57	06:09 21:16	06:59 20:10	07:25-07:40/15 19:01	07:49 16:59	08:33-08:58/25 16:27
9	05:28 21:56	06:11 21:14	07:01 20:08	07:26-07:38/12 18:59	07:50 16:57	08:33-08:58/25 16:27
10	05:29 21:56	06:12 21:12	07:02 20:06	07:28-07:36/8 18:56	07:52 16:55	08:33-08:58/24 16:27
11	05:30 21:55	06:14 21:11	07:04 20:04	07:30-07:34/4 18:54	07:54 16:54	08:34-08:58/24 16:26
12	05:31 21:54	06:15 21:09	07:06 20:01	07:06 18:52	07:55 18:52	08:35-08:58/23 16:26
13	05:32 21:53	06:17 21:07	07:07 19:59	07:07 18:50	07:57 16:51	08:35-08:58/23 16:26
14	05:34 21:52	06:19 21:05	07:09 19:57	07:09 18:48	07:59 16:49	08:36-08:57/21 16:26
15	05:35 21:51	06:20 21:03	07:26-07:39/13 19:54	07:11 18:45	08:00 16:48	08:36-08:56/20 16:26
16	05:36 21:50	06:22 21:01	07:22-07:41/19 19:52	07:12 18:43	08:02 18:43	14:32-14:42/10 08:39
17	05:37 21:49	06:23 20:59	07:21-07:43/22 19:50	07:14 18:41	08:04 18:41	10:00-10:57/57 16:27
18	05:38 21:48	06:25 20:57	07:18-07:44/26 19:47	07:15 18:39	08:06 18:39	14:32-14:43/11 08:41
19	05:40 21:47	06:27 20:55	07:17-07:45/28 19:45	07:17 18:37	08:07 18:37	15:04-15:20/16 16:27
20	05:41 21:46	06:28 20:52	07:15-07:45/30 19:43	07:19 18:35	08:09 18:35	15:04-15:22/18 16:28
21	05:42 21:44	06:30 20:50	07:15-07:47/32 19:40	07:20 18:33	08:11 18:33	15:03-15:23/20 16:40
22	05:44 21:43	06:32 20:48	07:13-07:47/34 19:38	07:22 18:31	08:13 18:31	14:33-14:46/13 16:39
23	05:45 21:42	06:33 20:46	07:13-07:47/34 19:36	07:24 18:29	08:14 18:29	15:02-15:24/22 16:29
24	05:46 21:40	06:35 20:44	07:12-07:48/36 19:33	07:25 18:26	08:16 18:26	15:02-15:25/23 16:30
25	05:48 21:39	06:36 20:42	07:11-07:48/37 19:31	07:27 18:24	08:18 17:24	09:57-10:16/19 16:30
26	05:49 21:38	06:38 20:40	07:11-07:48/37 19:29	07:28 17:22	08:20 17:22	10:05-11:02/57 16:31
27	05:51 21:36	06:40 20:37	07:10-07:47/37 19:26	07:30 17:20	08:22 17:20	15:01-15:26/24 16:32
28	05:52 21:35	06:41 20:35	07:10-07:47/37 19:24	07:32 17:19	08:23 17:19	15:01-15:27/26 16:33
29	05:54 21:33	06:43 20:33	07:09-07:47/38 19:22	07:33 17:17	08:25 17:17	15:02-15:28/26 16:33
30	05:55 21:32	06:45 20:31	07:11-07:46/35 19:19	07:35 17:15	08:27 17:15	15:01-15:28/27 16:31
31	05:57 21:30	06:46 20:29	07:12-07:45/33 19:19	07:29 17:13	08:37-08:52/15 17:13	09:55-10:21/26 15:02-15:29/27
Potential sun hours	502	454	381	331	266	244
Sum of minutes with flicker	0	528	213	25	860	2933

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:58/3.5.584

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 2WTG: 9 - T9
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Table with columns for months (January to June) and rows for each day of the month, listing start and end times for shadow calculations and potential sun hours.

Table layout: For each day in each month the following matrix apply

Day in month Sun rise (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker



Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:58/3.5.584

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 2WTG: 9 - T9
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Table with columns for months (July to December) and rows for specific times of day, showing sun rise and set times for each month.

Table layout: For each day in each month the following matrix apply

Day in month Sun rise (hh:mm) Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:58/3.5.584

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 2WTG: 10 - T10

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 11:20-11:27/7 10:07-10:29/22	08:18 09:32-09:51/19	07:25	07:14 07:44-08:03/19	06:10	05:25 20:29-20:50/21
	16:36 12:36-12:53/17	17:24 15:59-16:13/14	18:16	20:10	21:01	21:46
2	08:45 11:22-11:25/3 10:07-10:29/22	08:17 09:32-09:51/19	07:23	07:12 07:44-08:03/19	06:08	05:24 20:29-20:50/21
	16:37 12:37-12:52/15	17:26 15:57-16:14/17	18:18	20:11	21:02	21:47
3	08:45 12:38-12:52/14	08:15 09:32-09:50/18	07:21	07:10 07:44-08:03/19	06:06	05:23 20:29-20:51/22
	16:39 10:07-10:30/23	17:28 15:56-16:15/19	18:19	20:13	21:04	21:48
4	08:45 12:40-12:52/12	08:14 09:34-09:50/16	07:18	07:08 07:43-08:02/19	06:04	05:22 20:29-20:51/22
	16:40 10:08-10:31/23	17:30 15:55-16:16/21	18:21	20:15	21:06	21:50
5	08:45 12:42-12:50/8 09:58-10:01/3	08:12 09:35-09:48/13	07:16	07:05 07:44-08:01/17	06:02	05:22 20:29-20:52/23
	16:41 10:08-10:31/23	17:32 15:55-16:18/23	18:23	20:17	21:07	21:51
6	08:44 10:09-10:32/23	08:10 09:37-09:46/9	07:14	07:03 07:45-08:00/15	06:00	05:21 20:29-20:52/23
	16:42 09:57-10:04/7	17:33 15:55-16:18/23	18:25	20:18	21:09	21:51
7	08:44 10:08-10:32/24	08:09 15:54-16:18/24	07:12	07:01 07:46-07:58/12	05:59	05:20 20:30-20:53/23
	16:43 09:55-10:05/10	17:35	18:26	20:20	21:10	21:52
8	08:43 10:09-10:33/24	08:07 15:54-16:19/25	07:10	06:58 07:48-07:54/6	05:57	05:20 20:29-20:52/23
	16:45 09:55-10:07/12	17:37	18:28	20:22	21:12	21:53
9	08:43 10:10-10:33/23	08:05 15:54-16:19/25	07:07	06:56	05:55	05:19 20:30-20:53/23
	16:46 09:54-10:08/14	17:39	18:30	20:23	21:14	21:54
10	08:42 10:10-10:33/23	08:03 15:54-16:19/25	07:05	06:54	05:53	05:19 20:29-20:53/24
	16:47 09:54-10:09/15	17:41	18:32	20:25	21:15	21:55
11	08:42 09:54-10:34/40	08:01 15:54-16:18/24	07:03	06:52	05:52	05:18 20:30-20:53/23
	16:49	17:43	18:34	20:27	21:17	21:56
12	08:41 09:54-10:34/40	08:00 15:55-16:18/23	07:01	06:50	05:50	05:18 20:30-20:54/24
	16:50	17:45	18:35	20:28	21:19	21:56
13	08:40 09:53-10:34/41	07:58 15:55-16:17/22	06:58	06:47	05:48	05:18 20:30-20:56/26
	16:52	17:46	18:37	20:30	21:20	21:57
14	08:40 09:53-10:34/41	07:56 15:56-16:17/21	06:56	06:45	05:47	05:18 20:31-20:58/27
	16:53	17:48	18:39	20:32	21:22	21:58
15	08:39 09:53-10:34/41	07:54 15:57-16:16/19	06:54	06:43	05:45	05:17 20:30-20:58/28
	16:55	17:50	18:41	20:34	21:23	21:58
16	08:38 09:53-10:34/41	07:52 15:59-16:14/15	06:51	06:41	05:44	05:17 20:30-20:58/28
	16:56	17:52	18:42	20:35	21:25	21:59
17	08:37 09:53-10:34/41	07:50 16:01-16:12/11	06:49	06:39	05:42	05:17 20:31-20:59/28
	16:58	17:54	18:44	20:37	21:26	21:59
18	08:36 09:53-10:34/41	07:48	06:47	06:36	05:41	05:17 20:31-20:59/28
	17:00	17:56	18:46	20:39	21:28	22:00
19	08:35 09:37-09:40/3	07:46	06:44	06:34	05:39	05:17 20:32-21:01/29
	17:01 09:54-10:33/39	17:58	18:47	20:40	21:29	22:00
20	08:34 09:33-09:43/10	07:44	06:42	06:32	05:38	05:17 20:32-21:01/29
	17:03 09:53-10:32/39	17:59	18:49	20:42	21:31	22:00
21	08:33 09:32-09:45/13 09:54-10:17/23	07:42	06:40	06:30	05:37	05:17 20:32-21:01/29
	17:05 10:19-10:31/12	18:01	18:51	20:44	21:32	22:00
22	08:32 09:32-09:47/15 09:54-10:18/24	07:40	06:38	06:28	05:35	05:18 20:32-21:01/29
	17:06 10:22-10:29/7	18:03	18:53	20:45	21:34	22:01
23	08:31 09:31-09:47/16	07:38	06:35	06:26	05:34 20:35-20:41/6	05:18 20:32-21:01/29
	17:08 09:54-10:17/23	18:05	18:54	20:47	21:35	22:01
24	08:30 09:30-09:48/18	07:36	06:33	06:24	05:33 20:33-20:44/11	05:18 20:33-21:02/29
	17:10 09:55-10:18/23	18:07	18:56	20:49	21:36	22:01
25	08:28 09:31-09:50/19	07:34	06:31	06:22	05:32 20:32-20:45/13	05:19 20:33-21:01/28
	17:12 09:56-10:18/22	18:09	18:58	20:50	21:38	22:01
26	08:27 09:30-09:50/20	07:31	06:28	06:20	05:30 20:31-20:46/15	05:19 20:33-21:02/29
	17:13 09:56-10:17/21	18:10	18:59	20:52	21:39	22:01
27	08:26 09:30-09:51/21	07:29	06:26 06:53-06:58/5	06:18	05:29 20:30-20:47/17	05:19 20:33-21:01/28
	17:15 09:57-10:17/20	18:12	19:01	20:54	21:40	22:01
28	08:24 09:30-09:51/21	07:27	06:24 06:49-07:00/11	06:16	05:28 20:30-20:48/18	05:20 20:33-21:00/27
	17:17 09:58-10:16/18	18:14	19:03	20:56	21:42	22:01
29	08:23 09:31-09:52/21	07:21	07:47-08:02/15	06:14	05:27 20:29-20:48/19	05:20 20:34-21:00/26
	17:19 10:00-10:16/16	18:05	20:05	20:57	21:43	22:01
30	08:21 09:30-09:51/21	07:19	07:46-08:03/17	06:12	05:26 20:30-20:50/20	05:21 20:34-20:58/24
	17:21 10:01-10:14/13	18:06	20:06	20:59	21:44	22:00
31	08:20 09:30-09:51/21 16:00-16:10/10	07:17	07:45-08:04/19	06:11	05:25 20:29-20:50/21	05:21 20:34-20:58/24
	17:22 10:03-10:12/9	18:08	20:08	20:58	21:45	22:00
Potential sun hours	259	278	367	416	485	499
Sum of minutes with flicker	1231	445	67	126	140	773

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:58/3.5.584

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 2WTG: 10 - T10
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (July-December) and rows for each day (1-31) showing sun rise/set times and minutes with flicker.

Table layout: For each day in each month the following matrix apply

Matrix with 2 rows and 3 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm); First time (hh:mm) with flicker; Last time (hh:mm) with flicker/Minutes with flicker



SHADOW - Calendar per WTG

Calculation: Alternative Scenario 2WTG: 11 - T11
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 16:36	08:18 17:24	07:25 18:16	07:14 20:10	19:30-19:41/11 21:01	06:10 21:46
2	08:45 16:37	08:17 17:26	07:23 18:18	07:12 20:11	19:28-19:43/15 21:02	06:08 21:47
3	08:45 16:39	08:15 17:28	07:21 18:19	07:10 20:13	19:26-19:43/17 21:04	06:06 21:48
4	08:45 16:40	08:14 17:30	07:18 18:21	07:08 20:15	19:25-19:44/19 21:06	06:04 21:49
5	08:44 16:41	08:12 17:32	07:16 18:23	07:05 20:16	19:25-19:44/19 21:07	06:02 21:50
6	08:44 16:42	08:10 17:33	07:14 18:25	07:03 20:18	19:24-19:44/20 21:09	06:00 21:51
7	08:44 16:43	08:09 17:35	07:12 18:26	07:01 20:20	19:24-19:43/19 21:10	05:59 21:52
8	08:43 16:45	08:07 17:37	07:10 18:28	06:58 20:22	19:24-19:43/19 21:12	05:57 21:53
9	08:43 16:46	08:05 17:39	07:07 18:30	06:56 20:23	19:24-19:42/18 21:14	05:55 21:54
10	08:42 16:47	08:03 17:41	07:05 18:32	06:54 20:25	19:25-19:41/16 21:15	05:53 21:55
11	08:42 16:49	08:01 17:43	07:03 18:34	06:52 20:27	19:27-19:39/12 21:17	05:52 21:56
12	08:41 16:50	08:00 17:45	07:00 18:35	06:49 20:28	19:28-19:36/8 21:18	05:50 21:56
13	08:40 16:52	07:58 17:46	06:58 18:37	06:47 20:30	19:57-20:31/34 21:20	05:18 21:57
14	08:40 16:53	07:56 17:48	06:56 18:39	06:45 20:32	19:57-20:32/35 21:22	05:18 21:58
15	08:39 16:55	07:54 17:50	06:54 18:40	06:43 20:33	05:45 21:23	05:17 21:58
16	08:38 16:56	07:52 17:52	06:51 18:42	06:41 20:35	19:56-20:32/36 21:25	05:17 21:59
17	08:37 16:58	07:50 17:54	06:49 18:44	06:39 20:37	19:56-20:32/36 21:26	05:17 21:59
18	08:36 17:00	07:48 17:56	06:47 18:46	06:36 20:39	19:56-20:32/36 21:28	05:17 22:00
19	08:35 17:01	07:46 17:58	06:44 18:47	06:34 20:40	19:56-20:32/36 21:29	05:17 22:00
20	08:34 17:03	07:44 17:59	06:42 18:49	06:32 20:42	19:56-20:32/36 21:31	05:17 22:00
21	08:33 17:05	07:42 18:01	06:40 18:51	06:30 20:44	19:57-20:33/36 21:32	05:17 22:00
22	08:32 17:06	07:40 18:03	06:37 18:53	06:28 20:45	20:33-20:37/4 21:33	05:18 22:01
23	08:31 17:08	07:38 18:05	06:35 18:54	06:26 20:47	19:56-20:32/36 21:35	05:18 22:01
24	08:29 17:10	07:36 18:07	06:33 18:56	06:24 20:49	19:57-20:43/46 21:36	05:18 22:01
25	08:28 17:12	07:34 18:09	06:31 18:58	06:22 20:50	19:57-20:44/47 21:38	05:19 22:01
26	08:27 17:13	07:31 18:10	06:28 18:59	06:20 20:52	19:57-20:45/48 21:39	05:19 22:01
27	08:26 17:15	07:29 18:12	06:26 19:01	06:18 20:54	19:58-20:46/48 21:40	05:19 22:01
28	08:24 17:17	07:27 18:14	06:24 19:03	06:16 20:55	19:58-20:47/49 21:41	05:20 22:01
29	08:23 17:19		07:21 20:05	06:14 20:57	19:59-20:48/49 21:43	05:20 22:01
30	08:21 17:21		07:19 20:06	06:12 20:59	20:00-20:49/49 21:44	05:21 22:00
31	08:20 17:22		07:17 20:08	19:32-19:39/7	20:00-20:50/50 21:45	
Potential sun hours	259	278	367	416	485	499
Sum of minutes with flicker	0	0	7	193	1040	1632

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:58/3.5.584

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 2WTG: 11 - T11

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22 20:11-21:06/55	05:58 20:08-20:41/33	06:48 19:26-19:38/12	07:37 19:17	07:30 17:11	08:21 16:31
	22:00	21:28	20:26	19:17	17:11	16:31
2	05:22 20:11-20:59/48	06:00 20:08-20:40/32	06:49 19:23-19:39/16	07:38 19:15	07:32 17:09	08:23 16:30
	22:00 21:00-21:05/5	21:27	20:24	19:15	17:09	16:30
3	05:23 20:11-20:59/48	06:01 20:09-20:40/31	06:51 19:22-19:40/18	07:40 19:12	07:34 17:07	08:24 16:29
	21:59	21:25	20:22	19:12	17:07	16:29
4	05:24 20:10-20:58/48	06:03 20:10-20:39/29	06:53 19:21-19:40/19	07:42 19:10	07:36 17:05	08:26 16:29
	21:59	21:23	20:20	19:10	17:05	16:29
5	05:25 20:10-20:59/49	06:04 20:11-20:38/27	06:54 19:21-19:40/19	07:43 19:08	07:38 17:04	08:27 16:28
	21:59	21:21	20:17	19:08	17:04	16:28
6	05:25 20:10-20:59/49	06:06 20:12-20:37/25	06:56 19:20-19:39/19	07:45 19:07	07:39 17:03	08:28 16:28
	21:58	21:20	20:15	19:05	17:02	16:28
7	05:26 20:10-20:59/49	06:07 20:12-20:35/23	06:58 19:20-19:39/19	07:47 19:03	07:41 17:00	08:29 16:27
	21:57	21:18	20:13	19:03	17:00	16:27
8	05:27 20:10-20:59/49	06:09 20:14-20:33/19	06:59 19:20-19:39/19	07:48 19:01	07:43 16:59	08:31 16:27
	21:57	21:16	20:10	19:01	16:59	16:27
9	05:28 20:10-20:59/49	06:11 20:16-20:31/15	07:01 19:20-19:37/17	07:50 18:59	07:45 16:57	08:32 16:27
	21:56	21:14	20:08	18:59	16:57	16:27
10	05:29 20:09-20:59/50	06:12 20:20-20:27/7	07:02 19:21-19:36/15	07:52 18:56	07:47 16:55	08:33 16:27
	21:55	21:12	20:06	18:56	16:55	16:27
11	05:30 20:09-20:59/50	06:14 20:20-20:27/7	07:04 19:22-19:34/12	07:54 18:54	07:48 16:54	08:34 16:26
	21:55	21:10	20:03	18:54	16:54	16:26
12	05:31 20:09-20:58/49	06:15 20:20-20:27/7	07:06 19:24-19:31/7	07:55 18:52	07:50 16:52	08:35 16:26
	21:54	21:09	20:01	18:52	16:52	16:26
13	05:32 20:09-20:58/49	06:17 20:20-20:27/7	07:07 19:24-19:31/7	07:57 18:50	07:52 16:51	08:36 16:26
	21:53	21:07	19:59	18:50	16:51	16:26
14	05:34 20:08-20:58/50	06:19 20:20-20:27/7	07:09 19:24-19:31/7	07:59 18:48	07:54 16:49	08:37 16:26
	21:52	21:05	19:56	18:48	16:49	16:26
15	05:35 20:08-20:57/49	06:20 20:20-20:27/7	07:10 19:24-19:31/7	08:00 18:45	07:55 16:48	08:38 16:26
	21:51	21:03	19:54	18:45	16:48	16:26
16	05:36 20:08-20:56/48	06:22 20:20-20:27/7	07:12 19:24-19:31/7	08:02 18:43	07:57 16:46	08:39 16:26
	21:50	21:01	19:52	18:43	16:46	16:26
17	05:37 20:07-20:55/48	06:23 20:20-20:27/7	07:14 19:24-19:31/7	08:04 18:41	07:59 16:45	08:40 16:27
	21:49	20:59	19:49	18:41	16:45	16:27
18	05:38 20:07-20:54/47	06:25 20:20-20:27/7	07:15 19:24-19:31/7	08:06 18:37	08:01 16:44	08:40 16:27
	21:48	20:57	19:47	18:39	16:44	16:27
19	05:40 20:06-20:53/47	06:27 20:20-20:27/7	07:17 19:24-19:31/7	08:07 18:35	08:02 16:43	08:41 16:27
	21:47	20:54	19:45	18:37	16:42	16:27
20	05:41 20:07-20:52/45	06:28 20:20-20:27/7	07:19 19:24-19:31/7	08:09 18:33	08:04 16:41	08:42 16:28
	21:46	20:52	19:42	18:35	16:41	16:28
21	05:42 20:07-20:50/43	06:30 20:20-20:27/7	07:20 19:24-19:31/7	08:11 18:31	08:06 16:40	08:42 16:28
	21:44	20:50	19:40	18:33	16:40	16:28
22	05:44 20:06-20:42/36	06:32 20:20-20:27/7	07:22 19:24-19:31/7	08:13 18:28	08:07 16:38	08:43 16:29
	21:43	20:48	19:38	18:31	16:39	16:28
23	05:45 20:06-20:42/36	06:33 20:20-20:27/7	07:23 19:24-19:31/7	08:14 18:26	08:09 16:37	08:43 16:29
	21:42	20:46	19:35	18:28	16:38	16:29
24	05:46 20:07-20:43/36	06:35 20:20-20:27/7	07:25 19:24-19:31/7	08:16 18:22	08:11 16:36	08:44 16:30
	21:40	20:44	19:33	18:26	16:37	16:29
25	05:48 20:06-20:42/36	06:36 20:20-20:27/7	07:27 19:24-19:31/7	08:18 18:18	08:12 16:35	08:44 16:31
	21:39	20:42	19:31	18:18	16:35	16:31
26	05:49 20:06-20:42/36	06:38 20:20-20:27/7	07:28 19:24-19:31/7	08:20 18:17	17:24 16:36	08:44 16:30
	21:38	20:40	19:28	18:17	16:35	16:31
27	05:51 20:07-20:43/36	06:40 20:20-20:27/7	07:30 19:24-19:31/7	08:22 18:15	17:22 16:34	08:45 16:32
	21:36	20:37	19:26	18:15	16:34	16:32
28	05:52 20:07-20:42/35	06:41 20:20-20:27/7	07:32 19:24-19:31/7	08:24 18:13	17:20 16:33	08:45 16:32
	21:35	20:35	19:24	18:13	16:33	16:32
29	05:54 20:06-20:42/36	06:43 20:20-20:27/7	07:33 19:24-19:31/7	08:26 18:11	17:18 16:32	08:45 16:33
	21:33	20:33	19:22	18:11	16:32	16:33
30	05:55 20:07-20:42/35	06:45 20:20-20:27/7	07:35 19:24-19:31/7	08:28 18:09	17:16 16:31	08:45 16:34
	21:32	20:31	19:19	18:09	16:31	16:34
31	05:57 20:07-20:41/34	06:46 19:28-19:36/8	07:37 19:24-19:31/7	08:30 18:07	17:14 16:30	08:45 16:35
	21:30	20:29	19:17	18:06	16:30	16:35
Potential sun hours	502	454	381	331	266	244
Sum of minutes with flicker	1380	249	192	0	0	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:58/3.5.584

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 2WTG: 12 - T12
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Table with columns for months (January to June) and rows for each day of the month, showing sunrise and sunset times. Summary rows at the bottom show Potential sun hours and Sum of minutes with flicker for each month.

Table layout: For each day in each month the following matrix apply

Day in month Sun rise (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:58/3.5.584

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 2WTG: 12 - T12

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22 22:00	05:58 21:28	06:48 20:26	07:37 19:17	18:04-18:09/5	07:30 17:11
2	05:22 22:00	06:00 21:27	06:49 20:24	07:38 19:15	17:59-18:11/12	07:32 17:09
3	05:23 21:59	06:01 21:25	06:51 20:22	07:40 19:12	17:58-18:13/15	07:34 17:07
4	05:24 21:59	06:03 21:23	06:53 20:20	07:42 19:10	17:56-18:14/18	07:36 17:05
5	05:25 21:59	06:04 21:22	06:54 20:17	07:43 19:08	17:54-18:14/20	07:38 17:04
6	05:25 21:58	06:06 21:20	06:56 20:15	07:45 19:05	17:52-18:14/22	07:39 17:02
7	05:26 21:57	06:07 21:18	06:57 20:13	07:47 19:03	17:50-18:14/24	07:41 17:00
8	05:27 21:57	06:09 21:16	06:59 20:10	07:48 19:01	17:48-18:14/26	07:43 16:59
9	05:28 21:56	06:11 21:14	07:01 20:08	07:50 18:59	17:46-18:13/27	07:45 16:57
10	05:29 21:55	06:12 21:12	07:02 20:06	07:52 18:56	17:46-18:13/27	07:47 16:55
11	05:30 21:55	06:14 21:10	07:04 20:03	07:54 18:54	17:45-18:12/27	07:48 16:54
12	05:31 21:54	06:15 21:09	07:06 20:01	07:55 18:52	17:10-17:34/24	07:50 16:52
13	05:32 21:53	06:17 21:07	07:07 19:59	07:57 18:50	17:04-17:36/32	07:52 16:51
14	05:33 21:52	06:19 21:05	07:09 19:56	07:59 18:48	17:00-17:37/37	07:54 16:49
15	05:35 21:51	06:20 21:03	07:10 19:54	08:00 18:45	16:59-17:39/40	07:55 16:48
16	05:36 21:50	06:22 21:01	07:12 19:52	08:02 18:43	16:57-17:39/42	07:57 16:46
17	05:37 21:49	06:23 20:59	07:14 19:49	08:04 18:41	16:56-17:40/44	07:59 16:45
18	05:38 21:48	06:25 20:57	07:15 19:47	08:06 18:39	16:56-17:40/44	08:01 16:44
19	05:40 21:47	06:27 20:55	07:17 19:45	08:07 18:37	16:54-17:39/45	08:02 16:42
20	05:41 21:46	06:28 20:52	07:19 19:42	08:09 18:35	16:54-17:39/45	08:04 16:41
21	05:42 21:44	06:30 20:50	07:20 19:40	08:11 18:33	16:53-17:38/45	08:06 16:40
22	05:44 21:43	06:31 20:48	07:22 19:38	08:13 18:30	16:53-17:37/44	08:07 16:39
23	05:45 21:42	06:33 20:46	07:23 19:35	08:14 18:28	16:53-17:36/43	08:09 16:38
24	05:46 21:40	06:35 20:44	07:25 19:33	08:16 18:26	16:52-17:35/43	08:11 16:37
25	05:48 21:39	06:36 20:42	07:27 19:31	08:18 18:24	16:51-16:33/42	08:12 16:36
26	05:49 21:38	06:38 20:40	07:28 19:28	08:20 18:22	15:50-16:25/35	08:14 16:35
27	05:51 21:36	06:40 20:37	07:30 19:26	08:21 18:20	15:48-16:21/33	08:15 16:34
28	05:52 21:35	06:41 20:35	07:32 19:24	08:23 18:18	15:48-16:20/32	08:17 16:33
29	05:54 21:33	06:43 20:33	07:33 19:22	08:25 18:16	15:48-16:18/30	08:18 16:32
30	05:55 21:32	06:45 20:31	07:35 19:19	08:27 18:15	15:48-16:16/28	08:20 16:31
31	05:57 21:30	06:46 20:29		08:29 18:13	15:48-16:10/22	
Potential sun hours	502	454	381	331	266	244
Sum of minutes with flicker	0	0	0	2590	2771	2046

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:58/3.5.584

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 2WTG: 13 - T13
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 14:33-15:35/62 13:19-14:07/48 16:36 09:30-10:02/32	08:18 15:56-16:19/23 15:25-15:48/23 17:24 16:28-16:49/21	07:25 07:14 18:16 20:10		06:10 20:17-20:32/15 21:01 21:46	05:24 20:33-20:55/22 21:46 21:54
2	08:45 14:33-15:35/62 13:18-14:07/49 16:37 09:29-10:02/33	08:17 15:56-16:18/22 15:27-15:44/17 17:26 16:27-16:51/24	07:23 07:12 18:18 20:11		06:08 20:15-20:33/18 21:02 21:47	05:24 20:33-20:55/22 21:47 21:54
3	08:45 14:34-15:36/62 13:19-14:07/48 16:38 09:30-10:02/32	08:15 15:56-16:18/22 15:29-15:42/13 17:28 16:26-16:53/27	07:21 07:10 18:19 20:13		06:06 20:15-20:34/19 21:04 21:48	05:23 20:35-20:55/20 21:48 21:54
4	08:45 14:35-15:38/63 13:20-14:08/48 16:40 09:30-10:03/33	08:14 15:57-16:17/20 17:30 16:25-16:54/29	07:18 07:08 18:21 20:15		06:04 20:15-20:37/22 21:06 21:49	05:22 20:35-20:55/20 21:49 21:54
5	08:44 14:35-15:39/64 13:20-14:08/48 16:41 09:30-10:03/33	08:12 15:59-16:17/18 17:32 16:26-16:56/30	07:16 07:05 18:23 20:16		06:02 20:14-20:38/24 21:07 21:50	05:21 20:36-20:55/19 21:50 21:54
6	08:44 14:37-15:41/64 13:21-14:09/48 16:42 09:31-10:04/33	08:10 16:00-16:16/16 17:33 16:25-16:56/31	07:14 07:03 18:25 20:18		06:00 20:14-20:39/25 21:09 21:51	05:21 20:36-20:54/18 21:51 21:54
7	08:44 14:37-15:42/65 13:21-14:09/48 16:43 09:30-10:04/34	08:09 16:02-16:14/12 17:35 16:25-16:57/32	07:12 07:01 18:26 20:20		05:59 20:14-20:42/28 21:10 21:52	05:20 20:37-20:55/18 21:52 21:54
8	08:43 14:38-15:43/65 13:22-14:10/48 16:45 09:31-10:05/34	08:07 16:05-16:11/6 17:37 16:25-16:57/32	07:09 06:58 18:28 20:22		05:57 20:14-20:42/28 21:12 21:53	05:20 20:37-20:54/17 21:53 21:54
9	08:43 14:39-15:44/65 13:22-14:10/48 16:46 09:31-10:05/34	08:05 16:25-16:57/32 17:39	07:07 06:56 18:30 20:23		05:55 20:14-20:42/28 21:14 21:54	05:19 20:38-20:54/16 21:54 21:54
10	08:42 14:39-15:45/66 13:22-14:10/48 16:47 09:31-10:04/33	08:03 16:25-16:57/32 17:41	07:05 06:54 18:32 20:25		05:53 20:15-20:43/28 21:15 21:55	05:19 20:38-20:53/15 21:55 21:54
11	08:42 14:40-15:46/66 13:23-14:10/47 16:49 09:32-10:05/33	08:01 16:26-16:57/31 17:43	07:03 06:52 18:33 20:27		05:52 20:15-20:43/28 21:17 21:56	05:18 20:39-20:53/14 21:56 21:54
12	08:41 15:01-15:47/46 09:32-10:05/33 16:50 14:42-15:00/18 13:24-14:11/47	08:00 16:27-16:57/30 17:45	07:00 06:49 18:35 20:28		05:50 20:16-20:46/30 21:18 21:56	05:18 20:40-20:53/13 21:56 21:54
13	08:40 15:02-15:48/46 09:33-10:05/32 16:52 14:44-15:00/16 13:25-14:11/46	07:58 16:28-16:56/28 17:46	06:58 06:47 18:37 20:30		05:48 20:17-20:48/31 21:20 21:57	05:18 20:40-20:53/13 21:57 21:54
14	08:40 15:02-15:49/47 09:33-10:05/32 16:53 14:45-14:59/14 13:25-14:11/46	07:56 16:29-16:55/26 17:48	06:56 06:45 18:39 20:32		05:47 20:18-20:50/32 21:22 21:58	05:18 20:41-20:53/12 21:58 21:54
15	08:39 15:02-15:50/48 09:33-10:05/32 16:55 14:47-14:57/10 13:26-14:11/45	07:54 16:31-16:55/24 17:50	06:54 06:43 18:40 20:33		05:45 20:19-20:51/32 21:23 21:58	05:17 20:41-20:52/11 21:58 21:54
16	08:38 15:02-15:50/48 09:34-10:04/30 16:56 14:51-14:55/4 13:27-14:11/44	07:52 16:33-16:54/21 17:52	06:51 06:41 18:42 20:35		05:44 20:21-20:52/31 21:25 21:59	05:17 20:41-20:52/11 21:59 21:54
17	08:37 15:03-15:51/48 13:27-14:11/44 16:58 09:34-10:04/30	07:50 16:34-16:53/19 17:54	06:49 06:38 18:44 20:37		05:42 20:22-20:53/31 21:26 21:59	05:17 20:42-20:52/10 21:59 21:54
18	08:36 15:03-15:52/49 13:28-14:11/43 17:00 09:35-10:03/28	07:48 16:35-16:52/17 17:56	06:47 06:36 18:46 20:39		05:41 20:22-20:53/31 21:28 22:00	05:17 20:42-20:52/10 22:00 21:54
19	08:35 15:03-15:51/48 09:36-10:03/27 17:01 15:59-16:07/8 13:28-14:10/42	07:46 16:37-16:50/13 17:57	06:44 06:34 18:47 20:40		05:39 20:23-20:54/31 21:29 22:00	05:17 20:43-20:53/10 22:00 21:54
20	08:34 15:04-15:52/48 09:36-10:02/26 17:03 15:57-16:10/13 13:30-14:10/40	07:44 16:40-16:47/7 17:59	06:42 06:32 18:49 20:42		05:38 20:24-20:55/31 21:31 22:00	05:17 20:44-20:53/9 22:00 21:54
21	08:33 15:05-15:52/47 09:37-10:03/26 17:05 15:57-16:12/15 13:31-14:10/39	07:42 18:01	06:40 06:30 18:51 20:44		05:37 20:25-20:55/30 21:32 22:00	05:17 20:44-20:53/9 22:00 21:54
22	08:32 15:06-15:53/47 09:38-10:03/25 17:06 15:56-16:13/17 13:32-14:10/38	07:40 18:03	06:37 06:28 18:53 20:45		05:35 20:25-20:55/30 21:33 22:01	05:18 20:44-20:53/9 22:01 21:54
23	08:31 15:06-15:53/47 09:38-10:02/24 17:08 15:55-16:14/19 13:33-14:08/35	07:38 18:05	06:35 06:26 18:54 20:47		05:34 20:26-20:55/29 21:35 22:01	05:18 20:44-20:53/9 22:01 21:54
24	08:29 15:07-15:53/46 09:39-10:01/22 17:10 15:55-16:15/20 13:35-14:08/33	07:36 18:07	06:33 06:24 18:56 20:49		05:33 20:28-20:55/27 21:36 22:01	05:18 20:44-20:54/10 22:01 21:54
25	08:28 15:08-15:53/45 09:41-10:01/20 17:11 15:55-16:16/21 13:37-14:08/31	07:34 18:08	06:31 06:22 18:58 20:50		05:32 20:31-20:55/24 21:38 22:01	05:18 20:44-20:54/10 22:01 21:54
26	08:27 15:54-16:17/23 09:42-10:00/18 17:13 15:09-15:53/44 13:38-14:06/28	07:31 18:10	06:28 06:20 18:59 20:52		05:30 20:31-20:55/24 21:39 22:01	05:19 20:43-20:54/11 22:01 21:54
27	08:26 15:55-16:18/23 09:44-09:59/15 17:15 15:10-15:53/43 13:40-14:05/25	07:29 18:12	06:26 06:18 19:01 20:54		05:29 20:31-20:55/24 21:40 22:01	05:19 20:44-20:55/11 22:01 21:54
28	08:24 15:54-16:18/24 09:46-09:56/10 17:17 15:11-15:52/41 13:43-14:02/19	07:27 18:14	06:24 06:16 20:23-20:28/5 19:03 20:55		05:28 20:32-20:55/23 21:41 22:01	05:20 20:43-20:55/12 22:01 21:54
29	08:23 15:54-16:18/24 15:13-15:51/38 17:19 16:32-16:38/6 13:46-13:59/13	 	07:21 06:14 20:20-20:29/9 20:05 20:57		05:27 20:32-20:55/23 21:43 22:01	05:20 20:44-20:56/12 22:01 21:54
30	08:21 15:55-16:18/23 15:15-15:51/36 17:20 16:30-16:41/11	 	07:19 06:12 20:18-20:31/13 20:06 20:59		05:26 20:33-20:56/23 21:44 22:00	05:21 20:44-20:57/13 22:00 21:54
31	08:20 15:55-16:18/23 15:18-15:49/31 17:22 16:28-16:43/15	 	07:17 20:08		05:25 20:33-20:55/22 21:45	 499
Potential sun hours	259	278	367	416	485	499
Sum of minutes with flicker	3924	698	0	27	822	406

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker



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SHADOW - Calendar per WTG

Calculation: Alternative Scenario 2WTG: 13 - T13

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22 20:43-20:57/14 22:00	05:58 20:26-20:54/28 21:28	06:48 20:25-20:53/28 20:26	07:37 20:24 19:17	07:30 15:55-16:27/32 17:11	08:21 14:22-15:28/66 16:31 09:14-09:47/33
2	05:22 20:43-20:58/15 22:00	06:00 20:25-20:53/28 21:27	06:49 20:24 19:15	07:38 20:22 19:12	07:32 15:55-16:27/32 17:09	08:23 14:44-15:28/44 16:30 14:23-14:43/20
3	05:23 20:43-20:59/16 21:59	06:01 20:25-20:53/28 21:25	06:51 20:20 19:10	07:40 20:17 19:08	07:34 15:34-15:41/7 17:07 15:55-16:27/32	08:24 14:22-15:27/65 16:29 09:15-09:49/34
4	05:24 20:42-20:59/17 21:59	06:03 20:24-20:52/28 21:23	06:53 20:20 19:10	07:42 20:15 19:05	07:36 15:31-15:44/13 17:05 15:55-16:26/31	08:26 14:22-15:28/66 16:29 09:15-09:49/34
5	05:25 20:42-21:00/18 21:59	06:04 20:23-20:51/28 21:21	06:54 20:17 19:08	07:43 20:13 19:03	07:38 15:30-15:46/16 17:04 15:55-16:26/31	08:27 14:22-15:27/65 16:28 09:16-09:49/33
6	05:25 20:42-21:00/18 21:58	06:06 20:24-20:50/26 21:20	06:56 20:15 19:05	07:45 20:13 19:03	07:39 15:28-15:47/19 17:02 15:55-16:25/30	08:28 14:23-15:27/64 16:28 09:17-09:50/33
7	05:26 20:42-21:01/19 21:57	06:07 20:23-20:48/25 21:18	06:57 20:13 19:03	07:47 20:10 19:01	07:41 15:28-15:48/20 17:00 15:56-16:25/29	08:29 14:22-15:26/64 16:27 09:17-09:50/33
8	05:27 20:42-21:02/20 21:57	06:09 20:24-20:47/23 21:16	06:59 20:10 19:01	07:48 20:08 18:59	07:43 15:27-15:49/22 16:58 15:57-16:24/27	08:31 14:22-15:25/63 16:27 09:17-09:50/33
9	05:28 20:42-21:02/20 21:56	06:11 20:23-20:45/22 21:14	07:01 20:08 18:59	07:50 20:07 18:52	07:45 15:27-15:49/22 16:57 15:58-16:22/24	08:32 14:22-15:25/63 16:27 09:19-09:51/32
10	05:29 20:41-21:02/21 21:55	06:12 20:24-20:44/20 21:12	07:02 20:06 18:56	07:52 20:04 18:54	07:47 15:26-15:50/24 16:55 15:59-16:20/21	08:33 14:23-15:26/62 16:27 09:19-09:52/33
11	05:30 20:41-21:02/21 21:55	06:14 20:24-20:41/17 21:10	07:04 20:03 18:54	07:54 20:03 18:54	07:48 15:26-15:50/24 16:54 16:00-16:15/15	08:34 14:24-15:25/61 16:26 09:20-09:52/32
12	05:31 20:41-21:03/22 21:54	06:15 20:25-20:40/15 21:09	07:06 20:01 18:52	07:55 20:01 18:52	07:50 15:26-15:49/23 16:52 16:01-16:12/11	08:35 14:24-15:25/61 16:26 09:20-09:52/32
13	05:32 20:41-21:04/23 21:53	06:17 20:26-20:38/12 21:07	07:07 19:59 18:50	07:57 19:59 18:50	07:52 15:26-15:49/23 16:51 16:04-16:09/5	08:36 14:24-15:26/62 16:26 09:21-09:53/32
14	05:33 20:41-21:04/23 21:52	06:19 20:28-20:36/8 21:05	07:09 19:56 18:48	07:59 19:56 18:48	07:54 15:26-15:50/24 16:49 14:43-15:24/41	08:37 14:25-15:26/61 16:26 09:22-09:53/31
15	05:35 20:41-21:05/24 21:51	06:20 20:30-20:34/4 21:03	07:10 19:54 18:45	08:00 19:54 18:45	07:55 15:27-15:50/23 16:48 14:42-15:25/43	08:38 14:25-15:27/62 16:26 09:22-09:54/32
16	05:36 20:41-21:05/24 21:50	06:22 21:01 19:52	07:12 18:43 18:43	08:02 18:43 18:43	07:57 15:27-15:50/23 16:46 14:42-15:26/44	08:39 14:26-15:27/61 16:26 09:23-09:54/31
17	05:37 20:41-21:05/24 21:49	06:23 20:59 19:49	07:14 18:04 18:41	08:04 18:41 18:41	07:59 14:41-15:26/45 16:45 15:28-15:49/21	08:40 14:25-15:27/62 16:27 09:23-09:54/31
18	05:38 20:41-21:05/24 21:48	06:25 20:57 20:57	07:15 18:06 18:39	08:06 18:39 18:39	08:01 14:41-15:27/46 16:44 15:29-15:49/20	08:40 14:26-15:27/61 16:27 09:24-09:55/31
19	05:40 20:39-21:05/26 21:47	06:27 20:54 20:54	07:17 18:07 18:37	08:07 18:37 18:37	08:02 14:41-15:28/47 16:42 15:30-15:49/19	08:41 14:27-15:28/61 16:27 09:25-09:55/30
20	05:41 20:38-21:06/28 21:46	06:28 20:52 20:52	07:19 18:09 18:35	08:09 18:35 18:35	08:04 14:41-15:28/47 16:41 15:31-15:48/17	08:42 14:26-15:28/62 16:27 09:25-09:55/30
21	05:42 20:36-21:05/29 21:44	06:30 20:50 20:50	07:20 18:11 18:33	08:11 18:33 18:33	08:06 14:40-15:27/47 16:40 15:32-15:47/15	08:42 14:27-15:29/62 16:28 09:25-09:56/31
22	05:44 20:35-21:05/30 21:43	06:31 20:48 20:48	07:22 18:13 18:30	08:13 18:30 18:30	08:07 14:40-15:28/48 16:39 15:33-15:46/13	08:43 14:27-15:29/62 16:28 09:25-09:56/31
23	05:45 20:34-21:04/30 21:42	06:33 20:46 20:46	07:23 18:14 18:28	08:14 18:28 18:28	08:09 14:40-15:28/48 16:38 15:36-15:44/8	08:43 14:28-15:30/62 16:29 09:26-09:57/31
24	05:46 20:34-21:05/31 21:40	06:35 20:44 20:44	07:25 18:16 18:26	08:16 18:26 18:26	08:11 14:41-15:29/48 16:37 09:12-09:40/28	08:44 14:29-15:30/61 16:29 09:27-09:57/30
25	05:48 20:33-21:04/31 21:39	06:36 20:42 20:42	07:27 18:18 17:24	08:18 17:24 17:24	08:12 14:41-15:29/48 16:36 09:12-09:42/30	08:44 14:29-15:30/61 16:30 09:27-09:57/30
26	05:49 20:32-21:03/31 21:38	06:38 20:40 20:40	07:28 17:22 17:22	08:20 17:22 17:22	08:14 14:41-15:28/47 16:35 14:29-14:33/4	08:44 14:30-15:32/62 16:31 09:28-09:59/31
27	05:51 20:32-21:03/31 21:36	06:40 20:37 20:37	07:30 17:20 17:20	08:21 17:20 17:20	08:15 14:41-15:29/48 16:34 14:26-14:36/10	08:45 14:30-15:32/62 16:32 09:28-09:59/31
28	05:52 20:32-21:02/30 21:35	06:41 20:35 20:35	07:32 17:18 17:18	08:23 17:18 17:18	08:17 14:42-15:29/47 16:33 14:25-14:39/14	08:45 14:31-15:32/61 16:32 09:28-09:59/31
29	05:54 20:29-21:01/32 21:33	06:43 20:33 20:33	07:33 17:16 17:16	08:25 17:16 17:16	08:18 14:42-15:28/46 16:32 14:24-14:40/16	08:45 14:31-15:33/62 16:33 09:28-10:00/32
30	05:55 20:28-21:00/32 21:32	06:44 20:31 20:31	07:35 17:15 17:15	08:27 17:15 17:15	08:20 14:43-15:28/45 16:31 14:23-14:41/18	08:45 14:32-15:33/61 16:34 09:29-10:00/31
31	05:57 20:27-20:58/31 21:30	06:46 20:29 20:29	07:37 17:13 17:13	08:29 17:13 17:13	15:55-16:27/32 266	08:45 14:33-15:34/61 16:35 09:29-10:01/32
Potential sun hours	502	454	381	331	266	244
Sum of minutes with flicker	755	312	0	226	2815	4419

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:58/3.5.584

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 2WTG: 14 - T14

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 15:09-15:50/41 09:17-09:22/5 16:36 14:43-15:01/18	08:18 17:24	07:25 17:17-17:39/22 18:16 20:10	07:14 18:16 20:10	06:10 19:57-20:32/35 21:00 21:46	05:24 20:25-20:59/34 21:24 21:46
2	08:45 15:10-15:51/41 09:16-09:22/6 16:37 14:43-15:00/17	08:17 17:26	07:23 17:17-17:39/22 18:17 20:11	07:12 18:17 20:11	06:08 19:58-20:33/35 21:02 21:47	05:24 20:25-20:59/34 21:27 21:47
3	08:45 15:11-15:51/40 09:16-09:23/7 16:38 14:44-15:00/16	08:15 17:28	07:21 17:18-17:38/20 18:19 20:13	07:10 18:19 20:13	06:06 19:59-20:35/36 21:04 21:48	05:23 20:26-20:59/33 21:48 21:48
4	08:45 15:12-15:52/40 09:16-09:25/9 16:40 14:46-15:00/14	08:14 17:30	07:18 17:18-17:38/20 18:21 20:15	07:07 18:21 20:15	06:04 20:00-20:37/37 21:05 21:49	05:22 20:25-20:59/34 21:49 21:49
5	08:44 15:12-15:52/40 09:15-09:25/10 16:41 14:46-15:00/14	08:12 17:31	07:16 17:18-17:36/18 18:23 20:16	07:05 18:23 20:16	06:02 20:01-20:38/37 21:07 21:50	05:21 20:26-21:00/34 21:50 21:50
6	08:44 15:13-15:53/40 09:15-09:26/11 16:42 14:48-15:00/12	08:10 17:33	07:14 17:20-17:35/15 18:25 20:18	07:03 18:25 20:18	06:00 20:02-20:39/37 21:09 21:51	05:21 20:26-20:59/33 21:51 21:51
7	08:44 15:13-15:53/40 09:14-09:26/12 16:43 14:50-14:58/8	08:08 17:35	07:12 17:22-17:32/10 18:26 20:20	07:01 18:26 20:20	05:59 20:03-20:40/37 21:10 21:52	05:20 20:27-21:00/33 21:52 21:52
8	08:43 15:14-15:55/41 09:14-09:28/14 16:45 14:53-14:57/4	08:07 17:37	07:09 18:28 20:22	06:58 18:28 20:22	05:57 20:03-20:40/37 21:12 21:53	05:20 20:27-20:59/32 21:53 21:53
9	08:43 15:15-15:55/40 16:46 09:13-09:28/15	08:05 17:39	07:07 18:30 20:23	06:56 19:55-19:57/2 20:23 21:14	05:55 20:03-20:40/37 21:14 21:54	05:19 20:27-21:00/33 21:54 21:54
10	08:42 15:15-15:55/40 16:47 09:12-09:28/16	08:03 17:41	07:05 18:32 20:25	06:54 19:51-19:59/8 20:25 21:15	05:53 20:04-20:41/37 21:15 21:55	05:19 20:27-20:59/32 21:55 21:55
11	08:42 15:16-15:55/39 16:49 09:12-09:30/18	08:01 17:43	07:03 18:33 20:27	06:52 19:49-20:01/12 20:27 21:17	05:52 20:05-20:45/40 21:17 21:56	05:18 20:28-20:59/31 21:56 21:56
12	08:41 15:17-15:56/39 16:50 09:11-09:30/19	08:00 17:45	07:00 18:35 20:28	06:49 19:47-20:01/14 20:28 21:18	05:50 20:06-20:48/42 21:18 21:56	05:18 20:28-21:00/32 21:56 21:56
13	08:40 15:18-15:56/38 16:52 09:10-09:31/21	07:58 17:46	06:58 18:37 20:30	06:47 19:46-20:03/17 20:30 21:20	05:48 20:07-20:50/43 21:20 21:57	05:18 20:29-21:00/31 21:57 21:57
14	08:40 15:19-15:57/38 16:53 09:09-09:31/22	07:56 17:48	06:56 18:39 20:32	06:45 19:45-20:05/20 20:32 21:22	05:47 20:09-20:51/42 21:22 21:58	05:18 20:29-21:00/31 21:58 21:58
15	08:39 15:19-15:57/38 16:55 09:09-09:31/22	07:54 17:50	06:54 18:40 20:33	06:43 19:44-20:07/23 20:33 21:23	05:45 20:10-20:52/42 21:23 21:58	05:17 20:28-21:00/32 21:58 21:58
16	08:38 15:20-15:57/37 16:56 09:10-09:32/22	07:52 17:52	06:51 18:42 20:35	06:41 19:44-20:08/24 20:35 21:25	05:44 20:11-20:53/42 21:25 21:59	05:17 20:29-21:00/31 21:59 21:59
17	08:37 15:21-15:57/36 16:58 09:10-09:32/22	07:50 17:54	06:49 18:44 20:37	06:38 19:44-20:10/26 20:37 21:26	05:42 20:12-20:55/43 21:26 21:59	05:17 20:29-21:00/31 21:59 21:59
18	08:36 15:22-15:57/35 17:00 09:11-09:32/21	07:48 17:56	06:47 18:46 20:39	06:36 19:43-20:12/29 20:39 21:28	05:41 20:12-20:55/43 21:28 21:59	05:17 20:29-21:00/31 21:59 21:59
19	08:35 15:23-15:56/33 17:01 09:12-09:32/20	07:46 17:57	06:44 18:47 20:40	06:34 19:43-20:13/30 20:40 21:29	05:39 20:13-20:55/42 21:29 22:00	05:17 20:30-21:01/31 22:00 22:00
20	08:34 15:24-15:55/31 17:03 09:12-09:32/20	07:44 17:59	06:42 18:49 20:42	06:32 19:43-20:14/31 20:42 21:31	05:38 20:13-20:56/43 21:31 22:00	05:17 20:31-21:01/30 22:00 22:00
21	08:33 15:26-15:55/29 17:05 09:13-09:32/19	07:42 18:01	06:40 18:51 20:44	06:30 19:43-20:16/33 20:44 21:32	05:37 20:14-20:57/43 21:32 22:00	05:17 20:31-21:01/30 22:00 22:00
22	08:32 15:28-15:54/26 17:06 09:14-09:32/18	07:40 17:25-17:34/9 18:03	06:37 18:53 20:45	06:28 19:44-20:17/33 20:45 21:33	05:35 20:14-20:56/42 21:33 22:01	05:18 20:31-21:01/30 22:01 22:01
23	08:31 15:45-15:51/6 09:14-09:31/17 17:08 15:30-15:40/10	07:38 17:23-17:36/13 18:05	06:35 18:54 20:47	06:26 19:45-20:19/34 20:47 21:35	05:34 20:15-20:57/42 21:35 22:01	05:18 20:31-21:01/30 22:01 22:01
24	08:29 09:16-09:30/14 17:10	07:36 17:20-17:37/17 18:07	06:33 18:56 20:49	06:24 19:47-20:21/34 20:49 21:36	05:33 20:16-20:57/41 21:36 22:01	05:18 20:31-21:02/31 22:01 22:01
25	08:28 09:18-09:30/12 17:11	07:34 17:19-17:38/19 18:08	06:31 18:58 20:50	06:22 19:49-20:22/33 20:50 21:38	05:32 20:17-20:58/41 21:38 22:01	05:18 20:31-21:02/31 22:01 22:01
26	08:27 09:19-09:27/8 17:13	07:31 17:19-17:39/20 18:10	06:28 18:59 20:52	06:20 19:51-20:24/33 20:52 21:39	05:30 20:18-20:58/40 21:39 22:01	05:19 20:31-21:02/31 22:01 22:01
27	08:26 17:15	07:29 17:18-17:39/21 18:12	06:26 19:01 20:54	06:18 19:51-20:25/34 20:54 21:40	05:29 20:20-20:58/38 21:40 22:01	05:19 20:32-21:03/31 22:01 22:01
28	08:24 17:17	07:27 17:18-17:40/22 18:14	06:24 19:03 20:55	06:16 19:53-20:28/35 20:55 21:41	05:28 20:22-20:58/36 21:41 22:01	05:20 20:31-21:02/31 22:01 22:01
29	08:23 17:19	 18:14	07:21 20:04 20:57	06:14 19:54-20:29/35 20:57 21:43	05:27 20:24-20:58/34 21:43 22:01	05:20 20:32-21:03/31 22:01 22:01
30	08:21 17:20	 18:14	07:19 20:06 20:59	06:12 19:55-20:31/36 20:59 21:44	05:26 20:25-20:59/34 21:44 22:00	05:21 20:32-21:04/32 22:00 22:00
31	08:20 17:22	 18:14	07:17 20:08 20:59	 20:59 21:45	05:25 20:25-20:59/34 21:45 22:00	 22:00 22:00
Potential sun hours	259	278	367	416	485	499
Sum of minutes with flicker	1341	121	127	576	1212	951

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:58/3.5.584

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 2WTG: 14 - T14
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (July-December) and rows for each day (1-31) showing sun rise/set times and minutes with flicker.

Table layout: For each day in each month the following matrix apply

Matrix with 2 rows and 3 columns: Day in month, Sun rise/set times, First time with flicker, Last time with flicker, Minutes with flicker.



SHADOW - Calendar per WTG

Calculation: Alternative Scenario 2WTG: 15 - Derragh
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

Table with 13 columns: N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum. Values range from 194 to 1,318.

Main data table with columns for months (January to June) and rows for days (1 to 31). Each cell contains start and end times for shadow events. Summary rows at the bottom show Potential sun hours and Sum of minutes with flicker for each month.

Table layout: For each day in each month the following matrix apply

Matrix with 2 rows and 3 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm); First time (hh:mm) with flicker, Last time (hh:mm) with flicker, Minutes with flicker.

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 2WTG: 15 - Derragh
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

Table with 13 columns: N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum. Values range from 194 to 1,557.

Main data table with columns for months (July-December) and rows for each day (1-31). Includes 'Potential sun hours' and 'Sum of minutes with flicker' at the bottom.

Table layout: For each day in each month the following matrix apply

Matrix with 2 rows and 3 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm); First time (hh:mm) with flicker, Last time (hh:mm) with flicker, Minutes with flicker.

Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:58/3.5.584

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 2WTG: 16 - Derragh
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 15:25-15:59/34 16:36	08:18 08:45-09:19/34 17:24	07:25 17:09-17:43/34 18:16 07:49-08:00/11	07:14 07:37-07:48/11 20:10	06:10 21:00	05:25 06:02-06:31/29 21:46
2	08:45 15:26-16:00/34 16:38	08:17 08:43-09:19/36 17:26	07:23 17:08-17:44/36 18:18 07:46-08:01/15	07:12 07:35-07:48/13 20:11	06:08 21:02	05:24 06:03-06:32/29 21:47
3	08:45 15:27-16:01/34 16:39	08:15 08:41-09:19/38 17:28	07:21 17:08-17:45/37 18:19 07:44-08:03/19	07:10 07:33-07:49/16 20:13	06:06 06:36-06:46/10 21:04	05:23 06:02-06:32/30 21:48
4	08:45 15:28-16:02/34 16:40	08:14 08:39-09:19/40 17:30	07:18 17:07-17:46/39 18:21 07:42-08:04/22	07:08 07:30-07:48/18 20:15	06:04 06:33-06:47/14 21:05	05:22 06:02-06:32/30 21:49
5	08:44 15:28-16:02/34 16:41	08:12 08:38-09:20/42 17:32	07:16 17:06-17:45/39 18:23 07:40-08:06/26	07:05 07:28-07:48/20 20:16	06:02 06:31-06:48/17 21:07	05:22 06:03-06:32/29 21:50
6	08:44 15:29-16:03/34 16:42	08:10 08:37-09:20/43 17:33	07:14 17:07-17:45/38 18:25 07:37-08:06/29	07:03 07:26-07:48/22 20:18	06:00 06:31-06:50/19 21:09	05:21 06:03-06:32/29 21:51
7	08:44 15:29-16:03/34 16:43	08:08 08:37-09:20/43 17:35	07:12 17:07-17:45/38 18:26 07:35-08:07/32	07:01 07:24-07:47/23 20:20	05:59 06:30-06:50/20 21:10	05:20 06:03-06:33/30 21:52
8	08:43 15:30-16:03/33 16:45	08:07 08:37-09:20/43 17:37	07:10 17:08-17:45/37 18:28 07:33-08:08/35	06:59 07:21-07:45/24 20:22	05:57 06:29-06:51/22 21:12	05:20 06:03-06:32/29 21:53
9	08:43 15:31-16:04/33 16:46	08:05 08:37-09:20/43 17:39	07:07 17:07-17:43/36 18:30 07:30-08:07/37	06:56 07:19-07:45/26 20:23	05:55 06:29-06:52/23 21:14	05:19 06:03-06:33/30 21:54
10	08:42 15:32-16:04/32 16:48	08:03 08:37-09:19/42 17:41	07:05 17:09-17:43/34 18:32 07:28-08:08/40	06:54 07:17-07:45/28 20:25	05:53 06:28-06:52/24 21:15	05:19 06:04-06:33/29 21:55
11	08:42 15:33-16:05/32 16:49	08:01 08:37-09:19/42 17:43	07:03 17:10-17:41/31 18:34 07:26-08:08/42	06:52 07:15-07:45/30 20:27	05:52 06:27-06:51/24 21:17	05:19 06:04-06:33/29 21:56
12	08:41 15:35-16:06/31 16:50	08:00 08:38-09:19/41 17:45	07:00 17:11-17:39/28 18:35 07:23-08:08/45	06:50 07:13-07:45/32 20:28	05:50 06:27-06:52/25 21:18	05:18 06:04-06:33/29 21:56
13	08:40 15:36-16:06/30 16:52	07:58 08:38-09:18/40 17:46	06:58 17:14-17:35/21 18:37 07:21-08:08/47	06:47 07:11-07:44/33 20:30	05:48 06:27-06:51/24 21:20	05:18 06:04-06:34/30 21:57
14	08:40 15:38-16:06/28 16:53	07:56 08:39-09:17/38 17:48	06:56 17:23-17:25/2 18:39 07:20-08:08/48	06:45 07:10-07:43/33 20:32	05:47 06:27-06:52/25 21:22	05:18 06:05-06:34/29 21:57
15	08:39 15:41-16:06/25 16:55	07:54 08:40-09:16/36 17:50	06:54 07:20-08:08/48 18:41	06:43 07:10-07:42/32 20:33	05:45 06:28-06:52/24 21:23	05:18 06:05-06:34/29 21:58
16	08:38 15:43-16:07/24 16:57	07:52 08:41-09:15/34 17:52	06:51 07:20-08:07/47 18:42	06:41 07:10-07:41/31 20:35	05:44 06:28-06:51/23 21:25	05:17 06:06-06:34/28 21:59
17	08:37 15:43-16:07/24 16:58	07:50 08:42-09:14/32 17:54	06:49 07:20-08:07/47 18:44	06:39 07:10-07:41/31 20:37	05:42 06:12-06:20/8 21:26	05:17 06:06-06:35/29 21:59
18	08:36 15:44-16:07/23 17:00	07:48 08:43-09:13/30 17:56	06:47 07:20-08:06/46 18:46	06:36 07:09-07:41/32 20:39	05:41 06:10-06:23/13 21:28	05:17 06:06-06:35/29 21:59
19	08:35 15:44-16:06/22 17:01	07:46 08:45-09:11/26 17:58	06:44 07:20-08:05/45 18:47	06:34 07:09-07:40/31 20:40	05:39 06:07-06:23/16 21:29	05:17 06:06-06:35/29 22:00
20	08:34 15:45-16:06/21 17:03	07:44 08:47-09:09/22 17:59	06:42 07:20-08:04/44 18:49	06:32 07:09-07:40/31 20:42	05:38 06:06-06:25/19 21:31	05:17 06:06-06:35/29 22:00
21	08:33 15:47-16:06/19 17:05	07:42 08:50-09:06/16 18:01	06:40 07:21-08:03/42 18:51	06:30 07:09-07:40/31 20:44	05:37 06:06-06:26/20 21:32	05:18 06:06-06:35/29 22:00
22	08:32 15:48-16:06/18 17:06	07:40 09:00-09:08/8 18:03	06:38 07:21-08:01/40 18:53	06:28 07:09-07:39/30 20:45	05:35 06:05-06:27/22 21:33	05:18 06:06-06:35/29 22:01
23	08:31 15:49-16:04/15 17:08	07:38 08:58-09:09/11 18:05	06:35 07:22-08:00/38 18:54	06:26 07:10-07:38/28 20:47	05:34 06:04-06:28/24 21:35	05:18 06:07-06:36/29 22:01
24	08:29 15:51-16:03/12 17:10	07:36 17:26-17:31/5 18:07	06:33 07:23-07:59/36 18:56	06:24 07:10-07:38/28 20:49	05:33 06:03-06:28/25 21:36	05:18 06:07-06:36/29 22:01
25	08:28 15:53-16:01/8 17:12	07:34 17:16-17:34/18 18:09	06:31 07:24-07:56/32 18:58	06:22 07:11-07:36/25 20:50	05:32 06:03-06:28/25 21:38	05:19 06:07-06:36/29 22:01
26	08:27 08:54-09:13/19 17:13	07:31 17:13-17:36/23 18:10	06:28 07:26-07:54/28 18:59	06:20 07:11-07:35/24 20:52	05:31 06:02-06:29/27 21:39	05:19 06:08-06:36/28 22:01
27	08:26 08:53-09:15/22 17:15	07:29 17:12-17:39/27 18:12	06:26 07:28-07:52/24 19:01	06:18 07:12-07:34/22 20:54	05:29 06:02-06:29/27 21:40	05:19 06:07-06:36/29 22:01
28	08:24 08:51-09:15/24 17:17	07:27 17:11-17:42/31 18:14	06:24 07:30-07:48/18 19:03	06:16 07:14-07:32/18 20:55	05:28 06:03-06:31/28 21:41	05:20 06:08-06:37/29 22:01
29	08:23 08:49-09:16/27 17:19		07:21 08:35-08:42/7 20:05	06:14 07:15-07:29/14 20:57	05:27 06:03-06:31/28 21:43	05:21 06:08-06:37/29 22:01
30	08:21 08:48-09:17/29 17:21		07:19 07:42-07:46/4 20:06	06:12 07:18-07:26/8 20:59	05:26 06:02-06:31/29 21:44	05:21 06:08-06:37/29 22:00
31	08:20 08:46-09:17/31 17:22		07:17 07:40-07:47/7 20:08		05:26 06:02-06:31/29 21:45	
Potential sun hours	259	278	367	416	485	499
Sum of minutes with flicker	877	871	1451	745	796	873

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 2WTG: 16 - Derragh
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22 06:08-06:37/29 22:00	05:58 06:38-07:02/24 21:28	06:48 07:14-07:44/30 20:26	07:37 17:52-18:17/25 19:17 08:02-08:48/46	07:30 08:07-08:49/42 17:11	08:21 15:15-15:47/32 16:31
2	05:22 06:08-06:38/30 22:00	06:00 06:38-07:02/24 21:27	06:49 07:15-07:43/28 20:24	07:38 17:49-18:19/30 19:15 08:03-08:46/43	07:32 08:06-08:49/43 17:09	08:23 15:15-15:47/32 16:30
3	05:23 06:09-06:38/29 21:59	06:01 06:38-07:02/24 21:25	06:51 07:17-07:43/26 20:22	07:40 17:47-18:20/33 19:12 08:05-08:46/41	07:34 08:06-08:50/44 17:07	08:24 15:14-15:47/33 16:29
4	05:24 06:09-06:39/30 21:59	06:03 06:38-07:01/23 21:23	06:53 07:19-07:43/24 20:20	07:42 17:46-18:21/35 19:10 08:07-08:46/39	07:36 08:06-08:50/44 17:05	08:25 15:15-15:48/33 16:29
5	05:25 06:09-06:38/29 21:58	06:04 06:39-07:01/22 21:21	06:54 07:20-07:43/23 20:17	07:43 17:44-18:21/37 19:08 08:09-08:45/36	07:38 08:06-08:50/44 17:04	08:27 15:14-15:48/34 16:28
6	05:26 06:09-06:38/29 21:58	06:06 06:39-07:00/21 21:20	06:56 07:22-07:44/22 20:15	07:45 17:43-18:21/38 19:05 08:10-08:43/33	07:39 08:08-08:50/42 17:02	08:28 15:15-15:49/34 16:28
7	05:26 06:09-06:39/30 21:57	06:07 06:41-06:59/18 21:18	06:58 07:23-07:43/20 20:13	07:47 17:43-18:21/38 19:03 08:12-08:42/30	07:41 08:10-08:50/40 17:00	08:29 15:15-15:49/34 16:28
8	05:27 06:10-06:39/29 21:57	06:09 06:41-06:57/16 21:16	06:59 07:25-07:43/18 20:10	07:48 17:43-18:21/38 19:01 08:14-08:41/27	07:43 08:12-08:50/38 16:59	08:31 15:15-15:49/34 16:27
9	05:28 06:10-06:39/29 21:56	06:11 06:43-06:56/13 21:14	07:01 07:26-07:42/16 20:08	07:50 17:41-18:20/39 18:59 08:15-08:39/24	07:45 08:14-08:50/36 16:57	08:32 15:15-15:49/34 16:27
10	05:29 06:10-06:39/29 21:55	06:12 06:45-06:53/8 21:12	07:02 07:28-07:42/14 20:06	07:52 17:42-18:20/38 18:56 08:17-08:38/21	07:47 08:16-08:49/33 16:55	08:33 15:16-15:50/34 16:27
11	05:30 06:10-06:40/30 21:55	06:14 21:10	07:04 07:29-07:40/11 20:03	07:54 17:42-18:19/37 18:54 08:19-08:36/17	07:48 08:18-08:49/31 16:54	08:34 15:16-15:50/34 16:26
12	05:31 06:11-06:40/29 21:54	06:15 21:09	07:06 07:31-07:39/8 20:01	07:55 17:42-18:18/36 18:52 08:21-08:34/13	07:50 08:20-08:49/29 16:52	08:35 15:16-15:50/34 16:26
13	05:33 06:11-06:40/29 21:53	06:17 07:26-07:35/9 21:07	07:07 07:33-07:37/4 19:59	07:57 17:42-18:16/34 18:50 08:23-08:32/9	07:52 08:21-08:48/27 16:51	08:36 15:17-15:50/33 16:26
14	05:34 06:11-06:39/28 21:52	06:19 07:22-07:38/16 21:05	07:09 08:27-08:31/4 19:56	07:59 17:43-18:13/30 18:48 08:24-08:27/3	07:54 08:23-08:47/24 16:49	08:37 15:17-15:51/34 16:26
15	05:35 06:11-06:39/28 21:51	06:20 07:21-07:40/19 21:03	07:11 08:21-08:38/17 19:54	08:00 17:44-18:09/25 18:45	07:55 08:25-08:47/22 16:48	08:38 15:18-15:51/33 16:26
16	05:36 06:11-06:39/28 21:50	06:22 07:19-07:41/22 21:01	07:12 08:17-08:40/23 19:52	08:02 17:46-18:08/22 18:43	07:57 08:27-08:46/19 16:46	08:39 15:17-15:51/34 16:27
17	05:37 06:12-06:39/27 21:49	06:23 07:18-07:42/24 20:59	07:14 08:14-08:42/28 19:49	08:04 17:49-18:06/17 18:41	07:59 15:27-15:35/8 16:45	08:39 15:18-15:51/33 16:27
18	05:38 06:12-06:38/26 21:48	06:25 07:16-07:42/26 20:57	07:15 08:13-08:44/31 19:47	08:06 18:39	08:01 15:25-15:37/12 16:44 08:31-08:45/14	08:40 15:18-15:52/34 16:27
19	05:40 06:13-06:39/26 21:47	06:27 07:16-07:43/27 20:54	07:17 08:10-08:45/35 19:45	08:07 18:37	08:02 15:24-15:39/15 16:42 08:33-08:44/11	08:41 15:19-15:52/33 16:27
20	05:41 06:14-06:38/24 21:45	06:28 07:14-07:43/29 20:52	07:19 08:09-08:46/37 19:42	08:09 09:24-09:32/8 18:35	08:04 15:23-15:41/18 16:41 08:35-08:44/9	08:42 15:19-15:52/33 16:28
21	05:42 06:14-06:37/23 21:44	06:30 07:14-07:44/30 20:50	07:20 08:07-08:47/40 19:40	08:11 09:20-09:37/17 18:33	08:06 15:22-15:41/19 16:40 08:36-08:42/6	08:42 15:20-15:53/33 16:28
22	05:44 06:15-06:36/21 21:43	06:32 07:13-07:44/31 20:48	07:22 08:06-08:48/42 19:38	08:13 09:17-09:40/23 18:31	08:07 15:21-15:42/21 16:39 08:38-08:40/2	08:43 15:20-15:53/33 16:28
23	05:45 06:16-06:36/20 21:42	06:33 07:13-07:44/31 20:46	07:24 08:05-08:48/43 19:35	08:14 09:15-09:42/27 18:29	08:09 15:21-15:43/22 16:38	08:43 15:21-15:54/33 16:29
24	05:46 06:17-06:35/18 21:40	06:35 07:12-07:43/31 20:44	07:25 08:04-08:48/44 19:33	08:16 09:13-09:44/31 18:26	08:11 15:21-15:44/23 16:37	08:44 15:21-15:54/33 16:30
25	05:48 06:18-06:33/15 21:39	06:36 07:12-07:43/31 20:42	07:27 08:03-08:49/46 19:31	07:18 08:12-08:45/33 17:24	08:12 15:20-15:44/24 16:36	08:44 15:21-15:55/34 16:30
26	05:49 06:21-06:32/11 21:38	06:38 07:13-07:43/30 20:40	07:28 08:02-08:48/46 19:28	07:20 08:11-08:46/35 17:22	08:14 15:21-15:45/24 16:35	08:44 15:22-15:55/33 16:31
27	05:51 06:24-06:28/4 21:36	06:40 07:12-07:43/31 20:37	07:30 08:01-08:48/47 19:26	07:21 08:10-08:47/37 17:20	08:15 15:20-15:45/25 16:34	08:45 15:23-15:56/33 16:32
28	05:52 06:38-07:02/24 21:35	06:41 07:12-07:44/32 20:35	07:32 08:01-08:49/48 19:24	07:23 08:08-08:47/39 17:19	08:17 15:18-15:46/28 16:33	08:45 15:23-15:57/34 16:32
29	05:54 06:38-07:02/24 21:33	06:43 07:11-07:44/33 20:33	07:33 08:00-08:48/48 19:22	07:25 08:08-08:48/40 17:17	08:18 15:16-15:46/30 16:32	08:45 15:24-15:57/33 16:33
30	05:55 06:38-07:02/24 21:31	06:45 07:12-07:44/32 20:31	07:35 17:58-18:09/11 19:19	07:27 08:07-08:48/41 17:15	08:20 15:16-15:47/31 16:31	08:45 15:24-15:58/34 16:34
31	05:57 06:38-07:03/25 21:30	06:46 07:12-07:44/32 20:29	 	07:29 08:07-08:49/42 17:13	 	08:45 15:25-15:59/34 16:35
Potential sun hours	502	454	381	331	266	244
Sum of minutes with flicker	950	709	882	1307	917	1036

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:58/3.5.584

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 2WTG: 17 - Derragh
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 16:36	08:18 16:04-16:34/30 17:24	07:25 18:16	07:14 20:10	07:53-08:11/18 21:00	06:10 21:46
2	08:45 16:38	08:17 16:04-16:42/38 17:26	07:23 18:18	07:12 20:11	07:55-08:10/15 21:02	06:08 21:47
3	08:45 16:39	08:15 16:03-16:45/42 17:28	07:21 18:19	07:10 20:13	07:57-08:07/10 21:04	06:06 21:48
4	08:45 16:40	08:14 16:02-16:48/46 17:30	07:18 18:21	07:08 20:15	06:04 21:05	05:22 21:49
5	08:44 16:41	08:12 16:02-16:51/49 17:32	07:16 18:23	07:05 20:16	06:02 21:07	05:22 21:50
6	08:44 16:42	08:10 16:02-16:53/51 17:33	07:14 18:25	07:03 20:18	06:00 21:09	05:21 21:51
7	08:44 16:43	08:08 16:02-16:54/52 17:35	07:12 18:26	07:01 20:20	05:59 21:10	05:20 21:52
8	08:43 16:45	08:07 16:02-16:55/53 17:37	07:09 18:28	06:58 20:22	05:57 21:12	05:20 21:53
9	08:43 16:46	08:05 16:02-16:56/54 17:39	07:07 18:30	06:56 20:23	05:55 21:14	05:19 21:54
10	08:42 16:48	08:03 16:02-16:57/55 17:41	07:05 18:32	06:54 20:25	05:53 21:15	05:19 21:55
11	08:42 16:49	08:01 16:02-16:57/55 17:43	07:03 18:34	06:52 20:27	07:16-07:25/9 21:17	05:19 21:55
12	08:41 16:50	07:59 16:02-16:57/55 17:45	07:00 18:35	06:50 20:28	07:13-07:27/14 21:18	05:18 21:56
13	08:40 16:52	07:58 16:03-16:57/54 17:46	06:58 18:37	06:47 20:30	07:11-07:27/16 21:20	05:18 21:57
14	08:40 16:53	07:56 16:03-16:57/54 17:48	06:56 18:39	06:45 20:32	07:10-07:28/18 21:22	05:18 21:57
15	08:39 16:55	07:54 16:04-16:57/53 17:50	06:54 18:40	06:43 20:33	07:09-07:28/19 21:23	05:18 21:58
16	08:38 16:56	07:52 16:05-16:57/52 17:52	06:51 18:42	06:41 20:35	07:09-07:29/20 21:25	05:17 21:59
17	08:37 16:58	07:50 16:07-16:57/50 17:54	06:49 18:44	06:39 20:37	07:02-07:29/27 21:26	05:17 21:59
18	08:36 17:00	07:48 16:09-16:56/47 17:56	06:47 18:46	07:10-07:13/3 20:39	06:36 21:28	05:17 21:59
19	08:35 17:01	07:46 16:12-16:55/43 17:58	06:44 18:47	07:07-07:14/7 20:40	06:34 21:29	05:17 22:00
20	08:34 17:03	07:44 16:35-16:54/19 17:59	06:42 18:49	07:05-07:15/10 20:42	06:32 21:31	05:17 22:00
21	08:33 17:05	07:42 16:36-16:52/16 18:01	06:40 18:51	07:03-07:16/13 20:44	06:30 21:32	05:18 22:00
22	08:32 17:06	07:40 16:39-16:50/11 18:03	06:38 18:53	07:00-07:16/16 20:45	06:28 21:33	05:18 22:01
23	08:31 17:08	07:38 18:05	06:35 18:54	06:58-07:16/18 20:47	06:26 21:35	05:18 22:01
24	08:29 17:10	07:36 18:07	06:33 18:56	06:56-07:16/20 20:49	06:24 21:36	05:18 22:01
25	08:28 17:12	07:34 18:09	06:31 18:58	06:53-07:16/23 20:50	06:22 21:38	05:19 22:01
26	08:27 17:13	07:31 18:10	06:28 18:59	06:53-07:16/23 20:52	06:20 21:39	05:19 22:01
27	08:26 17:15	16:11-16:19/8 18:12	06:26 19:01	06:52-07:16/24 20:54	06:18 21:40	05:19 22:01
28	08:24 17:17	16:09-16:22/13 18:14	06:24 19:03	06:51-07:15/24 20:55	06:16 21:41	05:20 22:01
29	08:23 17:19	16:07-16:24/17 18:15	07:21 20:05	07:52-08:15/23 20:57	06:14 21:43	05:27 22:01
30	08:21 17:21	16:06-16:29/23 18:16	07:19 20:06	07:52-08:14/22 20:59	06:12 21:44	05:27 22:00
31	08:20 17:22	16:05-16:32/27 18:17	07:17 20:08	07:52-08:12/20 20:59	05:26 21:45	05:21 22:00
Potential sun hours	259	278	367	416	485	499
Sum of minutes with flicker	88	1002	246	508	40	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:58/3.5.584

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 2WTG: 17 - Derragh

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22 22:00	05:58 21:28	06:48 07:15-07:24/9 20:26	07:37 19:17	07:30 15:31-16:26/55 17:11	08:21 16:31
2	05:22 22:00	06:00 21:27	06:49 20:24	07:38 19:15	07:32 15:31-16:26/55 17:09	08:23 16:30
3	05:23 21:59	06:01 21:25	06:51 20:22	07:40 19:12	07:34 15:31-16:25/54 17:07	08:24 16:29
4	05:24 21:59	06:03 21:23	06:53 20:19	07:42 19:10	07:36 15:31-16:24/53 17:05	08:25 16:29
5	05:25 21:58	06:04 21:21	06:54 20:17	07:43 19:08	07:38 15:32-16:23/51 17:04	08:27 16:28
6	05:26 21:58	06:06 21:20	06:56 20:15	07:45 19:05	07:39 15:32-16:21/49 17:02	08:28 16:28
7	05:26 21:57	06:07 21:18	06:58 20:13	07:47 19:03	07:41 15:33-16:18/45 17:00	08:29 16:27
8	05:27 21:57	06:09 21:16	06:59 20:10	07:48 19:01	07:43 15:34-16:16/42 16:59	08:31 16:27
9	05:28 21:56	06:11 07:09-07:14/5 21:14	07:01 07:50-08:00/10 20:08	07:50 18:59	07:45 15:34-16:12/38 16:57	08:32 16:27
10	05:29 21:55	06:12 07:05-07:17/12 21:12	07:02 07:48-08:03/15 20:06	07:52 18:56	07:46 15:35-16:06/31 16:55	08:33 16:27
11	05:30 21:55	06:14 07:04-07:19/15 21:10	07:04 07:45-08:03/18 20:03	07:54 18:54	07:48 15:36-16:03/27 16:54	08:34 16:26
12	05:31 21:54	06:15 07:02-07:20/18 21:08	07:06 07:44-08:05/21 20:01	07:55 18:52	07:50 15:37-16:00/23 16:52	08:35 16:26
13	05:32 21:53	06:17 07:01-07:21/20 21:07	07:07 07:44-08:06/22 19:59	07:57 18:50	07:52 15:39-15:56/17 16:51	08:36 16:26
14	05:34 21:52	06:19 07:00-07:21/21 21:05	07:09 07:42-08:05/23 19:56	07:59 18:48	07:54 15:41-15:54/13 16:49	08:37 16:26
15	05:35 21:51	06:20 07:00-07:22/22 21:03	07:10 07:42-08:05/23 19:54	08:00 18:45	07:55 15:44-15:51/7 16:48	08:38 16:26
16	05:36 21:50	06:22 06:59-07:22/23 21:01	07:12 07:41-08:05/24 19:52	08:02 18:43	07:57 16:46	08:39 16:27
17	05:37 21:49	06:23 06:59-07:22/23 20:59	07:14 07:41-08:05/24 19:49	08:04 18:41	07:59 16:45	08:39 16:27
18	05:38 21:48	06:25 06:58-07:21/23 20:57	07:15 07:41-08:04/23 19:47	08:06 18:39	08:00 16:44	08:40 16:27
19	05:40 21:47	06:27 06:58-07:26/28 20:54	07:17 07:42-08:03/21 19:45	08:07 17:13-17:17/4 18:37	08:02 16:42	08:41 16:27
20	05:41 21:45	06:28 06:57-07:28/31 20:52	07:19 07:44-08:02/18 19:42	08:09 17:08-17:21/13 18:35	08:04 16:41	08:42 16:28
21	05:42 21:44	06:30 06:58-07:30/32 20:50	07:20 07:45-08:01/16 19:40	08:11 17:06-17:23/17 18:33 16:52-17:03/11	08:06 16:40	08:42 16:28
22	05:44 21:43	06:32 06:58-07:30/32 20:48	07:22 07:47-08:01/14 19:38	08:13 16:45-17:25/40 18:31	08:07 16:39	08:43 16:28
23	05:45 21:42	06:33 07:00-07:31/31 20:46	07:24 07:49-08:00/11 19:35	08:14 16:41-17:26/45 18:28	08:09 16:38	08:43 16:29
24	05:46 21:40	06:35 07:01-07:32/31 20:44	07:25 07:50-07:58/8 19:33	08:16 16:39-17:27/48 18:26	08:11 16:37	08:44 16:30
25	05:48 21:39	06:36 07:03-07:31/28 20:42	07:27 07:52-07:56/4 19:31	07:18 15:37-16:27/50 17:24	08:12 16:36	08:44 16:30
26	05:49 21:37	06:38 07:05-07:31/26 20:40	07:28 19:28	07:20 15:36-16:27/51 17:22	08:14 16:35	08:44 16:31
27	05:51 21:36	06:40 07:11-07:30/19 20:37	07:30 19:26	07:21 15:34-16:27/53 17:20	08:15 16:34	08:45 16:32
28	05:52 21:35	06:41 07:11-07:30/19 20:35	07:32 19:24	07:23 15:33-16:27/54 17:18	08:17 16:33	08:45 16:32
29	05:54 21:33	06:43 07:11-07:29/18 20:33	07:33 19:22	07:25 15:32-16:27/55 17:17	08:18 16:32	08:45 16:33
30	05:55 21:31	06:45 07:12-07:28/16 20:31	07:35 19:19	07:27 15:32-16:27/55 17:15	08:20 16:31	08:45 16:34
31	05:57 21:30	06:46 07:12-07:26/14 20:29		07:29 15:31-16:27/56 17:13		08:45 16:35
Potential sun hours	502	454	381	331	266	244
Sum of minutes with flicker	0	507	304	552	560	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 2WTG: 18 - Derragh
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 14:35-15:02/27 16:36 13:16-14:16/60	08:18 14:35-15:25/50 17:24 13:25-14:30/65	07:25 07:14 18:16 20:10	06:10 21:00	05:25 06:25-06:55/30 21:46	
2	08:45 14:35-15:04/29 16:37 13:17-14:17/60	08:17 14:36-15:26/50 17:26 13:27-14:30/63	07:23 07:12 18:18 20:11	06:08 21:02	05:24 06:26-06:56/30 21:47	
3	08:45 14:35-15:06/31 16:39 13:17-14:18/61	08:15 14:37-15:25/48 17:28 13:27-14:30/63	07:21 07:10 18:19 20:13	06:06 21:04	05:23 06:26-06:56/30 21:48	
4	08:45 14:35-15:07/32 16:40 13:17-14:18/61	08:13 14:37-15:24/47 17:30 13:28-14:29/61	07:18 07:08 18:21 20:15	06:04 21:05	05:22 06:26-06:55/29 21:49	
5	08:44 14:35-15:08/33 16:41 13:17-14:19/62	08:12 14:39-15:24/45 17:32 13:30-14:29/59	07:16 07:05 18:23 20:16	06:02 21:07	05:21 06:27-06:56/29 21:50	
6	08:44 14:35-15:10/35 16:42 13:18-14:20/62	08:10 14:40-15:23/43 17:33 13:32-14:28/56	07:14 07:01 18:25 20:18	06:00 21:09	05:21 06:27-06:55/28 21:51	
7	08:44 14:34-15:11/37 16:43 13:18-14:21/63	08:08 14:40-15:21/41 17:35 13:33-14:27/54	07:12 07:01 18:26 20:20	05:59 21:10	05:20 06:28-06:55/27 21:52	
8	08:43 14:34-15:12/38 16:45 13:17-14:21/64	08:07 14:42-15:20/38 17:37 13:35-14:25/50	07:09 06:58 18:28 20:22	05:57 21:12	05:20 06:27-06:55/28 21:53	
9	08:43 14:34-15:14/40 16:46 13:18-14:22/64	08:05 14:43-15:17/34 17:39 13:38-14:23/45	07:07 06:56 18:30 20:23	05:55 06:37-06:43/6 21:14	05:19 06:28-06:55/27 21:54	
10	08:42 14:34-15:14/40 16:47 13:18-14:23/65	08:03 14:45-15:13/28 17:41 13:42-14:21/39	07:05 06:54 18:32 20:25	05:53 06:33-06:46/13 21:15	05:19 06:29-06:55/26 21:55	
11	08:42 14:34-15:15/41 16:49 13:18-14:23/65	08:01 14:47-15:10/23 17:43 14:00-14:18/18	07:03 06:52 18:33 20:27	05:52 06:30-06:47/17 21:17	05:18 06:29-06:55/26 21:55	
12	08:41 14:33-15:16/43 16:50 13:18-14:24/66	07:59 14:50-15:07/17 17:45 14:08-14:11/3	07:00 06:49 18:35 20:28	05:50 06:29-06:49/20 21:18	05:18 06:29-06:55/26 21:56	
13	08:40 14:34-15:18/44 16:52 13:19-14:26/67	07:58 14:55-15:03/8 17:46	06:58 06:47 18:37 20:30	05:48 06:28-06:50/22 21:20	05:18 06:30-06:55/25 21:57	
14	08:40 14:34-15:19/45 16:53 13:19-14:26/67	07:56 17:48	06:56 06:45 18:39 20:32	05:47 06:27-06:51/24 21:21	05:18 06:30-06:55/25 21:57	
15	08:39 14:33-15:20/47 16:55 13:19-14:27/68	07:54 17:50	06:54 06:43 18:40 20:33	05:45 06:27-06:52/25 21:23	05:17 06:31-06:55/24 21:58	
16	08:38 14:33-15:21/48 16:56 13:19-14:27/68	07:52 17:52	06:51 06:41 18:42 20:35	05:44 06:25-06:52/27 21:25	05:17 06:31-06:56/25 21:58	
17	08:37 14:33-15:21/48 16:58 13:20-14:28/68	07:50 17:54	06:49 06:39 18:44 20:37	05:42 06:25-06:53/28 21:26	05:17 06:31-06:56/25 21:59	
18	08:36 14:32-15:21/49 17:00 13:19-14:28/69	07:48 17:56	06:47 06:36 18:46 20:38	05:41 06:24-06:53/29 21:28	05:17 06:32-06:56/24 21:59	
19	08:35 14:33-15:22/49 17:01 13:19-14:28/69	07:46 17:58	06:44 06:34 18:47 20:40	05:39 06:24-06:54/30 21:29	05:17 06:32-06:56/24 22:00	
20	08:34 14:33-15:23/50 17:03 13:20-14:29/69	07:44 17:59	06:42 06:32 18:49 20:42	05:38 06:24-06:54/30 21:31	05:17 06:32-06:56/24 22:00	
21	08:33 14:33-15:24/51 17:05 13:20-14:30/70	07:42 18:01	06:40 06:30 18:51 20:44	05:37 06:24-06:55/31 21:32	05:18 06:32-06:56/24 22:00	
22	08:32 14:33-15:25/52 17:06 13:21-14:30/69	07:40 18:03	06:37 06:28 18:53 20:45	05:35 06:24-06:55/31 21:33	05:18 06:32-06:56/24 22:01	
23	08:31 14:33-15:24/51 17:08 13:20-14:30/70	07:38 18:05	06:35 06:26 18:54 20:47	05:34 06:23-06:55/32 21:35	05:18 06:33-06:57/24 22:01	
24	08:29 14:33-15:25/52 17:10 13:21-14:31/70	07:36 18:07	06:33 06:24 18:56 20:49	05:33 06:23-06:55/32 21:36	05:18 06:33-06:57/24 22:01	
25	08:28 14:33-15:25/52 17:12 13:21-14:30/69	07:33 18:08	06:31 06:22 18:58 20:50	05:32 06:23-06:55/32 21:37	05:19 06:33-06:57/24 22:01	
26	08:27 14:33-15:26/53 17:13 13:22-14:31/69	07:31 18:10	06:28 06:20 18:59 20:52	05:31 06:23-06:55/32 21:39	05:19 06:33-06:58/25 22:01	
27	08:25 14:33-15:25/52 17:15 13:22-14:31/69	07:29 18:12	06:26 06:18 19:01 20:54	05:29 06:23-06:55/32 21:40	05:19 06:33-06:57/24 22:01	
28	08:24 14:34-15:26/52 17:17 13:23-14:31/68	07:27 18:14	06:24 06:16 19:03 20:55	05:28 06:24-06:55/31 21:41	05:20 06:34-06:58/24 22:01	
29	08:23 14:34-15:26/52 17:19 13:23-14:31/68		07:21 06:14 20:04 20:57	05:27 06:25-06:56/31 21:43	05:20 06:33-06:58/25 22:00	
30	08:21 14:35-15:26/51 17:21 13:24-14:31/67		07:19 06:12 20:06 20:59	05:26 06:25-06:56/31 21:44	05:21 06:33-06:59/26 22:00	
31	08:20 14:35-15:26/51 17:22 13:25-14:31/66		07:17 20:08	05:25 06:25-06:56/31 21:45		
Potential sun hours	259	278	367	416	485	499
Sum of minutes with flicker	3428	1048	0	0	617	776

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 2WTG: 18 - Derragh
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22 06:33-06:59/26 22:00	05:58 06:40-06:59/19 21:28	06:48 07:37 20:26	07:37 19:17	07:30 14:14-14:44/30 17:11 13:11-13:51/40	08:21 14:16-14:57/41 16:31 13:00-14:06/66
2	05:22 06:33-07:00/27 22:00	06:00 06:41-06:57/16 21:27	06:49 20:24	07:38 19:15	07:32 14:12-14:47/35 17:09 13:07-13:53/46	08:23 14:17-14:58/41 16:30 13:01-14:06/65
3	05:23 06:33-07:00/27 21:59	06:01 06:44-06:55/11 21:25	06:51 20:22	07:40 19:12	07:34 14:11-14:50/39 17:07 13:05-13:55/50	08:24 14:17-14:57/40 16:29 13:01-14:06/65
4	05:24 06:33-07:00/27 21:59	06:03 21:23	06:53 20:19	07:42 19:10	07:36 14:10-14:51/41 17:05 13:03-13:56/53	08:25 14:19-14:57/38 16:29 13:02-14:06/64
5	05:25 06:33-07:01/28 21:58	06:04 21:21	06:54 20:17	07:43 19:08	07:38 14:09-14:53/44 17:04 13:01-13:58/57	08:27 14:19-14:56/37 16:28 13:03-14:06/63
6	05:25 06:33-07:01/28 21:58	06:06 21:20	06:56 20:15	07:45 19:05	07:39 14:08-14:54/46 17:02 13:00-13:59/59	08:28 14:20-14:55/35 16:28 13:04-14:05/61
7	05:26 06:33-07:02/29 21:57	06:07 21:18	06:57 20:13	07:47 19:03	07:41 14:08-14:55/47 17:00 12:59-14:00/61	08:29 14:22-14:56/34 16:27 13:04-14:06/62
8	05:27 06:33-07:02/29 21:57	06:09 21:16	06:59 20:10	07:48 19:01	07:43 14:07-14:56/49 16:59 12:58-14:01/63	08:30 14:23-14:55/32 16:27 13:05-14:06/61
9	05:28 06:33-07:03/30 21:56	06:11 21:14	07:01 20:08	07:50 18:59	07:45 14:07-14:56/49 16:57 12:57-14:01/64	08:32 14:23-14:54/31 16:27 13:05-14:06/61
10	05:29 06:33-07:03/30 21:55	06:12 21:12	07:02 20:06	07:52 18:56	07:46 14:07-14:57/50 16:55 12:57-14:02/65	08:33 14:24-14:53/29 16:27 13:06-14:06/60
11	05:30 06:33-07:04/31 21:54	06:14 21:10	07:04 20:03	07:53 18:54	07:48 14:06-14:57/51 16:54 12:55-14:02/67	08:34 14:26-14:53/27 16:26 13:07-14:07/60
12	05:31 06:33-07:04/31 21:54	06:15 21:08	07:06 20:01	07:55 18:52	07:50 14:06-14:57/51 16:52 12:55-14:02/67	08:35 14:27-14:52/25 16:26 13:08-14:07/59
13	05:32 06:33-07:04/31 21:53	06:17 21:07	07:07 19:59	07:57 18:50	07:52 14:06-14:58/52 16:51 12:55-14:03/68	08:36 14:28-14:51/23 16:26 13:09-14:07/58
14	05:34 06:33-07:04/31 21:52	06:19 21:05	07:09 19:56	07:59 18:48	07:54 14:06-14:58/52 16:49 12:55-14:03/68	08:37 14:29-14:47/18 16:26 13:09-14:07/58
15	05:35 06:33-07:04/31 21:51	06:20 21:03	07:10 19:54	08:00 18:45	07:55 14:06-14:58/52 16:48 12:55-14:04/69	08:38 14:30-14:47/17 16:26 13:10-14:08/58
16	05:36 06:33-07:05/32 21:50	06:22 21:01	07:12 19:52	08:02 18:43	07:57 14:06-14:59/53 16:46 12:55-14:04/69	08:39 14:30-14:46/16 16:26 13:10-14:07/57
17	05:37 06:33-07:05/32 21:49	06:23 20:59	07:14 19:49	08:04 18:41	07:59 14:07-14:59/52 16:45 12:55-14:04/69	08:39 14:32-14:46/14 16:27 13:11-14:07/56
18	05:38 06:33-07:05/32 21:48	06:25 20:56	07:15 19:47	08:06 18:39	08:00 14:07-14:59/52 16:44 12:55-14:05/70	08:40 14:33-14:46/13 16:27 13:11-14:08/57
19	05:40 06:34-07:05/31 21:47	06:27 20:54	07:17 19:45	08:07 18:37	08:02 14:08-14:59/51 16:42 12:55-14:05/70	08:41 14:34-14:47/13 16:27 13:12-14:09/57
20	05:41 06:34-07:05/31 21:45	06:28 20:52	07:19 19:42	08:09 18:35	08:04 14:08-15:00/52 16:41 12:56-14:05/69	08:42 14:34-14:46/12 16:28 13:12-14:09/57
21	05:42 06:34-07:05/31 21:44	06:30 20:50	07:20 19:40	08:11 18:33	08:06 14:08-14:59/51 16:40 12:55-14:05/70	08:42 14:35-14:47/12 16:28 13:13-14:09/56
22	05:44 06:34-07:05/31 21:43	06:32 20:48	07:22 19:38	08:13 18:31	08:07 14:09-14:59/50 16:39 12:56-14:05/69	08:43 14:35-14:47/12 16:28 13:13-14:09/56
23	05:45 06:34-07:05/31 21:42	06:33 20:46	07:23 19:35	08:14 18:28	08:09 14:10-14:59/49 16:38 12:56-14:05/69	08:43 14:36-14:48/12 16:29 13:14-14:10/56
24	05:46 06:34-07:05/31 21:40	06:35 20:44	07:25 19:33	08:16 18:26	08:10 14:11-14:59/48 16:37 12:57-14:06/69	08:44 14:36-14:48/12 16:30 13:14-14:11/57
25	05:48 06:35-07:04/29 21:39	06:36 20:42	07:27 19:31	08:18 17:24	08:12 14:10-14:58/48 16:36 12:57-14:05/68	08:44 14:36-14:49/13 16:30 13:14-14:11/57
26	05:49 06:36-07:04/28 21:37	06:38 20:40	07:28 19:28	08:20 17:22	08:14 14:11-14:59/48 16:35 12:57-14:05/68	08:44 14:36-14:50/14 16:31 13:15-14:11/56
27	05:51 06:36-07:04/28 21:36	06:40 20:37	07:30 19:26	08:21 17:20	08:15 14:13-14:59/46 16:34 12:58-14:06/68	08:45 14:37-14:51/14 16:32 13:16-14:13/57
28	05:52 06:36-07:03/27 21:34	06:41 20:35	07:32 19:24	08:23 17:18	08:17 14:13-14:58/45 16:33 12:59-14:05/66	08:45 14:36-14:52/16 16:32 13:16-14:13/57
29	05:54 06:37-07:02/25 21:33	06:43 20:33	07:33 19:21	08:25 17:17	08:18 14:14-14:58/44 16:32 12:59-14:06/67	08:45 14:36-14:53/17 16:33 13:16-14:14/58
30	05:55 06:38-07:01/23 21:31	06:45 20:31	07:35 19:19	08:27 17:15	08:20 14:15-14:58/43 16:31 13:00-14:06/66	08:45 14:36-14:55/19 16:34 13:16-14:15/59
31	05:57 06:38-07:00/22 21:30	06:46 20:28		08:29 17:13	14:16-14:40/24 13:29-13:48/19	08:45 14:36-15:00/24 16:35 13:17-14:16/59
Potential sun hours	502	454	381	331	266	244
Sum of minutes with flicker	900	46	0	81	3344	2534

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:58/3.5.584

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 2WTG: 19 - Derragh
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
--	---------	----------	-------	-------	-----	------

1	08:45 14:46-15:22/36 16:36 14:04-14:45/41	08:18 17:24 18:16	07:25 18:16	07:14 20:10	06:10 07:15-07:53/38 21:00	05:25 21:46
2	08:45 14:47-15:22/35 16:38 14:05-14:45/40	08:17 17:26 18:18	07:23 18:18	07:12 20:11	06:08 07:15-07:52/37 21:02	05:24 21:47
3	08:45 14:48-15:23/35 16:39 14:06-14:46/40	08:15 17:28 18:19	07:21 18:19	07:10 20:13	06:06 07:17-07:52/35 21:04	05:23 21:48
4	08:45 14:47-15:23/36 16:40 14:06-14:45/39	08:13 17:30 18:21	07:18 18:21	07:08 20:15	06:04 07:17-07:51/34 21:05	05:22 21:49
5	08:44 14:48-15:23/35 16:41 14:07-14:46/39	08:12 17:32 18:23	07:16 18:23	07:05 20:16	06:02 07:18-07:49/31 21:07	05:22 21:50
6	08:44 14:50-15:24/34 16:42 14:09-14:46/37	08:10 17:33 18:25	07:14 18:25	07:03 20:18	06:00 07:19-07:48/29 21:09	05:21 21:51
7	08:44 14:50-15:24/34 16:43 14:09-14:46/37	08:08 17:35 18:26	07:12 18:26	07:01 20:20	05:59 07:20-07:47/27 21:10	05:20 21:52
8	08:43 14:50-15:24/34 16:45 14:10-14:45/35	08:07 17:37 18:28	07:09 18:28	06:58 20:22	05:57 07:21-07:45/24 21:12	05:20 21:53
9	08:43 14:51-15:25/34 16:46 14:12-14:46/34	08:05 17:39 18:30	07:07 18:30	06:56 20:23	05:55 07:24-07:44/20 21:14	05:19 21:54
10	08:42 14:52-15:25/33 16:47 14:13-14:45/32	08:03 17:41 18:32	07:05 18:32	06:54 07:32-07:47/15 20:25	05:53 07:26-07:41/15 21:15	05:19 21:55
11	08:42 14:52-15:24/32 16:49 14:15-14:45/30	08:01 17:43 18:33	07:03 18:33	06:52 07:29-07:50/21 20:27	05:52 07:29-07:36/7 21:17	05:19 21:55
12	08:41 14:53-15:24/31 16:50 14:17-14:44/27	07:59 17:45 18:35	07:00 18:35	06:50 07:26-07:51/25 20:28	05:50 07:26-07:51/25 21:18	05:18 21:56
13	08:40 14:55-15:25/30 16:52 14:28-14:44/16	07:58 17:46 18:37	06:58 18:37	06:47 07:24-07:53/29 20:30	05:48 07:24-07:53/29 21:20	05:18 21:57
14	08:40 14:56-15:25/29 16:53 14:30-14:42/12	07:56 17:48 18:39	06:56 18:39	06:45 07:22-07:54/32 20:32	05:47 07:22-07:54/32 21:22	05:18 21:57
15	08:39 14:57-15:25/28 16:55 14:33-14:40/7	07:54 17:50 18:40	06:54 18:40	06:43 07:21-07:55/34 20:33	05:45 07:21-07:55/34 21:23	05:18 21:58
16	08:38 14:58-15:24/26 16:56 17:52	07:52 17:52 18:42	06:51 18:42	06:41 07:20-07:56/36 20:35	05:44 07:20-07:56/36 21:25	05:17 21:58
17	08:37 15:00-15:24/24 16:58 17:54	07:50 17:54 18:44	06:49 18:44	06:39 07:19-07:57/38 20:37	05:42 07:19-07:57/38 21:26	05:17 21:59
18	08:36 15:01-15:22/21 17:00 17:56	07:48 17:56 18:46	06:47 18:46	06:36 07:18-07:57/39 20:39	05:41 07:18-07:57/39 21:28	05:17 21:59
19	08:35 15:03-15:21/18 17:01 17:58	07:46 17:58 18:47	06:44 18:47	06:34 07:17-07:57/40 20:40	05:39 07:17-07:57/40 21:29	05:17 22:00
20	08:34 15:06-15:18/12 17:03 17:59	07:44 17:59 18:49	06:42 18:49	06:32 07:17-07:58/41 20:42	05:38 07:17-07:58/41 21:31	05:17 22:00
21	08:33 17:05 17:06 18:01	07:42 18:01 18:51	06:40 18:51	06:30 07:16-07:58/42 20:44	05:37 07:16-07:58/42 21:32	05:18 22:00
22	08:32 17:06 17:08 18:03	07:40 18:03 18:53	06:37 18:53	06:28 07:15-07:57/42 20:45	05:35 07:15-07:57/42 21:33	05:18 22:00
23	08:31 17:08 17:09 18:05	07:38 18:05 18:54	06:35 18:54	06:26 07:14-07:57/43 20:47	05:34 07:14-07:57/43 21:35	05:18 22:01
24	08:29 17:10 17:11 18:07	07:36 18:07 18:56	06:33 18:56	06:24 07:14-07:57/43 20:49	05:33 07:14-07:57/43 21:36	05:18 22:01
25	08:28 17:12 17:13 18:09	07:33 18:09 18:58	06:31 18:58	06:22 07:15-07:57/42 20:50	05:32 07:15-07:57/42 21:37	05:19 22:01
26	08:27 17:13 17:14 18:10	07:31 18:10 18:59	06:28 18:59	06:20 07:15-07:57/42 20:52	05:31 07:15-07:57/42 21:39	05:19 22:01
27	08:25 17:15 17:16 18:12	07:29 18:12 19:01	06:26 19:01	06:18 07:15-07:56/41 20:54	05:29 07:15-07:56/41 21:40	05:19 22:01
28	08:24 17:17 17:18 18:14	07:27 18:14 19:03	06:24 19:03	06:16 07:15-07:56/41 20:55	05:28 07:15-07:56/41 21:41	05:20 22:01
29	08:23 17:19 17:20 18:19	07:25 18:19 19:04	06:22 19:04	06:14 07:15-07:55/40 20:57	05:27 07:15-07:55/40 21:43	05:20 22:00
30	08:21 17:21 17:22 18:20	07:23 18:20 19:06	06:20 19:06	06:12 07:15-07:54/39 20:59	05:26 07:15-07:54/39 21:44	05:21 22:00
31	08:20 17:22	07:21 18:20	06:19 19:05	06:11 07:15-07:54/39	05:25 07:15-07:54/39	05:21 22:00
Potential sun hours	259	278	367	416	485	499
Sum of minutes with flicker	1063	0	0	765	297	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 2WTG: 19 - Derragh
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (July-December) and rows for days (1-31). Includes sub-headers for 'Potential sun hours' and 'Sum of minutes with flicker'.

Table layout: For each day in each month the following matrix apply

Matrix with 2 rows and 3 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm); First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:58/3.5.584

SHADOW - Calendar per WTG

Calculation: Alternative Scenario 2WTG: 20 - Derragh
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June	July	August	September	October	November	December	
1	08:45	08:18	07:25	07:14	06:10	05:25	05:22	05:58	06:48	07:37	08:02-08:10/8	07:30	08:21
	16:36	17:24	18:16	20:10	21:00	21:46	22:00	21:28	20:26	19:17		17:11	16:31
2	08:45	08:17	07:23	07:12	06:08	05:24	05:22	06:00	06:49	07:38	08:03-08:06/3	07:32	08:23
	16:38	17:26	18:18	20:11	21:02	21:47	22:00	21:27	20:24	19:15		17:09	16:30
3	08:45	08:15	07:21	07:10	06:06	05:23	05:23	06:01	06:51	07:40		07:34	08:24
	16:39	17:28	18:19	20:13	21:04	21:48	21:59	21:25	20:22	19:12		17:07	16:29
4	08:45	08:13	07:18	07:08	06:04	05:22	05:24	06:03	06:53	07:42		07:36	08:25
	16:40	17:30	18:21	20:15	21:05	21:49	21:59	21:23	20:19	19:10		17:05	16:29
5	08:44	08:12	07:16	07:05	06:02	05:22	05:25	06:04	06:54	07:43		07:37	08:27
	16:41	17:32	18:23	20:16	21:07	21:50	21:58	21:21	20:17	19:08		17:04	16:28
6	08:44	08:10	07:14	07:03	06:00	05:21	05:26	06:06	06:56	07:45		07:39	08:28
	16:42	17:33	18:25	20:18	21:09	21:51	21:58	21:20	20:15	19:05		17:02	16:28
7	08:44	08:08	07:12	07:01	05:59	05:20	05:26	06:07	06:57	07:47		07:41	08:29
	16:43	17:35	18:26	20:20	21:10	21:52	21:57	21:18	20:13	19:03		17:00	16:27
8	08:43	08:07	07:09	06:58	05:57	05:20	05:27	06:09	06:59	07:48		07:43	08:30
	16:45	17:37	18:28	20:22	21:12	21:53	21:57	21:16	20:10	19:01		16:59	16:27
9	08:43	08:05	07:07	06:56	05:55	05:19	05:28	06:11	07:01	07:50		07:45	08:32
	16:46	17:39	18:30	20:23	21:14	21:54	21:56	21:14	20:08	18:59		16:57	16:27
10	08:42	08:03	07:05	06:54	05:53	05:19	05:29	06:12	07:02	07:52		07:46	08:33
	16:47	17:41	18:32	20:25	21:15	21:55	21:55	21:12	20:06	18:56		16:55	16:27
11	08:42	08:01	07:03	06:52	05:52	05:19	05:30	06:14	07:04	07:53		07:48	08:34
	16:49	17:43	18:33	20:27	21:17	21:55	21:54	21:10	20:03	18:54		16:54	16:26
12	08:41	07:59	07:00	06:49	05:50	06:49	05:31	06:15	07:06	07:55		07:50	08:35
	16:50	17:45	18:35	20:28	21:18	21:56	21:54	21:08	20:01	18:52		16:52	16:26
13	08:40	07:58	06:58	06:47	05:48	05:18	05:32	06:17	07:07	07:57	08:03-08:15/12	07:52	08:36
	16:52	17:46	18:37	20:30	21:20	21:57	21:53	21:06	19:59	18:50		16:51	16:26
14	08:39	07:56	06:56	06:45	05:47	05:18	05:34	06:19	07:09	07:59	07:59-08:16/17	07:59	08:37
	16:53	17:48	18:39	20:32	21:21	21:57	21:52	21:05	19:56	18:48		16:49	16:26
15	08:39	07:54	06:54	06:43	05:45	05:18	05:35	06:20	07:10	07:57	07:57-08:18/21	08:00	08:38
	16:55	17:50	18:40	20:33	21:23	21:58	21:51	21:03	19:54	18:45		16:48	16:26
16	08:38	07:52	06:51	06:41	05:44	05:17	05:36	06:22	07:12	07:55	07:55-08:19/24	08:02	08:39
	16:56	17:52	18:42	20:35	21:25	21:58	21:50	21:01	19:52	18:43		16:46	16:27
17	08:37	07:50	06:49	06:39	05:42	05:17	05:37	06:23	07:14	07:54	07:54-08:20/26	08:04	08:39
	16:58	17:54	18:44	20:37	21:26	21:59	21:49	20:58	19:49	18:41		16:45	16:27
18	08:36	07:48	06:47	06:36	05:41	05:17	05:38	06:25	07:15	07:52	07:52-08:20/28	08:06	08:40
	17:00	17:56	18:46	20:38	21:28	21:59	21:48	20:56	19:47	18:39		16:44	16:27
19	08:35	07:46	06:44	06:34	05:39	05:17	05:40	06:27	07:17	07:51	07:51-08:21/30	08:07	08:41
	17:01	17:58	18:47	20:40	21:29	22:00	21:47	20:54	19:45	18:37		16:42	16:27
20	08:34	07:44	06:42	06:32	05:38	05:17	05:41	06:28	07:19	07:51	07:51-08:21/30	08:09	08:41
	17:03	17:59	18:49	20:42	21:30	22:00	21:45	20:52	19:42	18:35		16:41	16:28
21	08:33	07:42	06:40	06:30	05:37	05:18	05:42	06:30	07:20	07:49	07:49-08:21/32	08:11	08:42
	17:05	18:01	18:51	20:44	21:32	22:00	21:44	20:50	19:40	18:33		16:40	16:28
22	08:32	07:40	06:37	06:28	05:35	05:18	05:44	06:32	07:22	07:49	07:49-08:21/32	08:13	08:43
	17:06	18:03	18:53	20:45	21:33	22:00	21:43	20:48	19:38	18:31		16:39	16:28
23	08:31	07:38	06:35	06:26	05:34	05:18	05:45	06:33	07:23	07:49	07:49-08:21/32	08:14	08:43
	17:08	18:05	18:54	20:47	21:35	22:01	21:42	20:46	19:35	18:28		16:38	16:29
24	08:29	07:36	06:33	06:24	05:33	05:18	05:46	06:35	07:25	07:50	07:50-08:20/30	08:16	08:44
	17:10	18:07	18:56	20:49	21:36	22:01	21:40	20:44	19:33	18:26		16:37	16:30
25	08:28	07:33	06:31	06:22	05:32	05:19	05:48	06:36	07:27	07:52	07:52-08:19/27	07:18	08:44
	17:12	18:08	18:58	20:50	21:37	22:01	21:39	20:42	19:31	18:24		16:36	16:30
26	08:27	07:31	06:28	06:20	05:31	05:19	05:49	06:38	07:28	07:53	07:53-08:18/25	07:20	08:44
	17:13	18:10	18:59	20:52	21:39	22:01	21:37	20:39	19:28	18:22		16:35	16:31
27	08:25	07:29	06:26	06:18	05:29	05:19	05:51	06:40	07:30	07:55	07:55-08:17/22	07:21	08:45
	17:15	18:12	19:01	20:54	21:40	22:01	21:36	20:37	19:26	18:20		16:34	16:32
28	08:24	07:27	06:24	06:16	05:28	05:20	05:52	06:41	07:32	07:57	07:57-08:16/19	07:23	08:45
	17:17	18:14	19:03	20:55	21:41	22:01	21:34	20:35	19:24	18:18		16:33	16:32
29	08:23	07:21	06:18	06:14	05:27	05:20	05:54	06:43	07:33	07:58	07:58-08:14/16	07:25	08:45
	17:19	18:16	19:04	20:57	21:43	22:00	21:33	20:33	19:21	18:15		16:32	16:33
30	08:21	07:19	06:15	06:12	05:26	05:21	05:55	06:45	07:35	08:00	08:00-08:12/12	07:27	08:45
	17:21	18:18	19:06	20:59	21:44	22:00	21:31	20:31	19:19	18:13		16:31	16:34
31	08:20	07:17	06:13	06:10	05:25	05:20	05:57	06:46	07:36	08:01		07:29	08:45
	17:22	18:19	19:08	20:58	21:45	22:00	21:30	20:28	19:16	18:10		17:13	16:35
Potential sun hours	259	278	367	416	485	499	502	454	381	331		266	244
Sum of minutes with flicker	0	0	438	0	0	0	0	0	435	11		0	0

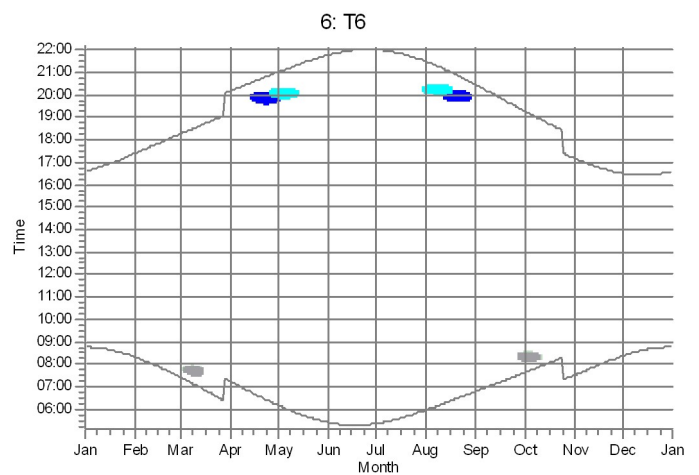
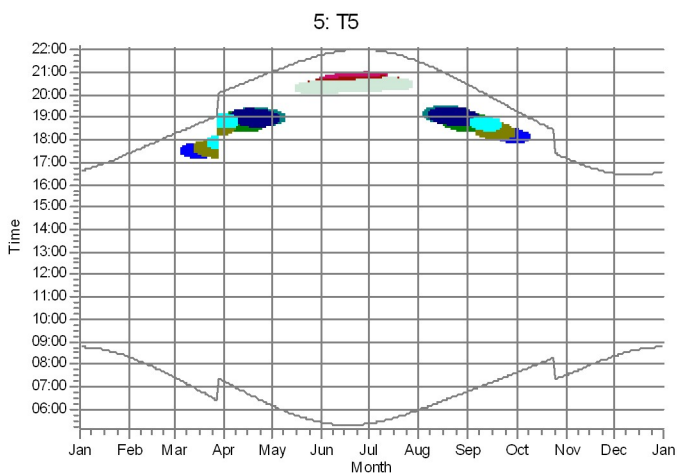
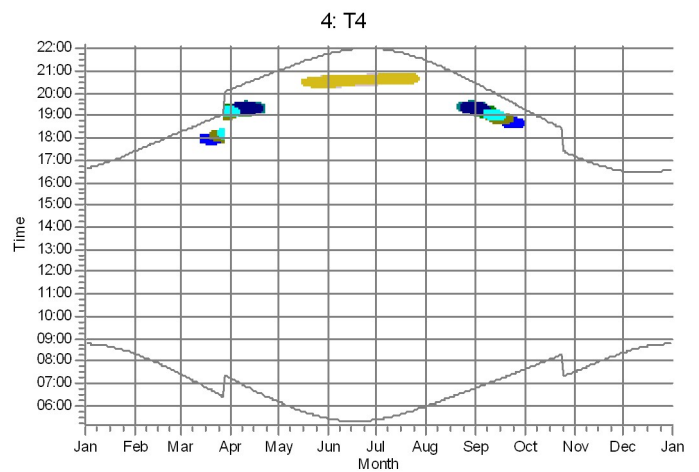
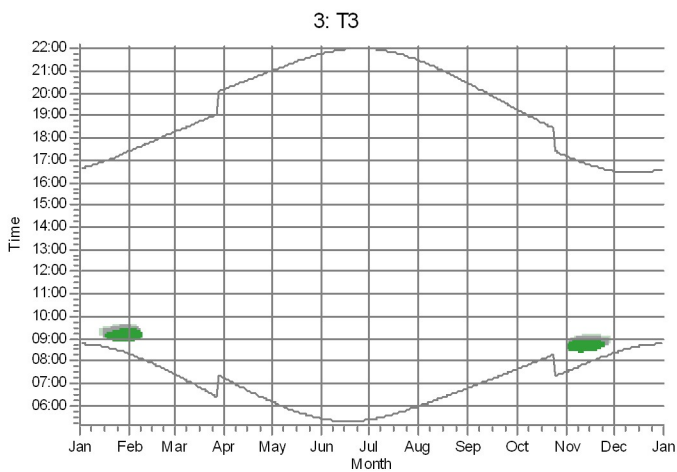
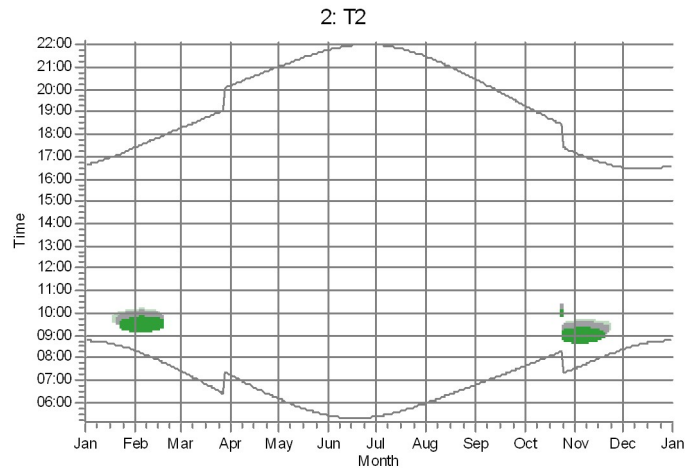
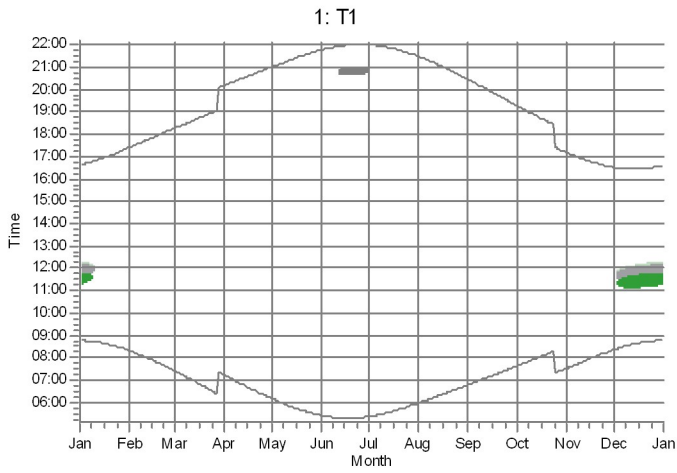
Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker



SHADOW - Calendar per WTG, graphical

Calculation: Alternative Scenario 2

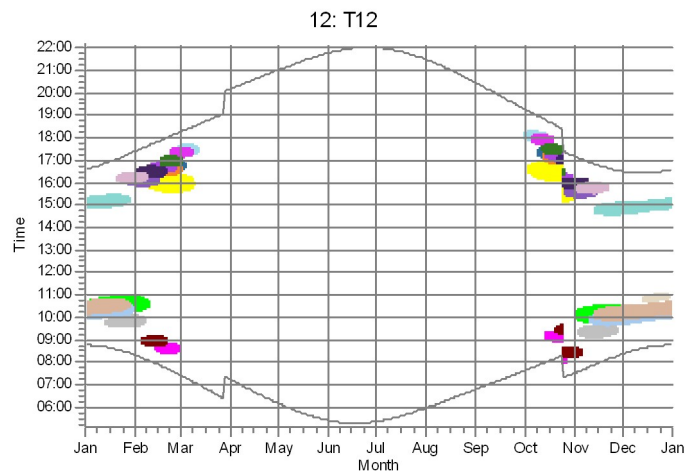
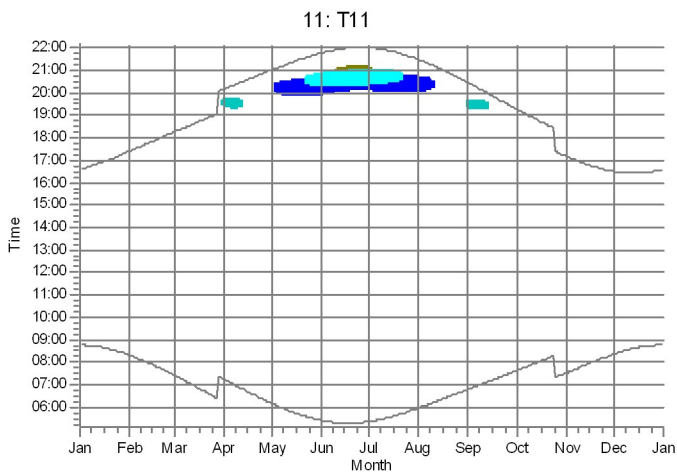
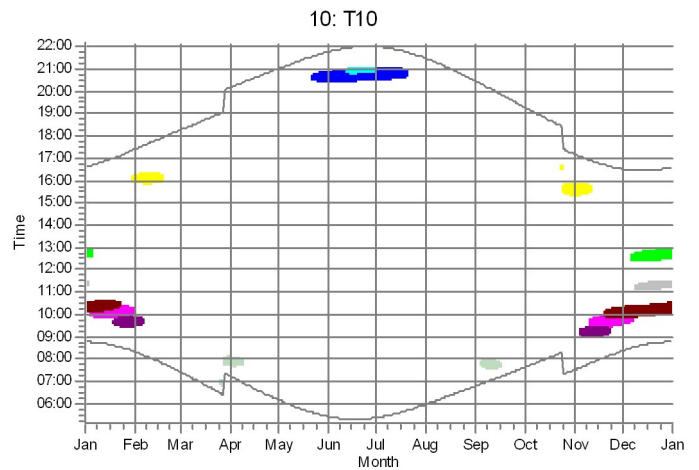
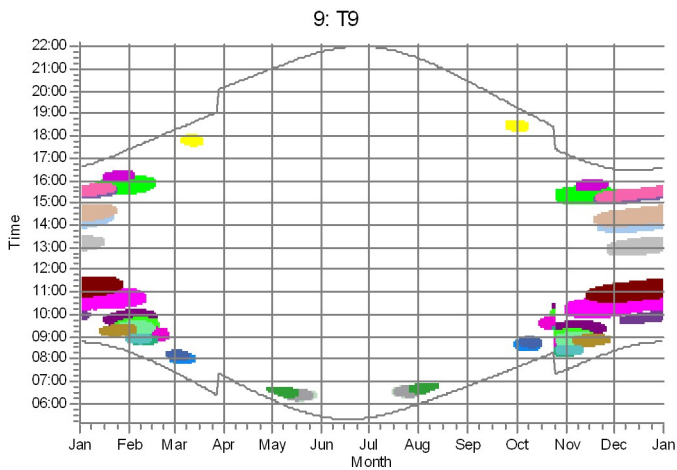
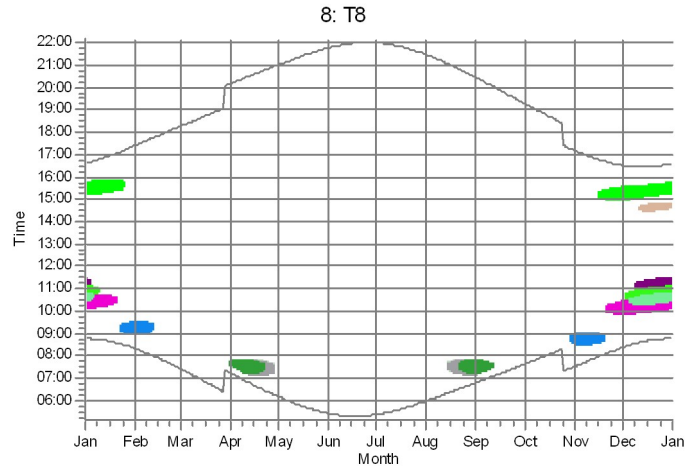
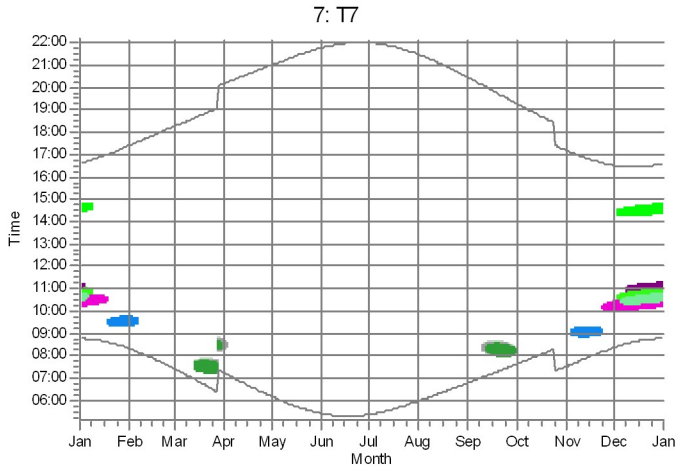


Shadow receptors



SHADOW - Calendar per WTG, graphical

Calculation: Alternative Scenario 2

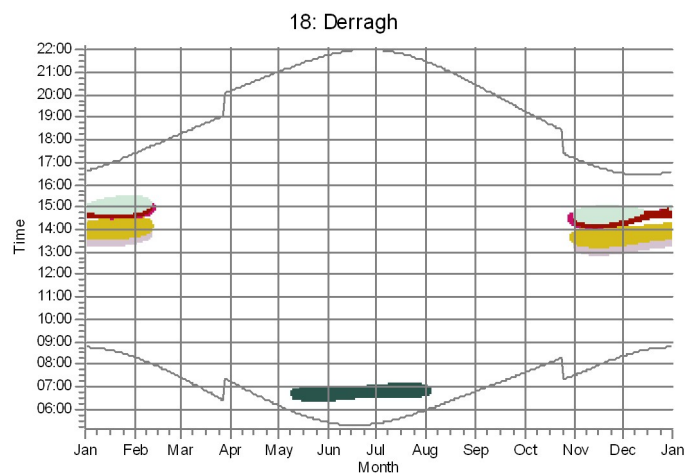
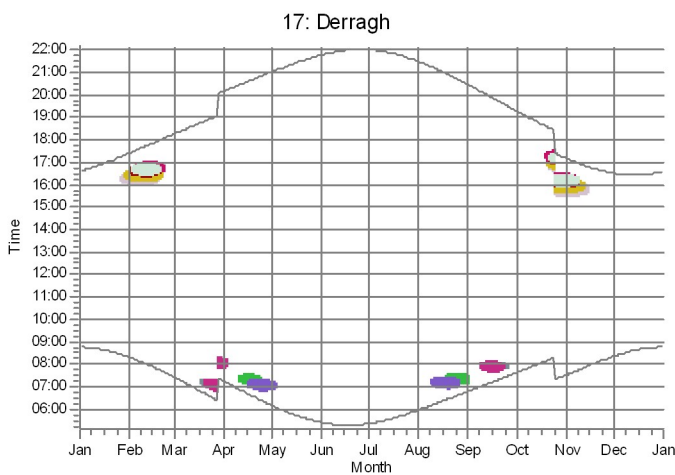
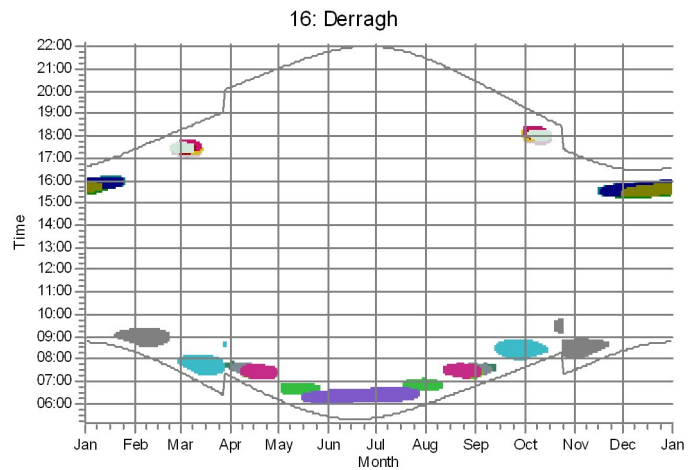
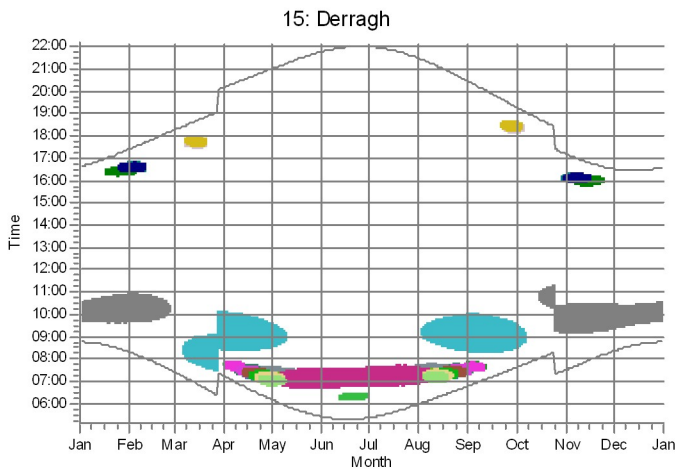
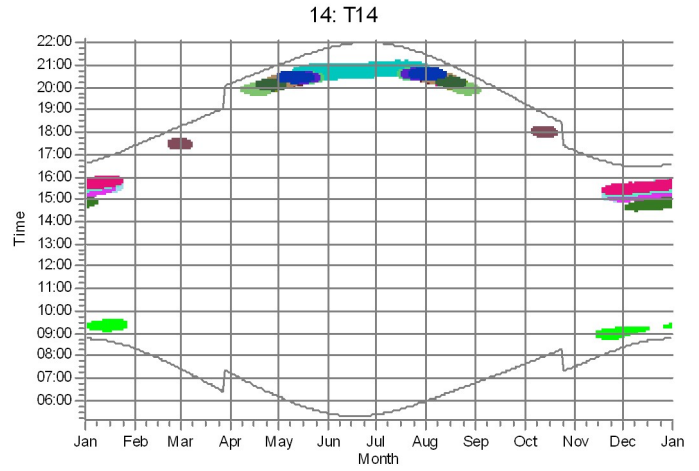
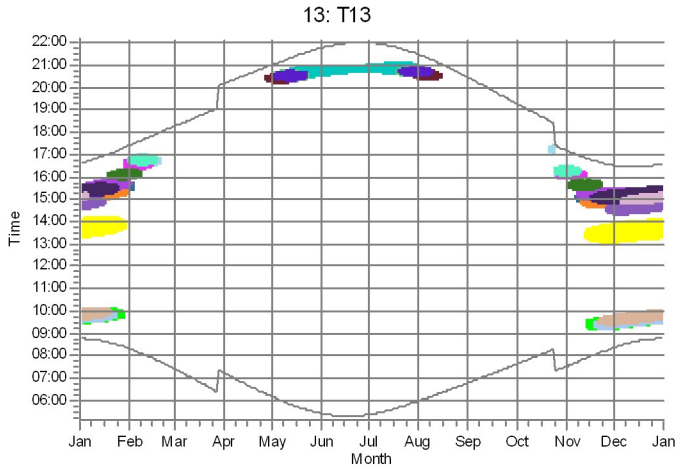


Shadow receptors

B: H2	J: H10	O: H15	U: H21	AG: H33	AU: H47	BM: H65	CC: H81
C: H3	K: H11	P: H16	V: H22	AO: H41	AV: H48	BP: H68	CE: H83
E: H5	L: H12	Q: H17	W: H23	AQ: H43	AW: H49	BV: H74	CN: H92
H: H8	M: H13	R: H18	X: H24	AR: H44	BH: H60	BZ: H78	CQ: H95
I: H9	N: H14	T: H20	Z: H26	AS: H45	BJ: H62	CB: H80	

SHADOW - Calendar per WTG, graphical

Calculation: Alternative Scenario 2

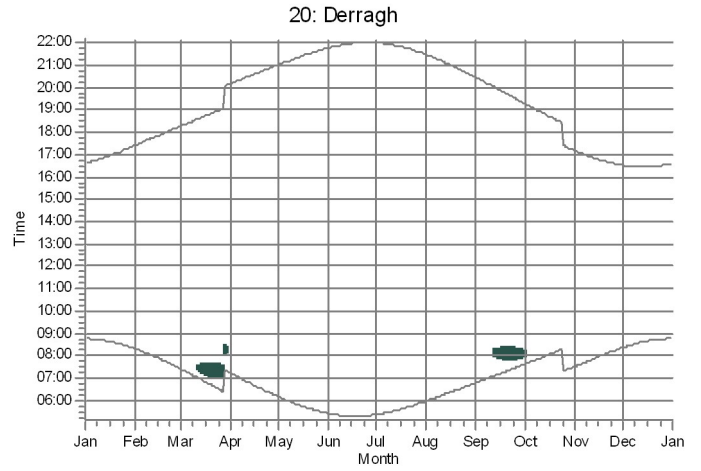
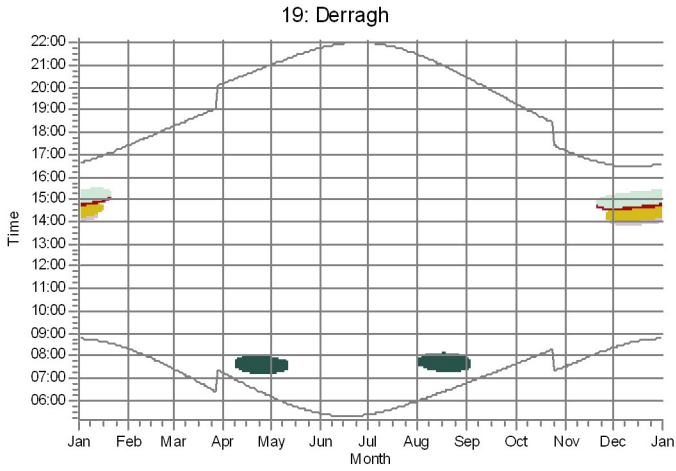


Shadow receptors

A: H1	Q: H15	AA: H27	AH: H34	AQ: H43	BB: H54	BL: H64	BS: H71	CB: H80
B: H2	Q: H17	AB: H28	AI: H35	AS: H45	BC: H55	BM: H65	BT: H72	CG: H85
D: H4	S: H19	AC: H29	AJ: H36	AT: H46	BD: H56	BN: H66	BU: H73	CK: H89
F: H6	U: H21	AD: H30	AK: H37	AU: H47	BE: H57	BO: H67	BV: H74	CR: H96
G: H7	V: H22	AE: H31	AL: H38	AX: H50	BF: H58	BP: H68	BX: H76	CS: H97
I: H9	W: H23	AF: H32	AN: H40	AY: H51	BG: H59	BQ: H69	BY: H77	
J: H10	Y: H25	AG: H33	AP: H42	AZ: H52	BI: H61	BR: H70	CA: H79	

SHADOW - Calendar per WTG, graphical

Calculation: Alternative Scenario 2

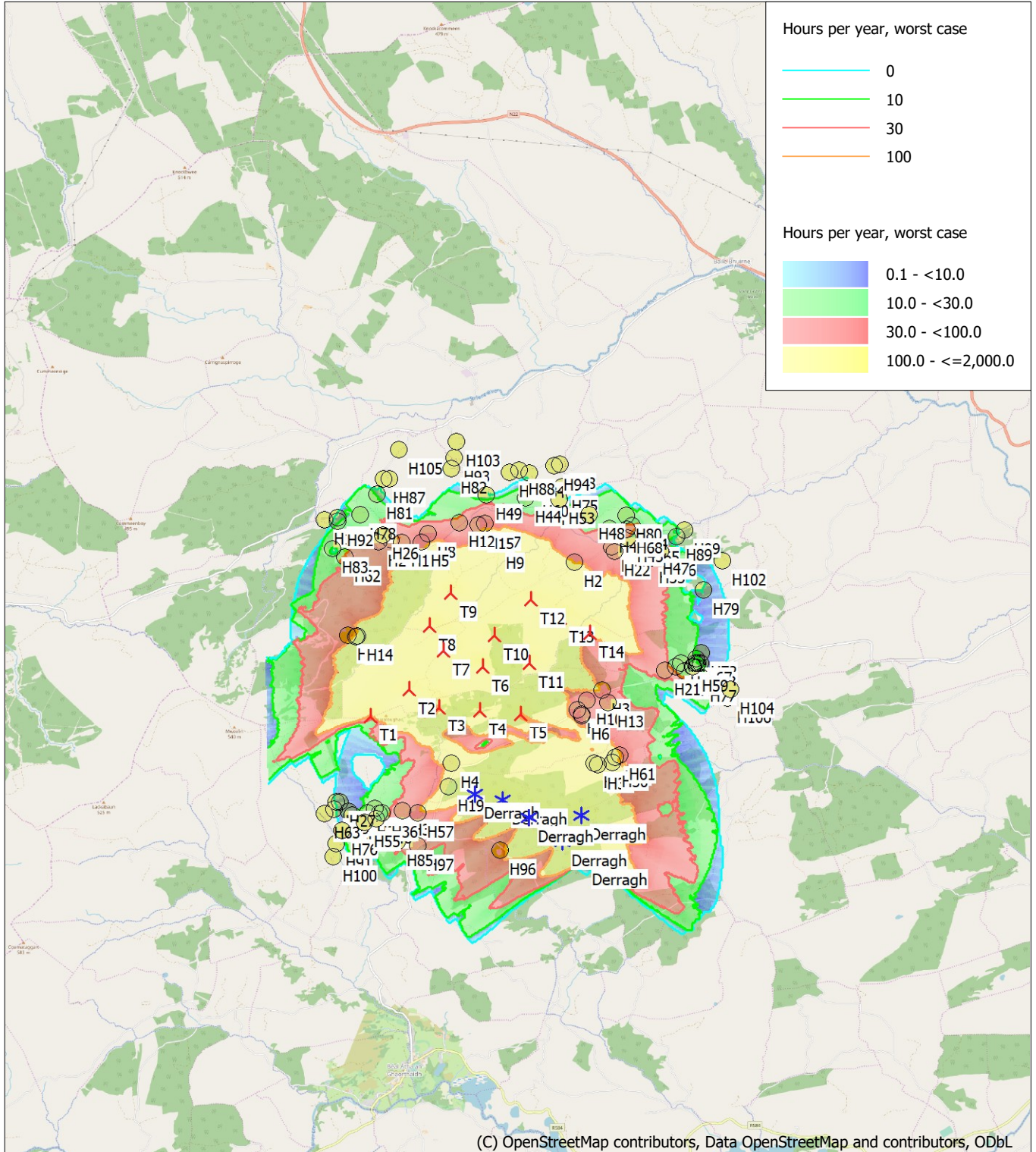


Shadow receptors

- Y: H25
- AD: H30
- AX: H50
- AY: H51
- BI: H61
- CR: H96

SHADOW - Map

Calculation: Alternative Scenario 2

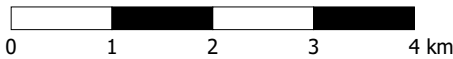
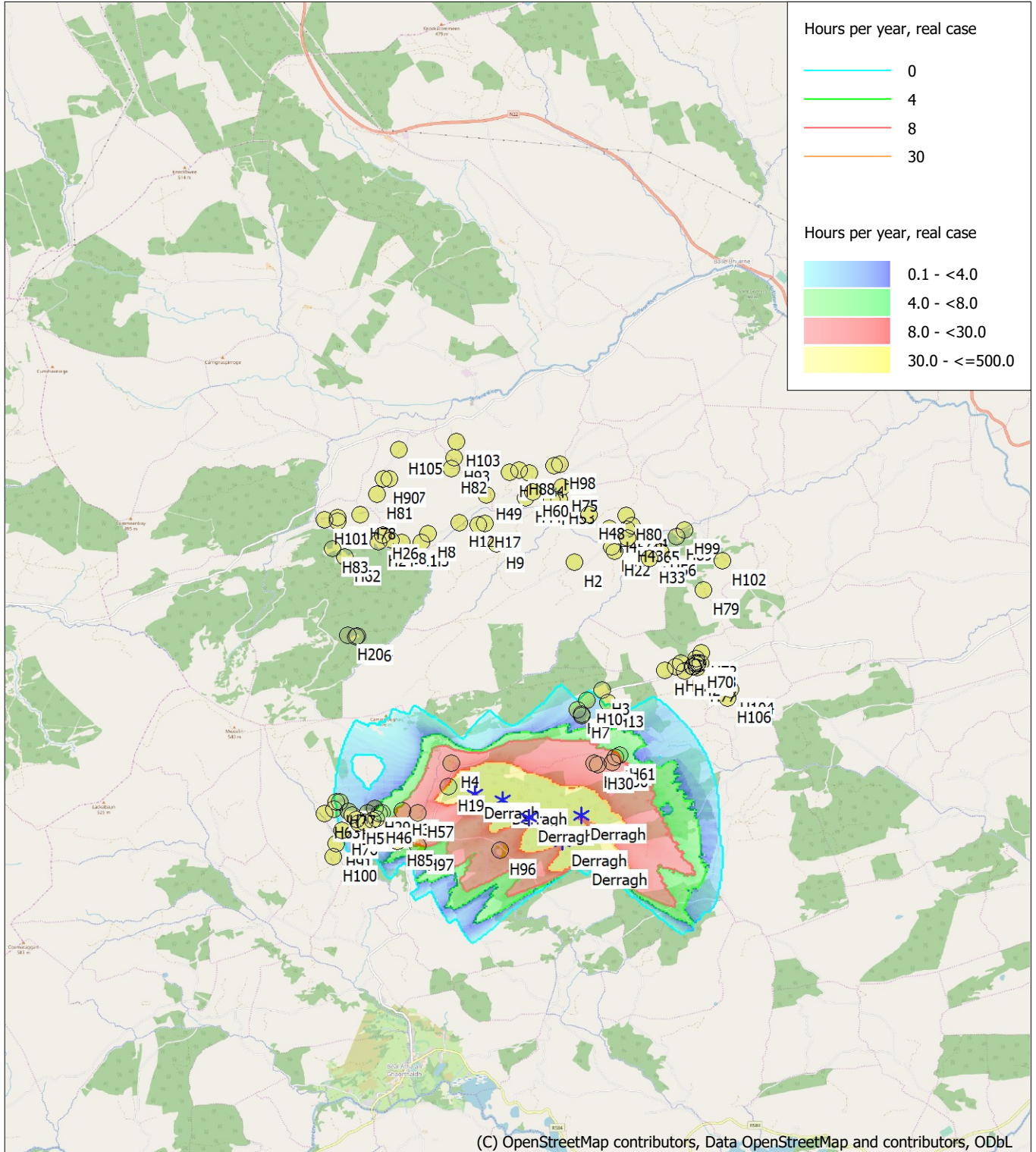


Map: EMD OpenStreetMap , Print scale 1:75,000, Map center Irish ITM-IRENET95 (IE), geocentric, GRS80 East: 516,660 North: 573,620
 New WTG Existing WTG Shadow receptor
 Flicker map level: Elevation Grid Data Object: Gortyrahilly_ShadowFlicker_12042022_EMDGrid_0.wpg (1)
 Time step: 3 minutes, Day step: 7 days, Map resolution: 20 m, Visibility resolution: 10 m, Eye height: 1.5 m

Shadow F. - Derragh WF Only

SHADOW - Map

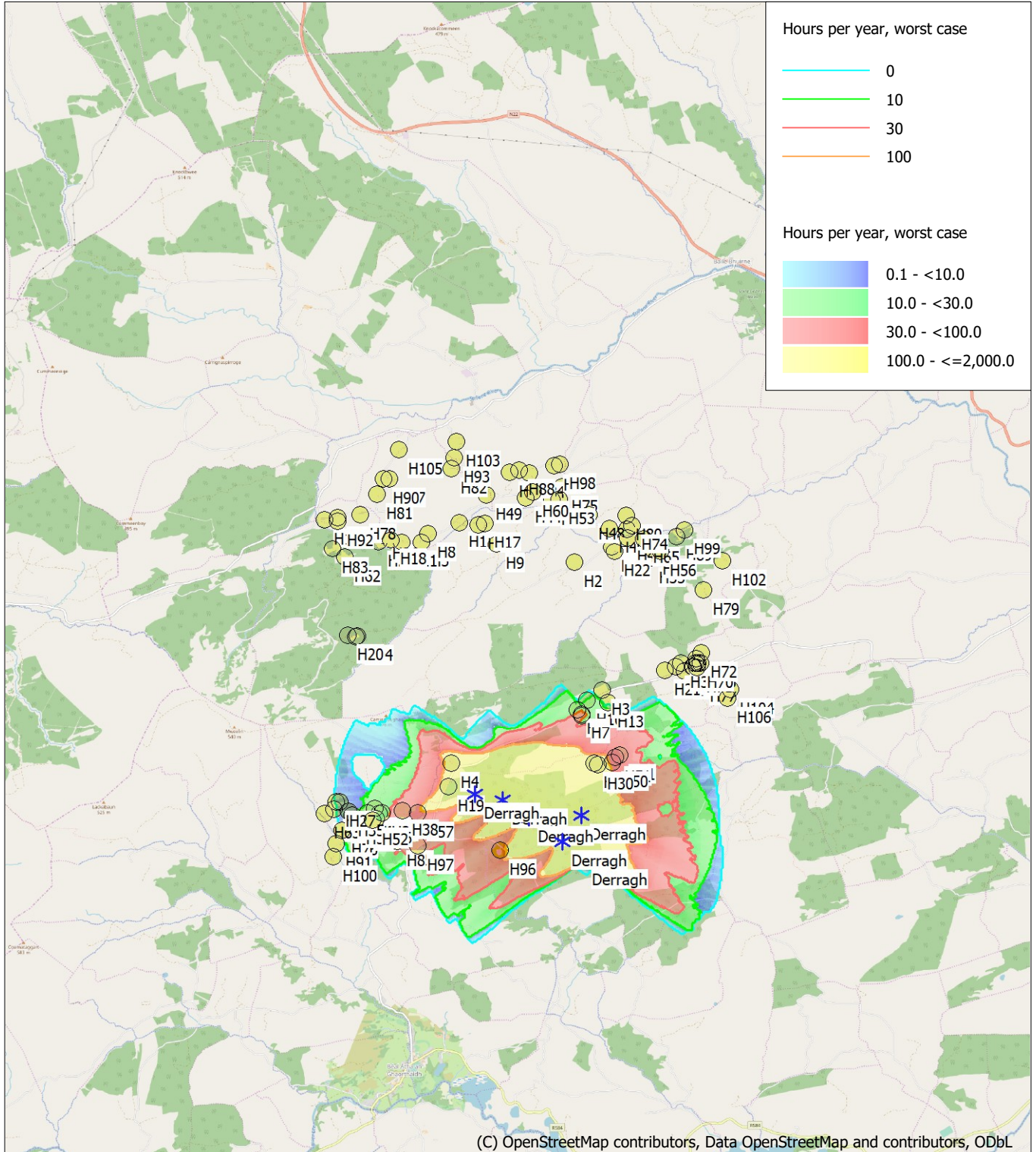
Calculation: Derragh WF Impacts Only - Real Case



Map: EMD OpenStreetMap , Print scale 1:75,000, Map center Irish ITM-IRENET95 (IE), geocentric, GRS80 East: 516,660 North: 573,620
 * Existing WTG Shadow receptor
 Flicker map level: Elevation Grid Data Object: Gortyrahill_ShadowFlicker_12042022_EMDGrid_0.wpg (1)
 Time step: 3 minutes, Day step: 7 days, Map resolution: 20 m, Visibility resolution: 10 m, Eye height: 1.5 m

SHADOW - Map

Calculation: Derragh WF Impacts Only - Worst Case



Map: EMD OpenStreetMap , Print scale 1:75,000, Map center Irish ITM-IRENET95 (IE), geocentric, GRS80 East: 516,660 North: 573,620
 * Existing WTG Shadow receptor
 Flicker map level: Elevation Grid Data Object: Gortyrahill_ShadowFlicker_12042022_EMDGrid_0.wpg (1)
 Time step: 3 minutes, Day step: 7 days, Map resolution: 20 m, Visibility resolution: 10 m, Eye height: 1.5 m

SHADOW - Main Result

Calculation: Derragh WF Impacts Only

Assumptions for shadow calculations

Maximum distance for influence

Calculate only when more than 20 % of sun is covered by the blade

Please look in WTG table

Minimum sun height over horizon for influence 3 °

Day step for calculation 1 days

Time step for calculation 1 minutes

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

A ZVI (Zones of Visual Influence) calculation is performed before flicker calculation so non visible WTG do not contribute to calculated flicker values. A WTG will be visible if it is visible from any part of the receiver window. The ZVI calculation is based on the following assumptions:

Height contours used: Elevation Grid Data Object: Gortyrahill_ShadowFlicker

Obstacles used in calculation

Receptor grid resolution: 1.0 m

All coordinates are in

Irish ITM-IRENET95 (IE), geocentric, GRS80

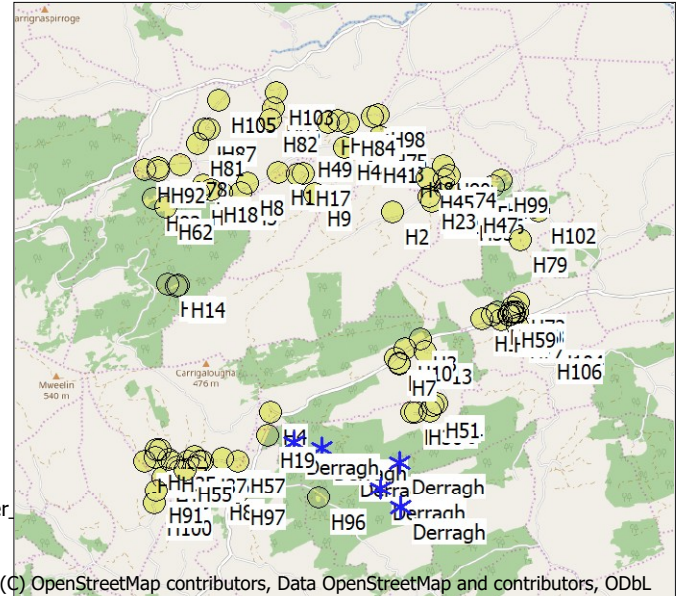
WTGs

Easting	Northing	Z	Row data/Description	WTG type				Shadow data			
				Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Calculation distance	RPM
1	516,034	570,784	321.2 Derragh	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	100.0	1,823	10.7
2	516,405	570,706	285.7 Derragh	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	100.0	1,823	10.7
3	516,741	570,457	285.6 Derragh	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	100.0	1,823	10.7
4	517,429	570,484	311.2 Derragh	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	100.0	1,823	10.7
5	517,175	570,142	285.9 Derragh	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	100.0	1,823	10.7
6	517,446	569,894	246.0 Derragh	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	100.0	1,823	10.7

Shadow receptor-Input

No.	Name	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
A	H1	517,410	571,864	254.5	2.0	2.0	0.5	90.0	"Green house mode"	2.5
B	H2	517,402	573,794	210.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
C	H3	517,734	572,119	250.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
D	H4	515,736	571,186	296.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
E	H5	515,395	574,092	216.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
F	H6	517,462	571,790	234.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
G	H7	517,467	571,806	236.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
H	H8	515,487	574,211	217.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
I	H9	516,372	574,046	234.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
J	H10	517,533	571,990	257.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
K	H11	515,143	574,094	215.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
L	H12	515,896	574,342	196.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
M	H13	517,811	571,946	218.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
N	H14	514,534	572,878	305.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
O	H15	516,142	574,318	209.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
P	H16	514,510	572,872	306.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
Q	H17	516,223	574,321	211.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
R	H18	514,997	574,130	212.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
S	H19	515,702	570,880	296.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
T	H20	514,411	572,890	315.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
U	H21	518,556	572,363	233.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
V	H22	517,923	573,934	204.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
W	H23	517,883	573,984	196.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
X	H24	514,830	574,098	207.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5

To be continued on next page...



SHADOW - Main Result

Calculation: Derragh WF Impacts Only

...continued from previous page

No.	Name	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
				[m]	[m]	[m]	[m]	[°]		[m]
Y	H25	517,613	571,154	192.5	2.0	2.0	0.5	90.0	"Green house mode"	2.5
Z	H26	514,887	574,194	223.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AA	H27	514,265	570,703	232.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AB	H28	518,705	572,403	235.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AC	H29	514,728	570,617	256.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AD	H30	517,670	571,142	196.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AE	H31	514,223	570,697	230.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AF	H32	518,774	572,454	239.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AG	H33	518,384	573,830	215.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AH	H34	514,633	570,556	244.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AI	H35	514,379	570,581	225.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AJ	H36	514,814	570,551	250.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AK	H37	514,777	570,545	248.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AL	H38	515,088	570,586	257.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AM	H39	514,187	570,609	220.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AN	H40	514,433	570,535	223.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AO	H41	517,124	574,610	192.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AP	H42	518,824	572,353	223.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AQ	H43	518,107	574,098	177.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AR	H44	516,773	574,652	186.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AS	H45	517,869	574,232	179.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AT	H46	514,750	570,477	235.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AU	H47	518,434	573,927	210.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AV	H48	517,605	574,420	191.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AW	H49	516,256	574,698	198.5	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AX	H50	517,850	571,155	205.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AY	H51	517,890	571,229	190.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AZ	H52	514,698	570,464	232.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BA	H53	517,210	574,625	194.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BB	H54	514,485	570,469	217.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BC	H55	514,590	570,438	221.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BD	H56	518,528	573,917	219.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BE	H57	515,290	570,548	246.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BF	H58	514,512	570,431	214.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BG	H59	518,930	572,410	225.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BH	H60	516,878	574,725	190.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BI	H61	517,955	571,250	190.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BJ	H62	514,394	573,903	230.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BK	H63	514,059	570,556	212.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BL	H64	518,941	572,403	223.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BM	H65	518,321	574,087	175.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BN	H66	518,957	572,447	229.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BO	H67	518,976	572,514	232.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BP	H68	518,097	574,217	178.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BQ	H69	518,989	572,432	225.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BR	H70	519,003	572,456	227.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BS	H71	518,987	572,390	220.5	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BT	H72	519,042	572,577	229.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BU	H73	519,032	572,454	225.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BV	H74	518,159	574,273	188.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BW	H75	517,248	574,791	194.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BX	H76	514,292	570,334	200.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BY	H77	519,031	572,269	210.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BZ	H78	514,600	574,467	239.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CA	H79	519,083	573,399	197.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CB	H80	518,088	574,393	211.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CC	H81	514,828	574,738	256.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CD	H82	515,800	575,045	228.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CE	H83	514,232	574,023	197.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CF	H84	516,832	574,974	226.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CG	H85	515,011	570,183	215.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CH	H86	516,572	574,987	243.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CI	H87	514,991	574,930	242.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CJ	H88	516,684	575,011	243.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5

To be continued on next page...

SHADOW - Main Result

Calculation: Derragh WF Impacts Only

...continued from previous page

No.	Name	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
				[m]	[m]	[m]	[m]	[°]		[m]
CK H89		518,743	574,118	179.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CL H90		514,914	574,938	236.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CM H91		514,204	570,162	194.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CN H92		514,308	574,396	209.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CO H93		515,847	575,193	208.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CP H94		517,147	575,057	191.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CQ H95		514,310	574,440	217.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CR H96		516,360	570,045	235.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CS H97		515,285	570,118	238.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CT H98		517,237	575,083	187.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CU H99		518,853	574,198	159.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CV H100		514,172	569,993	196.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CW H101		514,126	574,409	191.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CX H102		519,337	573,772	183.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CY H103		515,882	575,406	186.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CZ H104		519,423	572,097	200.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
DA H105		515,128	575,313	171.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
DB H106		519,384	571,987	200.5	2.0	2.0	0.5	90.0	"Green house mode"	2.5

Calculation Results

Shadow receptor

No.	Name	Shadow, worst case			Shadow, expected values	
		Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]	
A	H1	27:23	88	0:25	2:31	
B	H2	0:00	0	0:00	0:00	
C	H3	0:00	0	0:00	0:00	
D	H4	158:42	134	1:53	19:14	
E	H5	0:00	0	0:00	0:00	
F	H6	33:44	103	0:25	3:13	
G	H7	33:04	102	0:25	3:08	
H	H8	0:00	0	0:00	0:00	
I	H9	0:00	0	0:00	0:00	
J	H10	12:11	42	0:21	0:59	
K	H11	0:00	0	0:00	0:00	
L	H12	0:00	0	0:00	0:00	
M	H13	0:00	0	0:00	0:00	
N	H14	0:00	0	0:00	0:00	
O	H15	0:00	0	0:00	0:00	
P	H16	0:00	0	0:00	0:00	
Q	H17	0:00	0	0:00	0:00	
R	H18	0:00	0	0:00	0:00	
S	H19	175:36	144	1:39	34:31	
T	H20	0:00	0	0:00	0:00	
U	H21	0:00	0	0:00	0:00	
V	H22	0:00	0	0:00	0:00	
W	H23	0:00	0	0:00	0:00	
X	H24	0:00	0	0:00	0:00	
Y	H25	131:42	172	1:11	14:02	
Z	H26	0:00	0	0:00	0:00	
AA	H27	6:41	27	0:20	1:26	
AB	H28	0:00	0	0:00	0:00	
AC	H29	18:35	58	0:27	3:59	
AD	H30	131:15	173	1:08	14:09	
AE	H31	6:21	24	0:19	1:21	
AF	H32	0:00	0	0:00	0:00	
AG	H33	0:00	0	0:00	0:00	
AH	H34	17:22	58	0:25	3:43	
AI	H35	8:01	28	0:21	1:43	
AJ	H36	23:30	69	0:29	5:01	
AK	H37	22:08	68	0:28	4:44	
AL	H38	46:39	121	0:37	9:46	

To be continued on next page...

SHADOW - Main Result

Calculation: Derragh WF Impacts Only

...continued from previous page

No.	Name	Shadow, worst case		Shadow, expected values	
		Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
AM	H39	0:00	0	0:00	0:00
AN	H40	8:53	31	0:22	1:54
AO	H41	0:00	0	0:00	0:00
AP	H42	0:00	0	0:00	0:00
AQ	H43	0:00	0	0:00	0:00
AR	H44	0:00	0	0:00	0:00
AS	H45	0:00	0	0:00	0:00
AT	H46	22:56	71	0:27	4:53
AU	H47	0:00	0	0:00	0:00
AV	H48	0:00	0	0:00	0:00
AW	H49	0:00	0	0:00	0:00
AX	H50	94:53	157	0:56	10:17
AY	H51	84:26	150	0:51	9:01
AZ	H52	21:17	69	0:26	4:32
BA	H53	0:00	0	0:00	0:00
BB	H54	9:54	34	0:23	2:06
BC	H55	12:01	38	0:24	2:33
BD	H56	0:00	0	0:00	0:00
BE	H57	93:36	172	0:46	18:42
BF	H58	10:40	37	0:23	2:15
BG	H59	0:00	0	0:00	0:00
BH	H60	0:00	0	0:00	0:00
BI	H61	74:23	150	0:48	8:00
BJ	H62	0:00	0	0:00	0:00
BK	H63	0:00	0	0:00	0:00
BL	H64	0:00	0	0:00	0:00
BM	H65	0:00	0	0:00	0:00
BN	H66	0:00	0	0:00	0:00
BO	H67	0:00	0	0:00	0:00
BP	H68	0:00	0	0:00	0:00
BQ	H69	0:00	0	0:00	0:00
BR	H70	0:00	0	0:00	0:00
BS	H71	0:00	0	0:00	0:00
BT	H72	0:00	0	0:00	0:00
BU	H73	0:00	0	0:00	0:00
BV	H74	0:00	0	0:00	0:00
BW	H75	0:00	0	0:00	0:00
BX	H76	8:11	32	0:20	1:43
BY	H77	0:00	0	0:00	0:00
BZ	H78	0:00	0	0:00	0:00
CA	H79	0:00	0	0:00	0:00
CB	H80	0:00	0	0:00	0:00
CC	H81	0:00	0	0:00	0:00
CD	H82	0:00	0	0:00	0:00
CE	H83	0:00	0	0:00	0:00
CF	H84	0:00	0	0:00	0:00
CG	H85	25:18	93	0:25	5:15
CH	H86	0:00	0	0:00	0:00
CI	H87	0:00	0	0:00	0:00
CJ	H88	0:00	0	0:00	0:00
CK	H89	0:00	0	0:00	0:00
CL	H90	0:00	0	0:00	0:00
CM	H91	0:00	0	0:00	0:00
CN	H92	0:00	0	0:00	0:00
CO	H93	0:00	0	0:00	0:00
CP	H94	0:00	0	0:00	0:00
CQ	H95	0:00	0	0:00	0:00
CR	H96	89:23	185	0:43	18:02
CS	H97	42:22	107	0:30	8:17
CT	H98	0:00	0	0:00	0:00
CU	H99	0:00	0	0:00	0:00
CV	H100	0:00	0	0:00	0:00
CW	H101	0:00	0	0:00	0:00

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SHADOW - Main Result

Calculation: Derragh WF Impacts Only

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No.	Name	Shadow, worst case		Shadow, expected values	
		Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
CX	H102	0:00	0	0:00	0:00
CY	H103	0:00	0	0:00	0:00
CZ	H104	0:00	0	0:00	0:00
DA	H105	0:00	0	0:00	0:00
DB	H106	0:00	0	0:00	0:00

Total amount of flickering on the shadow receptors caused by each WTG

No.	Name	Worst case [h/year]	Expected [h/year]
1	Derragh	413:34	70:50
2	Derragh	190:14	30:31
3	Derragh	63:27	10:04
4	Derragh	212:54	24:52
5	Derragh	97:09	13:06
6	Derragh	14:44	2:37

Total times in Receptor wise and WTG wise tables can differ, as a WTG can lead to flicker at 2 or more receptors simultaneously and/or receptors may receive flicker from 2 or more WTGs simultaneously.

The calculation of the total expected values for a given receptor assumes a weighted average directional reduction for all WTGs contributing to shadow flicker within the same day. In the case where shadow flicker from different WTGs is not concurrent within the day, the total expected time at a given receptor may deviate marginally from the individual flicker time caused by each turbine separately.

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:07/3.5.584

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: A - H1

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June	July	August	September	October	November	December	
1	08:45	15:25 (2) 08:18	16:19 (1) 07:25	07:14	06:10	05:25	05:22	05:58	06:48	07:37	07:30	08:21	15:15 (2)
2	08:45	15:26 (2) 08:17	16:19 (1) 07:23	07:12	06:08	05:24	05:22	06:00	06:49	07:38	07:32	08:23	15:15 (2)
3	08:45	15:27 (2) 08:15	16:20 (1) 07:21	07:10	06:06	05:23	05:23	06:01	06:51	07:40	07:34	08:24	15:14 (2)
4	08:45	15:28 (2) 08:14	16:22 (1) 07:18	07:08	06:04	05:22	05:24	06:03	06:53	07:42	07:36	08:25	15:15 (2)
5	08:44	15:28 (2) 08:12	16:25 (1) 07:16	07:05	06:02	05:21	05:25	06:04	06:54	07:43	07:38	08:27	15:14 (2)
6	08:44	15:29 (2) 08:10	16:32 (1) 07:14	07:03	06:00	05:21	05:25	06:06	06:56	07:45	07:39	08:28	15:15 (2)
7	08:44	15:29 (2) 08:08	16:33 (1) 07:12	07:01	05:59	05:20	05:26	06:07	06:57	07:47	07:41	08:29	15:15 (2)
8	08:43	15:30 (2) 08:07	16:35 (1) 07:10	06:58	05:57	05:20	05:27	06:09	06:59	07:48	07:43	08:31	15:15 (2)
9	08:43	15:31 (2) 08:05	16:37 (1) 07:07	06:56	05:55	05:19	05:28	06:11	07:01	07:50	07:45	08:32	15:15 (2)
10	08:42	15:32 (2) 08:03	16:39 (1) 07:05	06:54	05:53	05:19	05:29	06:12	07:02	07:52	07:46	08:33	15:16 (2)
11	08:42	15:33 (2) 08:01	16:41 (1) 07:03	06:52	05:52	05:18	05:30	06:14	07:04	07:53	07:48	08:34	15:16 (2)
12	08:41	15:35 (2) 07:59	16:43 (1) 07:01	06:50	05:50	05:18	05:31	06:15	07:06	07:55	07:50	08:35	15:16 (2)
13	08:40	15:36 (2) 07:58	16:45 (1) 06:58	06:47	05:48	05:18	05:32	06:17	07:07	07:57	07:52	08:36	15:17 (2)
14	08:40	15:38 (2) 07:56	16:47 (1) 06:56	06:45	05:47	05:18	05:34	06:19	07:09	07:59	07:54	08:37	15:17 (2)
15	08:39	15:41 (2) 07:54	16:49 (1) 06:54	06:43	05:45	05:17	05:35	06:20	07:10	08:00	07:55	08:38	15:18 (2)
16	08:38	15:46 (2) 07:52	16:51 (1) 06:51	06:41	05:44	05:17	05:36	06:22	07:12	08:02	07:57	08:39	15:17 (2)
17	08:37	15:50 (2) 07:50	16:53 (1) 06:49	06:38	05:42	05:17	05:37	06:23	07:14	08:04	07:59	08:40	15:18 (2)
18	08:36	16:00 (1) 07:48	16:55 (1) 06:47	06:36	05:41	05:17	05:38	06:25	07:15	08:06	08:01	08:41	15:18 (2)
19	08:35	16:08 (1) 07:46	16:57 (1) 06:44	06:34	05:39	05:17	05:40	06:27	07:17	08:07	08:02	08:42	15:19 (2)
20	08:34	16:18 (1) 07:44	16:59 (1) 06:42	06:32	05:38	05:17	05:41	06:28	07:19	08:09	08:04	08:43	15:19 (2)
21	08:33	16:30 (1) 07:42	17:01 (1) 06:40	06:30	05:37	05:17	05:42	06:30	07:20	08:11	08:06	08:44	15:20 (2)
22	08:32	16:33 (1) 07:40	17:03 (1) 06:37	06:28	05:35	05:18	05:44	06:31	07:22	08:13	08:07	08:45	15:20 (2)
23	08:31	16:34 (1) 07:38	17:05 (1) 06:35	06:26	05:34	05:18	05:45	06:33	07:23	08:14	08:09	08:46	15:21 (2)
24	08:29	16:34 (1) 07:36	17:07 (1) 06:33	06:24	05:33	05:18	05:46	06:35	07:25	08:16	08:11	08:47	15:21 (2)
25	08:28	16:35 (1) 07:34	17:09 (1) 06:31	06:22	05:32	05:19	05:48	06:36	07:27	08:18	08:12	08:48	15:21 (2)
26	08:27	16:36 (1) 07:31	17:11 (1) 06:28	06:20	05:30	05:19	05:49	06:38	07:28	08:20	08:14	08:49	15:22 (2)
27	08:26	16:36 (1) 07:29	17:13 (1) 06:26	06:18	05:29	05:19	05:51	06:40	07:30	08:21	08:15	08:50	15:23 (2)
28	08:24	16:37 (1) 07:27	17:15 (1) 06:24	06:16	05:28	05:20	05:52	06:41	07:32	08:23	08:17	08:51	15:23 (2)
29	08:23	16:37 (1) 07:25	17:17 (1) 06:21	06:14	05:27	05:20	05:54	06:43	07:33	08:25	08:18	08:52	15:24 (2)
30	08:21	16:37 (1) 07:23	17:19 (1) 06:19	06:12	05:26	05:21	05:55	06:44	07:35	08:27	08:20	08:53	15:24 (2)
31	08:20	16:37 (1) 07:21	17:21 (1) 06:17	06:10	05:24	05:21	05:57	06:46	07:37	08:29	08:22	08:54	15:25 (2)
Potential sun hours	259	278	367	416	485	499	502	454	381	331	266	244	710
Total, worst case	511	68									354		1.00
Sun reduction	0.16	0.21									0.18		0.13
Oper. time red.	1.00	1.00									1.00		1.00
Wind dir. red.	0.60	0.60									0.60		0.59
Total reduction	0.09	0.12									0.11		0.08
Total, real	47	8									39		56

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)



SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: B - H2

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main data table with 13 columns (January-December) and 31 rows of daily data. Includes columns for sun rise/set, operational time, and various reduction metrics.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: C - H3

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: D - H4

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 16:36 47	09:43 (1) 17:24 105	08:18 17:26 107	08:45 (2) 18:16 20:10	07:25 18:16 21:01	07:14 21:01 05:25
2	08:45 16:38 48	09:43 (1) 17:26 107	08:17 17:26 107	08:43 (2) 18:18 20:11	07:23 18:18 21:02	06:08 21:02 05:24
3	08:45 16:39 49	09:43 (1) 17:28 108	08:15 17:28 108	08:41 (2) 18:19 20:13	07:21 18:19 21:04	06:06 21:04 05:23
4	08:45 16:40 50	09:44 (1) 17:30 110	08:14 17:30 110	08:39 (2) 18:21 20:15	07:18 18:21 21:06	06:04 21:06 05:22
5	08:44 16:41 51	09:43 (1) 17:32 112	08:12 17:32 112	08:38 (2) 18:23 20:17	07:16 18:23 21:07	06:02 21:07 05:22
6	08:44 16:42 51	09:44 (1) 17:33 113	08:10 17:33 113	08:37 (2) 18:25 20:18	07:14 18:25 21:09	06:00 21:09 05:21
7	08:44 16:43 53	09:43 (1) 17:35 112	08:09 17:35 112	08:37 (2) 18:27 20:20	07:12 18:27 21:10	05:59 21:10 05:20
8	08:43 16:45 53	09:44 (1) 17:37 112	08:07 17:37 112	08:37 (2) 18:28 20:22	07:10 18:28 21:12	05:57 21:12 05:20
9	08:43 16:46 55	09:43 (1) 17:39 110	08:05 17:39 110	08:37 (2) 18:30 20:23	07:07 18:30 21:14	05:55 21:14 05:19
10	08:42 16:48 55	09:43 (1) 17:41 109	08:03 17:41 109	08:37 (2) 18:32 20:25	07:05 18:32 21:15	05:53 21:15 05:19
11	08:42 16:49 57	09:42 (1) 17:43 107	08:01 17:43 107	08:37 (2) 18:34 20:27	07:03 18:34 21:17	05:52 21:17 05:19
12	08:41 16:50 58	09:43 (1) 17:45 106	08:00 17:45 106	08:38 (2) 18:35 20:28	07:01 18:35 21:18	05:50 21:18 05:18
13	08:40 16:52 59	09:43 (1) 17:47 103	07:58 17:47 103	08:38 (2) 18:37 20:30	06:58 18:37 21:20	05:49 21:20 05:18
14	08:40 16:53 59	09:43 (1) 17:48 100	07:56 17:48 100	08:39 (2) 18:39 20:32	06:56 18:39 21:22	05:47 21:22 05:18
15	08:39 16:55 60	09:43 (1) 17:50 96	07:54 17:50 96	08:40 (2) 18:41 20:34	06:54 18:41 21:23	05:45 21:23 05:18
16	08:38 16:57 62	09:42 (1) 17:52 92	07:52 17:52 92	08:41 (2) 18:42 20:35	06:51 18:42 21:25	05:44 21:25 05:17
17	08:37 16:58 63	09:42 (1) 17:54 88	07:50 17:54 88	08:42 (2) 18:44 20:37	06:49 18:44 21:26	05:42 21:26 05:17
18	08:36 17:00 64	09:42 (1) 17:56 84	07:48 17:56 84	08:43 (2) 18:46 20:39	06:47 18:46 21:28	05:41 21:28 05:17
19	08:35 17:01 65	09:41 (1) 17:58 77	07:46 17:58 77	08:45 (2) 18:47 20:40	06:44 18:47 21:29	05:39 21:29 05:17
20	08:34 17:03 66	09:02 (2) 17:59 70	07:44 17:59 70	08:47 (2) 18:49 20:42	06:42 18:49 21:31	05:38 21:31 05:17
21	08:33 17:05 70	09:01 (2) 18:01 61	07:42 18:01 61	08:50 (2) 18:51 20:44	06:40 18:51 21:32	05:37 21:32 05:18
22	08:32 17:06 74	09:00 (2) 18:03 40	07:40 18:03 40	09:56 (1) 18:53 20:45	06:38 18:53 21:33	05:35 21:33 05:18
23	08:31 17:08 78	08:58 (2) 18:05 36	07:38 18:05 36	10:36 (1) 18:54 20:47	06:35 18:54 21:35	05:34 21:35 05:18
24	08:30 17:10 81	08:57 (2) 18:07 30	07:36 18:07 30	10:01 (1) 18:56 20:49	06:33 18:56 21:36	05:33 21:36 05:18
25	08:28 17:12 85	08:56 (2) 18:09 22	07:34 18:09 22	10:04 (1) 18:58 20:50	06:31 18:58 21:38	05:32 21:38 05:19
26	08:27 17:13 88	08:54 (2) 18:10 7	07:31 18:10 7	10:11 (1) 18:59 20:52	06:28 18:59 21:39	05:31 21:39 05:19
27	08:26 17:15 91	08:53 (2) 18:12 7	07:29 18:12 7	10:18 (1) 19:01 20:54	06:26 19:01 21:40	05:29 21:40 05:19
28	08:24 17:17 93	08:51 (2) 18:14 7	07:27 18:14 7	10:18 (1) 19:03 20:56	06:24 19:03 21:41	05:28 21:41 05:20
29	08:23 17:19 97	08:49 (2) 18:14 7	07:25 18:14 7	10:18 (1) 19:05 20:57	06:22 19:05 21:43	05:27 21:43 05:21
30	08:21 17:21 99	08:48 (2) 18:14 7	07:23 18:14 7	10:18 (1) 19:07 20:59	06:20 19:07 21:44	05:26 21:44 05:21
31	08:20 17:22 101	08:46 (2) 18:14 7	07:21 18:14 7	10:18 (1) 19:09 20:59	06:18 19:09 21:45	05:25 21:45 05:21
Potential sun hours	259	278	367	416	485	499
Total, worst case	2082	2217				
Sun reduction	0.16	0.21				
Oper. time red.	1.00	1.00				
Wind dir. red.	0.66	0.67				
Total reduction	0.10	0.14				
Total, real	215	305				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: D - H4

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December	
1	05:22	05:58	06:48	07:37	07:30	08:07 (2) 08:21	
	22:00	21:28	20:26	19:17	17:11	109 10:21 (1) 16:31	
2	05:22	06:00	06:49	07:38	07:32	08:06 (2) 08:23	
	22:00	21:27	20:24	19:15	17:09	111 10:21 (1) 16:30	
3	05:23	06:01	06:51	07:40	07:34	08:06 (2) 08:24	
	21:59	21:25	20:22	19:12	17:07	113 10:22 (1) 16:29	
4	05:24	06:03	06:53	07:42	07:36	08:06 (2) 08:26	
	21:59	21:23	20:20	19:10	17:05	113 10:22 (1) 16:29	
5	05:25	06:04	06:54	07:43	07:38	08:06 (2) 08:27	
	21:59	21:22	20:17	19:08	17:04	113 10:22 (1) 16:28	
6	05:26	06:06	06:56	07:45	07:39	08:08 (2) 08:28	
	21:58	21:20	20:15	19:06	17:02	112 10:23 (1) 16:28	
7	05:26	06:08	06:58	07:47	07:41	08:10 (2) 08:29	
	21:57	21:18	20:13	19:03	17:00	110 10:23 (1) 16:28	
8	05:27	06:09	06:59	07:48	07:43	08:12 (2) 08:31	
	21:57	21:16	20:10	19:01	16:59	108 10:23 (1) 16:27	
9	05:28	06:11	07:01	07:50	07:45	08:14 (2) 08:32	
	21:56	21:14	20:08	18:59	16:57	106 10:23 (1) 16:27	
10	05:29	06:12	07:02	07:52	07:47	08:16 (2) 08:33	
	21:55	21:12	20:06	18:56	16:55	104 10:24 (1) 16:27	
11	05:30	06:14	07:04	07:54	07:48	08:18 (2) 08:34	
	21:55	21:10	20:03	18:54	16:54	102 10:24 (1) 16:27	
12	05:31	06:15	07:06	07:55	07:50	08:20 (2) 08:35	
	21:54	21:09	20:01	18:52	16:52	99 10:24 (1) 16:26	
13	05:33	06:17	07:07	07:57	07:52	08:21 (2) 08:36	
	21:53	21:07	19:59	18:50	16:51	97 10:23 (1) 16:26	
14	05:34	06:19	07:09	07:59	07:54	08:23 (2) 08:37	
	21:52	21:05	19:57	18:48	16:49	94 10:23 (1) 16:26	
15	05:35	06:20	07:11	08:00	07:55	08:25 (2) 08:38	
	21:51	21:03	19:54	18:45	16:48	91 10:23 (1) 16:26	
16	05:36	06:22	07:12	08:02	10:39 (1) 07:57	08:27 (2) 08:39	
	21:50	21:01	19:52	18:43	15 10:54 (1) 16:46	88 10:23 (1) 16:27	
17	05:37	06:24	07:14	08:04	10:34 (1) 07:59	08:29 (2) 08:40	
	21:49	20:59	19:50	18:41	26 11:00 (1) 16:45	85 10:23 (1) 16:27	
18	05:38	06:25	07:15	08:06	10:31 (1) 08:01	08:31 (2) 08:40	
	21:48	20:57	19:47	18:39	32 11:03 (1) 16:44	81 10:23 (1) 16:27	
19	05:40	06:27	07:17	08:07	10:28 (1) 08:02	08:33 (2) 08:41	
	21:47	20:55	19:45	18:37	37 11:05 (1) 16:42	78 10:23 (1) 16:27	
20	05:41	06:28	07:19	08:09	09:24 (2) 08:04	08:35 (2) 08:42	
	21:46	20:52	19:43	18:35	50 11:08 (1) 16:41	75 10:23 (1) 16:28	
21	05:42	06:30	07:20	08:11	09:20 (2) 08:06	08:36 (2) 08:42	
	21:44	20:50	19:40	18:33	63 11:10 (1) 16:40	71 10:22 (1) 16:28	
22	05:44	06:32	07:22	08:13	09:17 (2) 08:07	08:38 (2) 08:43	
	21:43	20:48	19:38	18:31	72 11:11 (1) 16:39	67 10:23 (1) 16:29	
23	05:45	06:33	07:24	08:14	09:15 (2) 08:09	09:19 (1) 08:43	
	21:42	20:46	19:36	18:29	79 11:13 (1) 16:38	64 10:23 (1) 16:29	
24	05:46	06:35	07:25	08:16	09:13 (2) 08:11	09:19 (1) 08:44	
	21:40	20:44	19:33	18:26	86 11:15 (1) 16:37	64 10:23 (1) 16:30	
25	05:48	06:36	07:27	07:18	08:12 (2) 08:12	09:20 (1) 08:44	
	21:39	20:42	19:31	17:24	90 10:16 (1) 16:36	63 10:23 (1) 16:30	
26	05:49	06:38	07:28	07:20	08:11 (2) 08:14	09:20 (1) 08:44	
	21:38	20:40	19:29	17:22	94 10:17 (1) 16:35	62 10:22 (1) 16:31	
27	05:51	06:40	07:30	07:21	08:10 (2) 08:15	09:22 (1) 08:45	
	21:36	20:37	19:26	17:20	98 10:18 (1) 16:34	60 10:22 (1) 16:32	
28	05:52	06:41	07:32	07:23	08:08 (2) 08:17	09:23 (1) 08:45	
	21:35	20:35	19:24	17:19	101 10:18 (1) 16:33	59 10:22 (1) 16:32	
29	05:54	06:43	07:33	07:25	08:08 (2) 08:18	09:23 (1) 08:45	
	21:33	20:33	19:22	17:17	104 10:19 (1) 16:32	59 10:22 (1) 16:33	
30	05:55	06:45	07:35	07:27	08:07 (2) 08:20	09:24 (1) 08:45	
	21:32	20:31	19:19	17:15	105 10:19 (1) 16:31	58 10:22 (1) 16:34	
31	05:57	06:46		07:29	08:07 (2)	08:45	09:44 (1)
	21:30	20:29		17:13	108 10:20 (1)	16:35	46 10:30 (1)
Potential sun hours	502	454	381	331	266	244	
Total, worst case				1160	2616	1447	
Sun reduction				0.24	0.18	0.13	
Oper. time red.				1.00	1.00	1.00	
Wind dir. red.				0.67	0.67	0.66	
Total reduction				0.16	0.12	0.09	
Total, real				184	322	129	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: E - H5

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: F - H6

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each hour of the day (08:45 to 17:22). Includes summary rows for Potential sun hours, Total, worst case, Sun reduction, Oper. time red., Wind dir. red., Total reduction, and Total, real.

Table layout: For each day in each month the following matrix apply

Matrix layout table with 2 rows: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:07/3.5.584

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: G - H7

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Table with columns for months (January to December) and rows for each day of the month, showing sunrise and sunset times and shadow reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix with columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: H - H8

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining table layout: Day in month, Sun rise/set, Minutes with flicker, First/Last time with flicker, and WTG causing flicker first/last time.

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: J - H10

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

		January		February		March		April		May		June		July		August		September		October		November		December	
1	08:45			15:29 (2)	08:18	07:25	07:14	06:10	05:25	05:22	05:58	06:48	07:37	07:30	08:21										
	16:36	20	15:49 (2)	17:24	18:16	20:10	21:00	21:46	22:00	21:28	20:26	19:17	17:11	16:31	5	15:28 (2)									
2	08:45			15:30 (2)	08:17	07:23	07:12	06:08	05:23	05:22	06:00	06:49	07:38	07:32	08:23										
	16:37	19	15:49 (2)	17:26	18:17	20:11	21:02	21:47	22:00	21:27	20:24	19:15	17:09	16:30	9	15:31 (2)									
3	08:45			15:31 (2)	08:15	07:21	07:10	06:06	05:23	05:23	06:01	06:51	07:40	07:34	08:24										
	16:39	19	15:50 (2)	17:28	18:19	20:13	21:04	21:48	21:59	21:25	20:22	19:12	17:07	16:29	11	15:32 (2)									
4	08:45			15:33 (2)	08:14	07:18	07:08	06:04	05:22	05:24	06:03	06:53	07:42	07:36	08:25										
	16:40	17	15:50 (2)	17:30	18:21	20:15	21:05	21:49	21:59	21:23	20:19	19:10	17:05	16:29	13	15:34 (2)									
31	08:20			17:17	18:14	19:03	20:55	21:41	22:01	21:35	20:35	19:24	17:18	16:33	20	15:48 (2)									
	17:22			20:08	21:45	21:45	21:45	21:45	21:45	21:30	20:28	19:19	17:13	16:35	20	15:49 (2)									
Potential sun hours		259		278		367		416		485		499		502		454		381		331		266		244	
Total, worst case		163																						568	
Sun reduction		0.16																						0.13	
Oper. time red.		1.00																						1.00	
Wind dir. red.		0.59																						0.59	
Total reduction		0.09																						0.08	
Total, real		15																						45	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Derragh WF Impacts Only **Shadow receptor:** K - H11

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45 16:36	08:18 17:24	07:25 18:16	07:14 20:10	06:10 21:01	05:25 21:46	05:22 22:00	05:58 21:28	06:48 20:26	07:37 19:17	07:31 17:11	08:21 16:31
2	08:45 16:37	08:17 17:26	07:23 18:18	07:12 20:11	06:08 21:02	05:24 21:48	05:22 22:00	06:00 21:27	06:49 20:24	07:38 19:15	07:32 17:09	08:23 16:30
3	08:45 16:39	08:15 17:28	07:21 18:19	07:10 20:13	06:06 21:04	05:23 21:49	05:23 22:00	06:01 21:25	06:51 20:22	07:40 19:12	07:34 17:07	08:24 16:29
4	08:45 16:40	08:14 17:30	07:19 18:21	07:08 20:15	06:04 21:06	05:22 21:50	05:24 21:59	06:03 21:23	06:53 20:20	07:42 19:10	07:36 17:05	08:26 16:29
5	08:45 16:41	08:12 17:32	07:16 18:23	07:05 20:17	06:02 21:07	05:22 21:51	05:25 21:59	06:04 21:22	06:54 20:17	07:43 19:08	07:38 17:04	08:27 16:28
6	08:44 16:42	08:10 17:33	07:14 18:25	07:03 20:18	06:00 21:09	05:21 21:52	05:25 21:58	06:06 21:20	06:56 20:15	07:45 19:06	07:40 17:02	08:28 16:28
7	08:44 16:43	08:09 17:35	07:12 18:27	07:01 20:20	05:59 21:11	05:20 21:53	05:26 21:58	06:07 21:18	06:58 20:13	07:47 19:03	07:41 17:00	08:30 16:27
8	08:44 16:45	08:07 17:37	07:10 18:28	06:59 20:22	05:57 21:12	05:20 21:53	05:27 21:57	06:09 21:16	06:59 20:10	07:49 19:01	07:43 16:59	08:31 16:27
9	08:43 16:46	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	05:19 21:54	05:28 21:56	06:11 21:14	07:01 20:08	07:50 18:59	07:45 16:57	08:32 16:27
10	08:42 16:47	08:03 17:41	07:05 18:32	06:54 20:25	05:53 21:15	05:19 21:55	05:29 21:56	06:12 21:13	07:02 20:06	07:52 18:57	07:47 16:55	08:33 16:27
11	08:42 16:49	08:02 17:43	07:03 18:34	06:52 20:27	05:52 21:17	05:18 21:56	05:30 21:55	06:14 21:11	07:04 20:04	07:54 18:54	07:48 16:54	08:34 16:26
12	08:41 16:50	08:00 17:45	07:01 18:35	06:50 20:29	05:50 21:19	05:18 21:56	05:31 21:54	06:15 21:09	07:06 20:01	07:55 18:52	07:50 16:52	08:35 16:26
13	08:41 16:52	07:58 17:46	06:58 18:37	06:47 20:30	05:48 21:20	05:18 21:57	05:32 21:53	06:17 21:07	07:07 19:59	07:57 18:50	07:52 16:51	08:36 16:26
14	08:40 16:53	07:56 17:48	06:56 18:39	06:45 20:32	05:47 21:22	05:18 21:58	05:34 21:52	06:19 21:05	07:09 19:57	07:59 18:48	07:54 16:49	08:37 16:26
15	08:39 16:55	07:54 17:50	06:54 18:41	06:43 20:34	05:45 21:23	05:17 21:58	05:35 21:51	06:20 21:03	07:11 19:54	08:01 18:45	07:56 16:48	08:38 16:26
16	08:38 16:56	07:52 17:52	06:51 18:42	06:41 20:35	05:44 21:25	05:17 21:59	05:36 21:50	06:22 21:01	07:12 19:52	08:02 18:43	07:57 16:46	08:39 16:26
17	08:37 16:58	07:50 17:54	06:49 18:44	06:39 20:37	05:42 21:26	05:17 21:59	05:37 21:49	06:23 20:59	07:14 19:50	08:04 18:41	07:59 16:45	08:40 16:27
18	08:36 17:00	07:48 17:56	06:47 18:46	06:36 20:39	05:41 21:28	05:17 22:00	05:38 21:48	06:25 20:57	07:15 19:47	08:06 18:39	08:01 16:44	08:40 16:27
19	08:35 17:01	07:46 17:58	06:45 18:48	06:34 20:40	05:39 21:29	05:17 22:00	05:40 21:47	06:27 20:55	07:17 19:45	08:07 18:37	08:02 16:42	08:41 16:27
20	08:34 17:03	07:44 17:59	06:42 18:49	06:32 20:42	05:38 21:31	05:17 22:00	05:41 21:46	06:28 20:53	07:19 19:43	08:09 18:35	08:04 16:41	08:42 16:28
21	08:33 17:05	07:42 18:01	06:40 18:51	06:30 20:44	05:37 21:32	05:17 22:01	05:42 21:44	06:30 20:50	07:20 19:40	08:11 18:33	08:06 16:40	08:42 16:28
22	08:32 17:06	07:40 18:03	06:38 18:53	06:28 20:45	05:35 21:34	05:18 22:01	05:44 21:43	06:32 20:48	07:22 19:38	08:13 18:31	08:07 16:39	08:43 16:28
23	08:31 17:08	07:38 18:05	06:35 18:54	06:26 20:47	05:34 21:35	05:18 22:01	05:45 21:42	06:33 20:46	07:24 19:36	08:14 18:29	08:09 16:38	08:43 16:29
24	08:30 17:10	07:36 18:07	06:33 18:56	06:24 20:49	05:33 21:36	05:18 22:01	05:46 21:41	06:35 20:44	07:25 19:33	08:16 18:26	08:11 16:37	08:44 16:30
25	08:28 17:12	07:34 18:09	06:31 18:58	06:22 20:51	05:32 21:38	05:19 22:01	05:48 21:39	06:36 20:42	07:27 19:31	08:18 18:24	08:12 16:36	08:44 16:30
26	08:27 17:13	07:32 18:10	06:28 19:00	06:20 20:52	05:31 21:39	05:19 22:01	05:49 21:38	06:38 20:40	07:29 19:29	08:20 18:22	08:14 16:35	08:45 16:31
27	08:26 17:15	07:29 18:12	06:26 19:01	06:18 20:54	05:29 21:40	05:19 22:01	05:51 21:36	06:40 20:38	07:30 19:26	08:22 18:20	08:16 16:34	08:45 16:32
28	08:24 17:17	07:27 18:14	06:24 19:03	06:16 20:56	05:28 21:42	05:20 22:01	05:52 21:35	06:41 20:35	07:32 19:24	08:23 18:19	08:17 16:33	08:45 16:32
29	08:23 17:19	07:21 18:05	06:14 19:05	06:14 20:57	05:27 21:43	05:20 22:01	05:54 21:33	06:43 20:33	07:33 19:22	08:25 18:17	08:19 16:32	08:45 16:33
30	08:21 17:21	07:19 18:06	06:12 19:02	06:12 20:59	05:26 21:44	05:21 22:01	05:55 21:32	06:45 20:31	07:35 19:19	08:27 17:15	08:20 16:31	08:45 16:34
31	08:20 17:22	07:17 18:08	06:11 19:08	06:11 20:08	05:25 21:45	05:25 21:45	05:57 21:30	06:46 20:29	07:37 17:13	08:29 17:13	08:21 16:35	08:45 16:35
Potential sun hours	259	278	367	416	485	499	502	454	381	331	266	244
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:07/3.5.584

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: L - H12

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with 13 columns (January-December) and 31 rows of daily data, including sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: M - H13

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: N - H14

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with 13 columns (January-December) and 33 rows of time intervals (1-31) plus summary rows for potential sun hours and reductions.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise/set, Minutes with flicker, First/Last time with flicker, and WTG causing flicker first/last time.



SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: O - H15

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of sunshine probability values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of operational time values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining table layout: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

Project:
6225Gortyrahilly_ShadowFlicker_12042022

Description:
14 Turbine Layout, West Cork, FEI/SSE

Licensed user:
Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:07/3.5.584

SHADOW - Calendar

Calculation: Derragh WF Impacts Only **Shadow receptor:** P - H16

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45 16:36	08:18 17:24	07:25 18:16	07:15 20:10	06:10 21:01	05:25 21:46	05:22 22:00	05:58 21:28	06:48 20:26	07:37 19:17	07:31 17:11	08:21 16:31
2	08:45 16:38	08:17 17:26	07:23 18:18	07:12 20:11	06:08 21:02	05:24 21:48	05:22 22:00	06:00 21:27	06:50 20:24	07:38 19:15	07:32 17:09	08:23 16:30
3	08:45 16:39	08:15 17:28	07:21 18:19	07:10 20:13	06:06 21:04	05:23 21:49	05:23 22:00	06:01 21:25	06:51 20:22	07:40 19:12	07:34 17:07	08:24 16:29
4	08:45 16:40	08:14 17:30	07:19 18:21	07:08 20:15	06:04 21:06	05:22 21:50	05:24 21:59	06:03 21:23	06:53 20:20	07:42 19:10	07:36 17:06	08:26 16:29
5	08:45 16:41	08:12 17:32	07:16 18:23	07:05 20:17	06:02 21:07	05:22 21:51	05:25 21:59	06:04 21:22	06:54 20:17	07:44 19:08	07:38 17:04	08:27 16:28
6	08:44 16:42	08:10 17:34	07:14 18:25	07:03 20:18	06:00 21:09	05:21 21:52	05:26 21:58	06:06 21:20	06:56 20:15	07:45 19:06	07:40 17:02	08:28 16:28
7	08:44 16:43	08:09 17:35	07:12 18:27	07:01 20:20	05:59 21:11	05:20 21:52	05:26 21:58	06:08 21:18	06:58 20:13	07:47 19:03	07:41 17:00	08:30 16:28
8	08:43 16:45	08:07 17:37	07:10 18:28	06:59 20:22	05:57 21:12	05:20 21:53	05:27 21:57	06:09 21:16	06:59 20:11	07:49 19:01	07:43 16:59	08:31 16:27
9	08:43 16:46	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	05:19 21:54	05:28 21:56	06:11 21:14	07:01 20:08	07:50 18:59	07:45 16:57	08:32 16:27
10	08:42 16:48	08:03 17:41	07:05 18:32	06:54 20:25	05:53 21:15	05:19 21:55	05:29 21:56	06:12 21:13	07:03 20:06	07:52 18:57	07:47 16:55	08:33 16:27
11	08:42 16:49	08:02 17:43	07:03 18:34	06:52 20:27	05:52 21:17	05:19 21:56	05:30 21:55	06:14 21:11	07:04 20:04	07:54 18:54	07:48 16:54	08:34 16:27
12	08:41 16:50	08:00 17:45	07:01 18:35	06:50 20:29	05:50 21:19	05:18 21:56	05:31 21:54	06:15 21:09	07:06 20:01	07:55 18:52	07:50 16:52	08:35 16:26
13	08:41 16:52	07:58 17:47	06:58 18:37	06:47 20:30	05:49 21:20	05:18 21:57	05:33 21:53	06:17 21:07	07:07 19:59	07:57 18:50	07:52 16:51	08:36 16:26
14	08:40 16:53	07:56 17:48	06:56 18:39	06:45 20:32	05:47 21:22	05:18 21:58	05:34 21:52	06:19 21:05	07:09 19:57	07:59 18:48	07:54 16:49	08:37 16:26
15	08:39 16:55	07:54 17:50	06:54 18:41	06:43 20:34	05:45 21:23	05:18 21:58	05:35 21:51	06:20 21:03	07:11 19:54	08:01 18:46	07:56 16:48	08:38 16:26
16	08:38 16:57	07:52 17:52	06:51 18:42	06:41 20:35	05:44 21:25	05:17 21:59	05:36 21:50	06:22 21:01	07:12 19:52	08:02 18:43	07:57 16:46	08:39 16:27
17	08:37 16:58	07:50 17:54	06:49 18:44	06:39 20:37	05:42 21:26	05:17 21:59	05:37 21:49	06:24 20:59	07:14 19:50	08:04 18:41	07:59 16:45	08:40 16:27
18	08:36 17:00	07:48 17:56	06:47 18:46	06:36 20:39	05:41 21:28	05:17 22:00	05:38 21:48	06:25 20:57	07:15 19:47	08:06 18:39	08:01 16:44	08:40 16:27
19	08:35 17:01	07:46 17:58	06:45 18:48	06:34 20:40	05:39 21:29	05:17 22:00	05:40 21:47	06:27 20:55	07:17 19:45	08:07 18:37	08:02 16:43	08:41 16:27
20	08:34 17:03	07:44 17:59	06:42 18:49	06:32 20:42	05:38 21:31	05:17 22:00	05:41 21:46	06:28 20:53	07:19 19:43	08:09 18:35	08:04 16:41	08:42 16:28
21	08:33 17:05	07:42 18:01	06:40 18:51	06:30 20:44	05:37 21:32	05:18 22:01	05:42 21:44	06:30 20:50	07:20 19:40	08:11 18:33	08:06 16:40	08:42 16:28
22	08:32 17:06	07:40 18:03	06:38 18:53	06:28 20:45	05:35 21:34	05:18 22:01	05:44 21:43	06:32 20:48	07:22 19:38	08:13 18:31	08:07 16:39	08:43 16:29
23	08:31 17:08	07:38 18:05	06:35 18:54	06:26 20:47	05:34 21:35	05:18 22:01	05:45 21:42	06:33 20:46	07:24 19:36	08:14 18:29	08:09 16:38	08:43 16:29
24	08:30 17:10	07:36 18:07	06:33 18:56	06:24 20:49	05:33 21:36	05:18 22:01	05:46 21:41	06:35 20:44	07:25 19:33	08:16 18:27	08:11 16:37	08:44 16:30
25	08:28 17:12	07:34 18:09	06:31 18:58	06:22 20:51	05:32 21:38	05:19 22:01	05:48 21:39	06:37 20:42	07:27 19:31	08:18 17:25	08:12 16:36	08:44 16:30
26	08:27 17:13	07:32 18:10	06:28 19:00	06:20 20:52	05:31 21:39	05:19 22:01	05:49 21:38	06:38 20:40	07:29 19:29	08:20 17:23	08:14 16:35	08:45 16:31
27	08:26 17:15	07:29 18:12	06:26 19:01	06:18 20:54	05:29 21:40	05:19 22:01	05:51 21:36	06:40 20:38	07:30 19:26	08:22 17:21	08:15 16:34	08:45 16:32
28	08:24 17:17	07:27 18:14	06:24 19:03	06:16 20:56	05:28 21:42	05:20 22:01	05:52 21:35	06:41 20:35	07:32 19:24	08:23 17:19	08:17 16:33	08:45 16:32
29	08:23 17:19	07:23 18:05	06:21 19:05	06:14 20:57	05:27 21:43	05:21 22:01	05:54 21:33	06:43 20:33	07:34 19:22	08:25 17:17	08:19 16:32	08:45 16:33
30	08:21 17:21	07:19 18:06	06:19 19:06	06:12 20:59	05:26 21:44	05:21 22:01	05:55 21:32	06:45 20:31	07:35 19:19	08:27 17:15	08:20 16:31	08:45 16:34
31	08:20 17:22	07:17 18:08	06:17 19:08	06:10 20:08	05:26 21:45	05:22 22:01	05:57 21:30	06:46 20:29	07:29 17:13	08:29 17:13	08:45 16:35	08:45 16:35
Potential sun hours	259	278	367	416	485	499	502	454	381	331	266	244
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: Q - H17

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining table layout: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:07/3.5.584

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: S - H19

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June	
1	08:45 16:37	08:18 17:24	07:25 18:16	07:49 (2) 08:00 (2)	07:14 20:10	08:29 (1) 21:01	08:35 (1) 21:46
2	08:45 16:38	08:17 17:26	07:23 18:18	07:46 (2) 08:01 (2)	07:12 20:11	08:29 (1) 21:02	08:36 (1) 21:47
3	08:45 16:39	08:15 17:28	07:21 18:19	07:44 (2) 08:03 (2)	07:10 20:13	08:28 (1) 21:04	08:38 (1) 21:48
4	08:45 16:40	08:14 17:30	07:18 18:21	07:42 (2) 08:04 (2)	07:08 20:15	08:27 (1) 21:06	08:40 (1) 21:49
5	08:44 16:41	08:12 17:32	07:16 18:23	07:40 (2) 08:06 (2)	07:05 20:17	08:27 (1) 21:07	08:41 (1) 21:50
6	08:44 16:42	08:10 17:34	07:14 18:25	07:37 (2) 08:06 (2)	07:03 20:18	08:27 (1) 21:09	08:43 (1) 21:51
7	08:44 16:44	08:09 17:35	07:12 18:27	07:35 (2) 08:30 (1)	07:01 20:20	08:27 (1) 21:10	08:46 (1) 21:52
8	08:43 16:45	08:07 17:37	07:10 18:28	07:33 (2) 08:37 (1)	06:59 20:22	08:26 (1) 21:12	08:48 (1) 21:53
9	08:43 16:46	08:05 17:39	07:07 18:30	07:30 (2) 08:41 (1)	06:56 20:23	08:26 (1) 21:14	08:52 (1) 21:54
10	08:42 16:48	08:03 17:41	07:05 18:32	07:28 (2) 08:44 (1)	06:54 20:25	08:26 (1) 21:15	05:19 21:55
11	08:42 16:49	08:01 17:43	07:03 18:34	07:26 (2) 08:47 (1)	06:52 20:27	08:26 (1) 21:17	05:19 21:56
12	08:41 16:50	08:00 17:45	07:01 18:35	07:23 (2) 08:49 (1)	06:50 20:28	08:26 (1) 21:18	05:18 21:56
13	08:40 16:52	07:58 17:47	06:58 18:37	07:21 (2) 08:51 (1)	06:47 20:30	08:25 (1) 21:20	05:18 21:57
14	08:40 16:53	07:56 17:48	06:56 18:39	07:20 (2) 08:53 (1)	06:45 20:32	08:26 (1) 21:22	05:18 21:58
15	08:39 16:55	07:54 17:50	06:54 18:41	07:20 (2) 08:55 (1)	06:43 20:34	08:26 (1) 21:23	05:18 21:58
16	08:38 16:57	07:52 17:52	06:51 18:42	07:20 (2) 08:55 (1)	06:41 20:35	08:26 (1) 21:25	05:17 21:59
17	08:37 16:58	07:50 17:54	06:49 18:44	07:20 (2) 08:57 (1)	06:39 20:37	08:26 (1) 21:26	05:17 21:59
18	08:36 17:00	07:48 17:56	06:47 18:46	07:20 (2) 08:58 (1)	06:36 20:39	08:27 (1) 21:28	05:17 21:59
19	08:35 17:01	07:46 17:58	06:44 18:47	07:20 (2) 08:58 (1)	06:34 20:40	08:27 (1) 21:29	05:17 22:00
20	08:34 17:03	07:44 17:59	06:42 18:49	07:20 (2) 08:59 (1)	06:32 20:42	08:28 (1) 21:31	05:17 22:00
21	08:33 17:05	07:42 18:01	06:40 18:51	07:21 (2) 09:00 (1)	06:30 20:44	08:28 (1) 21:32	05:18 22:00
22	08:32 17:06	07:40 18:03	06:38 18:53	07:21 (2) 09:00 (1)	06:28 20:45	08:29 (1) 21:33	05:18 22:01
23	08:31 17:08	07:38 18:05	06:35 18:54	07:22 (2) 09:01 (1)	06:26 20:47	08:29 (1) 21:35	05:18 22:01
24	08:29 17:10	07:36 18:07	06:33 18:56	07:23 (2) 09:02 (1)	06:24 20:49	08:30 (1) 21:36	05:18 22:01
25	08:28 17:12	07:34 18:09	06:31 18:58	07:24 (2) 09:02 (1)	06:22 20:50	08:30 (1) 21:38	05:19 22:01
26	08:27 17:13	07:31 18:10	06:28 18:59	07:26 (2) 09:03 (1)	06:20 20:52	08:31 (1) 21:39	05:19 22:01
27	08:26 17:15	07:29 18:12	06:26 19:01	07:28 (2) 09:03 (1)	06:18 20:54	08:32 (1) 21:40	05:20 22:01
28	08:24 17:17	07:27 18:14	07:51 (2) 07:57 (2)	06:24 19:03 (1)	06:16 20:56	08:33 (1) 21:41	05:20 22:01
29	08:23 17:19			07:21 (1) 20:05	06:14 20:57	08:33 (1) 21:43	05:21 22:01
30	08:21 17:21			08:31 (1) 20:06	06:12 20:59	08:34 (1) 21:44	05:21 22:01
31	08:20 17:22			07:19 20:08		08:34 (1) 21:45	05:21 22:01
Potential sun hours	259	278	367	416	485		499
Total, worst case			6	2362	2504		359
Sun reduction			0.21	0.24	0.35		0.37
Oper. time red.			1.00	1.00	1.00		1.00
Wind dir. red.			0.67	0.67	0.67		0.67
Total reduction			0.14	0.16	0.24		0.25
Total, real			1	385	593		89

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)



SHADOW - Calendar

Calculation: Derragh WF Impacts Only **Shadow receptor:** S - H19

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22	05:58	06:48	08:25 (1)	07:37	08:02 (2)
	22:00	21:28	20:26	09:57 (1)	19:17	09:29 (1)
2	05:22	06:00	06:49	08:24 (1)	07:38	08:03 (2)
	22:00	21:27	20:24	09:56 (1)	19:15	09:26 (1)
3	05:23	06:01	09:06 (1)	06:51	08:24 (1)	07:40
	21:59	21:25	10	09:16 (1)	20:22	09:57 (1)
4	05:24	06:03	09:00 (1)	06:53	08:23 (1)	07:42
	21:59	21:23	21	09:21 (1)	20:20	09:56 (1)
5	05:25	06:04	08:57 (1)	06:54	08:23 (1)	07:43
	21:59	21:22	29	09:26 (1)	20:17	09:57 (1)
6	05:26	06:06	08:54 (1)	06:56	08:23 (1)	07:45
	21:58	21:20	34	09:28 (1)	20:15	09:57 (1)
7	05:26	06:08	08:52 (1)	06:58	08:22 (1)	07:47
	21:57	21:18	39	09:31 (1)	20:13	09:56 (1)
8	05:27	06:09	08:50 (1)	06:59	08:22 (1)	07:48
	21:57	21:16	43	09:33 (1)	20:10	09:56 (1)
9	05:28	06:11	08:49 (1)	07:01	08:22 (1)	07:50
	21:56	21:14	46	09:35 (1)	20:08	09:56 (1)
10	05:29	06:12	08:46 (1)	07:02	08:22 (1)	07:52
	21:55	21:12	51	09:37 (1)	20:06	09:56 (1)
11	05:30	06:14	08:45 (1)	07:04	08:21 (1)	07:54
	21:55	21:10	54	09:39 (1)	20:03	09:55 (1)
12	05:31	06:15	08:43 (1)	07:06	08:21 (1)	07:55
	21:54	21:09	57	09:40 (1)	20:01	09:54 (1)
13	05:33	06:17	08:42 (1)	07:07	08:22 (1)	07:57
	21:53	21:07	60	09:42 (1)	19:59	09:54 (1)
14	05:34	06:19	08:41 (1)	07:09	08:21 (1)	07:59
	21:52	21:05	62	09:43 (1)	19:57	09:53 (1)
15	05:35	06:20	08:40 (1)	07:11	08:21 (2)	08:00
	21:51	21:03	65	09:45 (1)	19:54	09:53 (1)
16	05:36	06:22	08:38 (1)	07:12	08:17 (2)	08:02
	21:50	21:01	68	09:46 (1)	19:52	09:51 (1)
17	05:37	06:24	08:37 (1)	07:14	08:14 (2)	08:04
	21:49	20:59	70	09:47 (1)	19:50	09:51 (1)
18	05:38	06:25	08:36 (1)	07:15	08:13 (2)	08:06
	21:48	20:57	72	09:48 (1)	19:47	09:50 (1)
19	05:40	06:27	08:35 (1)	07:17	08:10 (2)	08:07
	21:47	20:55	74	09:49 (1)	19:45	09:49 (1)
20	05:41	06:28	08:34 (1)	07:19	08:09 (2)	08:09
	21:46	20:52	76	09:50 (1)	19:43	09:48 (1)
21	05:42	06:30	08:33 (1)	07:20	08:07 (2)	08:11
	21:44	20:50	78	09:51 (1)	19:40	09:46 (1)
22	05:44	06:32	08:32 (1)	07:22	08:06 (2)	08:13
	21:43	20:48	79	09:51 (1)	19:38	09:45 (1)
23	05:45	06:33	08:31 (1)	07:24	08:05 (2)	08:14
	21:42	20:46	82	09:53 (1)	19:36	09:44 (1)
24	05:46	06:35	08:30 (1)	07:25	08:04 (2)	08:16
	21:40	20:44	83	09:53 (1)	19:33	09:42 (1)
25	05:48	06:36	08:29 (1)	07:27	08:03 (2)	07:18
	21:39	20:42	85	09:54 (1)	19:31	09:41 (1)
26	05:49	06:38	08:29 (1)	07:28	08:02 (2)	07:20
	21:38	20:40	86	09:55 (1)	19:29	09:39 (1)
27	05:51	06:40	08:28 (1)	07:30	08:01 (2)	07:21
	21:36	20:37	87	09:55 (1)	19:26	09:38 (1)
28	05:52	06:41	08:28 (1)	07:32	08:01 (2)	07:23
	21:35	20:35	88	09:56 (1)	19:24	09:36 (1)
29	05:54	06:43	08:26 (1)	07:33	08:00 (2)	07:25
	21:33	20:33	90	09:56 (1)	19:22	09:33 (1)
30	05:55	06:45	08:26 (1)	07:35	08:00 (2)	07:27
	21:32	20:31	90	09:56 (1)	19:19	09:31 (1)
31	05:57	06:46	08:25 (1)		07:29	
	21:30	20:29	91	09:56 (1)		17:13
Potential sun hours	502	454	381	331	266	244
Total, worst case		1870		2849		586
Sun reduction		0.30		0.28		0.24
Oper. time red.		1.00		1.00		1.00
Wind dir. red.		0.67		0.67		0.67
Total reduction		0.20		0.19		0.16
Total, real		371		540		93

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: T - H20

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: U - H21

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: V - H22

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main data table with columns for months (January-December) and rows for days (1-31) and summary rows (Potential sun hours, Total, worst case, Sun reduction, Oper. time red., Wind dir. red., Total reduction, Total, real).

Table layout: For each day in each month the following matrix apply

Matrix with 4 columns: Day in month, Sun rise (hh:mm) / Sun set (hh:mm), Minutes with flicker, and First/Last time (hh:mm) with flicker (WTG causing flicker first/last time).

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: W - H23

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main data table with 13 columns (January-December) and 31 rows of daily data including sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: X - H24

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for days (1-31) and summary rows (Potential sun hours, Total, worst case, etc.)

Table layout: For each day in each month the following matrix apply

Summary table with 4 columns: Day in month, Sun rise/set, Minutes with flicker, First/Last time with flicker (WTG causing flicker)

SHADOW - Calendar

Calculation: Derragh WF Impacts Only **Shadow receptor:** Y - H25

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

Day	January		February		March		April		May		June	
	Sunrise	Sunset	Sunrise	Sunset	Sunrise	Sunset	Sunrise	Sunset	Sunrise	Sunset	Sunrise	Sunset
1	08:45	13:16 (4)	08:18	13:25 (4)	07:25	17:09 (2)	07:14	06:10	05:25			
	16:36	69 14:31 (5)	17:24	70 16:29 (3)	18:16	23 17:32 (2)	20:10	21:00	21:46			
2	08:45	13:17 (4)	08:17	13:27 (4)	07:23	17:08 (2)	07:12	06:08	05:24			
	16:37	68 14:31 (5)	17:26	69 16:30 (3)	18:17	25 17:33 (2)	20:11	21:02	21:47			
3	08:45	13:17 (4)	08:15	13:27 (4)	07:21	17:08 (2)	07:10	06:06	05:23			
	16:39	69 14:32 (5)	17:28	70 16:31 (3)	18:19	26 17:34 (2)	20:13	21:04	21:48			
4	08:45	13:17 (4)	08:13	13:28 (4)	07:18	17:07 (2)	07:08	06:04	05:22			
	16:40	68 14:31 (5)	17:30	69 16:31 (3)	18:21	27 17:34 (2)	20:15	21:05	21:49			
5	08:44	13:17 (4)	08:12	13:30 (4)	07:16	17:06 (2)	07:05	06:02	05:22			
	16:41	69 14:32 (5)	17:32	69 16:33 (3)	18:23	27 17:33 (2)	20:16	21:07	21:50			
6	08:44	13:18 (4)	08:10	13:32 (4)	07:14	17:07 (2)	07:03	06:00	05:21			
	16:42	67 14:32 (5)	17:33	66 16:33 (3)	18:25	26 17:33 (2)	20:18	21:09	21:51			
7	08:44	13:18 (4)	08:08	13:33 (4)	07:12	17:07 (2)	07:01	05:59	05:20			
	16:43	67 14:31 (5)	17:35	63 16:33 (3)	18:26	26 17:33 (2)	20:20	21:10	21:52			
8	08:43	13:17 (4)	08:07	13:35 (4)	07:09	17:08 (2)	06:58	05:57	05:20			
	16:45	67 14:31 (5)	17:37	59 16:33 (3)	18:28	28 17:46 (1)	20:22	21:12	21:53			
9	08:43	13:18 (4)	08:05	13:38 (4)	07:07	17:07 (2)	06:56	05:55	05:19			
	16:46	65 14:31 (5)	17:39	54 16:33 (3)	18:30	36 17:49 (1)	20:23	21:14	21:54			
10	08:42	13:18 (4)	08:03	13:42 (4)	07:05	17:09 (2)	06:54	05:53	05:19			
	16:47	64 14:30 (5)	17:41	46 16:33 (3)	18:32	37 17:51 (1)	20:25	21:15	21:55			
11	08:42	13:18 (4)	08:01	16:02 (3)	07:03	17:10 (2)	06:52	05:52	05:18			
	16:49	61 14:29 (5)	17:43	31 16:33 (3)	18:33	37 17:52 (1)	20:27	21:17	21:55			
12	08:41	13:18 (4)	07:59	16:02 (3)	07:00	17:11 (2)	06:49	05:50	05:18			
	16:50	58 14:27 (5)	17:45	30 16:32 (3)	18:35	34 17:52 (1)	20:28	21:18	21:56			
13	08:40	13:19 (4)	07:58	16:03 (3)	06:58	17:14 (2)	06:47	05:48	05:18			
	16:52	48 14:07 (4)	17:46	29 16:32 (3)	18:37	30 17:53 (1)	20:30	21:20	21:57			
14	08:40	13:19 (4)	07:56	16:03 (3)	06:56	17:32 (1)	06:45	05:47	05:18			
	16:53	49 14:08 (4)	17:48	28 16:31 (3)	18:39	21 17:53 (1)	20:32	21:22	21:57			
15	08:39	13:19 (4)	07:54	16:04 (3)	06:54	17:31 (1)	06:43	05:45	05:17			
	16:55	49 14:08 (4)	17:50	27 16:31 (3)	18:40	21 17:52 (1)	20:33	21:23	21:58			
16	08:38	13:19 (4)	07:52	16:05 (3)	06:51	17:31 (1)	06:41	05:44	05:17			
	16:56	50 14:09 (4)	17:52	25 16:30 (3)	18:42	21 17:52 (1)	20:35	21:25	21:59			
17	08:37	13:20 (4)	07:50	16:07 (3)	06:49	17:32 (1)	06:38	05:42	05:17			
	16:58	49 14:09 (4)	17:54	21 16:28 (3)	18:44	19 17:51 (1)	20:37	21:26	21:59			
18	08:36	13:19 (4)	07:48	16:09 (3)	06:47	17:31 (1)	06:36	05:41	05:17			
	17:00	50 14:09 (4)	17:56	18 16:27 (3)	18:46	19 17:50 (1)	20:39	21:28	21:59			
19	08:35	13:19 (4)	07:46	16:12 (3)	06:44	17:33 (1)	06:34	05:39	05:17			
	17:01	51 14:10 (4)	17:58	12 16:24 (3)	18:47	16 17:49 (1)	20:40	21:29	22:00			
20	08:34	13:20 (4)	07:44	06:42	06:42	17:35 (1)	06:32	05:38	05:17			
	17:03	50 14:10 (4)	17:59	12 18:49	18:49	12 17:47 (1)	20:42	21:31	22:00			
21	08:33	13:20 (4)	07:42	06:40	06:40	17:37 (1)	06:30	05:37	05:17			
	17:05	51 14:11 (4)	18:01	6 17:43 (1)	18:51	6 17:43 (1)	20:44	21:32	22:00			
22	08:32	13:21 (4)	07:40	06:37	06:37	06:28	06:28	05:35	05:18			
	17:06	50 14:11 (4)	18:03	18:53	18:53	20:45	20:45	21:33	22:01			
23	08:31	13:20 (4)	07:38	06:35	06:35	06:26	06:26	05:34	05:18			
	17:08	51 14:11 (4)	18:05	18:54	18:54	20:47	20:47	21:35	22:01			
24	08:29	13:21 (4)	07:36	06:33	06:33	06:24	06:24	05:33	05:18			
	17:10	51 14:12 (4)	18:07	18:56	18:56	20:49	20:49	21:36	22:01			
25	08:28	13:21 (4)	07:33	17:16 (2)	06:31	06:22	06:22	05:32	05:19			
	17:12	50 14:11 (4)	18:08	11 17:27 (2)	18:58	20:50	20:50	21:37	22:01			
26	08:27	13:22 (4)	07:31	17:13 (2)	06:28	06:20	06:20	05:30	05:19			
	17:13	50 14:12 (4)	18:10	16 17:29 (2)	18:59	20:52	20:52	21:39	22:01			
27	08:25	13:22 (4)	07:29	17:12 (2)	06:26	06:18	06:18	05:29	05:19			
	17:15	57 16:19 (3)	18:12	19 17:31 (2)	19:01	20:54	20:54	21:40	22:01			
28	08:24	13:23 (4)	07:27	17:11 (2)	06:24	06:16	06:16	05:28	05:20			
	17:17	62 16:22 (3)	18:14	21 17:32 (2)	19:03	20:55	20:55	21:41	22:01			
29	08:23	13:23 (4)	07:23	07:21	07:21	06:14	06:14	05:27	05:20			
	17:19	65 16:24 (3)	07:19	20:04	20:04	20:57	20:57	21:43	22:01			
30	08:21	13:24 (4)	07:20	07:19	07:19	06:12	06:12	05:26	05:21			
	17:20	69 16:27 (3)	07:17	20:06	20:06	20:59	20:59	21:44	22:00			
31	08:20	13:25 (4)	07:17	07:17	07:17	05:25	05:25	21:45	21:45			
	17:22	69 16:28 (3)	20:08	20:08	20:08	21:45	21:45	21:45	21:45			
Potential sun hours	259		278		367		416		485		499	
Total, worst case	1813		923		517							
Sun reduction	0.16		0.21		0.24							
Oper. time red.	1.00		1.00		1.00							
Wind dir. red.	0.59		0.60		0.64							
Total reduction	0.09		0.12		0.16							
Total, real	166		113		81							

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: Y - H25

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December				
1	05:22	05:58	06:48	07:37	17:52 (2)	07:30	13:11 (4)	08:21	13:00 (4)	
	22:00	21:28	20:26	19:17	33 18:32 (1)	17:11	49 16:03 (3)	16:31	61 14:11 (5)	
2	05:22	06:00	06:49	07:38	17:49 (2)	07:32	13:07 (4)	08:23	13:01 (4)	
	22:00	21:27	20:24	19:15	35 18:30 (1)	17:09	56 16:03 (3)	16:30	63 14:13 (5)	
3	05:23	06:01	06:51	07:40	17:47 (2)	07:34	13:05 (4)	08:24	13:01 (4)	
	21:59	21:25	20:22	19:12	36 18:29 (1)	17:07	60 16:03 (3)	16:29	65 14:14 (5)	
4	05:24	06:03	06:53	07:42	17:46 (2)	07:36	13:03 (4)	08:25	13:02 (4)	
	21:59	21:23	20:19	19:10	36 18:28 (1)	17:05	64 16:03 (3)	16:29	67 14:16 (5)	
5	05:25	06:04	06:54	07:43	17:44 (2)	07:38	13:01 (4)	08:27	13:03 (4)	
	21:58	21:21	20:17	19:08	32 18:24 (1)	17:04	67 16:03 (3)	16:28	66 14:16 (5)	
6	05:25	06:06	06:56	07:45	17:43 (2)	07:39	13:00 (4)	08:28	13:04 (4)	
	21:58	21:20	20:15	19:05	26 18:09 (2)	17:02	68 16:02 (3)	16:28	68 14:18 (5)	
7	05:26	06:07	06:57	07:47	17:43 (2)	07:41	12:59 (4)	08:29	13:04 (4)	
	21:57	21:18	20:13	19:03	26 18:09 (2)	17:00	69 16:02 (3)	16:27	69 14:19 (5)	
8	05:27	06:09	06:59	07:48	17:43 (2)	07:43	12:58 (4)	08:30	13:05 (4)	
	21:57	21:16	20:10	19:01	26 18:09 (2)	16:59	70 16:02 (3)	16:27	68 14:19 (5)	
9	05:28	06:11	07:01	07:50	17:41 (2)	07:45	12:57 (4)	08:32	13:05 (4)	
	21:56	21:14	20:08	18:59	27 18:08 (2)	16:57	71 16:01 (3)	16:27	69 14:20 (5)	
10	05:29	06:12	07:02	07:52	17:42 (2)	07:46	12:57 (4)	08:33	13:06 (4)	
	21:55	21:12	20:06	18:56	26 18:08 (2)	16:55	70 16:00 (3)	16:27	68 14:20 (5)	
11	05:30	06:14	07:04	07:53	17:42 (2)	07:48	12:55 (4)	08:34	13:07 (4)	
	21:55	21:10	20:03	18:54	26 18:08 (2)	16:54	69 15:58 (3)	16:26	69 14:22 (5)	
12	05:31	06:15	07:06	07:55	17:42 (2)	07:50	12:55 (4)	08:35	13:08 (4)	
	21:54	21:08	20:01	18:52	25 18:07 (2)	16:52	67 15:57 (3)	16:26	69 14:23 (5)	
13	05:32	06:17	07:07	07:57	17:42 (2)	07:52	12:55 (4)	08:36	13:09 (4)	
	21:53	21:07	19:59	18:50	23 18:05 (2)	16:51	65 15:56 (3)	16:26	68 14:23 (5)	
14	05:34	06:19	07:09	07:59	17:43 (2)	07:54	12:55 (4)	08:37	13:09 (4)	
	21:52	21:05	19:56	18:48	21 18:04 (2)	16:49	62 15:54 (3)	16:26	70 14:24 (5)	
15	05:35	06:20	07:10	08:00	17:44 (2)	07:55	12:55 (4)	08:38	13:10 (4)	
	21:51	21:03	19:54	18:45	19 18:03 (2)	16:48	56 15:51 (3)	16:26	69 14:25 (5)	
16	05:36	06:22	07:12	08:02	17:46 (2)	07:57	12:55 (4)	08:39	13:10 (4)	
	21:50	21:01	19:52	18:43	15 18:01 (2)	16:46	50 13:45 (4)	16:26	69 14:24 (5)	
17	05:37	06:23	07:14	08:04	17:49 (2)	07:59	12:55 (4)	08:39	13:11 (4)	
	21:49	20:59	19:49	18:41	9 17:58 (2)	16:45	50 13:45 (4)	16:27	68 14:25 (5)	
18	05:38	06:25	07:15	08:06	16:44	51 13:46 (4)	16:27	70 14:26 (5)		
	21:48	20:56	19:47	18:39	08:00	12:55 (4)	08:40	13:11 (4)		
19	05:40	06:27	07:17	08:07	16:42	51 13:46 (4)	16:27	69 14:27 (5)		
	21:47	20:54	19:45	18:37	08:04	12:56 (4)	08:42	13:12 (4)		
20	05:41	06:28	07:19	08:09	16:41	50 13:46 (4)	16:28	69 14:27 (5)		
	21:45	20:52	19:42	18:35	08:06	12:55 (4)	08:42	13:13 (4)		
21	05:42	06:30	07:20	08:11	16:40	51 13:46 (4)	16:28	69 14:28 (5)		
	21:44	20:50	19:40	18:33	08:07	12:56 (4)	08:43	13:13 (4)		
22	05:44	06:31	07:22	18:25 (1)	08:13	16:45 (3)	13:46 (4)	16:28	69 14:28 (5)	
	21:43	20:48	19:38	18:26 (1)	18:30	6 16:51 (3)	16:39	50 13:46 (4)	16:28	69 14:28 (5)
23	05:45	06:33	07:23	18:19 (1)	08:14	16:41 (3)	08:09	12:56 (4)	08:43	13:14 (4)
	21:42	20:46	19:35	11 18:30 (1)	18:28	14 16:55 (3)	16:38	51 13:47 (4)	16:29	69 14:29 (5)
24	05:46	06:35	07:25	18:17 (1)	08:16	16:39 (3)	08:10	12:57 (4)	08:44	13:14 (4)
	21:40	20:44	19:33	15 18:32 (1)	18:26	19 16:58 (3)	16:37	50 13:47 (4)	16:30	69 14:29 (5)
25	05:48	06:36	07:27	18:15 (1)	07:18	15:37 (3)	08:12	12:57 (4)	08:44	13:14 (4)
	21:39	20:42	19:31	18 18:33 (1)	17:24	22 15:59 (3)	16:36	49 13:46 (4)	16:30	70 14:29 (5)
26	05:49	06:38	07:28	18:14 (1)	07:20	15:36 (3)	08:14	12:57 (4)	08:44	13:15 (4)
	21:37	20:40	19:28	19 18:33 (1)	17:22	24 16:00 (3)	16:35	50 13:47 (4)	16:31	68 14:29 (5)
27	05:51	06:40	07:30	18:13 (1)	07:21	15:34 (3)	08:15	12:58 (4)	08:45	13:16 (4)
	21:36	20:37	19:26	20 18:33 (1)	17:20	26 16:00 (3)	16:34	49 13:47 (4)	16:32	68 14:30 (5)
28	05:52	06:41	07:32	18:13 (1)	07:23	15:33 (3)	08:17	12:59 (4)	08:45	13:16 (4)
	21:35	20:35	19:24	21 18:34 (1)	17:18	28 16:01 (3)	16:33	49 13:48 (4)	16:32	69 14:31 (5)
29	05:54	06:43	07:33	18:12 (1)	07:25	15:32 (3)	08:18	12:59 (4)	08:45	13:16 (4)
	21:33	20:33	19:21	21 18:33 (1)	17:16	30 16:02 (3)	16:32	48 13:47 (4)	16:33	69 14:31 (5)
30	05:55	06:44	07:35	17:58 (2)	07:27	15:32 (3)	08:20	13:00 (4)	08:45	13:16 (4)
	21:31	20:31	19:19	22 18:33 (1)	17:15	30 16:02 (3)	16:31	57 14:09 (5)	16:34	69 14:31 (5)
31	05:57	06:46	07:36	17:13	31 16:02 (3)	15:31 (3)	08:45	13:17 (4)	14:31 (5)	
	21:30	20:28	19:17	17:13	31 16:02 (3)	15:31 (3)	08:45	13:17 (4)	14:31 (5)	
Potential sun hours	502	454	381	331	266	1719	2111	1635	68	14:31 (5)
Total, worst case			148	671	1719	2111				
Sun reduction			0.28	0.24	0.18	0.13				
Oper. time red.			1.00	1.00	1.00	1.00				
Wind dir. red.			0.64	0.63	0.59	0.59				
Total reduction			0.18	0.15	0.11	0.08				
Total, real			27	100	187	168				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: Z - H26

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of sunshine probability values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of operational time values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (Jan-Dec) and rows for days (1-31). Includes summary rows for Potential sun hours, Total, worst case, Sun reduction, Oper. time red., Wind dir. red., Total reduction, and Total, real.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:07/3.5.584

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: AA - H27

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June	July	August	September	October	November	December	
1	08:45 16:37	08:18 17:24	07:25 18:16	07:15 20:10	07:44 (1) 21:01	06:10 21:46	05:25 22:00	05:22 21:28	05:58 21:28	06:48 20:26	07:32 (1) 19:17	07:37 17:11	08:21 16:31
2	08:45 16:38	08:17 17:26	07:23 18:18	07:12 20:11	07:39 (1) 21:02	06:08 21:47	05:24 22:00	05:23 21:27	06:00 21:27	06:50 20:24	07:31 (1) 19:15	07:38 17:09	08:23 16:30
3	08:45 16:39	08:15 17:28	07:21 18:19	07:10 20:13	07:37 (1) 21:04	06:06 21:48	05:23 22:00	05:23 21:25	06:01 21:25	06:51 20:22	07:30 (1) 19:12	07:40 17:07	08:24 16:30
4	08:45 16:40	08:14 17:30	07:19 18:21	07:08 20:15	07:35 (1) 21:06	06:04 21:50	05:22 21:59	05:24 21:23	06:03 21:23	06:53 20:20	07:30 (1) 19:10	07:42 17:06	08:26 16:29
5	08:45 16:41	08:12 17:32	07:16 18:23	07:05 20:17	07:34 (1) 21:07	06:02 21:51	05:22 21:59	05:25 21:22	06:04 21:22	06:54 20:17	07:29 (1) 19:08	07:44 17:04	08:27 16:28
6	08:44 16:42	08:10 17:34	07:14 18:25	07:03 20:18	07:33 (1) 21:09	06:01 21:51	05:21 21:58	05:26 21:20	06:06 21:20	06:56 20:15	07:30 (1) 19:06	07:45 17:02	08:28 16:28
7	08:44 16:44	08:09 17:35	07:12 18:27	07:01 20:20	07:33 (1) 21:11	05:59 21:52	05:21 21:58	05:27 21:18	06:08 21:18	06:58 20:13	07:29 (1) 19:03	07:47 17:00	08:29 16:28
8	08:43 16:45	08:07 17:37	07:10 18:28	06:59 20:22	07:32 (1) 21:12	05:57 21:53	05:20 21:57	05:27 21:16	06:09 21:16	06:59 20:10	07:30 (1) 19:01	07:49 16:59	08:31 16:27
9	08:43 16:46	08:05 17:39	07:07 18:30	06:56 20:23	07:32 (1) 21:14	05:55 21:54	05:19 21:56	05:28 21:14	06:11 21:14	07:01 20:08	07:30 (1) 18:59	07:50 16:57	08:32 16:27
10	08:42 16:48	08:03 17:41	07:05 18:32	06:54 20:25	07:33 (1) 21:15	05:54 21:55	05:19 21:55	05:29 21:12	06:12 21:12	07:03 20:06	07:32 (1) 18:57	07:52 16:55	08:33 16:27
11	08:42 16:49	08:01 17:43	07:03 18:34	06:52 20:27	07:33 (1) 21:17	05:52 21:56	05:19 21:55	05:30 21:11	06:14 21:11	07:04 20:04	07:36 (1) 18:54	07:54 16:54	08:34 16:27
12	08:41 16:51	08:00 17:45	07:01 18:35	06:50 20:29	07:35 (1) 21:19	05:50 21:56	05:18 21:54	05:32 21:09	06:16 21:09	07:06 20:01	07:55 18:52	07:50 16:52	08:35 16:27
13	08:40 16:52	07:58 17:47	06:58 18:37	06:47 20:30	07:35 (1) 21:20	05:49 21:57	05:18 21:53	05:33 21:07	06:17 21:07	07:07 19:59	07:57 18:50	07:52 16:51	08:36 16:26
14	08:40 16:54	07:56 17:48	06:56 18:39	06:45 20:32	07:45 (1) 21:22	05:47 21:58	05:18 21:52	05:34 21:05	06:19 21:05	07:09 19:57	07:59 18:48	07:54 16:49	08:37 16:26
15	08:39 16:55	07:54 17:50	06:54 18:41	06:43 20:34	05:45 21:23	05:18 21:58	05:35 21:51	06:20 21:03	06:20 21:03	07:11 19:54	08:01 18:46	07:55 16:48	08:38 16:27
16	08:38 16:57	07:52 17:52	06:51 18:42	06:41 20:35	05:44 21:25	05:18 21:59	05:36 21:50	06:22 21:01	06:22 21:01	07:12 19:52	08:02 18:43	07:57 16:47	08:39 16:27
17	08:37 16:58	07:50 17:54	06:49 18:44	06:39 20:37	05:42 21:26	05:17 21:59	05:37 21:49	06:24 20:59	06:24 20:59	07:14 19:50	08:04 18:41	07:59 16:45	08:40 16:27
18	08:36 17:00	07:48 17:56	06:47 18:46	06:37 20:39	05:41 21:28	05:17 22:00	05:39 21:48	06:25 20:57	06:25 20:57	07:15 19:47	08:06 18:39	08:01 16:44	08:40 16:27
19	08:35 17:01	07:46 17:58	06:45 18:48	06:34 20:40	05:40 21:29	05:17 22:00	05:40 21:47	06:27 20:55	06:27 20:55	07:17 19:45	08:07 18:37	08:02 16:43	08:41 16:27
20	08:34 17:03	07:44 18:00	06:42 18:49	06:32 20:42	05:38 21:31	05:18 22:00	05:41 21:46	06:28 20:53	06:28 20:53	07:19 19:43	08:09 18:35	08:04 16:41	08:42 16:28
21	08:33 17:05	07:42 18:01	06:40 18:51	06:30 20:44	05:37 21:32	05:18 22:00	05:42 21:44	06:30 20:50	06:30 20:50	07:20 19:40	08:11 18:33	08:06 16:40	08:42 16:28
22	08:32 17:07	07:40 18:03	06:38 18:53	06:28 20:45	05:36 21:34	05:18 22:01	05:44 21:43	06:32 20:48	06:32 20:48	07:22 19:38	08:13 18:31	08:07 16:39	08:43 16:29
23	08:31 17:08	07:38 18:05	06:35 18:54	06:26 20:47	05:34 21:35	05:18 22:01	05:45 21:42	06:33 20:46	06:33 20:46	07:24 19:36	08:14 18:29	08:09 16:38	08:43 16:29
24	08:30 17:10	07:36 18:07	06:33 18:56	06:24 20:49	05:33 21:36	05:18 22:01	05:47 21:40	06:35 20:44	06:35 20:44	07:25 19:33	08:16 18:27	08:11 16:37	08:44 16:30
25	08:28 17:12	07:34 18:09	06:31 18:58	06:22 20:51	05:32 21:38	05:19 22:01	05:48 21:39	06:37 20:42	06:37 20:42	07:27 19:31	08:18 17:25	08:12 16:36	08:44 16:30
26	08:27 17:14	07:32 18:10	06:28 19:00	06:20 20:52	05:31 21:39	05:19 22:01	05:49 21:38	06:38 20:40	06:38 20:40	07:29 19:29	08:20 17:23	08:14 16:35	08:44 16:31
27	08:26 17:15	07:29 18:12	06:26 19:01	06:18 20:54	05:30 21:40	05:20 22:01	05:51 21:36	06:40 20:38	06:40 20:38	07:30 19:26	08:22 17:21	08:15 16:34	08:45 16:32
28	08:24 17:17	07:27 18:14	06:24 19:03	06:16 20:56	05:29 21:42	05:20 22:01	05:52 21:35	06:41 20:35	06:41 20:35	07:32 19:24	08:23 17:19	08:17 16:33	08:45 16:33
29	08:23 17:19	07:21 20:05	06:14 20:57	06:06 20:57	05:28 21:43	05:21 22:01	05:54 21:33	06:43 20:33	06:43 20:33	07:34 19:22	08:25 17:17	08:18 16:32	08:45 16:33
30	08:21 17:21	07:19 20:06	06:12 20:59	06:04 20:59	05:27 21:44	05:21 22:00	05:55 21:32	06:45 20:31	06:45 20:31	07:35 19:19	08:26 17:15	08:20 16:32	08:45 16:34
31	08:20 17:23	07:17 20:08	06:08 20:59	06:00 20:59	05:26 21:45	05:20 21:30	05:57 20:29	06:46 20:29	06:46 20:29	07:33 (1) 19:19	08:29 17:13	08:20 16:35	08:45 16:35
Potential sun hours	259	278	367	416	485	499	502	454	381	331	266	244	
Total, worst case				197									
Sun reduction				0.35				0.30			0.28		
Oper. time red.				1.00				1.00			1.00		
Wind dir. red.				0.67				0.67			0.67		
Total reduction				0.24				0.20			0.19		
Total, real				47				5			34		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:07/3.5.584

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: AB - H28

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45 16:36	08:18 17:24	07:25 18:16	07:14 20:10	06:10 21:00	05:24 21:46	05:21 22:00	05:58 21:28	06:48 20:26	07:37 19:17	07:30 17:11	08:21 16:30
2	08:45 16:37	08:17 17:26	07:23 18:17	07:12 20:11	06:08 21:02	05:24 21:47	05:22 22:00	06:00 21:27	06:49 20:24	07:38 19:14	07:32 17:09	08:23 16:30
3	08:45 16:38	08:15 17:28	07:20 18:19	07:10 20:13	06:06 21:04	05:23 21:48	05:23 21:59	06:01 21:25	06:51 20:22	07:40 19:12	07:34 17:07	08:24 16:29
4	08:45 16:40	08:13 17:30	07:18 18:21	07:07 20:15	06:04 21:05	05:22 21:49	05:24 21:59	06:03 21:23	06:53 20:19	07:42 19:10	07:36 17:05	08:25 16:29
5	08:44 16:41	08:12 17:31	07:16 18:23	07:05 20:16	06:02 21:07	05:21 21:50	05:24 21:58	06:04 21:21	06:54 20:17	07:43 19:08	07:37 17:04	08:27 16:28
6	08:44 16:42	08:10 17:33	07:14 18:25	07:03 20:18	06:00 21:09	05:21 21:51	05:25 21:58	06:06 21:20	06:56 20:15	07:45 19:05	07:39 17:02	08:28 16:28
7	08:44 16:43	08:08 17:35	07:12 18:26	07:01 20:20	05:58 21:10	05:20 21:52	05:26 21:57	06:07 21:18	06:57 20:13	07:47 19:03	07:41 17:00	08:29 16:27
8	08:43 16:45	08:07 17:37	07:09 18:28	06:58 20:21	05:57 21:12	05:20 21:53	05:27 21:57	06:09 21:16	06:59 20:10	07:48 19:01	07:43 16:58	08:30 16:27
9	08:43 16:46	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	05:19 21:54	05:28 21:56	06:10 21:14	07:01 20:08	07:50 18:59	07:45 16:57	08:32 16:27
10	08:42 16:47	08:03 17:41	07:05 18:32	06:54 20:25	05:53 21:15	05:19 21:55	05:29 21:55	06:12 21:12	07:02 20:06	07:52 18:56	07:46 16:55	08:33 16:26
11	08:42 16:49	08:01 17:43	07:03 18:33	06:52 20:27	05:52 21:17	05:18 21:55	05:30 21:55	06:14 21:10	07:04 20:03	07:53 18:54	07:48 16:54	08:34 16:26
12	08:41 16:50	07:59 17:44	07:00 18:35	06:49 20:28	05:50 21:18	05:18 21:56	05:31 21:54	06:15 21:08	07:06 20:01	07:55 18:52	07:50 16:52	08:35 16:26
13	08:40 16:52	07:58 17:46	06:58 18:37	06:47 20:30	05:48 21:20	05:18 21:57	05:32 21:53	06:17 21:06	07:07 19:59	07:57 18:50	07:52 16:51	08:36 16:26
14	08:40 16:53	07:56 17:48	06:56 18:39	06:45 20:32	05:47 21:21	05:17 21:57	05:33 21:52	06:18 21:05	07:09 19:56	07:59 18:47	07:54 16:49	08:37 16:26
15	08:39 16:55	07:54 17:50	06:54 18:40	06:43 20:33	05:45 21:23	05:17 21:58	05:35 21:51	06:20 21:03	07:10 19:54	08:00 18:45	07:55 16:48	08:38 16:26
16	08:38 16:56	07:52 17:52	06:51 18:42	06:41 20:35	05:44 21:25	05:17 21:59	05:36 21:50	06:22 21:01	07:12 19:52	08:02 18:43	07:57 16:46	08:39 16:26
17	08:37 16:58	07:50 17:54	06:49 18:44	06:38 20:37	05:42 21:26	05:17 21:59	05:37 21:49	06:23 20:58	07:14 19:49	08:04 18:41	07:59 16:45	08:39 16:27
18	08:36 17:00	07:48 17:56	06:47 18:46	06:36 20:38	05:41 21:28	05:17 21:59	05:38 21:48	06:25 20:56	07:15 19:47	08:05 18:39	08:00 16:44	08:40 16:27
19	08:35 17:01	07:46 17:57	06:44 18:47	06:34 20:40	05:39 21:29	05:17 22:00	05:40 21:47	06:27 20:54	07:17 19:45	08:07 18:37	08:02 16:42	08:41 16:27
20	08:34 17:03	07:44 17:59	06:42 18:49	06:32 20:42	05:38 21:31	05:17 22:00	05:41 21:45	06:28 20:52	07:18 19:42	08:09 18:35	08:04 16:41	08:42 16:27
21	08:33 17:05	07:42 18:01	06:40 18:51	06:30 20:44	05:37 21:32	05:17 22:00	05:42 21:44	06:30 20:50	07:20 19:40	08:11 18:32	08:06 16:40	08:42 16:28
22	08:32 17:06	07:40 18:03	06:37 18:52	06:28 20:45	05:35 21:33	05:18 22:01	05:43 21:43	06:31 20:48	07:22 19:38	08:12 18:30	08:07 16:39	08:43 16:28
23	08:31 17:08	07:38 18:05	06:35 18:54	06:26 20:47	05:34 21:35	05:18 22:01	05:45 21:42	06:33 20:46	07:23 19:35	08:14 18:28	08:09 16:38	08:43 16:29
24	08:29 17:10	07:36 18:07	06:33 18:56	06:24 20:49	05:33 21:36	05:18 22:01	05:46 21:40	06:35 20:44	07:25 19:33	08:16 18:26	08:10 16:37	08:44 16:29
25	08:28 17:11	07:33 18:08	06:30 18:58	06:22 20:50	05:32 21:37	05:18 22:01	05:48 21:39	06:36 20:42	07:27 19:31	07:18 17:24	08:12 16:36	08:44 16:30
26	08:27 17:13	07:31 18:10	06:28 18:59	06:19 20:52	05:30 21:39	05:19 22:01	05:49 21:37	06:38 20:39	07:28 19:28	07:20 17:22	08:14 16:35	08:44 16:31
27	08:25 17:15	07:29 18:12	06:26 19:01	06:17 20:54	05:29 21:40	05:19 22:01	05:51 21:36	06:40 20:37	07:30 19:26	07:21 17:20	08:15 16:34	08:45 16:31
28	08:24 17:17	07:27 18:14	06:24 19:03	06:15 20:55	05:28 21:41	05:20 22:01	05:52 21:34	06:41 20:35	07:32 19:24	07:23 17:18	08:17 16:33	08:45 16:32
29	08:23 17:19	07:21 18:04	06:13 19:04	06:13 20:57	05:27 21:43	05:20 22:01	05:53 21:33	06:43 20:33	07:33 19:21	07:25 17:16	08:18 16:32	08:45 16:33
30	08:21 17:20	07:19 18:06	06:12 19:09	06:12 20:59	05:26 21:44	05:21 22:00	05:55 21:31	06:44 20:31	07:35 19:19	07:27 17:14	08:20 16:31	08:45 16:34
31	08:20 17:22	07:17 18:08	06:11 19:08	06:11 20:08	05:25 21:45	05:21 21:45	05:56 21:30	06:46 20:28	07:29 17:13	07:29 17:13	08:21 16:34	08:45 16:35
Potential sun hours	259	278	367	416	485	499	502	454	381	331	266	244
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: AD - H30

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec. Values range from 1.06 to 3.60.

Operational time

Table with 13 columns: N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum. Values range from 194 to 8,760.

Main shadow calculation table with columns for months (January to June) and rows for each day. Includes summary rows for potential sun hours and various reduction metrics.

Table layout: For each day in each month the following matrix apply

Matrix defining shadow calculation parameters: Day in month, Sun rise/set, Minutes with flicker, First/Last time with flicker, and WTG causing flicker time.



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:07/3.5.584

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: AD - H30

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (July-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Summary matrix table with 4 columns: Day in month, Sun rise/set, Minutes with flicker, First/Last time with flicker.



SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: AF - H32

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: AG - H33

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of sunshine probability values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of operational time values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Row of month headers: | January | February | March | April | May | June | July | August | September | October | November | December

Main data table with 31 rows (Day 1-31) and 12 columns (Months). Each cell contains two time values (Sun rise and Sun set). Summary rows include Potential sun hours, Total, worst case, Sun reduction, Oper. time red., Wind dir. red., Total reduction, and Total, real.

Table layout: For each day in each month the following matrix apply

Matrix with 2 columns and 4 rows: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:07/3.5.584

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: AJ - H36

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June	July	August	September	October	November	December			
1	08:45	08:18	07:25	07:15	06:10	07:03 (1)	05:25	05:22	05:58	06:48	07:17 (2)	07:37	07:30	08:21	
2	08:45	08:17	07:23	07:12	06:08	07:27 (1)	21:46	22:00	21:28	20:26	22	07:39 (2)	19:17	17:11	16:31
3	08:45	08:15	07:21	07:10	06:06	07:05 (1)	05:23	05:23	06:01	06:51	07:17 (2)	07:40	07:34	08:24	
4	08:45	08:14	07:19	07:08	06:04	07:26 (1)	21:48	21:59	21:25	20:22	21	07:38 (2)	19:12	17:07	16:30
5	08:44	08:12	07:16	07:05	06:02	07:06 (1)	05:22	05:24	06:03	06:53	07:19 (2)	07:42	07:36	08:26	
6	08:44	08:10	07:14	07:03	06:01	07:24 (1)	21:49	21:59	21:23	20:20	19	07:38 (2)	19:10	17:06	16:29
7	08:44	08:09	07:12	07:01	05:59	07:07 (1)	05:22	05:25	06:04	06:54	07:20 (2)	07:43	07:38	08:27	
8	08:43	08:07	07:10	06:59	05:57	07:22 (1)	21:50	21:59	21:22	20:17	17	07:37 (2)	19:08	17:04	16:28
9	08:43	08:05	07:07	06:56	05:55	07:10 (1)	05:21	05:26	06:06	06:56	14	07:22 (2)	19:07	16:59	16:28
10	08:42	08:03	07:05	06:54	05:54	07:21 (1)	21:51	21:58	21:20	20:15	17	07:36 (2)	19:06	17:02	16:28
11	08:42	08:01	07:03	06:52	05:52		05:20	05:27	06:08	06:58	14	07:23 (2)	19:04	16:59	16:28
12	08:41	08:00	07:01	06:50	05:50	07:41 (2)	21:10	21:52	21:18	20:13	11	07:34 (2)	19:03	17:00	16:28
13	08:40	07:58	06:58	06:47	05:49	07:21 (2)	21:12	21:53	21:16	20:10	8	07:33 (2)	19:01	16:59	16:27
14	08:40	07:56	06:56	06:45	05:48	07:19 (2)	21:14	21:54	21:14	20:08	4	07:30 (2)	18:59	16:57	16:27
15	08:39	07:54	06:54	06:43	05:47	07:18 (2)	21:15	21:55	21:12	20:06			18:57	16:55	16:27
16	08:38	07:52	06:51	06:41	05:46	07:17 (2)	21:16	21:56	21:13	20:05			18:56	16:54	16:27
17	08:37	07:50	06:49	06:39	05:45	07:16 (2)	21:17	21:57	21:14	20:04			18:55	16:53	16:27
18	08:36	07:48	06:47	06:37	05:44	07:15 (2)	21:18	21:58	21:15	20:03			18:54	16:52	16:27
19	08:35	07:46	06:45	06:35	05:43	07:14 (2)	21:19	21:59	21:16	20:02			18:53	16:51	16:27
20	08:34	07:44	06:42	06:32	05:42	07:13 (2)	21:20	21:59	21:17	20:01			18:52	16:50	16:27
21	08:33	07:42	06:40	06:30	05:41	07:12 (2)	21:21	21:59	21:18	20:00			18:51	16:49	16:27
22	08:32	07:40	06:38	06:28	05:40	07:11 (2)	21:22	21:59	21:19	19:59			18:50	16:48	16:27
23	08:31	07:38	06:35	06:26	05:39	07:10 (2)	21:23	21:59	21:20	19:58			18:49	16:47	16:27
24	08:30	07:36	06:33	06:24	05:38	07:09 (2)	21:24	21:59	21:21	19:57			18:48	16:46	16:27
25	08:29	07:34	06:31	06:22	05:37	07:08 (2)	21:25	21:59	21:22	19:56			18:47	16:45	16:27
26	08:28	07:32	06:28	06:20	05:36	07:07 (2)	21:26	21:59	21:23	19:55			18:46	16:44	16:27
27	08:27	07:29	06:26	06:18	05:35	07:06 (2)	21:27	21:59	21:24	19:54			18:45	16:43	16:27
28	08:26	07:27	06:24	06:16	05:34	07:05 (2)	21:28	21:59	21:25	19:53			18:44	16:42	16:27
29	08:25	07:25	06:22	06:14	05:33	07:04 (2)	21:29	21:59	21:26	19:52			18:43	16:41	16:27
30	08:24	07:23	06:20	06:12	05:32	07:03 (2)	21:30	21:59	21:27	19:51			18:42	16:40	16:27
31	08:23	07:21	06:18	06:10	05:31	07:02 (2)	21:31	21:59	21:28	19:50			18:41	16:39	16:27
Potential sun hours	259	278	367	416	485		499	502	454	381		331	266	244	
Total, worst case				585	112				575	138					
Sun reduction				0.35	0.37				0.30	0.28					
Oper. time red.				1.00	1.00				1.00	1.00					
Wind dir. red.				0.66	0.65				0.66	0.67					
Total reduction				0.23	0.24				0.19	0.19					
Total, real				137	27				112	26					

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		



SHADOW - Calendar

Calculation: Derragh WF Impacts Only **Shadow receptor:** AL - H38

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45	08:18	07:25	07:15	06:10	06:58 (1)
	16:37	17:24	18:16	20:10	21:01	37 07:35 (1)
2	08:45	08:17	07:23	07:12	07:35 (2)	06:08 06:58 (1)
	16:38	17:26	18:18	20:11	21:02	36 07:34 (1)
3	08:45	08:15	07:21	07:10	07:33 (2)	06:06 06:59 (1)
	16:39	17:28	18:19	20:13	21:04	36 07:35 (1)
4	08:45	08:14	07:18	07:08	07:30 (2)	06:04 06:58 (1)
	16:40	17:30	18:21	20:15	21:06	37 07:35 (1)
5	08:44	08:12	07:16	07:05	07:28 (2)	06:02 06:58 (1)
	16:41	17:32	18:23	20:17	21:07	36 07:34 (1)
6	08:44	08:10	07:14	07:03	07:26 (2)	06:01 06:59 (1)
	16:42	17:34	18:25	20:18	21:09	35 07:34 (1)
7	08:44	08:09	07:12	07:01	07:24 (2)	05:59 06:59 (1)
	16:44	17:35	18:27	20:20	21:10	34 07:33 (1)
8	08:43	08:07	07:10	06:59	07:21 (2)	05:57 06:59 (1)
	16:45	17:37	18:28	20:22	21:12	34 07:33 (1)
9	08:43	08:05	07:07	06:56	07:19 (2)	05:55 07:00 (1)
	16:46	17:39	18:30	20:23	21:14	32 07:32 (1)
10	08:42	08:03	07:05	06:54	07:19 (2)	05:54 07:00 (1)
	16:48	17:41	18:32	20:25	21:15	31 07:31 (1)
11	08:42	08:01	07:03	06:52	07:19 (2)	05:52 07:00 (1)
	16:49	17:43	18:34	20:27	21:17	30 07:30 (1)
12	08:41	08:00	07:01	06:50	07:19 (2)	05:50 07:02 (1)
	16:50	17:45	18:35	20:28	21:19	28 07:30 (1)
13	08:40	07:58	06:58	06:47	07:18 (2)	05:49 07:02 (1)
	16:52	17:47	18:37	20:30	21:20	26 07:28 (1)
14	08:40	07:56	06:56	06:45	07:19 (2)	05:47 07:03 (1)
	16:53	17:48	18:39	20:32	21:22	25 07:28 (1)
15	08:39	07:54	06:54	06:43	07:19 (2)	05:45 07:05 (1)
	16:55	17:50	18:41	20:34	21:23	22 07:27 (1)
16	08:38	07:52	06:51	06:41	07:20 (2)	05:44 07:06 (1)
	16:57	17:52	18:42	20:35	21:25	19 07:25 (1)
17	08:37	07:50	06:49	06:39	07:21 (2)	05:42 07:08 (1)
	16:58	17:54	18:44	20:37	21:26	15 07:23 (1)
18	08:36	07:48	06:47	07:10 (3)	06:36	07:23 (2)
	17:00	17:56	18:46	20:39	21:28	14 07:21 (1)
19	08:35	07:46	06:45	07:07 (3)	06:34	07:14 (1)
	17:01	17:58	18:48	20:40	21:29	20 07:34 (2)
20	08:34	07:44	06:42	07:05 (3)	06:32	07:10 (1)
	17:03	17:59	18:49	20:42	21:31	18 07:28 (1)
21	08:33	07:42	06:40	07:03 (3)	06:30	07:08 (1)
	17:05	18:01	18:51	20:44	21:32	22 07:30 (1)
22	08:32	07:40	06:38	07:00 (3)	06:28	07:06 (1)
	17:06	18:03	18:53	20:45	21:33	26 07:32 (1)
23	08:31	07:38	06:35	06:58 (3)	06:26	07:05 (1)
	17:08	18:05	18:54	20:47	21:35	28 07:33 (1)
24	08:30	07:36	06:33	06:56 (3)	06:24	07:03 (1)
	17:10	18:07	18:56	20:49	21:36	30 07:33 (1)
25	08:28	07:34	06:31	06:54 (3)	06:22	07:02 (1)
	17:12	18:09	18:58	20:50	21:38	32 07:34 (1)
26	08:27	07:31	06:28	06:55 (3)	06:20	07:01 (1)
	17:13	18:10	19:00	20:52	21:39	34 07:35 (1)
27	08:26	07:29	06:26	06:55 (3)	06:18	07:01 (1)
	17:15	18:12	19:01	20:54	21:40	34 07:35 (1)
28	08:24	07:27	06:24	06:56 (3)	06:16	07:00 (1)
	17:17	18:14	19:03	20:56	21:41	35 07:35 (1)
29	08:23	07:21	06:21	07:57 (3)	06:14	06:59 (1)
	17:19	18:16	19:05	20:57	21:42	36 07:35 (1)
30	08:21	07:19	06:19	08:00 (3)	06:12	06:59 (1)
	17:21	18:18	19:07	20:59	21:44	36 07:35 (1)
31	08:20	07:17	06:17		06:10	06:58 (1)
	17:22	18:14	19:03		21:45	
Potential sun hours	259	278	367	416	485	499
Total, worst case			180	685	523	
Sun reduction			0.24	0.35	0.37	
Oper. time red.			1.00	1.00	1.00	
Wind dir. red.			0.68	0.66	0.65	
Total reduction			0.17	0.23	0.24	
Total, real			30	160	126	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Derragh WF Impacts Only **Shadow receptor:** AL - H38

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22	05:58	07:12 (1)	06:48	07:18 (2)	07:37
	22:00	21:28	20:26	26	07:44 (2)	19:17
2	05:22	06:00	07:10 (1)	06:50	07:17 (2)	07:38
	22:00	21:27	20:24	26	07:43 (2)	19:15
3	05:23	06:01	07:10 (1)	06:51	07:17 (2)	07:40
	21:59	21:25	20:22	26	07:43 (2)	19:12
4	05:24	06:03	07:09 (1)	06:53	07:19 (2)	07:42
	21:59	21:23	20:20	24	07:43 (2)	19:10
5	05:25	06:04	07:09 (1)	06:54	07:20 (2)	07:43
	21:59	21:22	20:17	22	07:42 (2)	19:08
6	05:26	06:06	07:08 (1)	06:56	07:22 (2)	07:45
	21:58	21:20	20:15	19	07:41 (2)	19:06
7	05:26	06:08	07:08 (1)	06:58	07:23 (2)	07:47
	21:57	21:18	20:13	16	07:39 (2)	19:03
8	05:27	06:09	07:08 (1)	06:59	07:25 (2)	07:49
	21:57	21:16	20:10	13	07:38 (2)	19:01
9	05:28	06:11	07:08 (1)	07:01	07:26 (2)	07:50
	21:56	21:14	20:08	9	07:35 (2)	18:59
10	05:29	06:12	07:07 (1)	07:02	07:28 (2)	07:52
	21:55	21:12	20:06	4	07:32 (2)	18:57
11	05:30	06:14	07:07 (1)	07:04		07:54
	21:55	21:11	20:04			18:54
12	05:31	06:16	07:07 (1)	07:06		07:55
	21:54	21:09	20:01			18:52
13	05:33	06:17	07:07 (1)	07:07	07:52 (3)	07:57
	21:53	21:07	19:59	5	07:57 (3)	18:50
14	05:34	06:19	07:07 (1)	07:09	07:48 (3)	07:59
	21:52	21:05	19:57	11	07:59 (3)	18:48
15	05:35	06:20	07:07 (1)	07:11	07:46 (3)	08:00
	21:51	21:03	19:54	15	08:01 (3)	18:46
16	05:36	06:22	07:07 (1)	07:12	07:44 (3)	08:02
	21:50	21:01	19:52	18	08:02 (3)	18:43
17	05:37	06:24	07:08 (1)	07:14	07:43 (3)	08:04
	21:49	20:59	19:50	19	08:02 (3)	18:41
18	05:39	06:25	07:08 (1)	07:15	07:43 (3)	08:06
	21:48	20:57	19:47	20	08:03 (3)	18:39
19	05:40	06:27	07:09 (1)	07:17	07:42 (3)	08:07
	21:47	20:55	19:45	20	08:02 (3)	18:37
20	05:41	06:28	07:10 (1)	07:19	07:44 (3)	08:09
	21:46	20:52	19:43	18	08:02 (3)	18:35
21	05:42	06:30	07:11 (1)	07:20	07:45 (3)	08:11
	21:44	20:50	19:40	16	08:01 (3)	18:33
22	05:44	06:32	07:12 (1)	07:22	07:47 (3)	08:13
	21:43	20:48	19:38	14	08:01 (3)	18:31
23	05:45	06:33	07:14 (1)	07:24	07:49 (3)	08:14
	21:42	20:46	19:36	11	08:00 (3)	18:29
24	05:47	06:35	07:18 (1)	07:25	07:50 (3)	08:16
	21:40	20:44	19:33	8	07:58 (3)	18:27
25	05:48	07:22 (1)	06:37	07:27	07:52 (3)	07:18
	21:39	07:29 (1)	20:42	15	07:40 (2)	19:31
26	05:49	07:20 (1)	06:38	07:24 (2)	07:29	07:20
	21:38	07:33 (1)	20:40	18	07:42 (2)	19:29
27	05:51	07:17 (1)	06:40	07:22 (2)	07:30	07:22
	21:36	07:34 (1)	20:37	21	07:43 (2)	19:26
28	05:52	07:16 (1)	06:41	07:21 (2)	07:32	07:23
	21:35	07:36 (1)	20:35	23	07:44 (2)	19:24
29	05:54	07:15 (1)	06:43	07:19 (2)	07:33	07:25
	21:33	07:38 (1)	20:33	25	07:44 (2)	19:22
30	05:55	07:13 (1)	06:45	07:19 (2)	07:35	07:27
	21:32	07:38 (1)	20:31	25	07:44 (2)	19:19
31	05:57	07:13 (1)	06:46	07:18 (2)		07:29
	21:30	07:40 (1)	20:29	26	07:44 (2)	17:13
Potential sun hours	502	454	381	331	266	244
Total, worst case	132	915	364			
Sun reduction	0.27	0.30	0.28			
Oper. time red.	1.00	1.00	1.00			
Wind dir. red.	0.65	0.65	0.67			
Total reduction	0.17	0.19	0.19			
Total, real	23	178	70			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: AM - H39

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for days (1-31) and summary rows (Potential sun hours, Total, worst case, etc.)

Table layout: For each day in each month the following matrix apply

Matrix with 4 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:07/3.5.584

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: AN - H40

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times, potential sun hours, and reduction metrics.

Table layout: For each day in each month the following matrix apply

Matrix with 2 rows and 4 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: AO - H41

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main data table with 13 columns (January-December) and 31 rows of daily data including sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:07/3.5.584

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: AP - H42

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Table with 13 columns (January to December) and multiple rows of shadow calculation data including sun rise/set times, potential sun hours, and reduction factors.

Table layout: For each day in each month the following matrix apply

Matrix table with columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: AQ - H43

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining table layout: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: AR - H44

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Table with columns for months (January to December) and rows for days (1-31), showing sun rise and set times and shadow reduction values.

Table layout: For each day in each month the following matrix apply

Day in month Sun rise (hh:mm) Sun set (hh:mm) Minutes with flicker First time (hh:mm) with flicker Last time (hh:mm) with flicker (WTG causing flicker first time) (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: AS - H45

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main data table with 13 columns (January-December) and 31 rows of daily data including sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:07/3.5.584

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: AT - H46

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec. Values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 14 columns: N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum. Values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each hour (08:45-17:23). Includes a summary section at the bottom for potential sun hours, sun reduction, and total reduction.

Table layout: For each day in each month the following matrix apply

Matrix with 4 columns: Day in month, Sun rise (hh:mm) / Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker / Last time (hh:mm) with flicker. Includes notes about WTG causing flicker first/last time.



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:07/3.5.584

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: AU - H47

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan to Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N to Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main table with 13 columns (January to December) and 31 rows (Day 1 to 31). Each cell contains two time values (rise and set) for each day.

Table layout: For each day in each month the following matrix apply

Matrix with 4 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: AV - H48

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: AW - H49

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



SHADOW - Calendar

Calculation: Derragh WF Impacts Only **Shadow receptor:** AX - H50

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22 22:00	05:58 21:28	06:48 20:26	07:37 19:17	18:07 (2) 18:17 (2)	07:30 17:11
2	05:22 22:00	06:00 21:27	06:49 20:24	07:38 19:15	18:04 (2) 18:19 (2)	07:32 17:09
3	05:23 21:59	06:01 21:25	06:51 20:22	07:40 19:12	18:02 (2) 18:20 (2)	07:34 17:07
4	05:24 21:59	06:03 21:23	06:53 20:19	07:42 19:10	18:01 (2) 18:21 (2)	07:36 17:05
5	05:25 21:58	06:04 21:21	06:54 20:17	07:43 19:08	17:59 (2) 18:21 (2)	07:38 17:04
6	05:25 21:58	06:06 21:20	06:56 20:15	07:45 19:05	17:59 (2) 18:21 (2)	07:39 17:02
7	05:26 21:57	06:07 21:18	06:57 20:13	07:47 19:03	17:58 (2) 18:21 (2)	07:41 17:00
8	05:27 21:57	06:09 21:16	06:59 20:10	07:48 19:01	17:58 (2) 18:21 (2)	07:43 16:59
9	05:28 21:56	06:11 21:14	07:01 20:08	07:50 18:59	17:58 (2) 18:20 (2)	07:45 16:57
10	05:29 21:55	06:12 21:12	07:02 20:06	07:52 18:56	17:58 (2) 18:20 (2)	07:46 16:55
11	05:30 21:55	06:14 21:10	07:04 20:03	07:53 18:54	17:59 (2) 18:19 (2)	07:48 16:54
12	05:31 21:54	06:15 21:08	07:06 20:01	07:55 18:52	18:00 (2) 18:18 (2)	07:50 16:52
13	05:32 21:53	06:17 21:06	07:07 19:59	07:57 18:50	18:00 (2) 18:16 (2)	07:52 16:51
14	05:34 21:52	06:19 21:05	07:09 19:56	07:59 18:48	18:02 (2) 18:13 (2)	07:54 16:49
15	05:35 21:51	06:20 21:03	07:10 19:54	08:00 18:45	18:06 (2) 18:09 (2)	07:55 16:48
16	05:36 21:50	06:22 21:01	07:12 19:52	08:02 18:43	18:09 (2) 18:00 (2)	16:47 16:46
17	05:37 21:49	06:23 20:59	07:14 19:49	08:04 18:41	18:00 (2) 18:16 (2)	07:59 16:45
18	05:38 21:48	06:25 20:56	07:15 19:47	08:06 18:39	18:00 (2) 18:16 (2)	08:00 16:44
19	05:40 21:47	06:27 20:54	07:17 19:45	08:07 18:37	18:00 (2) 17:17 (3)	08:02 16:42
20	05:41 21:45	06:28 20:52	07:19 19:42	08:09 18:35	17:08 (3) 17:21 (3)	08:04 16:41
21	05:42 21:44	06:30 20:50	07:20 19:40	08:11 18:33	17:06 (3) 17:23 (3)	08:06 16:40
22	05:44 21:43	06:31 20:48	07:22 19:38	08:13 18:30	17:05 (3) 17:25 (3)	08:07 16:39
23	05:45 21:42	06:33 20:46	07:23 19:35	08:14 18:28	17:03 (3) 17:26 (3)	08:09 16:38
24	05:46 21:40	06:35 20:44	07:25 19:33	08:16 18:26	17:03 (3) 17:27 (3)	08:10 16:37
25	05:48 21:39	06:36 20:42	07:27 19:31	08:18 18:24	16:02 (3) 16:27 (3)	08:12 16:36
26	05:49 21:37	06:38 20:40	07:28 19:28	08:20 18:22	16:00 (3) 16:27 (3)	08:14 16:35
27	05:51 21:36	06:40 20:37	07:30 19:26	08:21 18:20	16:00 (3) 16:27 (3)	08:15 16:34
28	05:52 21:34	06:41 20:35	07:32 19:24	08:23 18:18	16:00 (3) 16:27 (3)	08:17 16:33
29	05:54 21:33	06:43 20:33	07:33 19:21	08:25 18:16	14:23 (4) 16:27 (3)	08:18 16:32
30	05:55 21:31	06:44 20:31	07:35 19:19	08:27 18:15	14:19 (4) 16:27 (3)	08:20 16:31
31	05:57 21:30	06:46 20:28	07:37 19:17	08:29 18:13	14:16 (4) 16:27 (3)	08:22 16:30
Potential sun hours	502	454	381	331	266	244
Total, worst case				606	1391	1241
Sun reduction				0.24	0.18	0.13
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.63	0.60	0.60
Total reduction				0.15	0.11	0.08
Total, real				90	155	100

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Derragh WF Impacts Only **Shadow receptor:** AY - H51

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22	05:58	06:48	07:37	07:30	14:23 (4)
	22:00	21:28	20:26	19:17	17:11	34 16:20 (3)
2	05:22	06:00	06:49	07:38	07:32	14:19 (4)
	22:00	21:27	20:24	19:15	17:09	42 16:20 (3)
3	05:23	06:01	06:51	07:40	07:34	14:16 (4)
	21:59	21:25	20:22	19:12	17:07	46 16:19 (3)
4	05:24	06:03	06:53	07:42	17:58 (2)	07:36
	21:59	21:23	20:19	19:10	18:09 (2)	17:05
5	05:25	06:04	06:54	07:43	17:55 (2)	07:38
	21:58	21:21	20:17	19:08	18:10 (2)	17:04
6	05:25	06:06	06:56	07:45	17:54 (2)	07:39
	21:58	21:20	20:15	19:05	18:11 (2)	17:02
7	05:26	06:07	06:57	07:47	17:53 (2)	07:41
	21:57	21:18	20:13	19:03	18:12 (2)	17:00
8	05:27	06:09	06:59	07:48	17:52 (2)	07:43
	21:57	21:16	20:10	19:01	18:13 (2)	16:58
9	05:28	06:11	07:01	07:50	17:50 (2)	07:45
	21:56	21:14	20:08	18:59	18:12 (2)	16:57
10	05:29	06:12	07:02	07:52	17:50 (2)	07:46
	21:55	21:12	20:06	18:56	18:12 (2)	16:55
11	05:30	06:14	07:04	07:53	17:50 (2)	07:48
	21:55	21:10	20:03	18:54	18:12 (2)	16:54
12	05:31	06:15	07:06	07:55	17:51 (2)	07:50
	21:54	21:08	20:01	18:52	18:12 (2)	16:52
13	05:32	06:17	07:07	07:57	17:50 (2)	07:52
	21:53	21:06	19:59	18:50	18:10 (2)	16:51
14	05:34	06:19	07:09	07:59	17:51 (2)	07:54
	21:52	21:05	19:56	18:48	18:10 (2)	16:49
15	05:35	06:20	07:10	08:00	17:52 (2)	07:55
	21:51	21:03	19:54	18:45	18:08 (2)	16:48
16	05:36	06:22	07:12	08:02	17:53 (2)	07:57
	21:50	21:01	19:52	18:43	18:07 (2)	16:46
17	05:37	06:23	07:14	08:04	17:56 (2)	07:59
	21:49	20:59	19:49	18:41	18:04 (2)	16:45
18	05:38	06:25	07:15	08:06	08:00	14:08 (4)
	21:48	20:56	19:47	18:39	16:44	41 14:49 (4)
19	05:40	06:27	07:17	08:07	08:02	14:09 (4)
	21:47	20:54	19:45	18:37	16:42	40 14:49 (4)
20	05:41	06:28	07:19	08:09	08:04	14:09 (4)
	21:45	20:52	19:42	18:35	16:41	40 14:49 (4)
21	05:42	06:30	07:20	08:11	08:06	14:09 (4)
	21:44	20:50	19:40	18:33	16:40	40 14:49 (4)
22	05:44	06:31	07:22	08:13	17:04 (3)	08:07
	21:43	20:48	19:38	18:30	9 17:13 (3)	16:39
23	05:45	06:33	07:23	08:14	17:01 (3)	08:09
	21:42	20:46	19:35	18:28	15 17:16 (3)	16:38
24	05:46	06:35	07:25	08:16	16:59 (3)	08:10
	21:40	20:44	19:33	18:26	18 17:17 (3)	16:37
25	05:48	06:36	07:27	08:18	15:58 (3)	08:12
	21:39	20:42	19:31	17:24	20 16:18 (3)	16:36
26	05:49	06:38	07:28	08:20	15:56 (3)	08:14
	21:37	20:39	19:28	17:22	22 16:18 (3)	16:35
27	05:51	06:40	07:30	08:21	15:55 (3)	08:15
	21:36	20:37	19:26	17:20	24 16:19 (3)	16:34
28	05:52	06:41	07:32	08:23	15:55 (3)	08:17
	21:34	20:35	19:24	17:18	25 16:20 (3)	16:33
29	05:54	06:43	07:33	08:25	15:55 (3)	08:18
	21:33	20:33	19:21	17:16	25 16:20 (3)	16:32
30	05:55	06:44	07:35	08:27	15:55 (3)	08:20
	21:31	20:31	19:19	17:15	25 16:20 (3)	16:31
31	05:57	06:46	07:37	08:29	15:55 (3)	08:22
	21:30	20:28	19:17	17:13	25 16:20 (3)	16:30
Potential sun hours	502	454	381	331	266	244
Total, worst case				455	1261	1185
Sun reduction				0.24	0.18	0.13
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.63	0.60	0.60
Total reduction				0.15	0.11	0.08
Total, real				68	140	96

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

6225Gortyrahill_ShadwFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:07/3.5.584

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: AZ - H52

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 2 rows of sunshine probability values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 2 rows of operational time values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day of the year (1-31), including start/end times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining day in month, sun rise/set times, minutes with flicker, and first/last times with flicker (WTG causing flicker).



SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: BA - H53

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main data table with 13 columns (January-December) and 31 rows of sunrise/set times and reduction metrics.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: BC - H55

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Assumptions for shadow calculations

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for days (1-31), including sun rise/set times and reduction factors.

Table layout: For each day in each month the following matrix apply

Matrix table with columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:07/3.5.584

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: BD - H56

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main calendar table with 13 columns (months) and 34 rows (numbered 1-31) of shadow data. Includes sub-totals for Potential sun hours, Total worst case, Sun reduction, Oper. time red., Wind dir. red., Total reduction, and Total, real.

Table layout: For each day in each month the following matrix apply

Matrix for daily data layout with 4 columns: Day in month, Sun rise/set times, Minutes with flicker, and First/Last times with flicker (including WTG causing flicker).



SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: BE - H57

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June	
1	08:45 16:37	08:18 17:24	07:25 18:16	07:15 20:10	07:53 (3) 08:11 (3)	06:10 21:01	05:25 21:46
2	08:45 16:38	08:17 17:26	07:23 18:18	07:12 20:11	07:55 (3) 08:10 (3)	06:08 21:02	05:24 21:47
3	08:45 16:39	08:15 17:28	07:21 18:19	07:10 20:13	07:57 (3) 08:07 (3)	06:06 21:04	05:23 21:48
4	08:45 16:40	08:14 17:30	07:18 18:21	07:08 20:15	07:05 21:06	06:04 21:06	05:22 21:49
5	08:44 16:41	08:12 17:32	07:16 18:23	07:05 20:17	06:02 21:07	07:02 (1) 07:14 (1)	05:22 21:50
6	08:44 16:42	08:10 17:34	07:14 18:25	07:03 20:18	06:01 21:09	06:54 (1) 07:16 (1)	05:21 21:51
7	08:44 16:44	08:09 17:35	07:12 18:27	07:01 20:20	05:59 21:10	06:53 (1) 07:19 (1)	05:20 21:52
8	08:43 16:45	08:07 17:37	07:10 18:28	06:59 20:22	05:57 21:12	06:51 (1) 07:20 (1)	05:20 21:53
9	08:43 16:46	08:05 17:39	07:07 18:30	06:56 20:23	07:21 (2) 07:33 (2)	05:55 21:14	05:19 21:54
10	08:42 16:48	08:03 17:41	07:05 18:32	06:54 20:25	07:18 (2) 07:36 (2)	05:54 21:15	05:19 21:55
11	08:42 16:49	08:01 17:43	07:03 18:34	06:52 20:27	07:16 (2) 07:38 (2)	05:52 21:17	05:19 21:56
12	08:41 16:50	08:00 17:45	07:01 18:35	06:50 20:28	07:15 (2) 07:39 (2)	05:50 21:18	05:18 21:56
13	08:40 16:52	07:58 17:47	06:58 18:37	06:47 20:30	07:13 (2) 07:39 (2)	05:49 21:20	05:18 21:57
14	08:40 16:53	07:56 17:48	06:56 18:39	06:45 20:32	07:12 (2) 07:40 (2)	05:47 21:22	05:18 21:58
15	08:39 16:55	07:54 17:50	06:54 18:41	06:43 20:34	07:11 (2) 07:40 (2)	05:45 21:23	05:18 21:58
16	08:38 16:57	07:52 17:52	06:51 18:42	06:41 20:35	07:10 (2) 07:40 (2)	05:44 21:25	05:17 21:59
17	08:37 16:58	07:50 17:54	06:49 18:44	06:39 20:37	07:10 (2) 07:41 (2)	05:42 21:26	05:17 21:59
18	08:36 17:00	07:48 17:56	06:47 18:46	06:36 20:39	07:09 (2) 07:41 (2)	05:41 21:28	05:17 21:59
19	08:35 17:01	07:46 17:58	06:45 18:47	06:34 20:40	07:09 (2) 07:40 (2)	05:40 21:29	05:17 22:00
20	08:34 17:03	07:44 17:59	06:42 18:49	06:32 20:42	07:09 (2) 07:40 (2)	05:38 21:31	05:18 22:00
21	08:33 17:05	07:42 18:01	06:40 18:51	06:30 20:44	07:09 (2) 07:40 (2)	05:37 21:32	05:18 22:00
22	08:32 17:06	07:40 18:03	06:38 18:53	06:28 20:45	07:09 (2) 07:39 (2)	05:35 21:33	05:18 22:01
23	08:31 17:08	07:38 18:05	06:35 18:54	06:26 20:47	07:10 (2) 07:38 (2)	05:34 21:35	05:18 22:01
24	08:30 17:10	07:36 18:07	06:33 18:56	06:24 20:49	07:10 (2) 07:38 (2)	05:33 21:36	05:18 22:01
25	08:28 17:12	07:34 18:09	06:31 18:58	06:22 20:50	07:11 (2) 07:36 (2)	05:32 21:38	05:19 22:01
26	08:27 17:13	07:31 18:10	06:28 18:59	06:20 20:52	07:11 (2) 07:35 (2)	05:31 21:39	05:19 22:01
27	08:26 17:15	07:29 18:12	06:26 19:01	06:18 20:54	07:12 (2) 07:34 (2)	05:30 21:40	05:20 22:01
28	08:24 17:17	07:27 18:14	06:24 19:03	06:16 20:56	07:14 (2) 07:32 (2)	05:28 21:41	05:20 22:01
29	08:23 17:19	07:21 20:05	06:14 20:57	06:14 20:57	07:15 (2) 07:29 (2)	05:27 21:43	05:21 22:01
30	08:21 17:21	07:19 20:06	06:12 20:59	06:12 20:59	07:18 (2) 07:26 (2)	05:27 21:44	05:21 22:00
31	08:20 17:22	07:17 20:08	06:11 20:58	06:11 20:58	07:18 (2) 21:45	05:26 21:45	05:21 22:00
Potential sun hours	259	278	367	416	485	499	
Total, worst case			225	585	1084	1299	
Sun reduction			0.24	0.35	0.37	0.30	
Oper. time red.			1.00	1.00	1.00	1.00	
Wind dir. red.			0.68	0.66	0.64	0.64	
Total reduction			0.17	0.24	0.24	0.19	
Total, real			37	138	258	251	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Derragh WF Impacts Only **Shadow receptor:** BE - H57

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22	06:50 (1)	05:58	06:57 (1)	06:48	07:15 (2)
	22:00	43 07:33 (1)	21:28	37 07:34 (1)	20:26	22 07:37 (2)
2	05:22	06:51 (1)	06:00	06:58 (1)	06:50	07:16 (2)
	22:00	43 07:34 (1)	21:27	35 07:33 (1)	20:24	18 07:34 (2)
3	05:23	06:51 (1)	06:01	06:59 (1)	06:51	07:19 (2)
	21:59	44 07:35 (1)	21:25	33 07:32 (1)	20:22	12 07:31 (2)
4	05:24	06:51 (1)	06:03	07:00 (1)	06:53	07:42
	21:59	44 07:35 (1)	21:23	31 07:31 (1)	20:20	19:10
5	05:25	06:51 (1)	06:04	07:02 (1)	06:54	07:43
	21:59	44 07:35 (1)	21:22	28 07:30 (1)	20:17	19:08
6	05:26	06:51 (1)	06:06	07:03 (1)	06:56	07:45
	21:58	44 07:35 (1)	21:20	25 07:28 (1)	20:15	19:06
7	05:26	06:51 (1)	06:08	07:05 (1)	06:58	07:47
	21:57	45 07:36 (1)	21:18	21 07:26 (1)	20:13	19:03
8	05:27	06:51 (1)	06:09	07:08 (1)	06:59	07:49
	21:57	45 07:36 (1)	21:16	15 07:23 (1)	20:10	19:01
9	05:28	06:51 (1)	06:11	07:14 (1)	07:01	07:50 (3)
	21:56	46 07:37 (1)	21:14	3 07:17 (1)	20:08	10 08:00 (3)
10	05:29	06:52 (1)	06:12	07:02	07:48 (3)	07:52
	21:55	45 07:37 (1)	21:12	20:06	15 08:03 (3)	18:57
11	05:30	06:52 (1)	06:14	07:04	07:45 (3)	07:54
	21:55	45 07:37 (1)	21:10	20:04	18 08:03 (3)	18:54
12	05:31	06:52 (1)	06:16	07:06	07:44 (3)	07:55
	21:54	46 07:38 (1)	21:09	20:01	21 08:05 (3)	18:52
13	05:33	06:52 (1)	06:17	07:26 (2)	07:07	07:44 (3)
	21:53	46 07:38 (1)	21:07	9 07:35 (2)	19:59	22 08:06 (3)
14	05:34	06:52 (1)	06:19	07:22 (2)	07:09	07:42 (3)
	21:52	46 07:38 (1)	21:05	16 07:38 (2)	19:57	23 08:05 (3)
15	05:35	06:52 (1)	06:20	07:21 (2)	07:11	07:42 (3)
	21:51	46 07:38 (1)	21:03	19 07:40 (2)	19:54	23 08:05 (3)
16	05:36	06:52 (1)	06:22	07:19 (2)	07:12	07:41 (3)
	21:50	46 07:38 (1)	21:01	22 07:41 (2)	19:52	24 08:05 (3)
17	05:37	06:52 (1)	06:24	07:18 (2)	07:14	07:41 (3)
	21:49	46 07:38 (1)	20:59	24 07:42 (2)	19:50	24 08:05 (3)
18	05:39	06:52 (1)	06:25	07:16 (2)	07:15	07:41 (3)
	21:48	46 07:38 (1)	20:57	26 07:42 (2)	19:47	23 08:04 (3)
19	05:40	06:53 (1)	06:27	07:16 (2)	07:17	07:42 (3)
	21:47	46 07:39 (1)	20:55	27 07:43 (2)	19:45	21 08:03 (3)
20	05:41	06:53 (1)	06:28	07:14 (2)	07:19	07:44 (3)
	21:46	46 07:39 (1)	20:52	29 07:43 (2)	19:43	18 08:02 (3)
21	05:42	06:53 (1)	06:30	07:14 (2)	07:20	07:45 (3)
	21:44	45 07:38 (1)	20:50	30 07:44 (2)	19:40	15 08:00 (3)
22	05:44	06:52 (1)	06:32	07:13 (2)	07:22	07:47 (3)
	21:43	46 07:38 (1)	20:48	31 07:44 (2)	19:38	11 07:58 (3)
23	05:45	06:53 (1)	06:33	07:13 (2)	07:24	07:49 (3)
	21:42	46 07:39 (1)	20:46	31 07:44 (2)	19:36	7 07:56 (3)
24	05:47	06:53 (1)	06:35	07:12 (2)	07:25	08:16
	21:40	45 07:38 (1)	20:44	31 07:43 (2)	19:33	18:27
25	05:48	06:53 (1)	06:37	07:12 (2)	07:27	07:18
	21:39	45 07:38 (1)	20:42	31 07:43 (2)	19:31	17:25
26	05:49	06:54 (1)	06:38	07:13 (2)	07:29	07:20
	21:38	44 07:38 (1)	20:40	30 07:43 (2)	19:29	17:23
27	05:51	06:54 (1)	06:40	07:12 (2)	07:30	07:22
	21:36	43 07:37 (1)	20:37	30 07:42 (2)	19:26	17:21
28	05:52	06:55 (1)	06:41	07:13 (2)	07:32	07:23
	21:35	41 07:36 (1)	20:35	29 07:42 (2)	19:24	17:19
29	05:54	06:56 (1)	06:43	07:13 (2)	07:33	07:25
	21:33	41 07:37 (1)	20:33	27 07:40 (2)	19:22	17:17
30	05:55	06:56 (1)	06:45	07:14 (2)	07:35	07:27
	21:32	40 07:36 (1)	20:31	26 07:40 (2)	19:19	17:15
31	05:57	06:56 (1)	06:46	07:14 (2)	07:36	07:29
	21:30	38 07:34 (1)	20:29	24 07:38 (2)	19:17	17:13
Potential sun hours	502	454	381	331	266	244
Total, worst case	1376	720	327			
Sun reduction	0.27	0.30	0.28			
Oper. time red.	1.00	1.00	1.00			
Wind dir. red.	0.64	0.66	0.68			
Total reduction	0.17	0.19	0.19			
Total, real	236	140	63			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: BF - H58

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec. Values range from 1.06 to 2.89.

Operational time

Table with 13 columns: N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum. Values range from 194 to 1,318.

Main shadow calculation table with 13 columns (January to December) and 33 rows (Day in month to Total, real). Shows sun rise/set times, minutes with flicker, and shadow reduction factors.

Table layout: For each day in each month the following matrix apply

Matrix layout table with 2 rows and 4 columns: Day in month, Sun rise/set, Minutes with flicker, First/Last time with flicker (with WTG causing flicker first/last time).

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: BG - H59

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining table layout: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: BH - H60

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main data table with 13 columns (January-December) and 31 rows of daily data. Includes columns for sun rise/set, sun reduction, and operational time. Summary rows at the bottom show potential sun hours and various reductions.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Derragh WF Impacts Only **Shadow receptor:** BI - H61

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January		February		March		April		May		June	
1	08:45		14:52 (4)	08:18	14:50 (4)	07:25	17:18 (2)	07:14	06:10	05:25		
	16:36	30	15:22 (5)	17:24	15:25 (4)	18:16	20	17:38 (2)	20:10	21:00	21:46	
2	08:45		14:51 (4)	08:17	14:51 (4)	07:23	17:17 (2)	07:12	06:08	05:24		
	16:37	31	15:22 (5)	17:26	15:26 (4)	18:17	21	17:38 (2)	20:11	21:02	21:47	
3	08:45		14:51 (4)	08:15	14:52 (4)	07:21	17:17 (2)	07:10	06:06	05:23		
	16:39	32	15:23 (5)	17:28	16:45 (3)	18:19	22	17:39 (2)	20:13	21:04	21:48	
4	08:45		14:50 (4)	08:13	14:52 (4)	07:18	17:18 (2)	07:07	06:04	05:22		
	16:40	33	15:23 (5)	17:30	16:47 (3)	18:21	20	17:38 (2)	20:15	21:05	21:49	
5	08:44		14:50 (4)	08:12	14:54 (4)	07:16	17:17 (2)	07:05	06:02	05:21		
	16:41	33	15:23 (5)	17:32	16:50 (3)	18:23	20	17:37 (2)	20:16	21:07	21:50	
6	08:44		14:50 (4)	08:10	14:56 (4)	07:14	17:18 (2)	07:03	06:00	05:21		
	16:42	34	15:24 (5)	17:33	16:51 (3)	18:25	18	17:36 (2)	20:18	21:09	21:51	
7	08:44		14:49 (4)	08:08	14:57 (4)	07:12	17:19 (2)	07:01	05:59	05:20		
	16:43	35	15:24 (5)	17:35	16:52 (3)	18:26	17	17:36 (2)	20:20	21:10	21:52	
8	08:43		14:48 (4)	08:07	14:59 (4)	07:09	17:21 (2)	06:58	05:57	05:20		
	16:45	36	15:24 (5)	17:37	16:52 (3)	18:28	13	17:34 (2)	20:21	21:12	21:53	
9	08:43		14:49 (4)	08:05	15:02 (4)	07:07	17:22 (2)	06:56	05:55	05:19		
	16:46	36	15:25 (5)	17:39	16:53 (3)	18:30	9	17:31 (2)	20:23	21:14	21:54	
10	08:42		14:48 (4)	08:03	15:06 (4)	07:05		06:54	05:53	05:19		
	16:47	37	15:25 (5)	17:41	16:53 (3)	18:32		20:25	21:15	21:55		
11	08:42		14:47 (4)	08:01	16:29 (3)	07:03		06:52	05:52	05:18		
	16:49	37	15:24 (5)	17:43	16:53 (3)	18:33		20:27	21:17	21:55		
12	08:41		14:47 (4)	07:59	16:29 (3)	07:00		06:49	05:50	05:18		
	16:50	37	15:24 (5)	17:45	16:53 (3)	18:35		20:28	21:18	21:56		
13	08:40		14:48 (4)	07:58	16:29 (3)	06:58		06:47	05:48	05:18		
	16:52	37	15:25 (5)	17:46	16:53 (3)	18:37		20:30	21:20	21:57		
14	08:40		14:47 (4)	07:56	16:29 (3)	06:56		06:45	05:47	05:18		
	16:53	38	15:25 (5)	17:48	16:53 (3)	18:39		20:32	21:21	21:57		
15	08:39		14:47 (4)	07:54	16:30 (3)	06:54		06:43	05:45	05:17		
	16:55	38	15:25 (5)	17:50	16:52 (3)	18:40		20:33	21:23	21:58		
16	08:38		14:47 (4)	07:52	16:31 (3)	06:51		06:41	05:44	05:17		
	16:56	37	15:24 (5)	17:52	16:52 (3)	18:42		20:35	21:25	21:59		
17	08:37		14:47 (4)	07:50	16:32 (3)	06:49		06:38	05:42	05:17		
	16:58	37	15:24 (5)	17:54	16:51 (3)	18:44		20:37	21:26	21:59		
18	08:36		14:46 (4)	07:48	16:33 (3)	06:47		06:36	05:41	05:17		
	17:00	36	15:22 (5)	17:56	16:49 (3)	18:46		20:38	21:28	21:59		
19	08:35		14:46 (4)	07:46	16:35 (3)	06:44		06:34	05:39	05:17		
	17:01	36	15:22 (4)	17:57	16:47 (3)	18:47		20:40	21:29	22:00		
20	08:34		14:47 (4)	07:44	16:39 (3)	06:42		06:32	05:38	05:17		
	17:03	36	15:23 (4)	17:59	16:44 (3)	18:49		20:42	21:31	22:00		
21	08:33		14:47 (4)	07:42		06:40		06:30	05:37	05:17		
	17:05	37	15:24 (4)	18:01		18:51		20:44	21:32	22:00		
22	08:32		14:47 (4)	07:40		06:37		06:28	05:35	05:18		
	17:06	38	15:25 (4)	18:03		18:52		20:45	21:33	22:01		
23	08:31		14:47 (4)	07:38		06:35		06:26	05:34	05:18		
	17:08	37	15:24 (4)	18:05		18:54		20:47	21:35	22:01		
24	08:29		14:47 (4)	07:36	17:26 (2)	06:33		06:24	05:33	05:18		
	17:10	38	15:25 (4)	18:07	17:31 (2)	18:56		20:49	21:36	22:01		
25	08:28		14:47 (4)	07:33	17:23 (2)	06:30		06:22	05:32	05:19		
	17:12	38	15:25 (4)	18:08	17:34 (2)	18:58		20:50	21:37	22:01		
26	08:27		14:47 (4)	07:31	17:21 (2)	06:28		06:20	05:30	05:19		
	17:13	39	15:26 (4)	18:10	17:36 (2)	18:59		20:52	21:39	22:01		
27	08:25		14:47 (4)	07:29	17:20 (2)	06:26		06:18	05:29	05:19		
	17:15	38	15:25 (4)	18:12	17:38 (2)	19:01		20:54	21:40	22:01		
28	08:24		14:48 (4)	07:27	17:19 (2)	06:24		06:16	05:28	05:20		
	17:17	38	15:26 (4)	18:14	17:39 (2)	19:03		20:55	21:41	22:01		
29	08:23		14:48 (4)			07:21		06:14	05:27	05:20		
	17:19	38	15:26 (4)			20:04		20:57	21:43	22:00		
30	08:21		14:49 (4)			07:19		06:12	05:26	05:21		
	17:20	37	15:26 (4)			20:06		20:59	21:44	22:00		
31	08:20		14:49 (4)			07:17			05:25			
	17:22	37	15:26 (4)			20:08			21:45			
Potential sun hours		259		278		367		416	485	499		
Total, worst case		1121		669		160						
Sun reduction		0.16		0.21		0.24						
Oper. time red.		1.00		1.00		1.00						
Wind dir. red.		0.60		0.61		0.64						
Total reduction		0.09		0.13		0.16						
Total, real		104		84		25						

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: BI - H61

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22	05:58	06:48	07:37	07:30	14:35 (4)
	22:00	21:28	20:26	19:17	17:11	33 16:23 (3)
2	05:22	06:00	06:49	07:38	07:32	14:31 (4)
	22:00	21:27	20:24	19:15	17:09	39 16:22 (3)
3	05:23	06:01	06:51	07:40	07:34	14:28 (4)
	21:59	21:25	20:22	19:12	17:07	44 16:22 (3)
4	05:24	06:03	06:53	07:42	18:03 (2)	17:36
	21:59	21:23	20:19	19:10	3 18:06 (2)	17:05
5	05:25	06:04	06:54	07:43	17:58 (2)	07:38
	21:58	21:21	20:17	19:08	11 18:09 (2)	17:04
6	05:25	06:06	06:56	07:45	17:56 (2)	07:39
	21:58	21:20	20:15	19:05	15 18:11 (2)	17:02
7	05:26	06:07	06:57	07:47	17:54 (2)	07:41
	21:57	21:18	20:13	19:03	18 18:12 (2)	17:00
8	05:27	06:09	06:59	07:48	17:54 (2)	07:43
	21:57	21:16	20:10	19:01	19 18:13 (2)	16:58
9	05:28	06:11	07:01	07:50	17:52 (2)	07:45
	21:56	21:14	20:08	18:59	20 18:12 (2)	16:57
10	05:29	06:12	07:02	07:52	17:52 (2)	07:46
	21:55	21:12	20:06	18:56	21 18:13 (2)	16:55
11	05:30	06:14	07:04	07:53	17:52 (2)	07:48
	21:54	21:10	20:03	18:54	21 18:13 (2)	16:54
12	05:31	06:15	07:06	07:55	17:52 (2)	07:50
	21:54	21:08	20:01	18:52	20 18:12 (2)	16:52
13	05:32	06:17	07:07	07:57	17:51 (2)	07:52
	21:53	21:06	19:59	18:50	20 18:11 (2)	16:51
14	05:34	06:19	07:09	07:59	17:52 (2)	07:54
	21:52	21:05	19:56	18:48	18 18:10 (2)	16:49
15	05:35	06:20	07:10	08:00	17:53 (2)	07:55
	21:51	21:03	19:54	18:45	16 18:09 (2)	16:48
16	05:36	06:22	07:12	08:02	17:54 (2)	07:57
	21:50	21:01	19:52	18:43	14 18:08 (2)	16:46
17	05:37	06:23	07:14	08:04	17:56 (2)	07:59
	21:49	20:59	19:49	18:41	10 18:06 (2)	16:45
18	05:38	06:25	07:15	08:06	08:00	14:21 (4)
	21:48	20:56	19:47	18:39	16:44	38 14:59 (4)
19	05:40	06:27	07:17	08:07	08:02	14:22 (4)
	21:47	20:54	19:45	18:37	16:42	37 14:59 (4)
20	05:41	06:28	07:19	08:09	08:04	14:22 (4)
	21:45	20:52	19:42	18:35	16:41	38 15:00 (4)
21	05:42	06:30	07:20	08:11	08:06	14:22 (4)
	21:44	20:50	19:40	18:33	16:40	37 14:59 (4)
22	05:44	06:31	07:22	08:13	17:08 (3)	08:07
	21:43	20:48	19:38	18:30	8 17:16 (3)	16:39
23	05:45	06:33	07:23	08:14	17:05 (3)	08:09
	21:42	20:46	19:35	18:28	14 17:19 (3)	16:38
24	05:46	06:35	07:25	08:16	17:03 (3)	08:10
	21:40	20:44	19:33	18:26	17 17:20 (3)	16:37
25	05:48	06:36	07:27	08:18	16:02 (3)	08:12
	21:39	20:42	19:31	17:24	19 16:21 (3)	16:36
26	05:49	06:38	07:28	08:20	16:00 (3)	08:14
	21:37	20:39	19:28	17:22	21 16:21 (3)	16:35
27	05:51	06:40	07:30	08:21	15:59 (3)	08:15
	21:36	20:37	19:26	17:20	23 16:22 (3)	16:34
28	05:52	06:41	07:32	08:23	15:59 (3)	08:17
	21:34	20:35	19:24	17:18	23 16:22 (3)	16:33
29	05:54	06:43	07:33	08:25	15:58 (3)	08:18
	21:33	20:33	19:21	17:16	25 16:23 (3)	16:32
30	05:55	06:44	07:35	08:27	15:58 (3)	08:20
	21:31	20:31	19:19	17:15	25 16:23 (3)	16:31
31	05:57	06:46	07:37	08:29	15:58 (3)	08:22
	21:30	20:28	19:17	17:13	25 16:23 (3)	16:30
Potential sun hours	502	454	381	331	266	244
Total, worst case				426	1161	926
Sun reduction				0.24	0.18	0.13
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.63	0.60	0.60
Total reduction				0.15	0.11	0.08
Total, real				64	129	75

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Derragh WF Impacts Only **Shadow receptor:** BJ - H62

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:19	07:25	07:15	06:10	05:25	05:22	05:58	06:48	07:37	07:31	08:22
	16:36	17:24	18:16	20:10	21:01	21:46	22:00	21:28	20:26	19:17	17:11	16:31
2	08:45	08:17	07:23	07:12	06:08	05:24	05:22	06:00	06:50	07:39	07:32	08:23
	16:38	17:26	18:18	20:12	21:02	21:48	22:00	21:27	20:24	19:15	17:09	16:30
3	08:45	08:15	07:21	07:10	06:06	05:23	05:23	06:01	06:51	07:40	07:34	08:24
	16:39	17:28	18:19	20:13	21:04	21:49	22:00	21:25	20:22	19:12	17:07	16:29
4	08:45	08:14	07:19	07:08	06:04	05:22	05:24	06:03	06:53	07:42	07:36	08:26
	16:40	17:30	18:21	20:15	21:06	21:50	21:59	21:23	20:20	19:10	17:06	16:29
5	08:45	08:12	07:16	07:05	06:02	05:22	05:25	06:04	06:54	07:44	07:38	08:27
	16:41	17:32	18:23	20:17	21:07	21:51	21:59	21:22	20:17	19:08	17:04	16:28
6	08:44	08:10	07:14	07:03	06:00	05:21	05:25	06:06	06:56	07:45	07:40	08:28
	16:42	17:34	18:25	20:18	21:09	21:52	21:58	21:20	20:15	19:06	17:02	16:28
7	08:44	08:09	07:12	07:01	05:59	05:20	05:26	06:08	06:58	07:47	07:41	08:30
	16:43	17:35	18:27	20:20	21:11	21:53	21:58	21:18	20:13	19:03	17:00	16:27
8	08:44	08:07	07:10	06:59	05:57	05:20	05:27	06:09	06:59	07:49	07:43	08:31
	16:45	17:37	18:28	20:22	21:12	21:53	21:57	21:16	20:11	19:01	16:59	16:27
9	08:43	08:05	07:07	06:56	05:55	05:19	05:28	06:11	07:01	07:50	07:45	08:32
	16:46	17:39	18:30	20:23	21:14	21:54	21:56	21:14	20:08	18:59	16:57	16:27
10	08:43	08:03	07:05	06:54	05:53	05:19	05:29	06:12	07:02	07:52	07:47	08:33
	16:48	17:41	18:32	20:25	21:15	21:55	21:56	21:13	20:06	18:57	16:55	16:27
11	08:42	08:02	07:03	06:52	05:52	05:19	05:30	06:14	07:04	07:54	07:49	08:34
	16:49	17:43	18:34	20:27	21:17	21:56	21:55	21:11	20:04	18:54	16:54	16:26
12	08:41	08:00	07:01	06:50	05:50	05:18	05:31	06:15	07:06	07:55	07:50	08:35
	16:50	17:45	18:35	20:29	21:19	21:57	21:54	21:09	20:01	18:52	16:52	16:26
13	08:41	07:58	06:58	06:47	05:48	05:18	05:32	06:17	07:07	07:57	07:52	08:36
	16:52	17:47	18:37	20:30	21:20	21:57	21:53	21:07	19:59	18:50	16:51	16:26
14	08:40	07:56	06:56	06:45	05:47	05:18	05:34	06:19	07:09	07:59	07:54	08:37
	16:53	17:48	18:39	20:32	21:22	21:58	21:52	21:05	19:57	18:48	16:49	16:26
15	08:39	07:54	06:54	06:43	05:45	05:17	05:35	06:20	07:11	08:01	07:56	08:38
	16:55	17:50	18:41	20:34	21:23	21:58	21:51	21:03	19:54	18:46	16:48	16:26
16	08:38	07:52	06:51	06:41	05:44	05:17	05:36	06:22	07:12	08:02	07:57	08:39
	16:56	17:52	18:42	20:35	21:25	21:59	21:50	21:01	19:52	18:43	16:46	16:27
17	08:37	07:50	06:49	06:39	05:42	05:17	05:37	06:24	07:14	08:04	07:59	08:40
	16:58	17:54	18:44	20:37	21:26	21:59	21:49	20:59	19:50	18:41	16:45	16:27
18	08:36	07:48	06:47	06:36	05:41	05:17	05:38	06:25	07:15	08:06	08:01	08:41
	17:00	17:56	18:46	20:39	21:28	22:00	21:48	20:57	19:47	18:39	16:44	16:27
19	08:35	07:46	06:45	06:34	05:39	05:17	05:40	06:27	07:17	08:07	08:02	08:41
	17:01	17:58	18:48	20:40	21:29	22:00	21:47	20:55	19:45	18:37	16:42	16:27
20	08:34	07:44	06:42	06:32	05:38	05:17	05:41	06:28	07:19	08:09	08:04	08:42
	17:03	17:59	18:49	20:42	21:31	22:00	21:46	20:53	19:43	18:35	16:41	16:28
21	08:33	07:42	06:40	06:30	05:37	05:18	05:42	06:30	07:20	08:11	08:06	08:42
	17:05	18:01	18:51	20:44	21:32	22:01	21:44	20:50	19:40	18:33	16:40	16:28
22	08:32	07:40	06:38	06:28	05:35	05:18	05:44	06:32	07:22	08:13	08:08	08:43
	17:06	18:03	18:53	20:46	21:34	22:01	21:43	20:48	19:38	18:31	16:39	16:28
23	08:31	07:38	06:35	06:26	05:34	05:18	05:45	06:33	07:24	08:15	08:09	08:43
	17:08	18:05	18:54	20:47	21:35	22:01	21:42	20:46	19:36	18:29	16:38	16:29
24	08:30	07:36	06:33	06:24	05:33	05:18	05:46	06:35	07:25	08:16	08:11	08:44
	17:10	18:07	18:56	20:49	21:36	22:01	21:41	20:44	19:33	18:27	16:37	16:30
25	08:28	07:34	06:31	06:22	05:32	05:19	05:48	06:37	07:27	08:18	08:12	08:44
	17:12	18:09	18:58	20:51	21:38	22:01	21:39	20:42	19:31	17:25	16:36	16:30
26	08:27	07:32	06:28	06:20	05:31	05:19	05:49	06:38	07:29	08:20	08:14	08:45
	17:13	18:10	19:00	20:52	21:39	22:01	21:38	20:40	19:29	17:22	16:35	16:31
27	08:26	07:29	06:26	06:18	05:29	05:19	05:51	06:40	07:30	08:22	08:16	08:45
	17:15	18:12	19:01	20:54	21:40	22:01	21:36	20:38	19:26	17:21	16:34	16:32
28	08:24	07:27	06:24	06:16	05:28	05:20	05:52	06:41	07:32	08:23	08:17	08:45
	17:17	18:14	19:03	20:56	21:42	22:01	21:35	20:35	19:24	17:19	16:33	16:32
29	08:23	07:21	06:14	06:06	05:27	05:20	05:54	06:43	07:34	08:25	08:19	08:45
	17:19	18:16	19:05	20:57	21:43	22:01	21:33	20:33	19:22	17:17	16:32	16:33
30	08:22	07:19	06:12	06:04	05:26	05:21	05:55	06:45	07:35	08:27	08:20	08:45
	17:21	18:18	19:07	20:59	21:44	22:01	21:32	20:31	19:19	17:15	16:31	16:34
31	08:20	07:17	06:05	05:57	05:25	05:20	05:57	06:46	07:36	08:28	08:21	08:45
	17:22	18:19	19:08	20:58	21:45	22:02	21:30	20:29	19:17	17:13	16:31	16:35
Potential sun hours	259	278	367	416	485	499	502	454	381	331	266	244
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: BK - H63

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45 16:37	08:18 17:24	07:25 18:16	07:15 20:10	06:10 21:01	05:25 21:46	05:22 22:00	05:58 21:28	06:48 20:26	07:37 19:17	07:31 17:11	08:21 16:31
2	08:45 16:38	08:17 17:26	07:23 18:18	07:12 20:11	06:08 21:02	05:24 21:47	05:23 22:00	06:00 21:27	06:50 20:24	07:39 19:15	07:32 17:09	08:23 16:30
3	08:45 16:39	08:15 17:28	07:21 18:20	07:10 20:13	06:06 21:04	05:23 21:48	05:23 22:00	06:01 21:25	06:51 20:22	07:40 19:12	07:34 17:07	08:24 16:30
4	08:45 16:40	08:14 17:30	07:19 18:21	07:08 20:15	06:04 21:06	05:22 21:50	05:24 21:59	06:03 21:23	06:53 20:20	07:42 19:10	07:36 17:06	08:26 16:29
5	08:45 16:41	08:12 17:32	07:16 18:23	07:05 20:17	06:02 21:07	05:22 21:51	05:25 21:59	06:04 21:22	06:54 20:17	07:44 19:08	07:38 17:04	08:27 16:28
6	08:44 16:42	08:10 17:34	07:14 18:25	07:03 20:18	06:01 21:09	05:21 21:51	05:26 21:58	06:06 21:20	06:56 20:15	07:45 19:06	07:40 17:02	08:28 16:28
7	08:44 16:44	08:09 17:35	07:12 18:27	07:01 20:20	05:59 21:11	05:21 21:52	05:27 21:58	06:08 21:18	06:58 20:13	07:47 19:03	07:41 17:00	08:29 16:28
8	08:43 16:45	08:07 17:37	07:10 18:28	06:59 20:22	05:57 21:12	05:20 21:53	05:27 21:57	06:09 21:16	06:59 20:11	07:49 19:01	07:43 16:59	08:31 16:27
9	08:43 16:46	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	05:20 21:54	05:28 21:56	06:11 21:14	07:01 20:08	07:50 18:59	07:45 16:57	08:32 16:27
10	08:42 16:48	08:03 17:41	07:05 18:32	06:54 20:25	05:54 21:15	05:19 21:55	05:29 21:55	06:12 21:12	07:03 20:06	07:52 18:57	07:47 16:55	08:33 16:27
11	08:42 16:49	08:01 17:43	07:03 18:34	06:52 20:27	05:52 21:17	05:19 21:56	05:30 21:55	06:14 21:11	07:04 20:04	07:54 18:54	07:48 16:54	08:34 16:27
12	08:41 16:51	08:00 17:45	07:01 18:35	06:50 20:29	05:50 21:19	05:18 21:56	05:32 21:54	06:16 21:09	07:06 20:01	07:55 18:52	07:50 16:52	08:35 16:27
13	08:40 16:52	07:58 17:47	06:58 18:37	06:47 20:30	05:49 21:20	05:18 21:57	05:33 21:53	06:17 21:07	07:07 19:59	07:57 18:50	07:52 16:51	08:36 16:26
14	08:40 16:54	07:56 17:48	06:56 18:39	06:45 20:32	05:47 21:22	05:18 21:58	05:34 21:52	06:19 21:05	07:09 19:57	07:59 18:48	07:54 16:49	08:37 16:26
15	08:39 16:55	07:54 17:50	06:54 18:41	06:43 20:34	05:45 21:23	05:18 21:58	05:35 21:51	06:20 21:03	07:11 19:54	08:01 18:46	07:55 16:48	08:38 16:27
16	08:38 16:57	07:52 17:52	06:51 18:42	06:41 20:35	05:44 21:25	05:18 21:59	05:36 21:50	06:22 21:01	07:12 19:52	08:02 18:43	07:57 16:47	08:39 16:27
17	08:37 16:58	07:50 17:54	06:49 18:44	06:39 20:37	05:42 21:26	05:17 21:59	05:37 21:49	06:24 20:59	07:14 19:50	08:04 18:41	07:59 16:45	08:40 16:27
18	08:36 17:00	07:48 17:56	06:47 18:46	06:37 20:39	05:41 21:28	05:17 22:00	05:39 21:48	06:25 20:57	07:16 19:47	08:06 18:39	08:01 16:44	08:40 16:27
19	08:35 17:02	07:46 17:58	06:45 18:48	06:34 20:40	05:40 21:29	05:18 22:00	05:40 21:47	06:27 20:55	07:17 19:45	08:07 18:37	08:02 16:43	08:41 16:27
20	08:34 17:03	07:44 18:00	06:42 18:49	06:32 20:42	05:38 21:31	05:18 22:00	05:41 21:46	06:28 20:53	07:19 19:43	08:09 18:35	08:04 16:41	08:42 16:28
21	08:33 17:05	07:42 18:01	06:40 18:51	06:30 20:44	05:37 21:32	05:18 22:00	05:42 21:44	06:30 20:50	07:20 19:40	08:11 18:33	08:06 16:40	08:42 16:28
22	08:32 17:07	07:40 18:03	06:38 18:53	06:28 20:45	05:36 21:34	05:18 22:01	05:44 21:43	06:32 20:48	07:22 19:38	08:13 18:31	08:07 16:39	08:43 16:29
23	08:31 17:08	07:38 18:05	06:35 18:54	06:26 20:47	05:34 21:35	05:18 22:01	05:45 21:42	06:33 20:46	07:24 19:36	08:14 18:29	08:09 16:38	08:43 16:29
24	08:30 17:10	07:36 18:07	06:33 18:56	06:24 20:49	05:33 21:36	05:18 22:01	05:47 21:40	06:35 20:44	07:25 19:33	08:16 18:27	08:11 16:37	08:44 16:30
25	08:28 17:12	07:34 18:09	06:31 18:58	06:22 20:51	05:32 21:38	05:19 22:01	05:48 21:39	06:37 20:42	07:27 19:31	08:18 18:25	08:12 16:36	08:44 16:30
26	08:27 17:14	07:32 18:10	06:28 19:00	06:20 20:52	05:31 21:39	05:19 22:01	05:49 21:38	06:38 20:40	07:29 19:29	08:20 18:23	08:14 16:35	08:44 16:31
27	08:26 17:15	07:29 18:12	06:26 19:01	06:18 20:54	05:30 21:40	05:20 22:01	05:51 21:36	06:40 20:38	07:30 19:26	08:22 18:21	08:15 16:34	08:45 16:32
28	08:24 17:17	07:27 18:14	06:24 19:03	06:16 20:56	05:29 21:42	05:20 22:01	05:52 21:35	06:41 20:35	07:32 19:24	08:23 18:19	08:17 16:33	08:45 16:33
29	08:23 17:19	07:25 18:16	06:21 19:05	06:14 20:57	05:28 21:43	05:21 22:01	05:54 21:33	06:43 20:33	07:34 19:22	08:25 18:17	08:18 16:32	08:45 16:33
30	08:21 17:21	07:19 18:18	06:19 19:06	06:12 20:59	05:27 21:44	05:21 22:00	05:55 21:32	06:45 20:31	07:35 19:19	08:27 18:15	08:20 16:32	08:45 16:34
31	08:20 17:23	07:17 18:20	06:17 19:08	06:11 20:08	05:26 21:45	05:20 22:01	05:57 21:30	06:46 20:29	07:37 19:13	08:29 18:13	08:22 16:35	08:45 16:35
Potential sun hours	259	278	367	416	485	499	502	454	381	331	266	244
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: BL - H64

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and potential sun hours.

Table layout: For each day in each month the following matrix apply

Matrix defining day in month, sun rise/set, minutes with flicker, and first/last time with flicker.

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: BM - H65

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for days (1-31) and summary rows (Potential sun hours, Total, worst case, etc.)

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: BN - H66

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main data table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: BO - H67

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for days (1-31) and summary rows (Potential sun hours, Total, worst case, Sun reduction, Oper. time red., Wind dir. red., Total reduction, Total, real).

Table layout: For each day in each month the following matrix apply

Matrix with 4 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: BP - H68

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining table layout: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: BQ - H69

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: BR - H70

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (Jan-Dec) and rows for day numbers (1-31) and summary rows (Potential sun hours, Total, worst case, etc.)

Table layout: For each day in each month the following matrix apply

Matrix defining day in month, Sun rise/set, Minutes with flicker, First/Last time with flicker, and WTG causing flicker times.

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: BS - H71

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Table with 13 columns for months (January to December) and multiple rows for days in each month. Columns contain sun rise and set times, and potential sun hours. Summary rows at the bottom show total sun hours and various reduction factors.

Table layout: For each day in each month the following matrix apply

Day in month Sun rise (hh:mm) Sun set (hh:mm) Minutes with flicker First time (hh:mm) with flicker Last time (hh:mm) with flicker (WTG causing flicker first time) (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: BT - H72

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with months (Jan to Dec) and values (1.30 to 1.06)

Operational time

Table with cardinal directions (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW) and corresponding values (357 to 8,760)

Main shadow calculation table with columns for months (Jan-Dec) and rows for 31 days, including sunrise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Summary table for daily data layout with columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: BU - H73

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: BV - H74

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining table layout: Day in month, Sun rise/set, Minutes with flicker, First/Last time with flicker, and WTG causing flicker first/last time.

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: BW - H75

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main data table with 13 columns (January-December) and 31 rows of daily data. Includes columns for sun rise/set, operational time, and various reduction metrics.

Table layout: For each day in each month the following matrix apply

Summary table with 4 columns: Day in month, Sun rise/set, Minutes with flicker, and Last time with flicker.



SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: BY - H77

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for days (1-31) and summary rows (Potential sun hours, Total, worst case, etc.)

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: CA - H79

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main data table with 13 columns (January-December) and 31 rows of sunrise/set times and reduction metrics.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:07/3.5.584

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: CB - H80

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for days 1-31, including potential sun hours and reduction metrics.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise/set (hh:mm), Minutes with flicker, First/Last time (hh:mm) with flicker, and WTG causing flicker first/last time.



SHADOW - Calendar

Calculation: Derragh WF Impacts Only **Shadow receptor:** CC - H81

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45 16:36	08:19 17:24	07:25 18:16	07:15 20:10	06:10 21:01	05:25 21:46	05:22 22:00	05:58 21:28	06:48 20:26	07:37 19:17	07:31 17:11	08:22 16:31
2	08:45 16:37	08:17 17:26	07:23 18:18	07:12 20:11	06:08 21:02	05:24 21:48	05:22 22:00	06:00 21:27	06:49 20:24	07:38 19:15	07:32 17:09	08:23 16:30
3	08:45 16:39	08:15 17:28	07:21 18:19	07:10 20:13	06:06 21:04	05:23 21:49	05:23 22:00	06:01 21:25	06:51 20:22	07:40 19:12	07:34 17:07	08:24 16:29
4	08:45 16:40	08:14 17:30	07:19 18:21	07:08 20:15	06:04 21:06	05:22 21:50	05:24 21:59	06:03 21:23	06:53 20:20	07:42 19:10	07:36 17:05	08:26 16:29
5	08:45 16:41	08:12 17:32	07:16 18:23	07:05 20:17	06:02 21:07	05:22 21:51	05:25 21:59	06:04 21:22	06:54 20:17	07:44 19:08	07:38 17:04	08:27 16:28
6	08:44 16:42	08:10 17:33	07:14 18:25	07:03 20:18	06:00 21:09	05:21 21:52	05:25 21:58	06:06 21:20	06:56 20:15	07:45 19:06	07:40 17:02	08:28 16:28
7	08:44 16:43	08:09 17:35	07:12 18:27	07:01 20:20	05:59 21:11	05:20 21:53	05:26 21:58	06:07 21:18	06:58 20:13	07:47 19:03	07:41 17:00	08:30 16:27
8	08:44 16:45	08:07 17:37	07:10 18:28	06:59 20:22	05:57 21:12	05:20 21:53	05:27 21:57	06:09 21:16	06:59 20:11	07:49 19:01	07:43 16:59	08:31 16:27
9	08:43 16:46	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	05:19 21:54	05:28 21:56	06:11 21:14	07:01 20:08	07:50 18:59	07:45 16:57	08:32 16:27
10	08:43 16:47	08:03 17:41	07:05 18:32	06:54 20:25	05:53 21:15	05:19 21:55	05:29 21:56	06:12 21:13	07:02 20:06	07:52 18:57	07:47 16:55	08:33 16:27
11	08:42 16:49	08:02 17:43	07:03 18:34	06:52 20:27	05:52 21:17	05:18 21:56	05:30 21:55	06:14 21:11	07:04 20:04	07:54 18:54	07:49 16:54	08:34 16:26
12	08:41 16:50	08:00 17:45	07:01 18:35	06:50 20:29	05:50 21:19	05:18 21:57	05:31 21:54	06:15 21:09	07:06 20:01	07:55 18:52	07:50 16:52	08:35 16:26
13	08:41 16:52	07:58 17:46	06:58 18:37	06:47 20:30	05:48 21:20	05:18 21:57	05:32 21:53	06:17 21:07	07:07 19:59	07:57 18:50	07:52 16:51	08:36 16:26
14	08:40 16:53	07:56 17:48	06:56 18:39	06:45 20:32	05:47 21:22	05:18 21:58	05:34 21:52	06:19 21:05	07:09 19:57	07:59 18:48	07:54 16:49	08:37 16:26
15	08:39 16:55	07:54 17:50	06:54 18:41	06:43 20:34	05:45 21:23	05:17 21:58	05:35 21:51	06:20 21:03	07:11 19:54	08:01 18:45	07:56 16:48	08:38 16:26
16	08:38 16:56	07:52 17:52	06:51 18:42	06:41 20:35	05:44 21:25	05:17 21:59	05:36 21:50	06:22 21:01	07:12 19:52	08:02 18:43	07:57 16:46	08:39 16:26
17	08:37 16:58	07:50 17:54	06:49 18:44	06:39 20:37	05:42 21:26	05:17 21:59	05:37 21:49	06:23 20:59	07:14 19:50	08:04 18:41	07:59 16:45	08:40 16:27
18	08:36 17:00	07:48 17:56	06:47 18:46	06:36 20:39	05:41 21:28	05:17 22:00	05:38 21:48	06:25 20:57	07:15 19:47	08:06 18:39	08:01 16:44	08:41 16:27
19	08:35 17:01	07:46 17:58	06:45 18:48	06:34 20:40	05:39 21:29	05:17 22:00	05:40 21:47	06:27 20:55	07:17 19:45	08:07 18:37	08:02 16:42	08:41 16:27
20	08:34 17:03	07:44 17:59	06:42 18:49	06:32 20:42	05:38 21:31	05:17 22:00	05:41 21:46	06:28 20:53	07:19 19:43	08:09 18:35	08:04 16:41	08:42 16:28
21	08:33 17:05	07:42 18:01	06:40 18:51	06:30 20:44	05:37 21:32	05:17 22:01	05:42 21:45	06:30 20:50	07:20 19:40	08:11 18:33	08:06 16:40	08:42 16:28
22	08:32 17:06	07:40 18:03	06:38 18:53	06:28 20:46	05:35 21:34	05:18 22:01	05:44 21:43	06:32 20:48	07:22 19:38	08:13 18:31	08:08 16:39	08:43 16:28
23	08:31 17:08	07:38 18:05	06:35 18:54	06:26 20:47	05:34 21:35	05:18 22:01	05:45 21:42	06:33 20:46	07:24 19:36	08:15 18:29	08:09 16:38	08:44 16:29
24	08:30 17:10	07:36 18:07	06:33 18:56	06:24 20:49	05:33 21:36	05:18 22:01	05:46 21:41	06:35 20:44	07:25 19:33	08:16 18:26	08:11 16:37	08:44 16:30
25	08:28 17:12	07:34 18:09	06:31 18:58	06:22 20:51	05:32 21:38	05:19 22:01	05:48 21:39	06:36 20:42	07:27 19:31	08:18 17:24	08:12 16:36	08:44 16:30
26	08:27 17:13	07:32 18:10	06:28 19:00	06:20 20:52	05:30 21:39	05:19 22:01	05:49 21:38	06:38 20:40	07:29 19:29	08:19 17:22	08:14 16:35	08:45 16:31
27	08:26 17:15	07:29 18:12	06:26 19:01	06:18 20:54	05:29 21:40	05:19 22:01	05:51 21:36	06:40 20:38	07:30 19:26	08:20 17:20	08:16 16:34	08:45 16:32
28	08:24 17:17	07:27 18:14	06:24 19:03	06:16 20:56	05:28 21:42	05:20 22:01	05:52 21:35	06:41 20:35	07:32 19:24	08:17 17:19	08:17 16:33	08:45 16:32
29	08:23 17:19	07:21 18:05	06:21 20:05	06:14 20:57	05:27 21:43	05:20 22:01	05:54 21:33	06:43 20:33	07:33 19:22	08:19 17:17	08:19 16:32	08:45 16:33
30	08:22 17:21	07:19 18:06	06:19 20:06	06:12 20:59	05:26 21:44	05:21 22:01	05:55 21:32	06:45 20:31	07:35 19:19	08:20 17:15	08:20 16:31	08:45 16:34
31	08:20 17:22	07:17 18:08	06:17 20:08	06:10 21:45	05:25 21:45	05:19 22:01	05:57 21:30	06:46 20:29	07:29 17:13	08:20 17:13	08:20 16:34	08:45 16:35
Potential sun hours	259	278	367	416	485	499	502	454	381	331	266	244
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)



SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: CD - H82

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining table layout: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: CE - H83

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: CF - H84

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Summary table with 4 columns: Day in month, Sun rise/set, Minutes with flicker, and First/Last time with flicker.

SHADOW - Calendar

Calculation: Derragh WF Impacts Only **Shadow receptor:** CG - H85

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June			
1	08:45	08:18	07:25	07:15	06:10	05:25			
	16:37	17:24	18:16	20:10	21:01	21:46			
2	08:45	08:17	07:23	07:12	06:08	05:24			
	16:38	17:26	18:18	20:11	21:02	21:47			
3	08:45	08:15	07:21	07:10	06:06	06:36 (2)	05:23		
	16:39	17:28	18:19	20:13	21:04	10 06:46 (2)	21:48		
4	08:45	08:14	07:18	07:08	06:04	06:33 (2)	05:22		
	16:40	17:30	18:21	20:15	21:06	14 06:47 (2)	21:49		
5	08:44	08:12	07:16	07:05	06:02	06:31 (2)	05:22		
	16:41	17:32	18:23	20:17	21:07	17 06:48 (2)	21:50		
6	08:44	08:10	07:14	07:03	06:01	06:31 (2)	05:21		
	16:42	17:34	18:25	20:18	21:09	19 06:50 (2)	21:51		
7	08:44	08:09	07:12	07:01	05:59	06:30 (2)	05:20		
	16:44	17:35	18:27	20:20	21:10	20 06:50 (2)	21:52		
8	08:43	08:07	07:10	06:59	05:57	06:29 (2)	05:20		
	16:45	17:37	18:28	20:22	21:12	22 06:51 (2)	21:53		
9	08:43	08:05	07:07	06:56	05:55	06:29 (2)	05:19		
	16:46	17:39	18:30	20:23	21:14	23 06:52 (2)	21:54		
10	08:42	08:03	07:05	06:54	05:54	06:28 (2)	05:19		
	16:48	17:41	18:32	20:25	21:15	24 06:52 (2)	21:55		
11	08:42	08:01	07:03	06:52	07:16 (3)	05:52	06:27 (2)	05:19	
	16:49	17:43	18:34	20:27	9 07:25 (3)	21:17	24 06:51 (2)	21:56	
12	08:41	08:00	07:01	06:50	07:13 (3)	05:50	06:27 (2)	05:18	
	16:50	17:45	18:35	20:28	14 07:27 (3)	21:18	25 06:52 (2)	21:56	
13	08:40	07:58	06:58	06:47	07:11 (3)	05:49	06:27 (2)	05:18	
	16:52	17:47	18:37	20:30	16 07:27 (3)	21:20	24 06:51 (2)	21:57	3 06:19 (1)
14	08:40	07:56	06:56	06:45	07:10 (3)	05:47	06:27 (2)	05:18	06:15 (1)
	16:53	17:48	18:39	20:32	18 07:28 (3)	21:22	25 06:52 (2)	21:58	6 06:21 (1)
15	08:39	07:54	06:54	06:43	07:09 (3)	05:45	06:28 (2)	05:18	06:15 (1)
	16:55	17:50	18:41	20:34	19 07:28 (3)	21:23	24 06:52 (2)	21:58	7 06:22 (1)
16	08:38	07:52	06:51	06:41	07:09 (3)	05:44	06:28 (2)	05:18	06:14 (1)
	16:57	17:52	18:42	20:35	20 07:29 (3)	21:25	23 06:51 (2)	21:59	9 06:23 (1)
17	08:37	07:50	06:49	06:39	07:08 (3)	05:42	06:28 (2)	05:17	06:14 (1)
	16:58	17:54	18:44	20:37	21 07:29 (3)	21:26	23 06:51 (2)	21:59	10 06:24 (1)
18	08:36	07:48	06:47	06:36	07:08 (3)	05:41	06:29 (2)	05:17	06:14 (1)
	17:00	17:56	18:46	20:39	20 07:28 (3)	21:28	22 06:51 (2)	21:59	11 06:25 (1)
19	08:35	07:46	06:45	06:34	07:09 (3)	05:40	06:29 (2)	05:17	06:14 (1)
	17:01	17:58	18:48	20:40	19 07:28 (3)	21:29	21 06:50 (2)	22:00	11 06:25 (1)
20	08:34	07:44	06:42	06:32	07:09 (3)	05:38	06:30 (2)	05:18	06:14 (1)
	17:03	18:00	18:49	20:42	18 07:27 (3)	21:31	20 06:50 (2)	22:00	11 06:25 (1)
21	08:33	07:42	06:40	06:30	07:09 (3)	05:37	06:31 (2)	05:18	06:14 (1)
	17:05	18:01	18:51	20:44	17 07:26 (3)	21:32	18 06:49 (2)	22:00	11 06:25 (1)
22	08:32	07:40	06:38	06:28	07:10 (3)	05:36	06:32 (2)	05:18	06:14 (1)
	17:07	18:03	18:53	20:45	15 07:25 (3)	21:33	16 06:48 (2)	22:01	11 06:25 (1)
23	08:31	07:38	06:35	06:26	07:12 (3)	05:34	06:33 (2)	05:18	06:15 (1)
	17:08	18:05	18:54	20:47	11 07:23 (3)	21:35	15 06:48 (2)	22:01	11 06:26 (1)
24	08:30	07:36	06:33	06:24	07:14 (3)	05:33	06:33 (2)	05:18	06:15 (1)
	17:10	18:07	18:56	20:49	6 07:20 (3)	21:36	13 06:46 (2)	22:01	11 06:26 (1)
25	08:28	07:34	06:31	06:22	05:32	06:35 (2)	05:19	06:15 (1)	
	17:12	18:09	18:58	20:50	9 06:44 (2)	22:01	10 06:25 (1)		
26	08:27	07:31	06:28	06:20	05:31	06:37 (2)	05:19	06:16 (1)	
	17:13	18:10	19:00	20:52	5 06:42 (2)	22:01	10 06:26 (1)		
27	08:26	07:29	06:26	06:18	05:30	05:20	9 06:16 (1)		
	17:15	18:12	19:01	20:54	21:40	22:01	9 06:25 (1)		
28	08:24	07:27	06:24	06:16	05:29	05:20	06:18 (1)		
	17:17	18:14	19:03	20:56	21:41	22:01	7 06:25 (1)		
29	08:23	07:21	06:14	06:14	05:28	05:21	06:19 (1)		
	17:19	07:20	06:14	06:14	21:43	22:01	4 06:23 (1)		
30	08:21	07:19	06:12	06:12	05:27	05:21			
	17:21	07:18	06:12	06:12	21:44	22:00			
31	08:20	07:17	06:11	06:11	05:26				
	17:23	07:16	06:11	06:11	21:45				
Potential sun hours	259	278	367	416	485	499			
Total, worst case				223	456	152			
Sun reduction				0.35	0.37	0.30			
Oper. time red.				1.00	1.00	1.00			
Wind dir. red.				0.66	0.64	0.63			
Total reduction				0.23	0.24	0.19			
Total, real				52	108	29			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Derragh WF Impacts Only **Shadow receptor:** CG - H85

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22 22:00	05:58 21:28	06:38 (2) 07:02 (2)	06:48 20:26	07:15 (3) 07:24 (3)	07:37 19:17
2	05:23 22:00	06:00 21:27	06:38 (2) 07:02 (2)	06:50 20:24	07:38 19:15	07:32 17:09
3	05:23 21:59	06:01 21:25	06:38 (2) 07:02 (2)	06:51 20:22	07:40 19:12	07:34 17:07
4	05:24 21:59	06:03 21:23	06:38 (2) 07:01 (2)	06:53 20:20	07:42 19:10	07:36 17:06
5	05:25 21:59	06:04 21:22	06:39 (2) 07:01 (2)	06:54 20:17	07:43 19:08	07:38 17:04
6	05:26 21:58	06:06 21:20	06:39 (2) 07:00 (2)	06:56 20:15	07:45 19:06	07:39 17:02
7	05:27 21:57	06:08 21:18	06:41 (2) 06:59 (2)	06:58 20:13	07:47 19:03	07:41 17:00
8	05:27 21:57	06:09 21:16	06:41 (2) 06:57 (2)	06:59 20:10	07:49 19:01	07:43 16:59
9	05:28 21:56	06:11 21:14	06:43 (2) 06:56 (2)	07:01 20:08	07:50 18:59	07:45 16:57
10	05:29 21:55	06:12 21:12	06:45 (2) 06:53 (2)	07:02 20:06	07:52 18:57	07:47 16:55
11	05:30 21:55	06:14 21:11	07:04 20:04	07:04 20:04	07:54 18:54	07:48 16:54
12	05:32 21:54	06:16 21:09	07:06 20:01	07:06 20:01	07:55 18:52	07:50 16:52
13	05:33 21:53	06:17 21:07	07:07 19:59	07:07 19:59	07:57 18:50	07:52 16:51
14	05:34 21:52	06:19 21:05	07:09 19:57	07:09 19:57	07:59 18:48	07:54 16:49
15	05:35 21:51	06:20 21:03	07:11 19:54	07:11 19:54	08:00 18:46	07:55 16:48
16	05:36 21:50	06:22 21:01	07:12 19:52	07:12 19:52	08:02 18:43	07:57 16:47
17	05:37 21:49	06:24 20:59	07:14 19:50	07:14 19:50	08:04 18:41	07:59 16:45
18	05:39 21:48	06:45 (2) 06:53 (2)	06:25 20:57	07:15 19:47	08:06 18:39	08:01 16:44
19	05:40 21:47	06:44 (2) 06:56 (2)	06:27 20:55	07:17 19:45	08:07 18:37	08:02 16:43
20	05:41 21:46	06:43 (2) 06:57 (2)	06:28 20:52	07:19 (3) 19:43	08:09 18:35	08:04 16:41
21	05:42 21:44	06:42 (2) 06:58 (2)	06:30 20:50	07:20 19:40	08:11 18:33	08:06 16:40
22	05:44 21:43	06:41 (2) 06:58 (2)	06:32 20:48	07:22 19:38	08:13 18:31	08:07 16:39
23	05:45 21:42	06:41 (2) 07:00 (2)	06:33 20:46	07:24 19:36	08:14 18:29	08:09 16:38
24	05:47 21:40	06:40 (2) 07:00 (2)	06:35 20:44	07:25 19:33	08:16 18:27	08:11 16:37
25	05:48 21:39	06:39 (2) 07:00 (2)	06:37 20:42	07:27 19:31	07:18 17:25	08:12 16:36
26	05:49 21:38	06:39 (2) 07:02 (2)	06:38 20:40	07:29 19:29	07:20 17:23	08:14 16:35
27	05:51 21:36	06:39 (2) 07:02 (2)	06:40 20:37	07:30 (3) 19:26	07:22 17:21	08:15 16:34
28	05:52 21:35	06:38 (2) 07:02 (2)	06:41 20:35	07:32 (3) 19:24	07:23 17:19	08:17 16:33
29	05:54 21:33	06:38 (2) 07:02 (2)	06:43 20:33	07:33 (3) 19:22	07:25 17:17	08:18 16:32
30	05:55 21:32	06:38 (2) 07:02 (2)	06:45 20:31	07:35 (3) 19:19	07:27 17:15	08:20 16:32
31	05:57 21:30	06:38 (2) 07:03 (2)	06:46 20:29	07:36 (3) 19:17	07:29 17:13	08:45 16:35
Potential sun hours	502	454	381	331	266	244
Total, worst case	270	408	9			
Sun reduction	0.27	0.30	0.28			
Oper. time red.	1.00	1.00	1.00			
Wind dir. red.	0.64	0.65	0.66			
Total reduction	0.17	0.19	0.19			
Total, real	46	79	2			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:07/3.5.584

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: CH - H86

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:25	07:14	06:10	05:24	05:21	05:58	06:48	07:37	07:30	08:21
	16:36	17:24	18:16	20:10	21:01	21:46	22:00	21:28	20:26	19:17	17:11	16:30
2	08:45	08:17	07:23	07:12	06:08	05:24	05:22	06:00	06:49	07:38	07:32	08:23
	16:37	17:26	18:18	20:11	21:02	21:47	22:00	21:27	20:24	19:15	17:09	16:30
3	08:45	08:15	07:21	07:10	06:06	05:23	05:23	06:01	06:51	07:40	07:34	08:24
	16:38	17:28	18:19	20:13	21:04	21:49	22:00	21:25	20:22	19:12	17:07	16:29
4	08:45	08:14	07:18	07:08	06:04	05:22	05:24	06:03	06:53	07:42	07:36	08:26
	16:40	17:30	18:21	20:15	21:06	21:50	21:59	21:23	20:20	19:10	17:05	16:29
5	08:45	08:12	07:16	07:05	06:02	05:21	05:24	06:04	06:54	07:43	07:38	08:27
	16:41	17:31	18:23	20:17	21:07	21:51	21:59	21:22	20:17	19:08	17:04	16:28
6	08:44	08:10	07:14	07:03	06:00	05:21	05:25	06:06	06:56	07:45	07:39	08:28
	16:42	17:33	18:25	20:18	21:09	21:52	21:58	21:20	20:15	19:05	17:02	16:28
7	08:44	08:09	07:12	07:01	05:59	05:20	05:26	06:07	06:57	07:47	07:41	08:30
	16:43	17:35	18:26	20:20	21:11	21:52	21:58	21:18	20:13	19:03	17:00	16:27
8	08:43	08:07	07:10	06:58	05:57	05:20	05:27	06:09	06:59	07:48	07:43	08:31
	16:45	17:37	18:28	20:22	21:12	21:53	21:57	21:16	20:10	19:01	16:58	16:27
9	08:43	08:05	07:07	06:56	05:55	05:19	05:28	06:11	07:01	07:50	07:45	08:32
	16:46	17:39	18:30	20:23	21:14	21:54	21:56	21:14	20:08	18:59	16:57	16:27
10	08:42	08:03	07:05	06:54	05:53	05:19	05:29	06:12	07:02	07:52	07:47	08:33
	16:47	17:41	18:32	20:25	21:15	21:55	21:56	21:12	20:06	18:56	16:55	16:26
11	08:42	08:01	07:03	06:52	05:52	05:18	05:30	06:14	07:04	07:54	07:48	08:34
	16:49	17:43	18:34	20:27	21:17	21:56	21:55	21:11	20:03	18:54	16:54	16:26
12	08:41	08:00	07:00	06:49	05:50	05:18	05:31	06:15	07:06	07:55	07:50	08:35
	16:50	17:45	18:35	20:28	21:19	21:56	21:54	21:09	20:01	18:52	16:52	16:26
13	08:41	07:58	06:58	06:47	05:48	05:18	05:32	06:17	07:07	07:57	07:52	08:36
	16:52	17:46	18:37	20:30	21:20	21:57	21:53	21:07	19:59	18:50	16:51	16:26
14	08:40	07:56	06:56	06:45	05:47	05:17	05:33	06:19	07:09	07:59	07:54	08:37
	16:53	17:48	18:39	20:32	21:22	21:58	21:52	21:05	19:57	18:48	16:49	16:26
15	08:39	07:54	06:54	06:43	05:45	05:17	05:35	06:20	07:10	08:00	07:55	08:38
	16:55	17:50	18:40	20:34	21:23	21:58	21:51	21:03	19:54	18:45	16:48	16:26
16	08:38	07:52	06:51	06:41	05:44	05:17	05:36	06:22	07:12	08:02	07:57	08:39
	16:56	17:52	18:42	20:35	21:25	21:59	21:50	21:01	19:52	18:43	16:46	16:26
17	08:37	07:50	06:49	06:38	05:42	05:17	05:37	06:23	07:14	08:04	07:59	08:40
	16:58	17:54	18:44	20:37	21:26	21:59	21:49	20:59	19:50	18:41	16:45	16:27
18	08:36	07:48	06:47	06:36	05:41	05:17	05:38	06:25	07:15	08:06	08:01	08:40
	17:00	17:56	18:46	20:39	21:28	22:00	21:48	20:57	19:47	18:39	16:44	16:27
19	08:35	07:46	06:44	06:34	05:39	05:17	05:40	06:27	07:17	08:07	08:02	08:41
	17:01	17:57	18:47	20:40	21:29	22:00	21:47	20:55	19:45	18:37	16:42	16:27
20	08:34	07:44	06:42	06:32	05:38	05:17	05:41	06:28	07:19	08:09	08:04	08:42
	17:03	17:59	18:49	20:42	21:31	22:00	21:46	20:52	19:42	18:35	16:41	16:27
21	08:33	07:42	06:40	06:30	05:37	05:17	05:42	06:30	07:20	08:11	08:06	08:42
	17:05	18:01	18:51	20:44	21:32	22:01	21:44	20:50	19:40	18:33	16:40	16:28
22	08:32	07:40	06:38	06:28	05:35	05:18	05:44	06:31	07:22	08:13	08:07	08:43
	17:06	18:03	18:53	20:45	21:34	22:01	21:43	20:48	19:38	18:30	16:39	16:28
23	08:31	07:38	06:35	06:26	05:34	05:18	05:45	06:33	07:24	08:14	08:09	08:43
	17:08	18:05	18:54	20:47	21:35	22:01	21:42	20:46	19:35	18:28	16:38	16:29
24	08:30	07:36	06:33	06:24	05:33	05:18	05:46	06:35	07:25	08:16	08:11	08:44
	17:10	18:07	18:56	20:49	21:36	22:01	21:40	20:44	19:33	18:26	16:37	16:29
25	08:28	07:34	06:31	06:22	05:32	05:18	05:48	06:36	07:27	08:17	08:12	08:44
	17:11	18:08	18:58	20:51	21:38	22:01	21:39	20:42	19:31	17:24	16:36	16:30
26	08:27	07:31	06:28	06:20	05:30	05:19	05:49	06:38	07:28	08:18	08:14	08:45
	17:13	18:10	18:59	20:52	21:39	22:01	21:38	20:40	19:28	17:22	16:35	16:31
27	08:26	07:29	06:26	06:18	05:29	05:19	05:51	06:40	07:30	08:20	08:15	08:45
	17:15	18:12	19:01	20:54	21:40	22:01	21:36	20:37	19:26	17:20	16:34	16:31
28	08:24	07:27	06:24	06:16	05:28	05:20	05:52	06:41	07:32	08:23	08:17	08:45
	17:17	18:14	19:03	20:56	21:42	22:01	21:35	20:35	19:24	17:18	16:33	16:32
29	08:23	07:21	06:14	06:04	05:27	05:20	05:53	06:43	07:33	08:25	08:19	08:45
	17:19	18:16	19:05	20:57	21:43	22:01	21:33	20:33	19:22	17:16	16:32	16:33
30	08:21	07:19	06:12	06:02	05:26	05:21	05:55	06:44	07:35	08:27	08:20	08:45
	17:20	18:17	19:06	20:59	21:44	22:01	21:32	20:31	19:19	17:15	16:31	16:34
31	08:20	07:17	06:05	05:55	05:25	05:20	05:56	06:46	07:37	08:29	08:22	08:45
	17:22	18:19	19:08	20:58	21:45	22:02	21:30	20:29	19:17	17:13	16:31	16:35
Potential sun hours	259	278	367	416	485	499	502	454	381	331	266	244
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: CI - H87

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for days (1-31) and summary rows (Potential sun hours, Total, worst case, etc.)

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: CJ - H88

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: CK - H89

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main data table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: CL - H90

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Derragh WF Impacts Only **Shadow receptor:** CM - H91

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:25	07:15	06:10	05:25	05:22	05:58	06:48	07:37	07:31	08:21
	16:37	17:24	18:16	20:10	21:01	21:46	22:00	21:28	20:26	19:17	17:11	16:31
2	08:45	08:17	07:23	07:12	06:08	05:24	05:23	06:00	06:50	07:38	07:32	08:23
	16:38	17:26	18:18	20:11	21:02	21:47	22:00	21:27	20:24	19:15	17:09	16:30
3	08:45	08:15	07:21	07:10	06:06	05:23	05:23	06:01	06:51	07:40	07:34	08:24
	16:39	17:28	18:19	20:13	21:04	21:48	21:59	21:25	20:22	19:12	17:07	16:30
4	08:45	08:14	07:19	07:08	06:04	05:22	05:24	06:03	06:53	07:42	07:36	08:26
	16:40	17:30	18:21	20:15	21:06	21:49	21:59	21:23	20:20	19:10	17:06	16:29
5	08:45	08:12	07:16	07:05	06:02	05:22	05:25	06:04	06:54	07:44	07:38	08:27
	16:41	17:32	18:23	20:17	21:07	21:50	21:59	21:22	20:17	19:08	17:04	16:29
6	08:44	08:10	07:14	07:03	06:01	05:21	05:26	06:06	06:56	07:45	07:39	08:28
	16:42	17:34	18:25	20:18	21:09	21:51	21:58	21:20	20:15	19:06	17:02	16:28
7	08:44	08:09	07:12	07:01	05:59	05:21	05:27	06:08	06:58	07:47	07:41	08:29
	16:44	17:35	18:27	20:20	21:11	21:52	21:57	21:18	20:13	19:03	17:00	16:28
8	08:43	08:07	07:10	06:59	05:57	05:20	05:27	06:09	06:59	07:49	07:43	08:31
	16:45	17:37	18:28	20:22	21:12	21:53	21:57	21:16	20:10	19:01	16:59	16:27
9	08:43	08:05	07:07	06:56	05:55	05:20	05:28	06:11	07:01	07:50	07:45	08:32
	16:46	17:39	18:30	20:23	21:14	21:54	21:56	21:14	20:08	18:59	16:57	16:27
10	08:42	08:03	07:05	06:54	05:54	05:19	05:29	06:12	07:03	07:52	07:47	08:33
	16:48	17:41	18:32	20:25	21:15	21:55	21:55	21:12	20:06	18:57	16:55	16:27
11	08:42	08:01	07:03	06:52	05:52	05:19	05:30	06:14	07:04	07:54	07:48	08:34
	16:49	17:43	18:34	20:27	21:17	21:56	21:55	21:11	20:04	18:54	16:54	16:27
12	08:41	08:00	07:01	06:50	05:50	05:18	05:32	06:16	07:06	07:55	07:50	08:35
	16:51	17:45	18:35	20:28	21:19	21:56	21:54	21:09	20:01	18:52	16:52	16:27
13	08:40	07:58	06:58	06:47	05:49	05:18	05:33	06:17	07:07	07:57	07:52	08:36
	16:52	17:47	18:37	20:30	21:20	21:57	21:53	21:07	19:59	18:50	16:51	16:26
14	08:40	07:56	06:56	06:45	05:47	05:18	05:34	06:19	07:09	07:59	07:54	08:37
	16:54	17:48	18:39	20:32	21:22	21:58	21:52	21:05	19:57	18:48	16:49	16:27
15	08:39	07:54	06:54	06:43	05:45	05:18	05:35	06:20	07:11	08:01	07:55	08:38
	16:55	17:50	18:41	20:34	21:23	21:58	21:51	21:03	19:54	18:46	16:48	16:27
16	08:38	07:52	06:51	06:41	05:44	05:18	05:36	06:22	07:12	08:02	07:57	08:39
	16:57	17:52	18:42	20:35	21:25	21:59	21:50	21:01	19:52	18:43	16:47	16:27
17	08:37	07:50	06:49	06:39	05:42	05:18	05:37	06:24	07:14	08:04	07:59	08:40
	16:58	17:54	18:44	20:37	21:26	21:59	21:49	20:59	19:50	18:41	16:45	16:27
18	08:36	07:48	06:47	06:37	05:41	05:17	05:39	06:25	07:16	08:06	08:01	08:40
	17:00	17:56	18:46	20:39	21:28	22:00	21:48	20:57	19:47	18:39	16:44	16:27
19	08:35	07:46	06:45	06:34	05:40	05:18	05:40	06:27	07:17	08:07	08:02	08:41
	17:02	17:58	18:48	20:40	21:29	22:00	21:47	20:55	19:45	18:37	16:43	16:27
20	08:34	07:44	06:42	06:32	05:38	05:18	05:41	06:28	07:19	08:09	08:04	08:42
	17:03	18:00	18:49	20:42	21:31	22:00	21:46	20:53	19:43	18:35	16:41	16:28
21	08:33	07:42	06:40	06:30	05:37	05:18	05:43	06:30	07:20	08:11	08:06	08:42
	17:05	18:01	18:51	20:44	21:32	22:00	21:44	20:50	19:40	18:33	16:40	16:28
22	08:32	07:40	06:38	06:28	05:36	05:18	05:44	06:32	07:22	08:13	08:07	08:43
	17:07	18:03	18:53	20:45	21:34	22:01	21:43	20:48	19:38	18:31	16:39	16:29
23	08:31	07:38	06:35	06:26	05:34	05:18	05:45	06:33	07:24	08:14	08:09	08:43
	17:08	18:05	18:54	20:47	21:35	22:01	21:42	20:46	19:36	18:29	16:38	16:29
24	08:30	07:36	06:33	06:24	05:33	05:18	05:47	06:35	07:25	08:16	08:11	08:44
	17:10	18:07	18:56	20:49	21:36	22:01	21:40	20:44	19:33	18:27	16:37	16:30
25	08:28	07:34	06:31	06:22	05:32	05:19	05:48	06:37	07:27	08:18	08:12	08:44
	17:12	18:09	18:58	20:51	21:38	22:01	21:39	20:42	19:31	17:25	16:36	16:30
26	08:27	07:32	06:28	06:20	05:31	05:19	05:49	06:38	07:29	08:20	08:14	08:44
	17:14	18:10	19:00	20:52	21:39	22:01	21:38	20:40	19:29	17:23	16:35	16:31
27	08:26	07:29	06:26	06:18	05:30	05:20	05:51	06:40	07:30	08:22	08:15	08:45
	17:15	18:12	19:01	20:54	21:40	22:01	21:36	20:38	19:26	17:21	16:34	16:32
28	08:24	07:27	06:24	06:16	05:29	05:20	05:52	06:41	07:32	08:23	08:17	08:45
	17:17	18:14	19:03	20:56	21:42	22:01	21:35	20:35	19:24	17:19	16:33	16:33
29	08:23	07:21	06:14	06:05	05:28	05:21	05:54	06:43	07:34	08:25	08:18	08:45
	17:19	18:16	19:05	20:57	21:43	22:01	21:33	20:33	19:22	17:17	16:32	16:33
30	08:21	07:19	06:12	06:02	05:27	05:21	05:55	06:45	07:35	08:27	08:20	08:45
	17:21	18:18	19:06	20:59	21:44	22:00	21:32	20:31	19:19	17:15	16:32	16:34
31	08:20	07:17	06:08	05:59	05:26	05:20	05:57	06:46	07:36	08:28	08:21	08:45
	17:23	18:20	19:08	20:59	21:45	22:01	21:30	20:29	19:17	17:13	16:33	16:35
Potential sun hours	259	278	367	416	485	499	502	454	381	331	266	244
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: CN - H92

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: CP - H94

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main data table with 13 columns (January-December) and 31 rows of daily data. Includes columns for sun rise/set, shadow start/end, and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: CQ - H95

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for days (1-31) and summary rows (Potential sun hours, Total, worst case, etc.)

Table layout: For each day in each month the following matrix apply

Matrix defining table layout: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: CR - H96

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 16:37	08:18 17:24	07:25 18:16	07:14 20:10	06:10 21:00	07:15 (5) 21:46
2	08:45 16:38	08:17 17:26	07:23 18:18	07:12 20:11	06:08 21:02	07:15 (5) 21:47
3	08:45 16:39	08:15 17:28	07:21 18:19	07:10 20:13	06:06 21:04	07:17 (5) 21:48
4	08:45 16:40	08:14 17:30	07:18 18:21	07:08 20:15	06:04 21:05	07:17 (5) 21:49
5	08:44 16:41	08:12 17:32	07:16 18:23	07:05 20:16	06:02 21:07	07:18 (5) 21:50
6	08:44 16:42	08:10 17:33	07:14 18:25	07:03 20:18	06:00 21:09	07:19 (5) 21:51
7	08:44 16:44	08:08 17:35	07:12 18:26	07:01 20:20	05:59 21:10	07:20 (5) 21:52
8	08:43 16:45	08:07 17:37	07:10 18:28	06:59 20:22	05:57 21:12	07:21 (5) 21:53
9	08:43 16:46	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	06:37 (4) 21:54
10	08:42 16:48	08:03 17:41	07:05 18:32	06:54 20:25	05:53 21:15	06:33 (4) 21:55
11	08:42 16:49	08:01 17:43	07:03 18:34	06:52 20:27	05:52 21:17	06:30 (4) 21:55
12	08:41 16:50	08:00 17:45	07:00 18:35	06:50 20:28	05:50 21:18	06:29 (4) 21:56
13	08:40 16:52	07:58 17:47	06:58 18:37	06:47 20:30	05:49 21:20	06:28 (4) 21:57
14	08:40 16:53	07:56 17:48	06:56 18:39	06:45 20:32	05:47 21:22	06:27 (4) 21:57
15	08:39 16:55	07:54 17:50	06:54 18:41	06:43 20:33	05:45 21:23	06:27 (4) 21:58
16	08:38 16:57	07:52 17:52	06:51 18:42	06:41 20:35	05:44 21:25	06:25 (4) 21:59
17	08:37 16:58	07:50 17:54	06:49 18:44	06:39 20:37	05:42 21:26	06:25 (4) 21:59
18	08:36 17:00	07:48 17:56	06:47 18:46	06:36 20:39	05:41 21:28	06:24 (4) 21:59
19	08:35 17:01	07:46 17:58	06:44 18:47	06:34 20:40	05:39 21:29	06:24 (4) 22:00
20	08:34 17:03	07:44 17:59	06:42 18:49	06:32 20:42	05:38 21:31	06:24 (4) 22:00
21	08:33 17:05	07:42 18:01	06:40 18:51	06:30 20:44	05:37 21:32	06:24 (4) 22:00
22	08:32 17:06	07:40 18:03	06:38 18:53	06:28 20:45	05:35 21:33	06:24 (4) 22:01
23	08:31 17:08	07:38 18:05	06:35 18:54	06:26 20:47	05:34 21:35	06:23 (4) 22:01
24	08:29 17:10	07:36 18:07	06:33 18:56	06:24 20:49	05:33 21:36	06:23 (4) 22:01
25	08:28 17:12	07:34 18:09	06:31 18:58	06:22 20:50	05:32 21:38	06:23 (4) 22:01
26	08:27 17:13	07:31 18:10	06:28 18:59	06:20 20:52	05:31 21:39	06:23 (4) 22:01
27	08:26 17:15	07:29 18:12	06:26 19:01	06:18 20:54	05:30 21:40	06:23 (4) 22:01
28	08:24 17:17	07:27 18:14	06:24 19:03	06:16 20:55	05:28 21:41	06:24 (4) 22:01
29	08:23 17:19	07:21 20:05	06:14 18:26 (6)	06:14 20:57	05:27 21:43	06:25 (4) 22:01
30	08:21 17:21	07:19 20:06	06:12 18:24 (6)	06:12 20:59	05:26 21:44	06:25 (4) 22:00
31	08:20 17:22	07:17 20:08			05:26 21:45	06:25 (4) 22:00
Potential sun hours	259	278	367	416	485	499
Total, worst case			438	765	914	776
Sun reduction			0.24	0.35	0.37	0.30
Oper. time red.			1.00	1.00	1.00	1.00
Wind dir. red.			0.68	0.66	0.65	0.64
Total reduction			0.17	0.24	0.24	0.19
Total, real			72	180	219	149

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: CR - H96

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (July-December) and rows for each day of the month, including sunrise/sunset times and shadow reduction metrics.

Table layout: For each day in each month the following matrix apply

Summary table with 4 columns: Day in month, Sun rise/set, Minutes with flicker, and (WTG causing flicker first/last time).



SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: CT - H98

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of data: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of data: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with 12 columns (January-December) and 31 rows of data showing sun rise/set times and potential sun hours.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: CU - H99

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: CV - H100

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with 13 columns (January-December) and 31 rows of daily data including sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: CW - H101

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



SHADOW - Calendar

Calculation: Derragh WF Impacts Only **Shadow receptor:** CY - H103

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:25	07:14	06:10	05:24	05:22	05:58	06:48	07:37	07:31	08:22
2	08:45	08:17	07:23	07:12	06:08	05:24	05:22	06:00	06:49	07:38	07:32	08:23
3	08:45	08:15	07:21	07:10	06:06	05:23	05:23	06:01	06:51	07:40	07:34	08:24
4	08:45	08:14	07:18	07:08	06:04	05:22	05:24	06:03	06:53	07:42	07:36	08:26
5	08:45	08:12	07:16	07:05	06:02	05:21	05:24	06:04	06:54	07:43	07:38	08:27
6	08:44	08:10	07:14	07:03	06:00	05:21	05:25	06:06	06:56	07:45	07:40	08:28
7	08:44	08:09	07:12	07:01	05:59	05:20	05:26	06:07	06:58	07:47	07:41	08:30
8	08:44	08:07	07:10	06:58	05:57	05:20	05:27	06:09	06:59	07:49	07:43	08:31
9	08:43	08:05	07:07	06:56	05:55	05:19	05:28	06:11	07:01	07:50	07:45	08:32
10	08:43	08:03	07:05	06:54	05:53	05:19	05:29	06:12	07:02	07:52	07:47	08:33
11	08:42	08:02	07:03	06:52	05:52	05:18	05:30	06:14	07:04	07:54	07:48	08:34
12	08:41	08:00	07:01	06:50	05:50	05:18	05:31	06:15	07:06	07:55	07:50	08:35
13	08:41	07:58	06:58	06:47	05:48	05:18	05:32	06:17	07:07	07:57	07:52	08:36
14	08:40	07:56	06:56	06:45	05:47	05:18	05:33	06:19	07:09	07:59	07:54	08:37
15	08:39	07:54	06:54	06:43	05:45	05:17	05:35	06:20	07:11	08:00	07:56	08:38
16	08:38	07:52	06:51	06:41	05:44	05:17	05:36	06:22	07:12	08:02	07:57	08:39
17	08:37	07:50	06:49	06:39	05:42	05:17	05:37	06:23	07:14	08:04	07:59	08:40
18	08:36	07:48	06:47	06:36	05:41	05:17	05:38	06:25	07:15	08:06	08:01	08:40
19	08:35	07:46	06:44	06:34	05:39	05:17	05:40	06:27	07:17	08:07	08:02	08:41
20	08:34	07:44	06:42	06:32	05:38	05:17	05:41	06:28	07:19	08:09	08:04	08:42
21	08:33	07:42	06:40	06:30	05:37	05:17	05:42	06:30	07:20	08:11	08:06	08:42
22	08:32	07:40	06:38	06:28	05:35	05:18	05:44	06:32	07:22	08:13	08:07	08:43
23	08:31	07:38	06:35	06:26	05:34	05:18	05:45	06:33	07:24	08:14	08:09	08:43
24	08:30	07:36	06:33	06:24	05:33	05:18	05:46	06:35	07:25	08:16	08:11	08:44
25	08:28	07:34	06:31	06:22	05:32	05:18	05:48	06:36	07:27	08:18	08:12	08:44
26	08:27	07:32	06:28	06:20	05:30	05:19	05:49	06:38	07:28	08:19	08:14	08:45
27	08:26	07:29	06:26	06:18	05:29	05:19	05:51	06:40	07:30	08:20	08:16	08:45
28	08:24	07:27	06:24	06:16	05:28	05:20	05:52	06:41	07:32	08:22	08:17	08:45
29	08:23	07:25	06:22	06:14	05:27	05:20	05:54	06:43	07:33	08:23	08:19	08:45
30	08:21	07:19	06:12	06:12	05:26	05:21	05:55	06:45	07:35	08:24	08:20	08:45
31	08:20	07:17	06:11	06:11	05:25	05:22	05:57	06:46	07:36	08:24	08:20	08:45
Potential sun hours	259	278	367	416	485	499	502	454	381	331	266	244
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)



SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: CZ - H104

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining table layout: Day in month, Sun rise/set, Minutes with flicker, First/Last time with flicker, and WTG causing flicker first/last time.

SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: DA - H105

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main data table with 13 columns (January-December) and 31 rows of daily data. Includes 'Potential sun hours' and 'Total, real' at the bottom.

Table layout: For each day in each month the following matrix apply

Table with 4 columns: Day in month, Sun rise/set, Minutes with flicker, First/Last time with flicker (WTG causing flicker).



SHADOW - Calendar

Calculation: Derragh WF Impacts Only Shadow receptor: DB - H106

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

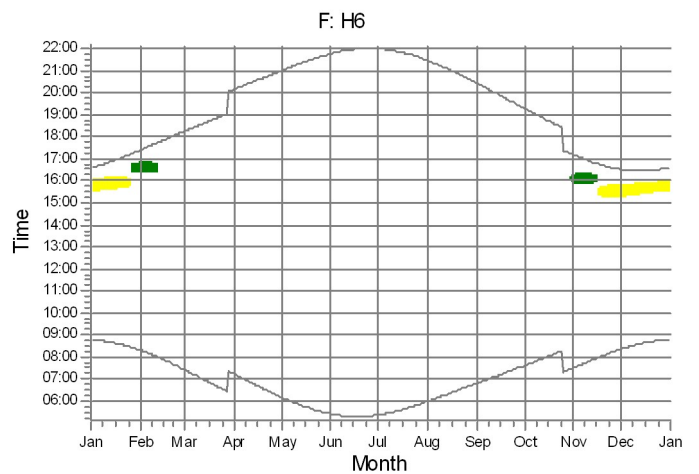
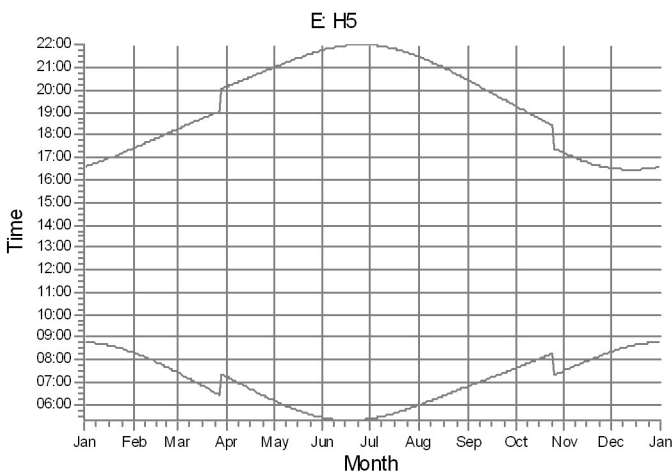
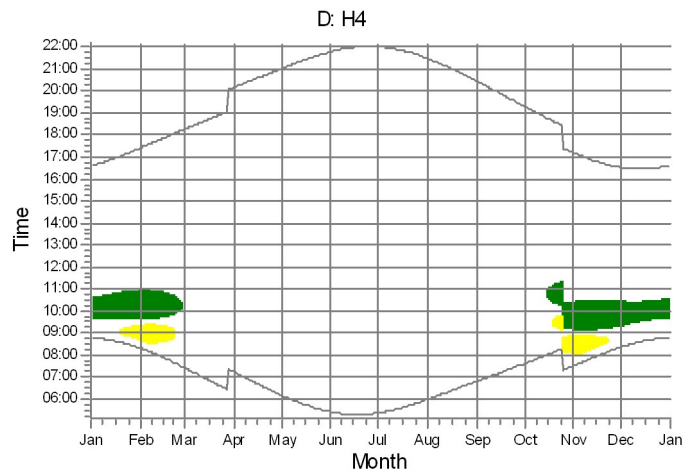
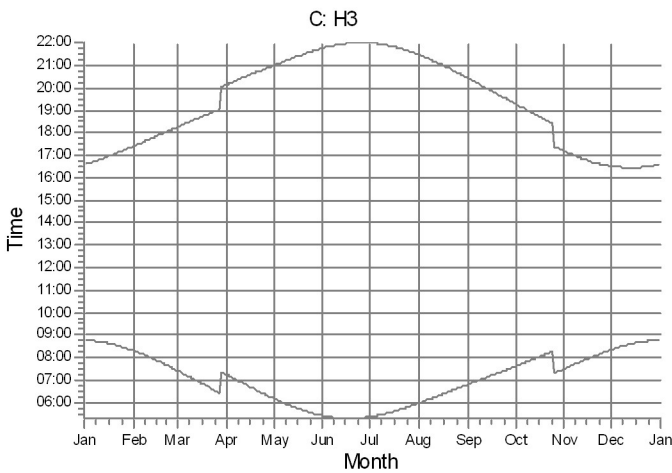
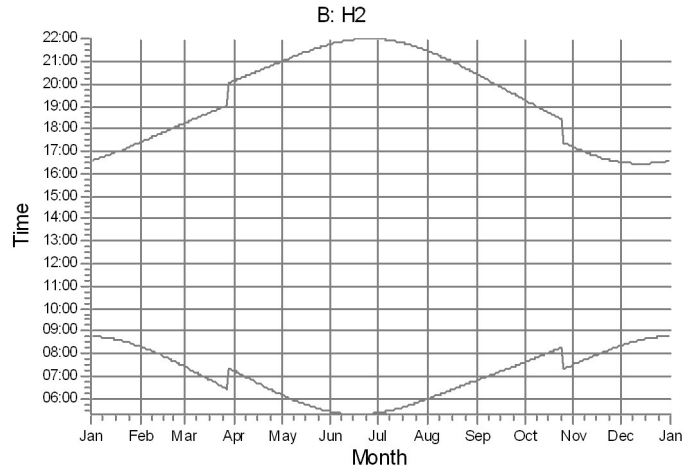
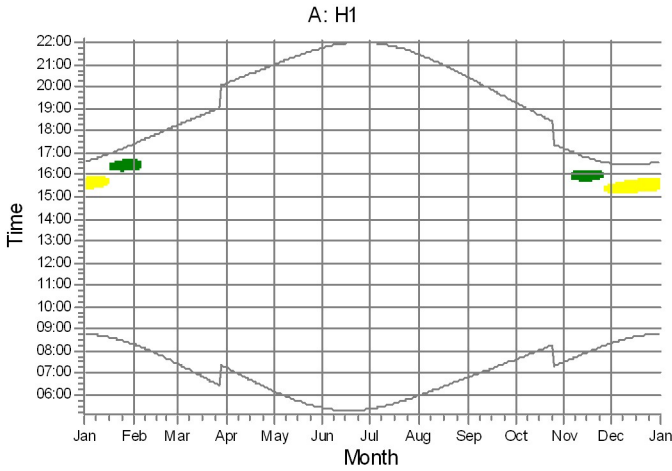
Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining table layout: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar, graphical

Calculation: Derragh WF Impacts Only

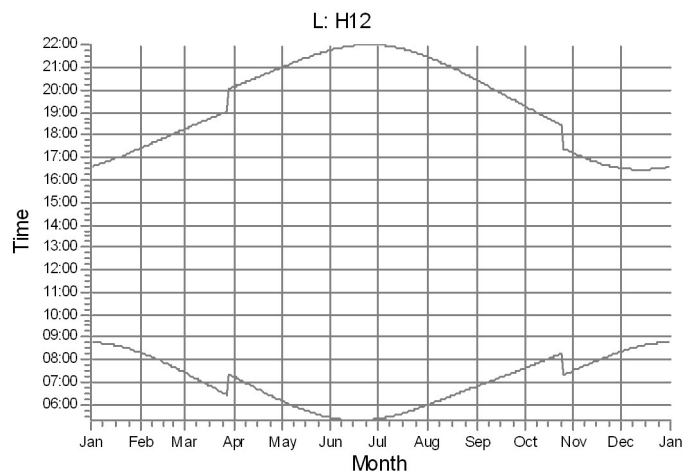
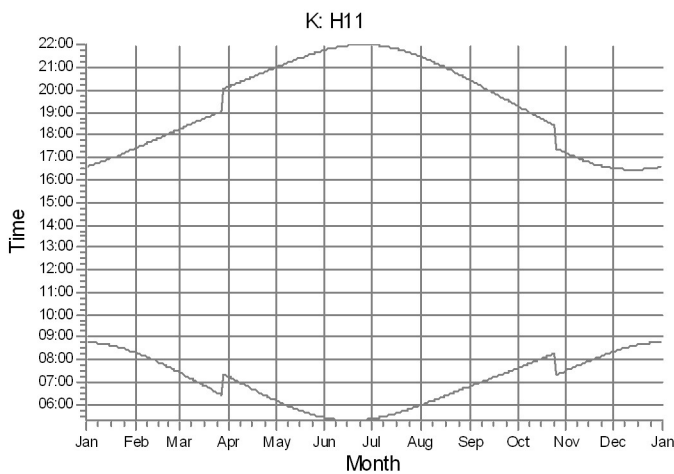
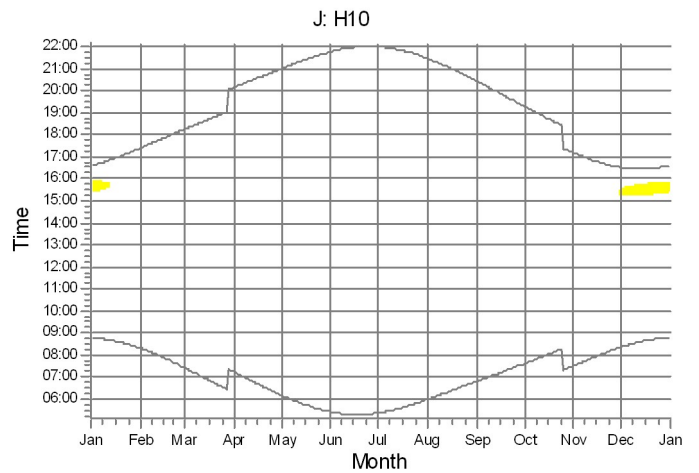
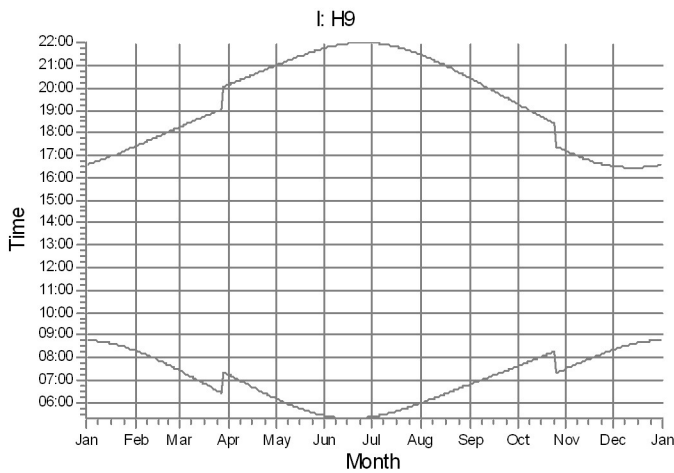
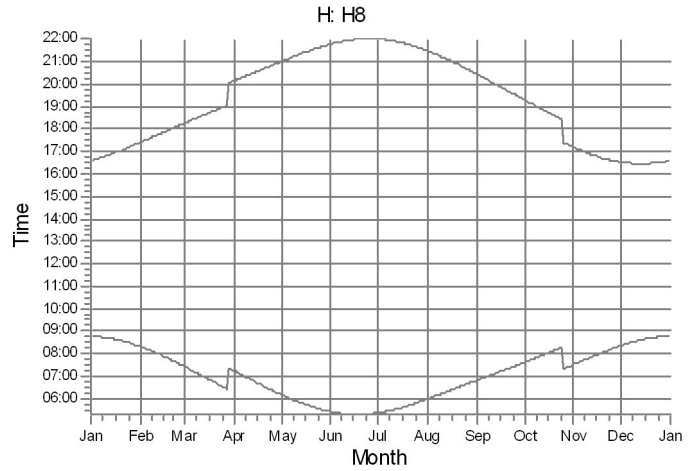
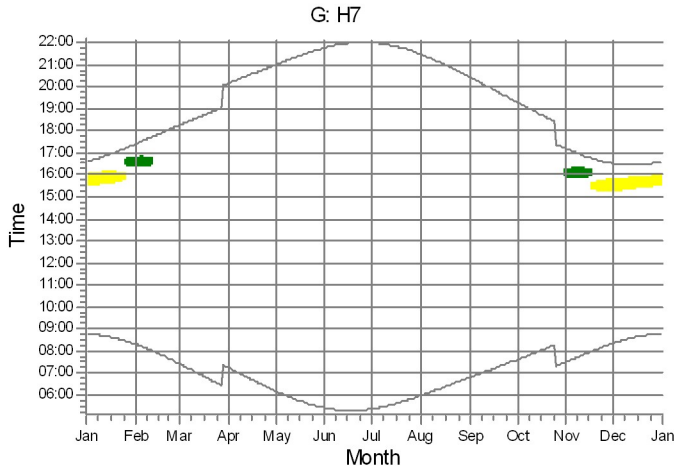


WTGs

1: Derragh
 2: Derragh

SHADOW - Calendar, graphical

Calculation: Derragh WF Impacts Only

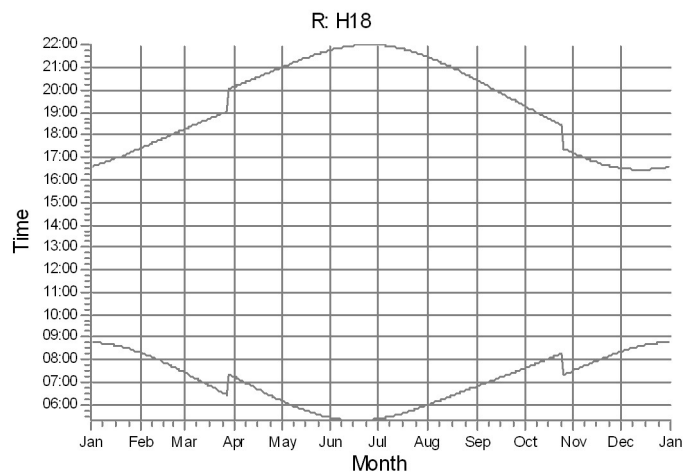
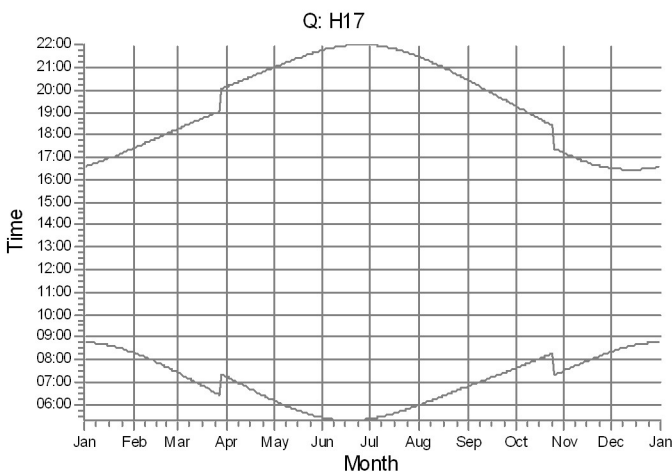
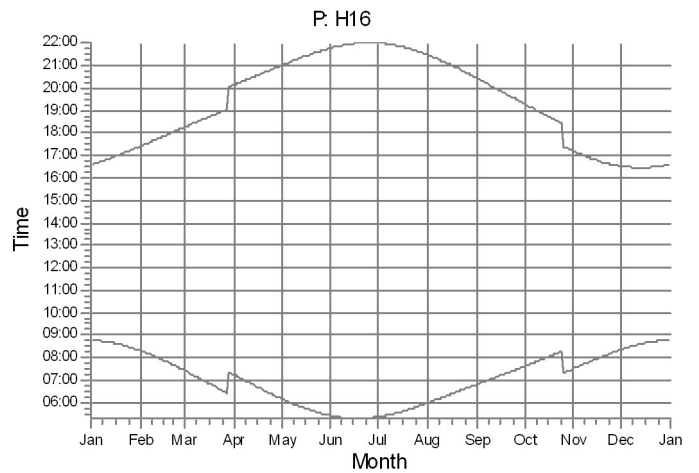
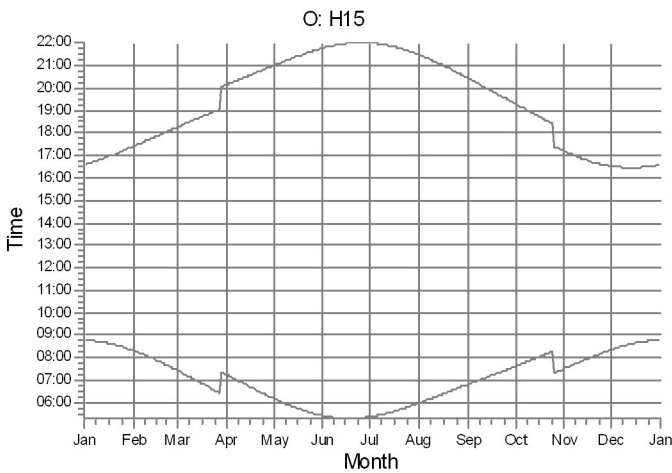
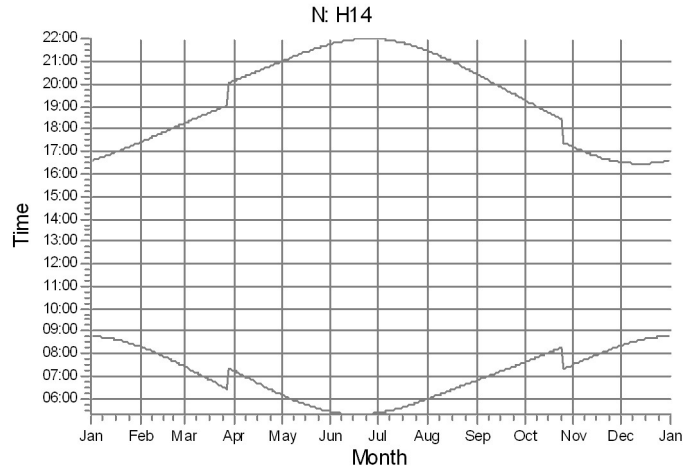
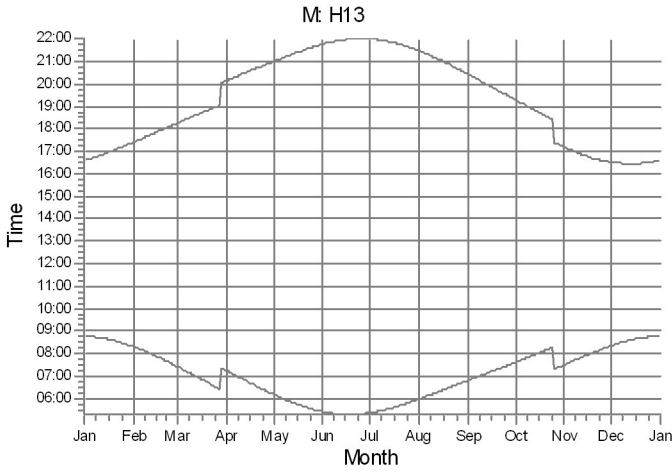


WTGs

1: Derragh
 2: Derragh

SHADOW - Calendar, graphical

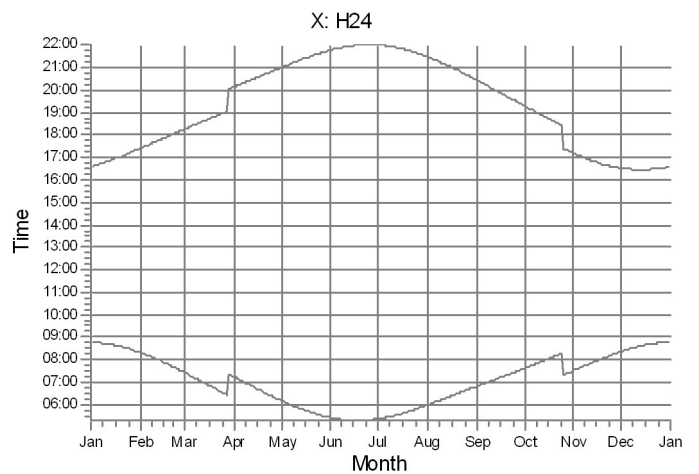
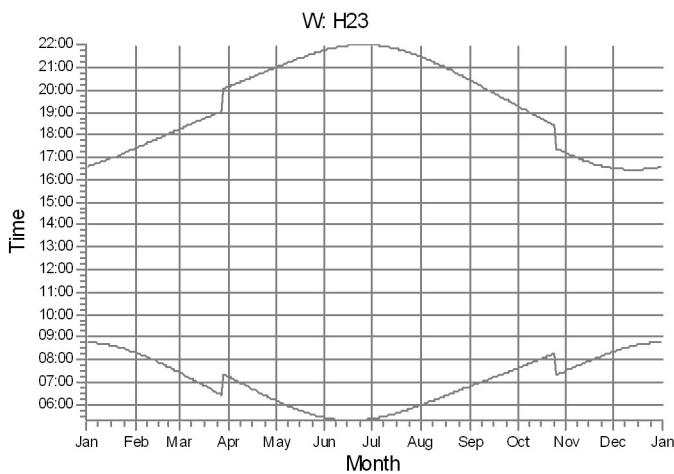
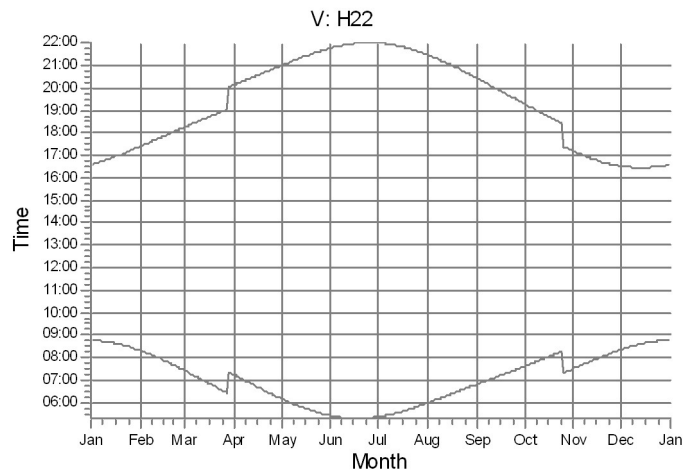
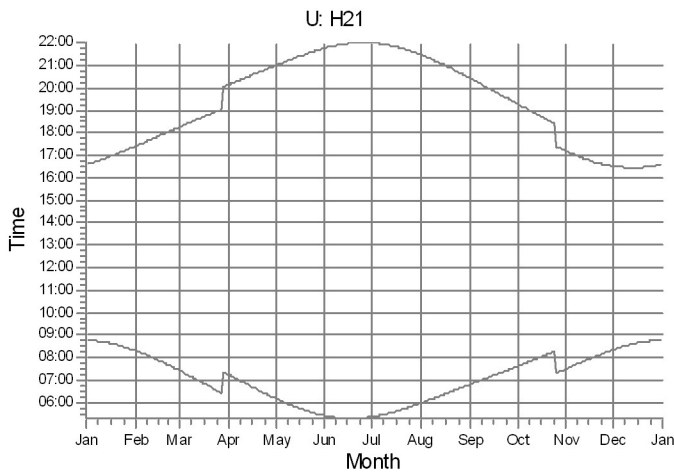
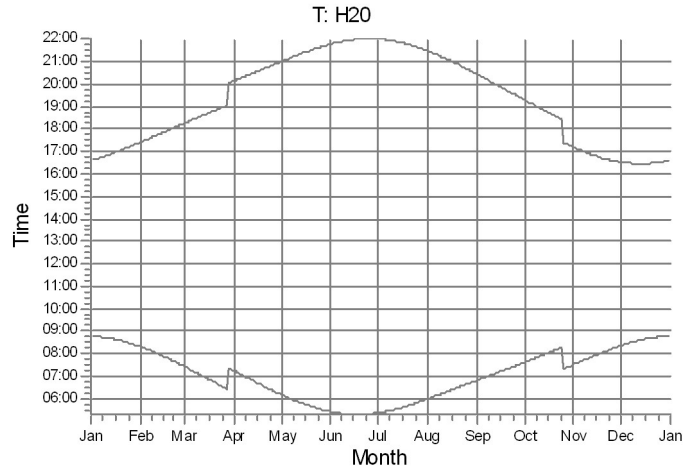
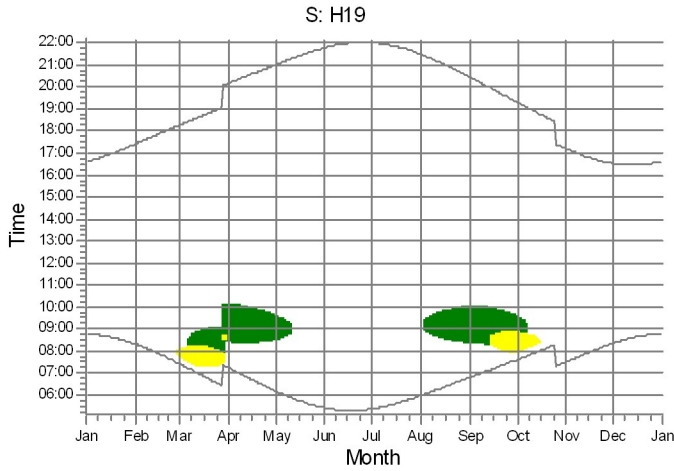
Calculation: Derragh WF Impacts Only



WTGs

SHADOW - Calendar, graphical

Calculation: Derragh WF Impacts Only

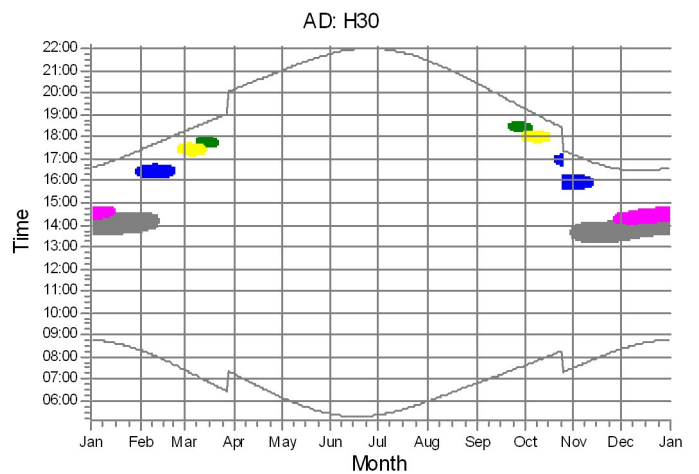
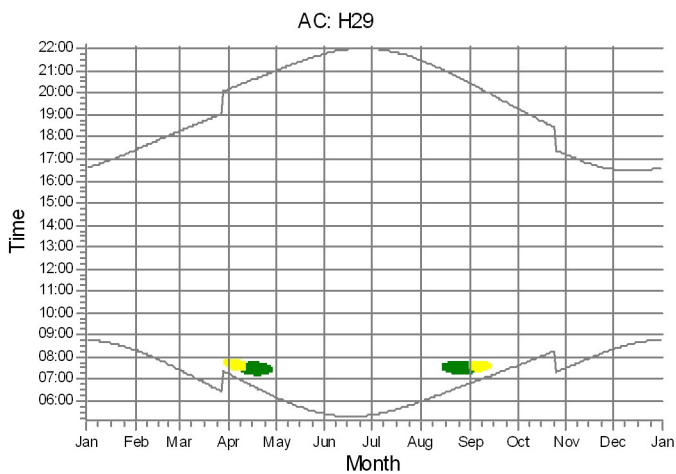
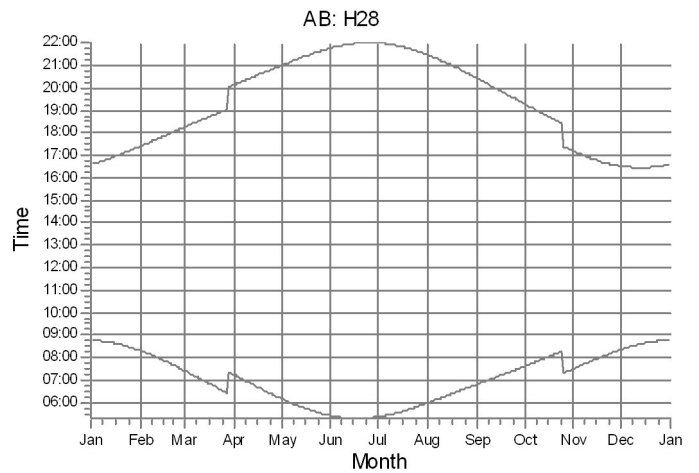
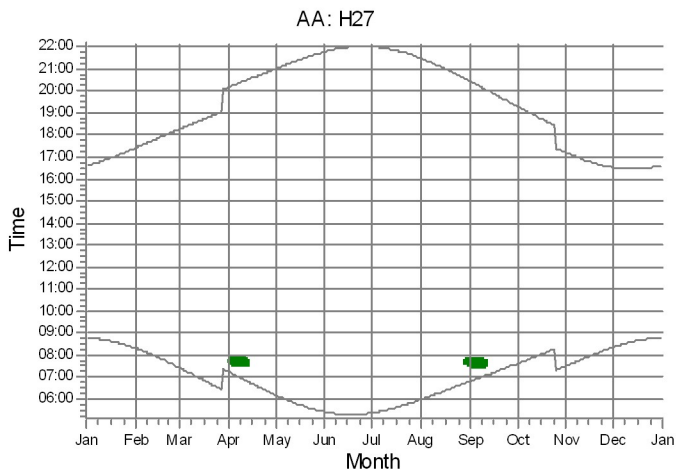
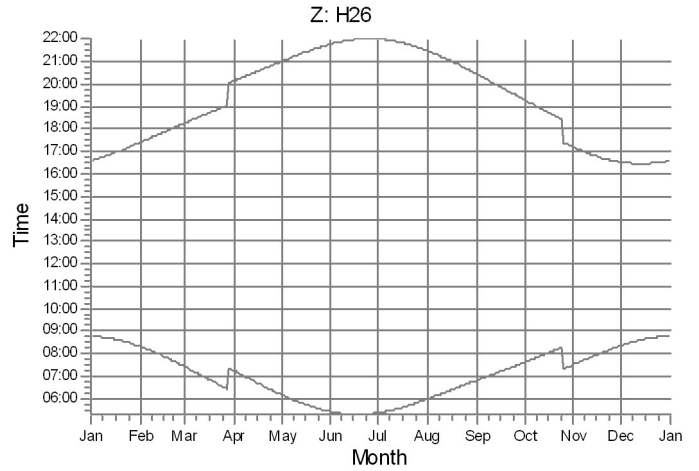
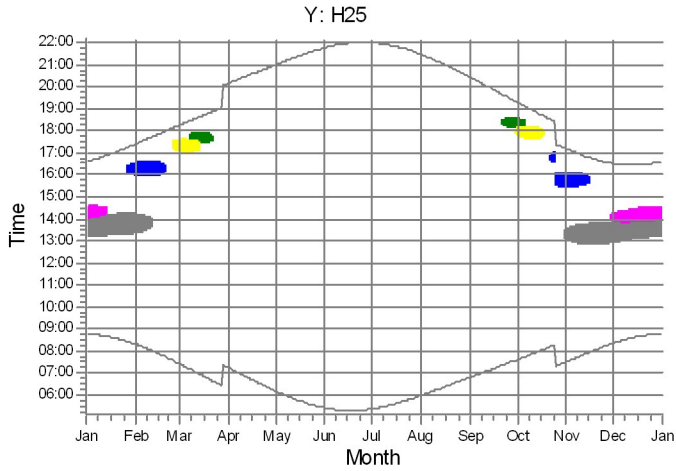


WTGs

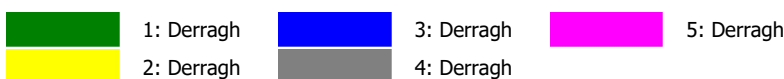
1: Derragh
 2: Derragh

SHADOW - Calendar, graphical

Calculation: Derragh WF Impacts Only

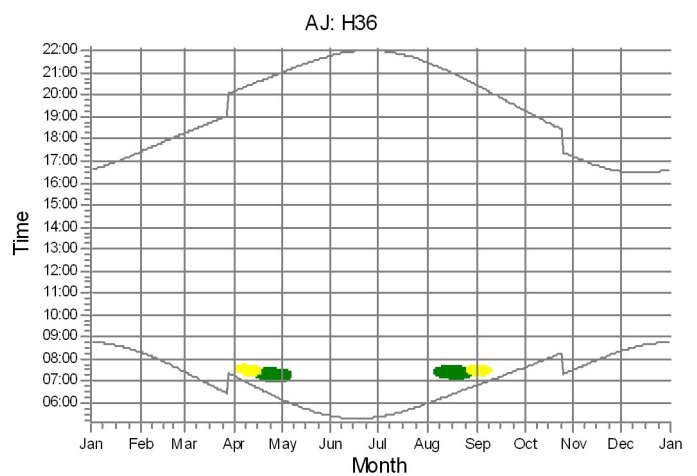
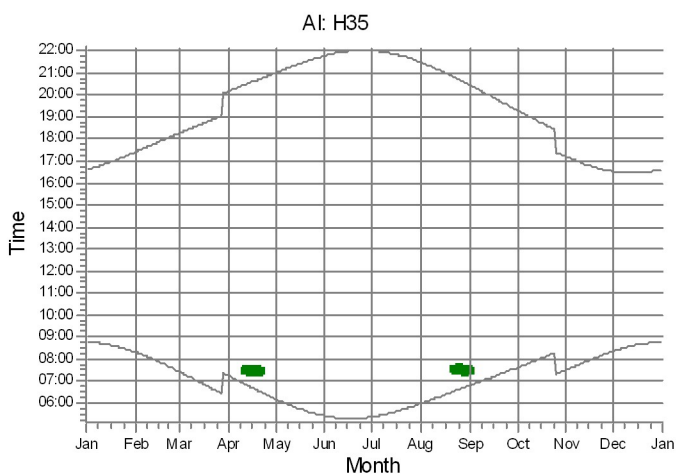
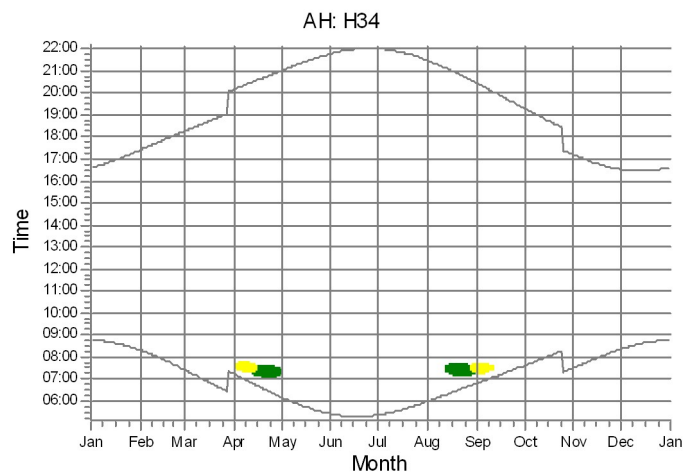
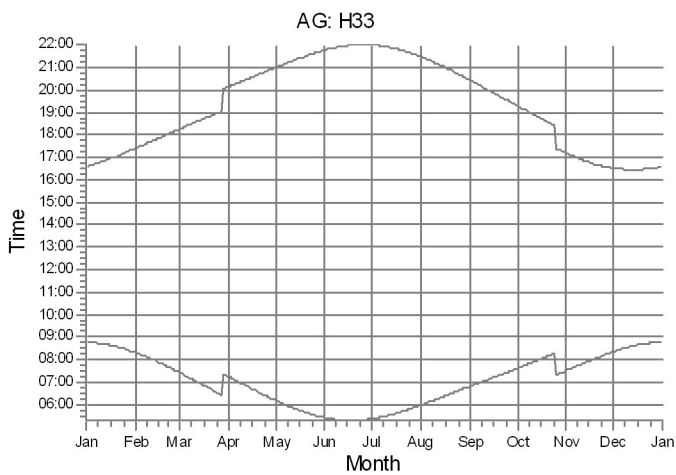
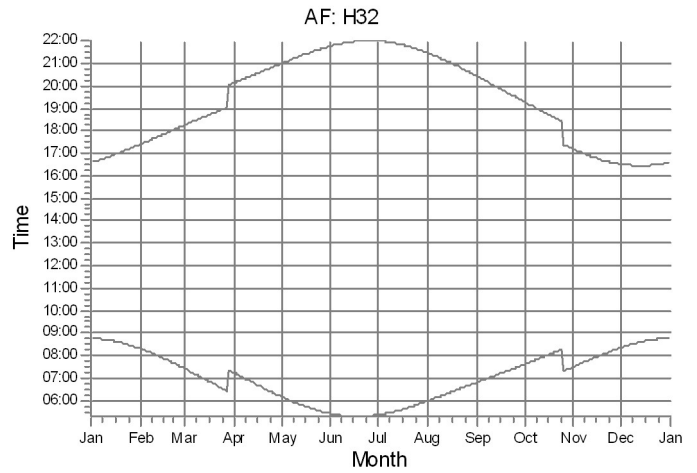
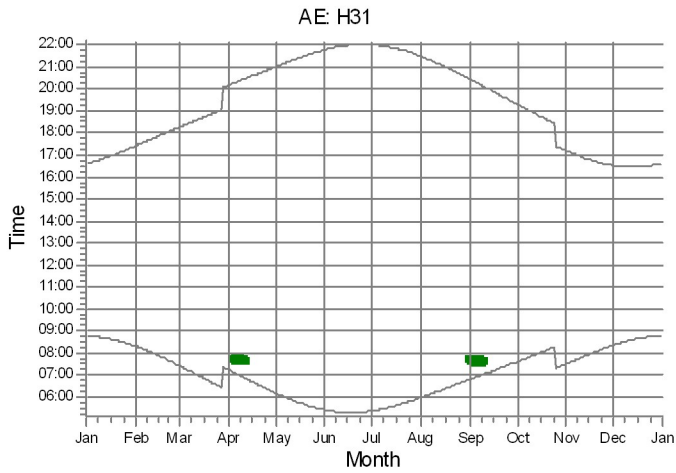


WTGs



SHADOW - Calendar, graphical

Calculation: Derragh WF Impacts Only

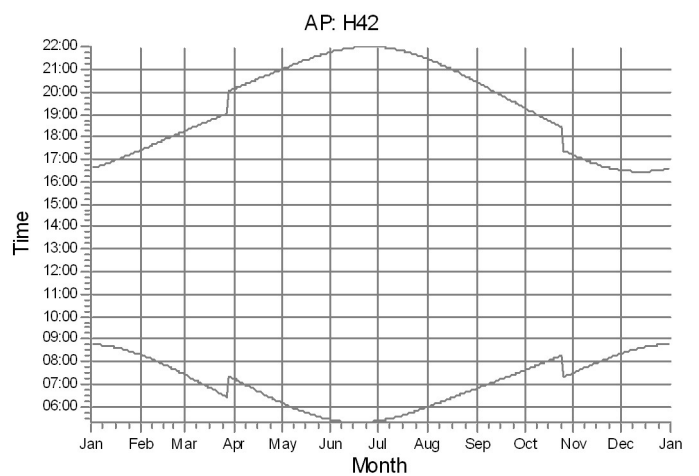
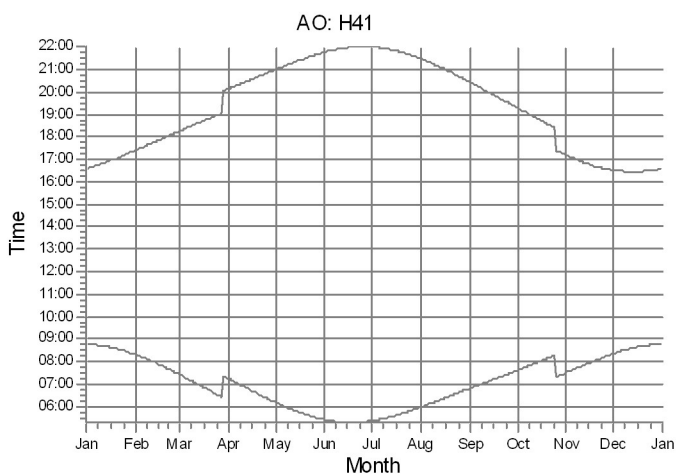
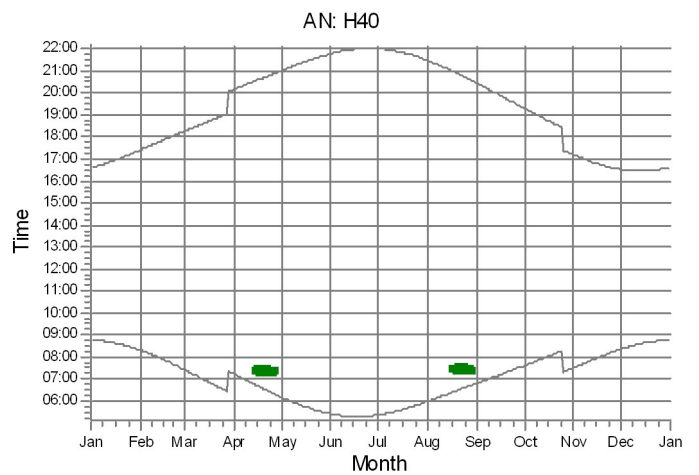
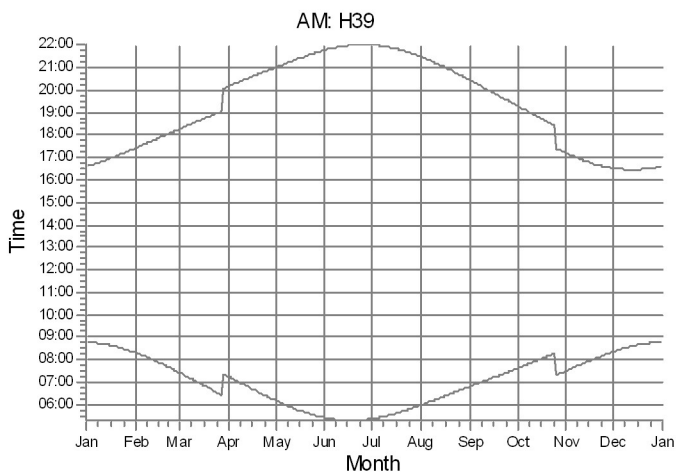
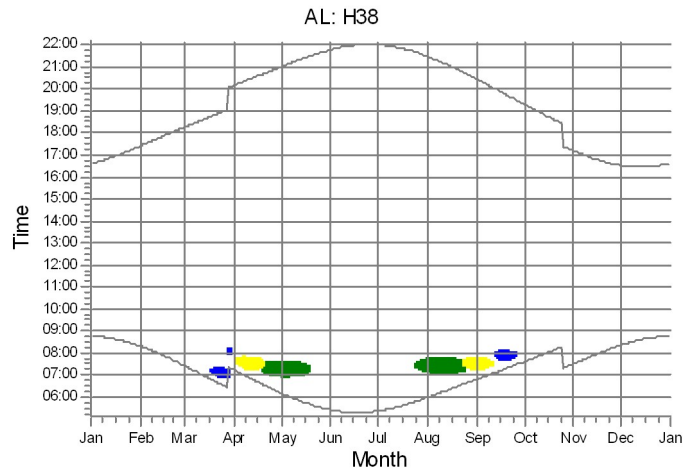
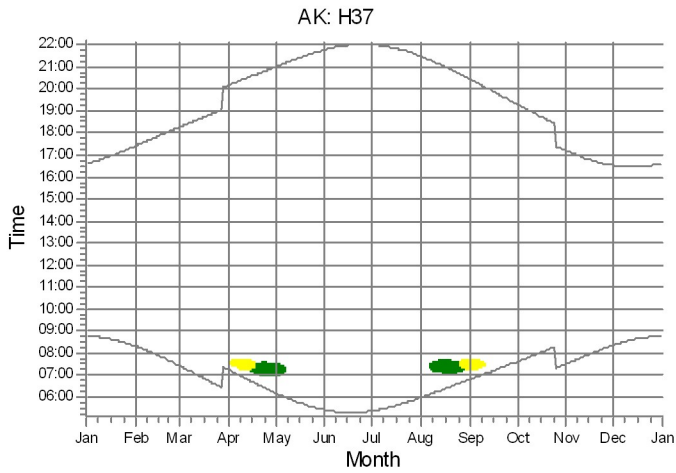


WTGs

1: Derragh 2: Derragh

SHADOW - Calendar, graphical

Calculation: Derragh WF Impacts Only

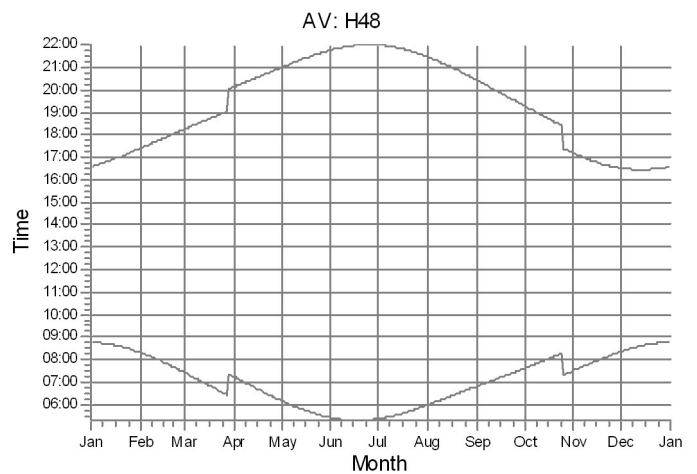
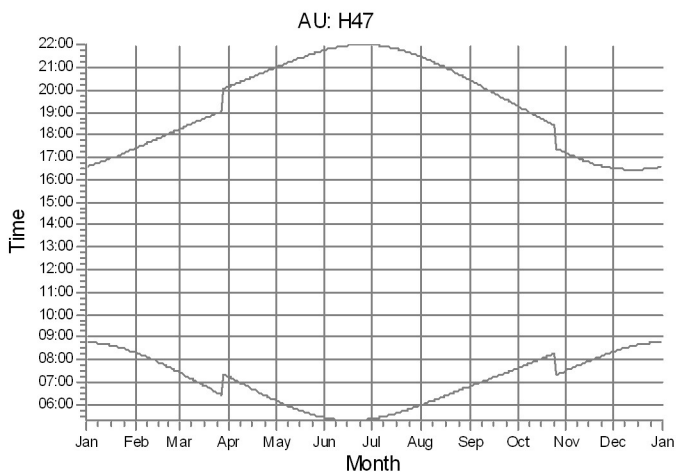
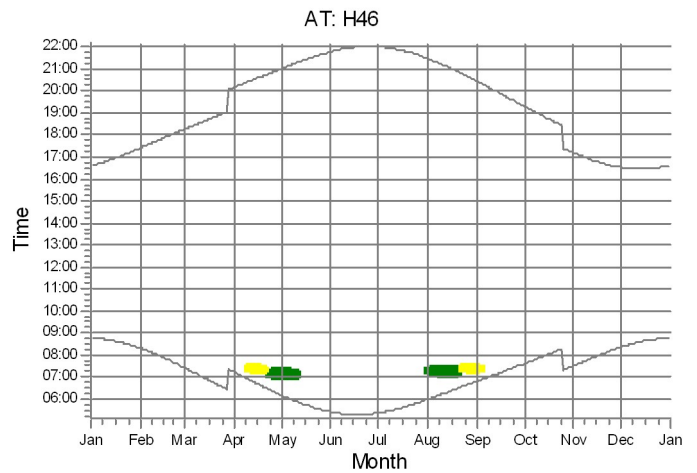
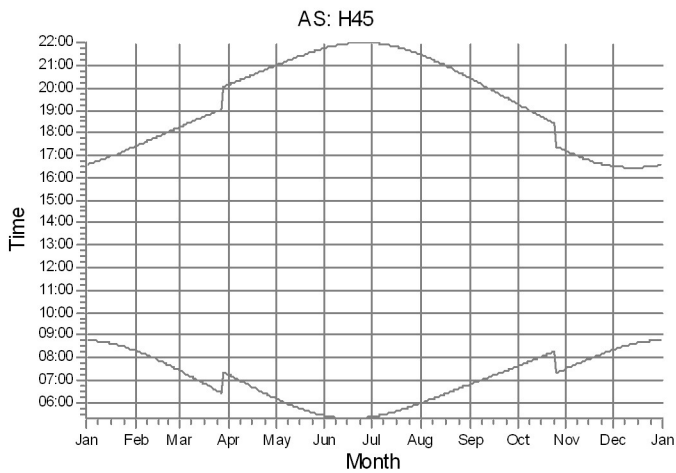
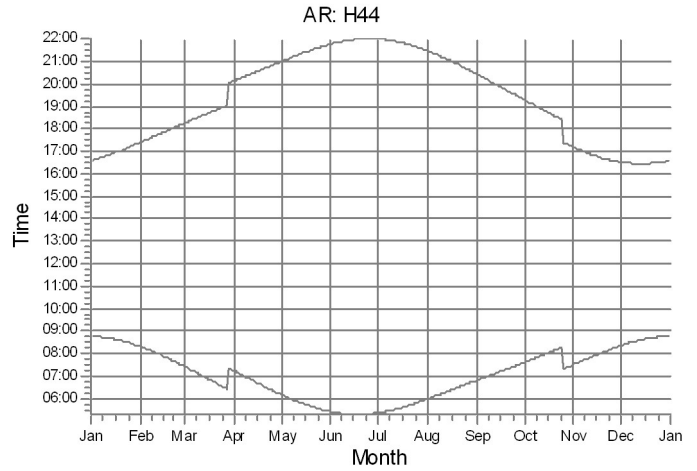
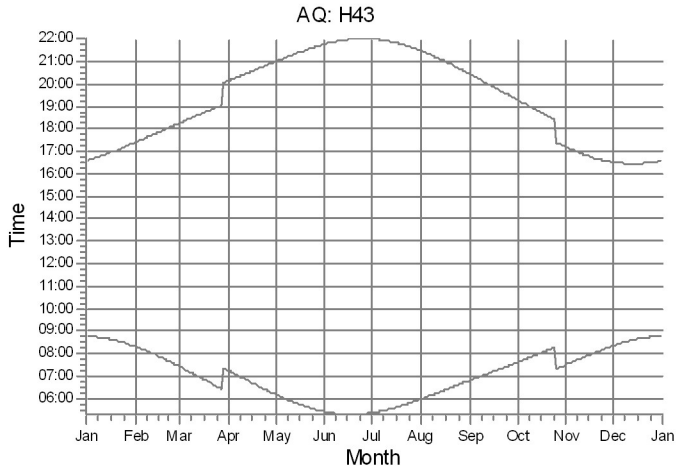


WTGs



SHADOW - Calendar, graphical

Calculation: Derragh WF Impacts Only

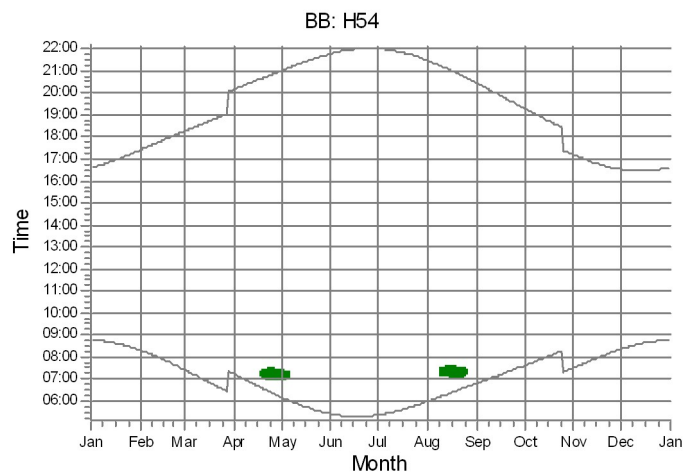
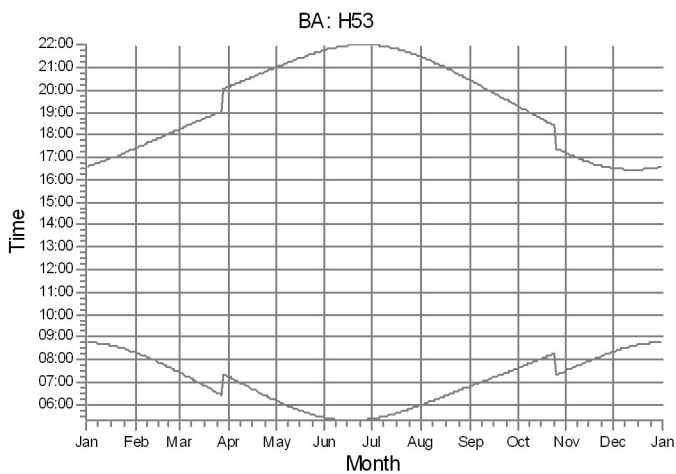
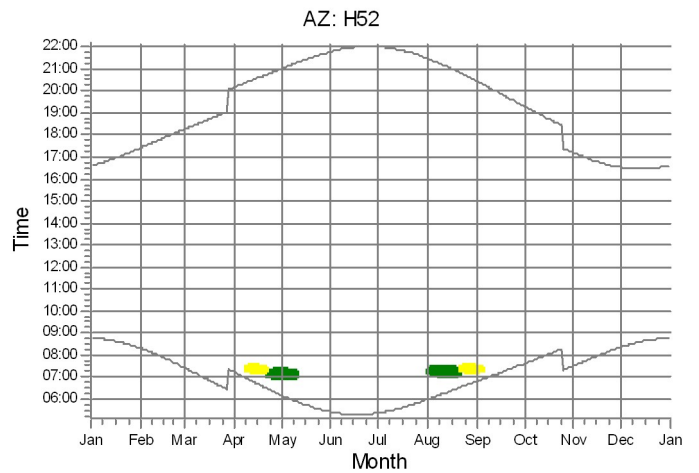
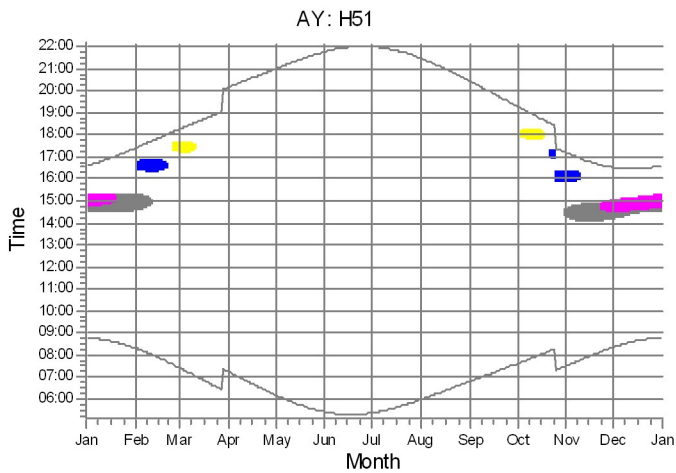
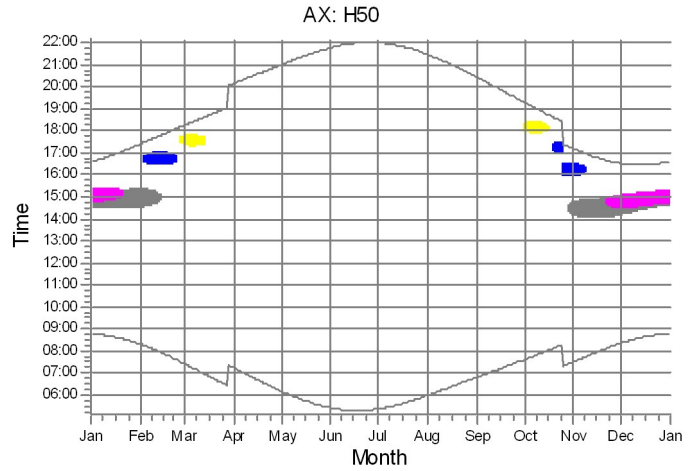
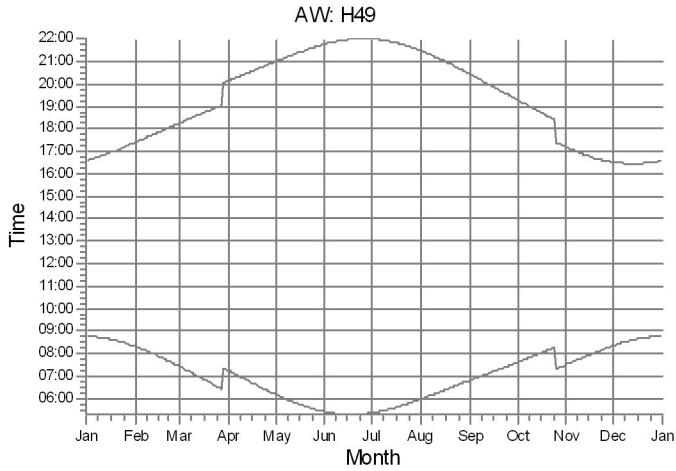


WTGs








SHADOW - Calendar, graphical

Calculation: Derragh WF Impacts Only

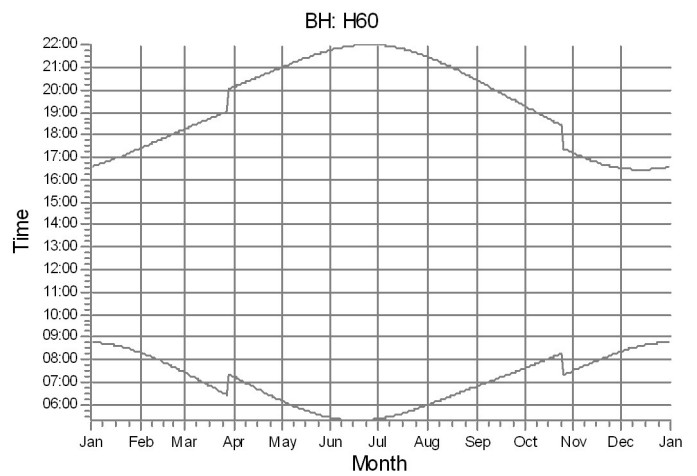
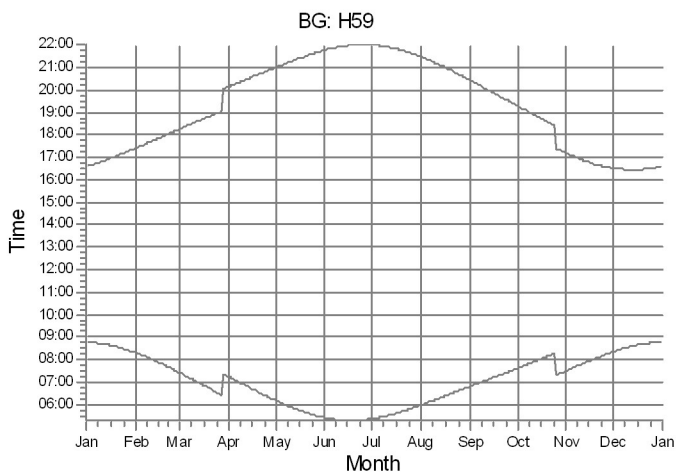
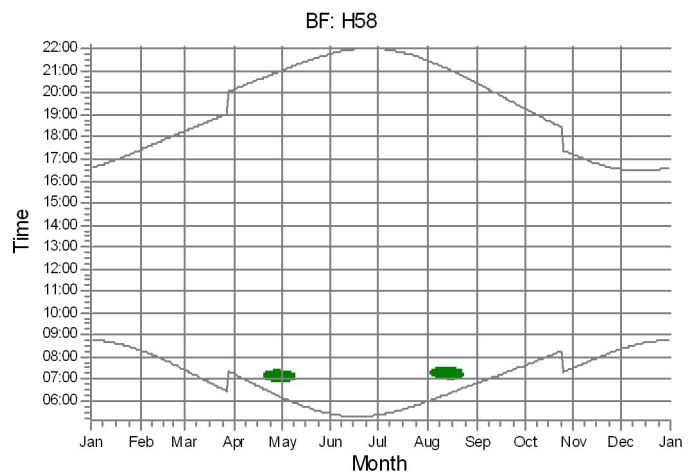
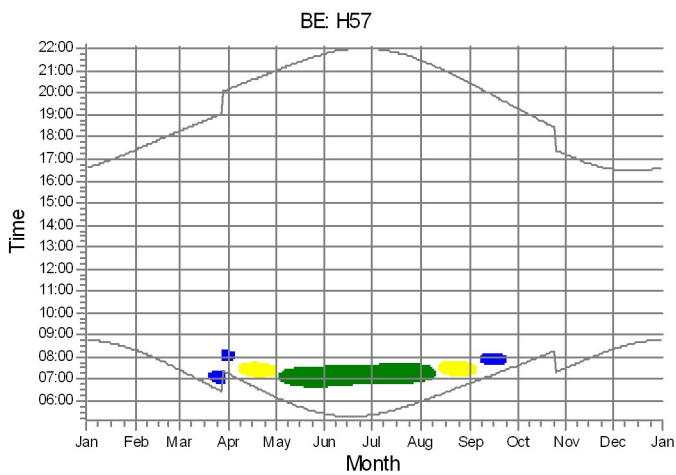
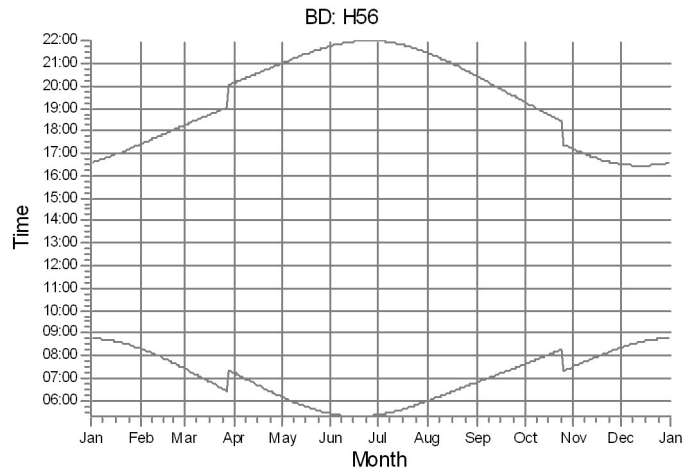
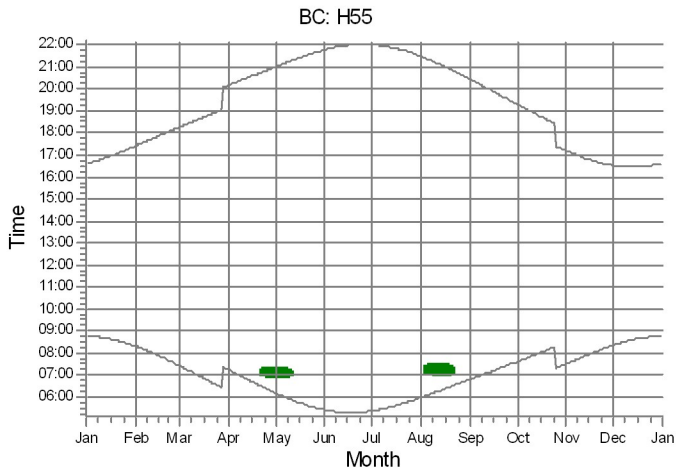


WTGs

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|---|------------|---|------------|---|------------|
|  | 1: Derragh |  | 3: Derragh |  | 5: Derragh |
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SHADOW - Calendar, graphical

Calculation: Derragh WF Impacts Only

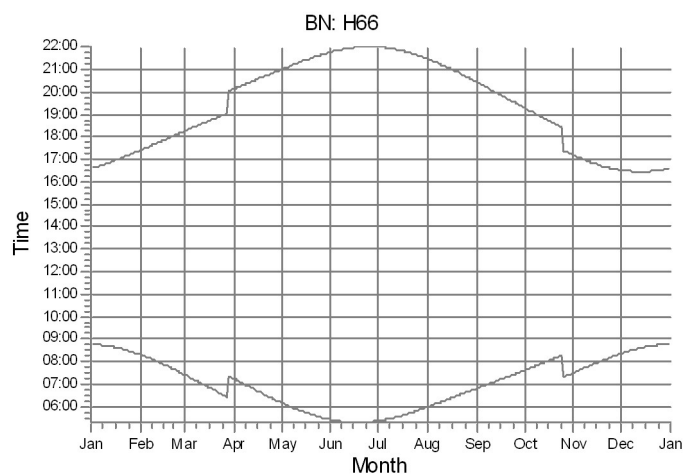
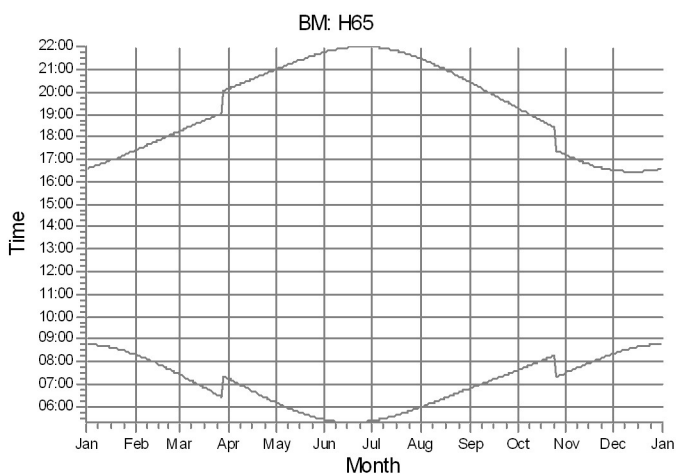
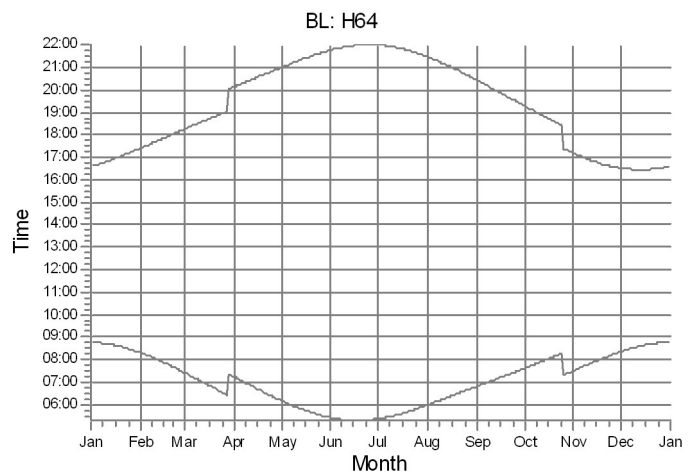
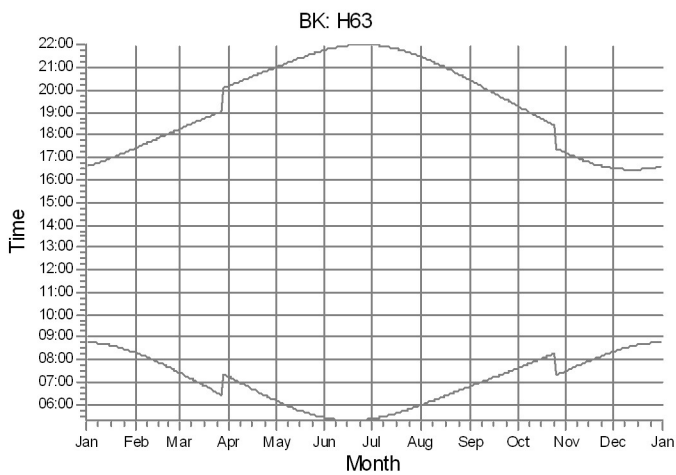
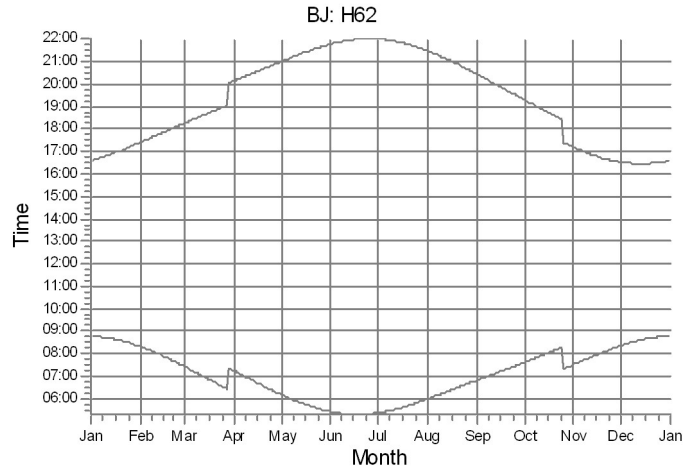
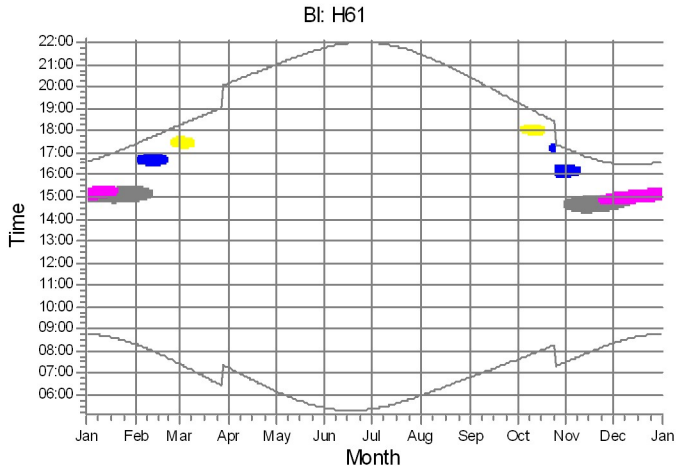


WTGs



SHADOW - Calendar, graphical

Calculation: Derragh WF Impacts Only

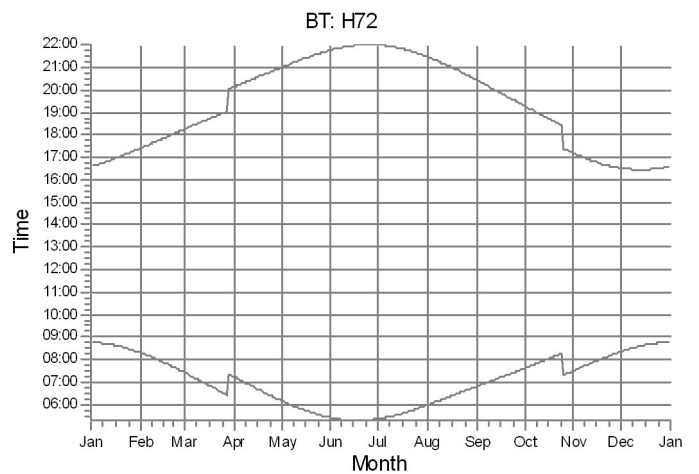
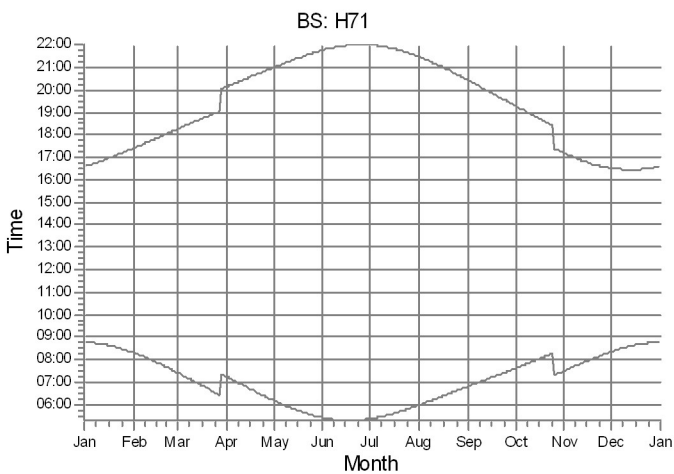
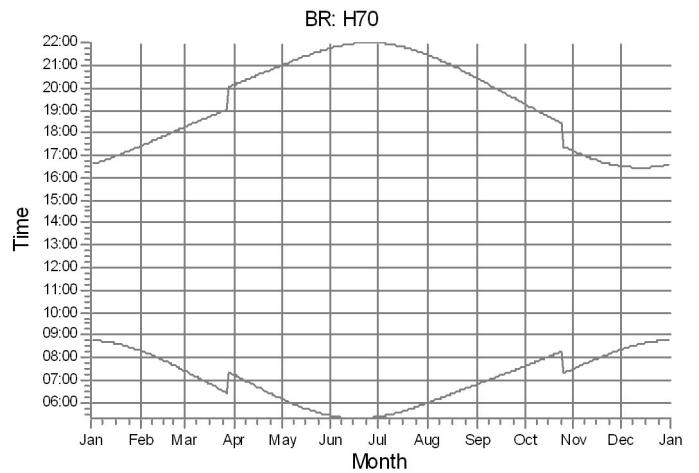
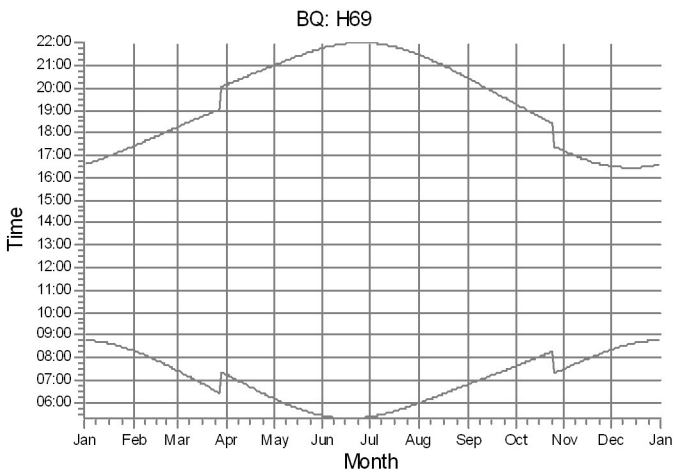
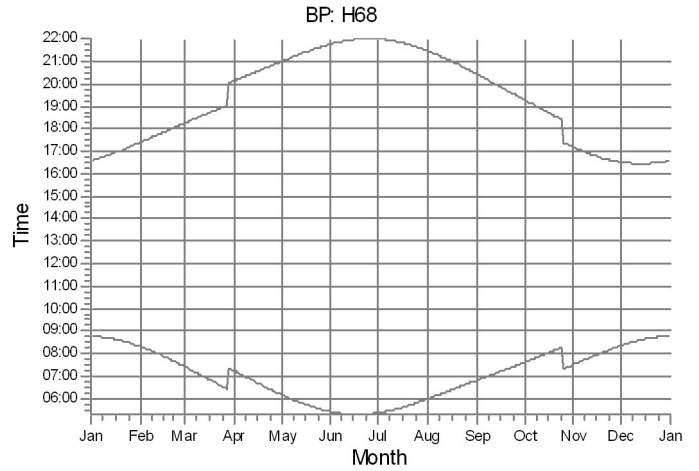
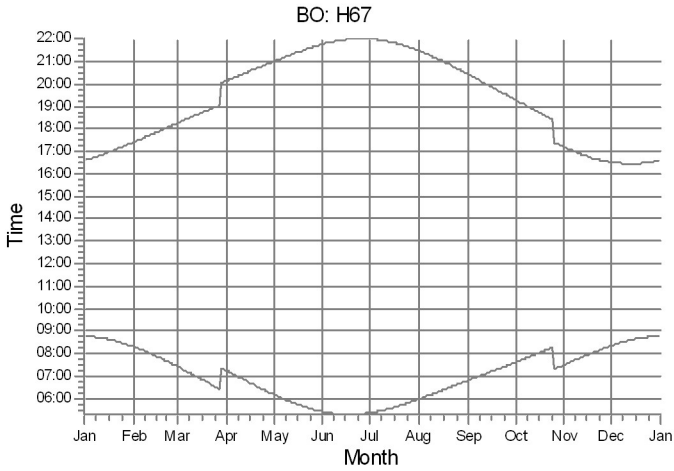


WTGs



SHADOW - Calendar, graphical

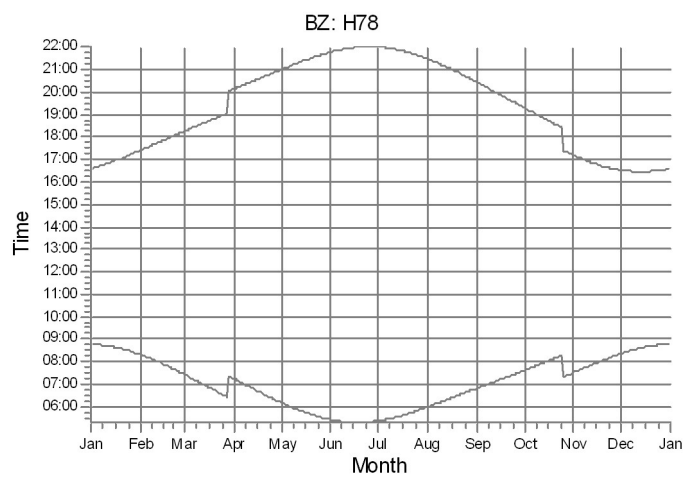
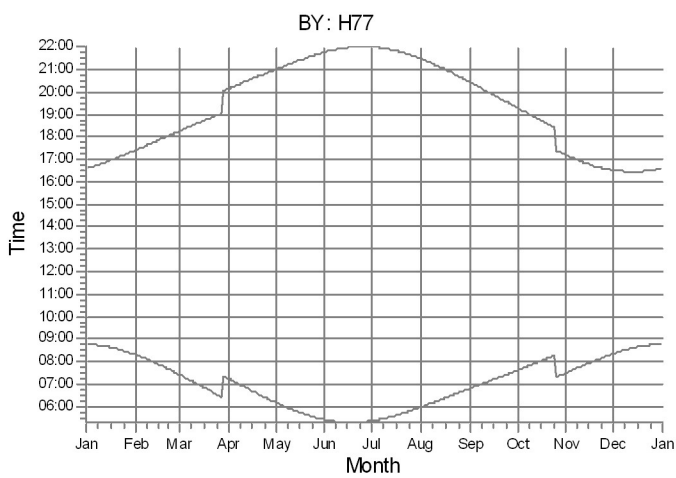
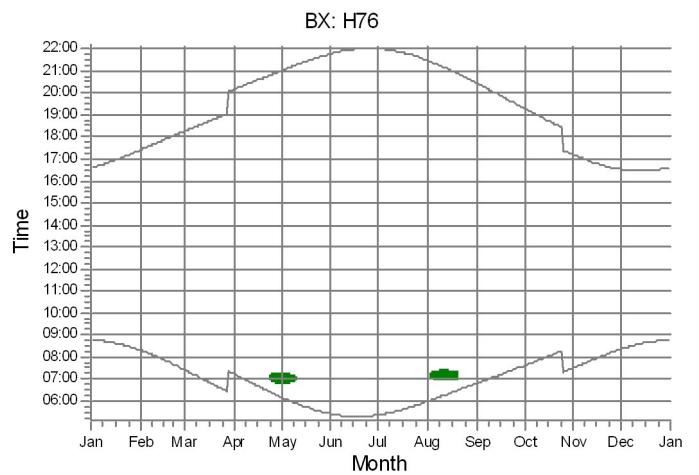
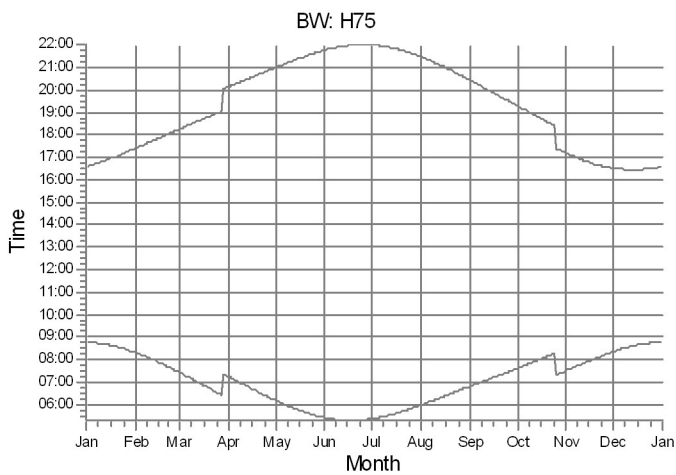
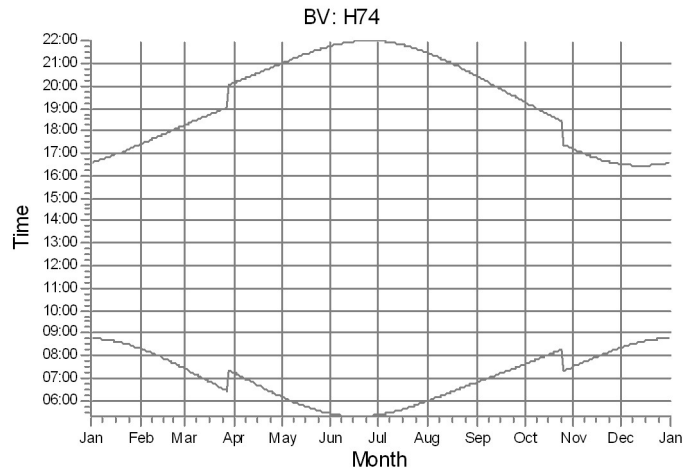
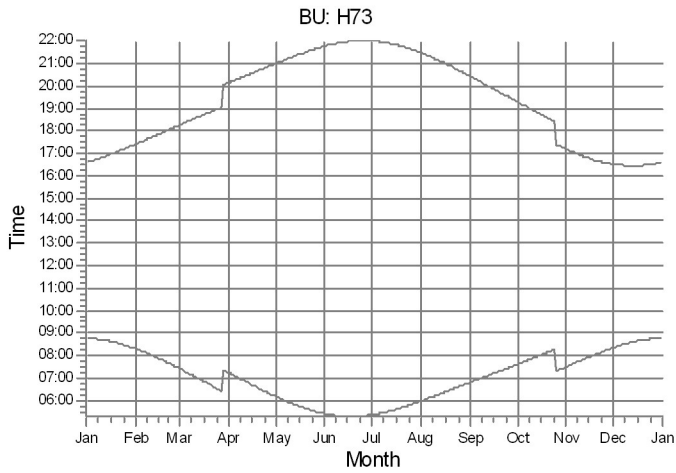
Calculation: Derragh WF Impacts Only



WTGs

SHADOW - Calendar, graphical

Calculation: Derragh WF Impacts Only

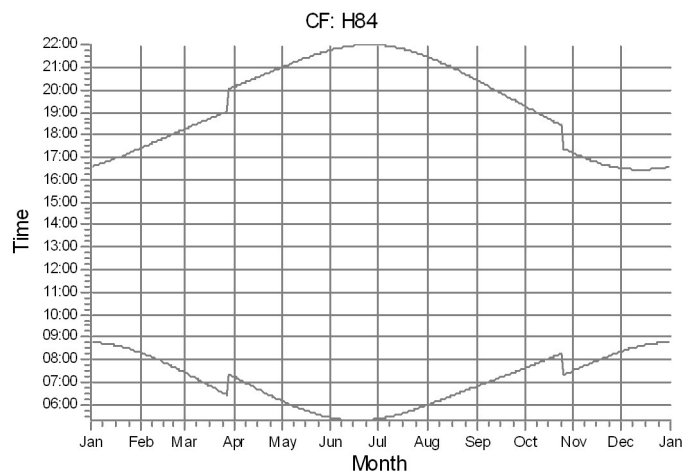
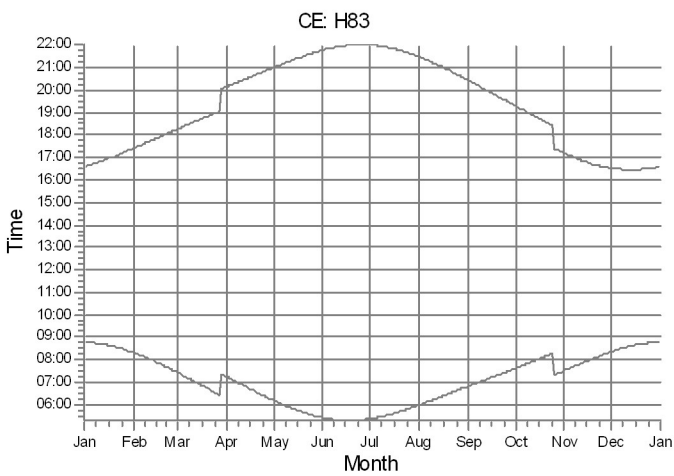
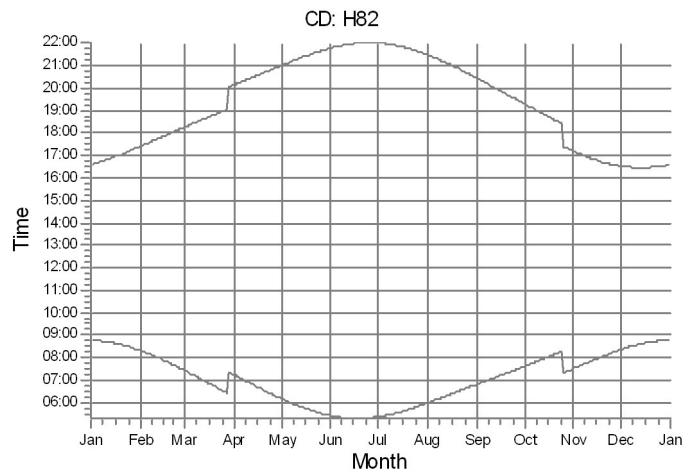
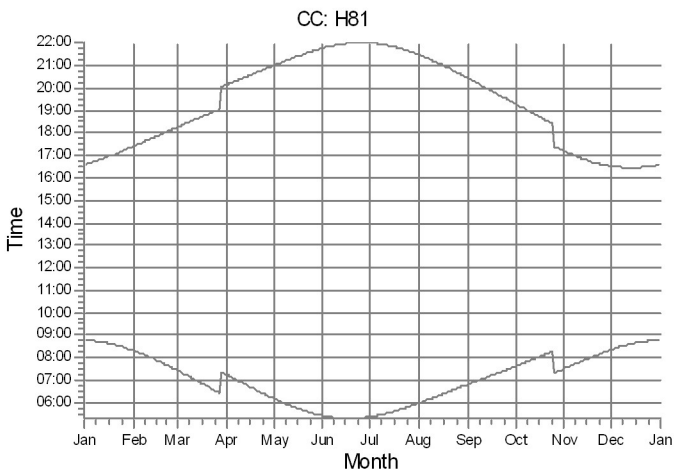
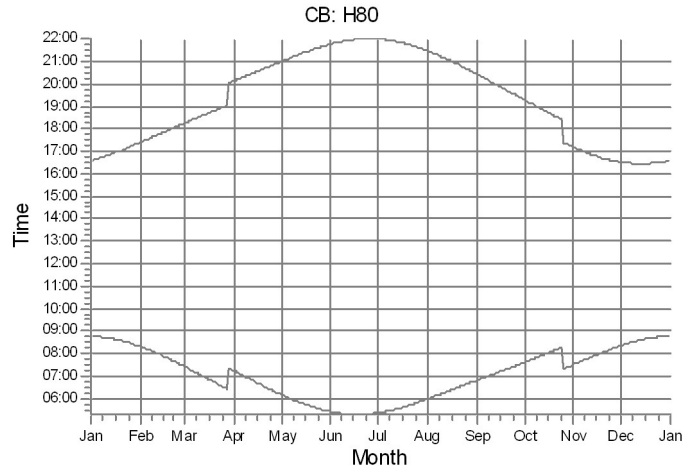
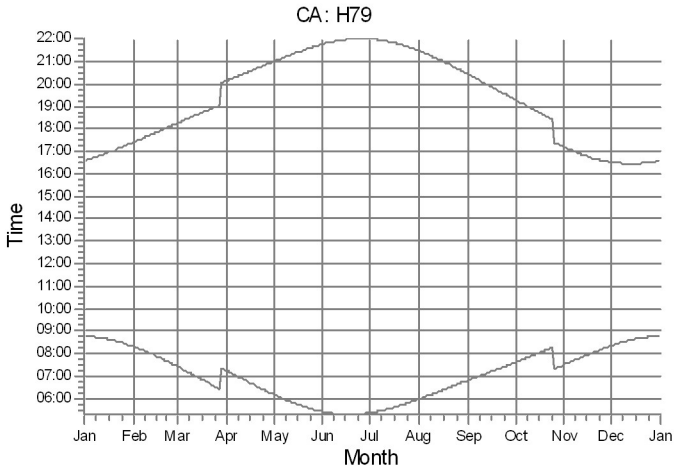


WTGs

1: Derragh

SHADOW - Calendar, graphical

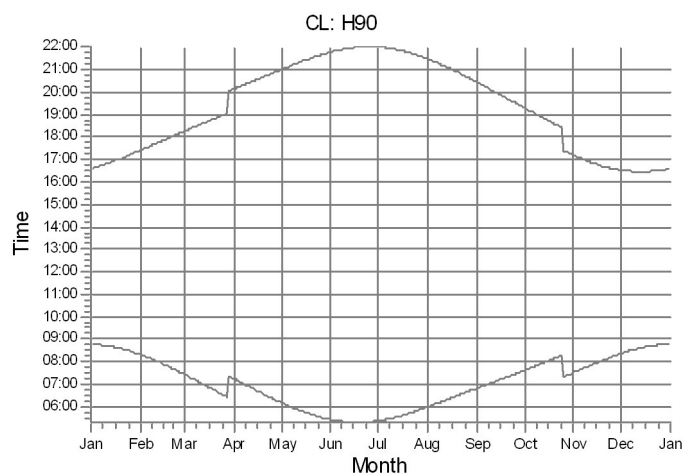
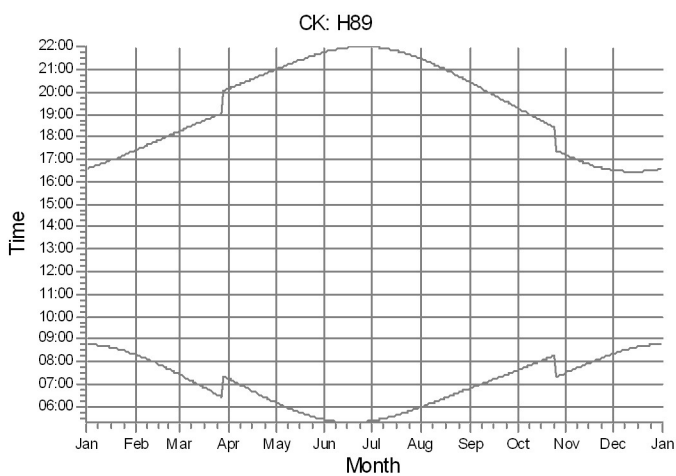
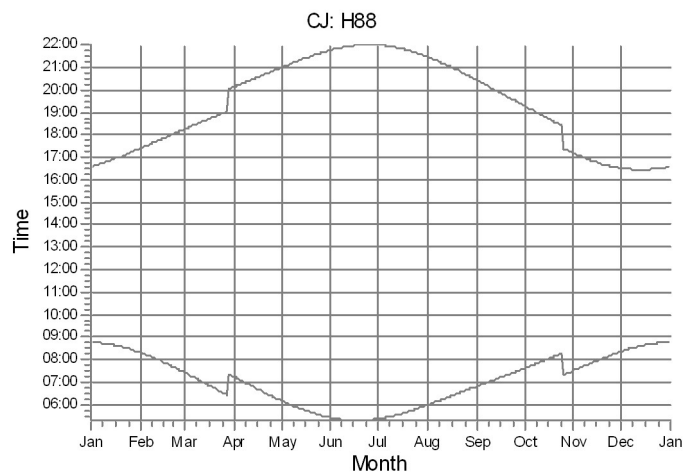
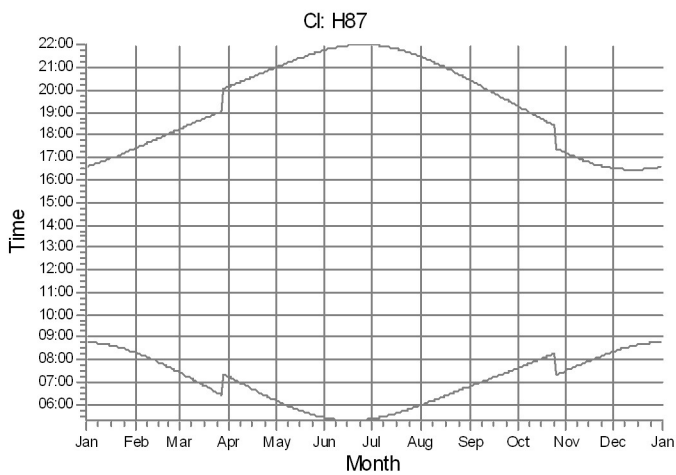
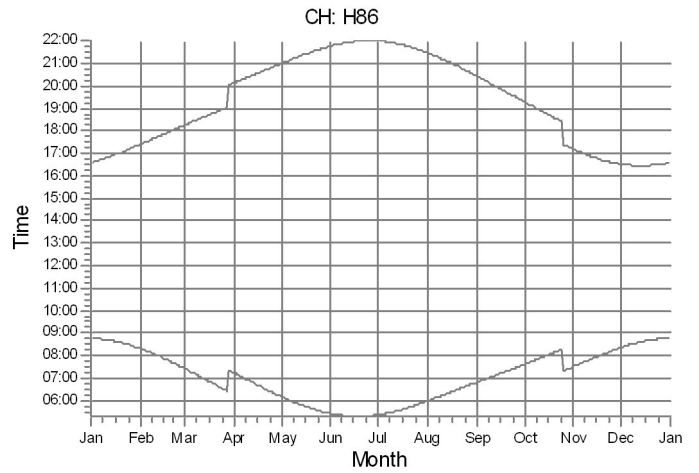
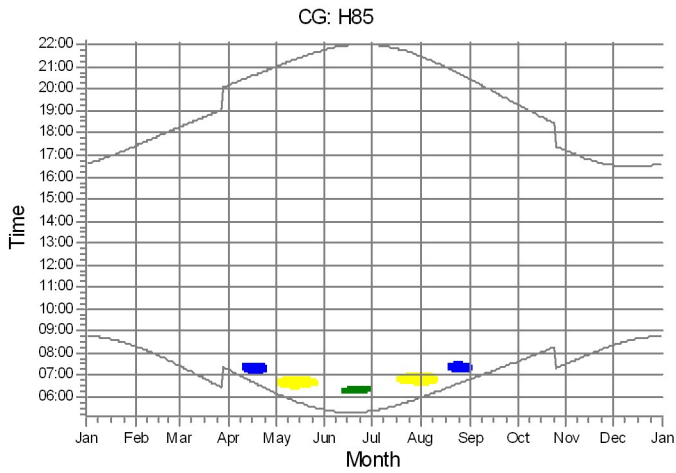
Calculation: Derragh WF Impacts Only



WTGs

SHADOW - Calendar, graphical

Calculation: Derragh WF Impacts Only

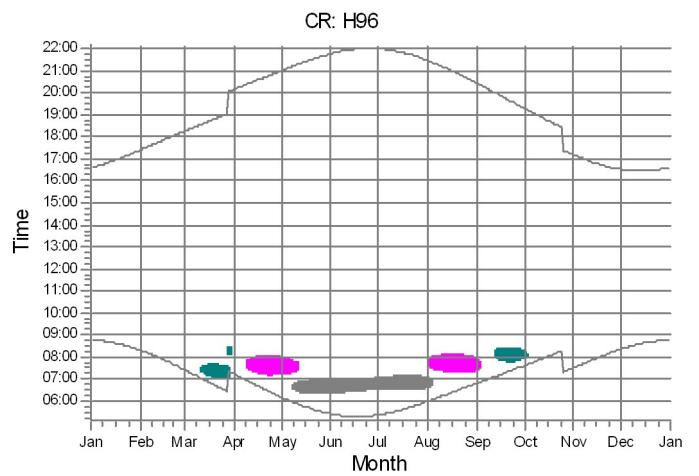
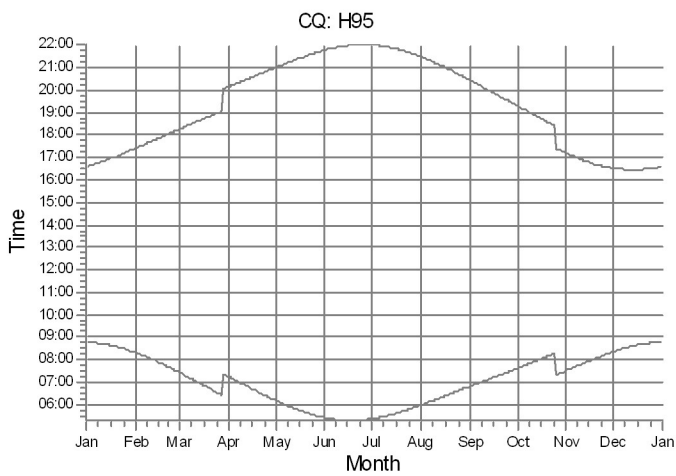
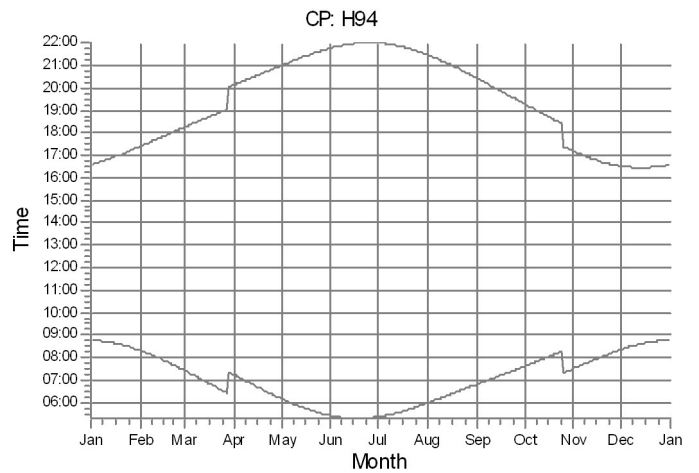
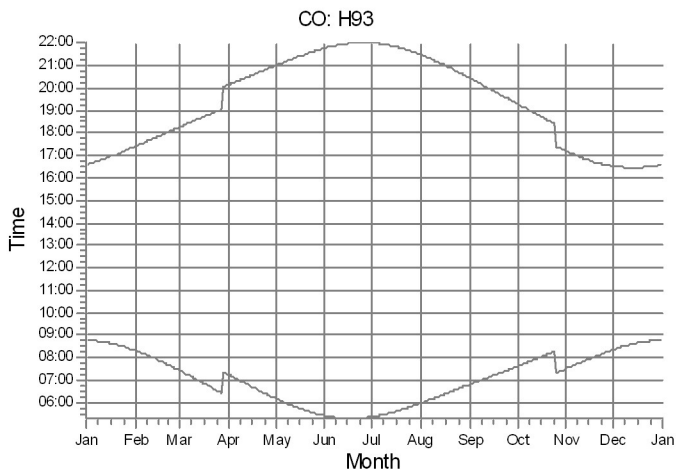
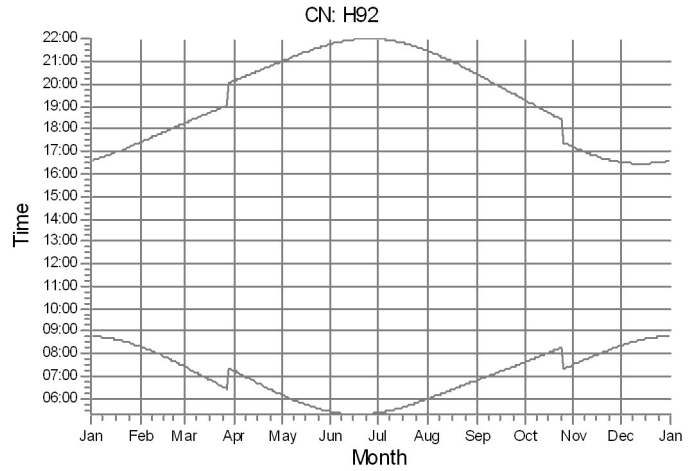
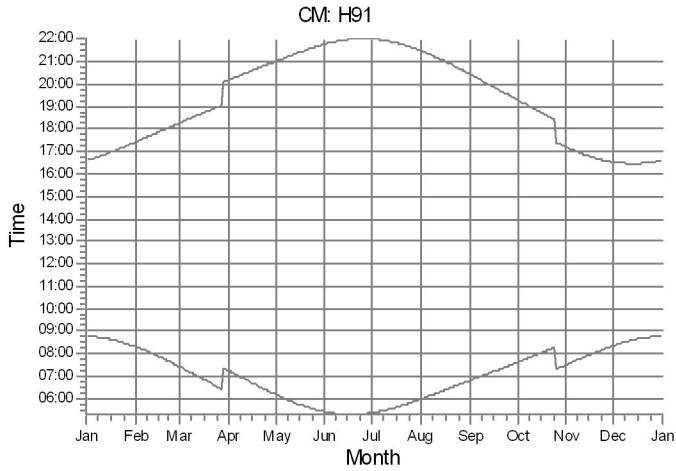


WTGs



SHADOW - Calendar, graphical

Calculation: Derragh WF Impacts Only

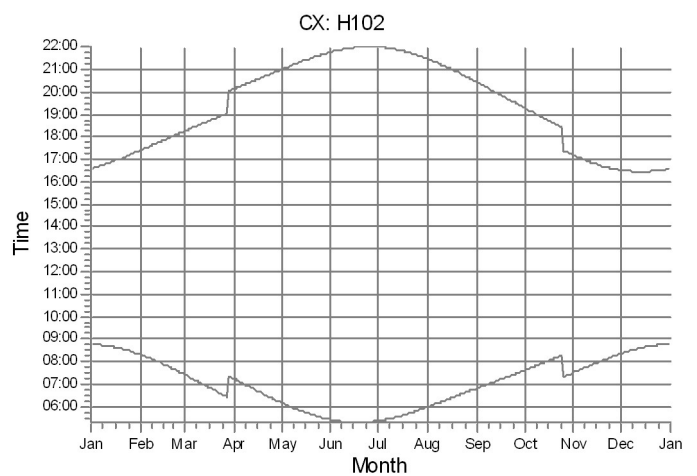
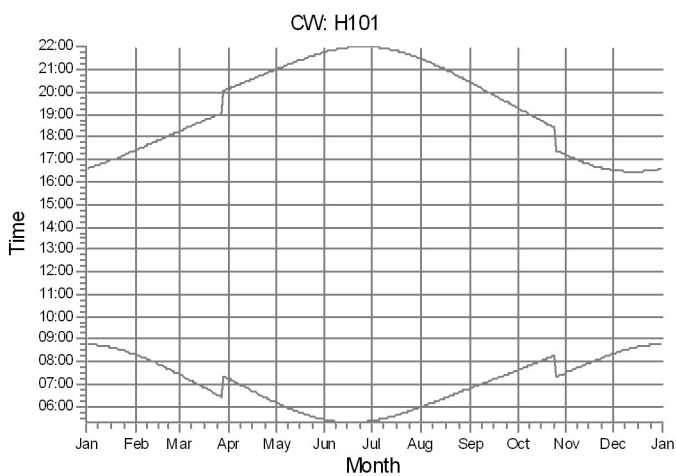
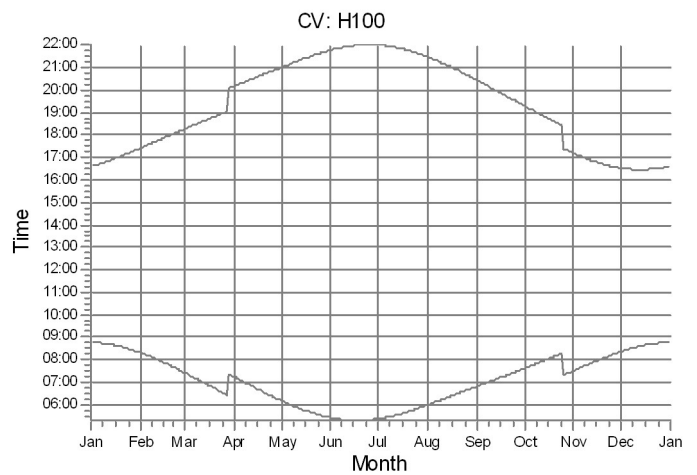
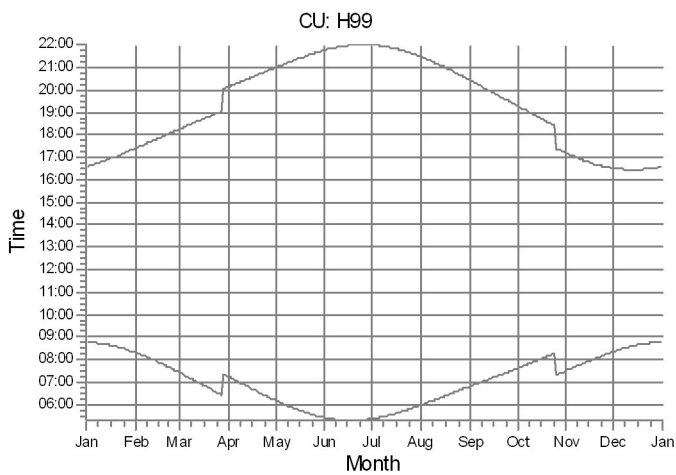
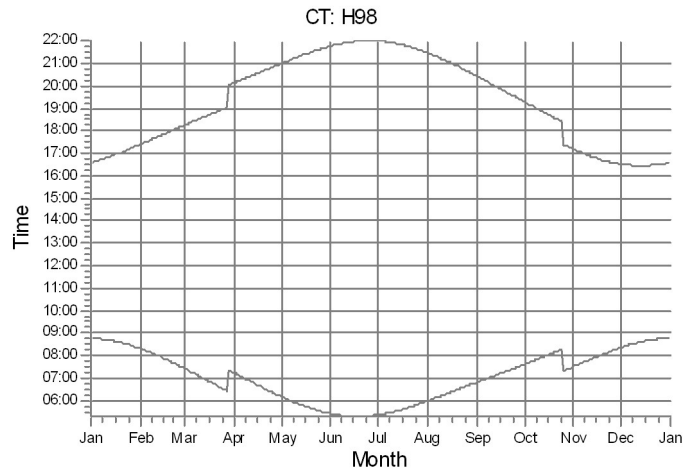
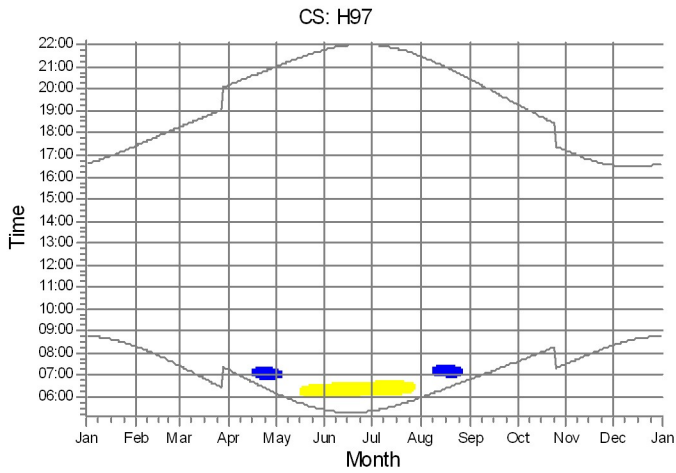


WTGs

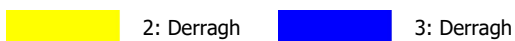
4: Derragh
 5: Derragh
 6: Derragh

SHADOW - Calendar, graphical

Calculation: Derragh WF Impacts Only

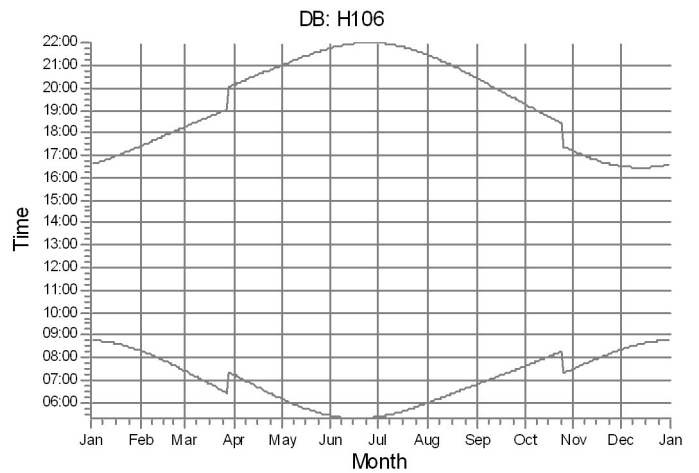
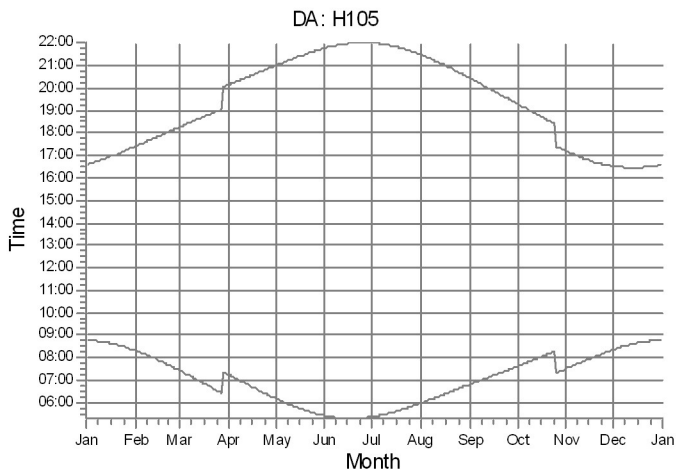
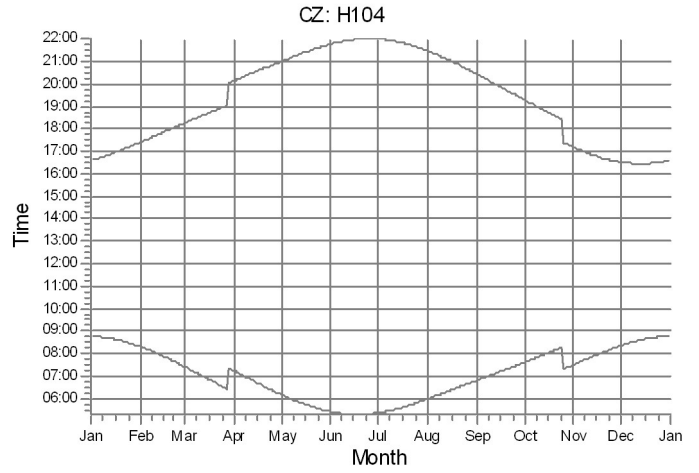
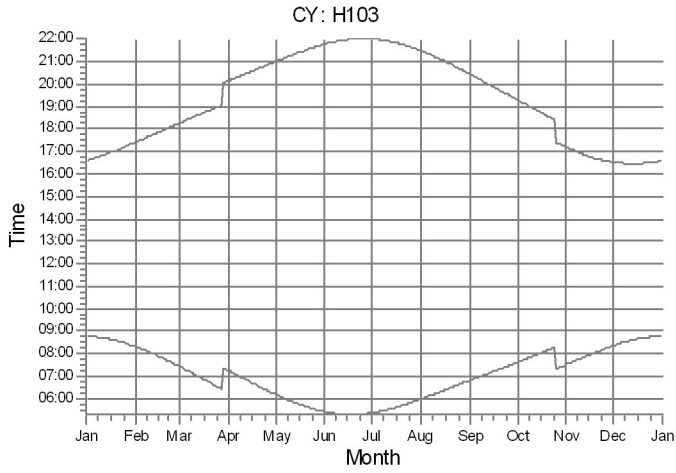


WTGs



SHADOW - Calendar, graphical

Calculation: Derragh WF Impacts Only



WTGs

SHADOW - Calendar per WTG

Calculation: Derragh WF Impacts Only WTG: 1 - Derragh
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Table with columns for months (January to June) and rows for each day (1-31) showing sunrise and sunset times for each hour. Includes summary rows for Potential sun hours and Sum of minutes with flicker.

Table layout: For each day in each month the following matrix apply

Matrix with columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), First time (hh:mm) with flicker, Last time (hh:mm) with flicker, Minutes with flicker.

SHADOW - Calendar per WTG

Calculation: Derragh WF Impacts Only WTG: 1 - Derragh
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

Table with columns: N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum. Values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (July-December) and rows for each day (1-31). Includes columns for sunrise, sunset, and shadow start/end times for each month. Summary rows at bottom show potential sun hours and minutes with flicker for each month.

Table layout: For each day in each month the following matrix apply

Matrix with 2 rows and 3 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm); First time (hh:mm) with flicker, Last time (hh:mm) with flicker/Minutes with flicker; First time (hh:mm) with flicker, Last time (hh:mm) with flicker/Minutes with flicker

Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:07/3.5.584

SHADOW - Calendar per WTG

Calculation: Derragh WF Impacts Only WTG: 2 - Derragh
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of sunshine probability values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of operational time values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main data table with columns for months (January to June) and rows for each day (1-31), showing sunrise/set times and flicker minutes.

Table layout: For each day in each month the following matrix apply

Matrix with 2 rows: Day in month, Sun rise (hh:mm), Sun set (hh:mm), First time (hh:mm) with flicker, Last time (hh:mm) with flicker, Minutes with flicker.



SHADOW - Calendar per WTG

Calculation: Derragh WF Impacts Only WTG: 2 - Derragh
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (July-December) and rows for each day (1-31) showing sun rise/set times and minutes with flicker.

Table layout: For each day in each month the following matrix apply

Matrix with 2 rows: Day in month, Sun rise (hh:mm), Sun set (hh:mm), First time (hh:mm) with flicker, Last time (hh:mm) with flicker, Minutes with flicker.

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:07/3.5.584

SHADOW - Calendar per WTG

Calculation: Derragh WF Impacts Only WTG: 3 - Derragh

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 16:36	08:18 16:04-16:34/30 17:24	07:25 18:16	07:14 20:10	07:53-08:11/18 21:00	06:10 21:46
2	08:45 16:38	08:17 16:04-16:42/38 17:26	07:23 18:18	07:12 20:11	07:55-08:10/15 21:02	06:08 21:47
3	08:45 16:39	08:15 16:03-16:45/42 17:28	07:21 18:19	07:10 20:13	07:57-08:07/10 21:04	06:06 21:48
4	08:45 16:40	08:14 16:02-16:48/46 17:30	07:18 18:21	07:08 20:15	06:04 21:05	05:22 21:49
5	08:44 16:41	08:12 16:02-16:51/49 17:32	07:16 18:23	07:05 20:16	06:02 21:07	05:22 21:50
6	08:44 16:42	08:10 16:02-16:53/51 17:33	07:14 18:25	07:03 20:18	06:00 21:09	05:21 21:51
7	08:44 16:43	08:08 16:02-16:54/52 17:35	07:12 18:26	07:01 20:20	05:59 21:10	05:20 21:52
8	08:43 16:45	08:07 16:02-16:55/53 17:37	07:09 18:28	06:58 20:22	05:57 21:12	05:20 21:53
9	08:43 16:46	08:05 16:02-16:56/54 17:39	07:07 18:30	06:56 20:23	05:55 21:14	05:19 21:54
10	08:42 16:48	08:03 16:02-16:57/55 17:41	07:05 18:32	06:54 20:25	05:53 21:15	05:19 21:55
11	08:42 16:49	08:01 16:02-16:57/55 17:43	07:03 18:34	06:52 20:27	07:16-07:25/9 21:17	05:19 21:55
12	08:41 16:50	07:59 16:02-16:57/55 17:45	07:00 18:35	06:50 20:28	07:13-07:27/14 21:18	05:18 21:56
13	08:40 16:52	07:58 16:03-16:57/54 17:46	06:58 18:37	06:47 20:30	07:11-07:27/16 21:20	05:18 21:57
14	08:40 16:53	07:56 16:03-16:57/54 17:48	06:56 18:39	06:45 20:32	07:10-07:28/18 21:22	05:18 21:57
15	08:39 16:55	07:54 16:04-16:57/53 17:50	06:54 18:40	06:43 20:33	07:09-07:28/19 21:23	05:18 21:58
16	08:38 16:56	07:52 16:05-16:57/52 17:52	06:51 18:42	06:41 20:35	07:09-07:29/20 21:25	05:17 21:59
17	08:37 16:58	07:50 16:07-16:57/50 17:54	06:49 18:44	06:39 20:37	07:02-07:29/27 21:26	05:17 21:59
18	08:36 17:00	07:48 16:09-16:56/47 17:56	06:47 18:46	07:10-07:13/3 20:39	06:36 21:28	05:17 21:59
19	08:35 17:01	07:46 16:12-16:55/43 17:58	06:44 18:47	07:07-07:14/7 20:40	06:34 21:29	05:17 22:00
20	08:34 17:03	07:44 16:35-16:54/19 17:59	06:42 18:49	07:05-07:15/10 20:42	06:32 21:31	05:17 22:00
21	08:33 17:05	07:42 16:36-16:52/16 18:01	06:40 18:51	07:03-07:16/13 20:44	06:30 21:32	05:18 22:00
22	08:32 17:06	07:40 16:39-16:50/11 18:03	06:38 18:53	07:00-07:16/16 20:45	06:28 21:33	05:18 22:01
23	08:31 17:08	07:38 18:05	06:35 18:54	06:58-07:16/18 20:47	06:26 21:35	05:18 22:01
24	08:29 17:10	07:36 18:07	06:33 18:56	06:56-07:16/20 20:49	06:24 21:36	05:18 22:01
25	08:28 17:12	07:34 18:09	06:31 18:58	06:53-07:16/23 20:50	06:22 21:38	05:19 22:01
26	08:27 17:13	07:31 18:10	06:28 18:59	06:53-07:16/23 20:52	06:20 21:39	05:19 22:01
27	08:26 17:15	16:11-16:19/8 18:12	06:26 19:01	06:52-07:16/24 20:54	06:18 21:40	05:19 22:01
28	08:24 17:17	16:09-16:22/13 18:14	06:24 19:03	06:51-07:15/24 20:55	06:16 21:41	05:20 22:01
29	08:23 17:19	16:07-16:24/17 18:15	06:21 19:05	07:52-08:15/23 20:57	06:14 21:43	05:20 22:01
30	08:21 17:21	16:06-16:29/23 18:16	06:19 19:07	07:52-08:14/22 20:59	06:12 21:44	05:21 22:00
31	08:20 17:22	16:05-16:32/27 18:17	06:17 19:08	07:52-08:12/20 20:08	05:26 21:45	05:21 22:00
Potential sun hours	259	278	367	416	485	499
Sum of minutes with flicker	88	1002	246	508	40	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:07/3.5.584

SHADOW - Calendar per WTG

Calculation: Derragh WF Impacts Only WTG: 3 - Derragh

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22 22:00	05:58 21:28	06:48 07:15-07:24/9 20:26	07:37 19:17	07:30 15:31-16:26/55 17:11	08:21 16:31
2	05:22 22:00	06:00 21:27	06:49 20:24	07:38 19:15	07:32 15:31-16:26/55 17:09	08:23 16:30
3	05:23 21:59	06:01 21:25	06:51 20:22	07:40 19:12	07:34 15:31-16:25/54 17:07	08:24 16:29
4	05:24 21:59	06:03 21:23	06:53 20:19	07:42 19:10	07:36 15:31-16:24/53 17:05	08:25 16:29
5	05:25 21:58	06:04 21:21	06:54 20:17	07:43 19:08	07:38 15:32-16:23/51 17:04	08:27 16:28
6	05:26 21:58	06:06 21:20	06:56 20:15	07:45 19:05	07:39 15:32-16:21/49 17:02	08:28 16:28
7	05:26 21:57	06:07 21:18	06:58 20:13	07:47 19:03	07:41 15:33-16:18/45 17:00	08:29 16:27
8	05:27 21:57	06:09 21:16	06:59 20:10	07:48 19:01	07:43 15:34-16:16/42 16:59	08:31 16:27
9	05:28 21:56	06:11 07:09-07:14/5 21:14	07:01 07:50-08:00/10 20:08	07:50 18:59	07:45 15:34-16:12/38 16:57	08:32 16:27
10	05:29 21:55	06:12 07:05-07:17/12 21:12	07:02 07:48-08:03/15 20:06	07:52 18:56	07:46 15:35-16:06/31 16:55	08:33 16:27
11	05:30 21:55	06:14 07:04-07:19/15 21:10	07:04 07:45-08:03/18 20:03	07:54 18:54	07:48 15:36-16:03/27 16:54	08:34 16:26
12	05:31 21:54	06:15 07:02-07:20/18 21:08	07:06 07:44-08:05/21 20:01	07:55 18:52	07:50 15:37-16:00/23 16:52	08:35 16:26
13	05:32 21:53	06:17 07:01-07:21/20 21:07	07:07 07:44-08:06/22 19:59	07:57 18:50	07:52 15:39-15:56/17 16:51	08:36 16:26
14	05:34 21:52	06:19 07:00-07:21/21 21:05	07:09 07:42-08:05/23 19:56	07:59 18:48	07:54 15:41-15:54/13 16:49	08:37 16:26
15	05:35 21:51	06:20 07:00-07:22/22 21:03	07:10 07:42-08:05/23 19:54	08:00 18:45	07:55 15:44-15:51/7 16:48	08:38 16:26
16	05:36 21:50	06:22 06:59-07:22/23 21:01	07:12 07:41-08:05/24 19:52	08:02 18:43	07:57 16:46	08:39 16:27
17	05:37 21:49	06:23 06:59-07:22/23 20:59	07:14 07:41-08:05/24 19:49	08:04 18:41	07:59 16:45	08:39 16:27
18	05:38 21:48	06:25 06:58-07:21/23 20:57	07:15 07:41-08:04/23 19:47	08:06 18:39	08:00 16:44	08:40 16:27
19	05:40 21:47	06:27 06:58-07:26/28 20:54	07:17 07:42-08:03/21 19:45	08:07 17:13-17:17/4 18:37	08:02 16:42	08:41 16:27
20	05:41 21:45	06:28 06:57-07:28/31 20:52	07:19 07:44-08:02/18 19:42	08:09 17:08-17:21/13 18:35	08:04 16:41	08:42 16:28
21	05:42 21:44	06:30 06:58-07:30/32 20:50	07:20 07:45-08:01/16 19:40	08:11 17:06-17:23/17 18:33	08:06 16:40	08:42 16:28
22	05:44 21:43	06:32 06:58-07:30/32 20:48	07:22 07:47-08:01/14 19:38	08:13 16:45-17:25/40 18:31	08:07 16:39	08:43 16:28
23	05:45 21:42	06:33 07:00-07:31/31 20:46	07:24 07:49-08:00/11 19:35	08:14 16:41-17:26/45 18:28	08:09 16:38	08:43 16:29
24	05:46 21:40	06:35 07:01-07:32/31 20:44	07:25 07:50-07:58/8 19:33	08:16 16:39-17:27/48 18:26	08:11 16:37	08:44 16:30
25	05:48 21:39	06:36 07:03-07:31/28 20:42	07:27 07:52-07:56/4 19:31	07:18 15:37-16:27/50 17:24	08:12 16:36	08:44 16:30
26	05:49 21:37	06:38 07:05-07:31/26 20:40	07:28 19:28	07:20 15:36-16:27/51 17:22	08:14 16:35	08:44 16:31
27	05:51 21:36	06:40 07:11-07:30/19 20:37	07:30 19:26	07:21 15:34-16:27/53 17:20	08:15 16:34	08:45 16:32
28	05:52 21:35	06:41 07:11-07:30/19 20:35	07:32 19:24	07:23 15:33-16:27/54 17:18	08:17 16:33	08:45 16:32
29	05:54 21:33	06:43 07:11-07:29/18 20:33	07:33 19:22	07:25 15:32-16:27/55 17:17	08:18 16:32	08:45 16:33
30	05:55 21:31	06:45 07:12-07:28/16 20:31	07:35 19:19	07:27 15:32-16:27/55 17:15	08:20 16:31	08:45 16:34
31	05:57 21:30	06:46 07:12-07:26/14 20:29		07:29 15:31-16:27/56 17:13		08:45 16:35
Potential sun hours	502	454	381	331	266	244
Sum of minutes with flicker	0	507	304	552	560	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Derragh WF Impacts Only WTG: 4 - Derragh
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of sunshine probability values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of operational time values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main data table with columns for months (January to June) and rows for days (1-31). Each cell contains a vertical list of time intervals (hh:mm) representing shadow events.

Table layout: For each day in each month the following matrix apply

Matrix with 2 rows and 3 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm); First time (hh:mm) with flicker, Last time (hh:mm) with flicker, Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Derragh WF Impacts Only WTG: 4 - Derragh
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time
N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Table with columns for months (July, August, September, October, November, December) and rows for days (1-31). Each cell contains time ranges for sunrise, sunset, and shadow flicker start/end times.

Table layout: For each day in each month the following matrix apply

Matrix with 2 rows and 3 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm); First time (hh:mm) with flicker, Last time (hh:mm) with flicker, Minutes with flicker.

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:07/3.5.584

SHADOW - Calendar per WTG

Calculation: Derragh WF Impacts Only WTG: 5 - Derragh

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
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1	08:45 14:46-15:22/36	08:18	07:25	07:14	06:10 07:15-07:53/38	05:25
	16:36 14:04-14:45/41	17:24	18:16	20:10	21:00	21:46
2	08:45 14:47-15:22/35	08:17	07:23	07:12	06:08 07:15-07:52/37	05:24
	16:38 14:05-14:45/40	17:26	18:18	20:11	21:02	21:47
3	08:45 14:48-15:23/35	08:15	07:21	07:10	06:06 07:17-07:52/35	05:23
	16:39 14:06-14:46/40	17:28	18:19	20:13	21:04	21:48
4	08:45 14:47-15:23/36	08:13	07:18	07:08	06:04 07:17-07:51/34	05:22
	16:40 14:06-14:45/39	17:30	18:21	20:15	21:05	21:49
5	08:44 14:48-15:23/35	08:12	07:16	07:05	06:02 07:18-07:49/31	05:22
	16:41 14:07-14:46/39	17:32	18:23	20:16	21:07	21:50
6	08:44 14:50-15:24/34	08:10	07:14	07:03	06:00 07:19-07:48/29	05:21
	16:42 14:09-14:46/37	17:33	18:25	20:18	21:09	21:51
7	08:44 14:50-15:24/34	08:08	07:12	07:01	05:59 07:20-07:47/27	05:20
	16:43 14:09-14:46/37	17:35	18:26	20:20	21:10	21:52
8	08:43 14:50-15:24/34	08:07	07:09	06:58	05:57 07:21-07:45/24	05:20
	16:45 14:10-14:45/35	17:37	18:28	20:22	21:12	21:53
9	08:43 14:51-15:25/34	08:05	07:07	06:56	05:55 07:24-07:44/20	05:19
	16:46 14:12-14:46/34	17:39	18:30	20:23	21:14	21:54
10	08:42 14:52-15:25/33	08:03	07:05	06:54 07:32-07:47/15	05:53 07:26-07:41/15	05:19
	16:47 14:13-14:45/32	17:41	18:32	20:25	21:15	21:55
11	08:42 14:52-15:24/32	08:01	07:03	06:52 07:29-07:50/21	05:52 07:29-07:36/7	05:19
	16:49 14:15-14:45/30	17:43	18:33	20:27	21:17	21:55
12	08:41 14:53-15:24/31	07:59	07:00	06:50 07:26-07:51/25	05:50	05:18
	16:50 14:17-14:44/27	17:45	18:35	20:28	21:18	21:56
13	08:40 14:55-15:25/30	07:58	06:58	06:47 07:24-07:53/29	05:48	05:18
	16:52 14:28-14:44/16	17:46	18:37	20:30	21:20	21:57
14	08:40 14:56-15:25/29	07:56	06:56	06:45 07:22-07:54/32	05:47	05:18
	16:53 14:30-14:42/12	17:48	18:39	20:32	21:22	21:57
15	08:39 14:57-15:25/28	07:54	06:54	06:43 07:21-07:55/34	05:45	05:18
	16:55 14:33-14:40/7	17:50	18:40	20:33	21:23	21:58
16	08:38 14:58-15:24/26	07:52	06:51	06:41 07:20-07:56/36	05:44	05:17
	16:56	17:52	18:42	20:35	21:25	21:58
17	08:37 15:00-15:24/24	07:50	06:49	06:39 07:19-07:57/38	05:42	05:17
	16:58	17:54	18:44	20:37	21:26	21:59
18	08:36 15:01-15:22/21	07:48	06:47	06:36 07:18-07:57/39	05:41	05:17
	17:00	17:56	18:46	20:39	21:28	21:59
19	08:35 15:03-15:21/18	07:46	06:44	06:34 07:17-07:57/40	05:39	05:17
	17:01	17:58	18:47	20:40	21:29	22:00
20	08:34 15:06-15:18/12	07:44	06:42	06:32 07:17-07:58/41	05:38	05:17
	17:03	17:59	18:49	20:42	21:31	22:00
21	08:33	07:42	06:40	06:30 07:16-07:58/42	05:37	05:18
	17:05	18:01	18:51	20:44	21:32	22:00
22	08:32	07:40	06:37	06:28 07:15-07:57/42	05:35	05:18
	17:06	18:03	18:53	20:45	21:33	22:00
23	08:31	07:38	06:35	06:26 07:14-07:57/43	05:34	05:18
	17:08	18:05	18:54	20:47	21:35	22:01
24	08:29	07:36	06:33	06:24 07:14-07:57/43	05:33	05:18
	17:10	18:07	18:56	20:49	21:36	22:01
25	08:28	07:33	06:31	06:22 07:15-07:57/42	05:32	05:19
	17:12	18:09	18:58	20:50	21:37	22:01
26	08:27	07:31	06:28	06:20 07:15-07:57/42	05:31	05:19
	17:13	18:10	18:59	20:52	21:39	22:01
27	08:25	07:29	06:26	06:18 07:15-07:56/41	05:29	05:19
	17:15	18:12	19:01	20:54	21:40	22:01
28	08:24	07:27	06:24	06:16 07:15-07:56/41	05:28	05:20
	17:17	18:14	19:03	20:55	21:41	22:01
29	08:23		07:21	06:14 07:15-07:55/40	05:27	05:20
	17:19		20:04	20:57	21:43	22:00
30	08:21		07:19	06:12 07:15-07:54/39	05:26	05:21
	17:21		20:06	20:59	21:44	22:00
31	08:20		07:17		05:25	
	17:22		20:08		21:45	
Potential sun hours	259	278	367	416	485	499
Sum of minutes with flicker	1063	0	0	765	297	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Derragh WF Impacts Only WTG: 5 - Derragh
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main data table with columns for months (July-December) and rows for days (1-31). Includes 'Potential sun hours' and 'Sum of minutes with flicker' at the bottom.

Table layout: For each day in each month the following matrix apply

Matrix with 2 rows: Day in month, Sun rise (hh:mm), Sun set (hh:mm), First time (hh:mm) with flicker, Last time (hh:mm) with flicker, Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Derragh WF Impacts Only WTG: 6 - Derragh
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Table with columns for months (January to December) and rows for days (1 to 31). Each cell contains sunrise and sunset times in hh:mm format. Summary rows at the bottom show potential sun hours and sum of minutes with flicker for each month.

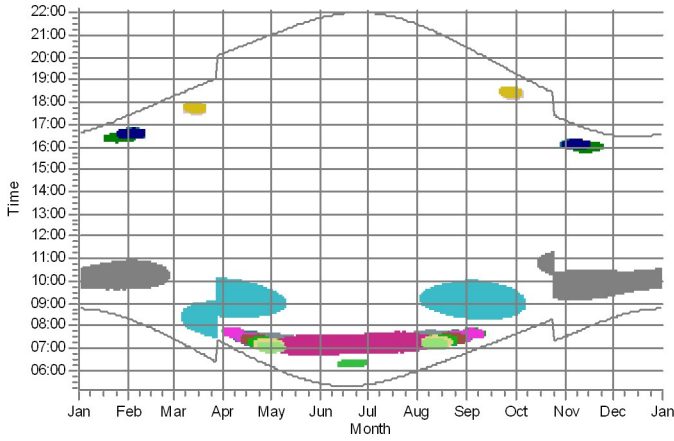
Table layout: For each day in each month the following matrix apply

Day in month Sun rise (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

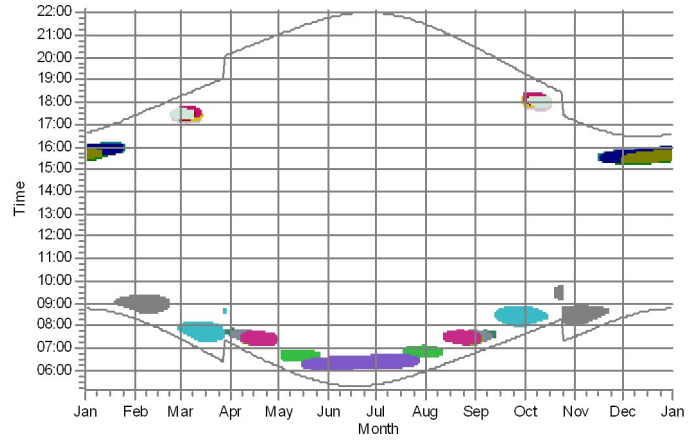
SHADOW - Calendar per WTG, graphical

Calculation: Derragh WF Impacts Only

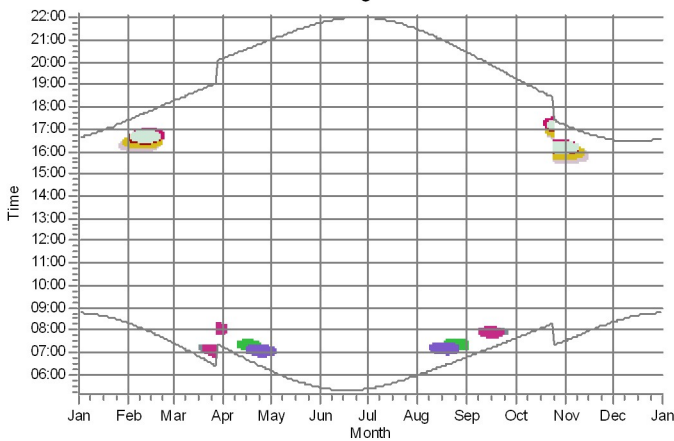
1: Derragh



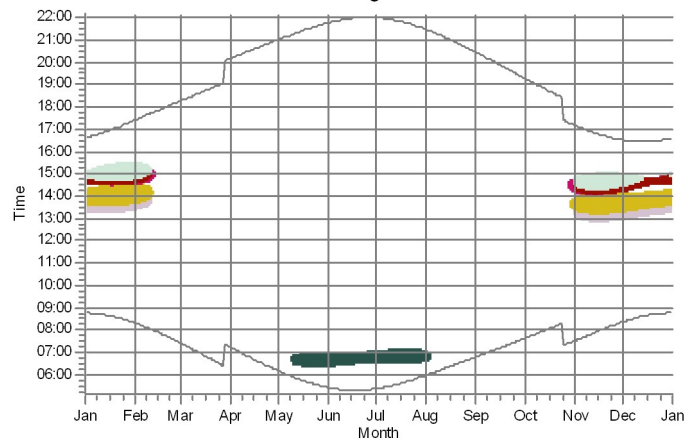
2: Derragh



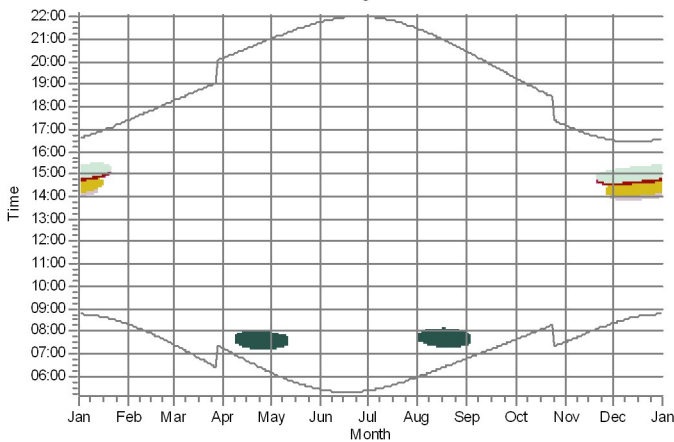
3: Derragh



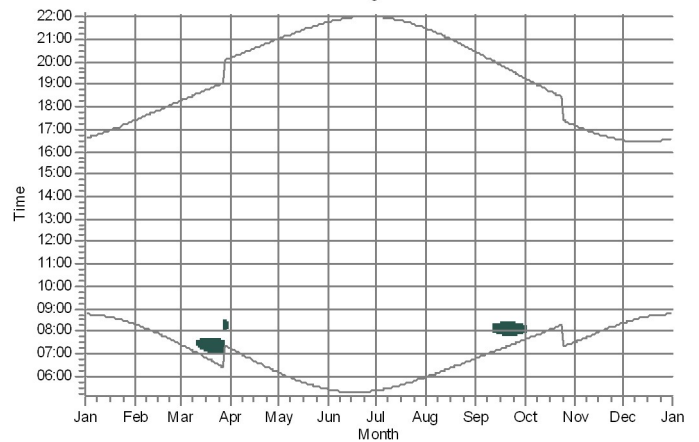
4: Derragh



5: Derragh



6: Derragh

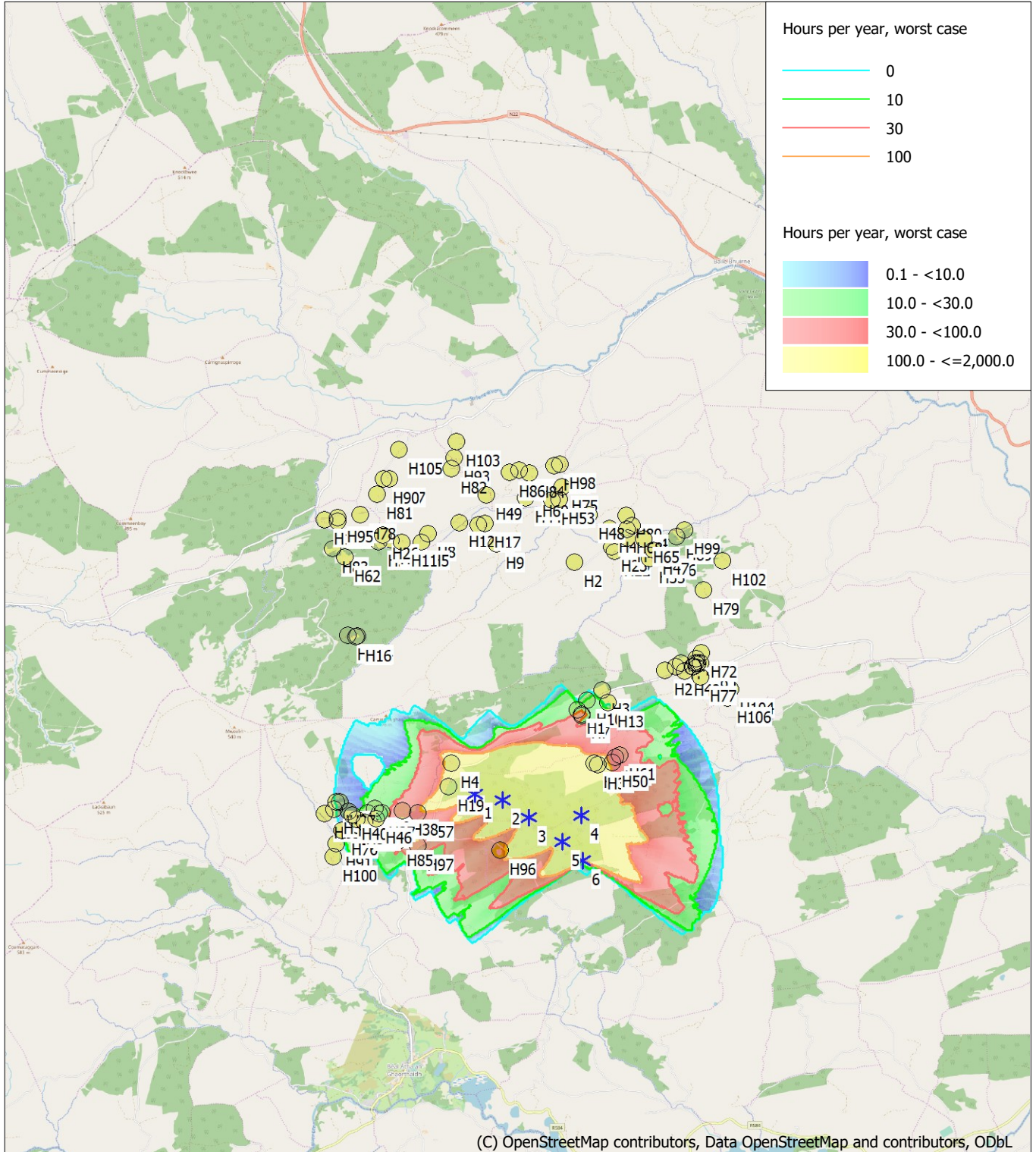


Shadow receptors

A: H1	J: H10	AC: H29	AI: H35	AN: H40	AZ: H52	BF: H58	CR: H96
D: H4	S: H19	AD: H30	AJ: H36	AT: H46	BB: H54	BI: H61	CS: H97
F: H6	Y: H25	AE: H31	AK: H37	AX: H50	BC: H55	BX: H76	
G: H7	AA: H27	AH: H34	AL: H38	AY: H51	BE: H57	CG: H85	

SHADOW - Map

Calculation: Derragh WF Impacts Only

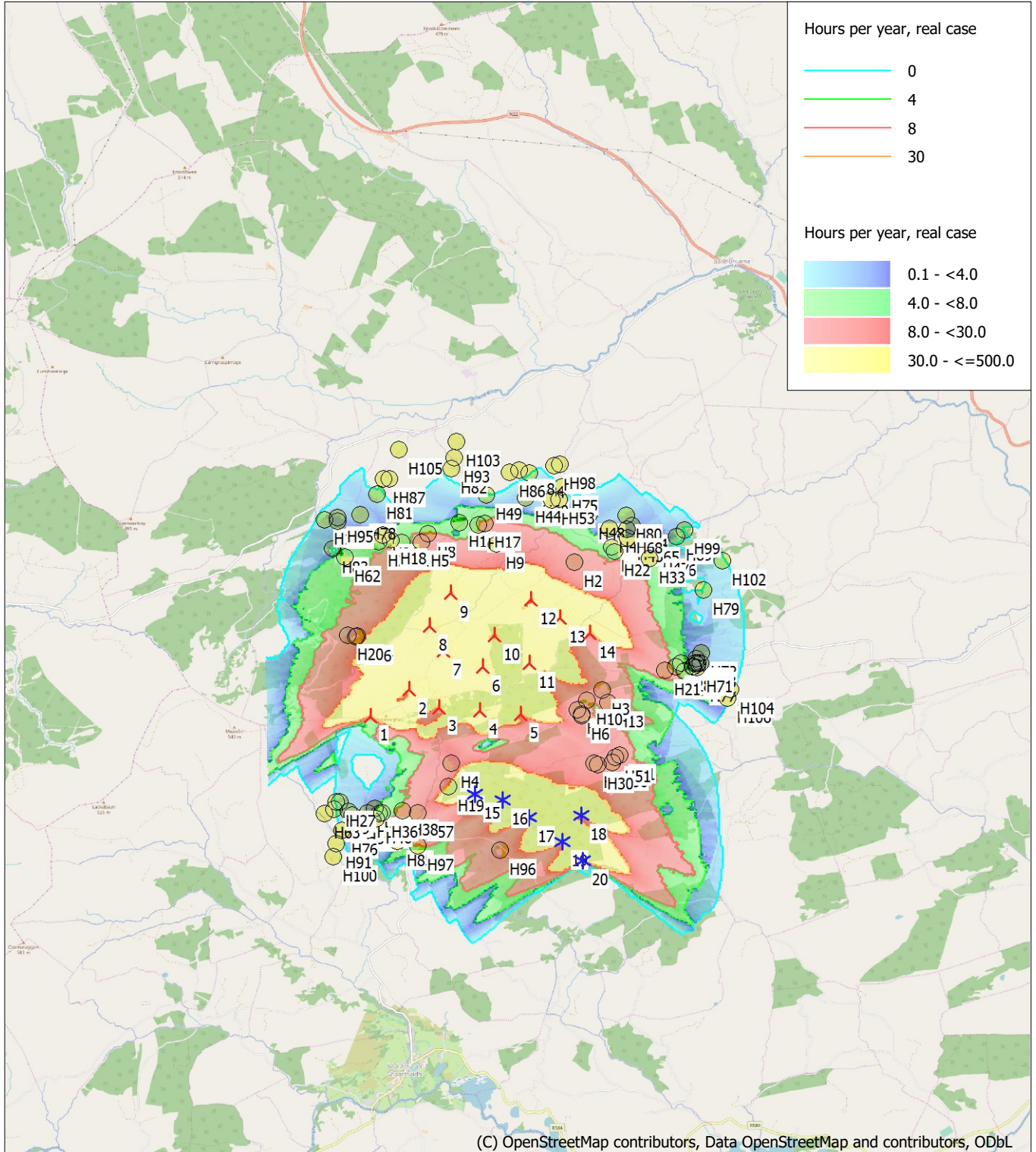


Map: EMD OpenStreetMap , Print scale 1:75,000, Map center Irish ITM-IRENET95 (IE), geocentric, GRS80 East: 516,660 North: 573,620
 * Existing WTG Shadow receptor
 Flicker map level: Elevation Grid Data Object: Gortyrahill_ShadowFlicker_12042022_EMDGrid_0.wpg (1)
 Time step: 3 minutes, Day step: 7 days, Map resolution: 20 m, Visibility resolution: 10 m, Eye height: 1.5 m

Shadow F. - Specimen Turbine

SHADOW - Map

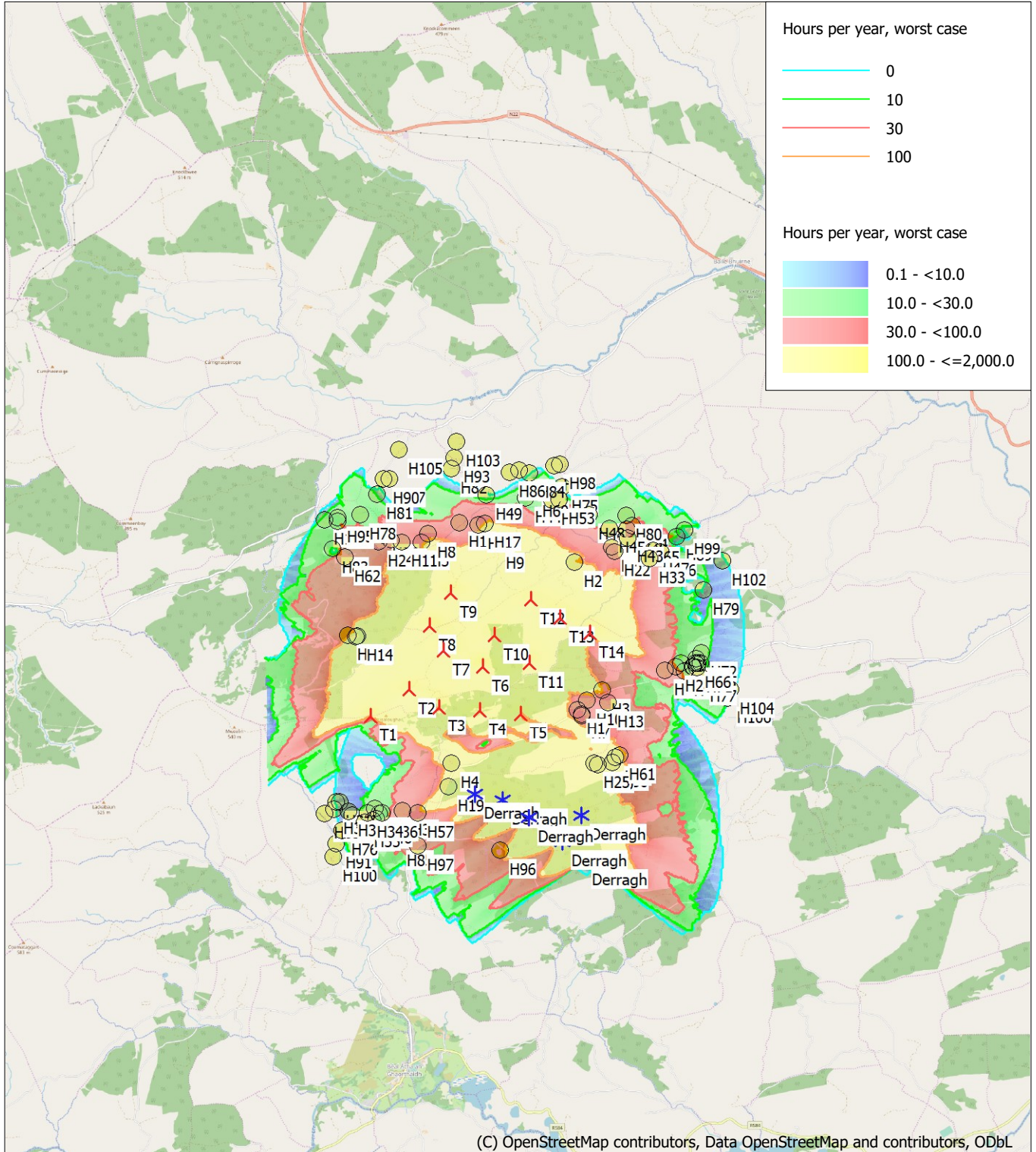
Calculation: Specimen Turbine - Real Case



Map: EMD OpenStreetMap , Print scale 1:75,000, Map center Irish ITM-IRENET95 (IE), geocentric, GRS80 East: 516,660 North: 573,620
 New WTG Existing WTG Shadow receptor
 Flicker map level: Elevation Grid Data Object: Gortyrahill_ShadowFlicker_12042022_EMDGrid_0.wpg (1)
 Time step: 3 minutes, Day step: 7 days, Map resolution: 20 m, Visibility resolution: 10 m, Eye height: 1.5 m

SHADOW - Map

Calculation: Specimen Turbine - Worst Case



Map: EMD OpenStreetMap , Print scale 1:75,000, Map center Irish ITM-IRENET95 (IE), geocentric, GRS80 East: 516,660 North: 573,620
 New WTG Existing WTG Shadow receptor
 Flicker map level: Elevation Grid Data Object: Gortyrahill_ShadowFlicker_12042022_EMDGrid_0.wpg (1)
 Time step: 3 minutes, Day step: 7 days, Map resolution: 20 m, Visibility resolution: 10 m, Eye height: 1.5 m

SHADOW - Main Result

Calculation: Specimen Turbine

Assumptions for shadow calculations

Maximum distance for influence

Calculate only when more than 20 % of sun is covered by the blade

Please look in WTG table

Minimum sun height over horizon for influence

3 °

Day step for calculation

1 days

Time step for calculation

1 minutes

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

A ZVI (Zones of Visual Influence) calculation is performed before flicker calculation so non visible WTG do not contribute to calculated flicker values. A WTG will be visible if it is visible from any part of the receiver window. The ZVI calculation is based on the following assumptions:

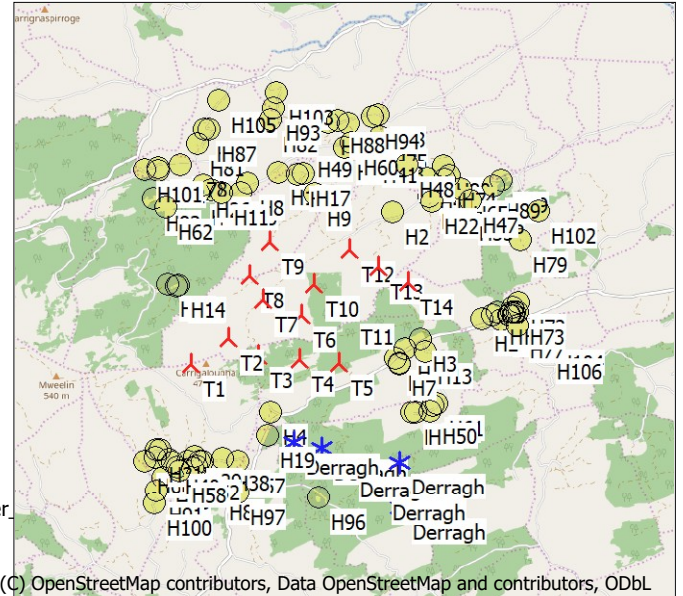
Height contours used: Elevation Grid Data Object: Gortyrahilly_ShadowFlicker

Obstacles used in calculation

Receptor grid resolution: 1.0 m

All coordinates are in

Irish ITM-IRENET95 (IE), geocentric, GRS80



Scale 1:100,000
 ▲ New WTG * Existing WTG ● Shadow receptor

WTGs

	Easting	Northing	Z	Row data/Description	WTG type		Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Shadow data	
					Valid	Manufact.					Calculation distance [m]	RPM [RPM]
1	514,680	571,824	415.3	T1	Yes	Siemens Gamesa	SG 6.0-155-6,600	6,600	155.0	107.5	2,007	9.3
2	515,203	572,167	392.1	T2	Yes	Siemens Gamesa	SG 6.0-155-6,600	6,600	155.0	107.5	2,007	9.3
3	515,580	571,929	356.7	T3	Yes	Siemens Gamesa	SG 6.0-155-6,600	6,600	155.0	107.5	2,007	9.3
4	516,129	571,873	345.9	T4	Yes	Siemens Gamesa	SG 6.0-155-6,600	6,600	155.0	107.5	2,007	9.3
5	516,658	571,817	338.6	T5	Yes	Siemens Gamesa	SG 6.0-155-6,600	6,600	155.0	107.5	2,007	9.3
6	516,169	572,451	340.7	T6	Yes	Siemens Gamesa	SG 6.0-155-6,600	6,600	155.0	107.5	2,007	9.3
7	515,652	572,675	372.3	T7	Yes	Siemens Gamesa	SG 6.0-155-6,600	6,600	155.0	107.5	2,007	9.3
8	515,484	572,994	303.0	T8	Yes	Siemens Gamesa	SG 6.0-155-6,600	6,600	155.0	107.5	2,007	9.3
9	515,769	573,427	291.1	T9	Yes	Siemens Gamesa	SG 6.0-155-6,600	6,600	155.0	107.5	2,007	9.3
10	516,329	572,863	380.0	T10	Yes	Siemens Gamesa	SG 6.0-155-6,600	6,600	155.0	107.5	2,007	9.3
11	516,794	572,484	305.5	T11	Yes	Siemens Gamesa	SG 6.0-155-6,600	6,600	155.0	107.5	2,007	9.3
12	516,819	573,308	326.4	T12	Yes	Siemens Gamesa	SG 6.0-155-6,600	6,600	155.0	107.5	2,007	9.3
13	517,195	573,067	286.5	T13	Yes	Siemens Gamesa	SG 6.0-155-6,600	6,600	155.0	107.5	2,007	9.3
14	517,592	572,862	257.9	T14	Yes	Siemens Gamesa	SG 6.0-155-6,600	6,600	155.0	107.5	2,007	9.3
15	516,034	570,784	321.2	Derragh	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	100.0	1,823	10.7
16	516,405	570,706	285.7	Derragh	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	100.0	1,823	10.7
17	516,741	570,457	285.6	Derragh	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	100.0	1,823	10.7
18	517,429	570,484	311.2	Derragh	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	100.0	1,823	10.7
19	517,175	570,142	285.9	Derragh	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	100.0	1,823	10.7
20	517,446	569,894	246.0	Derragh	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	100.0	1,823	10.7

Shadow receptor-Input

No.	Name	Easting	Northing	Z	Width [m]	Height [m]	Elevation a.g.l. [m]	Slope of window [°]	Direction mode	Eye height (ZVI) a.g.l. [m]
A	H1	517,410	571,864	254.5	2.0	2.0	0.5	90.0	"Green house mode"	2.5
B	H2	517,402	573,794	210.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
C	H3	517,734	572,119	250.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
D	H4	515,736	571,186	296.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
E	H5	515,395	574,092	216.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
F	H6	517,462	571,790	234.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
G	H7	517,467	571,806	236.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
H	H8	515,487	574,211	217.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
I	H9	516,372	574,046	234.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5

To be continued on next page...

SHADOW - Main Result

Calculation: Specimen Turbine

...continued from previous page

No.	Name	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
				[m]	[m]	[m]	[m]	[°]		[m]
J	H10	517,533	571,990	257.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
K	H11	515,143	574,094	215.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
L	H12	515,896	574,342	196.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
M	H13	517,811	571,946	218.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
N	H14	514,534	572,878	305.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
O	H15	516,142	574,318	209.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
P	H16	514,510	572,872	306.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
Q	H17	516,223	574,321	211.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
R	H18	514,997	574,130	212.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
S	H19	515,702	570,880	296.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
T	H20	514,411	572,890	315.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
U	H21	518,556	572,363	233.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
V	H22	517,923	573,934	204.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
W	H23	517,883	573,984	196.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
X	H24	514,830	574,098	207.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
Y	H25	517,613	571,154	192.5	2.0	2.0	0.5	90.0	"Green house mode"	2.5
Z	H26	514,887	574,194	223.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AA	H27	514,265	570,703	232.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AB	H28	518,705	572,403	235.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AC	H29	514,728	570,617	256.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AD	H30	517,670	571,142	196.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AE	H31	514,223	570,697	230.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AF	H32	518,774	572,454	239.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AG	H33	518,384	573,830	215.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AH	H34	514,633	570,556	244.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AI	H35	514,379	570,581	225.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AJ	H36	514,814	570,551	250.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AK	H37	514,777	570,545	248.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AL	H38	515,088	570,586	257.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AM	H39	514,187	570,609	220.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AN	H40	514,433	570,535	223.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AO	H41	517,124	574,610	192.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AP	H42	518,824	572,353	223.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AQ	H43	518,107	574,098	177.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AR	H44	516,773	574,652	186.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AS	H45	517,869	574,232	179.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AT	H46	514,750	570,477	235.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AU	H47	518,434	573,927	210.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AV	H48	517,605	574,420	191.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AW	H49	516,256	574,698	198.5	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AX	H50	517,850	571,155	205.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AY	H51	517,890	571,229	190.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AZ	H52	514,698	570,464	232.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BA	H53	517,210	574,625	194.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BB	H54	514,485	570,469	217.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BC	H55	514,590	570,438	221.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BD	H56	518,528	573,917	219.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BE	H57	515,290	570,548	246.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BF	H58	514,512	570,431	214.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BG	H59	518,930	572,410	225.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BH	H60	516,878	574,725	190.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BI	H61	517,955	571,250	190.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BJ	H62	514,394	573,903	230.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BK	H63	514,059	570,556	212.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BL	H64	518,941	572,403	223.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BM	H65	518,321	574,087	175.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BN	H66	518,957	572,447	229.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BO	H67	518,976	572,514	232.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BP	H68	518,097	574,217	178.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BQ	H69	518,989	572,432	225.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BR	H70	519,003	572,456	227.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BS	H71	518,987	572,390	220.5	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BT	H72	519,042	572,577	229.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BU	H73	519,032	572,454	225.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5

To be continued on next page...

SHADOW - Main Result

Calculation: Specimen Turbine

...continued from previous page

No.	Name	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
				[m]	[m]	[m]	[m]	[°]		[m]
BV	H74	518,159	574,273	188.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BW	H75	517,248	574,791	194.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BX	H76	514,292	570,334	200.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BY	H77	519,031	572,269	210.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BZ	H78	514,600	574,467	239.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CA	H79	519,083	573,399	197.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CB	H80	518,088	574,393	211.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CC	H81	514,828	574,738	256.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CD	H82	515,800	575,045	228.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CE	H83	514,232	574,023	197.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CF	H84	516,832	574,974	226.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CG	H85	515,011	570,183	215.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CH	H86	516,572	574,987	243.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CI	H87	514,991	574,930	242.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CJ	H88	516,684	575,011	243.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CK	H89	518,743	574,118	179.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CL	H90	514,914	574,938	236.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CM	H91	514,204	570,162	194.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CN	H92	514,308	574,396	209.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CO	H93	515,847	575,193	208.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CP	H94	517,147	575,057	191.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CQ	H95	514,310	574,440	217.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CR	H96	516,360	570,045	235.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CS	H97	515,285	570,118	238.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CT	H98	517,237	575,083	187.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CU	H99	518,853	574,198	159.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CV	H100	514,172	569,993	196.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CW	H101	514,126	574,409	191.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CX	H102	519,337	573,772	183.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CY	H103	515,882	575,406	186.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CZ	H104	519,423	572,097	200.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
DA	H105	515,128	575,313	171.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
DB	H106	519,384	571,987	200.5	2.0	2.0	0.5	90.0	"Green house mode"	2.5

Calculation Results

Shadow receptor

No.	Name	Shadow, worst case			Shadow, expected values	
		Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]	
A	H1	75:21	151	1:03	12:30	
B	H2	125:08	175	1:08	13:36	
C	H3	104:33	180	0:52	20:54	
D	H4	166:19	159	1:53	20:45	
E	H5	97:45	133	1:13	10:47	
F	H6	80:53	177	0:52	13:20	
G	H7	79:01	171	0:55	12:57	
H	H8	82:16	108	1:10	8:19	
I	H9	189:18	114	2:12	19:04	
J	H10	57:54	123	1:02	9:21	
K	H11	58:46	126	0:44	6:52	
L	H12	48:37	96	0:52	4:42	
M	H13	63:35	140	0:46	12:57	
N	H14	135:24	277	1:06	21:19	
O	H15	92:08	82	1:29	8:52	
P	H16	129:22	273	1:05	20:17	
Q	H17	109:51	76	1:54	10:29	
R	H18	39:26	96	0:36	4:35	
S	H19	175:36	144	1:39	34:31	
T	H20	101:26	240	0:54	15:44	
U	H21	57:21	135	0:36	11:42	
V	H22	60:13	144	0:34	6:30	
W	H23	58:42	136	0:34	6:13	

To be continued on next page...

SHADOW - Main Result

Calculation: Specimen Turbine

...continued from previous page

No.	Name	Shadow, worst case		Shadow, expected values	
		Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
X	H24	49:59	115	0:34	5:53
Y	H25	155:11	240	1:11	18:40
Z	H26	30:48	84	0:32	3:35
AA	H27	6:41	27	0:20	1:26
AB	H28	31:11	86	0:33	6:48
AC	H29	18:35	58	0:27	3:59
AD	H30	154:10	246	1:08	18:42
AE	H31	6:21	24	0:19	1:21
AF	H32	26:05	74	0:34	5:38
AG	H33	51:54	133	0:32	5:37
AH	H34	17:22	58	0:25	3:43
AI	H35	8:01	28	0:21	1:43
AJ	H36	23:30	69	0:29	5:01
AK	H37	22:08	68	0:28	4:44
AL	H38	46:39	121	0:37	9:46
AM	H39	0:00	0	0:00	0:00
AN	H40	8:53	31	0:22	1:54
AO	H41	11:12	40	0:21	1:08
AP	H42	20:41	55	0:30	4:35
AQ	H43	34:15	104	0:28	3:43
AR	H44	23:41	66	0:25	2:06
AS	H45	34:32	92	0:29	3:24
AT	H46	22:56	71	0:27	4:53
AU	H47	43:50	125	0:29	4:41
AV	H48	30:01	76	0:28	2:45
AW	H49	2:31	17	0:12	0:12
AX	H50	121:45	246	0:56	15:41
AY	H51	120:16	249	0:51	16:15
AZ	H52	21:17	69	0:26	4:32
BA	H53	9:59	38	0:20	1:02
BB	H54	9:54	34	0:23	2:06
BC	H55	12:01	38	0:24	2:33
BD	H56	44:14	126	0:28	4:41
BE	H57	93:36	172	0:46	18:42
BF	H58	10:40	37	0:23	2:15
BG	H59	16:54	45	0:31	3:46
BH	H60	21:13	64	0:23	1:52
BI	H61	112:45	255	0:48	15:49
BJ	H62	35:05	85	0:41	4:42
BK	H63	0:00	0	0:00	0:00
BL	H64	16:40	44	0:31	3:43
BM	H65	32:50	110	0:25	3:29
BN	H66	16:03	44	0:32	3:33
BO	H67	15:47	44	0:33	3:27
BP	H68	37:25	104	0:27	3:46
BQ	H69	15:25	43	0:31	3:25
BR	H70	15:14	43	0:31	3:21
BS	H71	15:42	42	0:30	3:30
BT	H72	15:09	43	0:33	3:18
BU	H73	14:44	42	0:31	3:14
BV	H74	33:45	98	0:25	3:20
BW	H75	0:00	0	0:00	0:00
BX	H76	8:11	32	0:20	1:43
BY	H77	15:01	45	0:27	3:20
BZ	H78	15:01	48	0:25	1:45
CA	H79	8:57	30	0:23	1:19
CB	H80	20:10	72	0:23	1:57
CC	H81	8:33	33	0:20	0:46
CD	H82	0:00	0	0:00	0:00
CE	H83	8:07	28	0:22	1:18
CF	H84	0:00	0	0:00	0:00
CG	H85	25:18	93	0:25	5:15
CH	H86	0:00	0	0:00	0:00

To be continued on next page...

SHADOW - Main Result

Calculation: Specimen Turbine

...continued from previous page

No.	Name	Shadow, worst case		Shadow, expected values	
		Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
CI	H87	0:00	0	0:00	0:00
CJ	H88	0:00	0	0:00	0:00
CK	H89	29:40	96	0:23	2:53
CL	H90	0:00	0	0:00	0:00
CM	H91	0:00	0	0:00	0:00
CN	H92	28:00	94	0:21	3:08
CO	H93	0:00	0	0:00	0:00
CP	H94	0:00	0	0:00	0:00
CQ	H95	26:10	89	0:21	2:52
CR	H96	89:23	185	0:43	18:02
CS	H97	42:22	107	0:30	8:17
CT	H98	0:00	0	0:00	0:00
CU	H99	0:00	0	0:00	0:00
CV	H100	0:00	0	0:00	0:00
CW	H101	18:59	76	0:20	2:20
CX	H102	6:31	28	0:19	0:54
CY	H103	0:00	0	0:00	0:00
CZ	H104	7:42	33	0:19	1:43
DA	H105	0:00	0	0:00	0:00
DB	H106	9:14	40	0:19	2:01

Total amount of flickering on the shadow receptors caused by each WTG

No.	Name	Worst case [h/year]	Expected [h/year]
1	T1	33:24	3:25
2	T2	46:35	5:58
3	T3	32:54	4:38
4	T4	86:19	17:13
5	T5	140:05	28:08
6	T6	49:31	7:41
7	T7	76:35	8:52
8	T8	152:56	17:56
9	T9	404:35	45:34
10	T10	135:20	17:51
11	T11	107:42	20:10
12	T12	260:53	32:50
13	T13	260:16	31:15
14	T14	176:50	27:24
15	Derragh	413:34	70:50
16	Derragh	190:14	30:31
17	Derragh	63:27	10:04
18	Derragh	212:54	24:52
19	Derragh	97:09	13:06
20	Derragh	14:44	2:37

Total times in Receptor wise and WTG wise tables can differ, as a WTG can lead to flicker at 2 or more receptors simultaneously and/or receptors may receive flicker from 2 or more WTGs simultaneously.

The calculation of the total expected values for a given receptor assumes a weighted average directional reduction for all WTGs contributing to shadow flicker within the same day. In the case where shadow flicker from different WTGs is not concurrent within the day, the total expected time at a given receptor may deviate marginally from the individual flicker time caused by each turbine separately.

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine **Shadow receptor:** A - H1
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 16:36	15:25 (16) 15:48 (16)	08:18 17:24	16:19 (15) 16:37 (15)	07:25 18:16	07:14 20:10
2	08:45 16:37	15:26 (16) 15:49 (16)	08:17 17:26	16:19 (15) 16:36 (15)	07:23 18:18	07:12 20:11
3	08:45 16:39	15:27 (16) 15:49 (16)	08:15 17:28	16:20 (15) 16:35 (15)	07:21 18:19	07:10 20:13
4	08:45 16:40	15:28 (16) 15:50 (16)	08:14 17:30	16:22 (15) 16:33 (15)	07:18 18:21	07:08 20:15
5	08:44 16:41	15:28 (16) 15:50 (16)	08:12 17:32	16:25 (15) 16:32 (15)	07:16 18:23	07:05 20:16
6	08:44 16:42	15:29 (16) 15:50 (16)	08:10 17:33	07:14 18:25	07:03 18:28 (5)	06:00 19:30 (4)
7	08:44 16:43	15:29 (16) 15:50 (16)	08:08 17:35	07:12 18:26	07:01 18:29 (4)	05:59 21:10
8	08:43 16:45	15:30 (16) 15:50 (16)	08:07 17:37	07:09 18:28	06:58 18:29 (4)	05:57 21:12
9	08:43 16:46	15:31 (16) 15:50 (16)	08:05 17:39	07:07 18:30	06:56 18:28 (4)	05:55 21:14
10	08:42 16:47	15:32 (16) 15:50 (16)	08:03 17:41	07:05 18:32	06:54 18:26 (5)	05:53 21:15
11	08:42 16:49	15:33 (16) 15:49 (16)	08:01 17:43	07:03 18:33	06:52 18:27 (4)	05:52 21:17
12	08:41 16:50	15:35 (16) 15:50 (16)	07:59 17:45	07:00 18:35	06:49 18:25 (5)	05:50 21:18
13	08:40 16:52	15:36 (16) 15:49 (16)	07:58 17:46	06:58 18:37	06:47 18:23 (4)	05:48 21:20
14	08:40 16:53	15:38 (16) 15:48 (16)	07:56 17:48	06:56 18:39	06:45 18:25 (5)	05:47 21:22
15	08:39 16:55	15:41 (16) 15:46 (16)	07:54 17:50	06:54 18:40	06:43 18:25 (5)	05:45 21:23
16	08:38 16:56	15:46 (16) 17:52	07:52 17:52	06:51 18:42	06:41 20:35	05:44 21:25
17	08:37 16:58	17:52 17:54	07:50 17:54	06:49 18:44	06:38 20:37	05:42 21:26
18	08:36 17:00	16:20 (15) 16:27 (15)	07:48 17:56	06:47 18:46	06:36 20:39	05:41 21:28
19	08:35 17:01	16:18 (15) 16:28 (15)	07:46 17:58	06:44 18:47	06:34 20:40	05:39 21:29
20	08:34 17:03	16:18 (15) 16:30 (15)	07:44 17:59	06:42 18:49	06:32 20:42	05:38 21:31
21	08:33 17:05	16:17 (15) 16:33 (15)	07:42 18:01	06:40 18:51	06:30 20:44	05:37 21:32
22	08:32 17:06	16:17 (15) 16:34 (15)	07:40 18:03	06:37 18:53	06:28 20:45	05:35 21:33
23	08:31 17:08	16:16 (15) 16:34 (15)	07:38 18:05	06:35 18:54	06:26 20:47	05:34 21:35
24	08:29 17:10	16:16 (15) 16:35 (15)	07:36 18:07	06:33 18:56	06:24 20:49	05:33 21:36
25	08:28 17:12	16:15 (15) 16:35 (15)	07:34 18:08	06:31 18:58	06:22 20:50	05:32 21:38
26	08:27 17:13	16:16 (15) 16:36 (15)	07:31 18:10	06:28 18:59	06:20 20:52	05:30 21:39
27	08:26 17:15	16:17 (15) 16:37 (15)	07:29 18:12	06:26 19:01	06:18 20:54	05:29 21:40
28	08:24 17:17	16:16 (15) 16:37 (15)	07:27 18:14	06:24 19:03	17:44 (5) 18:01 (5)	06:16 20:55
29	08:23 17:19	16:16 (15) 16:37 (15)	18:14 18:14	06:21 20:04	18:41 (5) 19:24 (4)	20:55 20:57
30	08:21 17:20	16:17 (15) 16:37 (15)	18:10 18:10	06:19 20:06	18:38 (5) 19:26 (4)	06:12 20:59
31	08:20 17:22	16:17 (15) 16:37 (15)	18:12 18:12	06:17 20:08	18:35 (5) 19:27 (4)	06:11 20:59
Potential sun hours	259	278	367	416	485	499
Total, worst case	511	68	147	1281		
Sun reduction	0.16	0.21	0.24	0.35		
Oper. time red.	1.00	1.00	1.00	1.00		
Wind dir. red.	0.60	0.60	0.67	0.67		
Total reduction	0.09	0.12	0.16	0.23		
Total, real	47	8	24	300		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Specimen Turbine **Shadow receptor:** A - H1
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December						
1	05:22	05:58	06:48	18:25 (5)	07:37	07:30	08:21	15:15 (16)				
	22:00	21:28	20:26	61 19:26 (4)	19:17	17:11	16:31	16	15:31 (16)			
2	05:22	06:00	06:49	18:24 (5)	07:38	07:32	08:23		15:15 (16)			
	22:00	21:27	20:24	62 19:26 (4)	19:15	17:09	16:30	18	15:33 (16)			
3	05:23	06:01	06:51	18:24 (5)	07:40	07:34	08:24		15:14 (16)			
	21:59	21:25	20:22	62 19:26 (4)	19:12	17:07	16:29	19	15:33 (16)			
4	05:24	06:03	06:53	18:23 (5)	07:42	07:36	08:25		15:15 (16)			
	21:59	21:23	20:19	63 19:26 (4)	19:10	17:05	16:29	20	15:35 (16)			
5	05:25	06:04	06:54	18:24 (5)	07:43	07:38	08:27		15:14 (16)			
	21:58	21:21	20:17	62 19:26 (4)	19:08	17:04	16:28	21	15:35 (16)			
6	05:25	06:06	06:56	18:24 (5)	07:45	07:39	08:28		15:15 (16)			
	21:58	21:20	20:15	62 19:26 (4)	19:05	17:02	16:28	21	15:36 (16)			
7	05:26	06:07	06:57	18:24 (5)	07:47	07:41	08:29		15:15 (16)			
	21:57	21:18	20:13	61 19:25 (4)	19:03	17:00	16:27	22	15:37 (16)			
8	05:27	06:09	06:59	18:25 (5)	07:48	07:43	08:31		15:15 (16)			
	21:57	21:16	20:10	60 19:25 (4)	19:01	16:59	16:27	22	15:37 (16)			
9	05:28	06:11	07:01	18:25 (5)	07:50	07:45	08:32		15:15 (16)			
	21:56	21:14	20:08	58 19:23 (4)	18:59	16:57	16:27	23	15:38 (16)			
10	05:29	06:12	07:02	18:26 (5)	07:52	07:46	08:33		15:16 (16)			
	21:55	21:12	20:06	57 19:23 (4)	18:56	16:55	16:27	23	15:39 (16)			
11	05:30	06:14	07:04	18:26 (5)	07:53	07:48	08:34		15:16 (16)			
	21:55	21:10	20:03	55 19:21 (4)	18:54	16:54	16:26	23	15:39 (16)			
12	05:31	06:15	07:06	18:27 (5)	07:55	07:50	08:35		15:16 (16)			
	21:54	21:08	20:01	53 19:20 (4)	18:52	16:52	16:26	24	15:40 (16)			
13	05:32	06:17	07:07	18:28 (5)	07:57	07:52	08:36		15:17 (16)			
	21:53	21:07	19:59	46 19:17 (4)	18:50	16:51	16:26	23	15:40 (16)			
14	05:34	06:19	07:09	18:30 (5)	07:59	07:54	08:37		15:17 (16)			
	21:52	21:05	19:56	38 19:15 (4)	18:48	16:49	16:26	24	15:41 (16)			
15	05:35	06:20	07:10	18:33 (5)	08:00	07:55	08:38		15:18 (16)			
	21:51	21:03	19:54	19 18:52 (5)	18:45	16:48	16:26	24	15:42 (16)			
16	05:36	06:22	18:46 (5)	07:12	18:38 (5)	08:02	07:57		15:49 (15)	16:26	24	15:41 (16)
	21:50	21:01	19:52	7 18:45 (5)	18:43	16:46	16:26	24	15:41 (16)			
17	05:37	06:23	18:43 (5)	07:14	18:04	07:59	15:49 (15)	16:26		15:18 (16)		
	21:49	20:59	19:03 (5)	19:49	18:41	16:45	16:09 (15)	16:27	24	15:42 (16)		
18	05:38	06:25	18:40 (5)	07:15	08:06	08:01	15:50 (15)	16:27		15:18 (16)		
	21:48	20:57	19:05 (5)	19:47	18:39	16:44	16:09 (15)	16:27	25	15:43 (16)		
19	05:40	06:27	18:38 (5)	07:17	08:07	08:02	15:51 (15)	16:27		15:19 (16)		
	21:47	20:54	19:07 (5)	19:45	18:37	16:42	16:09 (15)	16:27	25	15:44 (16)		
20	05:41	06:28	18:36 (5)	07:19	08:09	08:04	15:52 (15)	16:27		15:19 (16)		
	21:45	20:52	19:07 (5)	19:42	18:35	16:41	16:09 (15)	16:27	24	15:43 (16)		
21	05:42	06:30	18:35 (5)	07:20	08:11	08:06	15:52 (15)	16:27		15:20 (16)		
	21:44	20:50	19:09 (5)	19:40	18:33	16:40	16:08 (15)	16:28	24	15:44 (16)		
22	05:44	06:31	18:33 (5)	07:22	08:13	08:07	15:54 (15)	16:28		15:20 (16)		
	21:43	20:48	19:09 (5)	19:38	18:30	16:39	16:06 (15)	16:28	24	15:44 (16)		
23	05:45	06:33	18:32 (5)	07:23	08:14	08:09	15:55 (15)	16:29		15:21 (16)		
	21:42	20:46	19:10 (5)	19:35	18:28	16:38	16:05 (15)	16:29	24	15:45 (16)		
24	05:46	06:35	18:30 (5)	07:25	08:16	08:11	15:57 (15)	16:30		15:21 (16)		
	21:40	20:44	19:10 (5)	19:33	18:26	16:37	16:04 (15)	16:29	24	15:45 (16)		
25	05:48	06:36	18:29 (5)	07:27	07:18	08:12	15:59 (15)	16:31		15:21 (16)		
	21:39	20:42	19:11 (5)	19:31	17:24	16:36	16:30	25	15:46 (16)			
26	05:49	06:38	18:28 (5)	07:28	07:20	08:14	16:31		15:22 (16)			
	21:37	20:40	19:11 (5)	19:28	17:22	16:35	16:31	24	15:46 (16)			
27	05:51	06:40	18:27 (5)	07:30	07:21	08:15	15:20 (16)	16:32		15:23 (16)		
	21:36	20:37	19:11 (5)	19:26	17:20	16:34	15:25 (16)	16:32	24	15:47 (16)		
28	05:52	06:41	18:27 (5)	07:32	07:23	08:17	15:18 (16)	16:33		15:23 (16)		
	21:35	20:35	19:21 (4)	19:24	17:18	16:33	15:28 (16)	16:32	24	15:47 (16)		
29	05:54	06:43	18:26 (5)	07:33	07:25	08:18	15:16 (16)	16:34		15:24 (16)		
	21:33	20:33	19:22 (4)	19:21	17:16	16:32	15:29 (16)	16:33	24	15:48 (16)		
30	05:55	06:44	18:26 (5)	07:35	07:27	08:20	15:16 (16)	16:34		15:24 (16)		
	21:31	20:31	19:24 (4)	19:19	17:15	16:31	15:31 (16)	16:34	24	15:48 (16)		
31	05:57	06:46	18:25 (5)	07:36	07:29	08:21	15:15 (16)	16:35		15:25 (16)		
	21:30	20:28	19:25 (4)	17:13	17:13	16:35	16:35	24	15:49 (16)			
Potential sun hours	502	454	381	331	266	244	710	0.13				
Total, worst case			624	826	354	710	0.13					
Sun reduction			0.30	0.28	0.18	0.13						
Oper. time red.			1.00	1.00	1.00	1.00						
Wind dir. red.			0.67	0.67	0.60	0.59						
Total reduction			0.20	0.19	0.11	0.08						
Total, real			122	155	39	55						

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: B - H2

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

		January		February		March		April		May		June	
1	08:45		13:18 (13)	08:18		15:58 (10)	07:25		15:38 (12)	07:14	06:10		05:24
	16:36	60	15:44 (6)	17:24	16	16:14 (10)	18:16	42	16:20 (12)	20:10	21:01		21:46
2	08:45		13:18 (13)	08:17		15:56 (10)	07:23		15:39 (12)	07:12	06:08		05:24
	16:37	61	15:44 (6)	17:26	20	16:16 (10)	18:17	41	16:20 (12)	20:11	21:02		21:47
3	08:45		13:18 (13)	08:15		15:55 (10)	07:21		15:40 (12)	07:10	06:06		05:23
	16:38	64	15:46 (6)	17:28	21	16:16 (10)	18:19	39	16:19 (12)	20:13	21:04		21:48
4	08:45		13:19 (13)	08:14		15:55 (10)	07:18		15:41 (12)	07:07	06:04		05:22
	16:40	64	15:47 (6)	17:30	22	16:17 (10)	18:21	37	16:18 (12)	20:15	21:06		21:49
5	08:44		13:19 (13)	08:12		15:55 (10)	07:16		15:41 (12)	07:05	06:02		05:21
	16:41	64	15:47 (6)	17:31	24	16:19 (10)	18:23	35	16:16 (12)	20:16	21:07		21:50
6	08:44		13:20 (13)	08:10		15:54 (10)	07:14		15:43 (12)	07:03	06:00		05:21
	16:42	66	15:49 (6)	17:33	25	16:19 (10)	18:25	41	17:54 (9)	20:18	21:09		21:51
7	08:44		13:20 (13)	08:09		15:54 (10)	07:12		15:45 (12)	07:01	05:58		05:20
	16:43	66	15:49 (6)	17:35	25	16:19 (10)	18:26	42	17:56 (9)	20:20	21:10		21:52
8	08:43		13:21 (13)	08:07		15:54 (10)	07:09		15:48 (12)	06:58	05:57		05:20
	16:45	68	15:51 (6)	17:37	25	16:19 (10)	18:28	40	17:58 (9)	20:22	21:12		21:53
9	08:43		13:21 (13)	08:05		15:50 (12)	07:07		15:50 (12)	06:56	05:55		05:19
	16:46	68	15:51 (6)	17:39	29	16:19 (10)	18:30	36	17:58 (9)	20:23	21:14		21:54
10	08:42		13:22 (13)	08:03		15:48 (12)	07:05		15:56 (12)	06:54	05:53		05:19
	16:47	67	15:51 (6)	17:41	31	16:19 (10)	18:32	26	17:59 (9)	20:25	21:15		21:55
11	08:42		13:22 (13)	08:01		15:46 (12)	07:03		17:38 (9)	06:52	05:52		05:18
	16:49	68	15:52 (6)	17:43	33	16:19 (10)	18:33	21	17:59 (9)	20:27	21:17		21:56
12	08:41		13:24 (13)	08:00		15:44 (12)	07:00		17:37 (9)	06:49	05:50		05:18
	16:50	68	15:53 (6)	17:45	35	16:19 (10)	18:35	21	17:58 (9)	20:28	21:18		21:56
13	08:40		13:24 (13)	07:58		15:43 (12)	06:58		17:37 (9)	06:47	05:48		05:18
	16:52	68	15:54 (6)	17:46	35	16:18 (10)	18:37	21	17:58 (9)	20:30	21:20		21:57
14	08:40		13:25 (13)	07:56		15:42 (12)	06:56		17:38 (9)	06:45	05:47		05:17
	16:53	67	15:54 (6)	17:48	36	16:18 (12)	18:39	20	17:58 (9)	20:32	21:22		21:58
15	08:39		13:25 (13)	07:54		15:41 (12)	06:54		17:37 (9)	06:43	05:45		05:17
	16:55	68	15:55 (6)	17:50	38	16:19 (12)	18:40	20	17:57 (9)	20:33	21:23		21:58
16	08:38		13:26 (13)	07:52		15:40 (12)	06:51		17:38 (9)	06:41	05:44		05:17
	16:56	67	15:55 (6)	17:52	40	16:20 (12)	18:42	18	17:56 (9)	20:35	21:25		21:59
17	08:37		13:27 (13)	07:50		15:39 (12)	06:49		17:40 (9)	06:38	05:42		05:17
	16:58	66	15:56 (6)	17:54	42	16:21 (12)	18:44	14	17:54 (9)	20:37	21:26		21:59
18	08:36		13:28 (13)	07:48		15:39 (12)	06:47		17:41 (9)	06:36	05:41		05:17
	17:00	65	15:56 (6)	17:56	42	16:21 (12)	18:46	10	17:51 (9)	20:39	21:28		22:00
19	08:35		13:28 (13)	07:46		15:38 (12)	06:44			06:34	05:39		05:17
	17:01	63	15:55 (6)	17:57	44	16:22 (12)	18:47			20:40	21:29		22:00
20	08:34		13:29 (13)	07:44		15:38 (12)	06:42			06:32	05:38		05:17
	17:03	62	15:56 (6)	17:59	44	16:22 (12)	18:49			20:42	21:31		22:00
21	08:33		13:30 (13)	07:42		15:38 (12)	06:40			06:30	05:37		05:17
	17:05	60	15:56 (6)	18:01	45	16:23 (12)	18:51			20:44	21:32		22:00
22	08:32		13:32 (13)	07:40		15:37 (12)	06:37			06:28	05:35		05:18
	17:06	56	15:56 (6)	18:03	46	16:23 (12)	18:53			20:45	21:34		22:01
23	08:31		13:33 (13)	07:38		15:37 (12)	06:35			06:26	05:34		05:18
	17:08	53	15:55 (6)	18:05	46	16:23 (12)	18:54			20:47	21:35		22:01
24	08:29		13:34 (13)	07:36		15:37 (12)	06:33			06:24	05:33		05:18
	17:10	51	15:55 (6)	18:07	46	16:23 (12)	18:56			20:49	21:36		22:01
25	08:28		13:36 (13)	07:34		15:37 (12)	06:31			06:22	05:32		05:18
	17:11	45	15:54 (6)	18:08	45	16:22 (12)	18:58			20:50	21:38		22:01
26	08:27		13:38 (13)	07:31		15:37 (12)	06:28			06:20	05:30		05:19
	17:13	37	15:52 (6)	18:10	45	16:22 (12)	18:59			20:52	21:39		22:01
27	08:26		13:40 (13)	07:29		15:37 (12)	06:26			06:18	05:29		05:19
	17:15	28	15:50 (6)	18:12	45	16:22 (12)	19:01			20:54	21:40		22:01
28	08:24		13:43 (13)	07:27		15:38 (12)	06:24			06:16	05:28		05:20
	17:17	20	14:03 (13)	18:14	44	16:22 (12)	19:03			20:55	21:42		22:01
29	08:23		13:46 (13)				07:21			06:14	05:27		05:20
	17:19	13	13:59 (13)				20:05			20:57	21:43		22:01
30	08:21		16:01 (10)				07:19			06:12	05:26		05:21
	17:20	9	16:10 (10)				20:06			20:59	21:44		22:00
31	08:20		15:59 (10)				07:17				05:25		
	17:22	13	16:12 (10)				20:08				21:45		
Potential sun hours		259		278		367			416		485		499
Total, worst case		1695		989		524							
Sun reduction		0.16		0.21		0.24							
Oper. time red.		1.00		1.00		1.00							
Wind dir. red.		0.59		0.59		0.62							
Total reduction		0.09		0.12		0.15							
Total, real		155		121		79							

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Specimen Turbine **Shadow receptor:** B - H2
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22 22:00	05:58 21:28	06:48 20:26	07:37 19:17	18:17 (9) 17:11	08:21 16:30
2	05:22 22:00	06:00 21:27	06:49 20:24	07:38 19:15	18:16 (9) 17:09	08:23 16:30
3	05:23 21:59	06:01 21:25	06:51 20:22	07:40 19:12	18:16 (9) 17:07	08:24 16:29
4	05:24 21:59	06:03 21:23	06:53 20:20	07:42 19:10	16:30 (12) 17:05	08:26 16:29
5	05:24 21:59	06:04 21:22	06:54 20:17	07:43 19:08	16:26 (12) 17:04	08:27 16:28
6	05:25 21:58	06:06 21:20	06:56 20:15	07:45 19:05	16:22 (12) 17:02	08:28 16:28
7	05:26 21:57	06:07 21:18	06:57 20:13	07:47 19:03	16:20 (12) 17:00	08:29 16:27
8	05:27 21:57	06:09 21:16	06:59 20:10	07:48 19:01	16:18 (12) 16:58	08:31 16:27
9	05:28 21:56	06:11 21:14	07:01 20:08	07:50 18:59	16:16 (12) 16:57	08:32 16:27
10	05:29 21:55	06:12 21:12	07:02 20:06	07:52 18:56	16:14 (12) 16:55	08:33 16:26
11	05:30 21:55	06:14 21:10	07:04 20:03	07:54 18:54	16:13 (12) 16:54	08:34 16:26
12	05:31 21:54	06:15 21:09	07:06 20:01	07:55 18:52	16:12 (12) 16:52	08:35 16:26
13	05:32 21:53	06:17 21:07	07:07 19:59	07:57 18:50	16:12 (12) 16:51	08:36 16:26
14	05:33 21:52	06:19 21:05	07:09 19:56	07:59 18:48	16:10 (12) 16:49	08:37 16:26
15	05:35 21:51	06:20 21:03	07:10 19:54	08:00 18:45	16:09 (12) 16:48	08:38 16:26
16	05:36 21:50	06:22 21:01	07:12 19:52	08:02 18:43	16:09 (12) 16:46	13:11 (13) 16:26
17	05:37 21:49	06:23 20:59	07:14 19:49	08:04 18:41	16:09 (12) 16:45	08:40 16:27
18	05:38 21:48	06:25 20:57	07:15 19:47	08:06 18:39	16:09 (12) 16:44	08:40 16:27
19	05:40 21:47	06:27 20:54	07:17 19:45	08:07 18:37	16:08 (12) 16:42	08:41 16:27
20	05:41 21:46	06:28 20:52	07:19 19:42	08:09 18:35	16:08 (12) 16:41	13:07 (13) 16:27
21	05:42 21:44	06:30 20:50	07:20 19:40	08:11 18:33	16:08 (12) 16:40	13:06 (13) 16:28
22	05:44 21:43	06:31 20:48	07:22 19:38	08:13 18:30	16:08 (12) 16:39	13:05 (13) 16:28
23	05:45 21:42	06:33 20:46	07:23 19:35	08:14 18:28	16:09 (12) 16:38	13:05 (13) 16:29
24	05:46 21:40	06:35 20:44	07:25 19:33	08:16 18:26	16:09 (12) 16:37	13:05 (13) 16:29
25	05:48 21:39	06:36 20:42	07:27 19:31	07:18 18:25 (9) 17:24	15:10 (12) 08:12 15:51 (12) 16:36	13:05 (13) 08:44 13:04 (13) 16:30
26	05:49 21:38	06:38 20:40	07:28 19:28	07:20 18:22 (9) 17:22	15:11 (12) 08:14 15:50 (12) 16:35	13:04 (13) 08:44 15:33 (6) 16:31
27	05:51 21:36	06:40 20:37	07:30 19:26	07:21 18:20 (9) 17:20	15:10 (12) 08:15 15:48 (12) 16:34	13:04 (13) 08:45 15:34 (6) 16:31
28	05:52 21:35	06:41 20:35	07:32 19:24	07:23 18:19 (9) 17:18	15:11 (12) 08:17 15:47 (10) 16:33	13:05 (13) 08:45 15:34 (6) 16:32
29	05:53 21:33	06:43 20:33	07:33 19:21	07:25 18:18 (9) 17:16	15:13 (12) 08:18 15:48 (10) 16:32	13:04 (13) 08:45 15:34 (6) 16:33
30	05:55 21:32	06:44 20:31	07:35 19:19	07:27 18:17 (9) 17:15	15:14 (12) 08:20 15:48 (10) 16:31	13:05 (13) 08:45 15:35 (6) 16:34
31	05:56 21:30	06:46 20:29		07:29 17:13 15:49 (10)		08:45 16:35 15:42 (6)
Potential sun hours	502	454	381	331	266	244
Total, worst case			100	1207		1777
Sun reduction			0.28	0.24		0.13
Oper. time red.			1.00	1.00		1.00
Wind dir. red.			0.65	0.60		0.59
Total reduction			0.18	0.14		0.08
Total, real			18	172		141

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: C - H3
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June	
1	08:45 16:36	08:18 17:24	07:25 18:16	07:14 20:10	06:10 21:00	19:49 (6) 21:46	20:00 (11)
2	08:45 16:37	08:17 17:26	07:23 18:17	07:12 20:11	06:08 21:02	19:52 (6) 20:10 (11)	20:51 (10)
3	08:45 16:38	08:15 17:28	07:21 18:19	07:10 20:13	06:06 21:04	20:06 (11) 20:23 (11)	20:02 (11)
4	08:45 16:40	08:14 17:30	07:18 18:21	07:07 20:15	06:04 21:05	20:05 (11) 20:26 (11)	20:52 (10)
5	08:44 16:41	08:12 17:31	07:16 18:23	17:27 (5) 20:16	07:05 21:07	20:03 (11) 20:27 (11)	20:53 (11)
6	08:44 16:42	08:10 17:33	07:14 18:25	17:24 (5) 20:18	07:03 21:09	20:01 (11) 20:28 (11)	20:04 (11)
7	08:44 16:43	08:08 17:35	07:12 18:26	17:21 (5) 20:20	07:01 21:10	20:01 (11) 20:29 (11)	20:05 (11)
8	08:43 16:45	08:07 17:37	07:09 18:28	17:20 (5) 20:22	06:58 21:12	19:59 (11) 20:30 (11)	20:54 (10)
9	08:43 16:46	08:05 17:39	07:07 18:30	17:18 (5) 20:23	06:56 21:14	19:58 (11) 20:30 (11)	20:53 (10)
10	08:42 16:47	08:03 17:41	07:05 18:32	17:17 (5) 20:25	06:54 21:15	19:58 (11) 20:31 (11)	20:06 (11)
11	08:42 16:49	08:01 17:43	07:03 18:33	17:16 (5) 20:27	06:52 21:17	19:57 (11) 20:31 (11)	20:07 (11)
12	08:41 16:50	07:59 17:45	07:00 18:35	17:15 (5) 20:28	06:49 21:18	19:57 (11) 20:32 (11)	20:07 (11)
13	08:40 16:52	07:58 17:46	06:58 18:37	17:14 (5) 20:30	06:47 21:20	19:56 (11) 20:32 (11)	20:54 (10)
14	08:40 16:53	07:56 17:48	06:56 18:39	17:14 (5) 20:32	06:45 21:22	19:56 (11) 20:33 (11)	20:09 (11)
15	08:39 16:55	07:54 17:50	06:54 18:40	17:13 (5) 20:33	06:43 19:49 (6)	19:56 (11) 20:32 (11)	20:55 (10)
16	08:38 16:56	07:52 17:52	06:51 18:42	17:13 (5) 20:35	06:41 21:25	19:56 (11) 20:33 (11)	20:09 (11)
17	08:37 16:58	07:50 17:54	06:49 18:44	17:14 (5) 20:37	06:38 21:26	19:56 (11) 20:33 (11)	20:55 (10)
18	08:36 17:00	07:48 17:56	06:47 18:46	17:13 (5) 20:39	06:36 21:28	19:55 (11) 20:33 (11)	20:10 (11)
19	08:35 17:01	07:46 17:57	06:44 18:47	17:14 (5) 20:40	06:34 21:29	19:56 (11) 20:33 (11)	20:11 (11)
20	08:34 17:03	07:44 17:59	06:42 18:49	17:15 (5) 20:42	06:32 21:31	19:56 (11) 20:33 (11)	20:11 (11)
21	08:33 17:05	07:42 18:01	06:40 18:51	17:15 (5) 20:44	06:30 21:32	19:56 (11) 20:34 (11)	20:11 (11)
22	08:32 17:06	07:40 18:03	06:37 18:53	17:17 (5) 20:45	06:28 21:33	19:56 (11) 20:41 (10)	20:11 (11)
23	08:31 17:08	07:38 18:05	06:35 18:54	17:19 (5) 20:47	06:26 21:35	19:56 (11) 20:44 (10)	20:11 (11)
24	08:29 17:10	07:36 18:07	06:33 18:56	17:22 (5) 20:49	06:24 21:36	19:57 (11) 20:45 (10)	20:12 (11)
25	08:28 17:11	07:33 18:08	06:31 18:58	17:48 (4) 20:50	06:22 21:38	19:57 (11) 20:47 (10)	20:12 (11)
26	08:27 17:13	07:31 18:10	06:28 18:59	17:51 (4) 20:52	06:20 21:39	19:57 (11) 20:48 (10)	20:12 (11)
27	08:26 17:15	07:29 18:12	06:26 19:01	06:18 20:54	06:18 21:40	19:58 (11) 20:48 (10)	20:12 (11)
28	08:24 17:17	07:27 18:14	06:24 19:03	06:16 20:55	06:16 21:41	19:58 (11) 20:49 (10)	20:11 (11)
29	08:23 17:19	07:21 19:04	06:14 20:04	06:14 20:57	06:14 21:43	19:58 (11) 20:49 (10)	20:11 (11)
30	08:21 17:20	07:19 20:06	06:12 20:59	06:12 20:59	06:12 21:44	20:00 (11) 20:51 (10)	20:12 (11)
31	08:20 17:22	07:17 20:08	06:11 20:58	06:11 20:58	06:11 21:45	20:00 (11) 20:51 (10)	20:58 (10)
Potential sun hours	259	278	367	416	485	499	1365
Total, worst case			743	296			0.30
Sun reduction			0.24	0.35			1.00
Oper. time red.			1.00	1.00			0.68
Wind dir. red.			0.65	0.67			0.20
Total reduction			0.16	0.24			279
Total, real			117	71			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)



SHADOW - Calendar

Calculation: Specimen Turbine **Shadow receptor:** C - H3
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July		August		September		October		November		December		
1	05:22		20:11 (11)	05:58		20:08 (11)	06:48		07:37		17:54 (5)	07:30	08:21
	22:00	46	20:58 (10)	21:28	35	20:43 (11)	20:26		19:17	31	18:25 (5)	17:11	16:31
2	05:22		20:11 (11)	06:00		20:08 (11)	06:49		07:38		17:54 (5)	07:32	08:23
	22:00	48	20:59 (10)	21:27	34	20:42 (11)	20:24		19:15	30	18:24 (5)	17:09	16:30
3	05:23		20:11 (11)	06:01		20:09 (11)	06:51		07:40		17:54 (5)	07:34	08:24
	21:59	48	20:59 (10)	21:25	33	20:42 (11)	20:22		19:12	29	18:23 (5)	17:07	16:29
4	05:24		20:10 (11)	06:03		20:09 (11)	06:53		07:42		17:55 (5)	07:36	08:25
	21:59	48	20:58 (10)	21:23	31	20:40 (11)	20:19		19:10	27	18:22 (5)	17:05	16:29
5	05:25		20:10 (11)	06:04		20:10 (11)	06:54		07:43		17:55 (5)	07:38	08:27
	21:58	49	20:59 (10)	21:21	30	20:40 (11)	20:17		19:08	25	18:20 (5)	17:04	16:28
6	05:25		20:10 (11)	06:06		20:10 (11)	06:56		07:45		17:57 (5)	07:39	08:28
	21:58	49	20:59 (10)	21:20	29	20:39 (11)	20:15		19:05	22	18:19 (5)	17:02	16:28
7	05:26		20:10 (11)	06:07		20:11 (11)	06:57		07:47		17:58 (5)	07:41	08:29
	21:57	49	20:59 (10)	21:18	26	20:37 (11)	20:13		19:03	19	18:17 (5)	17:00	16:27
8	05:27		20:10 (11)	06:09		20:13 (11)	06:59		07:48		18:01 (5)	07:43	08:31
	21:57	50	21:00 (10)	21:16	23	20:36 (11)	20:10		19:01	13	18:14 (5)	16:58	16:27
9	05:28		20:10 (11)	06:11		20:14 (11)	07:01		07:50			07:45	08:32
	21:56	50	21:00 (10)	21:14	20	20:34 (11)	20:08		18:59			16:57	16:27
10	05:29		20:09 (11)	06:12		20:16 (11)	07:02		07:52			07:46	08:33
	21:55	51	21:00 (10)	21:12	16	20:32 (11)	20:06		18:56			16:55	16:27
11	05:30		20:09 (11)	06:14		20:19 (11)	07:04		07:53			07:48	08:34
	21:55	51	21:00 (10)	21:10	8	20:27 (11)	20:03		18:54			16:54	16:26
12	05:31		20:09 (11)	06:15		19:56 (6)	07:06		07:55			07:50	08:35
	21:54	51	21:00 (10)	21:08	7	20:03 (6)	20:01		18:52			16:52	16:26
13	05:32		20:08 (11)	06:17		19:53 (6)	07:07		07:57			07:52	08:36
	21:53	51	20:59 (10)	21:07	12	20:05 (6)	19:59		18:50			16:51	16:26
14	05:33		20:08 (11)	06:19		19:51 (6)	07:09		07:59			07:54	08:37
	21:52	51	20:59 (10)	21:05	16	20:07 (6)	19:56		18:48			16:49	16:26
15	05:35		20:08 (11)	06:20		19:50 (6)	07:10		08:00			07:55	08:38
	21:51	51	20:59 (10)	21:03	18	20:08 (6)	19:54		18:45			16:48	16:26
16	05:36		20:07 (11)	06:22		19:49 (6)	07:12		08:02			07:57	08:39
	21:50	51	20:58 (10)	21:01	19	20:08 (6)	19:52		18:43			16:46	16:26
17	05:37		20:07 (11)	06:23		19:48 (6)	07:14		18:40 (4)	08:04		07:59	08:39
	21:49	50	20:57 (10)	20:59	21	20:09 (6)	19:49	7	18:47 (4)	18:41		16:45	16:27
18	05:38		20:07 (11)	06:25		19:47 (6)	07:15		18:36 (4)	08:06		08:00	08:40
	21:48	50	20:57 (10)	20:56	22	20:09 (6)	19:47	13	18:49 (4)	18:39		16:44	16:27
19	05:40		20:06 (11)	06:27		19:47 (6)	07:17		18:09 (5)	08:07		08:02	08:41
	21:47	50	20:56 (10)	20:54	22	20:09 (6)	19:45	27	18:51 (4)	18:37		16:42	16:27
20	05:41		20:07 (11)	06:28		19:46 (6)	07:19		18:06 (5)	08:09		08:04	08:42
	21:45	48	20:55 (10)	20:52	23	20:09 (6)	19:42	35	18:52 (4)	18:35		16:41	16:27
21	05:42		20:07 (11)	06:30		19:46 (6)	07:20		18:03 (5)	08:11		08:06	08:42
	21:44	44	20:53 (10)	20:50	23	20:09 (6)	19:40	41	18:52 (4)	18:33		16:40	16:28
22	05:44		20:06 (11)	06:31		19:46 (6)	07:22		18:01 (5)	08:13		08:07	08:43
	21:43	37	20:43 (11)	20:48	22	20:08 (6)	19:38	45	18:52 (4)	18:30		16:39	16:28
23	05:45		20:06 (11)	06:33		19:46 (6)	07:23		17:59 (5)	08:14		08:09	08:43
	21:42	37	20:43 (11)	20:46	22	20:08 (6)	19:35	47	18:51 (4)	18:28		16:38	16:29
24	05:46		20:07 (11)	06:35		19:46 (6)	07:25		17:58 (5)	08:16		08:11	08:44
	21:40	37	20:44 (11)	20:44	21	20:07 (6)	19:33	51	18:52 (4)	18:26		16:37	16:29
25	05:48		20:06 (11)	06:36		19:47 (6)	07:27		17:57 (5)	07:18		08:12	08:44
	21:39	38	20:44 (11)	20:42	19	20:06 (6)	19:31	51	18:51 (4)	17:24		16:36	16:30
26	05:49		20:06 (11)	06:38		19:47 (6)	07:28		17:56 (5)	07:20		08:14	08:44
	21:37	37	20:43 (11)	20:40	17	20:04 (6)	19:28	51	18:50 (4)	17:22		16:35	16:31
27	05:51		20:07 (11)	06:40		19:49 (6)	07:30		17:55 (5)	07:21		08:15	08:45
	21:36	37	20:44 (11)	20:37	14	20:03 (6)	19:26	50	18:49 (4)	17:20		16:34	16:32
28	05:52		20:06 (11)	06:41		19:51 (6)	07:32		17:55 (5)	07:23		08:17	08:45
	21:35	37	20:43 (11)	20:35	9	20:00 (6)	19:24	49	18:48 (4)	17:18		16:33	16:32
29	05:54		20:06 (11)	06:43			07:33		17:54 (5)	07:25		08:18	08:45
	21:33	37	20:43 (11)	20:33			19:21	47	18:46 (4)	17:16		16:32	16:33
30	05:55		20:07 (11)	06:44			07:35		17:54 (5)	07:27		08:20	08:45
	21:31	36	20:43 (11)	20:31			19:19	41	18:43 (4)	17:15		16:31	16:34
31	05:57		20:07 (11)	06:46						07:29			08:45
	21:30	35	20:42 (11)	20:28						17:13			16:35
Potential sun hours	502		454		381		331			266		244	
Total, worst case	1404		592		555		196						
Sun reduction	0.27		0.30		0.28		0.24						
Oper. time red.	1.00		1.00		1.00		1.00						
Wind dir. red.	0.68		0.68		0.65		0.64						
Total reduction	0.18		0.20		0.18		0.15						
Total, real	255		119		102		30						

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Specimen Turbine **Shadow receptor: D - H4**
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June		
1	08:45 16:36	09:43 (15) 17:24	08:18 17:24	08:45 (16) 18:16	07:25 20:10	07:14 21:01	06:10 21:46	
2	08:45 16:38	09:43 (15) 17:26	08:17 17:26	08:43 (16) 18:18	07:23 20:11	07:12 21:02	06:08 21:47	
3	08:45 16:39	09:43 (15) 17:28	08:15 17:28	08:41 (16) 18:19	07:21 20:13	07:10 21:04	06:06 21:48	
4	08:45 16:40	09:44 (15) 17:30	08:14 17:30	08:39 (16) 18:21	07:18 20:15	07:08 21:06	06:04 21:49	
5	08:44 16:41	09:43 (15) 17:32	08:12 17:32	08:38 (16) 18:23	07:16 20:17	07:05 21:07	06:02 21:50	
6	08:44 16:42	09:44 (15) 17:33	08:10 17:33	08:37 (16) 18:25	07:14 20:18	07:03 21:09	06:00 21:51	
7	08:44 16:43	09:43 (15) 17:35	08:09 17:35	08:37 (16) 18:27	07:12 20:20	07:01 21:10	05:59 21:52	
8	08:43 16:45	09:44 (15) 17:37	08:07 17:37	08:37 (16) 18:28	07:10 20:22	06:59 21:12	05:57 21:53	
9	08:43 16:46	09:43 (15) 17:39	08:05 17:39	08:37 (16) 18:30	07:07 20:23	06:56 21:14	05:55 21:54	20:47 (1)
10	08:42 16:48	09:43 (15) 17:41	08:03 17:41	08:37 (16) 18:32	07:05 20:25	06:54 21:15	05:19 21:55	20:48 (1) 20:45 (1) 20:52 (1)
11	08:42 16:49	09:42 (15) 17:43	08:01 17:43	08:37 (16) 18:34	07:03 20:27	06:52 21:17	05:19 21:56	20:43 (1) 20:52 (1)
12	08:41 16:50	09:43 (15) 17:45	08:00 17:45	08:38 (16) 18:35	07:01 20:28	06:50 21:18	05:18 21:56	20:43 (1) 20:54 (1)
13	08:40 16:52	09:43 (15) 17:47	07:58 17:47	08:38 (16) 18:37	06:58 20:30	06:47 21:20	05:18 21:57	20:42 (1) 20:55 (1)
14	08:40 16:53	09:43 (15) 17:48	07:56 17:48	08:39 (16) 18:39	06:56 20:32	06:45 21:22	05:18 21:58	18 20:55 (1)
15	08:39 16:55	09:43 (15) 17:50	07:54 17:50	08:40 (16) 18:41	06:54 20:34	06:43 21:23	05:18 21:58	21 20:56 (1)
16	08:38 16:57	09:42 (15) 17:52	07:52 17:52	08:41 (16) 18:42	06:51 20:35	06:41 21:25	05:17 21:59	24 20:57 (1)
17	08:37 16:58	09:42 (15) 17:54	07:50 17:54	08:42 (16) 18:44	06:49 20:37	06:39 21:26	05:17 21:59	25 20:57 (1)
18	08:36 17:00	09:42 (15) 17:56	07:48 17:56	08:43 (16) 18:46	06:47 20:39	06:36 21:28	05:17 21:59	26 20:58 (1)
19	08:35 17:01	09:41 (15) 17:58	07:46 17:58	08:45 (16) 18:47	06:44 20:40	06:34 21:29	05:17 22:00	27 20:58 (1)
20	08:34 17:03	09:02 (16) 17:59	07:44 17:59	08:47 (16) 18:49	06:42 20:42	06:32 21:31	05:17 22:00	27 20:58 (1)
21	08:33 17:05	09:01 (16) 18:01	07:42 18:01	08:50 (16) 18:51	06:40 20:44	06:30 21:32	05:18 22:00	27 20:58 (1)
22	08:32 17:06	09:00 (16) 18:03	07:40 18:03	09:56 (15) 18:53	06:38 20:45	06:28 21:33	05:18 22:01	27 20:58 (1)
23	08:31 17:08	08:58 (16) 18:05	07:38 18:05	09:58 (15) 18:54	06:35 20:47	06:26 21:35	05:18 22:01	27 20:59 (1)
24	08:30 17:10	08:57 (16) 18:07	07:36 18:07	10:01 (15) 18:56	06:33 20:49	06:24 21:36	05:18 22:01	27 20:59 (1)
25	08:28 17:12	08:56 (16) 18:09	07:34 18:09	10:04 (15) 18:58	06:31 20:50	06:22 21:38	05:19 22:01	25 20:58 (1)
26	08:27 17:13	08:54 (16) 18:10	07:31 18:10	10:11 (15) 18:59	06:28 20:52	06:20 21:39	05:19 22:01	24 20:59 (1)
27	08:26 17:15	08:53 (16) 18:12	07:29 18:12	10:18 (15) 19:01	06:26 20:54	06:18 21:40	05:19 22:01	22 20:58 (1)
28	08:24 17:17	08:51 (16) 18:14	07:27 18:14	10:01 (15) 19:03	06:24 20:56	06:16 21:41	05:20 22:01	20 20:59 (1)
29	08:23 17:19	08:49 (16) 18:15	07:26 18:15	09:59 (15) 19:05	06:23 20:57	06:14 21:43	05:21 22:01	15 20:58 (1)
30	08:21 17:21	08:48 (16) 18:16	07:25 18:16	10:06 (15) 19:07	06:22 20:59	06:12 21:44	05:21 22:00	12 20:58 (1)
31	08:20 17:22	08:46 (16) 18:17	07:24 18:17	10:08 (15) 19:09	06:21 21:00	06:11 21:45	05:20 22:00	
Potential sun hours	259	278	367	416	485	499		
Total, worst case	2082	2217					435	
Sun reduction	0.16	0.21					0.30	
Oper. time red.	1.00	1.00					1.00	
Wind dir. red.	0.66	0.67					0.66	
Total reduction	0.10	0.14					0.20	
Total, real	215	305					87	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Specimen Turbine **Shadow receptor:** D - H4
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22	20:47 (1)	05:58	06:48	07:37	07:30
	22:00	10 20:57 (1)	21:28	20:26	19:17	17:11
2	05:22	20:48 (1)	06:00	06:49	07:38	07:32
	22:00	8 20:56 (1)	21:27	20:24	19:15	17:09
3	05:23	20:51 (1)	06:01	06:51	07:40	07:34
	21:59	4 20:55 (1)	21:25	20:22	19:12	17:07
4	05:24		06:03	06:53	07:42	07:36
	21:59		21:23	20:20	19:10	17:05
5	05:25		06:04	06:54	07:43	07:38
	21:59		21:22	20:17	19:08	17:04
6	05:26		06:06	06:56	07:45	07:39
	21:58		21:20	20:15	19:06	17:02
7	05:26		06:08	06:58	07:47	07:41
	21:57		21:18	20:13	19:03	17:00
8	05:27		06:09	06:59	07:48	07:43
	21:57		21:16	20:10	19:01	16:59
9	05:28		06:11	07:01	07:50	07:45
	21:56		21:14	20:08	18:59	16:57
10	05:29		06:12	07:02	07:52	07:47
	21:55		21:12	20:06	18:56	16:55
11	05:30		06:14	07:04	07:54	07:48
	21:55		21:10	20:03	18:54	16:54
12	05:31		06:15	07:06	07:55	07:50
	21:54		21:09	20:01	18:52	16:52
13	05:33		06:17	07:07	07:57	07:52
	21:53		21:07	19:59	18:50	16:51
14	05:34		06:19	07:09	07:59	07:54
	21:52		21:05	19:57	18:48	16:49
15	05:35		06:20	07:11	08:00	07:55
	21:51		21:03	19:54	18:45	16:48
16	05:36		06:22	07:12	08:02	07:57
	21:50		21:01	19:52	18:43	16:46
17	05:37		06:24	07:14	08:04	07:59
	21:49		20:59	19:50	18:41	16:45
18	05:38		06:25	07:15	08:06	08:01
	21:48		20:57	19:47	18:39	16:44
19	05:40		06:27	07:17	08:07	08:02
	21:47		20:55	19:45	18:37	16:42
20	05:41		06:28	07:19	08:09	08:04
	21:46		20:52	19:43	18:35	16:41
21	05:42		06:30	07:20	08:11	08:06
	21:44		20:50	19:40	18:33	16:40
22	05:44		06:32	07:22	08:13	08:07
	21:43		20:48	19:38	18:31	16:39
23	05:45		06:33	07:24	08:14	08:09
	21:42		20:46	19:36	18:29	16:38
24	05:46		06:35	07:25	08:16	08:11
	21:40		20:44	19:33	18:26	16:37
25	05:48		06:36	07:27	08:18	08:12
	21:39		20:42	19:31	17:24	16:36
26	05:49		06:38	07:28	08:19	08:14
	21:38		20:40	19:29	17:22	16:35
27	05:51		06:40	07:30	08:21	08:15
	21:36		20:37	19:26	17:20	16:34
28	05:52		06:41	07:32	08:22	08:16
	21:35		20:35	19:24	17:19	16:33
29	05:54		06:43	07:33	08:23	08:17
	21:33		20:33	19:22	17:17	16:32
30	05:55		06:45	07:35	08:24	08:18
	21:32		20:31	19:19	17:15	16:31
31	05:57		06:46	07:36	08:25	08:19
	21:30		20:29	19:17	17:13	16:30
Potential sun hours	502	454	381	331	266	244
Total, worst case				1160		1447
Sun reduction	0.27			0.24		0.13
Oper. time red.	1.00			1.00		1.00
Wind dir. red.	0.69			0.67		0.66
Total reduction	0.18			0.16		0.09
Total, real	4			184		129

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: E - H5
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

	January		February		March		April		May		June	
1	08:45		10:14 (9)	08:18		10:22 (9)	07:25		07:14		06:10	05:25
	16:36	40	10:54 (9)	17:24	43	11:05 (9)	18:16		20:10		21:01	21:46
2	08:45		10:13 (9)	08:17		10:23 (9)	07:23		07:12		06:08	05:24
	16:37	41	10:54 (9)	17:26	41	11:04 (9)	18:18		20:11		21:02	21:48
3	08:45		09:57 (10)	08:15		10:24 (9)	07:21		07:10		06:06	05:23
	16:39	44	10:55 (9)	17:28	39	11:03 (9)	18:19		20:13		21:04	21:49
4	08:45		09:56 (10)	08:14		10:25 (9)	07:19		07:08		06:04	05:22
	16:40	49	10:56 (9)	17:30	38	11:03 (9)	18:21		20:15		21:06	21:50
5	08:45		09:54 (10)	08:12		10:26 (9)	07:16		07:05		06:02	05:22
	16:41	52	10:56 (9)	17:32	36	11:02 (9)	18:23		20:17		21:07	21:51
6	08:44		09:54 (10)	08:10		10:27 (9)	07:14		07:03		06:00	05:21
	16:42	54	10:57 (9)	17:33	33	11:00 (9)	18:25		20:18		21:09	21:52
7	08:44		09:53 (10)	08:09		10:29 (9)	07:12		07:01		05:59	05:20
	16:43	58	10:58 (9)	17:35	30	10:59 (9)	18:27		20:20		21:11	21:53
8	08:43		09:53 (10)	08:07		10:31 (9)	07:10		06:59		05:57	05:20
	16:45	60	10:59 (9)	17:37	26	10:57 (9)	18:28		20:22		21:12	21:53
9	08:43		09:53 (10)	08:05		10:33 (9)	07:07		06:56		05:55	05:19
	16:46	60	10:59 (9)	17:39	21	10:54 (9)	18:30		20:23		21:14	21:54
10	08:42		09:52 (10)	08:03		10:37 (9)	07:05		06:54		05:53	05:19
	16:47	63	11:00 (9)	17:41	13	10:50 (9)	18:32		20:25		21:15	21:55
11	08:42		09:53 (10)	08:02			07:03		06:52		05:52	05:18
	16:49	65	11:01 (9)	17:43			18:34		20:27		21:17	21:56
12	08:41		09:53 (10)	08:00			07:01		06:50		05:50	05:18
	16:50	66	11:01 (9)	17:45			18:35		20:28		21:19	21:56
13	08:41		09:52 (10)	07:58			06:58		06:47		05:48	05:18
	16:52	68	11:02 (9)	17:46			18:37		20:30		21:20	21:57
14	08:40		09:52 (10)	07:56		08:35 (12)	06:56		06:45		05:47	05:18
	16:53	69	11:02 (9)	17:48	8	08:43 (12)	18:39		20:32		21:22	21:58
15	08:39		09:52 (10)	07:54		08:32 (12)	06:54		06:43		05:45	05:17
	16:55	70	11:03 (9)	17:50	14	08:46 (12)	18:41		20:34		21:23	21:58
16	08:38		09:52 (10)	07:52		08:31 (12)	06:51		06:41		05:44	05:17
	16:56	71	11:04 (9)	17:52	16	08:47 (12)	18:42		20:35		21:25	21:59
17	08:37		09:52 (10)	07:50		08:29 (12)	06:49		06:39		05:42	05:17
	16:58	72	11:04 (9)	17:54	18	08:47 (12)	18:44		20:37		21:26	21:59
18	08:36		09:53 (10)	07:48		08:28 (12)	06:47		06:36		05:41	05:17
	17:00	72	11:05 (9)	17:56	20	08:48 (12)	18:46		20:39		21:28	22:00
19	08:35		09:53 (10)	07:46		08:27 (12)	06:45		06:34		05:39	05:17
	17:01	72	11:05 (9)	17:58	22	08:49 (12)	18:47		20:40		21:29	22:00
20	08:34		09:52 (10)	07:44		08:27 (12)	06:42		06:32		05:38	05:17
	17:03	73	11:05 (9)	17:59	22	08:49 (12)	18:49		20:42		21:31	22:00
21	08:33		09:53 (10)	07:42		08:27 (12)	06:40		06:30		05:37	05:17
	17:05	73	11:06 (9)	18:01	22	08:49 (12)	18:51		20:44		21:32	22:01
22	08:32		09:54 (10)	07:40		08:27 (12)	06:38		06:28		05:35	05:18
	17:06	72	11:06 (9)	18:03	22	08:49 (12)	18:53		20:45		21:34	22:01
23	08:31		09:53 (10)	07:38		08:27 (12)	06:35		06:26		05:34	05:18
	17:08	73	11:06 (9)	18:05	22	08:49 (12)	18:54		20:47		21:35	22:01
24	08:30		09:54 (10)	07:36		08:28 (12)	06:33		06:24		05:33	05:18
	17:10	72	11:06 (9)	18:07	21	08:49 (12)	18:56		20:49		21:36	22:01
25	08:28		09:55 (10)	07:34		08:28 (12)	06:31		06:22		05:32	05:19
	17:12	72	11:07 (9)	18:09	19	08:47 (12)	18:58		20:51		21:38	22:01
26	08:27		09:56 (10)	07:32		08:29 (12)	06:28		06:20		05:30	05:19
	17:13	69	11:06 (9)	18:10	17	08:46 (12)	19:00		20:52		21:39	22:01
27	08:26		09:57 (10)	07:29		08:30 (12)	06:26		06:18		05:29	05:19
	17:15	68	11:07 (9)	18:12	14	08:44 (12)	19:01		20:54		21:40	22:01
28	08:24		09:57 (10)	07:27		08:33 (12)	06:24		06:16		05:28	05:20
	17:17	66	11:06 (9)	18:14	9	08:42 (12)	19:03		20:56		21:42	22:01
29	08:23		09:59 (10)				07:21		06:14		05:27	05:20
	17:19	64	11:07 (9)				20:05		20:57		21:43	22:01
30	08:21		10:00 (10)				07:19		06:12		05:26	05:21
	17:21	59	11:06 (9)				20:06		20:59		21:44	22:01
31	08:20		10:02 (10)				07:17				05:25	
	17:22	54	11:05 (9)				20:08				21:45	
Potential sun hours	259			278			367		416		485	499
Total, worst case	1961			586								
Sun reduction	0.16			0.21								
Oper. time red.	1.00			1.00								
Wind dir. red.	0.65			0.67								
Total reduction	0.10			0.14								
Total, real	200			80								

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
 Finisklin Business Park
 IE-F91 RHH9 Sligo
 +353719161416
 Karen O'Neill / koneill@jodireland.com
 Calculated:
 06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine **Shadow receptor:** E - H5
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22 22:00	05:58 21:28	06:48 20:26	07:37 19:17	07:31 17:11	10:05 (9) 16:31
2	05:22 22:00	06:00 21:27	06:49 20:24	07:38 19:15	07:32 17:09	10:02 (9) 16:30
3	05:23 22:00	06:01 21:25	06:51 20:22	07:40 19:12	07:34 17:07	10:00 (9) 16:29
4	05:24 21:59	06:03 21:23	06:53 20:20	07:42 19:10	07:36 17:05	09:58 (9) 16:29
5	05:25 21:59	06:04 21:22	06:54 20:17	07:43 19:08	07:38 17:04	09:57 (9) 16:28
6	05:25 21:58	06:06 21:20	06:56 20:15	07:45 19:06	07:40 17:02	09:56 (9) 16:28
7	05:26 21:58	06:07 21:18	06:58 20:13	07:47 19:03	07:41 17:00	09:55 (9) 16:27
8	05:27 21:57	06:09 21:16	06:59 20:10	07:49 19:01	07:43 16:59	09:54 (9) 16:27
9	05:28 21:56	06:11 21:14	07:01 20:08	07:50 18:59	07:45 16:57	09:54 (9) 16:27
10	05:29 21:56	06:12 21:12	07:02 20:06	07:52 18:56	07:47 16:55	09:53 (9) 16:27
11	05:30 21:55	06:14 21:11	07:04 20:04	07:54 18:54	07:48 16:54	09:54 (9) 16:26
12	05:31 21:54	06:15 21:09	07:06 20:01	07:55 18:52	07:50 16:52	09:53 (9) 16:26
13	05:32 21:53	06:17 21:07	07:07 19:59	07:57 18:50	07:52 16:51	09:52 (9) 16:26
14	05:34 21:52	06:19 21:05	07:09 19:57	07:59 18:48	07:54 16:49	09:51 (9) 16:26
15	05:35 21:51	06:20 21:03	07:11 19:54	08:00 18:45	07:56 16:48	09:50 (9) 16:26
16	05:36 21:50	06:22 21:01	07:12 19:52	08:02 18:43	07:57 16:46	09:49 (9) 16:26
17	05:37 21:49	06:23 20:59	07:14 19:50	08:04 18:41	07:59 16:45	09:48 (9) 16:27
18	05:38 21:48	06:25 20:57	07:15 19:47	08:06 18:39	08:01 16:44	09:47 (9) 16:27
19	05:40 21:47	06:27 20:55	07:17 19:45	08:07 18:37	08:02 16:42	09:46 (9) 16:27
20	05:41 21:46	06:28 20:53	07:19 19:43	08:09 18:35	08:04 16:41	09:45 (9) 16:28
21	05:42 21:44	06:30 20:50	07:20 19:40	08:11 18:33	08:06 16:40	09:44 (9) 16:28
22	05:44 21:43	06:32 20:48	07:22 19:38	08:13 18:31	08:07 16:39	09:43 (9) 16:28
23	05:45 21:42	06:33 20:46	07:24 19:36	08:14 18:29	08:09 16:38	09:42 (9) 16:29
24	05:46 21:41	06:35 20:44	07:25 19:33	08:16 18:26	08:11 16:37	09:41 (9) 16:30
25	05:48 21:39	06:36 20:42	07:27 19:31	08:18 18:24	08:12 16:36	09:40 (9) 16:30
26	05:49 21:38	06:38 20:40	07:29 19:29	08:20 18:22	08:14 16:35	09:39 (9) 16:31
27	05:51 21:36	06:40 20:38	07:30 19:26	08:22 18:20	08:15 16:34	09:38 (9) 16:32
28	05:52 21:35	06:41 20:35	07:32 19:24	08:23 18:17	08:17 16:33	09:37 (9) 16:32
29	05:54 21:33	06:43 20:33	07:33 19:22	08:25 18:15	08:19 16:32	09:36 (9) 16:33
30	05:55 21:32	06:45 20:31	07:35 19:19	08:27 18:13	08:20 16:31	09:35 (9) 16:34
31	05:57 21:30	06:46 20:29		08:29 18:11		08:45 16:35
Potential sun hours	502	454	381	331	266	244
Total, worst case				270	1702	1346
Sun reduction				0.24	0.18	0.13
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.69	0.65	0.65
Total reduction				0.16	0.12	0.09
Total, real				44	206	118

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: F - H6
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec. Values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06.

Operational time

Table with 13 columns: N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum. Values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760.

Main data table with columns for months (January to June) and rows for each day, containing sunrise/sunset times and shadow reduction metrics.

Table layout: For each day in each month the following matrix apply

Summary table with columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time).



SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: G - H7
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of sunshine probability values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of operational time values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January to June) and rows for individual days (1-31). Includes a summary table at the bottom with rows for 'Potential sun hours', 'Total, worst case', 'Sun reduction', 'Oper. time red.', 'Wind dir. red.', 'Total reduction', and 'Total, real'.

Table layout: For each day in each month the following matrix apply

Matrix table with 4 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: G - H7
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 12 rows (1.30-1.06) showing sunshine probability values.

Operational time

Table with 13 columns (N-Sum) and 1 row showing operational time values for various directions.

Main shadow calculation table with columns for months (July-December) and rows for each day of the month, including sunrise/sunset times, shadow angles, and reduction factors.

Table layout: For each day in each month the following matrix apply

Summary table with 4 columns: Day in month, Sun rise/set, Minutes with flicker, and WTG causing flicker first/last time.



SHADOW - Calendar

Calculation: Specimen Turbine **Shadow receptor:** H - H8
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45	10:06 (10)	08:18	07:25	07:14	06:10
	16:36	70 11:34 (9)	17:24	18:16	20:10	21:01
2	08:45	10:06 (10)	08:17	07:23	07:12	06:08
	16:37	69 11:34 (9)	17:26	18:18	20:11	21:02
3	08:45	10:06 (10)	08:15	07:21	07:10	06:06
	16:39	70 11:34 (9)	17:28	18:19	20:13	21:04
4	08:45	10:07 (10)	08:14	07:19	07:08	06:04
	16:40	70 11:35 (9)	17:30	18:21	20:15	21:06
5	08:45	10:07 (10)	08:12	08:53 (12)	07:16	07:05
	16:41	70 11:35 (9)	17:32	7 09:00 (12)	18:23	20:17
6	08:44	10:08 (10)	08:10	08:50 (12)	07:14	07:03
	16:42	70 11:36 (9)	17:33	13 09:03 (12)	18:25	20:18
7	08:44	10:08 (10)	08:09	08:48 (12)	07:12	07:01
	16:43	69 11:35 (9)	17:35	16 09:04 (12)	18:27	20:20
8	08:43	10:09 (10)	08:07	08:47 (12)	07:10	06:59
	16:45	68 11:36 (9)	17:37	18 09:05 (12)	18:28	20:22
9	08:43	10:09 (10)	08:05	08:46 (12)	07:07	06:56
	16:46	68 11:36 (9)	17:39	20 09:06 (12)	18:30	20:23
10	08:42	10:09 (10)	08:03	08:46 (12)	07:05	06:54
	16:47	68 11:36 (9)	17:41	21 09:07 (12)	18:32	20:25
11	08:42	10:10 (10)	08:02	08:46 (12)	07:03	06:52
	16:49	68 11:37 (9)	17:43	22 09:08 (12)	18:34	20:27
12	08:41	10:11 (10)	08:00	08:46 (12)	07:01	06:50
	16:50	66 11:37 (9)	17:45	22 09:08 (12)	18:35	20:28
13	08:41	10:11 (10)	07:58	08:46 (12)	06:58	06:47
	16:52	66 11:37 (9)	17:46	23 09:09 (12)	18:37	20:30
14	08:40	10:12 (10)	07:56	08:46 (12)	06:56	06:45
	16:53	64 11:37 (9)	17:48	22 09:08 (12)	18:39	20:32
15	08:39	10:12 (10)	07:54	08:46 (12)	06:54	06:43
	16:55	63 11:37 (9)	17:50	22 09:08 (12)	18:41	20:34
16	08:38	10:13 (10)	07:52	08:46 (12)	06:51	06:41
	16:56	61 11:37 (9)	17:52	22 09:08 (12)	18:42	20:35
17	08:37	10:14 (10)	07:50	08:46 (12)	06:49	06:39
	16:58	59 11:36 (9)	17:54	20 09:06 (12)	18:44	20:37
18	08:36	10:15 (10)	07:48	08:47 (12)	06:47	06:36
	17:00	56 11:36 (9)	17:56	18 09:05 (12)	18:46	20:39
19	08:35	10:16 (10)	07:46	08:48 (12)	06:45	06:34
	17:01	53 11:36 (9)	17:58	16 09:04 (12)	18:47	20:40
20	08:34	10:17 (10)	07:44	08:50 (12)	06:42	06:32
	17:03	50 11:35 (9)	17:59	12 09:02 (12)	18:49	20:42
21	08:33	10:19 (10)	07:42	08:55 (12)	06:40	06:30
	17:05	45 11:34 (9)	18:01	2 08:57 (12)	18:51	20:44
22	08:32	10:22 (10)	07:40	06:38	06:28	05:35
	17:06	38 11:34 (9)	18:03	18:53	20:45	21:34
23	08:31	11:04 (9)	07:38	06:35	06:26	05:34
	17:08	28 11:32 (9)	18:05	18:54	20:47	21:35
24	08:30	11:06 (9)	07:36	06:33	06:24	05:33
	17:10	25 11:31 (9)	18:07	18:56	20:49	21:36
25	08:28	11:08 (9)	07:34	06:31	06:22	05:32
	17:12	22 11:30 (9)	18:09	18:58	20:51	21:38
26	08:27	11:10 (9)	07:32	06:28	06:20	05:30
	17:13	17 11:27 (9)	18:10	19:00	20:52	21:39
27	08:26	11:15 (9)	07:29	06:26	06:18	05:29
	17:15	9 11:24 (9)	18:12	19:01	20:54	21:40
28	08:24	07:27	06:24	06:16	05:28	05:20
	17:17	18:14	19:03	20:56	21:42	22:01
29	08:23	07:21	07:21	06:14	05:27	05:20
	17:19	20:05	20:57	21:43	22:01	
30	08:21	07:19	06:12	05:26	05:21	05:21
	17:21	20:06	20:59	21:44	22:01	
31	08:20	07:17	05:25	05:25		
	17:22	20:08	21:45			
Potential sun hours	259	278	367	416	485	499
Total, worst case	1482	296				
Sun reduction	0.16	0.21				
Oper. time red.	1.00	1.00				
Wind dir. red.	0.63	0.68				
Total reduction	0.10	0.14				
Total, real	146	42				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: H - H8
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22	05:58	06:48	07:37	07:31	08:15 (12)
	22:00	21:28	20:26	19:17	17:11	21 08:36 (12)
2	05:22	06:00	06:49	07:38	07:32	08:16 (12)
	22:00	21:27	20:24	19:15	17:09	20 08:36 (12)
3	05:23	06:01	06:51	07:40	07:34	08:17 (12)
	22:00	21:25	20:22	19:12	17:07	18 08:35 (12)
4	05:24	06:03	06:53	07:42	07:36	08:18 (12)
	21:59	21:23	20:20	19:10	17:05	16 08:34 (12)
5	05:25	06:04	06:54	07:43	07:38	08:20 (12)
	21:59	21:22	20:17	19:08	17:04	12 08:32 (12)
6	05:25	06:06	06:56	07:45	07:40	08:23 (12)
	21:58	21:20	20:15	19:06	17:02	7 08:30 (12)
7	05:26	06:07	06:58	07:47	07:41	08:30
	21:58	21:18	20:13	19:03	17:00	16:27
8	05:27	06:09	06:59	07:49	07:43	08:31
	21:57	21:16	20:10	19:01	16:59	16:27
9	05:28	06:11	07:01	07:50	07:45	08:32
	21:56	21:14	20:08	18:59	16:57	16:27
10	05:29	06:12	07:02	07:52	07:47	08:33
	21:56	21:12	20:06	18:56	16:55	16:27
11	05:30	06:14	07:04	07:54	07:48	08:34
	21:55	21:11	20:04	18:54	16:54	16:26
12	05:31	06:15	07:06	07:55	07:50	08:35
	21:54	21:09	20:01	18:52	16:52	16:26
13	05:32	06:17	07:07	07:57	07:52	08:36
	21:53	21:07	19:59	18:50	16:51	16:26
14	05:34	06:19	07:09	07:59	07:54	08:37
	21:52	21:05	19:57	18:48	16:49	16:26
15	05:35	06:20	07:11	08:00	07:56	10:46 (9)
	21:51	21:03	19:54	18:45	16:48	10 10:56 (9)
16	05:36	06:22	07:12	08:02	07:57	10:43 (9)
	21:50	21:01	19:52	18:43	16:46	17 11:00 (9)
17	05:37	06:23	07:14	08:04	07:59	10:41 (9)
	21:49	20:59	19:50	18:41	16:45	22 11:03 (9)
18	05:38	06:25	07:15	08:06	08:01	10:40 (9)
	21:48	20:57	19:47	18:39	16:44	25 11:05 (9)
19	05:40	06:27	07:17	08:07	08:02	10:39 (9)
	21:47	20:55	19:45	18:37	16:42	28 11:07 (9)
20	05:41	06:28	07:19	08:09	08:04	09:57 (10)
	21:46	20:53	19:43	18:35	16:41	38 11:09 (9)
21	05:42	06:30	07:20	08:11	08:06	09:55 (10)
	21:44	20:50	19:40	18:33	16:40	45 11:10 (9)
22	05:44	06:32	07:22	08:13	08:07	09:53 (10)
	21:43	20:48	19:38	18:31	16:39	50 11:11 (9)
23	05:45	06:33	07:24	08:14	08:09	09:53 (10)
	21:42	20:46	19:36	18:28	16:38	53 11:12 (9)
24	05:46	06:35	07:25	08:16	08:11	09:52 (10)
	21:41	20:44	19:33	18:26	16:37	56 11:13 (9)
25	05:48	06:36	07:27	08:18	08:12	09:52 (10)
	21:39	20:42	19:31	17:24	16:36	58 11:14 (9)
26	05:49	06:38	07:29	08:20	08:14	09:51 (10)
	21:38	20:40	19:29	17:22	16:35	61 11:15 (9)
27	05:51	06:40	07:30	08:22	08:15	09:51 (10)
	21:36	20:38	19:26	17:20	16:34	63 11:16 (9)
28	05:52	06:41	07:32	08:23	08:17	09:52 (10)
	21:35	20:35	19:24	17:18	16:33	64 11:17 (9)
29	05:54	06:43	07:33	08:25	08:19	09:51 (10)
	21:33	20:33	19:22	17:17	16:32	65 11:17 (9)
30	05:55	06:45	07:35	08:27	08:20	09:52 (10)
	21:32	20:31	19:19	17:15	16:31	66 11:18 (9)
31	05:57	06:46	07:37	08:29	08:22	09:53 (10)
	21:30	20:29	19:17	17:13	16:30	69 11:19 (9)
Potential sun hours	502	454	381	331	266	244
Total, worst case				212	815	2131
Sun reduction				0.24	0.18	0.13
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.68	0.64	0.63
Total reduction				0.16	0.12	0.09
Total, real				34	96	182

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:11:35.584

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: I - H9
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Table with columns for months (January to December) and rows for each day of the year (1-365). Columns include start/end times and shadow reduction percentages. Summary rows at the bottom show total sun hours, reduction, and real values.

Table layout: For each day in each month the following matrix apply

Matrix with 4 columns: Day in month, Sun rise (hh:mm) / Sun set (hh:mm), Minutes with flicker, and Last time (hh:mm) with flicker. Includes notes about WTG causing flicker first/last time.

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: J - H10
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main data table with columns for months (January to June) and rows for days (1-31), including sunrise/set times and shadow reduction metrics.

Table layout: For each day in each month the following matrix apply

Summary table with 4 columns: Day in month, Sun rise/set, Minutes with flicker, and (WTG causing flicker first/last time)



SHADOW - Calendar

Calculation: Specimen Turbine **Shadow receptor: J - H10**
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December						
1	05:22	20:53 (11)	05:58	06:48	07:37	07:30	08:21	15:23 (16)				
	22:00	19	21:12 (11)	21:28	20:26	19:17	17:11	16:31	5	15:28 (16)		
2	05:22	20:55 (11)	06:00	06:49	07:38	07:32	08:23	15:22 (16)				
	22:00	16	21:11 (11)	21:27	20:24	19:15	17:09	16:30	9	15:31 (16)		
3	05:23	20:56 (11)	06:01	06:51	07:40	07:34	08:24	15:21 (16)				
	21:59	15	21:11 (11)	21:25	20:22	19:12	17:07	16:29	11	15:32 (16)		
4	05:24	20:57 (11)	06:03	06:53	07:42	07:36	08:25	15:21 (16)				
	21:59	12	21:09 (11)	21:23	20:19	19:10	17:05	16:29	13	15:34 (16)		
5	05:25	20:59 (11)	06:04	06:54	18:27 (5)	07:43	07:38	08:27	15:20 (16)			
	21:58	9	21:08 (11)	21:21	20:17	5	18:32 (5)	19:08	17:04	16:28	15	15:35 (16)
6	05:25	21:01 (11)	06:06	06:56	18:21 (5)	07:45	07:39	08:28	15:20 (16)			
	21:58	5	21:06 (11)	21:20	20:15	16	18:37 (5)	19:05	17:02	16:28	16	15:36 (16)
7	05:26		06:07	06:57	18:18 (5)	07:47	07:41	08:29	15:20 (16)			
	21:57		21:18	20:13	21	18:39 (5)	19:03	17:00	16:27	17	15:37 (16)	
8	05:27		06:09	06:59	18:16 (5)	07:48	07:43	08:31	15:20 (16)			
	21:57		21:16	20:10	32	19:01 (4)	19:01	16:58	16:27	17	15:37 (16)	
9	05:28		06:11	07:01	18:13 (5)	07:50	07:45	08:32	15:20 (16)			
	21:56		21:14	20:08	41	19:03 (4)	18:59	16:57	16:27	18	15:38 (16)	
10	05:29		06:12	07:02	18:12 (5)	07:52	07:46	08:33	15:21 (16)			
	21:55		21:12	20:06	48	19:05 (4)	18:56	16:55	16:27	18	15:39 (16)	
11	05:30		06:14	07:04	18:09 (5)	07:53	07:48	08:34	15:21 (16)			
	21:55		21:10	20:03	54	19:06 (4)	18:54	16:54	16:26	19	15:40 (16)	
12	05:31		06:15	07:06	18:09 (5)	07:55	07:50	08:35	15:21 (16)			
	21:54		21:08	20:01	57	19:07 (4)	18:52	16:52	16:26	19	15:40 (16)	
13	05:32		06:17	07:07	18:07 (5)	07:57	07:52	08:36	15:21 (16)			
	21:53		21:07	19:59	60	19:07 (4)	18:50	16:51	16:26	20	15:41 (16)	
14	05:34		06:19	07:09	18:06 (5)	07:59	07:54	08:37	15:21 (16)			
	21:52		21:05	19:56	61	19:07 (4)	18:48	16:49	16:26	21	15:42 (16)	
15	05:35		06:20	07:10	18:06 (5)	08:00	07:55	08:38	15:22 (16)			
	21:51		21:03	19:54	61	19:07 (4)	18:45	16:48	16:26	20	15:42 (16)	
16	05:36		06:22	07:12	18:05 (5)	08:02	07:57	08:39	15:21 (16)			
	21:50		21:01	19:52	61	19:06 (4)	18:43	16:46	16:26	21	15:42 (16)	
17	05:37		06:23	07:14	18:04 (5)	08:04	07:59	08:39	15:22 (16)			
	21:49		20:59	19:49	62	19:06 (4)	18:41	16:45	16:27	21	15:43 (16)	
18	05:38		06:25	07:15	18:03 (5)	08:06	08:01	08:40	15:23 (16)			
	21:48		20:57	19:47	62	19:05 (4)	18:39	16:44	16:27	20	15:43 (16)	
19	05:40		06:27	07:17	18:03 (5)	08:07	08:02	08:41	15:23 (16)			
	21:47		20:54	19:45	62	19:05 (4)	18:37	16:42	16:27	21	15:44 (16)	
20	05:41		06:28	07:19	18:04 (5)	08:09	08:04	08:42	15:23 (16)			
	21:45		20:52	19:42	60	19:04 (4)	18:35	16:41	16:27	21	15:44 (16)	
21	05:42		06:30	07:20	18:03 (5)	08:11	08:06	08:42	15:24 (16)			
	21:44		20:50	19:40	58	19:02 (4)	18:33	16:40	16:28	21	15:45 (16)	
22	05:44		06:31	07:22	18:03 (5)	08:13	08:07	08:43	15:24 (16)			
	21:43		20:48	19:38	55	19:00 (4)	18:30	16:39	16:28	21	15:45 (16)	
23	05:45		06:33	07:23	18:03 (5)	08:14	08:09	08:43	15:25 (16)			
	21:42		20:46	19:35	48	18:57 (4)	18:28	16:38	16:29	21	15:46 (16)	
24	05:46		06:35	07:25	18:04 (5)	08:16	08:11	08:44	15:25 (16)			
	21:40		20:44	19:33	38	18:53 (4)	18:26	16:37	16:29	21	15:46 (16)	
25	05:48		06:36	07:27	18:05 (5)	07:18	08:12	08:44	15:26 (16)			
	21:39		20:42	19:31	32	18:37 (5)	17:24	16:36	16:30	20	15:46 (16)	
26	05:49		06:38	07:28	18:05 (5)	07:20	08:14	08:44	15:26 (16)			
	21:37		20:40	19:28	30	18:35 (5)	17:22	16:35	16:31	21	15:47 (16)	
27	05:51		06:40	07:30	18:07 (5)	07:21	08:15	08:45	15:27 (16)			
	21:36		20:37	19:26	26	18:33 (5)	17:20	16:34	16:32	21	15:48 (16)	
28	05:52		06:41	07:32	18:08 (5)	07:23	08:17	08:45	15:28 (16)			
	21:35		20:35	19:24	23	18:31 (5)	17:18	16:33	16:32	20	15:48 (16)	
29	05:54		06:43	07:33	18:10 (5)	07:25	08:18	08:45	15:28 (16)			
	21:33		20:33	19:21	18	18:28 (5)	17:16	16:32	16:33	20	15:48 (16)	
30	05:55		06:44	07:35	18:14 (5)	07:27	08:20	08:45	15:29 (16)			
	21:31		20:31	19:19	10	18:24 (5)	17:15	16:31	16:34	20	15:49 (16)	
31	05:57		06:46				07:29	08:45	15:29 (16)			
	21:30		20:28				17:13	16:35	20	15:49 (16)		
Potential sun hours	502	454	381		331	266	244					
Total, worst case	76			1101							568	
Sun reduction	0.27			0.28							0.13	
Oper. time red.	1.00			1.00							1.00	
Wind dir. red.	0.69			0.66							0.59	
Total reduction	0.18			0.18							0.08	
Total, real	14			203							45	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: K - H11
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of sunshine probability values.

Operational time

Table with 13 columns (N-Sum) and 1 row of operational time values.

Main shadow calculation table with columns for months (January to June) and rows for days of the month, including sunrise/set times and shadow reduction metrics.

Table layout: For each day in each month the following matrix apply

Summary table with 4 columns: Day in month, Sun rise/set, Minutes with flicker, and (WTG causing flicker) first/last time.



SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: K - H11

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22	05:58	06:48	07:37	07:31	09:00 (9) 08:21
	22:00	21:28	20:26	19:17	17:11	36 09:36 (9) 16:31
2	05:22	06:00	06:49	07:38	07:32	08:59 (9) 08:23
	22:00	21:27	20:24	19:15	17:09	38 09:37 (9) 16:30
3	05:23	06:01	06:51	07:40	07:34	08:59 (9) 08:24
	22:00	21:25	20:22	19:12	17:07	39 09:38 (9) 16:29
4	05:24	06:03	06:53	07:42	07:36	08:59 (9) 08:26
	21:59	21:23	20:20	19:10	17:05	39 09:38 (9) 16:29
5	05:25	06:04	06:54	07:43	07:38	08:59 (9) 08:27
	21:59	21:22	20:17	19:08	17:04	39 09:38 (9) 16:28
6	05:25	06:06	06:56	07:45	07:40	08:59 (9) 08:28
	21:58	21:20	20:15	19:06	17:02	40 09:39 (9) 16:28
7	05:26	06:07	06:58	07:47	07:41	08:59 (9) 08:30
	21:58	21:18	20:13	19:03	17:00	40 09:39 (9) 16:27
8	05:27	06:09	06:59	07:49	07:43	08:59 (9) 08:31
	21:57	21:16	20:10	19:01	16:59	40 09:39 (9) 16:27
9	05:28	06:11	07:01	07:50	07:45	08:59 (9) 08:32
	21:56	21:14	20:08	18:59	16:57	40 09:39 (9) 16:27
10	05:29	06:12	07:02	07:52	07:47	08:59 (9) 08:33
	21:56	21:13	20:06	18:57	16:55	40 09:39 (9) 16:27
11	05:30	06:14	07:04	07:54	08:52 (12)	07:48
	21:55	21:11	20:04	18:54	9 09:01 (12)	16:54
12	05:31	06:15	07:06	07:55	08:50 (12)	07:50
	21:54	21:09	20:01	18:52	13 09:03 (12)	16:52
13	05:32	06:17	07:07	07:57	08:48 (12)	07:52
	21:53	21:07	19:59	18:50	16 09:04 (12)	16:51
14	05:34	06:19	07:09	07:59	08:46 (12)	07:54
	21:52	21:05	19:57	18:48	18 09:04 (12)	16:49
15	05:35	06:20	07:11	08:01	08:46 (12)	07:56
	21:51	21:03	19:54	18:45	19 09:05 (12)	16:48
16	05:36	06:22	07:12	08:02	08:46 (12)	07:57
	21:50	21:01	19:52	18:43	19 09:05 (12)	16:46
17	05:37	06:23	07:14	08:04	08:45 (12)	07:59
	21:49	20:59	19:50	18:41	20 09:05 (12)	16:45
18	05:38	06:25	07:15	08:06	08:46 (12)	08:01
	21:48	20:57	19:47	18:39	19 09:05 (12)	16:44
19	05:40	06:27	07:17	08:07	08:46 (12)	08:02
	21:47	20:55	19:45	18:37	18 09:04 (12)	16:42
20	05:41	06:28	07:19	08:09	08:46 (12)	08:04
	21:46	20:53	19:43	18:35	17 09:03 (12)	16:41
21	05:42	06:30	07:20	08:11	08:47 (12)	08:06
	21:44	20:50	19:40	18:33	15 09:02 (12)	16:40
22	05:44	06:32	07:22	08:13	08:48 (12)	08:07
	21:43	20:48	19:38	18:31	12 09:00 (12)	16:39
23	05:45	06:33	07:24	08:14	08:50 (12)	08:09
	21:42	20:46	19:36	18:29	8 08:58 (12)	16:38
24	05:46	06:35	07:25	08:16	10:13 (9)	08:11
	21:41	20:44	19:33	18:26	10 10:23 (9)	16:37
25	05:48	06:36	07:27	08:18	09:10 (9)	08:12
	21:39	20:42	19:31	17:24	17 09:27 (9)	16:36
26	05:49	06:38	07:29	08:20	09:07 (9)	08:14
	21:38	20:40	19:29	17:22	23 09:30 (9)	16:35
27	05:51	06:40	07:30	08:22	09:05 (9)	08:16
	21:36	20:38	19:26	17:20	27 09:32 (9)	16:34
28	05:52	06:41	07:32	08:23	09:04 (9)	08:17
	21:35	20:35	19:24	17:19	29 09:33 (9)	16:33
29	05:54	06:43	07:33	08:25	09:02 (9)	08:19
	21:33	20:33	19:22	17:17	32 09:34 (9)	16:32
30	05:55	06:45	07:35	08:27	09:01 (9)	08:20
	21:32	20:31	19:19	17:15	34 09:35 (9)	16:31
31	05:57	06:46		08:29	09:00 (9)	
	21:30	20:29		17:13	36 09:36 (9)	
Potential sun hours	502	454	381	331	266	244
Total, worst case				411	870	897
Sun reduction				0.24	0.18	0.13
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.67	0.66	0.63
Total reduction				0.16	0.12	0.08
Total, real				65	106	76

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: L - H12
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June	July	August	September	October	November	December	
1	08:45	11:20 (10) 08:18	09:38 (12) 07:25	07:14	06:10	05:25	05:22	05:58	06:48	07:37	07:31	08:21	12:44 (9)
2	08:45	11:22 (10) 08:17	09:39 (12) 07:23	07:12	06:08	05:24	05:22	06:00	06:49	07:38	07:32	08:23	12:43 (9)
3	08:45	13:27 (9) 08:15	09:39 (12) 07:21	07:11	06:06	05:23	05:23	06:01	06:51	07:40	07:34	08:24	12:43 (9)
4	08:45	13:27 (9) 08:14	09:41 (12) 07:18	07:08	06:04	05:22	05:24	06:03	06:53	07:42	07:36	08:25	12:42 (9)
5	08:45	12:55 (9) 08:12	09:42 (12) 07:16	07:05	06:02	05:21	05:25	06:04	06:54	07:43	07:38	08:26	12:42 (9)
6	08:44	12:55 (9) 08:10	09:44 (12) 07:14	07:03	06:00	05:21	05:25	06:06	06:56	07:45	07:40	08:27	12:42 (9)
7	08:44	13:28 (9) 08:09	09:47 (12) 07:12	07:01	05:59	05:20	05:26	06:07	06:58	07:47	07:41	08:28	12:42 (9)
8	08:43	13:27 (9) 08:07	09:54 (12) 07:10	06:58	05:57	05:20	05:27	06:09	06:59	07:49	07:43	08:29	12:42 (9)
9	08:43	12:59 (9) 08:05	07:07	06:56	05:55	05:19	05:28	06:11	07:01	07:50	07:45	08:30	12:42 (9)
10	08:42	13:00 (9) 08:03	07:05	06:54	05:53	05:19	05:29	06:12	07:02	07:52	07:47	08:31	11:12 (10)
11	08:42	13:26 (9) 08:01	07:03	06:52	05:52	05:18	05:30	06:14	07:04	07:54	07:48	08:32	11:10 (10)
12	08:41	13:03 (9) 08:00	07:01	06:50	05:50	05:18	05:31	06:15	07:06	07:55	07:50	08:33	11:10 (10)
13	08:41	09:43 (12) 07:58	06:58	06:47	05:48	05:18	05:32	06:17	07:07	07:57	07:52	08:34	11:09 (10)
14	08:40	09:40 (12) 07:56	06:56	06:45	05:47	05:18	05:33	06:19	07:09	07:59	07:54	08:35	11:09 (10)
15	08:39	09:39 (12) 07:54	06:54	06:43	05:45	05:17	05:35	06:20	07:11	08:00	07:55	08:36	11:09 (10)
16	08:38	09:38 (12) 07:52	06:51	06:41	05:44	05:17	05:36	06:22	07:12	08:02	07:57	08:37	11:10 (10)
17	08:37	09:38 (12) 07:50	06:49	06:39	05:42	05:17	05:37	06:23	07:14	08:04	07:59	08:38	11:10 (10)
18	08:36	09:37 (12) 07:48	06:47	06:36	05:41	05:17	05:38	06:25	07:15	08:06	08:01	08:40	11:10 (10)
19	08:35	09:37 (12) 07:46	06:44	06:34	05:39	05:17	05:40	06:27	07:17	08:07	08:02	08:41	11:10 (10)
20	08:34	09:36 (12) 07:44	06:42	06:32	05:38	05:17	05:41	06:28	07:19	08:09	08:04	08:42	11:10 (10)
21	08:33	09:36 (12) 07:42	06:40	06:30	05:37	05:17	05:42	06:30	07:20	08:11	08:06	08:43	11:11 (10)
22	08:32	09:36 (12) 07:40	06:38	06:28	05:35	05:18	05:44	06:32	07:22	08:13	08:07	08:44	11:11 (10)
23	08:31	09:35 (12) 07:38	06:35	06:26	05:34	05:18	05:45	06:33	07:24	08:14	08:09	08:45	11:12 (10)
24	08:30	09:35 (12) 07:36	06:33	06:24	05:33	05:18	05:46	06:35	07:25	08:16	08:11	08:46	11:12 (10)
25	08:28	09:36 (12) 07:34	06:31	06:22	05:32	05:18	05:48	06:36	07:27	08:18	08:12	08:47	11:13 (10)
26	08:27	09:36 (12) 07:32	06:28	06:20	05:30	05:19	05:49	06:38	07:28	08:20	08:14	08:48	11:14 (10)
27	08:26	09:36 (12) 07:29	06:26	06:18	05:29	05:19	05:51	06:40	07:30	08:22	08:15	08:49	11:14 (10)
28	08:24	09:36 (12) 07:27	06:24	06:16	05:28	05:20	05:52	06:41	07:32	08:23	08:17	08:50	11:15 (10)
29	08:23	09:37 (12) 07:25	06:21	06:14	05:27	05:20	05:54	06:43	07:33	08:25	08:19	08:51	11:16 (10)
30	08:21	09:37 (12) 07:23	06:19	06:12	05:26	05:21	05:55	06:45	07:35	08:27	08:20	08:52	11:17 (10)
31	08:20	09:37 (12) 07:21	06:17	06:10	05:25	05:20	05:57	06:46	07:37	08:29	08:22	08:53	11:18 (10)
Potential sun hours	259	278	367	416	485	499	502	454	381	331	266	244	1347
Total, worst case	831	128									611		1347
Sun reduction	0.16	0.21									0.18		0.13
Oper. time red.	1.00	1.00									1.00		1.00
Wind dir. red.	0.63	0.66									0.66		0.61
Total reduction	0.10	0.14									0.12		0.08
Total, real	82	17									74		110

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)



SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: M - H13
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Table with columns for months (January to June) and rows for days (1-31). Each row contains sun rise/set times, potential sun hours, and reduction metrics (Total, worst case, Sun reduction, Oper. time red., Wind dir. red., Total reduction, Total, real).

Table layout: For each day in each month the following matrix apply

Matrix with columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Specimen Turbine **Shadow receptor:** M - H13
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22	20:26 (11) 05:58	20:10 (6) 06:48	07:37	07:30	08:21
	22:00	35 21:01 (10) 21:28	12 20:22 (6) 20:26	19:17	17:11	16:31
2	05:22	20:27 (11) 06:00	20:08 (6) 06:49	18:45 (5) 07:38	07:32	08:23
	22:00	33 21:00 (11) 21:27	15 20:23 (6) 20:24	3 18:48 (5) 19:15	17:09	16:30
3	05:23	20:28 (11) 06:01	20:07 (6) 06:51	18:40 (5) 07:40	07:34	08:24
	21:59	32 21:00 (11) 21:25	17 20:24 (6) 20:22	13 18:53 (5) 19:12	17:07	16:29
4	05:24	20:27 (11) 06:03	20:06 (6) 06:53	18:37 (5) 07:42	07:36	08:25
	21:59	33 21:00 (11) 21:23	18 20:24 (6) 20:19	18 18:55 (5) 19:10	17:05	16:29
5	05:25	20:28 (11) 06:04	20:06 (6) 06:54	18:35 (5) 07:43	07:38	08:27
	21:58	32 21:00 (11) 21:21	19 20:25 (6) 20:17	21 18:56 (5) 19:08	17:04	16:28
6	05:25	20:28 (11) 06:06	20:05 (6) 06:56	18:33 (5) 07:45	07:39	08:28
	21:58	32 21:00 (11) 21:20	20 20:25 (6) 20:15	33 19:09 (4) 19:05	17:02	16:28
7	05:26	20:29 (11) 06:07	20:04 (6) 06:57	18:32 (5) 07:47	07:41	08:29
	21:57	31 21:00 (11) 21:18	21 20:25 (6) 20:13	39 19:11 (4) 19:03	17:00	16:27
8	05:27	20:29 (11) 06:09	20:04 (6) 06:59	18:31 (5) 07:48	07:43	08:31
	21:57	31 21:00 (11) 21:16	22 20:26 (6) 20:10	42 19:13 (4) 19:01	16:58	16:27
9	05:28	20:30 (11) 06:11	20:03 (6) 07:01	18:29 (5) 07:50	07:45	08:32
	21:56	30 21:00 (11) 21:14	22 20:25 (6) 20:08	44 19:13 (4) 18:59	16:57	16:27
10	05:29	20:30 (11) 06:12	20:04 (6) 07:02	18:29 (5) 07:52	07:46	08:33
	21:55	30 21:00 (11) 21:12	21 20:25 (6) 20:06	45 19:14 (4) 18:56	16:55	16:27
11	05:30	20:31 (11) 06:14	20:03 (6) 07:04	18:28 (5) 07:53	07:48	08:34
	21:55	29 21:00 (11) 21:10	21 20:24 (6) 20:03	45 19:13 (4) 18:54	16:54	16:26
12	05:31	20:31 (11) 06:15	20:04 (6) 07:06	18:28 (5) 07:55	07:50	08:35
	21:54	29 21:00 (11) 21:08	20 20:24 (6) 20:01	45 19:13 (4) 18:52	16:52	16:26
13	05:32	20:32 (11) 06:17	20:04 (6) 07:07	18:27 (5) 07:57	07:52	08:36
	21:53	28 21:00 (11) 21:07	19 20:23 (6) 19:59	45 19:12 (4) 18:50	16:51	16:26
14	05:33	20:32 (11) 06:19	20:05 (6) 07:09	18:27 (5) 07:59	07:54	08:37
	21:52	27 20:59 (11) 21:05	18 20:23 (6) 19:56	45 19:12 (4) 18:48	16:49	16:26
15	05:35	20:33 (11) 06:20	20:06 (6) 07:10	18:27 (5) 08:00	07:55	08:38
	21:51	26 20:59 (11) 21:03	16 20:22 (6) 19:54	45 19:12 (4) 18:45	16:48	16:26
16	05:36	20:33 (11) 06:22	20:07 (6) 07:12	18:27 (5) 08:02	07:57	08:39
	21:50	25 20:58 (11) 21:01	12 20:19 (6) 19:52	43 19:10 (4) 18:43	16:46	16:26
17	05:37	20:34 (11) 06:23	20:10 (6) 07:14	18:28 (5) 08:04	07:59	08:39
	21:49	23 20:57 (11) 20:59	7 20:17 (6) 19:49	41 19:09 (4) 18:41	16:45	16:27
18	05:38	20:35 (11) 06:25	07:15	18:28 (5) 08:06	08:00	08:40
	21:48	21 20:56 (11) 20:56	19:47	36 19:06 (4) 18:39	16:44	16:27
19	05:40	20:35 (11) 06:27	07:17	18:29 (5) 08:07	08:02	08:41
	21:47	20 20:55 (11) 20:54	19:45	26 19:02 (4) 18:37	16:42	16:27
20	05:41	20:37 (11) 06:28	07:19	18:31 (5) 08:09	08:04	08:42
	21:45	18 20:55 (11) 20:52	19:42	18 18:49 (5) 18:35	16:41	16:27
21	05:42	20:39 (11) 06:30	07:20	18:33 (5) 08:11	08:06	08:42
	21:44	14 20:53 (11) 20:50	19:40	12 18:45 (5) 18:33	16:40	16:28
22	05:44	20:40 (11) 06:31	07:22	08:13	08:07	08:43
	21:43	11 20:51 (11) 20:48	19:38	18:30	16:39	16:28
23	05:45	20:45 (11) 06:33	07:23	08:14	08:09	08:43
	21:42	2 20:47 (11) 20:46	19:35	18:28	16:38	16:29
24	05:46	06:35	07:25	08:16	08:11	08:44
	21:40	20:44	19:33	18:26	16:37	16:29
25	05:48	06:36	07:27	07:18	08:12	08:44
	21:39	20:42	19:31	17:24	16:36	16:30
26	05:49	06:38	07:28	07:20	08:14	08:44
	21:37	20:40	19:28	17:22	16:35	16:31
27	05:51	06:40	07:30	07:21	08:15	08:45
	21:36	20:37	19:26	17:20	16:34	16:32
28	05:52	06:41	07:32	07:23	08:17	08:45
	21:35	20:35	19:24	17:18	16:33	16:32
29	05:54	06:43	07:33	07:25	08:18	08:45
	21:33	20:33	19:21	17:16	16:32	16:33
30	05:55	06:44	07:35	07:27	08:20	08:45
	21:31	20:31	19:19	17:15	16:31	16:34
31	05:57	20:11 (6) 06:46		07:29		08:45
	21:30	8 20:19 (6) 20:28		17:13		16:35
Potential sun hours	502	454	381	331	266	244
Total, worst case	600	300	659			
Sun reduction	0.27	0.30	0.28			
Oper. time red.	1.00	1.00	1.00			
Wind dir. red.	0.69	0.67	0.67			
Total reduction	0.18	0.20	0.19			
Total, real	110	60	125			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: N - H14
 Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

	January	February	March	April	May	June
1	08:45	11:49 (1)	08:18	08:45 (4)	07:25	07:15
	16:36	23 12:12 (1)	17:24	59 10:07 (2)	18:16	07:43 (10)
2	08:45	11:50 (1)	08:17	08:43 (4)	07:23	20:10
	16:38	21 12:11 (1)	17:26	62 10:07 (2)	18:18	35 08:38 (7)
3	08:45	11:51 (1)	08:15	08:41 (4)	07:21	07:12
	16:39	20 12:11 (1)	17:28	64 10:07 (2)	18:19	27 20:11
4	08:45	11:53 (1)	08:14	08:40 (4)	07:19	07:43 (10)
	16:40	19 12:12 (1)	17:30	65 10:07 (2)	18:21	06:08
5	08:45	11:53 (1)	08:12	08:38 (4)	07:16	20:11
	16:41	17 12:10 (1)	17:32	66 10:07 (2)	18:23	27 08:34 (7)
6	08:44	11:55 (1)	08:10	08:36 (4)	07:14	07:33 (8)
	16:42	15 12:10 (1)	17:34	64 10:07 (2)	18:25	06:06
7	08:44	11:57 (1)	08:09	08:34 (4)	07:12	07:30 (8)
	16:43	12 12:09 (1)	17:35	54 10:06 (2)	18:27	24 08:03 (10)
8	08:43	12:00 (1)	08:07	08:33 (4)	07:10	07:30 (8)
	16:45	7 12:07 (1)	17:37	55 10:06 (2)	18:28	24 08:03 (10)
9	08:43	08:05	08:05	08:33 (4)	07:07	07:28 (8)
	16:46	17 12:10 (1)	17:32	66 10:07 (2)	18:23	28 08:02 (10)
10	08:42	08:03	08:03	08:33 (4)	07:05	06:02
	16:48	15 12:10 (1)	17:34	64 10:07 (2)	18:25	3 06:32 (9)
11	08:42	08:02	08:02	08:34 (4)	07:03	21 07:51 (6)
	16:49	12 12:09 (1)	17:35	54 10:06 (2)	18:27	28 08:02 (10)
12	08:41	09:15 (3)	08:00	08:35 (4)	07:01	07:28 (8)
	16:50	3 09:18 (3)	17:45	47 10:04 (2)	18:35	28 08:02 (10)
13	08:41	09:12 (3)	07:58	08:36 (4)	06:58	07:26 (8)
	16:52	9 09:21 (3)	17:47	43 10:03 (2)	18:37	21 07:54 (6)
14	08:40	09:11 (3)	07:56	08:38 (4)	06:56	07:05
	16:53	12 09:23 (3)	17:48	36 10:01 (2)	18:39	31 07:53 (6)
15	08:39	09:10 (3)	07:54	08:40 (4)	06:54	20:18
	16:55	15 09:25 (3)	17:50	27 09:59 (2)	18:41	33 08:00 (10)
16	08:38	09:09 (3)	07:52	09:41 (2)	06:51	07:28 (8)
	16:57	17 09:26 (3)	17:52	15 09:56 (2)	18:42	31 07:53 (6)
17	08:37	09:08 (3)	07:50	09:44 (2)	06:49	29 07:54 (6)
	16:58	27 09:48 (2)	17:54	7 09:51 (2)	18:44	29 07:54 (6)
18	08:36	09:08 (3)	07:48	06:47	06:47	26 07:45 (8)
	17:00	35 09:52 (2)	17:56	18:46	26 07:49 (7)	26 07:45 (8)
19	08:35	09:08 (3)	07:46	06:45	06:45	34 07:47 (8)
	17:01	40 09:54 (2)	17:58	18:48	28 07:49 (7)	20 06:36 (9)
20	08:34	09:07 (3)	07:44	06:42	06:42	21 07:46 (8)
	17:03	44 09:55 (2)	17:59	18:49	30 07:50 (7)	23 06:13 (9)
21	08:33	09:07 (3)	07:42	06:40	06:40	36 07:44 (8)
	17:05	48 09:57 (2)	18:01	18:51	30 07:50 (7)	24 06:34 (9)
22	08:32	09:07 (3)	07:40	06:38	06:38	36 07:44 (8)
	17:06	50 09:58 (2)	18:03	18:53	31 07:50 (7)	24 06:33 (9)
23	08:31	09:06 (3)	07:38	06:35	06:35	38 07:46 (8)
	17:08	53 09:59 (2)	18:05	18:54	31 07:50 (7)	23 06:12 (9)
24	08:30	09:07 (3)	07:36	06:33	06:33	38 07:46 (8)
	17:10	54 10:01 (2)	18:07	18:56	31 07:50 (7)	25 06:32 (9)
25	08:28	09:07 (3)	07:34	06:31	06:31	36 07:44 (8)
	17:12	55 10:02 (2)	18:09	18:58	31 07:49 (7)	23 06:13 (9)
26	08:27	09:07 (3)	07:32	06:28	06:28	36 07:44 (8)
	17:13	55 10:02 (2)	18:10	19:00	30 07:48 (7)	24 06:15 (9)
27	08:26	09:08 (3)	07:29	06:26	06:26	36 07:44 (8)
	17:15	56 10:04 (2)	18:12	19:01	38 07:48 (7)	14 06:16 (9)
28	08:24	09:07 (3)	07:27	06:24	06:24	18 07:33 (8)
	17:17	57 10:04 (2)	18:14	19:03	41 07:46 (7)	11 06:27 (9)
29	08:23	09:08 (3)	07:25	06:21	06:21	12 07:30 (8)
	17:19	57 10:05 (2)	18:15	19:05	42 08:45 (7)	7 06:25 (9)
30	08:21	09:08 (3)	07:23	06:19	06:19	12 07:30 (8)
	17:21	57 10:05 (2)	18:16	19:06	40 08:43 (7)	21 05:27
31	08:20	09:09 (3)	07:21	06:17	06:17	21 05:26
	17:22	57 10:06 (2)	18:17	19:08	39 08:42 (7)	21 05:25
Potential sun hours	259	278	367	416	485	499
Total, worst case	935	820	730	860	436	
Sun reduction	0.16	0.21	0.24	0.35	0.37	
Oper. time red.	1.00	1.00	1.00	1.00	1.00	
Wind dir. red.	0.66	0.67	0.67	0.67	0.64	
Total reduction	0.10	0.14	0.16	0.24	0.24	
Total, real	96	113	120	203	103	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: N - H14
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (July-December) and rows for each hour of the day (01:00-21:00). Includes summary rows for Total, worst case, Sun reduction, Oper. time red., Wind dir. red., Total reduction, and Total, real.

Table layout: For each day in each month the following matrix apply

Matrix with 4 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: P - H16
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Table with columns for months (January to June) and rows for each day of the month, showing sun rise/set times, shadow reduction, and operational time. Includes a summary table at the bottom for 'Potential sun hours' and 'Total reduction'.

Table layout: For each day in each month the following matrix apply

Matrix with columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: P - H16
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

Table with 13 columns: N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum. Values range from 194 to 1,318.

Main shadow calculation table with columns for months (July-December) and rows for time intervals (05:22-21:30). Includes summary rows for Potential sun hours, Total, worst case, Sun reduction, Oper. time red., Wind dir. red., Total reduction, and Total, real.

Table layout: For each day in each month the following matrix apply

Matrix with 4 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time).

Project:

6225Gortyrahill_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: Q - H17
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

Table with 14 columns: N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum. Values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Large table with 13 columns (Months) and 30 rows (Days). Columns include January through December. Rows include sunrise times, sunset times, and shadow calculations for various days and months.

Table layout: For each day in each month the following matrix apply

Day in month Sun rise (hh:mm) Sun set (hh:mm) Minutes with flicker First time (hh:mm) with flicker Last time (hh:mm) with flicker (WTG causing flicker first time) (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: R - H18

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 16:36	24 11:04 (7)	08:18 17:24	32 09:46 (9)	07:25 18:16	07:15 20:10
2	08:45 16:37	23 11:03 (8)	08:17 17:26	33 09:46 (9)	07:23 18:18	07:12 20:11
3	08:45 16:39	21 11:03 (8)	08:15 17:28	34 09:46 (9)	07:21 18:19	07:10 20:13
4	08:45 16:40	20 11:03 (8)	08:14 17:30	35 09:48 (9)	07:19 18:21	07:08 20:15
5	08:45 16:41	18 11:02 (8)	08:12 17:32	35 09:48 (9)	07:16 18:23	07:05 20:17
6	08:44 16:42	17 11:02 (8)	08:10 17:33	35 09:48 (9)	07:14 18:25	07:03 20:18
7	08:44 16:43	15 11:01 (8)	08:09 17:35	36 09:48 (9)	07:12 18:27	07:01 20:20
8	08:44 16:45	11 11:00 (8)	08:07 17:37	36 09:48 (9)	07:10 18:28	06:59 20:22
9	08:43 16:46	3 10:54 (8)	08:05 17:39	34 09:47 (9)	07:07 18:30	06:56 20:23
10	08:42 16:47		08:03 17:41	34 09:47 (9)	07:05 18:32	06:54 20:25
11	08:42 16:49		08:02 17:43	33 09:47 (9)	07:03 18:34	06:52 20:27
12	08:41 16:50		08:00 17:45	32 09:47 (9)	07:01 18:35	06:50 20:29
13	08:41 16:52		07:58 17:46	31 09:46 (9)	06:58 18:37	06:47 20:30
14	08:40 16:53		07:56 17:48	29 09:45 (9)	06:56 18:39	06:45 20:32
15	08:39 16:55		07:54 17:50	27 09:44 (9)	06:54 18:41	06:43 20:34
16	08:38 16:56		07:52 17:52	24 09:43 (9)	06:51 18:42	06:41 20:35
17	08:37 16:58		07:50 17:54	21 09:41 (9)	06:49 18:44	06:39 20:37
18	08:36 17:00		07:48 17:56	16 09:37 (9)	06:47 18:46	06:36 20:39
19	08:35 17:01		07:46 17:58	9 09:34 (9)	06:45 18:48	06:34 20:40
20	08:34 17:03		07:44 17:59		06:42 18:49	06:32 20:42
21	08:33 17:05		07:42 18:01		06:40 18:51	06:30 20:44
22	08:32 17:06	3 09:27 (10)	07:40 18:03		06:38 18:53	06:28 20:46
23	08:31 17:08	10 09:23 (9)	07:38 18:05		06:35 18:54	06:26 20:47
24	08:30 17:10	15 09:20 (9)	07:36 18:07		06:33 18:56	06:24 20:49
25	08:28 17:12	19 09:19 (9)	07:34 18:09		06:31 18:58	06:22 20:51
26	08:27 17:13	22 09:17 (9)	07:32 18:10		06:28 19:00	06:20 20:52
27	08:26 17:15	24 09:15 (9)	07:29 18:12		06:26 19:01	06:18 20:54
28	08:24 17:17	27 09:14 (9)	07:27 18:14		06:24 19:03	06:16 20:56
29	08:23 17:19	28 09:13 (9)			07:21 20:05	06:14 20:57
30	08:22 17:21	30 09:12 (9)			07:19 20:06	06:12 20:59
31	08:20 17:22	31 09:11 (9)			07:17 20:08	06:10 21:00
Potential sun hours	259	278	367	416	485	499
Total, worst case	361	566				
Sun reduction	0.16	0.21				
Oper. time red.	1.00	1.00				
Wind dir. red.	0.66	0.67				
Total reduction	0.10	0.14				
Total, real	37	78				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Specimen Turbine **Shadow receptor:** R - H18
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

	July	August	September	October	November	December
1	05:22	05:58	06:48	07:37	07:31	08:42 (9) 08:22
	22:00	21:28	20:26	19:17	17:11	35 09:17 (9) 16:31
2	05:22	06:00	06:49	07:38	07:32	08:42 (9) 08:23
	22:00	21:27	20:24	19:15	17:09	35 09:17 (9) 16:30
3	05:23	06:01	06:51	07:40	07:34	08:42 (9) 08:24
	22:00	21:25	20:22	19:12	17:07	35 09:17 (9) 16:29
4	05:24	06:03	06:53	07:42	07:36	08:42 (9) 08:26
	21:59	21:23	20:20	19:10	17:05	35 09:17 (9) 16:29
5	05:25	06:04	06:54	07:43	07:38	08:42 (9) 08:27
	21:59	21:22	20:17	19:08	17:04	35 09:17 (9) 16:28
6	05:25	06:06	06:56	07:45	07:40	08:42 (9) 08:28
	21:58	21:20	20:15	19:06	17:02	35 09:17 (9) 16:28
7	05:26	06:07	06:58	07:47	07:41	08:43 (9) 08:30
	21:58	21:18	20:13	19:03	17:00	34 09:17 (9) 16:27
8	05:27	06:09	06:59	07:49	07:43	08:43 (9) 08:31
	21:57	21:16	20:10	19:01	16:59	34 09:17 (9) 16:27
9	05:28	06:11	07:01	07:50	07:45	08:44 (9) 08:32
	21:56	21:14	20:08	18:59	16:57	33 09:17 (9) 16:27
10	05:29	06:12	07:02	07:52	07:47	08:44 (9) 08:33
	21:56	21:13	20:06	18:57	16:55	33 09:17 (9) 16:27
11	05:30	06:14	07:04	07:54	07:48	08:45 (9) 08:34
	21:55	21:11	20:04	18:54	16:54	31 09:16 (9) 16:26
12	05:31	06:15	07:06	07:55	07:50	08:46 (9) 08:35
	21:54	21:09	20:01	18:52	16:52	30 09:16 (9) 16:26
13	05:32	06:17	07:07	07:57	07:52	08:47 (9) 08:36
	21:53	21:07	19:59	18:50	16:51	28 09:15 (9) 16:26
14	05:34	06:19	07:09	07:59	07:54	08:48 (9) 08:37
	21:52	21:05	19:57	18:48	16:49	26 09:14 (9) 16:26
15	05:35	06:20	07:11	08:01	07:56	08:49 (9) 08:38
	21:51	21:03	19:54	18:45	16:48	24 09:13 (9) 16:26
16	05:36	06:22	07:12	08:02	07:57	08:50 (9) 08:39
	21:50	21:01	19:52	18:43	16:46	22 09:12 (9) 16:26
17	05:37	06:23	07:14	08:04	07:59	08:52 (9) 08:40
	21:49	20:59	19:50	18:41	16:45	18 09:10 (9) 16:27
18	05:38	06:25	07:15	08:06	08:01	08:54 (9) 08:40
	21:48	20:57	19:47	18:39	16:44	15 09:09 (9) 16:27
19	05:40	06:27	07:17	08:07	08:02	08:58 (9) 08:41
	21:47	20:55	19:45	18:37	16:42	10 09:08 (10) 16:27
20	05:41	06:28	07:19	08:09	08:04	09:02 (10) 08:42
	21:46	20:53	19:43	18:35	16:41	3 09:05 (10) 16:28
21	05:42	06:30	07:20	08:11	08:06	08:42 08:42
	21:44	20:50	19:40	18:33	16:40	27 11:00 (8)
22	05:44	06:32	07:22	08:13	08:07	08:43 10:33 (7)
	21:43	20:48	19:38	18:31	16:39	27 11:00 (8)
23	05:45	06:33	07:24	08:14	09:54 (9) 08:09	08:43 10:34 (7)
	21:42	20:46	19:36	18:29	11 10:05 (9) 16:38	16:29 27 11:01 (8)
24	05:46	06:35	07:25	08:16	09:51 (9) 08:11	08:44 10:35 (7)
	21:41	20:44	19:33	18:26	18 10:09 (9) 16:37	16:30 26 11:01 (8)
25	05:48	06:36	07:27	07:18	08:49 (9) 08:12	08:44 10:36 (7)
	21:39	20:42	19:31	17:24	22 09:11 (9) 16:36	16:30 26 11:02 (8)
26	05:49	06:38	07:29	07:20	08:48 (9) 08:14	08:45 10:36 (7)
	21:38	20:40	19:29	17:22	25 09:13 (9) 16:35	16:31 26 11:02 (8)
27	05:51	06:40	07:30	07:22	08:46 (9) 08:16	08:45 10:37 (7)
	21:36	20:38	19:26	17:20	28 09:14 (9) 16:34	16:32 25 11:02 (8)
28	05:52	06:41	07:32	07:23	08:46 (9) 08:17	08:45 10:37 (7)
	21:35	20:35	19:24	17:19	29 09:15 (9) 16:33	16:32 26 11:03 (8)
29	05:54	06:43	07:33	07:25	08:44 (9) 08:19	08:45 10:38 (7)
	21:33	20:33	19:22	17:17	31 09:15 (9) 16:32	16:33 25 11:03 (8)
30	05:55	06:45	07:35	07:27	08:43 (9) 08:20	08:45 10:38 (7)
	21:32	20:31	19:19	17:15	33 09:16 (9) 16:31	16:34 25 11:03 (8)
31	05:57	06:46		07:29	08:43 (9)	08:45 10:39 (7)
	21:30	20:29		17:13	33 09:16 (9)	16:35 24 11:03 (8)
Potential sun hours	502	454	381	331	266	244
Total, worst case				230	551	658
Sun reduction				0.24	0.18	0.13
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.67	0.67	0.64
Total reduction				0.16	0.12	0.09
Total, real				37	68	56

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: S - H19

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 16:37	08:18 17:24	07:25 18:16	07:49 (16) 08:00 (16) 20:10	08:29 (15) 10:02 (15) 21:01	08:35 (15) 09:31 (15) 21:46
2	08:45 16:38	08:17 17:26	07:23 18:18	07:46 (16) 08:01 (16) 20:11	08:29 (15) 10:02 (15) 21:02	08:36 (15) 09:29 (15) 21:47
3	08:45 16:39	08:15 17:28	07:21 18:19	07:44 (16) 08:03 (16) 20:13	08:28 (15) 10:02 (15) 21:04	08:38 (15) 09:28 (15) 21:48
4	08:45 16:40	08:14 17:30	07:18 18:21	07:42 (16) 08:04 (16) 20:15	08:27 (15) 10:01 (15) 21:06	08:40 (15) 09:25 (15) 21:49
5	08:44 16:41	08:12 17:32	07:16 18:23	07:40 (16) 08:06 (16) 20:17	08:27 (15) 10:01 (15) 21:07	08:41 (15) 09:23 (15) 21:50
6	08:44 16:42	08:10 17:34	07:14 18:25	07:37 (16) 08:06 (16) 20:18	08:27 (15) 10:01 (15) 21:09	08:43 (15) 09:20 (15) 21:51
7	08:44 16:44	08:09 17:35	07:12 18:27	07:35 (16) 08:30 (15) 20:20	08:27 (15) 10:01 (15) 21:10	08:46 (15) 09:18 (15) 21:52
8	08:43 16:45	08:07 17:37	07:10 18:28	07:33 (16) 08:37 (15) 20:22	08:26 (15) 09:59 (15) 21:12	08:48 (15) 09:14 (15) 21:53
9	08:43 16:46	08:05 17:39	07:07 18:30	07:30 (16) 08:41 (15) 20:23	08:26 (15) 09:59 (15) 21:14	08:52 (15) 09:10 (15) 21:54
10	08:42 16:48	08:03 17:41	07:05 18:32	07:28 (16) 08:44 (15) 20:25	08:26 (15) 09:58 (15) 21:15	08:54 (15) 09:08 (15) 21:55
11	08:42 16:49	08:01 17:43	07:03 18:34	07:26 (16) 08:47 (15) 20:27	08:26 (15) 09:58 (15) 21:17	08:56 (15) 09:06 (15) 21:56
12	08:41 16:50	08:00 17:45	07:01 18:35	07:23 (16) 08:49 (15) 20:28	08:26 (15) 09:57 (15) 21:18	08:58 (15) 09:04 (15) 21:57
13	08:40 16:52	07:58 17:47	06:58 18:37	07:21 (16) 08:51 (15) 20:30	08:25 (15) 09:55 (15) 21:20	08:59 (15) 09:02 (15) 21:58
14	08:40 16:53	07:56 17:48	06:56 18:39	07:20 (16) 08:53 (15) 20:32	08:26 (15) 09:55 (15) 21:22	09:00 (15) 09:00 (15) 21:59
15	08:39 16:55	07:54 17:50	06:54 18:41	07:20 (16) 08:55 (15) 20:34	08:26 (15) 09:54 (15) 21:23	09:01 (15) 09:00 (15) 21:58
16	08:38 16:57	07:52 17:52	06:51 18:42	07:20 (16) 08:57 (15) 20:35	08:26 (15) 09:53 (15) 21:25	09:02 (15) 09:00 (15) 21:57
17	08:37 16:58	07:50 17:54	06:49 18:44	07:20 (16) 08:59 (15) 20:37	08:26 (15) 09:52 (15) 21:26	09:03 (15) 09:00 (15) 21:59
18	08:36 17:00	07:48 17:56	06:47 18:46	07:20 (16) 08:58 (15) 20:39	08:27 (15) 09:51 (15) 21:28	09:04 (15) 09:00 (15) 21:59
19	08:35 17:01	07:46 17:58	06:44 18:47	07:20 (16) 08:58 (15) 20:40	08:27 (15) 09:50 (15) 21:29	09:05 (15) 09:00 (15) 22:00
20	08:34 17:03	07:44 17:59	06:42 18:49	07:20 (16) 08:59 (15) 20:42	08:28 (15) 09:49 (15) 21:31	09:06 (15) 09:00 (15) 22:00
21	08:33 17:05	07:42 18:01	06:40 18:51	07:21 (16) 09:00 (15) 20:44	08:28 (15) 09:48 (15) 21:32	09:07 (15) 09:00 (15) 22:00
22	08:32 17:06	07:40 18:03	06:38 18:53	07:21 (16) 09:01 (15) 20:45	08:29 (15) 09:46 (15) 21:33	09:08 (15) 09:00 (15) 22:01
23	08:31 17:08	07:38 18:05	06:35 18:54	07:22 (16) 09:01 (15) 20:47	08:29 (15) 09:45 (15) 21:35	09:09 (15) 09:00 (15) 22:01
24	08:29 17:10	07:36 18:07	06:33 18:56	07:23 (16) 09:02 (15) 20:49	08:30 (15) 09:43 (15) 21:36	09:10 (15) 09:00 (15) 22:01
25	08:28 17:12	07:34 18:09	06:31 18:58	07:24 (16) 09:02 (15) 20:50	08:30 (15) 09:42 (15) 21:38	09:11 (15) 09:00 (15) 22:01
26	08:27 17:13	07:31 18:10	06:28 18:59	07:26 (16) 09:02 (15) 20:52	08:31 (15) 09:40 (15) 21:39	09:12 (15) 09:00 (15) 22:01
27	08:26 17:15	07:29 18:12	06:26 19:01	07:28 (16) 09:03 (15) 20:54	08:32 (15) 09:39 (15) 21:40	09:13 (15) 09:00 (15) 22:01
28	08:24 17:17	07:27 18:14	07:51 (16) 06:24 19:03	07:30 (16) 09:02 (15) 20:56	08:33 (15) 09:37 (15) 21:41	09:14 (15) 09:00 (15) 22:01
29	08:23 17:19	07:25 18:16	07:57 (16) 06:22 19:05	07:31 (16) 09:01 (15) 20:58	08:33 (15) 09:36 (15) 21:43	09:15 (15) 09:00 (15) 22:01
30	08:21 17:21	07:23 18:18	07:59 (16) 06:20 19:07	07:32 (16) 09:00 (15) 21:00	08:34 (15) 09:35 (15) 21:44	09:16 (15) 09:00 (15) 22:01
31	08:20 17:22	07:22 18:19	07:59 (16) 06:19 19:08	07:33 (16) 09:00 (15) 21:02	08:34 (15) 09:34 (15) 21:46	09:17 (15) 09:00 (15) 22:01
Potential sun hours	259	278	367	416	485	499
Total, worst case		6	2362	2504	359	
Sun reduction		0.21	0.24	0.35	0.37	
Oper. time red.		1.00	1.00	1.00	1.00	
Wind dir. red.		0.67	0.67	0.67	0.67	
Total reduction		0.14	0.16	0.24	0.25	
Total, real		1	385	593	89	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: S - H19

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December	
1	05:22 22:00	05:58 21:28	06:48 20:26	08:25 (15) 09:57 (15)	07:37 19:17	08:02 (16) 17:11	08:21 16:31
2	05:22 22:00	06:00 21:27	06:49 20:24	08:24 (15) 09:56 (15)	07:38 19:15	08:03 (16) 17:09	08:23 16:30
3	05:23 21:59	06:01 21:25	09:06 (15) 20:22	08:24 (15) 09:57 (15)	07:40 19:12	08:05 (16) 17:07	08:24 16:29
4	05:24 21:59	06:03 21:23	09:00 (15) 20:20	08:23 (15) 09:56 (15)	07:42 19:10	08:07 (16) 17:05	08:26 16:29
5	05:25 21:59	06:04 21:22	08:57 (15) 20:17	08:23 (15) 09:57 (15)	07:43 19:08	08:09 (16) 17:04	08:27 16:28
6	05:26 21:58	06:06 21:20	08:54 (15) 20:15	08:23 (15) 09:57 (15)	07:45 19:06	08:10 (16) 17:02	08:28 16:28
7	05:26 21:57	06:08 21:18	08:52 (15) 20:13	08:22 (15) 09:56 (15)	07:47 19:03	08:12 (16) 17:00	08:29 16:28
8	05:27 21:57	06:09 21:16	08:50 (15) 20:10	08:22 (15) 09:56 (15)	07:48 19:01	08:14 (16) 16:59	08:31 16:27
9	05:28 21:56	06:11 21:14	08:49 (15) 20:08	08:22 (15) 09:56 (15)	07:50 18:59	08:15 (16) 16:57	08:32 16:27
10	05:29 21:55	06:12 21:12	08:46 (15) 20:06	08:22 (15) 09:56 (15)	07:52 18:56	08:17 (16) 16:55	08:33 16:27
11	05:30 21:55	06:14 21:10	08:45 (15) 20:03	08:21 (15) 09:55 (15)	07:54 18:54	08:19 (16) 16:54	08:34 16:27
12	05:31 21:54	06:15 21:09	08:43 (15) 20:01	08:21 (15) 09:54 (15)	07:55 18:52	08:21 (16) 16:52	08:35 16:26
13	05:33 21:53	06:17 21:07	08:42 (15) 19:59	08:22 (15) 09:54 (15)	07:57 18:50	08:23 (16) 16:51	08:36 16:26
14	05:34 21:52	06:19 21:05	08:41 (15) 19:57	08:21 (15) 09:53 (15)	07:59 18:48	08:24 (16) 16:49	08:37 16:26
15	05:35 21:51	06:20 21:03	08:40 (15) 19:54	08:21 (16) 09:53 (15)	08:00 18:45	07:55 16:48	08:38 16:26
16	05:36 21:50	06:22 21:01	08:38 (15) 19:52	08:17 (16) 09:51 (15)	08:02 18:43	07:57 16:46	08:39 16:27
17	05:37 21:49	06:24 20:59	08:37 (15) 19:50	08:14 (16) 09:51 (15)	08:04 18:41	07:59 16:45	08:40 16:27
18	05:38 21:48	06:25 20:57	08:36 (15) 19:47	08:13 (16) 09:50 (15)	08:06 18:39	08:01 16:44	08:40 16:27
19	05:40 21:47	06:27 20:55	08:35 (15) 19:45	08:10 (16) 09:49 (15)	08:07 18:37	08:02 16:43	08:41 16:27
20	05:41 21:46	06:28 20:52	08:34 (15) 19:43	08:09 (16) 09:48 (15)	08:09 18:35	08:04 16:41	08:42 16:28
21	05:42 21:44	06:30 20:50	08:33 (15) 19:40	08:07 (16) 09:46 (15)	08:11 18:33	08:06 16:40	08:42 16:28
22	05:44 21:43	06:32 20:48	08:32 (15) 19:38	08:06 (16) 09:45 (15)	08:13 18:31	08:07 16:39	08:43 16:29
23	05:45 21:42	06:33 20:46	08:31 (15) 19:36	08:05 (16) 09:44 (15)	08:14 18:29	08:09 16:38	08:43 16:29
24	05:46 21:40	06:35 20:44	08:30 (15) 19:33	08:04 (16) 09:42 (15)	08:16 18:26	08:11 16:37	08:44 16:30
25	05:48 21:39	06:36 20:42	08:29 (15) 19:31	08:03 (16) 09:41 (15)	07:18 17:24	08:12 16:36	08:44 16:30
26	05:49 21:38	06:38 20:40	08:29 (15) 19:29	08:02 (16) 09:39 (15)	07:20 17:22	08:14 16:35	08:44 16:31
27	05:51 21:36	06:40 20:37	08:28 (15) 19:26	08:01 (16) 09:38 (15)	07:21 17:21	08:15 16:34	08:45 16:32
28	05:52 21:35	06:41 20:35	08:28 (15) 19:24	08:01 (16) 09:36 (15)	07:23 17:19	08:17 16:33	08:45 16:33
29	05:54 21:33	06:43 20:33	08:26 (15) 19:22	08:00 (16) 09:33 (15)	07:25 17:17	08:18 16:32	08:45 16:33
30	05:55 21:32	06:45 20:31	08:26 (15) 19:19	08:00 (16) 09:31 (15)	07:27 17:15	08:20 16:31	08:45 16:34
31	05:57 21:30	06:46 20:29	08:25 (15) 09:56 (15)		07:29 17:13		08:45 16:35
Potential sun hours	502	454	381	331	266	244	
Total, worst case		1870	2849	586			
Sun reduction		0.30	0.28	0.24			
Oper. time red.		1.00	1.00	1.00			
Wind dir. red.		0.67	0.67	0.67			
Total reduction		0.20	0.19	0.16			
Total, real		371	540	93			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Specimen Turbine **Shadow receptor:** U - H21
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March		April		May		June	
1	08:45 16:36	08:18 17:24	07:25 18:16		17:37 (5) 17:43 (5)	07:14 20:10	14	19:29 (11) 19:43 (11)	06:10 21:00	20:25 (14) 21:00 (14)
2	08:45 16:37	08:17 17:26	07:23 18:17	6	17:34 (5) 17:46 (5)	07:12 20:11	17	19:27 (11) 19:44 (11)	06:08 21:02	20:24 (14) 21:00 (14)
3	08:45 16:38	08:15 17:28	07:21 18:19	12	17:33 (5) 17:47 (5)	07:10 20:13	19	19:25 (11) 19:44 (11)	06:06 21:04	20:25 (14) 21:00 (14)
4	08:45 16:40	08:13 17:30	07:18 18:21	14	17:32 (5) 17:48 (5)	07:07 20:15	19	19:25 (11) 19:44 (11)	06:04 21:05	20:25 (14) 21:00 (14)
5	08:44 16:41	08:12 17:31	07:16 18:23	16	17:30 (5) 17:48 (5)	07:05 20:16	21	19:24 (11) 19:45 (11)	06:02 21:07	20:26 (14) 21:01 (14)
6	08:44 16:42	08:10 17:33	07:14 18:25	18	17:30 (5) 17:48 (5)	07:03 20:18	21	19:24 (11) 19:45 (11)	06:00 21:09	20:26 (14) 21:00 (14)
7	08:44 16:43	08:08 17:35	07:12 18:26	18	17:30 (5) 17:48 (5)	07:01 20:20	21	19:23 (11) 19:44 (11)	05:58 21:10	20:27 (14) 21:01 (14)
8	08:43 16:45	08:07 17:37	07:09 18:28	18	17:31 (5) 17:48 (5)	06:58 20:21	19	19:24 (11) 19:43 (11)	05:57 21:12	20:26 (14) 21:00 (14)
9	08:43 16:46	08:05 17:39	07:07 18:30	17	17:30 (5) 17:47 (5)	06:56 20:23	18	19:24 (11) 19:42 (11)	05:55 21:14	20:27 (14) 21:01 (14)
10	08:42 16:47	08:03 17:41	07:05 18:32	15	17:31 (5) 17:46 (5)	06:54 20:25	16	19:25 (11) 19:41 (11)	05:53 21:15	20:27 (14) 21:00 (14)
11	08:42 16:49	08:01 17:43	07:03 18:33	11	17:33 (5) 17:44 (5)	06:52 20:27	13	19:27 (11) 19:40 (11)	05:52 21:17	20:27 (14) 21:00 (14)
12	08:41 16:50	07:59 17:44	07:00 18:35	6	17:35 (5) 17:41 (5)	06:49 20:28	9	19:28 (11) 19:37 (11)	05:50 21:18	20:28 (14) 21:01 (14)
13	08:40 16:52	07:58 17:46	06:58 18:37			06:47 20:30	21		05:48 21:20	20:29 (14) 21:01 (14)
14	08:40 16:53	07:56 17:48	06:56 18:39			06:45 20:32	23		05:47 21:22	20:29 (14) 21:01 (14)
15	08:39 16:55	07:54 17:50	06:54 18:40			06:43 20:33	25		05:45 21:23	20:27 (14) 21:00 (14)
16	08:38 16:56	07:52 17:52	06:51 18:42			06:41 20:35	27		05:44 21:25	20:27 (14) 21:01 (14)
17	08:37 16:58	07:50 17:54	06:49 18:44			06:38 20:37	30		05:42 21:26	20:26 (14) 21:01 (14)
18	08:36 17:00	07:48 17:56	06:47 18:46			06:36 20:38	31		05:41 21:28	20:25 (14) 21:01 (14)
19	08:35 17:01	07:46 17:57	06:44 18:47			06:34 20:40	32		05:39 21:29	20:25 (14) 22:00 (14)
20	08:34 17:03	07:44 17:59	06:42 18:49			06:32 20:42	33		05:38 21:31	20:25 (14) 22:00 (14)
21	08:33 17:05	07:42 18:01	06:40 18:51			06:30 20:44	33		05:37 21:32	20:25 (14) 22:00 (14)
22	08:32 17:06	07:40 18:03	06:37 18:52			06:28 20:45	34		05:35 21:33	20:24 (14) 22:01 (14)
23	08:31 17:08	07:38 18:05	06:35 18:54			06:26 20:47	34		05:34 21:35	20:24 (14) 22:01 (14)
24	08:29 17:10	07:36 18:07	06:33 18:56			06:24 20:49	34		05:33 21:36	20:24 (14) 22:01 (14)
25	08:28 17:11	07:33 18:08	06:30 18:58			06:22 20:50	35		05:32 21:37	20:24 (14) 22:01 (14)
26	08:27 17:13	07:31 18:10	06:28 18:59			06:19 20:52	35		05:30 21:39	20:24 (14) 22:01 (14)
27	08:25 17:15	07:29 18:12	06:26 19:01			06:17 20:54	35		05:29 21:40	20:24 (14) 22:01 (14)
28	08:24 17:17	07:27 18:14	06:24 19:03			06:15 20:55	35		05:28 21:41	20:24 (14) 22:01 (14)
29	08:23 17:19		07:21 20:04			06:13 20:57	35		05:27 21:43	20:24 (14) 22:01 (14)
30	08:21 17:20		07:19 20:06			06:12 20:59	35		05:26 21:44	20:25 (14) 22:00 (14)
31	08:20 17:22		07:17 20:08	10	19:31 (11) 19:41 (11)		35		05:25 21:45	20:25 (14) 21:00 (14)
Potential sun hours	259	278	367		416		485		499	
Total, worst case			178		207		645		984	
Sun reduction			0.24		0.35		0.37		0.30	
Oper. time red.			1.00		1.00		1.00		1.00	
Wind dir. red.			0.64		0.68		0.69		0.69	
Total reduction			0.16		0.24		0.25		0.21	
Total, real			28		50		164		202	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Specimen Turbine **Shadow receptor:** V - H22
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time
 N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

	July	August	September	October	November	December
1	05:21	05:58	06:48	07:37	07:30	15:58 (10) 08:21 14:56 (13)
	22:00	21:28	20:26	19:17	17:11	17 16:15 (10) 16:30 30 15:26 (13)
2	05:22	06:00	06:49	07:38	07:32	15:58 (10) 08:23 14:57 (13)
	22:00	21:27	20:24	19:15	17:09	17 16:15 (10) 16:30 30 15:27 (13)
3	05:23	06:01	06:51	07:40	07:34	15:59 (10) 08:24 14:57 (13)
	21:59	21:25	20:22	19:12	17:07	15 16:14 (10) 16:29 29 15:26 (13)
4	05:24	06:03	06:53	07:42	07:36	16:01 (10) 08:26 14:58 (13)
	21:59	21:23	20:19	19:10	17:05	12 16:13 (10) 16:29 29 15:27 (13)
5	05:24	06:04	06:54	07:43	07:38	16:03 (10) 08:27 14:59 (13)
	21:59	21:21	20:17	19:08	17:04	8 16:11 (10) 16:28 27 15:26 (13)
6	05:25	06:06	06:56	07:45	07:39	08:28 15:00 (13)
	21:58	21:20	20:15	19:05	17:02	16:28 27 15:27 (13)
7	05:26	06:07	06:57	07:47	07:41	15:04 (13) 08:29 15:01 (13)
	21:57	21:18	20:13	19:03	17:00	5 15:09 (13) 16:27 26 15:27 (13)
8	05:27	06:09	06:59	07:48	07:43	15:00 (13) 08:31 15:01 (13)
	21:57	21:16	20:10	19:01	16:58	13 15:13 (13) 16:27 25 15:26 (13)
9	05:28	06:10	07:01	07:50	07:45	14:58 (13) 08:32 15:01 (11)
	21:56	21:14	20:08	18:59	16:57	18 15:16 (13) 16:27 25 15:26 (13)
10	05:29	06:12	07:02	07:52	17:15 (12) 07:47	14:56 (13) 08:33 15:02 (11)
	21:55	21:12	20:06	18:56	12 17:27 (12) 16:55	22 15:18 (13) 16:26 25 15:27 (13)
11	05:30	06:14	07:04	07:53	17:12 (12) 07:48	14:55 (13) 08:34 15:02 (11)
	21:55	21:10	20:03	18:54	17 17:29 (12) 16:54	24 15:19 (13) 16:26 25 15:27 (13)
12	05:31	06:15	07:06	07:55	17:10 (12) 07:50	14:53 (13) 08:35 15:03 (11)
	21:54	21:09	20:01	18:52	21 17:31 (12) 16:52	26 15:19 (13) 16:26 24 15:27 (13)
13	05:32	06:17	07:07	07:57	17:09 (12) 07:52	14:52 (13) 08:36 15:03 (11)
	21:53	21:07	19:59	18:50	23 17:32 (12) 16:51	28 15:20 (13) 16:26 24 15:27 (13)
14	05:33	06:18	07:09	07:59	17:07 (12) 07:54	14:52 (13) 08:37 15:03 (11)
	21:52	21:05	19:56	18:47	25 17:32 (12) 16:49	29 15:21 (13) 16:26 24 15:27 (13)
15	05:35	06:20	07:10	08:00	17:06 (12) 07:55	14:52 (13) 08:38 15:04 (11)
	21:51	21:03	19:54	18:45	27 17:33 (12) 16:48	30 15:22 (13) 16:26 23 15:27 (13)
16	05:36	06:22	07:12	08:02	17:06 (12) 07:57	14:51 (13) 08:39 15:05 (11)
	21:50	21:01	19:52	18:43	27 17:33 (12) 16:46	32 15:23 (13) 16:26 22 15:27 (13)
17	05:37	06:23	07:14	08:04	17:05 (12) 07:59	14:51 (13) 08:40 15:04 (11)
	21:49	20:59	19:49	18:41	28 17:33 (12) 16:45	32 15:23 (13) 16:26 23 15:27 (13)
18	05:38	06:25	07:15	08:06	17:05 (12) 08:01	14:51 (13) 08:40 15:05 (11)
	21:48	20:57	19:47	18:39	28 17:33 (12) 16:44	33 15:24 (13) 16:27 22 15:27 (13)
19	05:40	06:27	07:17	08:07	17:04 (12) 08:02	14:52 (13) 08:41 15:06 (11)
	21:47	20:54	19:45	18:37	28 17:32 (12) 16:42	32 15:24 (13) 16:27 22 15:28 (13)
20	05:41	06:28	07:19	08:09	17:04 (12) 08:04	14:52 (13) 08:42 15:06 (11)
	21:46	20:52	19:42	18:35	28 17:32 (12) 16:41	33 15:25 (13) 16:27 22 15:28 (13)
21	05:42	06:30	07:20	08:11	17:04 (12) 08:06	14:51 (13) 08:42 15:06 (11)
	21:44	20:50	19:40	18:32	28 17:32 (12) 16:40	33 15:24 (13) 16:28 23 15:29 (13)
22	05:43	06:31	07:22	08:13	17:05 (12) 08:07	14:51 (13) 08:43 15:06 (11)
	21:43	20:48	19:38	18:30	26 17:31 (12) 16:39	34 15:25 (13) 16:28 23 15:29 (13)
23	05:45	06:33	07:23	08:14	17:04 (10) 08:09	14:52 (13) 08:43 15:08 (11)
	21:42	20:46	19:35	18:28	27 17:31 (12) 16:38	33 15:25 (13) 16:29 22 15:30 (13)
24	05:46	06:35	07:25	08:16	17:02 (10) 08:11	14:53 (13) 08:44 15:08 (11)
	21:40	20:44	19:33	18:26	28 17:30 (12) 16:37	33 15:26 (13) 16:29 22 15:30 (13)
25	05:48	06:36	07:27	07:18	16:00 (10) 08:12	14:53 (13) 08:44 15:08 (11)
	21:39	20:42	19:31	17:24	28 16:28 (12) 16:36	33 15:26 (13) 16:30 22 15:30 (13)
26	05:49	06:38	07:28	07:20	15:59 (10) 08:14	14:53 (13) 08:44 15:09 (11)
	21:38	20:40	19:28	17:22	28 16:27 (12) 16:35	33 15:26 (13) 16:31 23 15:32 (13)
27	05:51	06:40	07:30	07:21	15:57 (10) 08:15	14:54 (13) 08:45 15:09 (11)
	21:36	20:37	19:26	17:20	27 16:24 (12) 16:34	32 15:26 (13) 16:31 23 15:32 (13)
28	05:52	06:41	07:32	07:23	15:57 (10) 08:17	14:55 (13) 08:45 15:10 (11)
	21:35	20:35	19:24	17:18	23 16:20 (12) 16:33	32 15:27 (13) 16:32 23 15:33 (13)
29	05:53	06:43	07:33	07:25	15:57 (10) 08:18	14:55 (13) 08:45 15:10 (11)
	21:33	20:33	19:21	17:16	19 16:16 (10) 16:32	31 15:26 (13) 16:33 24 15:34 (13)
30	05:55	06:44	07:35	07:27	15:57 (10) 08:20	14:56 (13) 08:45 15:11 (11)
	21:32	20:31	19:19	17:14	19 16:16 (10) 16:31	31 15:27 (13) 16:34 23 15:34 (13)
31	05:56	06:46	07:37	07:29	15:57 (10) 08:21	14:57 (13) 08:45 15:11 (11)
	21:30	20:29	19:17	17:13	19 16:16 (10) 16:30	31 15:27 (13) 16:34 23 15:34 (13)
Potential sun hours	502	454	381	331	266	244
Total, worst case				536	751	756
Sun reduction				0.24	0.18	0.13
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.63	0.59	0.59
Total reduction				0.15	0.11	0.08
Total, real				79	82	60

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Specimen Turbine **Shadow receptor:** W - H23**Assumptions for shadow calculations**

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January		February		March		April		May		June	
1	08:45		14:58 (13)	08:18		07:25		16:31 (12)	07:14		06:10	05:24
	16:36	29	15:27 (13)	17:24		18:16	10	16:41 (12)	20:10		21:00	21:46
2	08:45		14:58 (13)	08:17		07:23			07:12		06:08	05:24
	16:37	29	15:27 (13)	17:26		18:17			20:11		21:02	21:47
3	08:45		14:58 (13)	08:15		07:21			07:10		06:06	05:23
	16:38	30	15:28 (13)	17:28	6	16:32 (10)			20:13		21:04	21:48
4	08:45		14:59 (13)	08:14		07:18			07:07		06:04	05:22
	16:40	30	15:29 (13)	17:30	11	16:34 (10)			20:15		21:05	21:49
5	08:44		14:59 (13)	08:12		07:16			07:05		06:02	05:21
	16:41	30	15:29 (13)	17:31	14	16:37 (10)			20:16		21:07	21:50
6	08:44		14:59 (13)	08:10		07:14			07:03		06:00	05:21
	16:42	31	15:30 (13)	17:33	16	16:38 (10)			20:18		21:09	21:51
7	08:44		14:59 (13)	08:08		07:12			07:01		05:58	05:20
	16:43	32	15:31 (13)	17:35	17	16:38 (10)			20:20		21:10	21:52
8	08:43		15:00 (13)	08:07		07:09			06:58		05:57	05:20
	16:45	32	15:32 (13)	17:37	19	16:39 (10)			20:22		21:12	21:53
9	08:43		15:00 (13)	08:05		07:07			06:56		05:55	05:19
	16:46	32	15:32 (13)	17:39	19	16:39 (10)			20:23		21:14	21:54
10	08:42		15:00 (13)	08:03		07:05			06:54		05:53	05:19
	16:47	32	15:32 (13)	17:41	19	16:39 (10)			20:25		21:15	21:55
11	08:42		15:00 (13)	08:01		07:03			06:52		05:52	05:18
	16:49	33	15:33 (13)	17:43	23	16:43 (12)			20:27		21:17	21:56
12	08:41		15:01 (13)	08:00		07:00			06:49		05:50	05:18
	16:50	33	15:34 (13)	17:44	25	16:45 (12)			20:28		21:18	21:56
13	08:40		15:01 (13)	07:58		06:58			06:47		05:48	05:18
	16:52	33	15:34 (13)	17:46	26	16:47 (12)			20:30		21:20	21:57
14	08:40		15:01 (13)	07:56		06:56			06:45		05:47	05:17
	16:53	34	15:35 (13)	17:48	26	16:48 (12)			20:32		21:22	21:58
15	08:39		15:02 (13)	07:54		06:54			06:43		05:45	05:17
	16:55	33	15:35 (13)	17:50	26	16:49 (12)			20:33		21:23	21:58
16	08:38		15:02 (13)	07:52		06:51			06:41		05:44	05:17
	16:56	33	15:35 (13)	17:52	26	16:50 (12)			20:35		21:25	21:59
17	08:37		15:03 (13)	07:50		06:49			06:38		05:42	05:17
	16:58	33	15:36 (13)	17:54	28	16:51 (12)			20:37		21:26	21:59
18	08:36		15:03 (13)	07:48		06:47			06:36		05:41	05:17
	17:00	33	15:36 (13)	17:56	28	16:51 (12)			20:39		21:28	22:00
19	08:35		15:03 (13)	07:46		06:44			06:34		05:39	05:17
	17:01	32	15:35 (13)	17:57	28	16:51 (12)			20:40		21:29	22:00
20	08:34		15:04 (13)	07:44		06:42			06:32		05:38	05:17
	17:03	32	15:36 (13)	17:59	28	16:51 (12)			20:42		21:31	22:00
21	08:33		15:04 (13)	07:42		06:40			06:30		05:36	05:17
	17:05	32	15:36 (13)	18:01	28	16:51 (12)			20:44		21:32	22:00
22	08:32		15:05 (13)	07:40		06:37			06:28		05:35	05:18
	17:06	31	15:36 (13)	18:03	28	16:51 (12)			20:45		21:33	22:01
23	08:31		15:05 (13)	07:38		06:35			06:26		05:34	05:18
	17:08	30	15:35 (13)	18:05	27	16:51 (12)			20:47		21:35	22:01
24	08:29		15:07 (13)	07:36		06:33			06:24		05:33	05:18
	17:10	29	15:36 (13)	18:07	26	16:49 (12)			20:49		21:36	22:01
25	08:28		15:08 (13)	07:34		06:30			06:22		05:31	05:18
	17:11	28	15:36 (13)	18:08	25	16:49 (12)			20:50		21:38	22:01
26	08:27		15:09 (13)	07:31		06:28			06:19		05:30	05:19
	17:13	26	15:35 (13)	18:10	23	16:48 (12)			20:52		21:39	22:01
27	08:26		15:10 (13)	07:29		06:26			06:17		05:29	05:19
	17:15	24	15:34 (13)	18:12	19	16:46 (12)			20:54		21:40	22:01
28	08:24		15:11 (13)	07:27		06:24			06:15		05:28	05:20
	17:17	22	15:33 (13)	18:14	16	16:45 (12)			20:55		21:41	22:01
29	08:23		15:13 (13)			07:21			06:13		05:27	05:20
	17:19	18	15:31 (13)			20:04			20:57		21:43	22:01
30	08:21		15:15 (13)			07:19			06:12		05:26	05:21
	17:20	15	15:30 (13)			20:06			20:59		21:44	22:00
31	08:20		15:18 (13)			07:17					05:25	
	17:22	9	15:27 (13)			20:08					21:45	
Potential sun hours	259		278			367			416		485	499
Total, worst case	900		577			10						
Sun reduction	0.16		0.21			0.24						
Oper. time red.	1.00		1.00			1.00						
Wind dir. red.	0.60		0.62			0.62						
Total reduction	0.09		0.13			0.15						
Total, real	83		73			2						

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: W - H23

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (July-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix with 4 columns: Day in month, Sun rise/set, Minutes with flicker, and WTG causing flicker times.



SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: X - H24
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-June) and rows for each day of the month, including sunrise, sunset, and shadow reduction data.

Table layout: For each day in each month the following matrix apply

Matrix table with 4 columns: Day in month, Sun rise/set, Minutes with flicker, and First/Last time with flicker.



SHADOW - Calendar

Calculation: Specimen Turbine **Shadow receptor:** X - H24
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22	05:58	06:48	07:37	07:31	08:21 (9) 08:22 09:55 (8)
	22:00	21:28	20:26	19:17	17:11	33 08:54 (10) 16:31 27 10:22 (7)
2	05:22	06:00	06:49	07:38	07:32	08:21 (9) 08:23 09:55 (8)
	22:00	21:27	20:24	19:15	17:09	34 08:55 (10) 16:30 27 10:22 (7)
3	05:23	06:01	06:51	07:40	07:34	08:22 (9) 08:24 09:55 (8)
	22:00	21:25	20:22	19:12	17:07	33 08:55 (10) 16:29 28 10:23 (7)
4	05:24	06:03	06:53	07:42	07:36	08:24 (9) 08:26 09:55 (8)
	21:59	21:23	20:20	19:10	17:05	31 08:55 (10) 16:29 29 10:24 (8)
5	05:25	06:04	06:54	07:44	07:38	08:25 (9) 08:27 09:55 (8)
	21:59	21:22	20:17	19:08	17:04	31 08:56 (10) 16:28 29 10:24 (7)
6	05:25	06:06	06:56	07:45	07:40	08:28 (9) 08:28 09:56 (8)
	21:58	21:20	20:15	19:06	17:02	28 08:56 (10) 16:28 29 10:25 (7)
7	05:26	06:07	06:58	07:47	07:41	08:31 (9) 08:30 09:56 (8)
	21:58	21:18	20:13	19:03	17:00	24 08:55 (10) 16:27 29 10:25 (7)
8	05:27	06:09	06:59	07:49	07:43	08:38 (10) 08:31 09:56 (8)
	21:57	21:16	20:11	19:01	16:59	17 08:55 (10) 16:27 29 10:25 (7)
9	05:28	06:11	07:01	07:50	07:45	08:39 (10) 08:32 09:57 (8)
	21:56	21:14	20:08	18:59	16:57	15 08:54 (10) 16:27 30 10:27 (7)
10	05:29	06:12	07:02	07:52	07:47	08:40 (10) 08:33 09:57 (8)
	21:56	21:13	20:06	18:57	16:55	14 08:54 (10) 16:27 30 10:27 (7)
11	05:30	06:14	07:04	07:54	07:48	08:41 (10) 08:34 09:57 (8)
	21:55	21:11	20:04	18:54	16:54	12 08:53 (10) 16:26 30 10:27 (7)
12	05:31	06:15	07:06	07:55	07:50	08:43 (10) 08:35 09:58 (8)
	21:54	21:09	20:01	18:52	16:52	8 08:51 (10) 16:26 30 10:28 (7)
13	05:32	06:17	07:07	07:57	07:52	08:36 09:58 (8)
	21:53	21:07	19:59	18:50	16:51	16:26 30 10:28 (7)
14	05:34	06:19	07:09	07:59	07:54	08:37 09:59 (8)
	21:52	21:05	19:57	18:48	16:49	16:26 30 10:29 (7)
15	05:35	06:20	07:11	08:01	07:56	08:38 09:59 (8)
	21:51	21:03	19:54	18:45	16:48	16:26 30 10:29 (7)
16	05:36	06:22	07:12	08:02	09:32 (9) 07:57	08:39 10:00 (8)
	21:50	21:01	19:52	18:43	8 09:40 (9) 16:46	16:26 30 10:30 (7)
17	05:37	06:23	07:14	08:04	09:28 (9) 07:59	08:40 09:59 (8)
	21:49	20:59	19:50	18:41	15 09:43 (9) 16:45	16:27 31 10:30 (8)
18	05:38	06:25	07:15	08:06	09:26 (9) 08:01	08:40 10:00 (8)
	21:48	20:57	19:47	18:39	20 09:46 (9) 16:44	16:27 30 10:30 (7)
19	05:40	06:27	07:17	08:07	09:25 (9) 08:02	08:41 10:01 (8)
	21:47	20:55	19:45	18:37	22 09:47 (9) 16:42	16:27 30 10:31 (7)
20	05:41	06:28	07:19	08:09	09:23 (9) 08:04	08:42 10:01 (8)
	21:46	20:53	19:43	18:35	25 09:48 (9) 16:41	16:28 30 10:31 (7)
21	05:42	06:30	07:20	08:11	09:22 (9) 08:06	08:42 10:02 (8)
	21:44	20:50	19:40	18:33	27 09:49 (9) 16:40	16:28 30 10:32 (7)
22	05:44	06:32	07:22	08:13	09:21 (9) 08:07	10:00 (8) 08:43 10:03 (8)
	21:43	20:48	19:38	18:31	29 09:50 (9) 16:39	9 10:09 (8) 16:28 30 10:33 (7)
23	05:45	06:33	07:24	08:15	09:20 (9) 08:09	09:58 (8) 08:43 10:03 (8)
	21:42	20:46	19:36	18:29	30 09:50 (9) 16:38	14 10:12 (8) 16:29 30 10:33 (7)
24	05:46	06:35	07:25	08:16	09:20 (9) 08:11	09:57 (8) 08:44 10:03 (8)
	21:41	20:44	19:33	18:26	31 09:51 (9) 16:37	17 10:14 (8) 16:30 30 10:33 (7)
25	05:48	06:36	07:27	07:18	08:20 (9) 08:12	09:57 (8) 08:44 10:04 (8)
	21:39	20:42	19:31	17:24	31 08:51 (9) 16:36	19 10:16 (8) 16:30 30 10:34 (7)
26	05:49	06:38	07:29	07:20	08:19 (9) 08:14	09:55 (8) 08:45 10:04 (8)
	21:38	20:40	19:29	17:22	32 08:51 (9) 16:35	22 10:17 (8) 16:31 30 10:34 (7)
27	05:51	06:40	07:30	07:22	08:19 (9) 08:16	09:55 (8) 08:45 10:05 (8)
	21:36	20:38	19:26	17:20	32 08:51 (9) 16:34	23 10:18 (8) 16:32 30 10:35 (7)
28	05:52	06:41	07:32	07:23	08:20 (9) 08:17	09:55 (8) 08:45 10:05 (8)
	21:35	20:35	19:24	17:19	31 08:51 (9) 16:33	24 10:19 (7) 16:32 30 10:35 (7)
29	05:54	06:43	07:33	07:25	08:19 (9) 08:19	09:55 (8) 08:45 10:05 (8)
	21:33	20:33	19:22	17:17	31 08:50 (9) 16:32	25 10:20 (8) 16:33 31 10:36 (8)
30	05:55	06:45	07:35	07:27	08:19 (9) 08:20	09:55 (8) 08:45 10:06 (8)
	21:32	20:31	19:19	17:15	32 08:51 (10) 16:31	26 10:21 (7) 16:34 30 10:36 (7)
31	05:57	06:46	07:29	07:29	08:20 (9) 08:17	08:45 10:06 (8)
	21:30	20:29	17:13	33 08:53 (10) 16:35	31 16:35 31 10:37 (8)	
Potential sun hours	502	454	381	331	266	244
Total, worst case				429	459	920
Sun reduction				0.24	0.18	0.13
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.68	0.67	0.65
Total reduction				0.16	0.12	0.09
Total, real				69	57	81

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: Y - H25

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January to June) and rows for each day (1-31) showing sun rise/set times, shadow reduction, and operational time. Includes summary rows for 'Potential sun hours' and 'Total, real'.

Table layout: For each day in each month the following matrix apply

Matrix table with 4 columns: Day in month, Sun rise/set, Minutes with flicker, and (WTG causing flicker first/last time).



SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: Y - H25

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22	20:26 (4)	05:58	06:48	07:37	17:52 (16)
	22:00	23 20:49 (4)	21:28	20:26	19:17	33 18:32 (15)
2	05:22	20:27 (4)	06:00	06:49	07:38	17:49 (16)
	22:00	22 20:49 (4)	21:27	20:24	19:15	35 18:30 (15)
3	05:23	20:27 (4)	06:01	06:51	07:40	17:47 (16)
	21:59	23 20:50 (4)	21:25	20:22	19:12	36 18:29 (15)
4	05:24	20:27 (4)	06:03	06:53	07:42	17:46 (16)
	21:59	22 20:49 (4)	21:23	20:19	19:10	36 18:28 (15)
5	05:25	20:27 (4)	06:04	06:54	07:43	17:44 (16)
	21:58	23 20:50 (4)	21:21	20:17	19:08	32 18:24 (15)
6	05:25	20:27 (4)	06:06	06:56	07:45	17:43 (16)
	21:58	23 20:50 (4)	21:20	20:15	19:05	26 18:09 (16)
7	05:26	20:27 (4)	06:07	06:57	07:47	17:43 (16)
	21:57	24 20:51 (4)	21:18	20:13	19:03	26 18:09 (16)
8	05:27	20:28 (4)	06:09	06:59	07:48	17:43 (16)
	21:57	23 20:51 (4)	21:16	20:10	19:01	26 18:09 (16)
9	05:28	20:28 (4)	06:11	07:01	07:50	17:41 (16)
	21:56	23 20:51 (4)	21:14	20:08	18:59	27 18:08 (16)
10	05:29	20:28 (4)	06:12	07:02	07:52	17:42 (16)
	21:55	23 20:51 (4)	21:12	20:06	18:56	26 18:08 (16)
11	05:30	20:28 (4)	06:14	07:04	07:53	17:42 (16)
	21:55	24 20:52 (4)	21:10	20:03	18:54	26 18:08 (16)
12	05:31	20:28 (4)	06:15	07:06	07:55	17:42 (16)
	21:54	24 20:52 (4)	21:08	20:01	18:52	25 18:07 (16)
13	05:32	20:29 (4)	06:17	07:07	07:57	17:42 (16)
	21:53	23 20:52 (4)	21:07	19:59	18:50	23 18:05 (16)
14	05:34	20:29 (4)	06:19	07:09	07:59	17:43 (16)
	21:52	23 20:52 (4)	21:05	19:56	18:48	21 18:04 (16)
15	05:35	20:29 (4)	06:20	07:10	08:00	17:44 (16)
	21:51	22 20:51 (4)	21:03	19:54	18:45	19 18:03 (16)
16	05:36	20:29 (4)	06:22	07:12	08:02	17:46 (16)
	21:50	22 20:51 (4)	21:01	19:52	18:43	15 18:01 (16)
17	05:37	20:29 (4)	06:23	07:14	08:04	17:49 (16)
	21:49	22 20:51 (4)	20:59	19:49	18:41	9 17:58 (16)
18	05:38	20:30 (4)	06:25	07:15	08:06	17:49 (16)
	21:48	20 20:50 (4)	20:56	19:47	18:39	16:44
19	05:40	20:30 (4)	06:27	07:17	08:07	17:49 (16)
	21:47	20 20:50 (4)	20:54	19:45	18:37	16:42
20	05:41	20:32 (4)	06:28	07:19	08:09	17:42 (16)
	21:45	18 20:50 (4)	20:52	19:42	18:35	16:41
21	05:42	20:32 (4)	06:30	07:20	08:11	17:42 (16)
	21:44	17 20:49 (4)	20:50	19:40	18:33	16:40
22	05:44	20:33 (4)	06:31	07:22	08:13	17:42 (16)
	21:43	15 20:48 (4)	20:48	19:38	1 18:25 (15)	08:13
23	05:45	20:33 (4)	06:33	07:23	08:14	16:45 (17)
	21:42	14 20:47 (4)	20:46	19:35	11 18:20 (15)	16:39
24	05:46	20:36 (4)	06:35	07:25	08:16	16:55 (17)
	21:40	10 20:46 (4)	20:44	19:33	15 18:32 (15)	16:38
25	05:48	20:38 (4)	06:36	07:27	08:18	16:39 (17)
	21:39	5 20:43 (4)	20:42	19:31	18 18:33 (15)	16:37
26	05:49	06:38	07:28	08:14	17:24	15:57 (17)
	21:37	20:40	19:28	18:33 (15)	17:22	24 15:36 (17)
27	05:51	06:40	07:30	18:13 (15)	07:21	16:35
	21:36	20:37	19:26	18:33 (15)	17:20	50 12:58 (18)
28	05:52	06:41	07:32	18:13 (15)	07:23	16:34
	21:35	20:35	19:24	18:34 (15)	17:18	49 13:47 (18)
29	05:54	06:43	07:33	18:12 (15)	07:25	12:59 (18)
	21:33	20:33	19:21	18:33 (15)	17:16	49 13:48 (18)
30	05:55	06:44	07:35	17:58 (16)	07:27	12:59 (18)
	21:31	20:31	19:19	18:33 (15)	17:15	48 13:47 (18)
31	05:57	06:46	07:37	17:58 (16)	07:29	13:00 (18)
	21:30	20:28	19:17	18:33 (15)	17:13	57 14:09 (19)
Potential sun hours	502	454	381	331	266	244
Total, worst case	508		148	671		2111
Sun reduction	0.27		0.28	0.24		0.18
Oper. time red.	1.00		1.00	1.00		1.00
Wind dir. red.	0.69		0.64	0.63		0.59
Total reduction	0.18		0.18	0.15		0.08
Total, real	92		27	99	186	167

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: Z - H26

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45	10:30 (7)	08:18	09:07 (9)	07:25	07:15
	16:36	16	10:46 (8)	17:24	30	09:37 (9)
	16:37	15	10:30 (8)	08:17	31	09:06 (9)
2	08:45	10:45 (8)	17:26	09:37 (9)	18:18	07:12
	16:39	14	10:31 (8)	08:15	31	09:06 (9)
	16:40	12	10:45 (8)	17:30	31	09:37 (9)
3	08:45	10:34 (8)	08:12	09:07 (9)	07:16	07:10
	16:41	9	10:43 (8)	17:32	31	09:38 (9)
	16:42	5	10:37 (7)	08:10	31	09:07 (9)
4	08:44	10:42 (8)	17:33	09:38 (9)	18:25	07:03
	16:43		08:09	09:07 (9)	07:12	07:01
	16:43		17:35	09:38 (9)	18:27	20:20
5	08:44	08:07	08:07	09:07 (9)	07:10	06:59
	16:45	30	17:37	09:37 (9)	18:28	20:22
	16:46		08:05	09:07 (9)	07:07	06:56
6	08:43	17:39	30	09:37 (9)	18:30	20:23
	16:46		08:03	09:08 (9)	07:05	06:54
7	08:43	17:41	28	09:36 (9)	18:32	20:25
	16:47		08:02	09:10 (9)	07:03	06:52
8	08:42	17:43	26	09:36 (9)	18:34	20:27
	16:49		08:00	09:11 (9)	07:01	06:50
9	08:41	17:45	24	09:35 (9)	18:35	20:29
	16:50		07:58	09:12 (9)	06:58	06:47
10	08:41	17:47	22	09:34 (9)	18:37	20:30
	16:52		07:56	09:14 (9)	06:56	06:45
11	08:40	17:48	18	09:32 (9)	18:39	20:32
	16:53		07:54	09:16 (9)	06:54	06:43
12	08:39	17:50	14	09:30 (9)	18:41	20:34
	16:55		07:52	09:20 (9)	06:51	06:41
13	08:38	17:52	5	09:25 (9)	18:42	20:35
	16:56		07:50	06:49	06:39	05:42
14	08:37	17:54		18:44	20:37	21:26
	16:58		07:48	06:47	06:36	05:41
15	08:36	17:56		18:46	20:39	21:28
	17:00		07:46	06:45	06:34	05:39
16	08:35	17:58		18:48	20:40	21:29
	17:01		07:44	06:42	06:32	05:38
17	08:34	17:59		18:49	20:42	21:31
	17:03		07:42	06:40	06:30	05:37
18	08:33	18:01		18:51	20:44	21:32
	17:05		07:40	06:38	06:28	05:35
19	08:32	09:15 (9)	07:40	06:38	06:28	05:35
	17:06	13	09:28 (10)	18:03	18:53	20:46
	17:06		09:13 (9)	07:38	06:35	06:26
20	08:31	09:30 (10)	18:05	18:54	20:47	21:35
	17:08	17	09:30 (10)	18:05	18:54	20:47
	17:10	20	09:31 (10)	18:07	18:56	20:49
21	08:30	09:11 (9)	07:36	06:33	06:24	05:33
	17:11		07:34	06:31	06:22	05:32
22	08:28	09:10 (9)	07:34	06:31	06:22	05:32
	17:12	23	09:33 (10)	18:09	18:58	20:51
	17:12		09:09 (9)	07:32	06:28	06:20
23	08:27	09:09 (9)	07:32	06:28	06:20	05:31
	17:13	24	09:33 (10)	18:10	19:00	20:52
	17:13		09:08 (9)	07:29	06:26	06:18
24	08:26	09:08 (9)	07:29	06:26	06:18	05:29
	17:15	26	09:34 (10)	18:12	19:01	20:54
	17:15		09:07 (9)	07:27	06:24	06:16
25	08:24	09:07 (9)	07:27	06:24	06:16	05:28
	17:17	27	09:34 (10)	18:14	19:03	20:56
	17:17		09:08 (9)	07:25	07:21	06:14
26	08:23	09:08 (9)	07:25	07:21	06:14	05:27
	17:19	27	09:35 (9)	18:15	20:05	20:57
	17:19		09:07 (9)	07:19	06:12	05:26
27	08:22	09:07 (9)	07:19	06:12	05:26	05:21
	17:21	29	09:36 (9)	18:16	20:06	20:59
	17:21		09:06 (9)	07:17	06:11	05:25
28	08:20	09:06 (9)	07:17	06:11	05:25	05:20
	17:22	30	09:36 (9)	18:17	20:08	21:45
	17:22		09:06 (9)	07:17	06:11	05:25
Potential sun hours	259	278	367	416	485	499
Total, worst case	307	413				
Sun reduction	0.16	0.21				
Oper. time red.	1.00	1.00				
Wind dir. red.	0.67	0.67				
Total reduction	0.10	0.14				
Total, real	32	57				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Specimen Turbine **Shadow receptor:** Z - H26
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22	05:58	06:48	07:37	07:31	08:37 (9) 08:22
	22:00	21:28	20:26	19:17	17:11	29 09:06 (9) 16:31
2	05:22	06:00	06:49	07:38	07:32	08:37 (9) 08:23
	22:00	21:27	20:24	19:15	17:09	30 09:07 (9) 16:30
3	05:23	06:01	06:51	07:40	07:34	08:37 (9) 08:24
	22:00	21:25	20:22	19:12	17:07	30 09:07 (9) 16:29
4	05:24	06:03	06:53	07:42	07:36	08:36 (9) 08:26
	21:59	21:23	20:20	19:10	17:05	31 09:07 (9) 16:29
5	05:25	06:04	06:54	07:44	07:38	08:36 (9) 08:27
	21:59	21:22	20:17	19:08	17:04	32 09:08 (9) 16:28
6	05:25	06:06	06:56	07:45	07:40	08:36 (9) 08:28
	21:58	21:20	20:15	19:06	17:02	32 09:08 (9) 16:28
						4 10:24 (7)
7	05:26	06:07	06:58	07:47	07:41	08:36 (9) 08:30
	21:58	21:18	20:13	19:03	17:00	32 09:08 (9) 16:27
						9 10:30 (8)
8	05:27	06:09	06:59	07:49	07:43	08:37 (9) 08:31
	21:57	21:16	20:10	19:01	16:59	31 09:08 (9) 16:27
						12 10:32 (8)
9	05:28	06:11	07:01	07:50	07:45	08:37 (9) 08:32
	21:56	21:14	20:08	18:59	16:57	31 09:08 (9) 16:27
						13 10:34 (8)
10	05:29	06:12	07:02	07:52	07:47	08:37 (9) 08:33
	21:56	21:13	20:06	18:57	16:55	31 09:08 (9) 16:27
						15 10:35 (8)
11	05:30	06:14	07:04	07:54	07:48	08:38 (9) 08:34
	21:55	21:11	20:04	18:54	16:54	30 09:08 (9) 16:26
						16 10:36 (8)
12	05:31	06:15	07:06	07:55	07:50	08:39 (9) 08:35
	21:54	21:09	20:01	18:52	16:52	29 09:08 (9) 16:26
						17 10:37 (8)
13	05:32	06:17	07:07	07:57	07:52	08:39 (9) 08:36
	21:53	21:07	19:59	18:50	16:51	28 09:07 (9) 16:26
						18 10:38 (8)
14	05:34	06:19	07:09	07:59	07:54	08:40 (9) 08:37
	21:52	21:05	19:57	18:48	16:49	27 09:07 (9) 16:26
						19 10:39 (8)
15	05:35	06:20	07:11	08:01	07:56	08:40 (9) 08:38
	21:51	21:03	19:54	18:45	16:48	26 09:06 (10) 16:26
						19 10:39 (8)
16	05:36	06:22	07:12	08:02	07:57	08:42 (9) 08:39
	21:50	21:01	19:52	18:43	16:46	24 09:06 (10) 16:26
						20 10:40 (8)
17	05:37	06:23	07:14	08:04	07:59	08:43 (9) 08:40
	21:49	20:59	19:50	18:41	16:45	23 09:06 (10) 16:27
						20 10:40 (8)
18	05:38	06:25	07:15	08:06	08:01	08:45 (9) 08:40
	21:48	20:57	19:47	18:39	16:44	20 09:05 (10) 16:27
						21 10:41 (8)
19	05:40	06:27	07:17	08:07	08:02	08:47 (9) 08:41
	21:47	20:55	19:45	18:37	16:42	17 09:04 (10) 16:27
						21 10:42 (8)
20	05:41	06:28	07:19	08:09	08:04	08:50 (9) 08:42
	21:46	20:53	19:43	18:35	16:41	13 09:03 (10) 16:28
						21 10:42 (8)
21	05:42	06:30	07:20	08:11	08:06	08:42 08:42
	21:44	20:50	19:40	18:33	16:40	16:28
						21 10:43 (8)
22	05:44	06:32	07:22	08:13	08:07	08:43 10:23 (8)
	21:43	20:48	19:38	18:31	16:39	16:28
						21 10:44 (8)
23	05:45	06:33	07:24	08:15	08:09	08:43 10:23 (8)
	21:42	20:46	19:36	18:29	16:38	16:29
						21 10:44 (8)
24	05:46	06:35	07:25	08:16	08:11	08:44 10:23 (8)
	21:41	20:44	19:33	18:26	16:37	16:30
						21 10:44 (8)
25	05:48	06:36	07:27	07:18	08:12	08:44 10:24 (8)
	21:39	20:42	19:31	17:24	16:36	16:30
						21 10:45 (8)
26	05:49	06:38	07:29	07:20	08:48 (9) 08:14	08:45 10:25 (8)
	21:38	20:40	19:29	17:22	8 08:56 (9) 16:35	16:31
						20 10:45 (8)
27	05:51	06:40	07:30	07:22	08:45 (9) 08:16	08:45 10:25 (8)
	21:36	20:38	19:26	17:20	15 09:00 (9) 16:34	16:32
						20 10:45 (8)
28	05:52	06:41	07:32	07:23	08:43 (9) 08:17	08:45 10:26 (8)
	21:35	20:35	19:24	17:19	19 09:02 (9) 16:33	16:32
						19 10:45 (8)
29	05:54	06:43	07:33	07:25	08:40 (9) 08:19	08:45 10:26 (8)
	21:33	20:33	19:22	17:17	23 09:03 (9) 16:32	16:33
						19 10:45 (8)
30	05:55	06:45	07:35	07:27	08:39 (9) 08:20	08:45 10:27 (8)
	21:32	20:31	19:19	17:15	25 09:04 (9) 16:31	16:34
						19 10:46 (8)
31	05:57	06:46	07:37	07:29	08:38 (9) 08:20	08:45 10:28 (8)
	21:30	20:29	19:17	17:13	27 09:05 (9) 16:31	16:35
						18 10:46 (8)
Potential sun hours	502	454	381	331	266	244
Total, worst case				117	546	465
Sun reduction				0.24	0.18	0.13
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.67	0.67	0.65
Total reduction				0.16	0.12	0.09
Total, real				19	68	40

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
 Finisklin Business Park
 IE-F91 RHH9 Sligo
 +353719161416
 Karen O'Neill / koneill@jodireland.com
 Calculated:
 06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine **Shadow receptor:** AA - H27

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45 16:37	08:18 17:24	07:25 18:16	07:15 20:10	07:44 (15) 21:01	06:10 21:46	05:25 22:00	05:22 21:28	05:58 20:26	07:32 (15) 19:17	07:37 17:11	08:21 16:31
2	08:45 16:38	08:17 17:26	07:23 18:18	07:12 20:11	07:39 (15) 21:02	06:08 21:47	05:24 22:00	05:23 21:27	06:00 20:24	07:31 (15) 19:15	07:38 17:09	08:23 16:30
3	08:45 16:39	08:15 17:28	07:21 18:19	07:10 20:13	07:37 (15) 21:04	06:06 21:48	05:23 22:00	05:23 21:25	06:01 20:22	07:30 (15) 19:12	07:40 17:07	08:24 16:30
4	08:45 16:40	08:14 17:30	07:19 18:21	07:08 20:15	07:35 (15) 21:06	06:04 21:50	05:22 21:59	05:24 21:23	06:03 20:20	07:30 (15) 19:10	07:42 17:06	08:26 16:29
5	08:45 16:41	08:12 17:32	07:16 18:23	07:05 20:17	07:34 (15) 21:07	06:02 21:51	05:22 21:59	05:25 21:22	06:04 20:17	07:29 (15) 19:08	07:44 17:04	08:27 16:28
6	08:44 16:42	08:10 17:34	07:14 18:25	07:03 20:18	07:33 (15) 21:09	06:01 21:51	05:21 21:58	05:26 21:20	06:06 20:15	07:30 (15) 19:06	07:45 17:02	08:28 16:28
7	08:44 16:44	08:09 17:35	07:12 18:27	07:01 20:20	07:33 (15) 21:11	05:59 21:52	05:21 21:58	05:27 21:18	06:08 20:13	07:29 (15) 19:03	07:47 17:00	08:29 16:28
8	08:43 16:45	08:07 17:37	07:10 18:28	06:59 20:22	07:32 (15) 21:12	05:57 21:53	05:20 21:57	05:27 21:16	06:09 20:10	07:30 (15) 19:01	07:49 16:59	08:31 16:27
9	08:43 16:46	08:05 17:39	07:07 18:30	06:56 20:23	07:32 (15) 21:14	05:55 21:54	05:19 21:56	05:28 21:14	06:11 20:08	07:30 (15) 18:59	07:50 16:57	08:32 16:27
10	08:42 16:48	08:03 17:41	07:05 18:32	06:54 20:25	07:33 (15) 21:15	05:54 21:55	05:19 21:55	05:29 21:12	06:12 20:06	07:32 (15) 18:57	07:52 16:55	08:33 16:27
11	08:42 16:49	08:01 17:43	07:03 18:34	06:52 20:27	07:33 (15) 21:17	05:52 21:56	05:19 21:55	05:30 21:11	06:14 20:04	07:34 (15) 18:54	07:54 16:54	08:34 16:27
12	08:41 16:51	08:00 17:45	07:01 18:35	06:50 20:29	07:35 (15) 21:19	05:50 21:56	05:18 21:54	05:32 21:09	06:16 20:01	07:35 (15) 18:52	07:55 16:52	08:35 16:27
13	08:40 16:52	07:58 17:47	06:58 18:37	06:47 20:30	07:48 (15) 21:20	05:49 21:57	05:18 21:53	05:33 21:07	06:17 19:59	07:36 (15) 18:50	07:57 16:51	08:36 16:26
14	08:40 16:54	07:56 17:48	06:56 18:39	06:45 20:32	07:45 (15) 21:22	05:47 21:58	05:18 21:52	05:34 21:05	06:19 19:57	07:36 (15) 18:48	07:59 16:49	08:37 16:26
15	08:39 16:55	07:54 17:50	06:54 18:41	06:43 20:34	05:45 21:23	05:18 21:58	05:35 21:51	06:20 21:03	07:11 19:54	08:01 18:46	07:55 16:58	08:38 16:27
16	08:38 16:57	07:52 17:52	06:51 18:42	06:41 20:35	05:44 21:25	05:18 21:59	05:36 21:50	06:22 21:01	07:12 19:52	08:02 18:43	07:57 16:47	08:39 16:27
17	08:37 16:58	07:50 17:54	06:49 18:44	06:39 20:37	05:42 21:26	05:17 21:59	05:37 21:49	06:24 20:59	07:14 19:50	08:04 18:41	07:59 16:45	08:40 16:27
18	08:36 17:00	07:48 17:56	06:47 18:46	06:37 20:39	05:41 21:28	05:17 22:00	05:39 21:48	06:25 20:57	07:15 19:47	08:06 18:39	08:01 16:44	08:40 16:27
19	08:35 17:01	07:46 17:58	06:45 18:48	06:34 20:40	05:40 21:29	05:17 22:00	05:40 21:47	06:27 20:55	07:17 19:45	08:07 18:37	08:02 16:43	08:41 16:27
20	08:34 17:03	07:44 18:00	06:42 18:49	06:32 20:42	05:38 21:31	05:18 22:00	05:41 21:46	06:28 20:53	07:19 19:43	08:09 18:35	08:04 16:41	08:42 16:28
21	08:33 17:05	07:42 18:01	06:40 18:51	06:30 20:44	05:37 21:32	05:18 22:00	05:42 21:44	06:30 20:50	07:20 19:40	08:11 18:33	08:06 16:40	08:42 16:28
22	08:32 17:07	07:40 18:03	06:38 18:53	06:28 20:45	05:36 21:34	05:18 22:01	05:44 21:43	06:32 20:48	07:22 19:38	08:13 18:31	08:07 16:39	08:43 16:29
23	08:31 17:08	07:38 18:05	06:35 18:54	06:26 20:47	05:34 21:35	05:18 22:01	05:45 21:42	06:33 20:46	07:24 19:36	08:14 18:29	08:09 16:38	08:43 16:29
24	08:30 17:10	07:36 18:07	06:33 18:56	06:24 20:49	05:33 21:36	05:18 22:01	05:47 21:40	06:35 20:44	07:25 19:33	08:16 18:27	08:11 16:37	08:44 16:30
25	08:28 17:12	07:34 18:09	06:31 18:58	06:22 20:51	05:32 21:38	05:19 22:01	05:48 21:39	06:37 20:42	07:27 19:31	08:18 17:25	08:12 16:36	08:44 16:30
26	08:27 17:14	07:32 18:10	06:28 19:00	06:20 20:52	05:31 21:39	05:19 22:01	05:49 21:38	06:38 20:40	07:29 19:29	08:20 17:23	08:14 16:35	08:44 16:31
27	08:26 17:15	07:29 18:12	06:26 19:01	06:18 20:54	05:30 21:40	05:20 22:01	05:51 21:36	06:40 20:38	07:30 19:26	08:22 17:21	08:15 16:34	08:45 16:32
28	08:24 17:17	07:27 18:14	06:24 19:03	06:16 20:56	05:29 21:42	05:20 22:01	05:52 21:35	06:41 20:35	07:32 19:24	08:23 17:19	08:17 16:33	08:45 16:33
29	08:23 17:19	07:21 18:05	06:14 19:01	06:14 20:57	05:28 21:43	05:21 22:01	05:54 21:33	06:43 20:33	07:34 19:22	08:25 17:17	08:18 16:32	08:45 16:33
30	08:21 17:21	07:19 18:06	06:12 19:02	06:12 20:59	05:27 21:44	05:21 22:00	05:55 21:32	06:45 20:31	07:35 19:19	08:27 17:15	08:20 16:32	08:45 16:34
31	08:20 17:23	07:17 18:08	06:11 19:08	06:11 20:59	05:26 21:45	05:20 22:00	05:57 21:30	06:46 20:29	07:36 (15) 19:19	08:29 17:13	08:45 16:35	08:45 16:35
Potential sun hours	259	278	367	416	485	499	502	454	381	331	266	244
Total, worst case					197				26	178		
Sun reduction					0.35				0.30	0.28		
Oper. time red.					1.00				1.00	1.00		
Wind dir. red.					0.67				0.67	0.67		
Total reduction					0.24				0.20	0.19		
Total, real					47				5	34		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)



SHADOW - Calendar

Calculation: Specimen Turbine **Shadow receptor: AB - H28**

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45	08:18	07:25	07:14	19:23 (11)	06:10
	16:36	17:24	18:16	20:10	19	20:17 (14)
2	08:45	08:17	07:23	07:12	19:23 (11)	06:08
	16:37	17:26	18:17	20:11	19	20:32 (14)
3	08:45	08:15	07:20	07:10	19:22 (11)	06:06
	16:38	17:28	18:19	20:13	19	20:33 (14)
4	08:45	08:13	07:18	07:07	19:22 (11)	06:04
	16:40	17:30	18:21	20:15	18	20:35 (13)
5	08:44	08:12	07:16	07:05	19:23 (11)	06:02
	16:41	17:31	18:23	20:16	17	20:36 (13)
6	08:44	08:10	07:14	07:03	19:24 (11)	06:00
	16:42	17:33	18:25	20:18	15	20:37 (13)
7	08:44	08:08	07:12	07:01	19:24 (11)	05:58
	16:43	17:35	18:26	20:20	12	20:38 (13)
8	08:43	08:07	07:09	06:58	19:26 (11)	05:57
	16:45	17:37	18:28	20:21	8	20:39 (13)
9	08:43	08:05	07:07	06:56	19:34 (11)	05:55
	16:46	17:39	18:30	20:23		20:40 (14)
10	08:42	08:03	07:05	06:54		05:55
	16:47	17:41	18:32	20:25		20:41 (14)
11	08:42	08:01	07:03	06:52		05:52
	16:49	17:43	18:33	20:27		20:42 (13)
12	08:41	07:59	07:00	06:49		05:50
	16:50	17:44	18:35	20:28		20:43 (13)
13	08:40	07:58	06:58	06:47		05:48
	16:52	17:46	18:37	20:30		20:44 (13)
14	08:40	07:56	06:56	06:45		05:47
	16:53	17:48	18:39	20:32		20:45 (13)
15	08:39	07:54	06:54	06:43		05:45
	16:55	17:50	18:40	20:33		20:46 (13)
16	08:38	07:52	06:51	06:41		05:44
	16:56	17:52	18:42	20:35		20:47 (13)
17	08:37	07:50	06:49	06:38		05:42
	16:58	17:54	18:44	20:37		20:48 (13)
18	08:36	07:48	06:47	06:36		05:41
	17:00	17:56	18:46	20:38		20:49 (13)
19	08:35	07:46	06:44	06:34		05:39
	17:01	17:57	18:47	20:40		20:50 (13)
20	08:34	07:44	06:42	06:32		05:38
	17:03	17:59	18:49	20:42		21:31
21	08:33	07:42	06:40	06:30		05:37
	17:05	18:01	18:51	20:44		21:32
22	08:32	07:40	06:37	06:28		05:35
	17:06	18:03	18:52	20:45		21:33
23	08:31	07:38	06:35	06:26		05:34
	17:08	18:05	18:54	20:47		21:35
24	08:29	07:36	06:33	06:24		05:33
	17:10	18:07	18:56	20:49		21:36
25	08:28	07:33	06:30	06:22		05:32
	17:11	18:08	18:58	20:50		21:37
26	08:27	07:31	06:28	06:19		05:30
	17:13	18:10	18:59	20:52		21:39
27	08:25	07:29	06:26	06:17		05:29
	17:15	18:12	19:01	20:54		21:40
28	08:24	07:27	06:24	18:29 (11)	06:15	05:28
	17:17	18:14	19:03	8	18:37 (11)	20:55
29	08:23		07:21	19:27 (11)	06:13	05:27
	17:19		20:04	12	19:39 (11)	20:57
30	08:21		07:19	19:26 (11)	06:12	05:26
	17:20		20:06	15	19:41 (11)	20:59
31	08:20		07:17	19:24 (11)		05:25
	17:22		20:08	17	19:41 (11)	21:45
Potential sun hours	259	278	367	416		485
Total, worst case						734
Sun reduction			0.24			0.35
Oper. time red.			1.00			1.00
Wind dir. red.			0.68			0.68
Total reduction			0.17			0.25
Total, real			9			185

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Specimen Turbine **Shadow receptor:** AB - H28

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:21	05:58	20:21 (14)	06:48	07:37	07:30
	22:00	21:28	33 20:54 (13)	20:26	19:17	17:11
2	05:22	06:00	20:21 (14)	06:49	07:38	07:32
	22:00	21:27	33 20:54 (13)	20:24	19:14	17:09
3	05:23	06:01	20:21 (14)	06:51	07:40	07:34
	21:59	21:25	33 20:54 (13)	20:22	19:12	17:07
4	05:24	06:03	20:21 (14)	06:53	19:23 (11)	07:42
	21:59	21:23	32 20:53 (13)	20:19	8 19:31 (11)	19:10
5	05:24	06:04	20:21 (14)	06:54	19:21 (11)	07:43
	21:58	21:21	31 20:52 (13)	20:17	12 19:33 (11)	19:08
6	05:25	06:06	20:21 (14)	06:56	19:19 (11)	07:45
	21:58	21:20	29 20:50 (13)	20:15	15 19:34 (11)	19:05
7	05:26	06:07	20:21 (14)	06:57	19:18 (11)	07:47
	21:57	21:18	27 20:48 (13)	20:13	17 19:35 (11)	19:03
8	05:27	06:09	20:22 (14)	06:59	19:17 (11)	07:48
	21:57	21:16	25 20:47 (13)	20:10	18 19:35 (11)	19:01
9	05:28	06:10	20:23 (14)	07:01	19:16 (11)	07:50
	21:56	21:14	22 20:45 (13)	20:08	19 19:35 (11)	18:59
10	05:29	06:12	20:24 (14)	07:02	19:16 (11)	07:52
	21:55	21:12	20 20:44 (13)	20:06	19 19:35 (11)	18:56
11	05:30	06:14	20:24 (14)	07:04	19:15 (11)	07:53
	21:55	21:10	17 20:41 (14)	20:03	19 19:34 (11)	18:54
12	05:31	06:15	20:26 (14)	07:06	19:16 (11)	07:55
	21:54	21:08	14 20:40 (14)	20:01	17 19:33 (11)	18:52
13	05:32	06:17	20:27 (14)	07:07	19:16 (11)	07:57
	21:53	21:06	11 20:38 (14)	19:59	15 19:31 (11)	18:50
14	05:33	06:18	20:31 (14)	07:09	19:17 (11)	07:59
	21:52	21:05	5 20:36 (14)	19:56	13 19:30 (11)	18:47
15	05:35	20:32 (14)	06:20	07:10	19:19 (11)	08:00
	21:51	9 20:41 (14)	21:03	19:54	9 19:28 (11)	18:45
16	05:36	20:30 (14)	06:22	07:12	18:02	07:57
	21:50	12 20:42 (14)	21:01	19:52	18:43	16:46
17	05:37	20:29 (14)	06:23	07:14	08:04	07:59
	21:49	15 20:44 (14)	20:58	19:49	18:41	16:45
18	05:38	20:27 (14)	06:25	07:15	08:05	08:00
	21:48	18 20:45 (14)	20:56	19:47	18:39	16:44
19	05:40	20:26 (14)	06:27	07:17	08:07	08:02
	21:47	20 20:46 (14)	20:54	19:45	18:37	16:42
20	05:41	20:26 (14)	06:28	07:18	08:09	08:04
	21:45	22 20:48 (13)	20:52	19:42	18:35	16:41
21	05:42	20:25 (14)	06:30	07:20	08:11	08:06
	21:44	24 20:49 (13)	20:50	19:40	18:32	16:40
22	05:43	20:24 (14)	06:31	07:22	08:12	08:07
	21:43	26 20:50 (13)	20:48	19:38	18:30	16:39
23	05:45	20:23 (14)	06:33	07:23	08:14	08:09
	21:42	28 20:51 (13)	20:46	19:35	18:28	16:38
24	05:46	20:23 (14)	06:35	07:25	08:16	08:10
	21:40	29 20:52 (13)	20:44	19:33	18:26	16:37
25	05:48	20:23 (14)	06:36	07:27	07:18	08:12
	21:39	29 20:52 (13)	20:42	19:31	17:24	16:36
26	05:49	20:22 (14)	06:38	07:28	07:20	08:14
	21:37	31 20:53 (13)	20:39	19:28	17:22	16:35
27	05:51	20:22 (14)	06:40	07:30	07:21	08:15
	21:36	32 20:54 (13)	20:37	19:26	17:20	16:34
28	05:52	20:21 (14)	06:41	07:32	07:23	08:17
	21:34	33 20:54 (13)	20:35	19:24	17:18	16:33
29	05:53	20:21 (14)	06:43	07:33	07:25	08:18
	21:33	32 20:53 (13)	20:33	19:21	17:16	16:32
30	05:55	20:21 (14)	06:44	07:35	07:27	08:20
	21:31	33 20:54 (13)	20:31	19:19	17:14	16:31
31	05:56	20:21 (14)	06:46		07:29	08:45
	21:30	33 20:54 (13)	20:28		17:13	16:35
Potential sun hours	502	454	381	331	266	244
Total, worst case	426	332	181			
Sun reduction	0.27	0.30	0.28			
Oper. time red.	1.00	1.00	1.00			
Wind dir. red.	0.68	0.68	0.68			
Total reduction	0.18	0.20	0.19			
Total, real	77	67	35			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: AD - H30

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January		February		March		April		May		June	
1	08:45	13:37 (18)	08:18	13:44 (18)	07:25	17:16 (16)	07:14	06:10				20:20 (4)
	16:36	68 14:45 (19)	17:24	64 16:34 (17)	18:16	20 17:36 (16)	20:10	21:00			21:46	22 20:42 (4)
2	08:45	13:38 (18)	08:17	13:45 (18)	07:23	17:15 (16)	07:12	06:08			05:24	20:20 (4)
	16:37	67 14:45 (19)	17:26	66 16:36 (17)	18:17	22 17:37 (16)	20:11	21:02			21:47	22 20:42 (4)
3	08:45	13:38 (18)	08:15	13:46 (18)	07:21	17:14 (16)	07:10	06:06			05:23	20:21 (4)
	16:39	68 14:46 (19)	17:28	67 16:37 (17)	18:19	24 17:38 (16)	20:13	21:04			21:48	22 20:43 (4)
4	08:45	13:37 (18)	08:13	13:47 (18)	07:18	17:14 (16)	07:08	06:04			05:22	20:21 (4)
	16:40	68 14:45 (19)	17:30	67 16:38 (17)	18:21	25 17:39 (16)	20:15	21:05			21:49	21 20:42 (4)
5	08:44	13:38 (18)	08:12	13:48 (18)	07:16	17:12 (16)	07:05	06:02			05:22	20:22 (4)
	16:41	68 14:46 (19)	17:32	68 16:40 (17)	18:23	26 17:38 (16)	20:16	21:07			21:50	21 20:43 (4)
6	08:44	13:39 (18)	08:10	13:50 (18)	07:14	17:12 (16)	07:03	06:00			05:21	20:22 (4)
	16:42	67 14:46 (19)	17:33	66 16:40 (17)	18:25	26 17:38 (16)	20:18	21:09			21:51	20 20:42 (4)
7	08:44	13:38 (18)	08:08	13:51 (18)	07:12	17:13 (16)	07:01	05:59			05:20	20:22 (4)
	16:43	68 14:46 (19)	17:35	65 16:41 (17)	18:26	25 17:38 (16)	20:20	21:10			21:52	21 20:43 (4)
8	08:43	13:38 (18)	08:07	13:52 (18)	07:09	17:13 (16)	06:58	05:57			05:20	20:22 (4)
	16:45	67 14:45 (19)	17:37	63 16:41 (17)	18:28	25 17:38 (16)	20:22	21:12			21:53	20 20:42 (4)
9	08:43	13:39 (18)	08:05	13:54 (18)	07:07	17:13 (16)	06:56	05:55			05:19	20:23 (4)
	16:46	67 14:46 (19)	17:39	59 16:41 (17)	18:30	30 17:50 (15)	20:23	21:14			21:54	20 20:43 (4)
10	08:42	13:38 (18)	08:03	13:57 (18)	07:05	17:13 (16)	06:54	05:53			05:19	20:23 (4)
	16:47	67 14:45 (19)	17:41	55 16:42 (17)	18:32	36 17:53 (15)	20:25	21:15			21:55	19 20:42 (4)
11	08:42	13:38 (18)	08:01	14:00 (18)	07:03	17:15 (16)	06:52	05:52			05:18	20:23 (4)
	16:49	66 14:45 (19)	17:43	49 16:42 (17)	18:33	36 17:55 (15)	20:27	21:17			21:55	19 20:42 (4)
12	08:41	13:38 (18)	07:59	14:08 (18)	07:00	17:15 (16)	06:49	05:50			05:18	20:24 (4)
	16:50	64 14:44 (19)	17:45	33 16:41 (17)	18:35	35 17:55 (15)	20:28	21:18			21:56	18 20:42 (4)
13	08:40	13:39 (18)	07:58	16:11 (17)	06:58	17:18 (16)	06:47	05:48			05:18	20:25 (4)
	16:52	63 14:44 (19)	17:46	30 16:41 (17)	18:37	32 17:56 (15)	20:30	21:20			21:57	18 20:43 (4)
14	08:40	13:39 (18)	07:56	16:12 (17)	06:56	17:23 (16)	06:45	05:47			05:18	20:25 (4)
	16:53	59 14:42 (19)	17:48	29 16:41 (17)	18:39	22 17:56 (15)	20:32	21:22			21:57	18 20:43 (4)
15	08:39	13:39 (18)	07:54	16:12 (17)	06:54	17:35 (15)	06:43	05:45			05:17	20:26 (4)
	16:55	55 14:40 (19)	17:50	28 16:40 (17)	18:40	20 17:55 (15)	20:33	21:23			21:58	17 20:43 (4)
16	08:38	13:39 (18)	07:52	16:13 (17)	06:51	17:35 (15)	06:41	05:44			05:17	20:25 (4)
	16:56	48 14:27 (18)	17:52	27 16:40 (17)	18:42	20 17:55 (15)	20:35	21:25	5	20:27 (4)	21:59	17 20:42 (4)
17	08:37	13:39 (18)	07:50	16:14 (17)	06:49	17:35 (15)	06:38	05:42			05:17	20:25 (4)
	16:58	49 14:28 (18)	17:54	25 16:39 (17)	18:44	20 17:55 (15)	20:37	21:26	10	20:35 (4)	21:59	17 20:42 (4)
18	08:36	13:39 (18)	07:48	16:15 (17)	06:47	17:35 (15)	06:36	05:41			05:17	20:27 (4)
	17:00	49 14:28 (18)	17:56	23 16:38 (17)	18:46	18 17:53 (15)	20:38	21:28	13	20:36 (4)	21:59	16 20:43 (4)
19	08:35	13:39 (18)	07:46	16:17 (17)	06:44	17:36 (15)	06:34	05:39			05:17	20:27 (4)
	17:01	49 14:28 (18)	17:57	19 16:36 (17)	18:47	16 17:52 (15)	20:40	21:29	15	20:37 (4)	22:00	16 20:43 (4)
20	08:34	13:39 (18)	07:44	16:19 (17)	06:42	17:38 (15)	06:32	05:38			05:17	20:27 (4)
	17:03	50 14:29 (18)	17:59	15 16:34 (17)	18:49	13 17:51 (15)	20:42	21:31	17	20:39 (4)	22:00	16 20:43 (4)
21	08:33	13:40 (18)	07:42	16:23 (17)	06:40	17:39 (15)	06:30	05:37			05:17	20:27 (4)
	17:05	50 14:30 (18)	18:01	8 16:31 (17)	18:51	9 17:48 (15)	20:44	21:32	19	20:40 (4)	22:00	16 20:43 (4)
22	08:32	13:40 (18)	07:40		06:37		06:28	05:35			05:18	20:27 (4)
	17:06	50 14:30 (18)	18:03		18:53		20:45	21:33	19	20:40 (4)	22:01	16 20:43 (4)
23	08:31	13:40 (18)	07:38		06:35		06:26	05:34			05:18	20:27 (4)
	17:08	50 14:30 (18)	18:05		18:54		20:47	21:35	20	20:40 (4)	22:01	16 20:43 (4)
24	08:29	13:41 (18)	07:36		06:33		06:24	05:33			05:18	20:28 (4)
	17:10	50 14:31 (18)	18:07		18:56		20:49	21:36	21	20:40 (4)	22:01	16 20:44 (4)
25	08:28	13:40 (18)	07:33		06:31		06:22	05:32			05:19	20:28 (4)
	17:12	50 14:30 (18)	18:08		18:58		20:50	21:37	22	20:41 (4)	22:01	16 20:44 (4)
26	08:27	13:41 (18)	07:31		06:28		06:20	05:30			05:19	20:28 (4)
	17:13	50 14:31 (18)	18:10	9	17:31 (16)	18:59	20:52	21:39	22	20:41 (4)	22:01	17 20:45 (4)
27	08:25	13:41 (18)	07:29		06:26		06:18	05:29			05:19	20:28 (4)
	17:15	50 14:31 (18)	18:12	14	17:34 (16)	19:01	20:54	21:40	22	20:41 (4)	22:01	17 20:45 (4)
28	08:24	13:42 (18)	07:27		06:24		06:16	05:28			05:20	20:28 (4)
	17:17	49 14:31 (18)	18:14	18	17:36 (16)	19:03	20:55	21:41	22	20:41 (4)	22:01	18 20:46 (4)
29	08:23	13:42 (18)			07:21		06:14	05:27			05:20	20:28 (4)
	17:19	49 14:31 (18)			20:04		20:57	21:43	22	20:41 (4)	22:01	18 20:46 (4)
30	08:21	13:43 (18)			07:19		06:12	05:26			05:21	20:28 (4)
	17:20	56 16:29 (17)			20:06		20:59	21:44	22	20:42 (4)	22:00	18 20:46 (4)
31	08:20	13:43 (18)			07:17			05:25			20:20 (4)	
	17:22	62 16:32 (17)			20:08			21:45	22	20:42 (4)		
Potential sun hours	259		278		367		416	485		499		
Total, worst case	1793		967		500			293		548		
Sun reduction	0.16		0.21		0.24			0.37		0.30		
Oper. time red.	1.00		1.00		1.00			1.00		1.00		
Wind dir. red.	0.60		0.61		0.64			0.68		0.68		
Total reduction	0.09		0.12		0.16			0.25		0.20		
Total, real	165		119		78			73		111		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

6225Gortyrahill_ShadwFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: AE - H31
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Table with 13 columns (months) and 36 rows (days). Includes columns for January through December. The table contains time data for each day, including sun rise and set times, and a summary row for 'Potential sun hours'.

Table layout: For each day in each month the following matrix apply

Day in month Sun rise (hh:mm) Sun set (hh:mm) Minutes with flicker First time (hh:mm) with flicker Last time (hh:mm) with flicker (WTG causing flicker first time) (WTG causing flicker last time)



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: AF - H32

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45	08:18	07:25	07:14	19:20 (11)	05:24
	16:36	17:24	18:16	20:10	06:10	20:02 (14)
2	08:45	08:17	07:23	07:12	19:37 (11)	21:46
	16:37	17:26	18:17	20:11	21:00	20:32 (13)
3	08:45	08:15	07:20	07:10	19:20 (11)	05:24
	16:38	17:28	18:19	20:13	06:08	20:02 (14)
4	08:45	08:13	07:18	07:07	19:36 (11)	21:47
	16:40	17:30	18:21	20:15	21:02	20:33 (13)
5	08:44	08:12	07:16	07:05	19:20 (11)	05:23
	16:41	17:31	18:23	20:16	06:06	20:01 (14)
6	08:44	08:10	07:14	07:03	19:34 (11)	21:48
	16:42	17:33	18:25	20:18	21:04	20:35 (13)
7	08:44	08:08	07:12	07:01	19:22 (11)	05:22
	16:43	17:35	18:26	20:20	06:04	20:02 (14)
8	08:43	08:07	07:09	06:58	19:33 (11)	21:49
	16:45	17:37	18:28	20:21	21:05	20:36 (13)
9	08:43	08:05	07:07	06:56	19:25 (11)	05:21
	16:46	17:39	18:30	20:23	06:02	20:02 (14)
10	08:42	08:03	07:05	06:54	19:29 (11)	21:50
	16:47	17:41	18:32	20:25	21:07	20:36 (13)
11	08:42	08:01	07:03	06:52	06:00	20:02 (14)
	16:49	17:43	18:33	20:27	21:09	20:36 (13)
12	08:41	07:59	07:00	06:49	05:58	20:03 (14)
	16:50	17:44	18:35	20:28	21:10	21:52
13	08:40	07:58	06:58	06:47	05:57	20:03 (14)
	16:52	17:46	18:37	20:30	21:12	21:53
14	08:40	07:56	06:56	06:45	05:55	20:03 (14)
	16:53	17:48	18:39	20:32	21:14	21:54
15	08:39	07:54	06:54	06:43	05:53	20:35 (13)
	16:55	17:50	18:40	20:33	21:15	21:55
16	08:38	07:52	06:51	06:41	05:52	20:04 (14)
	16:56	17:52	18:42	20:35	21:17	21:55
17	08:37	07:50	06:49	06:38	05:51	20:35 (13)
	16:58	17:54	18:44	20:37	21:19	21:53
18	08:36	07:48	06:47	06:36	05:49	20:05 (14)
	17:00	17:56	18:46	20:38	21:21	21:54
19	08:35	07:46	06:44	06:34	05:47	20:36 (13)
	17:01	17:57	18:47	20:40	21:22	21:53
20	08:34	07:44	06:42	06:32	05:45	20:06 (14)
	17:03	17:59	18:49	20:42	21:23	21:56
21	08:33	07:42	06:40	06:30	05:44	20:34 (13)
	17:05	18:01	18:51	20:44	21:25	21:56
22	08:32	07:40	06:37	06:28	05:42	20:07 (14)
	17:06	18:03	18:52	20:45	21:26	21:57
23	08:31	07:38	06:35	06:26	05:41	20:09 (14)
	17:08	18:05	18:54	20:47	21:28	21:57
24	08:29	07:36	06:33	06:24	05:39	20:10 (14)
	17:10	18:07	18:56	20:49	21:29	21:57
25	08:28	07:33	06:30	18:26 (11)	06:22	20:31 (13)
	17:11	18:08	18:58	6 18:32 (11)	20:50	21:59
26	08:27	07:31	06:28	18:24 (11)	06:19	20:32 (13)
	17:13	18:10	18:59	10 18:34 (11)	20:52	21:59
27	08:25	07:29	06:26	18:22 (11)	06:17	20:33 (13)
	17:15	18:12	19:01	13 18:35 (11)	20:54	21:59
28	08:24	07:27	06:24	18:21 (11)	06:15	20:34 (13)
	17:17	18:14	19:03	16 18:37 (11)	20:55	22:00
29	08:23	07:21	06:21	19:20 (11)	06:13	20:35 (13)
	17:19	07:19	20:04	18 19:38 (11)	20:57	22:00
30	08:21	07:19	06:19	19:20 (11)	06:12	20:36 (13)
	17:20	07:17	20:06	18 19:38 (11)	20:59	22:01
31	08:20	07:17	06:17	19:19 (11)	06:11	20:37 (13)
	17:22	07:15	20:08	18 19:37 (11)	20:59	22:01
Potential sun hours	259	278	367	416	485	499
Total, worst case			99	221	459	
Sun reduction			0.24	0.35	0.37	
Oper. time red.			1.00	1.00	1.00	
Wind dir. red.			0.68	0.68	0.68	
Total reduction			0.17	0.24	0.25	
Total, real			16	53	115	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Specimen Turbine **Shadow receptor:** AF - H32

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

July		August		September		October		November		December	
1	05:21	05:58	20:16 (14)	06:48		07:37	07:30	08:21			
	22:00	21:28	28 20:44 (13)	20:26		19:17	17:11	16:30			
2	05:22	06:00	20:15 (14)	06:49		07:38	07:32	08:23			
	22:00	21:27	29 20:44 (13)	20:24		19:14	17:09	16:30			
3	05:23	06:01	20:14 (14)	06:51		07:40	07:34	08:24			
	21:59	21:25	31 20:45 (13)	20:22		19:12	17:07	16:29			
4	05:24	06:03	20:13 (14)	06:53		07:42	07:36	08:25			
	21:59	21:23	32 20:45 (13)	20:19		19:10	17:05	16:29			
5	05:24	06:04	20:12 (14)	06:54		07:43	07:37	08:27			
	21:58	21:21	33 20:45 (13)	20:17		19:08	17:04	16:28			
6	05:25	06:06	20:12 (14)	06:56		07:45	07:39	08:28			
	21:58	21:20	34 20:46 (13)	20:15		19:05	17:02	16:28			
7	05:26	06:07	20:11 (14)	06:57		07:47	07:41	08:29			
	21:57	21:18	34 20:45 (13)	20:13	3	19:24 (11)	19:03	17:00	16:27		
8	05:27	06:09	20:11 (14)	06:59		19:17 (11)	07:48	07:43	08:30		
	21:57	21:16	34 20:45 (13)	20:10	11	19:28 (11)	19:01	16:58	16:27		
9	05:28	06:10	20:11 (14)	07:01		19:14 (11)	07:50	07:45	08:32		
	21:56	21:14	34 20:45 (13)	20:08	14	19:28 (11)	18:59	16:57	16:27		
10	05:29	06:12	20:11 (14)	07:02		19:13 (11)	07:52	07:46	08:33		
	21:55	21:12	33 20:44 (13)	20:06	16	19:29 (11)	18:56	16:55	16:26		
11	05:30	06:14	20:10 (14)	07:04		19:12 (11)	07:53	07:48	08:34		
	21:55	21:10	31 20:41 (13)	20:03	17	19:29 (11)	18:54	16:54	16:26		
12	05:31	06:15	20:11 (14)	07:05		19:12 (11)	07:55	07:50	08:35		
	21:54	21:08	29 20:40 (13)	20:01	18	19:30 (11)	18:52	16:52	16:26		
13	05:32	06:17	20:10 (14)	07:07		19:10 (11)	07:57	07:52	08:36		
	21:53	21:06	28 20:38 (13)	19:59	19	19:29 (11)	18:50	16:51	16:26		
14	05:33	06:18	20:11 (14)	07:09		19:11 (11)	07:59	07:54	08:37		
	21:52	21:05	25 20:36 (13)	19:56	18	19:29 (11)	18:47	16:49	16:26		
15	05:35	06:20	20:11 (14)	07:10		19:11 (11)	08:00	07:55	08:38		
	21:51	21:03	23 20:34 (13)	19:54	17	19:28 (11)	18:45	16:48	16:26		
16	05:36	06:22	20:12 (14)	07:12		19:11 (11)	08:02	07:57	08:39		
	21:50	21:01	20 20:32 (14)	19:52	14	19:25 (11)	18:43	16:46	16:26		
17	05:37	06:23	20:13 (14)	07:14		19:12 (11)	08:04	07:59	08:39		
	21:49	20:58	18 20:31 (14)	19:49	11	19:23 (11)	18:41	16:45	16:26		
18	05:38	06:25	20:13 (14)	07:15		19:13 (11)	08:05	08:00	08:40		
	21:48	20:56	15 20:28 (14)	19:47	7	19:20 (11)	18:39	16:44	16:27		
19	05:40	06:27	20:15 (14)	07:17			08:07	08:02	08:41		
	21:47	20:54	12 20:27 (14)	19:45			18:37	16:42	16:27		
20	05:41	06:28	20:16 (14)	07:18			08:09	08:04	08:42		
	21:45	20:52	8 20:24 (14)	19:42			18:35	16:41	16:27		
21	05:42	06:30	20:20 (14)	07:20			08:11	08:06	08:42		
	21:44	20:50	3 20:23 (14)	19:40			18:32	16:40	16:28		
22	05:43	06:31		07:22			08:12	08:07	08:43		
	21:43	20:48		19:38			18:30	16:39	16:28		
23	05:45	06:33		07:23			08:14	08:09	08:43		
	21:42	20:46		19:35			18:28	16:38	16:29		
24	05:46	06:35		07:25			08:16	08:10	08:44		
	21:40	20:44		19:33			18:26	16:37	16:29		
25	05:48	06:36		07:27			07:18	08:12	08:44		
	21:39	20:42		19:31			17:24	16:36	16:30		
26	05:49	06:38		07:28			07:20	08:14	08:44		
	21:37	20:39		19:28			17:22	16:35	16:31		
27	05:51	06:40		07:30			07:21	08:15	08:45		
	21:36	20:37		19:26			17:20	16:34	16:31		
28	05:52	20:22 (14)	06:41	07:32			07:23	08:17	08:45		
	21:34	16 20:39 (13)	20:35	19:24			17:18	16:33	16:32		
29	05:53	20:19 (14)	06:43	07:33			07:25	08:18	08:45		
	21:33	21 20:40 (13)	20:33	19:21			17:16	16:32	16:33		
30	05:55	20:18 (14)	06:44	07:35			07:27	08:20	08:45		
	21:31	24 20:42 (13)	20:31	19:19			17:14	16:31	16:34		
31	05:56	20:17 (14)	06:46				07:29		08:45		
	21:30	26 20:43 (13)	20:28				17:13		16:35		
Potential sun hours	502	454		381			331	266	244		
Total, worst case	87		534		165						
Sun reduction	0.27		0.30		0.28						
Oper. time red.	1.00		1.00		1.00						
Wind dir. red.	0.68		0.68		0.68						
Total reduction	0.18		0.20		0.19						
Total, real	16		107		32						

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: AG - H33

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January		February		March		April		May		June	
1	08:45	15:11 (14)	08:18	16:42 (13)	07:25	17:21 (12)	07:14	06:10	05:24			
	16:36	31	15:42 (14)	17:24	2	16:44 (13)	18:16	16	17:37 (12)	20:10	21:00	21:46
2	08:45	15:12 (14)	08:17	16:38 (13)	07:23	17:20 (12)	07:12	06:08	05:24			
	16:37	31	15:43 (14)	17:26	11	16:49 (13)	18:17	18	17:38 (12)	20:11	21:02	21:47
3	08:45	15:12 (14)	08:15	16:35 (13)	07:21	17:19 (12)	07:10	06:06	05:23			
	16:38	31	15:43 (14)	17:28	16	16:51 (13)	18:19	20	17:39 (12)	20:13	21:04	21:48
4	08:45	15:13 (14)	08:14	16:34 (13)	07:18	17:19 (12)	07:07	06:04	05:22			
	16:40	31	15:44 (14)	17:30	18	16:52 (13)	18:21	21	17:40 (12)	20:15	21:05	21:49
5	08:44	15:13 (14)	08:12	16:34 (13)	07:16	17:17 (12)	07:05	06:02	05:21			
	16:41	31	15:44 (14)	17:31	20	16:54 (13)	18:23	22	17:39 (12)	20:16	21:07	21:50
6	08:44	15:14 (14)	08:10	16:33 (13)	07:14	17:17 (12)	07:03	06:00	05:21			
	16:42	31	15:45 (14)	17:33	22	16:55 (13)	18:25	22	17:39 (12)	20:18	21:09	21:51
7	08:44	15:14 (14)	08:08	16:32 (13)	07:12	17:18 (12)	07:01	05:58	05:20			
	16:43	31	15:45 (14)	17:35	24	16:56 (13)	18:26	21	17:39 (12)	20:20	21:10	21:52
8	08:43	15:15 (14)	08:07	16:31 (13)	07:09	17:18 (12)	06:58	05:57	05:20			
	16:45	31	15:46 (14)	17:37	25	16:56 (13)	18:28	21	17:39 (12)	20:22	21:12	21:53
9	08:43	15:15 (14)	08:05	16:31 (13)	07:07	17:18 (12)	06:56	05:55	05:19			
	16:46	31	15:46 (14)	17:39	25	16:56 (13)	18:30	19	17:37 (12)	20:23	21:14	21:54
10	08:42	15:16 (14)	08:03	16:31 (13)	07:05	17:19 (12)	06:54	05:53	05:19			
	16:47	30	15:46 (14)	17:41	26	16:57 (13)	18:32	17	17:36 (12)	20:25	21:15	21:55
11	08:42	15:16 (14)	08:01	16:31 (13)	07:03	17:21 (12)	06:52	05:52	05:18			
	16:49	30	15:46 (14)	17:43	26	16:57 (13)	18:33	14	17:35 (12)	20:27	21:17	21:56
12	08:41	15:17 (14)	07:59	16:31 (13)	07:00	17:22 (12)	06:49	05:50	05:18			
	16:50	30	15:47 (14)	17:44	26	16:57 (13)	18:35	9	17:31 (12)	20:28	21:18	21:56
13	08:40	15:18 (14)	07:58	16:31 (13)	06:58		06:47	05:48	05:18			
	16:52	29	15:47 (14)	17:46	25	16:56 (13)	18:37		20:30	21:20	21:57	
14	08:40	15:19 (14)	07:56	16:31 (13)	06:56		06:45	05:47	05:17			
	16:53	28	15:47 (14)	17:48	25	16:56 (13)	18:39		20:32	21:22	21:58	
15	08:39	15:19 (14)	07:54	16:32 (13)	06:54		06:43	05:45	05:17			
	16:55	27	15:46 (14)	17:50	23	16:55 (13)	18:40		20:33	21:23	21:58	
16	08:38	15:20 (14)	07:52	16:33 (13)	06:51		06:41	05:44	05:17			
	16:56	26	15:46 (14)	17:52	22	16:55 (13)	18:42		20:35	21:25	21:59	
17	08:37	15:21 (14)	07:50	16:34 (13)	06:49		06:38	05:42	05:17			
	16:58	25	15:46 (14)	17:54	20	16:54 (13)	18:44		20:37	21:26	21:59	
18	08:36	15:22 (14)	07:48	16:35 (13)	06:47		06:36	05:41	05:17			
	16:59	24	15:46 (14)	17:56	18	16:53 (13)	18:46		20:39	21:28	21:59	
19	08:35	15:23 (14)	07:46	16:37 (13)	06:44		06:34	05:39	05:17			
	17:01	22	15:45 (14)	17:57	14	16:51 (13)	18:47		20:40	21:29	22:00	
20	08:34	15:24 (14)	07:44	16:40 (13)	06:42		06:32	05:38	05:17			
	17:03	20	15:44 (14)	17:59	7	16:47 (13)	18:49		20:42	21:31	22:00	
21	08:33	15:26 (14)	07:42		06:40		06:30	05:36	05:17			
	17:04	18	15:44 (14)	18:01		18:51		20:44	21:32	22:00		
22	08:32	15:28 (14)	07:40		06:37		06:28	05:35	05:17			
	17:06	15	15:43 (14)	18:03		18:52		20:45	21:33	22:01		
23	08:31	15:30 (14)	07:38		06:35		06:26	05:34	05:18			
	17:08	10	15:40 (14)	18:05		18:54		20:47	21:35	22:01		
24	08:29		07:36		06:33		06:24	05:33	05:18			
	17:10		18:07		18:56		20:49	21:36	22:01			
25	08:28		07:33		06:30		06:22	05:31	05:18			
	17:11		18:08		18:58		20:50	21:38	22:01			
26	08:27		07:31		06:28		06:19	05:30	05:19			
	17:13		18:10		18:59		20:52	21:39	22:01			
27	08:26		07:29		17:27 (12)	06:26		06:17	05:29	05:19		
	17:15		18:12	6	17:33 (12)	19:01		20:54	21:40	22:01		
28	08:24		07:27		17:24 (12)	06:24		06:15	05:28	05:20		
	17:17		18:14	12	17:36 (12)	19:03		20:55	21:41	22:01		
29	08:23				07:21			06:13	05:27	05:20		
	17:19				20:04			20:57	21:43	22:01		
30	08:21				07:19			06:12	05:26	05:21		
	17:20				20:06			20:59	21:44	22:00		
31	08:20				07:17				05:25			
	17:22				20:08				21:45			
Potential sun hours	259		278		367		416	485	499			
Total, worst case		613		413		220						
Sun reduction		0.16		0.21		0.24						
Oper. time red.		1.00		1.00		1.00						
Wind dir. red.		0.59		0.62		0.64						
Total reduction		0.09		0.13		0.16						
Total, real		56		53		34						

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)



SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: AG - H33

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (July-December) and rows for each day of the year (1-31), including sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Summary table with 4 columns: Day in month, Sun rise/set, Minutes with flicker, and WTG causing flicker first/last time.



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: AH - H34

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times, minutes with flicker, and operational time.

Table layout: For each day in each month the following matrix apply

Matrix defining day in month, sun rise/set times, minutes with flicker, and first/last times with flicker (WTG causing flicker).

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: AI - H35
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N to Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining day in month, sun rise/set times, minutes with flicker, and first/last times with flicker (WTG causing flicker).

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: AL - H38

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 16:37	08:18 17:24	07:25 18:16	07:15 20:10	06:10 21:01	05:25 21:46
2	08:45 16:38	08:17 17:26	07:23 18:18	07:12 20:11	06:08 21:02	05:24 21:47
3	08:45 16:39	08:15 17:28	07:21 18:19	07:10 20:13	06:06 21:04	05:23 21:48
4	08:45 16:40	08:14 17:30	07:18 18:21	07:08 20:15	06:04 21:06	05:22 21:49
5	08:44 16:41	08:12 17:32	07:16 18:23	07:05 20:17	06:02 21:07	05:22 21:50
6	08:44 16:42	08:10 17:34	07:14 18:25	07:03 20:18	06:01 21:09	05:21 21:51
7	08:44 16:44	08:09 17:35	07:12 18:27	07:01 20:20	05:59 21:10	05:20 21:52
8	08:43 16:45	08:07 17:37	07:10 18:28	06:59 20:22	05:57 21:12	05:20 21:53
9	08:43 16:46	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	05:19 21:54
10	08:42 16:48	08:03 17:41	07:05 18:32	06:54 20:25	05:54 21:15	05:19 21:55
11	08:42 16:49	08:01 17:43	07:03 18:34	06:52 20:27	05:52 21:17	05:19 21:56
12	08:41 16:50	08:00 17:45	07:01 18:35	06:50 20:28	05:50 21:19	05:18 21:56
13	08:40 16:52	07:58 17:47	06:58 18:37	06:47 20:30	05:49 21:20	05:18 21:57
14	08:40 16:53	07:56 17:48	06:56 18:39	06:45 20:32	05:47 21:22	05:18 21:58
15	08:39 16:55	07:54 17:50	06:54 18:41	06:43 20:34	05:45 21:23	05:18 21:58
16	08:38 16:57	07:52 17:52	06:51 18:42	06:41 20:35	05:44 21:25	05:17 21:59
17	08:37 16:58	07:50 17:54	06:49 18:44	06:39 20:37	05:42 21:26	05:17 21:59
18	08:36 17:00	07:48 17:56	06:47 18:46	06:36 20:39	05:41 21:28	05:17 22:00
19	08:35 17:01	07:46 17:58	06:45 18:48	06:34 20:40	05:40 21:29	05:17 22:00
20	08:34 17:03	07:44 17:59	06:42 18:49	06:32 20:42	05:38 21:31	05:18 22:00
21	08:33 17:05	07:42 18:01	06:40 18:51	06:30 20:44	05:37 21:32	05:18 22:00
22	08:32 17:06	07:40 18:03	06:38 18:53	06:28 20:45	05:35 21:33	05:18 22:01
23	08:31 17:08	07:38 18:05	06:35 18:54	06:26 20:47	05:34 21:35	05:18 22:01
24	08:30 17:10	07:36 18:07	06:33 18:56	06:24 20:49	05:33 21:36	05:18 22:01
25	08:28 17:12	07:34 18:09	06:31 18:58	06:22 20:50	05:32 21:38	05:19 22:01
26	08:27 17:13	07:31 18:10	06:28 19:00	06:20 20:52	05:31 21:39	05:19 22:01
27	08:26 17:15	07:29 18:12	06:26 19:01	06:18 20:54	05:30 21:40	05:20 22:01
28	08:24 17:17	07:27 18:14	06:24 19:03	06:16 20:56	05:29 21:41	05:20 22:01
29	08:23 17:19	07:25 18:16	06:22 19:05	06:14 20:57	05:27 21:43	05:21 22:01
30	08:21 17:21	07:23 18:18	06:20 19:07	06:12 20:59	05:27 21:44	05:21 22:01
31	08:20 17:22	07:21 18:20	06:18 19:08	06:10 20:59	05:26 21:45	05:21 22:01
Potential sun hours	259	278	367	416	485	499
Total, worst case			180	685	523	
Sun reduction			0.24	0.35	0.37	
Oper. time red.			1.00	1.00	1.00	
Wind dir. red.			0.68	0.66	0.65	
Total reduction			0.17	0.23	0.24	
Total, real			30	160	126	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Specimen Turbine **Shadow receptor:** AL - H38

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22	05:58	07:12 (15)	06:48	07:18 (16)	07:37
	22:00	21:28	29 07:41 (15)	20:26	26 07:44 (16)	19:17
2	05:22	06:00	07:10 (15)	06:50	07:17 (16)	07:38
	22:00	21:27	31 07:41 (15)	20:24	26 07:43 (16)	19:15
3	05:23	06:01	07:10 (15)	06:51	07:17 (16)	07:40
	21:59	21:25	32 07:42 (15)	20:22	26 07:43 (16)	19:12
4	05:24	06:03	07:09 (15)	06:53	07:19 (16)	07:42
	21:59	21:23	33 07:42 (15)	20:20	24 07:43 (16)	19:10
5	05:25	06:04	07:09 (15)	06:54	07:20 (16)	07:43
	21:59	21:22	34 07:43 (15)	20:17	22 07:42 (16)	19:08
6	05:26	06:06	07:08 (15)	06:56	07:22 (16)	07:45
	21:58	21:20	35 07:43 (15)	20:15	19 07:41 (16)	19:06
7	05:26	06:08	07:08 (15)	06:58	07:23 (16)	07:47
	21:57	21:18	36 07:44 (15)	20:13	16 07:39 (16)	19:03
8	05:27	06:09	07:08 (15)	06:59	07:25 (16)	07:49
	21:57	21:16	36 07:44 (15)	20:10	13 07:38 (16)	19:01
9	05:28	06:11	07:08 (15)	07:01	07:26 (16)	07:50
	21:56	21:14	36 07:44 (15)	20:08	9 07:35 (16)	18:59
10	05:29	06:12	07:07 (15)	07:02	07:28 (16)	07:52
	21:55	21:12	37 07:44 (15)	20:06	4 07:32 (16)	18:57
11	05:30	06:14	07:07 (15)	07:04		07:54
	21:55	21:11	37 07:44 (15)	20:04		18:54
12	05:31	06:16	07:07 (15)	07:06		07:55
	21:54	21:09	36 07:43 (15)	20:01		18:52
13	05:33	06:17	07:07 (15)	07:07	07:52 (17)	07:57
	21:53	21:07	36 07:43 (15)	19:59	5 07:57 (17)	18:50
14	05:34	06:19	07:07 (15)	07:09	07:48 (17)	07:59
	21:52	21:05	36 07:43 (15)	19:57	11 07:59 (17)	18:48
15	05:35	06:20	07:07 (15)	07:11	07:46 (17)	08:00
	21:51	21:03	36 07:43 (15)	19:54	15 08:01 (17)	18:46
16	05:36	06:22	07:07 (15)	07:12	07:44 (17)	08:02
	21:50	21:01	34 07:41 (15)	19:52	18 08:02 (17)	18:43
17	05:37	06:24	07:08 (15)	07:14	07:43 (17)	08:04
	21:49	20:59	33 07:41 (15)	19:50	19 08:02 (17)	18:41
18	05:39	06:25	07:08 (15)	07:15	07:43 (17)	08:06
	21:48	20:57	32 07:40 (15)	19:47	20 08:03 (17)	18:39
19	05:40	06:27	07:09 (15)	07:17	07:42 (17)	08:07
	21:47	20:55	30 07:39 (15)	19:45	20 08:02 (17)	18:37
20	05:41	06:28	07:10 (15)	07:19	07:44 (17)	08:09
	21:46	20:52	27 07:37 (15)	19:43	18 08:02 (17)	18:35
21	05:42	06:30	07:11 (15)	07:20	07:45 (17)	08:11
	21:44	20:50	25 07:36 (15)	19:40	16 08:01 (17)	18:33
22	05:44	06:32	07:12 (15)	07:22	07:47 (17)	08:13
	21:43	20:48	22 07:34 (15)	19:38	14 08:01 (17)	18:31
23	05:45	06:33	07:14 (15)	07:24	07:49 (17)	08:14
	21:42	20:46	18 07:32 (15)	19:36	11 08:00 (17)	18:29
24	05:47	06:35	07:18 (15)	07:25	07:50 (17)	08:16
	21:40	20:44	21 07:39 (16)	19:33	8 07:58 (17)	18:27
25	05:48	07:22 (15)	06:37	07:25 (16)	07:27	07:52 (17)
	21:39	7 07:29 (15)	20:42	15 07:40 (16)	19:31	4 07:56 (17)
26	05:49	07:20 (15)	06:38	07:24 (16)	07:29	07:20
	21:38	13 07:33 (15)	20:40	18 07:42 (16)	19:29	17:23
27	05:51	07:17 (15)	06:40	07:22 (16)	07:30	07:22
	21:36	17 07:34 (15)	20:37	21 07:43 (16)	19:26	17:21
28	05:52	07:16 (15)	06:41	07:21 (16)	07:32	07:23
	21:35	20 07:36 (15)	20:35	23 07:44 (16)	19:24	17:19
29	05:54	07:15 (15)	06:43	07:19 (16)	07:33	07:25
	21:33	23 07:38 (15)	20:33	25 07:44 (16)	19:22	17:17
30	05:55	07:13 (15)	06:45	07:19 (16)	07:35	07:27
	21:32	25 07:38 (15)	20:31	25 07:44 (16)	19:19	17:15
31	05:57	07:13 (15)	06:46	07:18 (16)		07:29
	21:30	27 07:40 (15)	20:29	26 07:44 (16)		17:13
Potential sun hours	502	454		381	331	266
Total, worst case			915		364	
Sun reduction	0.27		0.30		0.28	
Oper. time red.	1.00		1.00		1.00	
Wind dir. red.	0.65		0.65		0.67	
Total reduction	0.17		0.19		0.19	
Total, real	23		178		70	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: AM - H39

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan to Dec) and 1 row of sunshine probability values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 14 columns (N to Sum) and 1 row of operational time values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January to December) and rows for each day (1 to 31), showing sun rise/set times and potential sun hours.

Table layout: For each day in each month the following matrix apply

Matrix defining fields: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, and WTG causing flicker first/last time.



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: AQ - H43

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45	15:27 (13) 08:18	15:37 (13) 07:25	07:14	06:10	05:24
	16:36	10 15:37 (13) 17:24	12 15:49 (13) 18:16	20:10	21:00	21:46
2	08:45	15:26 (13) 08:17	15:41 (13) 07:23	07:12	06:08	05:24
	16:37	11 15:37 (13) 17:26	3 15:44 (13) 18:17	20:11	21:02	21:47
3	08:45	15:26 (13) 08:15	07:21	07:10	06:06	05:23
	16:38	13 15:39 (13) 17:28	18:19	20:13	21:04	21:48
4	08:45	15:26 (13) 08:14	07:18	07:07	06:04	05:22
	16:40	15 15:41 (13) 17:30	18:21	20:15	21:05	21:49
5	08:44	15:25 (13) 08:12	07:16	07:05	06:02	05:21
	16:41	16 15:41 (13) 17:31	18:23	20:16	21:07	21:50
6	08:44	15:25 (13) 08:10	07:14	07:03	06:00	05:21
	16:42	18 15:43 (13) 17:33	18:25	20:18	21:09	21:51
7	08:44	15:25 (13) 08:08	07:12	07:01	05:58	05:20
	16:43	18 15:43 (13) 17:35	18:26	20:20	21:10	21:52
8	08:43	15:25 (13) 08:07	07:09	06:58	05:57	05:20
	16:45	20 15:45 (13) 17:37	18:28	20:22	21:12	21:53
9	08:43	15:25 (13) 08:05	07:07	06:56	05:55	05:19
	16:46	21 15:46 (13) 17:39	18:30	20:23	21:14	21:54
10	08:42	15:24 (13) 08:03	07:05	06:54	05:53	05:19
	16:47	22 15:46 (13) 17:41	18:32	20:25	21:15	21:55
11	08:42	15:24 (13) 08:01	16:38 (12) 07:03	06:52	05:52	05:18
	16:49	23 15:47 (13) 17:43	8 16:46 (12) 18:33	20:27	21:17	21:56
12	08:41	15:25 (13) 08:00	16:35 (12) 07:00	06:49	05:50	05:18
	16:50	24 15:49 (13) 17:44	14 16:49 (12) 18:35	20:28	21:18	21:56
13	08:40	15:25 (13) 07:58	16:34 (12) 06:58	06:47	05:48	05:18
	16:52	24 15:49 (13) 17:46	17 16:51 (12) 18:37	20:30	21:20	21:57
14	08:40	15:25 (13) 07:56	16:33 (12) 06:56	06:45	05:47	05:17
	16:53	25 15:50 (13) 17:48	19 16:52 (12) 18:39	20:32	21:22	21:58
15	08:39	15:25 (13) 07:54	16:32 (12) 06:54	06:43	05:45	05:17
	16:55	26 15:51 (13) 17:50	21 16:53 (12) 18:40	20:33	21:23	21:58
16	08:38	15:25 (13) 07:52	16:31 (12) 06:51	06:41	05:44	05:17
	16:56	26 15:51 (13) 17:52	23 16:54 (12) 18:42	20:35	21:25	21:59
17	08:37	15:25 (13) 07:50	16:31 (12) 06:49	06:38	05:42	05:17
	16:58	27 15:52 (13) 17:54	23 16:54 (12) 18:44	20:37	21:26	21:59
18	08:36	15:25 (13) 07:48	16:30 (12) 06:47	06:36	05:41	05:17
	16:59	27 15:52 (13) 17:56	24 16:54 (12) 18:46	20:39	21:28	22:00
19	08:35	15:25 (13) 07:46	16:30 (12) 06:44	06:34	05:39	05:17
	17:01	27 15:52 (13) 17:57	24 16:54 (12) 18:47	20:40	21:29	22:00
20	08:34	15:25 (13) 07:44	16:31 (12) 06:42	06:32	05:38	05:17
	17:03	28 15:53 (13) 17:59	23 16:54 (12) 18:49	20:42	21:31	22:00
21	08:33	15:26 (13) 07:42	16:31 (12) 06:40	06:30	05:36	05:17
	17:04	27 15:53 (13) 18:01	23 16:54 (12) 18:51	20:44	21:32	22:00
22	08:32	15:26 (13) 07:40	16:32 (12) 06:37	06:28	05:35	05:17
	17:06	28 15:54 (13) 18:03	22 16:54 (12) 18:52	20:45	21:33	22:01
23	08:31	15:26 (13) 07:38	16:32 (12) 06:35	06:26	05:34	05:18
	17:08	27 15:53 (13) 18:05	21 16:53 (12) 18:54	20:47	21:35	22:01
24	08:29	15:27 (13) 07:36	16:32 (12) 06:33	06:24	05:33	05:18
	17:10	27 15:54 (13) 18:07	19 16:51 (12) 18:56	20:49	21:36	22:01
25	08:28	15:28 (13) 07:34	16:34 (12) 06:30	06:22	05:31	05:18
	17:11	26 15:54 (13) 18:08	16 16:50 (12) 18:58	20:50	21:38	22:01
26	08:27	15:28 (13) 07:31	16:36 (12) 06:28	06:19	05:30	05:19
	17:13	25 15:53 (13) 18:10	12 16:48 (12) 18:59	20:52	21:39	22:01
27	08:26	15:29 (13) 07:29	06:26	06:17	05:29	05:19
	17:15	24 15:53 (13) 18:12	19:01	20:54	21:40	22:01
28	08:24	15:30 (13) 07:27	06:24	06:15	05:28	05:20
	17:17	23 15:53 (13) 18:14	19:03	20:55	21:41	22:01
29	08:23	15:31 (13)	07:21	06:13	05:27	05:20
	17:19	21 15:52 (13)	20:04	20:57	21:43	22:01
30	08:21	15:33 (13)	07:19	06:12	05:26	05:21
	17:20	18 15:51 (13)	20:06	20:59	21:44	22:00
31	08:20	15:34 (13)	07:17		05:25	
	17:22	16 15:50 (13)	20:08		21:45	
Potential sun hours	259	278	367	416	485	499
Total, worst case	683	324				
Sun reduction	0.16	0.21				
Oper. time red.	1.00	1.00				
Wind dir. red.	0.59	0.62				
Total reduction	0.09	0.13				
Total, real	62	41				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)



SHADOW - Calendar

Calculation: Specimen Turbine **Shadow receptor:** AQ - H43
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:21	05:58	06:48	07:37	07:30	08:21
	22:00	21:28	20:26	19:17	17:11	16:30
2	05:22	05:59	06:49	07:38	07:32	08:23
	22:00	21:27	20:24	19:15	17:09	16:30
3	05:23	06:01	06:51	07:40	07:34	08:24
	21:59	21:25	20:22	19:12	17:07	16:29
4	05:24	06:03	06:53	07:42	07:36	08:26
	21:59	21:23	20:19	19:10	17:05	16:29
5	05:24	06:04	06:54	07:43	07:38	08:27
	21:59	21:21	20:17	19:08	17:04	16:28
6	05:25	06:06	06:56	07:45	07:39	08:28
	21:58	21:20	20:15	19:05	17:02	16:28
7	05:26	06:07	06:57	07:47	07:41	08:29
	21:57	21:18	20:13	19:03	17:00	16:27
8	05:27	06:09	06:59	07:48	07:43	08:31
	21:57	21:16	20:10	19:01	16:58	16:27
9	05:28	06:10	07:01	07:50	07:45	15:11 (13)
	21:56	21:14	20:08	18:59	16:57	15:16 (13)
10	05:29	06:12	07:02	07:52	07:47	15:07 (13)
	21:55	21:12	20:06	18:56	16:55	13 15:20 (13)
11	05:30	06:14	07:04	07:53	07:48	15:06 (13)
	21:55	21:10	20:03	18:54	16:54	16 15:22 (13)
12	05:31	06:15	07:06	07:55	07:50	15:03 (13)
	21:54	21:09	20:01	18:52	16:52	19 15:22 (13)
13	05:32	06:17	07:07	07:57	07:52	15:02 (13)
	21:53	21:07	19:59	18:50	16:51	21 15:23 (13)
14	05:33	06:18	07:09	07:59	07:54	15:02 (13)
	21:52	21:05	19:56	18:47	16:49	23 15:25 (13)
15	05:35	06:20	07:10	08:00	07:55	15:01 (13)
	21:51	21:03	19:54	18:45	7 17:18 (12)	16:48
16	05:36	06:22	07:12	08:02	17:08 (12)	07:57
	21:50	21:01	19:52	18:43	13 17:21 (12)	16:46
17	05:37	06:23	07:14	08:04	17:06 (12)	07:59
	21:49	20:59	19:49	18:41	16 17:22 (12)	16:45
18	05:38	06:25	07:15	08:06	17:04 (12)	08:01
	21:48	20:57	19:47	18:39	20 17:24 (12)	16:44
19	05:39	06:27	07:17	08:07	17:02 (12)	08:02
	21:47	20:54	19:45	18:37	22 17:24 (12)	16:42
20	05:41	06:28	07:19	08:09	17:02 (12)	08:04
	21:46	20:52	19:42	18:35	22 17:24 (12)	16:41
21	05:42	06:30	07:20	08:11	17:01 (12)	08:06
	21:44	20:50	19:40	18:32	24 17:25 (12)	16:40
22	05:43	06:31	07:22	08:13	17:01 (12)	08:07
	21:43	20:48	19:38	18:30	24 17:25 (12)	16:39
23	05:45	06:33	07:23	08:14	17:01 (12)	08:09
	21:42	20:46	19:35	18:28	24 17:25 (12)	16:38
24	05:46	06:35	07:25	08:16	17:01 (12)	08:11
	21:40	20:44	19:33	18:26	24 17:25 (12)	16:37
25	05:48	06:36	07:27	07:18	16:01 (12)	08:12
	21:39	20:42	19:31	17:24	23 16:24 (12)	16:36
26	05:49	06:38	07:28	07:20	16:02 (12)	08:14
	21:38	20:40	19:28	17:22	22 16:24 (12)	16:35
27	05:51	06:40	07:30	07:21	16:01 (12)	08:15
	21:36	20:37	19:26	17:20	21 16:22 (12)	16:34
28	05:52	06:41	07:32	07:23	16:02 (12)	08:17
	21:35	20:35	19:24	17:18	19 16:21 (12)	16:33
29	05:53	06:43	07:33	07:25	16:04 (12)	08:18
	21:33	20:33	19:21	17:16	16 16:20 (12)	16:32
30	05:55	06:44	07:35	07:27	16:05 (12)	08:20
	21:32	20:31	19:19	17:14	13 16:18 (12)	16:31
31	05:56	06:46		07:29	16:08 (12)	
	21:30	20:28		17:13	7 16:15 (12)	
Potential sun hours	502	454	381	331	266	244
Total, worst case				317	515	216
Sun reduction				0.24	0.18	0.13
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.62	0.59	0.59
Total reduction				0.15	0.11	0.08
Total, real				47	56	17

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Specimen Turbine **Shadow receptor:** AS - H45

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 16:36 27	14:33 (13) 17:24 23	08:18 15:55 (12) 07:25	07:14 16:18 (12) 18:16	06:10 20:10 21:01	05:24 21:46 05:24
2	08:45 16:37 27	14:33 (13) 17:26 24	08:17 15:54 (12) 07:23	07:23 16:18 (12) 18:17	06:08 20:11 21:02	05:24 21:47 05:23
3	08:45 16:38 26	14:34 (13) 17:28 25	08:15 15:53 (12) 07:21	07:21 16:18 (12) 18:19	06:06 20:13 21:04	05:23 21:48 05:22
4	08:45 16:40 26	14:35 (13) 17:30 26	08:14 15:53 (12) 18:21	07:18 16:19 (12) 18:21	06:04 20:15 21:06	05:22 21:49 05:21
5	08:44 16:41 26	14:35 (13) 17:31 26	08:12 15:54 (12) 18:23	07:16 16:20 (12) 18:23	06:02 20:16 21:07	05:21 21:50 05:21
6	08:44 16:42 25	14:36 (13) 17:33 27	08:10 15:53 (12) 18:25	07:14 16:20 (12) 18:25	06:00 20:18 21:09	05:21 21:51 05:20
7	08:44 16:43 24	14:37 (13) 17:35 27	08:09 15:53 (12) 18:26	07:12 16:20 (12) 18:26	05:58 20:20 21:10	05:20 21:52 05:20
8	08:43 16:45 24	14:38 (13) 17:37 25	08:07 15:54 (12) 18:28	07:09 16:19 (12) 18:28	05:57 20:22 21:12	05:20 21:53 05:19
9	08:43 16:46 22	14:39 (13) 17:39 25	08:05 15:54 (12) 18:30	07:07 16:19 (12) 18:30	05:56 20:23 21:14	05:19 21:54 05:19
10	08:42 16:47 22	14:39 (13) 17:41 25	08:03 15:54 (12) 18:32	07:05 16:19 (12) 18:32	05:53 20:25 21:15	05:19 21:55 05:18
11	08:42 16:49 20	14:40 (13) 17:43 23	08:01 15:55 (12) 18:33	07:03 16:18 (12) 18:33	05:52 20:27 21:17	05:18 21:56 05:18
12	08:41 16:50 19	14:42 (13) 17:44 21	08:00 15:56 (12) 18:35	07:00 16:17 (12) 18:35	05:50 20:28 21:18	05:18 21:56 05:18
13	08:40 16:52 17	14:43 (13) 17:46 19	07:58 15:57 (12) 18:37	06:58 16:16 (12) 18:37	05:47 20:30 21:20	05:18 21:57 05:17
14	08:40 16:53 14	14:45 (13) 17:48 15	07:56 15:59 (12) 18:39	06:56 16:14 (12) 18:39	05:47 20:32 21:22	05:17 21:58 05:17
15	08:39 16:55 11	14:47 (13) 17:50 10	07:54 16:02 (12) 18:40	06:54 16:12 (12) 18:40	05:45 20:33 21:23	05:17 21:58 05:17
16	08:38 16:56 5	14:50 (13) 17:52 5	07:52 18:42	06:51 20:35	05:44 21:25	05:17 21:59
17	08:37 16:58	14:55 (13) 17:50 07:50	18:42 06:49	20:35 06:38	21:25 05:42	21:59 05:17
18	08:36 16:59	17:54 17:56	18:44 06:47	20:37 06:36	21:26 05:41	21:59 05:17
19	08:35 17:01	17:57	18:46 06:46	20:39 06:34	21:28 05:39	22:00 05:17
20	08:34 17:03	17:59	18:47 06:44	20:40 06:34	21:29 05:39	22:00 05:17
21	08:33 17:04	17:57 18:01	18:48 06:42	20:42 06:32	21:31 05:38	22:00 05:17
22	08:32 17:06	17:59 18:03	18:49 06:40	20:42 06:30	21:31 05:36	22:00 05:17
23	08:31 17:08	17:57 18:05	18:51 06:37	20:44 06:28	21:32 05:35	22:00 05:18
24	08:29 17:10	18:07	18:53 06:35	20:45 06:26	21:33 05:34	22:01 05:18
25	08:28 17:11	18:08	18:54 06:33	20:47 06:24	21:35 05:33	22:01 05:18
26	08:27 17:13	18:10	18:55 06:30	20:49 06:22	21:36 05:31	22:01 05:18
27	08:26 17:15	18:12	18:56 06:30	20:49 06:22	21:36 05:31	22:01 05:18
28	08:24 17:17	18:14	19:01 06:26	20:54 06:17	21:40 05:29	22:01 05:19
29	08:23 17:19	16:00 (12) 18:12	19:03 06:24	20:55 06:15	21:41 05:28	22:01 05:20
30	08:21 17:20	15:56 (12) 18:14	19:03 07:21	20:55 06:13	21:41 05:27	22:01 05:20
31	08:20 17:22	16:13 (12) 18:14	19:03 07:21	20:55 06:13	21:41 05:27	22:01 05:20
	08:21 17:20	15:56 (12) 18:14	19:03 07:21	20:55 06:13	21:41 05:27	22:01 05:20
	08:20 17:22	15:55 (12) 18:14	19:03 07:21	20:55 06:13	21:41 05:27	22:01 05:20
	08:20 17:22	15:55 (12) 18:14	19:03 07:21	20:55 06:13	21:41 05:27	22:01 05:20
Potential sun hours	259	278	367	416	485	499
Total, worst case	416	341				
Sun reduction	0.16	0.21				
Oper. time red.	1.00	1.00				
Wind dir. red.	0.60	0.59				
Total reduction	0.09	0.12				
Total, real	39	41				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: AS - H45

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:21	05:58	06:48	07:37	07:30	08:21
	22:00	21:28	20:26	19:17	17:11	14:22 (13)
2	05:22	05:59	06:49	07:38	07:32	08:23
	22:00	21:27	20:24	19:15	17:09	14:44 (13)
3	05:23	06:01	06:51	07:40	07:34	08:24
	21:59	21:25	20:22	19:12	17:07	14:22 (13)
4	05:24	06:03	06:53	07:42	07:36	08:26
	21:59	21:23	20:19	19:10	17:05	14:46 (13)
5	05:24	06:04	06:54	07:43	07:38	08:27
	21:59	21:21	20:17	19:08	17:04	14:22 (13)
6	05:25	06:06	06:56	07:45	07:39	08:28
	21:58	21:20	20:15	19:05	17:02	14:47 (13)
7	05:26	06:07	06:57	07:47	07:41	08:29
	21:57	21:18	20:13	19:03	17:00	14:22 (13)
8	05:27	06:09	06:59	07:48	07:43	08:31
	21:57	21:16	20:10	19:01	16:58	14:48 (13)
9	05:28	06:10	07:01	07:50	07:45	08:32
	21:56	21:14	20:08	18:59	16:57	14:22 (13)
10	05:29	06:12	07:02	07:52	07:47	08:33
	21:55	21:12	20:06	18:56	16:55	14:48 (13)
11	05:30	06:14	07:04	07:53	07:48	08:34
	21:55	21:10	20:03	18:54	16:54	14:23 (13)
12	05:31	06:15	07:06	07:55	07:50	08:35
	21:54	21:09	20:01	18:52	16:52	14:50 (13)
13	05:32	06:17	07:07	07:57	07:52	08:36
	21:53	21:07	19:59	18:50	16:51	14:23 (13)
14	05:33	06:18	07:09	07:59	07:54	08:37
	21:52	21:05	19:56	18:47	16:49	14:51 (13)
15	05:35	06:20	07:10	08:00	07:55	08:38
	21:51	21:03	19:54	18:45	16:48	14:24 (13)
16	05:36	06:22	07:12	08:02	07:57	08:39
	21:50	21:01	19:52	18:43	16:46	14:53 (13)
17	05:37	06:23	07:14	08:04	07:59	08:40
	21:49	20:59	19:49	18:41	16:45	14:25 (13)
18	05:38	06:25	07:15	08:06	08:01	08:40
	21:48	20:57	19:47	18:39	16:44	14:53 (13)
19	05:39	06:27	07:17	08:07	08:02	08:41
	21:47	20:54	19:45	18:37	16:42	14:26 (13)
20	05:41	06:28	07:19	08:09	08:04	08:42
	21:46	20:52	19:42	18:35	16:41	14:55 (13)
21	05:42	06:30	07:20	08:11	08:06	08:42
	21:44	20:50	19:40	18:32	16:40	14:27 (13)
22	05:43	06:31	07:22	08:13	08:07	08:43
	21:43	20:48	19:38	18:30	16:39	14:55 (13)
23	05:45	06:33	07:23	08:14	08:09	08:43
	21:42	20:46	19:35	18:28	16:38	14:28 (13)
24	05:46	06:35	07:25	08:16	08:11	08:44
	21:40	20:44	19:33	18:26	16:37	14:56 (13)
25	05:48	06:36	07:27	08:18	08:12	08:44
	21:39	20:42	19:31	17:24	16:36	14:28 (13)
26	05:49	06:38	07:28	08:20	08:14	08:44
	21:38	20:40	19:28	17:22	16:35	14:57 (13)
27	05:51	06:40	07:30	08:21	08:15	08:45
	21:36	20:37	19:26	17:20	16:34	14:30 (13)
28	05:52	06:41	07:32	08:23	08:17	08:45
	21:35	20:35	19:24	17:18	16:33	14:58 (13)
29	05:53	06:43	07:33	08:25	08:18	08:45
	21:33	20:33	19:21	17:16	16:32	14:31 (13)
30	05:55	06:44	07:35	08:27	08:20	08:45
	21:32	20:31	19:19	17:14	16:31	14:59 (13)
31	05:56	06:46		08:29		08:45
	21:30	20:29		17:13		14:32 (13)
Potential sun hours	502	454	381	331	266	244
Total, worst case				91	397	827
Sun reduction				0.24	0.18	0.13
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.59	0.59	0.60
Total reduction				0.14	0.11	0.08
Total, real				13	43	67

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: AT - H46

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45	08:18	07:25	07:15	06:10	06:54 (15) 05:25
	16:37	17:24	18:16	20:10	21:01	27 07:21 (15) 21:46
2	08:45	08:17	07:23	07:12	06:08	06:54 (15) 05:24
	16:38	17:26	18:18	20:11	21:02	26 07:20 (15) 21:47
3	08:45	08:15	07:21	07:10	06:06	06:54 (15) 05:23
	16:39	17:28	18:19	20:13	21:04	27 07:21 (15) 21:48
4	08:45	08:14	07:19	07:08	06:04	06:54 (15) 05:22
	16:40	17:30	18:21	20:15	21:06	26 07:20 (15) 21:49
5	08:44	08:12	07:16	07:05	06:02	06:54 (15) 05:22
	16:41	17:32	18:23	20:17	21:07	26 07:20 (15) 21:50
6	08:44	08:10	07:14	07:03	06:01	06:55 (15) 05:21
	16:42	17:34	18:25	20:18	21:09	25 07:20 (15) 21:51
7	08:44	08:09	07:12	07:01	05:59	06:56 (15) 05:20
	16:44	17:35	18:27	20:20	21:10	23 07:19 (15) 21:52
8	08:43	08:07	07:10	06:59	07:21 (16) 05:57	06:56 (15) 05:20
	16:45	17:37	18:28	20:22	7 07:28 (16) 21:12	21 07:17 (15) 21:53
9	08:43	08:05	07:07	06:56	07:19 (16) 05:55	06:57 (15) 05:19
	16:46	17:39	18:30	20:23	11 07:30 (16) 21:14	20 07:17 (15) 21:54
10	08:42	08:03	07:05	06:54	07:17 (16) 05:54	06:58 (15) 05:19
	16:48	17:41	18:32	20:25	14 07:31 (16) 21:15	17 07:15 (15) 21:55
11	08:42	08:01	07:03	06:52	07:15 (16) 05:52	06:59 (15) 05:19
	16:49	17:43	18:34	20:27	17 07:32 (16) 21:17	14 07:13 (15) 21:56
12	08:41	08:00	07:01	06:50	07:13 (16) 05:50	07:01 (15) 05:18
	16:50	17:45	18:35	20:28	20 07:33 (16) 21:19	11 07:12 (15) 21:56
13	08:40	07:58	06:58	06:47	07:11 (16) 05:49	05:18
	16:52	17:47	18:37	20:30	21 07:32 (16) 21:20	21:57
14	08:40	07:56	06:56	06:45	07:11 (16) 05:47	05:18
	16:53	17:48	18:39	20:32	21 07:32 (16) 21:22	21:58
15	08:39	07:54	06:54	06:43	07:11 (16) 05:45	05:18
	16:55	17:50	18:41	20:34	21 07:32 (16) 21:23	21:58
16	08:38	07:52	06:51	06:41	07:11 (16) 05:44	05:18
	16:57	17:52	18:42	20:35	20 07:31 (16) 21:25	21:59
17	08:37	07:50	06:49	06:39	07:11 (16) 05:42	05:17
	16:58	17:54	18:44	20:37	20 07:31 (16) 21:26	21:59
18	08:36	07:48	06:47	06:37	07:12 (16) 05:41	05:17
	17:00	17:56	18:46	20:39	18 07:30 (16) 21:28	22:00
19	08:35	07:46	06:45	06:34	07:13 (16) 05:40	05:17
	17:01	17:58	18:48	20:40	16 07:29 (16) 21:29	22:00
20	08:34	07:44	06:42	06:32	07:14 (16) 05:38	05:18
	17:03	18:00	18:49	20:42	13 07:27 (16) 21:31	22:00
21	08:33	07:42	06:40	06:30	07:16 (16) 05:37	05:18
	17:05	18:01	18:51	20:44	8 07:24 (16) 21:32	22:00
22	08:32	07:40	06:38	06:28	07:04 (15) 05:36	05:18
	17:07	18:03	18:53	20:45	11 07:15 (15) 21:34	22:01
23	08:31	07:38	06:35	06:26	07:02 (15) 05:34	05:18
	17:08	18:05	18:54	20:47	15 07:17 (15) 21:35	22:01
24	08:30	07:36	06:33	06:24	07:00 (15) 05:33	05:18
	17:10	18:07	18:56	20:49	19 07:19 (15) 21:36	22:01
25	08:28	07:34	06:31	06:22	06:58 (15) 05:32	05:19
	17:12	18:09	18:58	20:50	22 07:20 (15) 21:38	22:01
26	08:27	07:32	06:28	06:20	06:57 (15) 05:31	05:19
	17:13	18:10	19:00	20:52	23 07:20 (15) 21:39	22:01
27	08:26	07:29	06:26	06:18	06:56 (15) 05:30	05:20
	17:15	18:12	19:01	20:54	25 07:21 (15) 21:40	22:01
28	08:24	07:27	06:24	06:16	06:55 (15) 05:29	05:20
	17:17	18:14	19:03	20:56	26 07:21 (15) 21:42	22:01
29	08:23		07:21	06:14	06:55 (15) 05:28	05:21
	17:19		20:05	20:57	26 07:21 (15) 21:43	22:01
30	08:21		07:19	06:12	06:54 (15) 05:27	05:21
	17:21		20:06	20:59	27 07:21 (15) 21:44	22:00
31	08:20		07:17		05:26	
	17:23		20:08		21:45	
Potential sun hours	259	278	367	416	485	499
Total, worst case				421		263
Sun reduction				0.35		0.37
Oper. time red.				1.00		1.00
Wind dir. red.				0.65		0.64
Total reduction				0.23		0.24
Total, real				98		63

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine **Shadow receptor:** AT - H46

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22	05:58	07:11 (15)	06:48	07:14 (16)	07:37
	22:00	21:28	12 07:23 (15)	20:26	17 07:31 (16)	19:17
2	05:23	06:00	07:09 (15)	06:50	07:15 (16)	07:38
	22:00	21:27	15 07:24 (15)	20:24	14 07:29 (16)	19:15
3	05:23	06:01	07:08 (15)	06:51	07:17 (16)	07:40
	21:59	21:25	18 07:26 (15)	20:22	11 07:28 (16)	19:12
4	05:24	06:03	07:06 (15)	06:53	07:19 (16)	07:42
	21:59	21:23	21 07:27 (15)	20:20	7 07:26 (16)	19:10
5	05:25	06:04	07:06 (15)	06:54		07:43
	21:59	21:22	22 07:28 (15)	20:17		19:08
6	05:26	06:06	07:05 (15)	06:56		07:45
	21:58	21:20	23 07:28 (15)	20:15		19:06
7	05:27	06:08	07:05 (15)	06:58		07:47
	21:57	21:18	24 07:29 (15)	20:13		19:03
8	05:27	06:09	07:04 (15)	06:59		07:49
	21:57	21:16	25 07:29 (15)	20:10		19:01
9	05:28	06:11	07:04 (15)	07:01		07:50
	21:56	21:14	26 07:30 (15)	20:08		18:59
10	05:29	06:12	07:03 (15)	07:03		07:52
	21:55	21:12	26 07:29 (15)	20:06		18:57
11	05:30	06:14	07:03 (15)	07:04		07:54
	21:55	21:11	27 07:30 (15)	20:04		18:54
12	05:32	06:16	07:02 (15)	07:06		07:55
	21:54	21:09	27 07:29 (15)	20:01		18:52
13	05:33	06:17	07:03 (15)	07:07		07:57
	21:53	21:07	27 07:30 (15)	19:59		18:50
14	05:34	06:19	07:02 (15)	07:09		07:59
	21:52	21:05	27 07:29 (15)	19:57		18:48
15	05:35	06:20	07:03 (15)	07:11		08:00
	21:51	21:03	26 07:29 (15)	19:54		18:46
16	05:36	06:22	07:03 (15)	07:12		08:02
	21:50	21:01	24 07:27 (15)	19:52		18:43
17	05:37	06:24	07:04 (15)	07:14		08:04
	21:49	20:59	23 07:27 (15)	19:50		18:41
18	05:39	06:25	07:04 (15)	07:15		08:06
	21:48	20:57	21 07:25 (15)	19:47		18:39
19	05:40	06:27	07:06 (15)	07:17		08:07
	21:47	20:55	18 07:24 (15)	19:45		18:37
20	05:41	06:28	07:07 (15)	07:19		08:09
	21:46	20:52	15 07:22 (15)	19:43		18:35
21	05:42	06:30	07:09 (15)	07:20		08:11
	21:44	20:50	10 07:19 (15)	19:40		18:33
22	05:44	06:32	07:19 (16)	07:22		08:13
	21:43	20:48	9 07:28 (16)	19:38		18:31
23	05:45	06:33	07:18 (16)	07:24		08:14
	21:42	20:46	13 07:31 (16)	19:36		18:29
24	05:47	06:35	07:16 (16)	07:25		08:16
	21:40	20:44	16 07:32 (16)	19:33		18:27
25	05:48	06:37	07:15 (16)	07:27		07:18
	21:39	20:42	18 07:33 (16)	19:31		17:25
26	05:49	06:38	07:14 (16)	07:29		07:20
	21:38	20:40	20 07:34 (16)	19:29		17:23
27	05:51	06:40	07:13 (16)	07:30		07:22
	21:36	20:37	20 07:33 (16)	19:26		17:21
28	05:52	06:41	07:13 (16)	07:32		07:23
	21:35	20:35	21 07:34 (16)	19:24		17:19
29	05:54	06:43	07:12 (16)	07:33		07:25
	21:33	20:33	21 07:33 (16)	19:22		17:17
30	05:55	06:45	07:12 (16)	07:35		07:27
	21:32	20:31	21 07:33 (16)	19:19		17:15
31	05:57	06:46	07:12 (16)			07:29
	21:30	7 07:14 (15)	20:29	20 07:32 (16)		17:13
Potential sun hours	502	454	381	331	266	244
Total, worst case	7	636	49			
Sun reduction	0.27	0.30	0.28			
Oper. time red.	1.00	1.00	1.00			
Wind dir. red.	0.64	0.65	0.66			
Total reduction	0.17	0.19	0.19			
Total, real	1	123	9			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: AU - H47

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January		February		March		April		May		June	
1	08:45	15:09 (14)	08:18	16:27 (13)	07:25	17:11 (12)	07:14	06:10	05:24			
	16:36	28 15:37 (14)	17:24	19 16:46 (13)	18:16	21 17:32 (12)	20:10	21:00	21:46			
2	08:45	15:10 (14)	08:17	16:26 (13)	07:23	17:11 (12)	07:12	06:08	05:24			
	16:37	28 15:38 (14)	17:26	21 16:47 (13)	18:17	21 17:32 (12)	20:11	21:02	21:47			
3	08:45	15:11 (14)	08:15	16:25 (13)	07:21	17:11 (12)	07:10	06:06	05:23			
	16:38	28 15:39 (14)	17:28	23 16:48 (13)	18:19	21 17:32 (12)	20:13	21:04	21:48			
4	08:45	15:12 (14)	08:14	16:25 (13)	07:18	17:12 (12)	07:07	06:04	05:22			
	16:40	27 15:39 (14)	17:30	23 16:48 (13)	18:21	19 17:31 (12)	20:15	21:05	21:49			
5	08:44	15:12 (14)	08:12	16:25 (13)	07:16	17:12 (12)	07:05	06:02	05:21			
	16:41	27 15:39 (14)	17:31	24 16:49 (13)	18:23	17 17:29 (12)	20:16	21:07	21:50			
6	08:44	15:13 (14)	08:10	16:25 (13)	07:14	17:13 (12)	07:03	06:00	05:21			
	16:42	27 15:40 (14)	17:33	24 16:49 (13)	18:25	15 17:28 (12)	20:18	21:09	21:51			
7	08:44	15:13 (14)	08:08	16:25 (13)	07:12	17:15 (12)	07:01	05:58	05:20			
	16:43	27 15:40 (14)	17:35	24 16:49 (13)	18:26	12 17:27 (12)	20:20	21:10	21:52			
8	08:43	15:14 (14)	08:07	16:25 (13)	07:09	17:18 (12)	06:58	05:57	05:20			
	16:45	26 15:40 (14)	17:37	24 16:49 (13)	18:28	6 17:24 (12)	20:22	21:12	21:53			
9	08:43	15:14 (14)	08:05	16:25 (13)	07:07		06:56	05:55	05:19			
	16:46	26 15:40 (14)	17:39	24 16:49 (13)	18:30		20:23	21:14	21:54			
10	08:42	15:15 (14)	08:03	16:25 (13)	07:05		06:54	05:53	05:19			
	16:47	25 15:40 (14)	17:41	24 16:49 (13)	18:32		20:25	21:15	21:55			
11	08:42	15:15 (14)	08:01	16:26 (13)	07:03		06:52	05:52	05:18			
	16:49	25 15:40 (14)	17:43	22 16:48 (13)	18:33		20:27	21:17	21:56			
12	08:41	15:17 (14)	07:59	16:27 (13)	07:00		06:49	05:50	05:18			
	16:50	24 15:41 (14)	17:44	20 16:47 (13)	18:35		20:28	21:18	21:56			
13	08:40	15:18 (14)	07:58	16:28 (13)	06:58		06:47	05:48	05:18			
	16:52	22 15:40 (14)	17:46	18 16:46 (13)	18:37		20:30	21:20	21:57			
14	08:40	15:19 (14)	07:56	16:29 (13)	06:56		06:45	05:47	05:17			
	16:53	21 15:40 (14)	17:48	16 16:45 (13)	18:39		20:32	21:22	21:58			
15	08:39	15:20 (14)	07:54	16:31 (13)	06:54		06:43	05:45	05:17			
	16:55	20 15:40 (14)	17:50	12 16:43 (13)	18:40		20:33	21:23	21:58			
16	08:38	15:21 (14)	07:52	16:35 (13)	06:51		06:41	05:44	05:17			
	16:56	18 15:39 (14)	17:52	4 16:39 (13)	18:42		20:35	21:25	21:59			
17	08:37	15:23 (14)	07:50		06:49		06:38	05:42	05:17			
	16:58	15 15:38 (14)	17:54		18:44		20:37	21:26	21:59			
18	08:36	15:25 (14)	07:48		06:47		06:36	05:41	05:17			
	16:59	12 15:37 (14)	17:56		18:46		20:39	21:28	21:59			
19	08:35	15:27 (14)	07:46		06:44		06:34	05:39	05:17			
	17:01	7 15:34 (14)	17:57		18:47		20:40	21:29	22:00			
20	08:34		07:44		06:42		06:32	05:38	05:17			
	17:03		17:59		18:49		20:42	21:31	22:00			
21	08:33		07:42		06:40		06:30	05:36	05:17			
	17:04		18:01		18:51		20:44	21:32	22:00			
22	08:32		07:40		06:37		06:28	05:35	05:17			
	17:06		18:03		18:52		20:45	21:33	22:01			
23	08:31		07:38	17:20 (12)	06:35		06:26	05:34	05:18			
	17:08		18:05	6 17:26 (12)	18:54		20:47	21:35	22:01			
24	08:29		07:36	17:16 (12)	06:33		06:24	05:33	05:18			
	17:10		18:07	12 17:28 (12)	18:56		20:49	21:36	22:01			
25	08:28		07:33	17:14 (12)	06:30		06:22	05:31	05:18			
	17:11		18:08	16 17:30 (12)	18:58		20:50	21:38	22:01			
26	08:27		07:31	17:13 (12)	06:28		06:19	05:30	05:19			
	17:13		18:10	18 17:31 (12)	18:59		20:52	21:39	22:01			
27	08:26		07:29	17:12 (12)	06:26		06:17	05:29	05:19			
	17:15		18:12	20 17:32 (12)	19:01		20:54	21:40	22:01			
28	08:24	16:34 (13)	07:27	17:12 (12)	06:24		06:15	05:28	05:20			
	17:17	3 16:37 (13)	18:14	20 17:32 (12)	19:03		20:55	21:41	22:01			
29	08:23	16:30 (13)			07:21		06:13	05:27	05:20			
	17:19	10 16:40 (13)			20:04		20:57	21:43	22:01			
30	08:21	16:29 (13)			07:19		06:12	05:26	05:21			
	17:20	14 16:43 (13)			20:06		20:59	21:44	22:00			
31	08:20	16:27 (13)			07:17			05:25				
	17:22	17 16:44 (13)			20:08			21:45				
Potential sun hours	259		278		367		416	485	499			
Total, worst case	477		414		132							
Sun reduction	0.16		0.21		0.24							
Oper. time red.	1.00		1.00		1.00							
Wind dir. red.	0.60		0.62		0.64							
Total reduction	0.09		0.13		0.16							
Total, real	44		53		21							

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: AU - H47

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:21	05:58	06:48	07:37	07:30	15:55 (13) 08:21 14:58 (14)
	22:00	21:28	20:26	19:17	17:11	23 16:18 (13) 16:30 24 15:22 (14)
2	05:22	05:59	06:49	07:38	07:32	15:55 (13) 08:23 14:58 (14)
	22:00	21:27	20:24	19:14	17:09	24 16:19 (13) 16:30 25 15:23 (14)
3	05:23	06:01	06:51	07:40	07:34	15:54 (13) 08:24 14:58 (14)
	21:59	21:25	20:22	19:12	17:07	25 16:19 (13) 16:29 25 15:23 (14)
4	05:24	06:03	06:53	07:42	07:36	15:54 (13) 08:25 14:58 (14)
	21:59	21:23	20:19	19:10	17:05	25 16:19 (13) 16:29 27 15:25 (14)
5	05:24	06:04	06:54	07:43	07:38	15:55 (13) 08:27 14:58 (14)
	21:59	21:21	20:17	19:08	17:04	24 16:19 (13) 16:28 27 15:25 (14)
6	05:25	06:06	06:56	07:45	17:52 (12)	07:39 15:55 (13) 08:28 14:59 (14)
	21:58	21:20	20:15	19:05	10 18:02 (12)	17:02 24 16:19 (13) 16:28 27 15:26 (14)
7	05:26	06:07	06:57	07:47	17:50 (12)	07:41 15:55 (13) 08:29 14:59 (14)
	21:57	21:18	20:13	19:03	14 18:04 (12)	17:00 24 16:19 (13) 16:27 27 15:26 (14)
8	05:27	06:09	06:59	07:48	17:48 (12)	07:43 15:56 (13) 08:31 14:59 (14)
	21:57	21:16	20:10	19:01	17 18:05 (12)	16:58 22 16:18 (13) 16:27 28 15:27 (14)
9	05:28	06:10	07:01	07:50	17:46 (12)	07:45 15:57 (13) 08:32 14:59 (14)
	21:56	21:14	20:08	18:59	19 18:05 (12)	16:57 21 16:18 (13) 16:27 28 15:27 (14)
10	05:29	06:12	07:02	07:52	17:45 (12)	07:47 15:58 (13) 08:33 15:00 (14)
	21:55	21:12	20:06	18:56	20 18:05 (12)	16:55 19 16:17 (13) 16:26 28 15:28 (14)
11	05:30	06:14	07:04	07:53	17:45 (12)	07:48 15:59 (13) 08:34 15:00 (14)
	21:55	21:10	20:03	18:54	21 18:06 (12)	16:54 17 16:16 (13) 16:26 29 15:29 (14)
12	05:31	06:15	07:06	07:55	17:45 (12)	07:50 16:00 (13) 08:35 15:00 (14)
	21:54	21:08	20:01	18:52	21 18:06 (12)	16:52 14 16:14 (13) 16:26 29 15:29 (14)
13	05:32	06:17	07:07	07:57	17:44 (12)	07:52 16:02 (13) 08:36 15:01 (14)
	21:53	21:07	19:59	18:50	21 18:05 (12)	16:51 10 16:12 (13) 16:26 28 15:29 (14)
14	05:33	06:18	07:09	07:59	17:44 (12)	07:54 16:06 (13) 08:37 15:01 (14)
	21:52	21:05	19:56	18:47	20 18:04 (12)	16:49 3 16:09 (13) 16:26 29 15:30 (14)
15	05:35	06:20	07:10	08:00	17:45 (12)	07:55 08:38 15:02 (14)
	21:51	21:03	19:54	18:45	19 18:04 (12)	16:48 16:26 29 15:31 (14)
16	05:36	06:22	07:12	08:02	17:46 (12)	07:57 08:39 15:01 (14)
	21:50	21:01	19:52	18:43	17 18:03 (12)	16:46 16:26 29 15:30 (14)
17	05:37	06:23	07:14	08:04	17:47 (12)	07:59 08:40 15:02 (14)
	21:49	20:59	19:49	18:41	14 18:01 (12)	16:45 16:26 29 15:31 (14)
18	05:38	06:25	07:15	08:06	17:49 (12)	08:01 08:40 15:03 (14)
	21:48	20:56	19:47	18:39	10 17:59 (12)	16:44 16:27 29 15:32 (14)
19	05:39	06:27	07:17	08:07	08:02 08:41 15:04 (14)	
	21:47	20:54	19:45	18:37	16:42 16:27 28 15:32 (14)	
20	05:41	06:28	07:18	08:09	08:04 08:42 15:03 (14)	
	21:45	20:52	19:42	18:35	16:41 16:27 29 15:32 (14)	
21	05:42	06:30	07:20	08:11	08:06 08:42 15:04 (14)	
	21:44	20:50	19:40	18:32	16:40 16:28 29 15:33 (14)	
22	05:43	06:31	07:22	08:13	08:07 08:43 15:04 (14)	
	21:43	20:48	19:38	18:30	16:39 16:28 29 15:33 (14)	
23	05:45	06:33	07:23	08:14	08:09 08:43 15:05 (14)	
	21:42	20:46	19:35	18:28	16:38 7 15:11 (14) 16:29 29 15:34 (14)	
24	05:46	06:35	07:25	08:16	08:11 15:02 (14) 08:44 15:06 (14)	
	21:40	20:44	19:33	18:26	16:37 12 15:14 (14) 16:29 28 15:34 (14)	
25	05:48	06:36	07:27	07:18	08:12 15:01 (14) 08:44 15:06 (14)	
	21:39	20:42	19:31	17:24	16:35 15 15:16 (14) 16:30 29 15:35 (14)	
26	05:49	06:38	07:28	07:20	16:04 (13) 08:14 14:59 (14) 08:44 15:07 (14)	
	21:38	20:40	19:28	17:22	7 16:11 (13) 16:35 18 15:17 (14) 16:31 29 15:36 (14)	
27	05:50	06:40	07:30	07:21	16:00 (13) 08:15 14:59 (14) 08:45 15:07 (14)	
	21:36	20:37	19:26	17:20	13 16:13 (13) 16:34 20 15:19 (14) 16:31 29 15:36 (14)	
28	05:52	06:41	07:32	07:23	15:58 (13) 08:17 14:59 (14) 08:45 15:08 (14)	
	21:35	20:35	19:24	17:18	17 16:15 (13) 16:33 21 15:20 (14) 16:32 28 15:36 (14)	
29	05:53	06:43	07:33	07:25	15:57 (13) 08:18 14:58 (14) 08:45 15:08 (14)	
	21:33	20:33	19:21	17:16	19 16:16 (13) 16:32 22 15:20 (14) 16:33 29 15:37 (14)	
30	05:55	06:44	07:35	07:27	15:56 (13) 08:20 14:58 (14) 08:45 15:09 (14)	
	21:31	20:31	19:19	17:14	21 16:17 (13) 16:31 24 15:22 (14) 16:34 28 15:37 (14)	
31	05:56	06:46	07:37	07:29	15:55 (13) 08:21 14:59 (14) 08:45 15:09 (14)	
	21:30	20:28	19:17	17:13	23 16:18 (13) 16:35 29 15:38 (14)	
Potential sun hours	502	454	381	331	266	244
Total, worst case				323	414	870
Sun reduction				0.24	0.18	0.13
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.63	0.61	0.59
Total reduction				0.15	0.11	0.08
Total, real				48	46	69

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)



SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: AV - H48

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N to Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January to December) and rows for each day of the year (01 to 31). Includes summary rows for Potential sun hours, Total, worst case, Sun reduction, Oper. time red., Wind dir. red., Total reduction, and Total, real.

Table layout: For each day in each month the following matrix apply

Table with 4 columns: Day in month, Sun rise (hh:mm) / Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker / Last time (hh:mm) with flicker, and (WTG causing flicker first time) / (WTG causing flicker last time).

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: AW - H49

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Main data table with columns for months (January-December) and rows for days (1-31). Includes summary rows for 'Potential sun hours', 'Total, worst case', 'Sun reduction', 'Oper. time red.', 'Wind dir. red.', 'Total reduction', and 'Total, real'.

Table layout: For each day in each month the following matrix apply

Matrix with 4 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Specimen Turbine **Shadow receptor:** AX - H50

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22	20:34 (5)	05:58	20:25 (4)	06:48	07:37
	23	20:57 (5)	21:28	18	20:43 (4)	20:26
2	05:22	20:35 (5)	06:00	20:25 (4)	06:49	07:38
	23	20:58 (5)	21:27	16	20:41 (4)	20:24
3	05:23	20:36 (5)	06:01	20:27 (4)	06:51	07:40
	22	20:58 (5)	21:25	14	20:41 (4)	20:22
4	05:24	20:35 (5)	06:03	20:28 (4)	06:53	07:42
	22	20:57 (5)	21:23	11	20:39 (4)	20:19
5	05:25	20:36 (5)	06:04	20:30 (4)	06:54	07:43
	21	20:57 (5)	21:21	7	20:37 (4)	20:17
6	05:25	20:37 (5)	06:06		06:56	07:45
	20	20:57 (5)	21:20		20:15	19:05
7	05:26	20:38 (5)	06:07		06:57	07:47
	19	20:57 (5)	21:18		20:13	19:03
8	05:27	20:39 (5)	06:09		06:59	07:48
	17	20:56 (5)	21:16		20:10	19:01
9	05:28	20:39 (5)	06:11		07:01	07:50
	17	20:56 (5)	21:14		20:08	18:59
10	05:29	20:40 (5)	06:12		07:02	07:52
	15	20:55 (5)	21:12		20:06	18:56
11	05:30	20:42 (5)	06:14		07:04	07:53
	13	20:55 (5)	21:10		20:03	18:54
12	05:31	20:43 (5)	06:15		07:06	07:55
	10	20:53 (5)	21:08		20:01	18:52
13	05:32	20:45 (5)	06:17		07:07	07:57
	7	20:52 (5)	21:06		19:59	18:50
14	05:34		06:19		07:09	07:59
			21:05		19:56	18:48
15	05:35	20:30 (4)	06:20		07:10	08:00
	6	20:36 (4)	21:03		19:54	18:45
16	05:36	20:29 (4)	06:22		07:12	08:02
	9	20:38 (4)	21:01		19:52	18:43
17	05:37	20:27 (4)	06:23		07:14	08:04
	12	20:39 (4)	20:59		19:49	18:41
18	05:38	20:26 (4)	06:25		07:15	08:06
	14	20:40 (4)	20:56		19:47	18:39
19	05:40	20:25 (4)	06:27		07:17	08:07
	15	20:40 (4)	20:54		19:45	18:37
20	05:41	20:26 (4)	06:28		07:19	08:09
	16	20:42 (4)	20:52		19:42	18:35
21	05:42	20:25 (4)	06:30		07:20	08:11
	17	20:42 (4)	20:50		19:40	18:33
22	05:44	20:24 (4)	06:31		07:22	08:13
	18	20:42 (4)	20:48		19:38	18:30
23	05:45	20:24 (4)	06:33		07:23	08:14
	19	20:43 (4)	20:46		19:35	18:28
24	05:46	20:24 (4)	06:35		07:25	08:16
	20	20:44 (4)	20:44		19:33	18:26
25	05:48	20:24 (4)	06:36		07:27	07:18
	20	20:44 (4)	20:42		19:31	17:24
26	05:49	20:23 (4)	06:38		07:28	07:20
	20	20:43 (4)	20:40		19:28	17:22
27	05:51	20:24 (4)	06:40		07:30	07:21
	20	20:44 (4)	20:37		19:26	17:20
28	05:52	20:23 (4)	06:41		07:32	07:23
	21	20:44 (4)	20:35		19:24	17:18
29	05:54	20:24 (4)	06:43		07:33	07:25
	20	20:44 (4)	20:33		19:21	17:16
30	05:55	20:24 (4)	06:44		07:35	07:27
	19	20:43 (4)	20:31		19:19	17:15
31	05:57	20:24 (4)	06:46			07:29
	19	20:43 (4)	20:28			17:13
Potential sun hours	502	454		381	331	266
Total, worst case	514	66			606	1391
Sun reduction	0.27	0.30			0.24	0.18
Oper. time red.	1.00	1.00			1.00	1.00
Wind dir. red.	0.68	0.68			0.63	0.60
Total reduction	0.18	0.20			0.15	0.11
Total, real	92	13			89	99

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: AY - H51

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (July-December) and rows for each day, showing sun rise/set times, shadow reduction, and operational time.

Table layout: For each day in each month the following matrix apply

Summary matrix table with columns: Day in month, Sun rise/set, Minutes with flicker, First/Last time with flicker, and WTG causing flicker times.

Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: BA - H53
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each hour of the day (08:45 to 17:22). Includes summary rows for Potential sun hours, Total, worst case, Sun reduction, Oper. time red., Wind dir. red., Total reduction, and Total, real.

Table layout: For each day in each month the following matrix apply

Matrix with 2 rows: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: BC - H55

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan to Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N to Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main calendar table with columns for months (January to December) and rows for days (1 to 31), showing start/end times and shadow reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix with 4 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: BD - H56

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of sunshine probability values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of operational time values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January to June) and rows for each day of the month, showing sun rise/set times and shadow reduction values.

Table layout: For each day in each month the following matrix apply

Matrix table with 2 rows and 4 columns: Day in month, Sun rise/set, Minutes with flicker, First/Last time with flicker.

SHADOW - Calendar

Calculation: Specimen Turbine **Shadow receptor: BD - H56**

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:21	05:58	06:48	07:37	07:30	16:04 (13) 08:21 15:10 (14)
	22:00	21:28	20:26	19:17	17:11	23 16:27 (13) 16:30 27 15:37 (14)
2	05:22	05:59	06:49	07:38	07:32	16:04 (13) 08:23 15:11 (14)
	22:00	21:27	20:24	19:14	17:09	24 16:28 (13) 16:30 27 15:38 (14)
3	05:23	06:01	06:51	07:40	07:34	16:04 (13) 08:24 15:11 (14)
	21:59	21:25	20:22	19:12	17:07	23 16:27 (13) 16:29 27 15:38 (14)
4	05:24	06:03	06:53	07:42	07:36	16:05 (13) 08:25 15:11 (14)
	21:59	21:23	20:19	19:10	17:05	22 16:27 (13) 16:29 28 15:39 (14)
5	05:24	06:04	06:54	07:43	18:00 (12) 07:38	16:05 (13) 08:27 15:11 (14)
	21:59	21:21	20:17	19:08	5 18:05 (12) 17:03	22 16:27 (13) 16:28 28 15:39 (14)
6	05:25	06:06	06:56	07:45	17:57 (12) 07:39	16:06 (13) 08:28 15:12 (14)
	21:58	21:20	20:15	19:05	11 18:08 (12) 17:02	20 16:26 (13) 16:28 28 15:40 (14)
7	05:26	06:07	06:57	07:47	17:55 (12) 07:41	16:07 (13) 08:29 15:12 (14)
	21:57	21:18	20:13	19:03	15 18:10 (12) 17:00	19 16:26 (13) 16:27 28 15:40 (14)
8	05:27	06:09	06:59	07:48	17:54 (12) 07:43	16:08 (13) 08:31 15:13 (14)
	21:57	21:16	20:10	19:01	17 18:11 (12) 16:58	17 16:25 (13) 16:27 27 15:40 (14)
9	05:28	06:10	07:01	07:50	17:52 (12) 07:45	16:09 (13) 08:32 15:13 (14)
	21:56	21:14	20:08	18:59	19 18:11 (12) 16:57	15 16:24 (13) 16:27 27 15:40 (14)
10	05:29	06:12	07:02	07:52	17:51 (12) 07:46	16:11 (13) 08:33 15:14 (14)
	21:55	21:12	20:06	18:56	20 18:11 (12) 16:55	11 16:22 (13) 16:26 28 15:42 (14)
11	05:30	06:14	07:04	07:53	17:51 (12) 07:48	16:15 (13) 08:34 15:14 (14)
	21:55	21:10	20:03	18:54	20 18:11 (12) 16:54	4 16:19 (13) 16:26 28 15:42 (14)
12	05:31	06:15	07:05	07:55	17:51 (12) 07:50	16:26 27 15:42 (14)
	21:54	21:08	20:01	18:52	20 18:11 (12) 16:52	16:26 27 15:42 (14)
13	05:32	06:17	07:07	07:57	17:51 (12) 07:52	16:26 27 15:42 (14)
	21:53	21:07	19:59	18:50	19 18:10 (12) 16:51	16:26 28 15:43 (14)
14	05:33	06:18	07:09	07:59	17:51 (12) 07:54	16:26 27 15:43 (14)
	21:52	21:05	19:56	18:47	18 18:09 (12) 16:49	16:26 27 15:43 (14)
15	05:35	06:20	07:10	08:00	17:52 (12) 07:55	16:26 27 15:43 (14)
	21:51	21:03	19:54	18:45	16 18:08 (12) 16:48	16:26 28 15:44 (14)
16	05:36	06:22	07:12	08:02	17:53 (12) 07:57	16:26 27 15:43 (14)
	21:50	21:01	19:52	18:43	14 18:07 (12) 16:46	16:26 27 15:43 (14)
17	05:37	06:23	07:14	08:04	17:55 (12) 07:59	16:26 27 15:44 (14)
	21:49	20:59	19:49	18:41	10 18:05 (12) 16:45	16:26 27 15:44 (14)
18	05:38	06:25	07:15	08:06	16:44 08:01	16:27 26 15:44 (14)
	21:48	20:56	19:47	18:39	16:44 08:00	16:27 26 15:44 (14)
19	05:39	06:27	07:17	08:07	16:42 08:02	16:27 27 15:45 (14)
	21:47	20:54	19:45	18:37	16:42 08:04	16:27 27 15:45 (14)
20	05:41	06:28	07:18	08:09	16:41 9 15:26 (14)	16:27 27 15:45 (14)
	21:45	20:52	19:42	18:35	16:41 9 15:26 (14)	16:27 27 15:45 (14)
21	05:42	06:30	07:20	08:11	16:40 13 15:27 (14)	16:27 27 15:46 (14)
	21:44	20:50	19:40	18:32	16:40 13 15:27 (14)	16:27 27 15:46 (14)
22	05:43	06:31	07:22	08:13	16:39 16 15:29 (14)	16:27 27 15:46 (14)
	21:43	20:48	19:38	18:30	16:39 16 15:29 (14)	16:27 27 15:46 (14)
23	05:45	06:33	07:23	08:14	16:38 19 15:31 (14)	16:27 27 15:47 (14)
	21:42	20:46	19:35	18:28	16:38 19 15:31 (14)	16:27 27 15:47 (14)
24	05:46	06:35	07:25	08:16	16:36 20 15:32 (14)	16:27 27 15:47 (14)
	21:40	20:44	19:33	18:26	16:36 20 15:32 (14)	16:27 27 15:47 (14)
25	05:48	06:36	07:27	07:18	16:12 (13) 08:12	15:12 (14) 08:44 15:20 (14)
	21:39	20:42	19:31	17:24	10 16:22 (13) 16:35	21 15:33 (14) 16:30 27 15:47 (14)
26	05:49	06:38	07:28	07:20	16:09 (13) 08:14	15:10 (14) 08:44 15:22 (14)
	21:38	20:40	19:28	17:22	15 16:24 (13) 16:35	23 15:33 (14) 16:31 27 15:49 (14)
27	05:50	06:40	07:30	07:21	16:07 (13) 08:15	15:11 (14) 08:45 15:22 (14)
	21:36	20:37	19:26	17:20	17 16:24 (13) 16:34	24 15:35 (14) 16:31 27 15:49 (14)
28	05:52	06:41	07:32	07:23	16:06 (13) 08:17	15:11 (14) 08:45 15:22 (14)
	21:35	20:35	19:24	17:18	19 16:25 (13) 16:33	25 15:36 (14) 16:32 27 15:49 (14)
29	05:53	06:43	07:33	07:25	16:05 (13) 08:18	15:10 (14) 08:45 15:23 (14)
	21:33	20:33	19:21	17:16	21 16:26 (13) 16:32	26 15:36 (14) 16:33 27 15:50 (14)
30	05:55	06:44	07:35	07:27	16:04 (13) 08:20	15:11 (14) 08:45 15:23 (14)
	21:31	20:31	19:19	17:14	23 16:27 (13) 16:31	26 15:37 (14) 16:34 27 15:50 (14)
31	05:56	06:46	07:36	07:29	16:04 (13) 08:21	15:11 (14) 08:45 15:23 (14)
	21:30	20:28	19:17	17:13	23 16:27 (13) 16:31	26 15:37 (14) 16:34 27 15:50 (14)
Potential sun hours	502	454	381	331	266	244
Total, worst case				332	422	844
Sun reduction				0.24	0.18	0.13
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.63	0.60	0.59
Total reduction				0.15	0.11	0.08
Total, real				50	47	66

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: BE - H57

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-June) and rows for days (1-31). Includes sub-totals for potential sun hours and various reduction factors.

Table layout: For each day in each month the following matrix apply

Matrix table with 4 columns: Day in month, Sun rise/set, Minutes with flicker, First/Last time with flicker (WTG causing flicker).



SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: BE - H57

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of sunshine probability values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of operational time values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (July-December) and rows for each day of the month, including sunrise, sunset, and shadow reduction data.

Table layout: For each day in each month the following matrix apply

Matrix table with 4 columns: Day in month, Sun rise/set, Minutes with flicker, and WTG causing flicker first/last time.

Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: BF - H58

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June	July	August	September	October	November	December	
1	08:45 16:37	08:18 17:24	07:25 18:16	07:15 20:10	06:10 21:01	06:56 (15) 21:46	05:25 22:00	05:58 21:28		06:48 20:26	07:37 19:17	07:30 17:11	08:21 16:31
2	08:45 16:38	08:17 17:26	07:23 18:18	07:12 20:11	06:08 21:02	06:56 (15) 21:47	05:23 22:00	06:00 21:27		06:50 20:24	07:38 19:15	07:32 17:09	08:23 16:30
3	08:45 16:39	08:15 17:28	07:21 18:19	07:10 20:13	06:06 21:04	06:57 (15) 21:48	05:23 21:59	06:01 21:25		06:51 20:22	07:40 19:12	07:34 17:07	08:24 16:30
4	08:45 16:40	08:14 17:30	07:19 18:21	07:08 20:15	06:04 21:06	06:58 (15) 21:49	05:22 21:59	06:03 21:23	07:15 (15)	06:53 20:20	07:42 19:10	07:36 17:06	08:26 16:29
5	08:45 16:41	08:12 17:32	07:16 18:23	07:05 20:17	06:02 21:07	06:58 (15) 21:50	05:22 21:59	06:04 21:22	07:18 (15)	06:54 20:17	07:43 19:08	07:38 17:04	08:27 16:28
6	08:44 16:42	08:10 17:34	07:14 18:25	07:03 20:18	06:01 21:09	07:00 (15) 21:51	05:21 21:58	06:06 21:20	07:10 (15)	06:56 20:15	07:45 19:06	07:39 17:02	08:28 16:28
7	08:44 16:44	08:09 17:35	07:12 18:27	07:01 20:20	05:59 21:11	07:15 (15) 21:52	21:58	06:08 21:18	07:23 (15)	06:58 20:13	07:47 19:03	07:41 17:00	08:29 16:28
8	08:43 16:45	08:07 17:37	07:10 18:28	06:59 20:22	05:57 21:12	07:13 (15) 21:53	05:27 21:57	06:09 21:16	07:07 (15)	06:59 20:10	07:49 19:01	07:43 16:59	08:31 16:27
9	08:43 16:46	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	07:11 (15) 21:53	05:19 21:56	06:11 21:14	07:07 (15)	07:01 20:08	07:50 18:59	07:45 16:57	08:32 16:27
10	08:42 16:48	08:03 17:41	07:05 18:32	06:54 20:25	05:54 21:15	05:19 21:55	05:29 21:55	06:12 21:12	07:06 (15)	07:03 20:06	07:52 18:57	07:47 16:55	08:33 16:27
11	08:42 16:49	08:01 17:43	07:03 18:34	06:52 20:27	05:52 21:17	05:19 21:56	05:30 21:55	06:14 21:11	07:06 (15)	07:04 20:04	07:54 18:54	07:48 16:54	08:34 16:27
12	08:41 16:51	08:00 17:45	07:01 18:35	06:50 20:28	05:50 21:19	05:18 21:56	05:32 21:54	06:16 21:09	07:05 (15)	07:06 20:01	07:55 18:52	07:50 16:52	08:35 16:27
13	08:40 16:52	07:58 17:47	06:58 18:37	06:47 20:30	05:49 21:20	05:18 21:57	05:33 21:53	06:17 21:07	07:05 (15)	07:07 19:59	07:57 18:50	07:52 16:51	08:36 16:26
14	08:40 16:54	07:56 17:48	06:56 18:39	06:45 20:32	05:47 21:22	05:18 21:58	05:34 21:52	06:19 21:05	07:04 (15)	07:09 19:57	07:59 18:48	07:54 16:49	08:37 16:26
15	08:39 16:55	07:54 17:50	06:54 18:41	06:43 20:34	05:45 21:23	05:18 21:58	05:35 21:51	06:20 21:03	07:05 (15)	07:11 19:54	08:00 18:46	07:55 16:48	08:38 16:27
16	08:38 16:57	07:52 17:52	06:51 18:42	06:41 20:35	05:44 21:25	05:18 21:59	05:36 21:50	06:22 21:01	07:04 (15)	07:12 19:52	08:02 18:43	07:57 16:47	08:39 16:27
17	08:37 16:58	07:50 17:54	06:49 18:44	06:39 20:37	05:42 21:26	05:17 21:59	05:37 21:49	06:24 20:59	07:05 (15)	07:14 19:50	08:04 18:41	07:59 16:45	08:40 16:27
18	08:36 17:00	07:48 17:56	06:47 18:46	06:37 20:39	05:41 21:28	05:17 22:00	05:39 21:48	06:25 20:57	07:05 (15)	07:15 19:47	08:06 18:39	08:01 16:44	08:40 16:27
19	08:35 17:01	07:46 17:58	06:45 18:48	06:34 20:40	05:40 21:29	05:17 22:00	05:40 21:47	06:27 20:55	07:06 (15)	07:17 19:45	08:07 18:37	08:02 16:43	08:41 16:27
20	08:34 17:03	07:44 18:00	06:42 18:49	06:32 20:42	05:38 21:31	05:18 22:00	05:41 21:46	06:28 20:52	07:07 (15)	07:19 19:43	08:09 18:35	08:04 16:41	08:42 16:28
21	08:33 17:05	07:42 18:01	06:40 18:51	06:30 20:44	05:37 21:32	05:18 22:00	05:42 21:44	06:30 20:50	07:22 (15)	07:20 19:40	08:11 18:33	08:06 16:40	08:42 16:28
22	08:32 17:07	07:40 18:03	06:38 18:53	06:28 20:45	05:36 21:34	05:18 22:01	05:44 21:43	06:32 20:48	07:13 (15)	07:22 19:38	08:13 18:31	08:07 16:39	08:43 16:29
23	08:31 17:08	07:38 18:05	06:35 18:54	06:26 20:47	05:34 21:35	05:18 22:01	05:45 21:42	06:33 20:46	07:14 (15)	07:24 19:36	08:14 18:29	08:09 16:38	08:43 16:29
24	08:30 17:10	07:36 18:07	06:33 18:56	06:24 20:49	05:33 21:36	05:18 22:01	05:47 21:40	06:35 20:44	07:15 (15)	07:25 19:33	08:16 18:27	08:11 16:37	08:44 16:30
25	08:28 17:12	07:34 18:09	06:31 18:58	06:22 20:51	05:32 21:38	05:19 22:01	05:48 21:39	06:37 20:42	07:16 (15)	07:27 19:31	08:17 17:25	08:12 16:36	08:44 16:30
26	08:27 17:14	07:32 18:10	06:28 19:00	06:20 20:52	05:31 21:39	05:19 22:01	05:49 21:38	06:38 20:40	07:17 (15)	07:29 19:29	08:18 17:23	08:14 16:35	08:44 16:31
27	08:26 17:15	07:29 18:12	06:26 19:01	06:18 20:54	05:30 21:40	05:20 22:01	05:51 21:36	06:40 20:37	07:18 (15)	07:30 19:26	08:19 17:21	08:15 16:34	08:45 16:32
28	08:24 17:17	07:27 18:14	06:24 19:03	06:16 20:56	05:29 21:42	05:20 22:01	05:52 21:35	06:41 20:35	07:19 (15)	07:32 19:24	08:20 17:19	08:17 16:33	08:45 16:33
29	08:23 17:19	07:21 18:12	06:14 19:01	06:14 20:57	05:28 21:43	05:21 22:01	05:54 21:33	06:43 20:33	07:20 (15)	07:34 19:22	08:21 17:17	08:18 16:32	08:45 16:33
30	08:21 17:21	07:19 18:20	06:12 19:06	06:12 20:59	05:27 21:44	05:21 22:00	05:55 21:32	06:45 20:31	07:21 (15)	07:35 19:19	08:22 17:15	08:20 16:32	08:45 16:34
31	08:20 17:23	07:17 18:20	06:11 19:08	06:11 20:59	05:26 21:45	05:20 22:01	05:57 21:30	06:46 20:29	07:22 (15)	07:39 19:08	08:23 17:13	08:45 16:35	08:45 16:35
Potential sun hours	259	278	367	416	485	499	502	454	381	331	266	244	
Total, worst case				180	139			321					
Sun reduction				0.35	0.37			0.30					
Oper. time red.				1.00	1.00			1.00					
Wind dir. red.				0.65	0.65			0.65					
Total reduction				0.23	0.24			0.19					
Total, real				41	33			62					

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: BG - H59
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Table with 13 columns for months (January to December) and rows for each day of the month, showing sunrise and sunset times (hh:mm) and potential sun hours. Summary rows at the bottom show total sun hours and reductions.

Table layout: For each day in each month the following matrix apply

Matrix table with columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: BH - H60
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Table with columns for months (January to December) and rows for time slots (e.g., 08:45, 16:36, etc.). Includes summary rows for 'Potential sun hours', 'Total, worst case', 'Sun reduction', 'Oper. time red.', 'Wind dir. red.', 'Total reduction', and 'Total, real'.

Table layout: For each day in each month the following matrix apply

Day in month Sun rise (hh:mm) Sun set (hh:mm) Minutes with flicker First time (hh:mm) with flicker Last time (hh:mm) with flicker (WTG causing flicker first time) (WTG causing flicker last time)



SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: BI - H61

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January to June) and rows for each day (1-31) showing sun rise/set times, minutes with flicker, and reduction factors.

Table layout: For each day in each month the following matrix apply

Matrix table with 4 columns: Day in month, Sun rise/set times, Minutes with flicker, and First/Last time with flicker (WTG causing flicker).

SHADOW - Calendar

Calculation: Specimen Turbine **Shadow receptor:** BI - H61

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22 22:00	20:14 (5) 20:39 (5)	05:58 21:28	20:12 (4) 20:30 (4)	06:48 20:26	07:37 19:17
2	05:22 22:00	20:15 (5) 20:40 (5)	06:00 21:27	20:11 (4) 20:30 (4)	06:49 20:24	07:38 19:15
3	05:23 21:59	20:15 (5) 20:40 (5)	06:01 21:25	20:11 (4) 20:30 (4)	06:51 20:22	07:40 19:12
4	05:24 21:59	20:14 (5) 20:40 (5)	06:03 21:23	20:11 (4) 20:30 (4)	06:53 20:19	07:42 19:10
5	05:25 21:58	20:15 (5) 20:41 (5)	06:04 21:21	20:11 (4) 20:30 (4)	06:54 20:17	07:43 19:08
6	05:25 21:58	20:15 (5) 20:41 (5)	06:06 21:20	20:11 (4) 20:30 (4)	06:56 20:15	07:45 19:05
7	05:26 21:57	20:15 (5) 20:41 (5)	06:07 21:18	20:10 (4) 20:29 (4)	06:57 20:13	07:47 19:03
8	05:27 21:57	20:15 (5) 20:42 (5)	06:09 21:16	20:11 (4) 20:29 (4)	06:59 20:10	07:48 19:01
9	05:28 21:56	20:15 (5) 20:42 (5)	06:11 21:14	20:11 (4) 20:28 (4)	07:01 20:08	07:50 18:59
10	05:29 21:55	20:16 (5) 20:42 (5)	06:12 21:12	20:12 (4) 20:27 (4)	07:02 20:06	07:52 18:56
11	05:30 21:54	20:16 (5) 20:43 (5)	06:14 21:10	20:13 (4) 20:25 (4)	07:04 20:03	07:53 18:54
12	05:31 21:54	20:16 (5) 20:43 (5)	06:15 21:08	20:15 (4) 20:24 (4)	07:06 20:01	07:55 18:52
13	05:32 21:53	20:16 (5) 20:43 (5)	06:17 21:06		07:07 19:59	07:57 18:50
14	05:34 21:52	20:16 (5) 20:43 (5)	06:19 21:05		07:09 19:56	07:59 18:48
15	05:35 21:51	20:16 (5) 20:43 (5)	06:20 21:03		07:10 19:54	08:00 18:45
16	05:36 21:50	20:16 (5) 20:43 (5)	06:22 21:01		07:12 19:52	08:02 18:43
17	05:37 21:49	20:16 (5) 20:42 (5)	06:23 20:59		07:14 19:49	08:04 18:41
18	05:38 21:48	20:16 (5) 20:42 (5)	06:25 20:56		07:15 19:47	08:06 18:39
19	05:40 21:47	20:17 (5) 20:42 (5)	06:27 20:54		07:17 19:45	08:07 18:37
20	05:41 21:45	20:18 (5) 20:42 (5)	06:28 20:52		07:19 19:42	08:09 18:35
21	05:42 21:44	20:18 (5) 20:42 (5)	06:30 20:50		07:20 19:40	08:11 18:33
22	05:44 21:43	20:18 (5) 20:41 (5)	06:31 20:48		07:22 19:38	08:13 18:30
23	05:45 21:42	20:19 (5) 20:40 (5)	06:33 20:46		07:23 19:35	08:14 18:28
24	05:46 21:40	20:20 (5) 20:40 (5)	06:35 20:44		07:25 19:33	08:16 18:26
25	05:48 21:39	20:21 (5) 20:39 (5)	06:36 20:42		07:27 19:31	08:18 18:24
26	05:49 21:37	20:21 (5) 20:38 (5)	06:38 20:39		07:28 19:28	08:20 18:22
27	05:51 21:36	20:18 (4) 20:37 (5)	06:40 20:37		07:30 19:26	08:21 18:20
28	05:52 21:34	20:15 (4) 20:35 (5)	06:41 20:35		07:32 19:24	08:23 18:18
29	05:54 21:33	20:15 (4) 20:28 (4)	06:43 20:33		07:33 19:21	08:25 18:16
30	05:55 21:31	20:13 (4) 20:28 (4)	06:44 20:31		07:35 19:19	08:27 18:15
31	05:57 21:30	20:12 (4) 20:29 (4)	06:46 20:28		07:29 17:13	08:29 16:23
Potential sun hours	502	454		381	331	266
Total, worst case	729	203			426	1161
Sun reduction	0.27	0.30			0.24	0.18
Oper. time red.	1.00	1.00			1.00	1.00
Wind dir. red.	0.68	0.67			0.63	0.60
Total reduction	0.18	0.20			0.15	0.11
Total, real	130	40			63	127

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: BJ - H62

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45	08:19	09:02 (8)	07:25	07:53 (9)	07:15
	16:36	17:24	09:43 (7)	18:16	08:13 (9)	20:10
2	08:45	08:17	09:02 (8)	07:23	07:51 (9)	07:12
	16:38	17:26	09:42 (7)	18:18	08:13 (9)	20:12
3	08:45	08:15	09:01 (8)	07:21	07:51 (9)	07:10
	16:39	17:28	09:41 (7)	18:19	08:14 (9)	20:13
4	08:45	08:14	09:02 (8)	07:19	07:50 (9)	07:08
	16:40	17:30	09:41 (7)	18:21	08:14 (9)	20:15
5	08:45	08:12	09:03 (8)	07:16	07:50 (9)	07:05
	16:41	17:32	09:39 (7)	18:23	08:15 (9)	20:17
6	08:44	08:10	09:03 (8)	07:14	07:49 (9)	07:03
	16:42	17:34	09:36 (7)	18:25	08:14 (9)	20:18
7	08:44	08:09	09:03 (8)	07:12	07:49 (9)	07:01
	16:43	17:35	09:27 (8)	18:27	08:14 (9)	20:20
8	08:44	08:07	09:04 (8)	07:10	07:50 (9)	06:59
	16:45	17:37	09:26 (8)	18:28	08:13 (9)	20:22
9	08:43	08:05	09:05 (8)	07:07	07:50 (9)	06:56
	16:46	17:39	09:25 (8)	18:30	08:13 (9)	20:23
10	08:43	08:03	09:07 (8)	07:05	07:50 (9)	06:54
	16:48	17:41	09:25 (8)	18:32	08:11 (9)	20:25
11	08:42	08:02	09:09 (8)	07:03	07:52 (9)	06:52
	16:49	17:43	09:23 (8)	18:34	08:10 (9)	20:27
12	08:41	08:00	09:11 (8)	07:01	07:53 (9)	06:50
	16:50	17:45	09:21 (8)	18:35	08:08 (9)	20:29
13	08:41	07:58	06:58	06:58	07:55 (9)	06:47
	16:52	17:47	18:37	9	08:04 (9)	20:30
14	08:40	07:56	06:56	06:45	05:47	05:18
	16:53	17:48	18:39	20:32	21:22	21:58
15	08:39	07:54	06:54	06:43	05:45	05:17
	16:55	17:50	18:41	20:34	21:23	21:58
16	08:38	07:52	06:51	06:41	05:44	05:17
	16:56	17:52	18:42	20:35	21:25	21:59
17	08:37	07:50	06:49	06:39	05:42	05:17
	16:58	17:54	18:44	20:37	21:26	21:59
18	08:36	09:28 (7)	07:48	06:47	06:36	05:41
	17:00	09:31 (7)	17:56	18:46	20:39	21:28
19	08:35	09:26 (7)	07:46	06:45	06:34	05:39
	17:01	09:34 (7)	17:58	18:48	20:40	21:29
20	08:34	09:23 (7)	07:44	06:42	06:32	05:38
	17:03	09:35 (7)	17:59	18:49	20:42	21:31
21	08:33	09:23 (7)	07:42	06:40	06:30	05:37
	17:05	09:37 (7)	18:01	18:51	20:44	21:32
22	08:32	09:10 (8)	07:40	06:38	06:28	05:35
	17:06	09:39 (7)	18:03	18:53	20:46	21:34
23	08:31	09:07 (8)	07:38	06:35	06:26	05:34
	17:08	09:40 (7)	18:05	18:54	20:47	21:35
24	08:30	09:05 (8)	07:36	06:33	06:24	05:33
	17:10	09:40 (7)	18:07	18:56	20:49	21:36
25	08:28	09:05 (8)	07:34	06:31	06:22	05:32
	17:12	09:41 (7)	18:09	18:58	20:51	21:38
26	08:27	09:03 (8)	07:32	07:59 (9)	06:20	05:31
	17:13	09:41 (7)	18:10	08:07 (9)	20:52	21:39
27	08:26	09:03 (8)	07:29	07:56 (9)	06:26	06:18
	17:15	09:42 (7)	18:12	08:10 (9)	19:01	20:54
28	08:24	09:02 (8)	07:27	07:54 (9)	06:24	06:16
	17:17	09:42 (7)	18:14	08:12 (9)	19:03	20:56
29	08:23	09:02 (8)	07:21	07:21	06:14	05:27
	17:19	09:43 (7)	07:21	20:05	20:57	21:43
30	08:22	09:02 (8)	07:19	07:19	06:12	05:26
	17:21	09:43 (7)	07:19	20:06	20:59	21:44
31	08:20	09:01 (8)	07:17	07:17	05:25	05:25
	17:22	09:42 (7)	20:08	20:08	21:45	21:45
Potential sun hours	259	278	367	416	485	499
Total, worst case	400	375	273			
Sun reduction	0.16	0.21	0.24			
Oper. time red.	1.00	1.00	1.00			
Wind dir. red.	0.67	0.67	0.67			
Total reduction	0.10	0.14	0.16			
Total, real	42	52	45			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: BJ - H62

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22 22:00	05:58 21:28	06:48 20:26	07:37 19:17	08:33 (9) 17:11	08:35 (8) 16:31
2	05:22 22:00	06:00 21:27	06:50 20:24	07:39 19:15	08:31 (9) 17:09	08:23 16:30
3	05:23 22:00	06:01 21:25	06:51 20:22	07:40 19:12	08:29 (9) 17:07	08:24 16:29
4	05:24 21:59	06:03 21:23	06:53 20:20	07:42 19:10	08:28 (9) 17:06	08:26 16:29
5	05:25 21:59	06:04 21:22	06:54 20:17	07:44 19:08	08:27 (9) 17:04	08:27 16:28
6	05:25 21:58	06:06 21:20	06:56 20:15	07:45 19:06	08:25 (9) 17:02	08:28 16:28
7	05:26 21:58	06:08 21:18	06:58 20:13	07:47 19:03	08:25 (9) 17:00	08:30 16:27
8	05:27 21:57	06:09 21:16	06:59 20:11	07:49 19:01	08:25 (9) 16:59	08:31 16:27
9	05:28 21:56	06:11 21:14	07:01 20:08	07:50 18:59	08:25 (9) 16:57	08:32 16:27
10	05:29 21:56	06:12 21:13	07:02 20:06	07:52 18:57	08:24 (9) 16:55	08:33 16:27
11	05:30 21:55	06:14 21:11	07:04 20:04	07:54 18:54	08:25 (9) 16:54	08:34 16:26
12	05:31 21:54	06:15 21:09	07:06 20:01	07:55 18:52	08:26 (9) 16:52	08:35 16:26
13	05:32 21:53	06:17 21:07	07:07 19:59	07:57 18:50	08:27 (9) 16:51	08:36 16:26
14	05:34 21:52	06:19 21:05	07:09 19:57	07:59 18:48	08:28 (9) 16:49	08:37 16:26
15	05:35 21:51	06:20 21:03	07:11 19:54	08:01 18:46	08:29 (9) 16:48	08:38 16:26
16	05:36 21:50	06:22 21:01	07:12 19:52	08:02 18:43	08:31 (9) 16:46	08:39 16:27
17	05:37 21:49	06:24 20:59	07:14 19:50	08:04 18:41	08:33 (9) 16:45	08:40 16:27
18	05:38 21:48	06:25 20:57	07:15 19:47	08:06 18:39	08:35 (9) 16:44	08:41 16:27
19	05:40 21:47	06:27 20:55	07:17 19:45	08:07 18:37	08:37 (9) 16:42	08:42 16:27
20	05:41 21:46	06:28 20:53	07:19 19:43	08:09 18:35	08:39 (9) 16:41	08:42 16:28
21	05:42 21:44	06:30 20:50	07:20 19:40	08:11 18:33	08:41 (9) 16:40	08:42 16:28
22	05:44 21:43	06:32 20:48	07:22 19:38	08:13 18:31	08:43 (9) 16:39	08:43 16:28
23	05:45 21:42	06:33 20:46	07:24 19:36	08:15 18:29	08:45 (9) 16:38	08:43 16:29
24	05:46 21:41	06:35 20:44	07:25 19:33	08:16 18:27	08:47 (9) 16:37	08:44 16:30
25	05:48 21:39	06:37 20:42	07:27 19:31	08:18 17:25	08:49 (9) 16:36	08:44 16:30
26	05:49 21:38	06:38 20:40	07:29 19:29	08:20 17:22	08:51 (9) 16:35	08:45 16:31
27	05:51 21:36	06:40 20:38	07:30 19:26	08:22 17:21	08:53 (9) 16:34	08:45 16:32
28	05:52 21:35	06:41 20:35	07:32 19:24	08:23 17:19	08:55 (9) 16:33	08:45 16:32
29	05:54 21:33	06:43 20:33	07:34 19:22	08:25 17:17	08:57 (9) 16:32	08:45 16:33
30	05:55 21:32	06:45 20:31	07:35 19:19	08:37 (9) 17:15	08:59 (8) 16:31	08:45 16:34
31	05:57 21:30	06:46 20:29		07:29 17:13	08:37 (8) 16:30	08:45 16:35
Potential sun hours	502	454	381	331	266	244
Total, worst case			4	336	717	
Sun reduction			0.28	0.24	0.18	
Oper. time red.			1.00	1.00	1.00	
Wind dir. red.			0.67	0.67	0.67	
Total reduction			0.19	0.16	0.12	
Total, real			1	54	89	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: BK - H63

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45 16:37	08:18 17:24	07:25 18:16	07:15 20:10	06:10 21:01	05:25 21:46	05:22 22:00	05:58 21:28	06:48 20:26	07:37 19:17	07:31 17:11	08:21 16:31
2	08:45 16:38	08:17 17:26	07:23 18:18	07:12 20:11	06:08 21:02	05:24 21:47	05:23 22:00	06:00 21:27	06:50 20:24	07:39 19:15	07:32 17:09	08:23 16:30
3	08:45 16:39	08:15 17:28	07:21 18:20	07:10 20:13	06:06 21:04	05:23 21:48	05:23 22:00	06:01 21:25	06:51 20:22	07:40 19:12	07:34 17:07	08:24 16:30
4	08:45 16:40	08:14 17:30	07:19 18:21	07:08 20:15	06:04 21:06	05:22 21:50	05:24 21:59	06:03 21:23	06:53 20:20	07:42 19:10	07:36 17:06	08:26 16:29
5	08:45 16:41	08:12 17:32	07:16 18:23	07:05 20:17	06:02 21:07	05:22 21:51	05:25 21:59	06:04 21:22	06:54 20:17	07:44 19:08	07:38 17:04	08:27 16:28
6	08:44 16:42	08:10 17:34	07:14 18:25	07:03 20:18	06:01 21:09	05:21 21:51	05:26 21:58	06:06 21:20	06:56 20:15	07:45 19:06	07:40 17:02	08:28 16:28
7	08:44 16:44	08:09 17:35	07:12 18:27	07:01 20:20	05:59 21:11	05:21 21:52	05:27 21:58	06:08 21:18	06:58 20:13	07:47 19:03	07:41 17:00	08:29 16:28
8	08:43 16:45	08:07 17:37	07:10 18:28	06:59 20:22	05:57 21:12	05:20 21:53	05:27 21:57	06:09 21:16	06:59 20:11	07:49 19:01	07:43 16:59	08:31 16:27
9	08:43 16:46	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	05:20 21:54	05:28 21:56	06:11 21:14	07:01 20:08	07:50 18:59	07:45 16:57	08:32 16:27
10	08:42 16:48	08:03 17:41	07:05 18:32	06:54 20:25	05:54 21:15	05:19 21:55	05:29 21:55	06:12 21:12	07:03 20:06	07:52 18:57	07:47 16:55	08:33 16:27
11	08:42 16:49	08:01 17:43	07:03 18:34	06:52 20:27	05:52 21:17	05:19 21:56	05:30 21:55	06:14 21:11	07:04 20:04	07:54 18:54	07:48 16:54	08:34 16:27
12	08:41 16:51	08:00 17:45	07:01 18:35	06:50 20:29	05:50 21:19	05:18 21:56	05:32 21:54	06:16 21:09	07:06 20:01	07:55 18:52	07:50 16:52	08:35 16:27
13	08:40 16:52	07:58 17:47	06:58 18:37	06:47 20:30	05:49 21:20	05:18 21:57	05:33 21:53	06:17 21:07	07:07 19:59	07:57 18:50	07:52 16:51	08:36 16:26
14	08:40 16:54	07:56 17:48	06:56 18:39	06:45 20:32	05:47 21:22	05:18 21:58	05:34 21:52	06:19 21:05	07:09 19:57	07:59 18:48	07:54 16:49	08:37 16:26
15	08:39 16:55	07:54 17:50	06:54 18:41	06:43 20:34	05:45 21:23	05:18 21:58	05:35 21:51	06:20 21:03	07:11 19:54	08:01 18:46	07:55 16:48	08:38 16:27
16	08:38 16:57	07:52 17:52	06:51 18:42	06:41 20:35	05:44 21:25	05:18 21:59	05:36 21:50	06:22 21:01	07:12 19:52	08:02 18:43	07:57 16:47	08:39 16:27
17	08:37 16:58	07:50 17:54	06:49 18:44	06:39 20:37	05:42 21:26	05:17 21:59	05:37 21:49	06:24 20:59	07:14 19:50	08:04 18:41	07:59 16:45	08:40 16:27
18	08:36 17:00	07:48 17:56	06:47 18:46	06:37 20:39	05:41 21:28	05:17 22:00	05:39 21:48	06:25 20:57	07:16 19:47	08:06 18:39	08:01 16:44	08:40 16:27
19	08:35 17:02	07:46 17:58	06:45 18:48	06:34 20:40	05:40 21:29	05:18 22:00	05:40 21:47	06:27 20:55	07:17 19:45	08:07 18:37	08:02 16:43	08:41 16:27
20	08:34 17:03	07:44 18:00	06:42 18:49	06:32 20:42	05:38 21:31	05:18 22:00	05:41 21:46	06:28 20:53	07:19 19:43	08:09 18:35	08:04 16:41	08:42 16:28
21	08:33 17:05	07:42 18:01	06:40 18:51	06:30 20:44	05:37 21:32	05:18 22:00	05:42 21:44	06:30 20:50	07:20 19:40	08:11 18:33	08:06 16:40	08:42 16:28
22	08:32 17:07	07:40 18:03	06:38 18:53	06:28 20:45	05:36 21:34	05:18 22:01	05:44 21:43	06:32 20:48	07:22 19:38	08:13 18:31	08:07 16:39	08:43 16:29
23	08:31 17:08	07:38 18:05	06:35 18:54	06:26 20:47	05:34 21:35	05:18 22:01	05:45 21:42	06:33 20:46	07:24 19:36	08:14 18:29	08:09 16:38	08:43 16:29
24	08:30 17:10	07:36 18:07	06:33 18:56	06:24 20:49	05:33 21:36	05:18 22:01	05:47 21:40	06:35 20:44	07:25 19:33	08:16 18:27	08:11 16:37	08:44 16:30
25	08:28 17:12	07:34 18:09	06:31 18:58	06:22 20:51	05:32 21:38	05:19 22:01	05:48 21:39	06:37 20:42	07:27 19:31	08:18 17:25	08:12 16:36	08:44 16:30
26	08:27 17:14	07:32 18:10	06:28 19:00	06:20 20:52	05:31 21:39	05:19 22:01	05:49 21:38	06:38 20:40	07:29 19:29	08:20 17:23	08:14 16:35	08:44 16:31
27	08:26 17:15	07:29 18:12	06:26 19:01	06:18 20:54	05:30 21:40	05:20 22:01	05:51 21:36	06:40 20:38	07:30 19:26	08:22 17:21	08:15 16:34	08:45 16:32
28	08:24 17:17	07:27 18:14	06:24 19:03	06:16 20:56	05:29 21:42	05:20 22:01	05:52 21:35	06:41 20:35	07:32 19:24	08:23 17:19	08:17 16:33	08:45 16:33
29	08:23 17:19	07:21 18:05	06:14 19:05	06:14 20:57	05:28 21:43	05:21 22:01	05:54 21:33	06:43 20:33	07:34 19:22	08:25 17:17	08:18 16:32	08:45 16:33
30	08:21 17:21	07:19 18:06	06:12 19:06	06:12 20:59	05:27 21:44	05:21 22:00	05:55 21:32	06:45 20:31	07:35 19:19	08:27 17:15	08:20 16:32	08:45 16:34
31	08:20 17:23	07:17 18:08	06:11 19:08	06:11 20:58	05:26 21:45	05:26 22:00	05:57 21:30	06:46 20:29	07:36 17:13	08:29 17:13	08:29 16:35	08:45 16:35
Potential sun hours	259	278	367	416	485	499	502	454	381	331	266	244
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: BL - H64

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Table with 12 columns for months and multiple rows for each day, containing shadow times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Day in month Sun rise (hh:mm) Sun set (hh:mm) Minutes with flicker First time (hh:mm) with flicker Last time (hh:mm) with flicker (WTG causing flicker first time) (WTG causing flicker last time)



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: BM - H65

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June						
1	08:45	14:43 (14)	08:18	15:56 (13)	07:25	16:52 (12)	07:14	06:10	05:24			
	16:36	18	15:01 (14)	17:24	23	16:19 (13)	18:16	10	17:02 (12)	20:10	21:00	21:46
2	08:45	14:43 (14)	08:17	15:56 (13)	07:23		07:12		06:08	05:24		
	16:37	17	15:00 (14)	17:26	23	16:19 (13)	18:17		20:11	21:02	21:47	
3	08:45	14:44 (14)	08:15	15:56 (13)	07:21		07:10		06:06	05:23		
	16:38	17	15:01 (14)	17:28	22	16:18 (13)	18:19		20:13	21:04	21:48	
4	08:45	14:46 (14)	08:14	15:57 (13)	07:18		07:07		06:04	05:22		
	16:40	15	15:01 (14)	17:30	20	16:17 (13)	18:21		20:15	21:05	21:49	
5	08:44	14:46 (14)	08:12	15:59 (13)	07:16		07:05		06:02	05:21		
	16:41	14	15:00 (14)	17:31	18	16:17 (13)	18:23		20:16	21:07	21:50	
6	08:44	14:48 (14)	08:10	16:00 (13)	07:14		07:03		06:00	05:21		
	16:42	12	15:00 (14)	17:33	16	16:16 (13)	18:25		20:18	21:09	21:51	
7	08:44	14:50 (14)	08:08	16:02 (13)	07:12		07:01		05:58	05:20		
	16:43	9	14:59 (14)	17:35	12	16:14 (13)	18:26		20:20	21:10	21:52	
8	08:43	14:53 (14)	08:07	16:05 (13)	07:09		06:58		05:57	05:20		
	16:45	4	14:57 (14)	17:37	6	16:11 (13)	18:28		20:22	21:12	21:53	
9	08:43		08:05		07:07		06:56		05:55	05:19		
	16:46		17:39		18:30		20:23		21:14	21:54		
10	08:42		08:03		07:05		06:54		05:53	05:19		
	16:47		17:41		18:32		20:25		21:15	21:55		
11	08:42		08:01		07:03		06:52		05:52	05:18		
	16:49		17:43		18:33		20:27		21:17	21:56		
12	08:41		07:59		07:00		06:49		05:50	05:18		
	16:50		17:44		18:35		20:28		21:18	21:56		
13	08:40		07:58		06:58		06:47		05:48	05:18		
	16:52		17:46		18:37		20:30		21:20	21:57		
14	08:40		07:56		06:56		06:45		05:47	05:17		
	16:53		17:48		18:39		20:32		21:22	21:58		
15	08:39		07:54		06:54		06:43		05:45	05:17		
	16:55		17:50		18:40		20:33		21:23	21:58		
16	08:38		07:52	16:55 (12)	06:51		06:41		05:44	05:17		
	16:56		17:52	7	17:02 (12)	18:42	20:35		21:25	21:59		
17	08:37		07:50	16:52 (12)	06:49		06:38		05:42	05:17		
	16:58		17:54	12	17:04 (12)	18:44	20:37		21:26	21:59		
18	08:36	15:59 (13)	07:48	16:50 (12)	06:47		06:36		05:41	05:17		
	16:59	9	16:08 (13)	17:56	16	17:06 (12)	18:46		20:39	21:28	22:00	
19	08:35	15:57 (13)	07:46	16:49 (12)	06:44		06:34		05:39	05:17		
	17:01	13	16:10 (13)	17:57	18	17:07 (12)	18:47		20:40	21:29	22:00	
20	08:34	15:56 (13)	07:44	16:49 (12)	06:42		06:32		05:38	05:17		
	17:03	15	16:11 (13)	17:59	19	17:08 (12)	18:49		20:42	21:31	22:00	
21	08:33	15:56 (13)	07:42	16:48 (12)	06:40		06:30		05:36	05:17		
	17:04	17	16:13 (13)	18:01	21	17:09 (12)	18:51		20:44	21:32	22:00	
22	08:32	15:55 (13)	07:40	16:48 (12)	06:37		06:28		05:35	05:17		
	17:06	20	16:15 (13)	18:03	21	17:09 (12)	18:52		20:45	21:33	22:01	
23	08:31	15:54 (13)	07:38	16:48 (12)	06:35		06:26		05:34	05:18		
	17:08	21	16:15 (13)	18:05	21	17:09 (12)	18:54		20:47	21:35	22:01	
24	08:29	15:54 (13)	07:36	16:47 (12)	06:33		06:24		05:33	05:18		
	17:10	22	16:16 (13)	18:07	21	17:08 (12)	18:56		20:49	21:36	22:01	
25	08:28	15:55 (13)	07:33	16:47 (12)	06:30		06:22		05:31	05:18		
	17:11	22	16:17 (13)	18:08	21	17:08 (12)	18:58		20:50	21:38	22:01	
26	08:27	15:54 (13)	07:31	16:48 (12)	06:28		06:19		05:30	05:19		
	17:13	23	16:17 (13)	18:10	19	17:07 (12)	18:59		20:52	21:39	22:01	
27	08:26	15:54 (13)	07:29	16:49 (12)	06:26		06:17		05:29	05:19		
	17:15	24	16:18 (13)	18:12	17	17:06 (12)	19:01		20:54	21:40	22:01	
28	08:24	15:54 (13)	07:27	16:51 (12)	06:24		06:15		05:28	05:20		
	17:17	24	16:18 (13)	18:14	14	17:05 (12)	19:03		20:55	21:41	22:01	
29	08:23	15:54 (13)			07:21		06:13		05:27	05:20		
	17:19	24	16:18 (13)		20:04		20:57		21:43	22:01		
30	08:21	15:54 (13)			07:19		06:12		05:26	05:21		
	17:20	25	16:19 (13)		20:06		20:59		21:44	22:00		
31	08:20	15:54 (13)			07:17				05:25			
	17:22	25	16:19 (13)		20:08				21:45			
Potential sun hours	259		278		367		416		485		499	
Total, worst case	390		367		10							
Sun reduction	0.16		0.21		0.24							
Oper. time red.	1.00		1.00		1.00							
Wind dir. red.	0.59		0.62		0.63							
Total reduction	0.09		0.13		0.15							
Total, real	36		46		2							

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)



SHADOW - Calendar

Calculation: Specimen Turbine **Shadow receptor:** BM - H65

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:21	05:58	06:48	07:37	07:30	08:21
	22:00	21:28	20:26	19:17	17:11	16:30
2	05:22	05:59	06:49	07:38	07:32	08:23
	22:00	21:27	20:24	19:14	17:09	16:30
3	05:23	06:01	06:51	07:40	07:34	15:34 (13) 08:24
	21:59	21:25	20:22	19:12	17:07	8 15:42 (13) 16:29
4	05:24	06:03	06:53	07:42	07:36	15:31 (13) 08:26
	21:59	21:23	20:19	19:10	17:05	13 15:44 (13) 16:29
5	05:24	06:04	06:54	07:43	07:38	15:30 (13) 08:27
	21:59	21:21	20:17	19:08	17:04	16 15:46 (13) 16:28
6	05:25	06:06	06:56	07:45	07:39	15:28 (13) 08:28
	21:58	21:20	20:15	19:05	17:02	19 15:47 (13) 16:28
7	05:26	06:07	06:57	07:47	07:41	15:28 (13) 08:29
	21:57	21:18	20:13	19:03	17:00	20 15:48 (13) 16:27
8	05:27	06:09	06:59	07:48	07:43	15:27 (13) 08:31
	21:57	21:16	20:10	19:01	16:58	22 15:49 (13) 16:27
9	05:28	06:10	07:01	07:50	07:45	15:27 (13) 08:32
	21:56	21:14	20:08	18:59	16:57	23 15:50 (13) 16:27
10	05:29	06:12	07:02	07:52	07:47	15:26 (13) 08:33
	21:55	21:12	20:06	18:56	16:55	24 15:50 (13) 16:26
11	05:30	06:14	07:04	07:53	07:48	15:26 (13) 08:34
	21:55	21:10	20:03	18:54	16:54	25 15:51 (13) 16:26
12	05:31	06:15	07:06	07:55	07:50	15:25 (13) 08:35
	21:54	21:09	20:01	18:52	6 17:34 (12) 16:52	25 15:50 (13) 16:26
13	05:32	06:17	07:07	07:57	17:24 (12) 07:52	15:26 (13) 08:36
	21:53	21:07	19:59	18:50	12 17:36 (12) 16:51	24 15:50 (13) 16:26
14	05:33	06:18	07:09	07:59	17:22 (12) 07:54	15:26 (13) 08:37
	21:52	21:05	19:56	18:47	16 17:38 (12) 16:49	24 15:50 (13) 16:26
15	05:35	06:20	07:10	08:00	17:21 (12) 07:55	15:26 (13) 08:38
	21:51	21:03	19:54	18:45	18 17:39 (12) 16:48	24 15:50 (13) 16:26
16	05:36	06:22	07:12	08:02	17:20 (12) 07:57	15:27 (13) 08:39
	21:50	21:01	19:52	18:43	20 17:40 (12) 16:46	23 15:50 (13) 16:26
17	05:37	06:23	07:14	08:04	17:20 (12) 07:59	15:28 (13) 08:40
	21:49	20:59	19:49	18:41	20 17:40 (12) 16:45	22 15:50 (13) 16:26
18	05:38	06:25	07:15	08:06	17:19 (12) 08:01	15:28 (13) 08:40
	21:48	20:57	19:47	18:39	21 17:40 (12) 16:44	22 15:50 (13) 16:27
19	05:39	06:27	07:17	08:07	17:18 (12) 08:02	15:29 (13) 08:41
	21:47	20:54	19:45	18:37	21 17:39 (12) 16:42	21 15:50 (13) 16:27
20	05:41	06:28	07:19	08:09	17:18 (12) 08:04	15:30 (13) 08:42
	21:46	20:52	19:42	18:35	21 17:39 (12) 16:41	20 15:50 (13) 16:27
21	05:42	06:30	07:20	08:11	17:19 (12) 08:06	15:31 (13) 08:42
	21:44	20:50	19:40	18:32	20 17:39 (12) 16:40	17 15:48 (13) 16:28
22	05:43	06:31	07:22	08:13	17:19 (12) 08:07	15:32 (13) 08:43
	21:43	20:48	19:38	18:30	19 17:38 (12) 16:39	16 15:48 (13) 16:28
23	05:45	06:33	07:23	08:14	17:20 (12) 08:09	15:34 (13) 08:43
	21:42	20:46	19:35	18:28	17 17:37 (12) 16:38	13 15:47 (13) 16:29
24	05:46	06:35	07:25	08:16	17:21 (12) 08:11	15:36 (13) 08:44
	21:40	20:44	19:33	18:26	15 17:36 (12) 16:37	9 15:45 (13) 16:29
25	05:48	06:36	07:27	07:18	16:23 (12) 08:12	15:41 (13) 08:44
	21:39	20:42	19:31	17:24	11 16:34 (12) 16:35	1 15:42 (13) 16:30
26	05:49	06:38	07:28	07:20	16:26 (12) 08:14	08:44
	21:38	20:40	19:28	17:22	5 16:31 (12) 16:35	16:31
27	05:50	06:40	07:30	07:21	08:15	08:45
	21:36	20:37	19:26	17:20	16:34	16:31
28	05:52	06:41	07:32	07:23	08:17	08:45
	21:35	20:35	19:24	17:18	16:33	16:32
29	05:53	06:43	07:33	07:25	08:18	08:45
	21:33	20:33	19:21	17:16	16:32	16:33
30	05:55	06:44	07:35	07:27	08:20	08:45
	21:31	20:31	19:19	17:14	16:31	16:34
31	05:56	06:46		07:29		08:45
	21:30	20:28		17:13		16:35
Potential sun hours	502	454	381	331	266	244
Total, worst case				242	431	530
Sun reduction				0.24	0.18	0.13
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.63	0.59	0.60
Total reduction				0.15	0.11	0.08
Total, real				36	47	43

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: BN - H66

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 14 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times, minutes with flicker, and total sun hours.

Table layout: For each day in each month the following matrix apply

Matrix with 4 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: BO - H67

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 14 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times, potential sun hours, and reduction factors.

Table layout: For each day in each month the following matrix apply

Matrix defining variables: Day in month, Sun rise/set (hh:mm), Minutes with flicker, First/Last time (hh:mm) with flicker, and WTG causing flicker first/last time.

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: BP - H68

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June	
1	08:45	15:08 (13)	08:18	07:25	07:14	06:10	05:24
	16:36	24 15:32 (13)	17:24	18:16	20:10	21:00	21:46
2	08:45	15:07 (13)	08:17	07:23	07:12	06:08	05:24
	16:37	25 15:32 (13)	17:26	18:17	20:11	21:02	21:47
3	08:45	15:08 (13)	08:15	07:21	07:10	06:06	05:23
	16:38	25 15:33 (13)	17:28	18:19	20:13	21:04	21:48
4	08:45	15:09 (13)	08:14	07:18	07:07	06:04	05:22
	16:40	25 15:34 (13)	17:30	18:21	20:15	21:05	21:49
5	08:44	15:08 (13)	08:12	07:16	07:05	06:02	05:21
	16:41	26 15:34 (13)	17:31	18:23	20:16	21:07	21:50
6	08:44	15:09 (13)	08:10	07:14	07:03	06:00	05:21
	16:42	26 15:35 (13)	17:33	18:25	20:18	21:09	21:51
7	08:44	15:09 (13)	08:08	07:12	07:01	05:58	05:20
	16:43	26 15:35 (13)	17:35	18:26	20:20	21:10	21:52
8	08:43	15:10 (13)	08:07	07:09	06:58	05:57	05:20
	16:45	26 15:36 (13)	17:37	18:28	20:22	21:12	21:53
9	08:43	15:10 (13)	08:05	07:07	06:56	05:55	05:19
	16:46	26 15:36 (13)	17:39	18:30	20:23	21:14	21:54
10	08:42	15:10 (13)	08:03	07:05	06:54	05:53	05:19
	16:47	26 15:36 (13)	17:41	18:32	20:25	21:15	21:55
11	08:42	15:10 (13)	08:01	07:03	06:52	05:52	05:18
	16:49	27 15:37 (13)	17:43	18:33	20:27	21:17	21:56
12	08:41	15:11 (13)	08:00	07:00	06:49	05:50	05:18
	16:50	27 15:38 (13)	17:44	18:35	20:28	21:18	21:56
13	08:40	15:12 (13)	07:58	06:58	06:47	05:48	05:18
	16:52	26 15:38 (13)	17:46	18:37	20:30	21:20	21:57
14	08:40	15:12 (13)	07:56	06:56	06:45	05:47	05:17
	16:53	26 15:38 (13)	17:48	18:39	20:32	21:22	21:58
15	08:39	15:13 (13)	07:54	06:54	06:43	05:45	05:17
	16:55	25 15:38 (13)	17:50	18:40	20:33	21:23	21:58
16	08:38	15:13 (13)	07:52	06:51	06:41	05:44	05:17
	16:56	25 15:38 (13)	17:52	18:42	20:35	21:25	21:59
17	08:37	15:14 (13)	07:50	06:49	06:38	05:42	05:17
	16:58	24 15:38 (13)	17:54	18:44	20:37	21:26	21:59
18	08:36	15:15 (13)	07:48	06:47	06:36	05:41	05:17
	16:59	24 15:39 (13)	17:56	18:46	20:39	21:28	22:00
19	08:35	15:15 (13)	07:46	06:44	06:34	05:39	05:17
	17:01	23 15:38 (13)	17:57	18:47	20:40	21:29	22:00
20	08:34	15:16 (13)	07:44	06:42	06:32	05:38	05:17
	17:03	22 15:38 (13)	17:59	18:49	20:42	21:31	22:00
21	08:33	15:18 (13)	07:42	06:40	06:30	05:36	05:17
	17:04	19 15:37 (13)	18:01	18:51	20:44	21:32	22:00
22	08:32	15:19 (13)	07:40	06:37	06:28	05:35	05:17
	17:06	18 15:37 (13)	18:03	18:52	20:45	21:33	22:01
23	08:31	15:20 (13)	07:38	06:35	06:26	05:34	05:18
	17:08	15 15:35 (13)	18:05	18:54	20:47	21:35	22:01
24	08:29	15:22 (13)	07:36	06:33	06:24	05:33	05:18
	17:10	13 15:35 (13)	18:07	18:56	20:49	21:36	22:01
25	08:28	15:26 (13)	07:34	06:30	06:22	05:31	05:18
	17:11	7 15:33 (13)	18:08	18:58	20:50	21:38	22:01
26	08:27		07:31	06:28	06:19	05:30	05:19
	17:13		18:10	18:59	20:52	21:39	22:01
27	08:26		07:29	06:26	06:17	05:29	05:19
	17:15		18:12	19:01	20:54	21:40	22:01
28	08:24		07:27	06:24	06:15	05:28	05:20
	17:17		18:14	19:03	20:55	21:41	22:01
29	08:23			07:21	06:13	05:27	05:20
	17:19			20:04	20:57	21:43	22:01
30	08:21			07:19	06:12	05:26	05:21
	17:20			20:06	20:59	21:44	22:00
31	08:20			07:17		05:25	
	17:22			20:08		21:45	
Potential sun hours	259	278	367	416	485	499	
Total, worst case	576	311					
Sun reduction	0.16	0.21					
Oper. time red.	1.00	1.00					
Wind dir. red.	0.59	0.61					
Total reduction	0.09	0.13					
Total, real	53	39					

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: BP - H68

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:21	05:58	06:48	07:37	07:30	15:48 (12) 08:21 14:52 (13)
	22:00	21:28	20:26	19:17	17:11	23 16:11 (12) 16:30 27 15:19 (13)
2	05:22	05:59	06:49	07:38	07:32	15:49 (12) 08:23 14:53 (13)
	22:00	21:27	20:24	19:15	17:09	21 16:10 (12) 16:30 26 15:19 (13)
3	05:23	06:01	06:51	07:40	07:34	15:49 (12) 08:24 14:53 (13)
	21:59	21:25	20:22	19:12	17:07	20 16:09 (12) 16:29 26 15:19 (13)
4	05:24	06:03	06:53	07:42	07:36	15:50 (12) 08:26 14:54 (13)
	21:59	21:23	20:19	19:10	17:05	19 16:09 (12) 16:29 26 15:20 (13)
5	05:24	06:04	06:54	07:43	07:38	15:51 (12) 08:27 14:54 (13)
	21:59	21:21	20:17	19:08	17:04	17 16:08 (12) 16:28 26 15:20 (13)
6	05:25	06:06	06:56	07:45	07:39	15:53 (12) 08:28 14:55 (13)
	21:58	21:20	20:15	19:05	17:02	13 16:06 (12) 16:28 26 15:21 (13)
7	05:26	06:07	06:57	07:47	07:41	15:56 (12) 08:29 14:55 (13)
	21:57	21:18	20:13	19:03	17:00	8 16:04 (12) 16:27 26 15:21 (13)
8	05:27	06:09	06:59	07:48	07:43	15:57 (12) 08:31 14:56 (13)
	21:57	21:16	20:10	19:01	16:58	16:27 25 15:21 (13)
9	05:28	06:10	07:01	07:50	07:45	15:58 (12) 08:32 14:56 (13)
	21:56	21:14	20:08	18:59	16:57	16:27 25 15:21 (13)
10	05:29	06:12	07:02	07:52	07:47	15:59 (12) 08:33 14:57 (13)
	21:55	21:12	20:06	18:56	16:55	16:26 25 15:22 (13)
11	05:30	06:14	07:04	07:53	07:48	15:59 (12) 08:34 14:58 (13)
	21:55	21:10	20:03	18:54	16:54	16:26 24 15:22 (13)
12	05:31	06:15	07:06	07:55	07:50	15:59 (12) 08:35 14:58 (13)
	21:54	21:09	20:01	18:52	16:52	16:26 25 15:23 (13)
13	05:32	06:17	07:07	07:57	07:52	15:59 (12) 08:36 14:59 (13)
	21:53	21:07	19:59	18:50	16:51	16:26 24 15:23 (13)
14	05:33	06:18	07:09	07:59	07:54	15:59 (12) 08:37 15:00 (13)
	21:52	21:05	19:56	18:47	16:49	16:26 23 15:23 (13)
15	05:35	06:20	07:10	08:00	07:55	15:59 (12) 08:38 15:00 (13)
	21:51	21:03	19:54	18:45	16:48	16:26 24 15:24 (13)
16	05:36	06:22	07:12	08:02	07:57	15:59 (12) 08:39 15:01 (13)
	21:50	21:01	19:52	18:43	16:46	16:26 23 15:24 (13)
17	05:37	06:23	07:14	08:04	07:59	14:59 (13) 08:40 15:01 (13)
	21:49	20:59	19:49	18:41	16:45	7 15:06 (13) 16:26 23 15:24 (13)
18	05:38	06:25	07:15	08:06	08:01	14:56 (13) 08:40 15:02 (13)
	21:48	20:57	19:47	18:39	16:44	13 15:09 (13) 16:27 22 15:24 (13)
19	05:39	06:27	07:17	08:07	08:02	14:55 (13) 08:41 15:02 (13)
	21:47	20:54	19:45	18:37	16:42	15 15:10 (13) 16:27 23 15:25 (13)
20	05:41	06:28	07:19	08:09	08:04	14:54 (13) 08:42 15:02 (13)
	21:46	20:52	19:42	18:35	16:41	18 15:12 (13) 16:27 23 15:25 (13)
21	05:42	06:30	07:20	08:11	08:06	14:53 (13) 08:42 15:03 (13)
	21:44	20:50	19:40	18:32	16:40	19 15:12 (13) 16:28 23 15:26 (13)
22	05:43	06:31	07:22	08:13	08:07	14:52 (13) 08:43 15:03 (13)
	21:43	20:48	19:38	18:30	9 16:56 (12) 16:39 22 15:14 (13) 16:28 23 15:26 (13)	
23	05:45	06:33	07:23	08:14	08:09	16:53 (12) 08:09 14:52 (13) 08:43 15:04 (13)
	21:42	20:46	19:35	18:28	14 17:07 (12) 16:38 23 15:15 (13) 16:29 23 15:27 (13)	
24	05:46	06:35	07:25	08:16	08:11	16:52 (12) 08:11 14:52 (13) 08:44 15:04 (13)
	21:40	20:44	19:33	18:26	17 17:09 (12) 16:37 24 15:16 (13) 16:29 23 15:27 (13)	
25	05:48	06:36	07:27	07:18	08:12	15:51 (12) 08:12 14:52 (13) 08:44 15:04 (13)
	21:39	20:42	19:31	17:24	19 16:10 (12) 16:35 25 15:17 (13) 16:30 23 15:27 (13)	
26	05:49	06:38	07:28	07:20	08:14	15:50 (12) 08:14 14:51 (13) 08:44 15:06 (13)
	21:38	20:40	19:28	17:22	21 16:11 (12) 16:35 25 15:16 (13) 16:31 23 15:29 (13)	
27	05:50	06:40	07:30	07:21	08:15	15:48 (12) 08:15 14:52 (13) 08:45 15:06 (13)
	21:36	20:37	19:26	17:20	22 16:10 (12) 16:34 25 15:17 (13) 16:31 23 15:29 (13)	
28	05:52	06:41	07:32	07:23	08:17	15:48 (12) 08:17 14:52 (13) 08:45 15:06 (13)
	21:35	20:35	19:24	17:18	23 16:11 (12) 16:33 26 15:18 (13) 16:32 24 15:30 (13)	
29	05:53	06:43	07:33	07:25	08:18	15:48 (12) 08:18 14:52 (13) 08:45 15:06 (13)
	21:33	20:33	19:21	17:16	23 16:11 (12) 16:32 26 15:18 (13) 16:33 24 15:30 (13)	
30	05:55	06:44	07:35	07:27	08:20	15:48 (12) 08:20 14:53 (13) 08:45 15:07 (13)
	21:32	20:31	19:19	17:14	23 16:11 (12) 16:31 26 15:19 (13) 16:34 24 15:31 (13)	
31	05:56	06:46	07:36	07:29	08:21	15:48 (12) 08:21 14:53 (13) 08:45 15:07 (13)
	21:30	20:28	19:17	17:13	23 16:11 (12) 16:32 26 15:19 (13) 16:35 24 15:31 (13)	
Potential sun hours	502	454	381	331	266	244
Total, worst case				194	415	749
Sun reduction				0.24	0.18	0.13
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.61	0.60	0.59
Total reduction				0.15	0.11	0.08
Total, real				28	46	60

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: BQ - H69

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times, operational time, and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix table with 4 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: BR - H70

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times, minutes with flicker, and total reduction.

Table layout: For each day in each month the following matrix apply

Matrix with 2 rows and 4 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: BS - H71
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times, shadow reduction percentages, and operational time.

Table layout: For each day in each month the following matrix apply

Matrix with 2 columns: Day in month and shadow reduction metrics (Sun rise/set, minutes with flicker, first/last time with flicker).



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine **Shadow receptor:** BV - H74

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June		
1	08:45	15:11 (13)	08:18	16:28 (12)	07:25	07:14	06:10	05:24
	16:36	25 15:36 (13)	17:24	4 16:32 (12)	18:16	20:10	21:00	21:46
2	08:45	15:11 (13)	08:17	16:24 (12)	07:23	07:12	06:08	05:24
	16:37	25 15:36 (13)	17:26	11 16:35 (12)	18:17	20:11	21:02	21:47
3	08:45	15:12 (13)	08:15	16:22 (12)	07:21	07:10	06:06	05:23
	16:38	24 15:36 (13)	17:28	15 16:37 (12)	18:19	20:13	21:04	21:48
4	08:45	15:12 (13)	08:14	16:21 (12)	07:18	07:07	06:04	05:22
	16:40	25 15:37 (13)	17:30	17 16:38 (12)	18:21	20:15	21:05	21:49
5	08:44	15:12 (13)	08:12	16:21 (12)	07:16	07:05	06:02	05:21
	16:41	25 15:37 (13)	17:31	19 16:40 (12)	18:23	20:16	21:07	21:50
6	08:44	15:13 (13)	08:10	16:20 (12)	07:14	07:03	06:00	05:21
	16:42	25 15:38 (13)	17:33	20 16:40 (12)	18:25	20:18	21:09	21:51
7	08:44	15:13 (13)	08:08	16:20 (12)	07:12	07:01	05:58	05:20
	16:43	25 15:38 (13)	17:35	21 16:41 (12)	18:26	20:20	21:10	21:52
8	08:43	15:14 (13)	08:07	16:19 (12)	07:09	06:58	05:57	05:20
	16:45	25 15:39 (13)	17:37	22 16:41 (12)	18:28	20:22	21:12	21:53
9	08:43	15:14 (13)	08:05	16:19 (12)	07:07	06:56	05:55	05:19
	16:46	25 15:39 (13)	17:39	22 16:41 (12)	18:30	20:23	21:14	21:54
10	08:42	15:14 (13)	08:03	16:19 (12)	07:05	06:54	05:53	05:19
	16:47	25 15:39 (13)	17:41	22 16:41 (12)	18:32	20:25	21:15	21:55
11	08:42	15:15 (13)	08:01	16:19 (12)	07:03	06:52	05:52	05:18
	16:49	24 15:39 (13)	17:43	22 16:41 (12)	18:33	20:27	21:17	21:56
12	08:41	15:16 (13)	08:00	16:19 (12)	07:00	06:49	05:50	05:18
	16:50	24 15:40 (13)	17:44	22 16:41 (12)	18:35	20:28	21:18	21:56
13	08:40	15:16 (13)	07:58	16:20 (12)	06:58	06:47	05:48	05:18
	16:52	24 15:40 (13)	17:46	20 16:40 (12)	18:37	20:30	21:20	21:57
14	08:40	15:17 (13)	07:56	16:21 (12)	06:56	06:45	05:47	05:17
	16:53	23 15:40 (13)	17:48	19 16:40 (12)	18:39	20:32	21:22	21:58
15	08:39	15:18 (13)	07:54	16:22 (12)	06:54	06:43	05:45	05:17
	16:55	22 15:40 (13)	17:50	16 16:38 (12)	18:40	20:33	21:23	21:58
16	08:38	15:19 (13)	07:52	16:24 (12)	06:51	06:41	05:44	05:17
	16:56	21 15:40 (13)	17:52	13 16:37 (12)	18:42	20:35	21:25	21:59
17	08:37	15:20 (13)	07:50	16:26 (12)	06:49	06:38	05:42	05:17
	16:58	20 15:40 (13)	17:54	9 16:35 (12)	18:44	20:37	21:26	21:59
18	08:36	15:21 (13)	07:48		06:47	06:36	05:41	05:17
	16:59	19 15:40 (13)	17:56		18:46	20:39	21:28	22:00
19	08:35	15:21 (13)	07:46		06:44	06:34	05:39	05:17
	17:01	18 15:39 (13)	17:57		18:47	20:40	21:29	22:00
20	08:34	15:23 (13)	07:44		06:42	06:32	05:38	05:17
	17:03	15 15:38 (13)	17:59		18:49	20:42	21:31	22:00
21	08:33	15:25 (13)	07:42		06:40	06:30	05:36	05:17
	17:04	12 15:37 (13)	18:01		18:51	20:44	21:32	22:00
22	08:32	15:27 (13)	07:40		06:37	06:28	05:35	05:17
	17:06	9 15:36 (13)	18:03		18:52	20:45	21:33	22:01
23	08:31		07:38		06:35	06:26	05:34	05:18
	17:08		18:05		18:54	20:47	21:35	22:01
24	08:29		07:36		06:33	06:24	05:33	05:18
	17:10		18:07		18:56	20:49	21:36	22:01
25	08:28		07:33		06:30	06:22	05:31	05:18
	17:11		18:08		18:58	20:50	21:38	22:01
26	08:27		07:31		06:28	06:19	05:30	05:19
	17:13		18:10		18:59	20:52	21:39	22:01
27	08:26		07:29		06:26	06:17	05:29	05:19
	17:15		18:12		19:01	20:54	21:40	22:01
28	08:24		07:27		06:24	06:15	05:28	05:20
	17:17		18:14		19:03	20:55	21:41	22:01
29	08:23				07:21	06:13	05:27	05:20
	17:19				20:04	20:57	21:43	22:01
30	08:21				07:19	06:12	05:26	05:21
	17:20				20:06	20:59	21:44	22:00
31	08:20				07:17		05:25	
	17:22				20:08		21:45	
Potential sun hours	259	278		367	416	485	499	
Total, worst case	480	294						
Sun reduction	0.16	0.21						
Oper. time red.	1.00	1.00						
Wind dir. red.	0.59	0.61						
Total reduction	0.09	0.13						
Total, real	44	37						

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: BV - H74

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:21	05:58	06:48	07:37	07:30	15:49 (12) 08:21 14:57 (13)
	22:00	21:28	20:26	19:17	17:11 22 16:11 (12) 16:30 24 15:21 (13)	
2	05:22	05:59	06:49	07:38	07:32	15:49 (12) 08:23 14:57 (13)
	22:00	21:27	20:24	19:14	17:09 22 16:11 (12) 16:30 25 15:22 (13)	
3	05:23	06:01	06:51	07:40	07:34	15:49 (12) 08:24 14:57 (13)
	21:59	21:25	20:22	19:12	17:07 22 16:11 (12) 16:29 25 15:22 (13)	
4	05:24	06:03	06:53	07:42	07:36	15:49 (12) 08:26 14:58 (13)
	21:59	21:23	20:19	19:10	17:05 22 16:11 (12) 16:29 25 15:23 (13)	
5	05:24	06:04	06:54	07:43	07:38	15:50 (12) 08:27 14:58 (13)
	21:59	21:21	20:17	19:08	17:04 20 16:10 (12) 16:28 25 15:23 (13)	
6	05:25	06:06	06:56	07:45	07:39	15:51 (12) 08:28 14:59 (13)
	21:58	21:20	20:15	19:05	17:02 18 16:09 (12) 16:28 25 15:24 (13)	
7	05:26	06:07	06:57	07:47	07:41	15:52 (12) 08:29 14:59 (13)
	21:57	21:18	20:13	19:03	17:00 17 16:09 (12) 16:27 25 15:24 (13)	
8	05:27	06:09	06:59	07:48	07:43	15:53 (12) 08:31 14:59 (13)
	21:57	21:16	20:10	19:01	16:58 14 16:07 (12) 16:27 25 15:24 (13)	
9	05:28	06:10	07:01	07:50	07:45	15:55 (12) 08:32 15:00 (13)
	21:56	21:14	20:08	18:59	16:57 11 16:06 (12) 16:27 24 15:24 (13)	
10	05:29	06:12	07:02	07:52	07:47	15:59 (12) 08:33 15:01 (13)
	21:55	21:12	20:06	18:56	16:55 3 16:02 (12) 16:26 25 15:26 (13)	
11	05:30	06:14	07:04	07:53	07:48	08:34 15:01 (13)
	21:55	21:10	20:03	18:54	16:54 16:26 25 15:26 (13)	
12	05:31	06:15	07:06	07:55	07:50	08:35 15:02 (13)
	21:54	21:09	20:01	18:52	16:52 16:26 24 15:26 (13)	
13	05:32	06:17	07:07	07:57	07:52	08:36 15:02 (13)
	21:53	21:07	19:59	18:50	16:51 16:26 25 15:27 (13)	
14	05:33	06:18	07:09	07:59	07:54	08:37 15:03 (13)
	21:52	21:05	19:56	18:47	16:49 16:26 24 15:27 (13)	
15	05:35	06:20	07:10	08:00	07:55	08:38 15:03 (13)
	21:51	21:03	19:54	18:45	16:48 16:26 24 15:27 (13)	
16	05:36	06:22	07:12	08:02	07:57	08:39 15:04 (13)
	21:50	21:01	19:52	18:43	16:46 16:26 24 15:28 (13)	
17	05:37	06:23	07:14	08:04	07:59	08:40 15:04 (13)
	21:49	20:59	19:49	18:41	16:45 16:26 24 15:28 (13)	
18	05:38	06:25	07:15	08:06	08:01	08:40 15:05 (13)
	21:48	20:57	19:47	18:39	16:44 16:27 23 15:28 (13)	
19	05:39	06:27	07:17	08:07	08:02	08:41 15:05 (13)
	21:47	20:54	19:45	18:37	16:42 16:27 24 15:29 (13)	
20	05:41	06:28	07:19	08:09	08:04	15:03 (13) 08:42 15:05 (13)
	21:46	20:52	19:42	18:35	16:41 8 15:11 (13) 16:27 24 15:29 (13)	
21	05:42	06:30	07:20	08:11	08:06	15:00 (13) 08:42 15:06 (13)
	21:44	20:50	19:40	18:32	16:40 12 15:12 (13) 16:28 24 15:30 (13)	
22	05:43	06:31	07:22	08:13	08:07	14:59 (13) 08:43 15:06 (13)
	21:43	20:48	19:38	18:30	16:39 15 15:14 (13) 16:28 24 15:30 (13)	
23	05:45	06:33	07:23	08:14	08:09	14:58 (13) 08:43 15:07 (13)
	21:42	20:46	19:35	18:28	16:38 18 15:16 (13) 16:29 24 15:31 (13)	
24	05:46	06:35	07:25	08:16	08:11	14:58 (13) 08:44 15:07 (13)
	21:40	20:44	19:33	18:26	16:37 19 15:17 (13) 16:29 24 15:31 (13)	
25	05:48	06:36	07:27	07:18	15:56 (12) 08:12	14:58 (13) 08:44 15:08 (13)
	21:39	20:42	19:31	17:24	10 16:06 (12) 16:35 20 15:18 (13) 16:30 23 15:31 (13)	
26	05:49	06:38	07:28	07:20	15:54 (12) 08:14	14:57 (13) 08:44 15:09 (13)
	21:38	20:40	19:28	17:22	14 16:08 (12) 16:35 21 15:18 (13) 16:31 23 15:32 (13)	
27	05:50	06:40	07:30	07:21	15:51 (12) 08:15	14:57 (13) 08:45 15:09 (13)
	21:36	20:37	19:26	17:20	17 16:08 (12) 16:34 22 15:19 (13) 16:31 24 15:33 (13)	
28	05:52	06:41	07:32	07:23	15:50 (12) 08:17	14:57 (13) 08:45 15:09 (13)
	21:35	20:35	19:24	17:18	19 16:09 (12) 16:33 23 15:20 (13) 16:32 24 15:33 (13)	
29	05:53	06:43	07:33	07:25	15:49 (12) 08:18	14:57 (13) 08:45 15:10 (13)
	21:33	20:33	19:21	17:16	21 16:10 (12) 16:32 23 15:20 (13) 16:33 24 15:34 (13)	
30	05:55	06:44	07:35	07:27	15:49 (12) 08:20	14:57 (13) 08:45 15:10 (13)
	21:32	20:31	19:19	17:14	21 16:10 (12) 16:31 24 15:21 (13) 16:34 24 15:34 (13)	
31	05:56	06:46		07:29	15:49 (12)	08:45 15:11 (13)
	21:30	20:28		17:13	22 16:11 (12)	16:35 24 15:35 (13)
Potential sun hours	502	454	381	331	266	244
Total, worst case				124	376	751
Sun reduction				0.24	0.18	0.13
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.61	0.60	0.59
Total reduction				0.14	0.11	0.08
Total, real				18	42	60

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Specimen Turbine **Shadow receptor:** BW - H75

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:25	07:14	06:10	05:24	05:21	05:58	06:48	07:37	07:30	08:21
	16:36	17:24	18:16	20:10	21:01	21:46	22:00	21:28	20:26	19:17	17:11	16:30
2	08:45	08:17	07:23	07:12	06:08	05:24	05:22	06:00	06:49	07:38	07:32	08:23
	16:37	17:26	18:17	20:11	21:02	21:47	22:00	21:27	20:24	19:15	17:09	16:30
3	08:45	08:15	07:21	07:10	06:06	05:23	05:23	06:01	06:51	07:40	07:34	08:24
	16:38	17:28	18:19	20:13	21:04	21:49	22:00	21:25	20:22	19:12	17:07	16:29
4	08:45	08:14	07:18	07:07	06:04	05:22	05:24	06:03	06:53	07:42	07:36	08:26
	16:40	17:30	18:21	20:15	21:06	21:50	21:59	21:23	20:20	19:10	17:05	16:29
5	08:45	08:12	07:16	07:05	06:02	05:21	05:24	06:04	06:54	07:43	07:38	08:27
	16:41	17:31	18:23	20:16	21:07	21:51	21:59	21:22	20:17	19:08	17:04	16:28
6	08:44	08:10	07:14	07:03	06:00	05:21	05:25	06:06	06:56	07:45	07:39	08:28
	16:42	17:33	18:25	20:18	21:09	21:52	21:58	21:20	20:15	19:05	17:02	16:28
7	08:44	08:09	07:12	07:01	05:58	05:20	05:26	06:07	06:57	07:47	07:41	08:29
	16:43	17:35	18:26	20:20	21:10	21:52	21:58	21:18	20:13	19:03	17:00	16:27
8	08:43	08:07	07:10	06:58	05:57	05:20	05:27	06:09	06:59	07:48	07:43	08:31
	16:45	17:37	18:28	20:22	21:12	21:53	21:57	21:16	20:10	19:01	16:58	16:27
9	08:43	08:05	07:07	06:56	05:55	05:19	05:28	06:10	07:01	07:50	07:45	08:32
	16:46	17:39	18:30	20:23	21:14	21:54	21:56	21:14	20:08	18:59	16:57	16:27
10	08:42	08:03	07:05	06:54	05:53	05:19	05:29	06:12	07:02	07:52	07:47	08:33
	16:47	17:41	18:32	20:25	21:15	21:55	21:55	21:12	20:06	18:56	16:55	16:26
11	08:42	08:01	07:03	06:52	05:52	05:18	05:30	06:14	07:04	07:54	07:48	08:34
	16:49	17:43	18:33	20:27	21:17	21:56	21:55	21:11	20:03	18:54	16:54	16:26
12	08:41	08:00	07:00	06:49	05:50	05:18	05:31	06:15	07:06	07:55	07:50	08:35
	16:50	17:44	18:35	20:28	21:19	21:56	21:54	21:09	20:01	18:52	16:52	16:26
13	08:40	07:58	06:58	06:47	05:48	05:18	05:32	06:17	07:07	07:57	07:52	08:36
	16:52	17:46	18:37	20:30	21:20	21:57	21:53	21:07	19:59	18:50	16:51	16:26
14	08:40	07:56	06:56	06:45	05:47	05:17	05:33	06:18	07:09	07:59	07:54	08:37
	16:53	17:48	18:39	20:32	21:22	21:58	21:52	21:05	19:56	18:48	16:49	16:26
15	08:39	07:54	06:54	06:43	05:45	05:17	05:35	06:20	07:10	08:00	07:55	08:38
	16:55	17:50	18:40	20:34	21:23	21:58	21:51	21:03	19:54	18:45	16:48	16:26
16	08:38	07:52	06:51	06:41	05:44	05:17	05:36	06:22	07:12	08:02	07:57	08:39
	16:56	17:52	18:42	20:35	21:25	21:59	21:50	21:01	19:52	18:43	16:46	16:26
17	08:37	07:50	06:49	06:38	05:42	05:17	05:37	06:23	07:14	08:04	07:59	08:40
	16:58	17:54	18:44	20:37	21:26	21:59	21:49	20:59	19:49	18:41	16:45	16:26
18	08:36	07:48	06:47	06:36	05:41	05:17	05:38	06:25	07:15	08:06	08:01	08:40
	17:00	17:56	18:46	20:39	21:28	22:00	21:48	20:57	19:47	18:39	16:44	16:27
19	08:35	07:46	06:44	06:34	05:39	05:17	05:40	06:27	07:17	08:07	08:02	08:41
	17:01	17:57	18:47	20:40	21:29	22:00	21:47	20:55	19:45	18:37	16:42	16:27
20	08:34	07:44	06:42	06:32	05:38	05:17	05:41	06:28	07:19	08:09	08:04	08:42
	17:03	17:59	18:49	20:42	21:31	22:00	21:46	20:52	19:42	18:35	16:41	16:27
21	08:33	07:42	06:40	06:30	05:36	05:17	05:42	06:30	07:20	08:11	08:06	08:42
	17:05	18:01	18:51	20:44	21:32	22:01	21:44	20:50	19:40	18:33	16:40	16:28
22	08:32	07:40	06:37	06:28	05:35	05:18	05:43	06:31	07:22	08:13	08:07	08:43
	17:06	18:03	18:53	20:45	21:34	22:01	21:43	20:48	19:38	18:30	16:39	16:28
23	08:31	07:38	06:35	06:26	05:34	05:18	05:45	06:33	07:23	08:14	08:09	08:43
	17:08	18:05	18:54	20:47	21:35	22:01	21:42	20:46	19:35	18:28	16:38	16:29
24	08:30	07:36	06:33	06:24	05:33	05:18	05:46	06:35	07:25	08:16	08:11	08:44
	17:10	18:07	18:56	20:49	21:36	22:01	21:40	20:44	19:33	18:26	16:37	16:29
25	08:28	07:34	06:31	06:22	05:32	05:18	05:48	06:36	07:27	08:18	08:12	08:44
	17:11	18:08	18:58	20:50	21:38	22:01	21:39	20:42	19:31	17:24	16:36	16:30
26	08:27	07:31	06:28	06:20	05:30	05:19	05:49	06:38	07:28	08:19	08:14	08:44
	17:13	18:10	18:59	20:52	21:39	22:01	21:38	20:40	19:28	17:22	16:35	16:31
27	08:26	07:29	06:26	06:17	05:29	05:19	05:51	06:40	07:30	08:21	08:15	08:45
	17:15	18:12	19:01	20:54	21:40	22:01	21:36	20:37	19:26	17:20	16:34	16:31
28	08:24	07:27	06:24	06:15	05:28	05:20	05:52	06:41	07:32	08:23	08:17	08:45
	17:17	18:14	19:03	20:56	21:42	22:01	21:35	20:35	19:24	17:18	16:33	16:32
29	08:23	07:21	06:14	06:04	05:27	05:20	05:53	06:43	07:33	08:25	08:18	08:45
	17:19	07:20	06:05	05:57	21:43	22:01	21:33	20:33	19:21	17:16	16:32	16:33
30	08:21	07:19	06:12	06:02	05:26	05:21	05:55	06:44	07:35	08:27	08:20	08:45
	17:20	07:20	06:06	05:59	21:44	22:01	21:32	20:31	19:19	17:15	16:31	16:34
31	08:20	07:17	06:09	06:00	05:25	05:20	05:56	06:46	07:37	08:29	08:22	08:45
	17:22	07:18	06:08	06:00	21:45	22:02	21:30	20:29	19:17	17:13	16:31	16:35
Potential sun hours	259	278	367	416	485	499	502	454	381	331	266	244
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: BX - H76

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N to Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January to December) and rows for 31 days. Includes 'Potential sun hours' and 'Total, real' at the bottom.

Table layout: For each day in each month the following matrix apply

Matrix with 4 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: BY - H77
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Table with columns for months (January to December) and rows for each day (1-31) showing sunrise and sunset times, and a summary row for 'Potential sun hours' and 'Total, real'.

Table layout: For each day in each month the following matrix apply

Day in month Sun rise (hh:mm) Sun set (hh:mm) Minutes with flicker First time (hh:mm) with flicker Last time (hh:mm) with flicker (WTG causing flicker first time) (WTG causing flicker last time)



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: BZ - H78

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan to Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January to December) and rows for time intervals (08:45 to 17:22) and summary statistics (Potential sun hours, Total, worst case, etc.).

Table layout: For each day in each month the following matrix apply

Table with 2 columns: Day in month and a matrix of values for Sun rise/set, Sun set, and minutes with flicker.



Project:

6225Gortyrhilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: CA - H79

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June	July	August	September	October	November	December	
1	08:45 16:36	08:18 17:24	07:25 18:16	17:17 (14) 20:10	06:10 21:00	05:24 21:46	05:21 22:00	05:58 21:28	06:48 20:26	07:37 19:17	07:30 17:11	08:21 16:30	
2	08:45 16:37	08:17 17:26	07:23 18:17	17:17 (14) 20:11	06:08 21:02	05:24 21:47	05:22 22:00	05:59 21:27	06:49 20:24	07:38 19:14	07:32 17:09	08:23 16:30	
3	08:45 16:38	08:15 17:28	07:20 18:19	17:18 (14) 20:13	06:06 21:04	05:23 21:48	05:23 21:59	06:01 21:25	06:51 20:22	07:40 19:12	07:34 17:07	08:24 16:29	
4	08:45 16:40	08:13 17:30	07:18 18:21	17:18 (14) 20:15	06:04 21:05	05:22 21:49	05:24 21:59	06:03 21:23	06:52 20:19	07:42 19:10	07:36 17:05	08:25 16:29	
5	08:44 16:41	08:12 17:31	07:16 18:23	17:18 (14) 20:16	06:02 21:07	05:21 21:50	05:24 21:58	06:04 21:21	06:54 20:17	07:43 19:08	07:37 17:03	08:27 16:28	
6	08:44 16:42	08:10 17:33	07:14 18:25	17:20 (14) 20:18	06:00 21:09	05:21 21:51	05:25 21:58	06:06 21:20	06:56 20:15	07:45 19:05	18:00 (14) 18:07 (14)	07:39 17:02	08:28 16:28
7	08:44 16:43	08:08 17:35	07:12 18:26	17:22 (14) 20:20	05:58 21:10	05:20 21:52	05:26 21:57	06:07 21:18	06:57 20:13	07:47 19:03	17:57 (14) 18:10 (14)	07:41 17:00	08:29 16:27
8	08:43 16:45	08:07 17:37	07:09 18:28	17:33 (14) 20:23	06:58 21:12	05:57 21:53	05:27 21:57	06:09 21:16	06:59 20:10	07:48 19:01	17:55 (14) 18:12 (14)	07:43 16:58	08:31 16:27
9	08:43 16:46	08:05 17:39	07:07 18:30	20:23 21:14	06:56 21:55	05:59 21:54	05:28 21:56	06:10 21:14	07:01 20:08	07:50 18:59	17:53 (14) 18:12 (14)	07:45 16:57	08:32 16:27
10	08:42 16:47	08:03 17:41	07:05 18:32	06:54 20:25	06:53 21:15	05:19 21:55	05:29 21:55	06:12 21:12	07:02 20:06	07:52 18:56	17:52 (14) 18:13 (14)	07:46 16:55	08:33 16:26
11	08:42 16:49	08:01 17:43	07:03 18:33	06:52 20:27	06:52 21:17	05:18 21:56	05:30 21:55	06:14 21:10	07:04 20:03	07:53 18:53	17:51 (14) 18:13 (14)	07:48 16:54	08:34 16:26
12	08:41 16:50	07:59 17:44	07:00 18:35	06:49 20:28	06:50 21:18	05:18 21:56	05:31 21:54	06:15 21:08	07:05 20:01	07:55 18:52	17:51 (14) 18:12 (14)	07:50 16:52	08:35 16:26
13	08:40 16:52	07:58 17:46	06:58 18:37	06:47 20:30	06:48 21:20	05:18 21:57	05:32 21:53	06:17 21:06	07:07 19:59	07:57 18:50	17:50 (14) 18:13 (14)	07:52 16:50	08:36 16:26
14	08:40 16:53	07:56 17:48	06:56 18:39	06:45 20:32	06:45 21:22	05:17 21:57	05:33 21:52	06:18 21:05	07:09 19:56	07:59 18:47	17:50 (14) 18:12 (14)	07:54 16:49	08:37 16:26
15	08:39 16:55	07:54 17:50	06:53 18:40	06:43 20:33	06:43 21:23	05:17 21:58	05:35 21:51	06:20 21:03	07:10 19:54	08:00 18:45	17:50 (14) 18:12 (14)	07:55 16:48	08:38 16:26
16	08:38 16:56	07:52 17:52	06:51 18:42	06:41 20:35	06:44 21:25	05:17 21:59	05:36 21:50	06:22 21:01	07:12 19:52	08:02 18:43	17:51 (14) 18:12 (14)	07:57 16:46	08:39 16:26
17	08:37 16:58	07:50 17:54	06:49 18:44	06:38 20:37	06:41 21:26	05:17 21:59	05:37 21:49	06:23 20:58	07:14 19:49	08:04 18:41	17:51 (14) 18:11 (14)	07:59 16:45	08:39 16:26
18	08:36 16:59	07:48 17:56	06:47 18:46	06:36 20:38	06:41 21:28	05:17 21:59	05:38 21:48	06:25 20:56	07:15 19:47	08:05 18:39	17:51 (14) 18:09 (14)	08:00 16:44	08:40 16:27
19	08:35 17:01	07:46 17:57	06:44 18:47	06:34 20:40	06:39 21:29	05:17 22:00	05:39 21:47	06:26 20:54	07:17 19:45	08:07 18:37	17:53 (14) 18:07 (14)	08:02 16:42	08:41 16:27
20	08:34 17:03	07:44 17:59	06:42 18:49	06:32 20:42	06:32 21:31	05:17 22:00	05:41 21:45	06:28 20:52	07:18 19:42	08:09 18:35	17:55 (14) 18:05 (14)	08:04 16:41	08:42 16:27
21	08:33 17:04	07:42 18:01	06:40 18:51	06:30 20:44	06:36 21:32	05:17 22:00	05:42 21:44	06:30 20:50	07:20 19:40	08:11 18:32	18:05 (14) 18:12 (14)	08:06 16:40	08:42 16:28
22	08:32 17:06	07:40 18:03	06:37 18:52	06:28 20:45	06:35 21:33	05:17 22:01	05:43 21:43	06:31 20:48	07:22 19:38	08:12 18:30	17:51 (14) 18:13 (14)	08:07 16:39	08:43 16:28
23	08:31 17:08	07:38 18:05	06:35 18:54	06:26 20:47	06:34 21:35	05:18 22:01	05:45 21:42	06:33 20:46	07:23 19:35	08:14 18:28	18:05 (14) 18:12 (14)	08:09 16:38	08:43 16:29
24	08:29 17:10	07:36 18:07	06:33 18:56	06:24 20:49	06:33 21:36	05:18 22:01	05:46 21:40	06:35 20:44	07:25 19:33	08:16 18:26	18:13 (14) 18:12 (14)	08:10 16:36	08:44 16:29
25	08:28 17:11	07:33 18:08	06:30 18:58	06:21 20:50	06:31 21:38	05:18 22:01	05:48 21:39	06:36 20:42	07:27 19:31	08:12 17:24	18:12 (14) 18:12 (14)	08:12 16:35	08:44 16:30
26	08:27 17:13	07:31 18:10	06:28 18:59	06:19 20:52	06:30 21:39	05:19 22:01	05:49 21:37	06:38 20:39	07:28 19:28	08:06 17:22	18:12 (14) 18:12 (14)	08:14 16:35	08:44 16:31
27	08:25 17:15	07:29 18:12	06:26 19:01	06:17 20:54	06:29 21:40	05:19 22:01	05:50 21:36	06:39 20:37	07:30 19:26	08:06 17:20	18:12 (14) 18:12 (14)	08:15 16:34	08:45 16:31
28	08:24 17:17	07:27 18:14	06:23 19:03	06:15 20:55	06:28 21:41	05:20 22:01	05:52 21:35	06:41 20:35	07:32 19:24	08:17 17:18	18:12 (14) 18:12 (14)	08:17 16:33	08:45 16:32
29	08:23 17:19	07:23 18:14	06:21 19:03	06:13 20:57	06:27 21:43	05:20 22:01	05:53 21:33	06:43 20:33	07:33 19:21	08:18 17:16	18:12 (14) 18:12 (14)	08:18 16:32	08:45 16:33
30	08:21 17:20	07:19 18:14	06:19 19:06	06:11 20:59	06:26 21:44	05:21 22:00	05:55 21:31	06:44 20:31	07:35 19:19	08:20 17:14	18:12 (14) 18:12 (14)	08:20 16:31	08:45 16:34
31	08:20 17:22	07:17 18:14	06:17 19:08	06:11 20:08	06:25 21:45	05:22 21:30	05:56 20:28	06:46 20:28	07:35 17:13	08:21 17:13	18:12 (14) 18:12 (14)	08:21 16:35	08:45 16:35
Potential sun hours	259	278	367	416	485	499	502	454	381	331	266	244	
Total, worst case		134		130						273			
Sun reduction		0.21		0.24						0.24			
Oper. time red.		1.00		1.00						1.00			
Wind dir. red.		0.64		0.64						0.64			
Total reduction		0.13		0.16						0.15			
Total, real		18		20						42			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: CB - H80

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for sun rise/set times, potential sun hours, and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix with 4 columns: Day in month, Sun rise/set, Minutes with flicker, Last time with flicker. Includes notes about WTG causing flicker.



SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: CF - H84
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Table with 13 columns (January-December) and 33 rows of data. Each cell contains a day number and a time range (e.g., 08:45-16:36). Summary rows at the bottom include 'Potential sun hours' and 'Total, worst case'.

Table layout: For each day in each month the following matrix apply

Matrix with 4 columns: Day in month, Sun rise/set times, Minutes with flicker, and First/Last time with flicker (WTG causing flicker).



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

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Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine **Shadow receptor:** CG - H85

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 16:37	08:18 17:24	07:25 18:16	07:15 20:10	06:10 21:01	05:25 21:46
2	08:45 16:38	08:17 17:26	07:23 18:18	07:12 20:11	06:08 21:02	05:24 21:47
3	08:45 16:39	08:15 17:28	07:21 18:19	07:10 20:13	06:06 21:04	05:23 21:48
4	08:45 16:40	08:14 17:30	07:18 18:21	07:08 20:15	06:04 21:06	05:22 21:49
5	08:44 16:41	08:12 17:32	07:16 18:23	07:05 20:17	06:02 21:07	05:22 21:50
6	08:44 16:42	08:10 17:34	07:14 18:25	07:03 20:18	06:01 21:09	05:21 21:51
7	08:44 16:44	08:09 17:35	07:12 18:27	07:01 20:20	05:59 21:10	05:20 21:52
8	08:43 16:45	08:07 17:37	07:10 18:28	06:59 20:22	05:57 21:12	05:20 21:53
9	08:43 16:46	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	05:19 21:54
10	08:42 16:48	08:03 17:41	07:05 18:32	06:54 20:25	05:54 21:15	05:19 21:55
11	08:42 16:49	08:01 17:43	07:03 18:34	06:52 20:27	05:52 21:17	05:19 21:56
12	08:41 16:50	08:00 17:45	07:01 18:35	06:50 20:28	05:50 21:18	05:18 21:56
13	08:40 16:52	07:58 17:47	06:58 18:37	06:47 20:30	05:49 21:20	05:18 21:57
14	08:40 16:53	07:56 17:48	06:56 18:39	06:45 20:32	05:47 21:22	05:18 21:58
15	08:39 16:55	07:54 17:50	06:54 18:41	06:43 20:34	05:45 21:23	05:18 21:58
16	08:38 16:57	07:52 17:52	06:51 18:42	06:41 20:35	05:44 21:25	05:18 21:59
17	08:37 16:58	07:50 17:54	06:49 18:44	06:39 20:37	05:42 21:26	05:17 21:59
18	08:36 17:00	07:48 17:56	06:47 18:46	06:36 20:39	05:41 21:28	05:17 21:59
19	08:35 17:01	07:46 17:58	06:45 18:48	06:34 20:40	05:40 21:29	05:17 22:00
20	08:34 17:03	07:44 18:00	06:42 18:49	06:32 20:42	05:38 21:31	05:18 22:00
21	08:33 17:05	07:42 18:01	06:40 18:51	06:30 20:44	05:37 21:32	05:18 22:00
22	08:32 17:07	07:40 18:03	06:38 18:53	06:28 20:45	05:36 21:33	05:18 22:01
23	08:31 17:08	07:38 18:05	06:35 18:54	06:26 20:47	05:34 21:35	05:18 22:01
24	08:30 17:10	07:36 18:07	06:33 18:56	06:24 20:49	05:33 21:36	05:18 22:01
25	08:28 17:12	07:34 18:09	06:31 18:58	06:22 20:50	05:32 21:38	05:19 22:01
26	08:27 17:13	07:31 18:10	06:28 19:00	06:20 20:52	05:31 21:39	05:19 22:01
27	08:26 17:15	07:29 18:12	06:26 19:01	06:18 20:54	05:30 21:40	05:20 22:01
28	08:24 17:17	07:27 18:14	06:24 19:03	06:16 20:56	05:29 21:41	05:20 22:01
29	08:23 17:19		07:21 20:05	06:14 20:57	05:28 21:43	05:21 22:01
30	08:21 17:21		07:19 20:06	06:12 20:59	05:27 21:44	05:21 22:00
31	08:20 17:23		07:17 20:08		05:26 21:45	
Potential sun hours	259	278	367	416	485	499
Total, worst case				223	456	152
Sun reduction				0.35	0.37	0.30
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.66	0.64	0.63
Total reduction				0.23	0.24	0.19
Total, real				52	108	29

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Specimen Turbine **Shadow receptor:** CG - H85

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22	05:58	06:38 (16)	06:48	07:15 (17)	07:37
	22:00	21:28	24 07:02 (16)	20:26	9 07:24 (17)	19:17
2	05:23	06:00	06:38 (16)	06:50		07:38
	22:00	21:27	24 07:02 (16)	20:24		19:15
3	05:23	06:01	06:38 (16)	06:51		07:40
	21:59	21:25	24 07:02 (16)	20:22		19:12
4	05:24	06:03	06:38 (16)	06:53		07:42
	21:59	21:23	23 07:01 (16)	20:20		19:10
5	05:25	06:04	06:39 (16)	06:54		07:43
	21:59	21:22	22 07:01 (16)	20:17		19:08
6	05:26	06:06	06:39 (16)	06:56		07:45
	21:58	21:20	21 07:00 (16)	20:15		19:06
7	05:27	06:08	06:41 (16)	06:58		07:47
	21:57	21:18	18 06:59 (16)	20:13		19:03
8	05:27	06:09	06:41 (16)	06:59		07:49
	21:57	21:16	16 06:57 (16)	20:10		19:01
9	05:28	06:11	06:43 (16)	07:01		07:50
	21:56	21:14	13 06:56 (16)	20:08		18:59
10	05:29	06:12	06:45 (16)	07:02		07:52
	21:55	21:12	8 06:53 (16)	20:06		18:57
11	05:30	06:14		07:04		07:54
	21:55	21:11		20:04		18:54
12	05:32	06:16		07:06		07:55
	21:54	21:09		20:01		18:52
13	05:33	06:17		07:07		07:57
	21:53	21:07		19:59		18:50
14	05:34	06:19		07:09		07:59
	21:52	21:05		19:57		18:48
15	05:35	06:20		07:11		08:00
	21:51	21:03		19:54		18:46
16	05:36	06:22		07:12		08:02
	21:50	21:01		19:52		18:43
17	05:37	06:24		07:14		08:04
	21:49	20:59		19:50		18:41
18	05:39	06:25		07:15		08:06
	21:48	8 06:53 (16)		19:47		18:39
19	05:40	06:27		07:17		08:07
	21:47	12 06:56 (16)	7 07:19 (17)	07:17		18:37
20	05:41	06:28		07:19		08:09
	21:46	14 06:57 (16)	12 07:28 (17)	19:43		18:35
21	05:42	06:30		07:20		08:11
	21:44	16 06:58 (16)	15 07:30 (17)	19:40		18:33
22	05:44	06:32		07:22		08:13
	21:43	17 06:58 (16)	17 07:30 (17)	19:38		18:31
23	05:45	06:33		07:24		08:14
	21:42	19 07:00 (16)	18 07:31 (17)	19:36		18:29
24	05:47	06:35		07:25		08:16
	21:40	20 07:00 (16)	20 07:32 (17)	19:33		18:27
25	05:48	06:37		07:27		07:18
	21:39	21 07:00 (16)	20 07:31 (17)	19:31		17:25
26	05:49	06:38		07:29		07:20
	21:38	23 07:02 (16)	20 07:31 (17)	19:29		17:23
27	05:51	06:40		07:30		07:22
	21:36	23 07:02 (16)	19 07:30 (17)	19:26		17:21
28	05:52	06:41		07:32		07:23
	21:35	24 07:02 (16)	19 07:30 (17)	19:24		17:19
29	05:54	06:43		07:33		07:25
	21:33	24 07:02 (16)	18 07:29 (17)	19:22		17:17
30	05:55	06:45		07:35		07:27
	21:32	24 07:02 (16)	16 07:28 (17)	19:19		17:15
31	05:57	06:46		07:37		07:29
	21:30	25 07:03 (16)	14 07:26 (17)			17:13
Potential sun hours	502	454	381	331	266	244
Total, worst case	270	408		9		
Sun reduction	0.27	0.30		0.28		
Oper. time red.	1.00	1.00		1.00		
Wind dir. red.	0.64	0.65		0.66		
Total reduction	0.17	0.19		0.19		
Total, real	46	79		2		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: CH - H86

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main data table with 13 columns (January-December) and 31 rows of daily data. Includes columns for sun rise, sun set, and potential sun hours.

Table layout: For each day in each month the following matrix apply

Matrix with 4 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: CI - H87

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main data table with columns for months (January-December) and rows for days (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
 Finisklin Business Park
 IE-F91 RHH9 Sligo
 +353719161416
 Karen O'Neill / koneill@jodireland.com
 Calculated:
 06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine **Shadow receptor:** CJ - H88

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45 16:36	08:18 17:24	07:25 18:16	07:14 20:10	06:10 21:01	05:24 21:46	05:21 22:00	05:58 21:28	06:48 20:26	07:37 19:17	07:30 17:11	08:21 16:30
2	08:45 16:37	08:17 17:26	07:23 18:18	07:12 20:11	06:08 21:02	05:24 21:47	05:22 22:00	06:00 21:27	06:49 20:24	07:38 19:15	07:32 17:09	08:23 16:30
3	08:45 16:38	08:15 17:28	07:21 18:19	07:10 20:13	06:06 21:04	05:23 21:49	05:23 22:00	06:01 21:25	06:51 20:22	07:40 19:12	07:34 17:07	08:24 16:29
4	08:45 16:40	08:14 17:30	07:18 18:21	07:08 20:15	06:04 21:06	05:22 21:50	05:24 21:59	06:03 21:23	06:53 20:20	07:42 19:10	07:36 17:05	08:26 16:29
5	08:45 16:41	08:12 17:31	07:16 18:23	07:05 20:17	06:02 21:07	05:21 21:51	05:24 21:59	06:04 21:22	06:54 20:17	07:43 19:08	07:38 17:04	08:27 16:28
6	08:44 16:42	08:10 17:33	07:14 18:25	07:03 20:18	06:00 21:09	05:21 21:52	05:25 21:58	06:06 21:20	06:56 20:15	07:45 19:05	07:39 17:02	08:28 16:28
7	08:44 16:43	08:09 17:35	07:12 18:26	07:01 20:20	05:58 21:11	05:20 21:52	05:26 21:58	06:07 21:18	06:57 20:13	07:47 19:03	07:41 17:00	08:30 16:27
8	08:43 16:45	08:07 17:37	07:10 18:28	06:58 20:22	05:57 21:12	05:20 21:53	05:27 21:57	06:09 21:16	06:59 20:10	07:48 19:01	07:43 16:58	08:31 16:27
9	08:43 16:46	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	05:19 21:54	05:28 21:56	06:11 21:14	07:01 20:08	07:50 18:59	07:45 16:57	08:32 16:27
10	08:42 16:47	08:03 17:41	07:05 18:32	06:54 20:25	05:53 21:15	05:19 21:55	05:29 21:56	06:12 21:12	07:02 20:06	07:52 18:56	07:47 16:55	08:33 16:26
11	08:42 16:49	08:01 17:43	07:03 18:33	06:52 20:27	05:52 21:17	05:18 21:56	05:30 21:55	06:14 21:11	07:04 20:03	07:54 18:54	07:48 16:54	08:34 16:26
12	08:41 16:50	08:00 17:45	07:00 18:35	06:49 20:28	05:50 21:19	05:18 21:56	05:31 21:54	06:15 21:09	07:06 20:01	07:55 18:52	07:50 16:52	08:35 16:26
13	08:40 16:52	07:58 17:46	06:58 18:37	06:47 20:30	05:48 21:20	05:18 21:57	05:32 21:53	06:17 21:07	07:07 19:59	07:57 18:50	07:52 16:51	08:36 16:26
14	08:40 16:53	07:56 17:48	06:56 18:39	06:45 20:32	05:47 21:22	05:17 21:58	05:33 21:52	06:19 21:05	07:09 19:56	07:59 18:48	07:54 16:49	08:37 16:26
15	08:39 16:55	07:54 17:50	06:54 18:40	06:43 20:34	05:45 21:23	05:17 21:58	05:35 21:51	06:20 21:03	07:10 19:54	08:00 18:45	07:55 16:48	08:38 16:26
16	08:38 16:56	07:52 17:52	06:51 18:42	06:41 20:35	05:44 21:25	05:17 21:59	05:36 21:50	06:22 21:01	07:12 19:52	08:02 18:43	07:57 16:46	08:39 16:26
17	08:37 16:58	07:50 17:54	06:49 18:44	06:38 20:37	05:42 21:26	05:17 21:59	05:37 21:49	06:23 20:59	07:14 19:49	08:04 18:41	07:59 16:45	08:40 16:27
18	08:36 17:00	07:48 17:56	06:47 18:46	06:36 20:39	05:41 21:28	05:17 22:00	05:38 21:48	06:25 20:57	07:15 19:47	08:06 18:39	08:01 16:44	08:40 16:27
19	08:35 17:01	07:46 17:57	06:44 18:47	06:34 20:40	05:39 21:29	05:17 22:00	05:40 21:47	06:27 20:55	07:17 19:45	08:07 18:37	08:02 16:42	08:41 16:27
20	08:34 17:03	07:44 17:59	06:42 18:49	06:32 20:42	05:38 21:31	05:17 22:00	05:41 21:46	06:28 20:52	07:19 19:42	08:09 18:35	08:04 16:41	08:42 16:27
21	08:33 17:05	07:42 18:01	06:40 18:51	06:30 20:44	05:37 21:32	05:17 22:01	05:42 21:44	06:30 20:50	07:20 19:40	08:11 18:33	08:06 16:40	08:42 16:28
22	08:32 17:06	07:40 18:03	06:38 18:53	06:28 20:45	05:35 21:34	05:18 22:01	05:44 21:43	06:31 20:48	07:22 19:38	08:13 18:30	08:07 16:39	08:43 16:28
23	08:31 17:08	07:38 18:05	06:35 18:54	06:26 20:47	05:34 21:35	05:18 22:01	05:45 21:42	06:33 20:46	07:24 19:35	08:14 18:28	08:09 16:38	08:43 16:29
24	08:30 17:10	07:36 18:07	06:33 18:56	06:24 20:49	05:33 21:36	05:18 22:01	05:46 21:40	06:35 20:44	07:25 19:33	08:16 18:26	08:11 16:37	08:44 16:29
25	08:28 17:11	07:34 18:08	06:31 18:58	06:22 20:51	05:32 21:38	05:18 22:01	05:48 21:39	06:36 20:42	07:27 19:31	07:18 17:24	08:12 16:36	08:44 16:30
26	08:27 17:13	07:31 18:10	06:28 18:59	06:20 20:52	05:30 21:39	05:19 22:01	05:49 21:38	06:38 20:40	07:28 19:28	07:20 17:22	08:14 16:35	08:45 16:31
27	08:26 17:15	07:29 18:12	06:26 19:01	06:18 20:54	05:29 21:40	05:19 22:01	05:51 21:36	06:40 20:37	07:30 19:26	07:22 17:20	08:15 16:34	08:45 16:31
28	08:24 17:17	07:27 18:14	06:24 19:03	06:16 20:56	05:28 21:42	05:20 22:01	05:52 21:35	06:41 20:35	07:32 19:24	07:23 17:18	08:17 16:33	08:45 16:32
29	08:23 17:19	07:23 19:05	06:21 20:05	06:14 20:57	05:27 21:43	05:20 22:01	05:53 21:33	06:43 20:33	07:33 19:22	07:25 17:16	08:19 16:32	08:45 16:33
30	08:21 17:20	07:19 20:06	06:19 20:59	06:12 20:59	05:26 21:44	05:21 22:01	05:55 21:32	06:44 20:31	07:35 19:19	07:27 17:15	08:20 16:31	08:45 16:34
31	08:20 17:22	07:17 20:08	06:17 20:58	06:11 21:45	05:25 21:45	05:21 22:01	05:56 21:30	06:46 20:29	07:35 17:13	07:29 17:13	08:21 16:34	08:45 16:35
Potential sun hours	259	278	367	416	485	499	502	454	381	331	266	244
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)



SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: CK - H89

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45	15:30 (14)	08:18	16:33 (13)	07:25	07:14
	16:36	20 15:50 (14)	17:24	13 16:46 (13)	18:16	20:10
2	08:45	15:30 (14)	08:17	16:32 (13)	07:23	07:12
	16:37	21 15:51 (14)	17:26	15 16:47 (13)	18:17	20:11
3	08:45	15:31 (14)	08:15	16:31 (13)	07:21	07:10
	16:38	21 15:52 (14)	17:28	17 16:48 (13)	18:19	20:13
4	08:45	15:31 (14)	08:14	16:30 (13)	07:18	07:07
	16:39	22 15:53 (14)	17:30	18 16:48 (13)	18:21	20:15
5	08:44	15:31 (14)	08:12	16:30 (13)	07:16	07:05
	16:41	22 15:53 (14)	17:31	20 16:50 (13)	18:23	20:16
6	08:44	15:32 (14)	08:10	16:30 (13)	07:14	07:03
	16:42	22 15:54 (14)	17:33	20 16:50 (13)	18:25	20:18
7	08:44	15:32 (14)	08:08	16:30 (13)	07:12	07:01
	16:43	22 15:54 (14)	17:35	20 16:50 (13)	18:26	20:20
8	08:43	15:33 (14)	08:07	16:30 (13)	07:09	06:58
	16:45	22 15:55 (14)	17:37	20 16:50 (13)	18:28	20:21
9	08:43	15:33 (14)	08:05	16:30 (13)	07:07	06:56
	16:46	22 15:55 (14)	17:39	19 16:49 (13)	18:30	20:23
10	08:42	15:33 (14)	08:03	16:31 (13)	07:05	06:54
	16:47	23 15:56 (14)	17:41	18 16:49 (13)	18:32	20:25
11	08:42	15:33 (14)	08:01	16:31 (13)	07:03	06:52
	16:49	23 15:56 (14)	17:43	17 16:48 (13)	18:33	20:27
12	08:41	15:34 (14)	07:59	16:32 (13)	07:00	06:49
	16:50	23 15:57 (14)	17:44	15 16:47 (13)	18:35	20:28
13	08:40	15:35 (14)	07:58	16:34 (13)	06:58	06:47
	16:52	22 15:57 (14)	17:46	12 16:46 (13)	18:37	20:30
14	08:40	15:35 (14)	07:56	16:37 (13)	06:56	06:45
	16:53	22 15:57 (14)	17:48	6 16:43 (13)	18:39	20:32
15	08:39	15:36 (14)	07:54		06:54	06:43
	16:55	21 15:57 (14)	17:50		18:40	20:33
16	08:38	15:36 (14)	07:52		06:51	06:41
	16:56	21 15:57 (14)	17:52		18:42	20:35
17	08:37	15:37 (14)	07:50		06:49	06:38
	16:58	20 15:57 (14)	17:54		18:44	20:37
18	08:36	15:38 (14)	07:48		06:47	06:36
	16:59	19 15:57 (14)	17:56		18:46	20:38
19	08:35	15:38 (14)	07:46		06:44	06:34
	17:01	18 15:56 (14)	17:57		18:47	20:40
20	08:34	15:40 (14)	07:44		06:42	06:32
	17:03	16 15:56 (14)	17:59		18:49	20:42
21	08:33	15:41 (14)	07:42		06:40	06:30
	17:04	14 15:55 (14)	18:01		18:51	20:44
22	08:32	15:43 (14)	07:40		06:37	06:28
	17:06	12 15:55 (14)	18:03		18:52	20:45
23	08:31	15:45 (14)	07:38		06:35	06:26
	17:08	7 15:52 (14)	18:05		18:54	20:47
24	08:29		07:36		06:33	06:24
	17:10		18:07		18:56	20:49
25	08:28		07:33		06:30	06:21
	17:11		18:08		18:58	20:50
26	08:27		07:31		06:28	06:19
	17:13		18:10		18:59	20:52
27	08:26		07:29		06:26	06:17
	17:15		18:12		19:01	20:54
28	08:24		07:27		06:24	06:15
	17:17		18:14		19:03	20:55
29	08:23				07:21	06:13
	17:19				20:04	20:57
30	08:21				07:19	06:11
	17:20				20:06	20:59
31	08:20	16:34 (13)			07:17	05:25
	17:22	9 16:43 (13)			20:08	21:45
Potential sun hours	259		278		367	416
Total, worst case	464		230			485
Sun reduction	0.16		0.21			499
Oper. time red.	1.00		1.00			
Wind dir. red.	0.59		0.62			
Total reduction	0.09		0.13			
Total, real	42		29			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: CK - H89

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:21	05:58	06:48	07:37	07:30	16:00 (13) 08:21 15:15 (14)
	22:00	21:28	20:26	19:17	17:11	19 16:19 (13) 16:30 23 15:38 (14)
2	05:22	05:59	06:49	07:38	07:32	16:00 (13) 08:23 15:16 (14)
	22:00	21:27	20:24	19:14	17:09	19 16:19 (13) 16:30 23 15:39 (14)
3	05:23	06:01	06:51	07:40	07:34	16:00 (13) 08:24 15:16 (14)
	21:59	21:25	20:22	19:12	17:07	19 16:19 (13) 16:29 22 15:38 (14)
4	05:24	06:03	06:53	07:42	07:36	16:00 (13) 08:25 15:17 (14)
	21:59	21:23	20:19	19:10	17:05	20 16:20 (13) 16:29 22 15:39 (14)
5	05:24	06:04	06:54	07:43	07:38	16:00 (13) 08:27 15:17 (14)
	21:59	21:21	20:17	19:08	17:03	20 16:20 (13) 16:28 22 15:39 (14)
6	05:25	06:06	06:56	07:45	07:39	16:00 (13) 08:28 15:18 (14)
	21:58	21:20	20:15	19:05	17:02	19 16:19 (13) 16:28 22 15:40 (14)
7	05:26	06:07	06:57	07:47	07:41	16:01 (13) 08:29 15:18 (14)
	21:57	21:18	20:13	19:03	17:00	18 16:19 (13) 16:27 22 15:40 (14)
8	05:27	06:09	06:59	07:48	07:43	16:02 (13) 08:31 15:18 (14)
	21:57	21:16	20:10	19:01	16:58	16 16:18 (13) 16:27 22 15:40 (14)
9	05:28	06:10	07:01	07:50	07:45	16:03 (13) 08:32 15:19 (14)
	21:56	21:14	20:08	18:59	16:57	15 16:18 (13) 16:27 21 15:40 (14)
10	05:29	06:12	07:02	07:52	07:46	16:04 (13) 08:33 15:20 (14)
	21:55	21:12	20:06	18:56	16:55	13 16:17 (13) 16:26 21 15:41 (14)
11	05:30	06:14	07:04	07:53	07:48	16:06 (13) 08:34 15:21 (14)
	21:55	21:10	20:03	18:54	16:54	9 16:15 (13) 16:26 21 15:42 (14)
12	05:31	06:15	07:05	07:55	07:50	16:05 (13) 08:35 15:21 (14)
	21:54	21:08	20:01	18:52	16:52	16:26 21 15:42 (14)
13	05:32	06:17	07:07	07:57	07:52	16:06 (13) 08:36 15:22 (14)
	21:53	21:07	19:59	18:50	16:50	16:26 20 15:42 (14)
14	05:33	06:18	07:09	07:59	07:54	16:07 (13) 08:37 15:22 (14)
	21:52	21:05	19:56	18:47	16:49	16:26 20 15:42 (14)
15	05:35	06:20	07:10	08:00	07:55	16:08 (13) 08:38 15:23 (14)
	21:51	21:03	19:54	18:45	16:48	16:26 20 15:43 (14)
16	05:36	06:22	07:12	08:02	07:57	16:09 (13) 08:39 15:23 (14)
	21:50	21:01	19:52	18:43	16:46	16:26 19 15:42 (14)
17	05:37	06:23	07:14	08:04	07:59	16:10 (13) 08:40 15:24 (14)
	21:49	20:59	19:49	18:41	16:45	16:26 19 15:43 (14)
18	05:38	06:25	07:15	08:06	08:01	16:11 (13) 08:40 15:24 (14)
	21:48	20:56	19:47	18:39	16:44	16:27 19 15:43 (14)
19	05:39	06:26	07:17	08:07	08:02	15:20 (14) 08:41 15:25 (14)
	21:47	20:54	19:45	18:37	16:42	7 15:27 (14) 16:27 19 15:44 (14)
20	05:41	06:28	07:18	08:09	08:04	15:19 (14) 08:42 15:25 (14)
	21:45	20:52	19:42	18:35	16:41	11 15:30 (14) 16:27 19 15:44 (14)
21	05:42	06:30	07:20	08:11	08:06	15:16 (14) 08:42 15:26 (14)
	21:44	20:50	19:40	18:32	16:40	14 15:30 (14) 16:28 19 15:45 (14)
22	05:43	06:31	07:22	08:13	08:07	15:16 (14) 08:43 15:26 (14)
	21:43	20:48	19:38	18:30	16:39	16 15:32 (14) 16:28 19 15:45 (14)
23	05:45	06:33	07:23	08:14	08:09	15:15 (14) 08:43 15:27 (14)
	21:42	20:46	19:35	18:28	16:38	18 15:33 (14) 16:29 19 15:46 (14)
24	05:46	06:35	07:25	08:16	08:11	15:15 (14) 08:44 15:27 (14)
	21:40	20:44	19:33	18:26	16:36	19 15:34 (14) 16:29 19 15:46 (14)
25	05:48	06:36	07:27	07:18	08:12	15:15 (14) 08:44 15:27 (14)
	21:39	20:42	19:31	17:24	16:35	20 15:35 (14) 16:30 19 15:46 (14)
26	05:49	06:38	07:28	07:20	08:14	15:14 (14) 08:44 15:28 (14)
	21:38	20:40	19:28	17:22	16:34	21 15:35 (14) 16:31 20 15:48 (14)
27	05:50	06:39	07:30	07:21	08:15	15:15 (14) 08:45 15:29 (14)
	21:36	20:37	19:26	17:20	16:34	21 15:36 (14) 16:31 19 15:48 (14)
28	05:52	06:41	07:32	07:23	16:05 (13) 08:17 15:15 (14) 08:45 15:29 (14)	
	21:35	20:35	19:24	17:18	9 16:14 (13) 16:33 22 15:37 (14) 16:32 20 15:49 (14)	
29	05:53	06:43	07:33	07:25	16:03 (13) 08:18 15:15 (14) 08:45 15:29 (14)	
	21:33	20:33	19:21	17:16	13 16:16 (13) 16:32 22 15:37 (14) 16:33 20 15:49 (14)	
30	05:55	06:44	07:35	07:27	16:02 (13) 08:20 15:15 (14) 08:45 15:30 (14)	
	21:31	20:31	19:19	17:14	15 16:17 (13) 16:31 23 15:38 (14) 16:34 20 15:50 (14)	
31	05:56	06:46	07:36	07:29	16:01 (13) 08:21 15:15 (14) 08:45 15:30 (14)	
	21:30	20:28	19:17	17:13	17 16:18 (13) 16:32 24 16:35 20 15:50 (14)	
Potential sun hours	502	454	381	331	266	244
Total, worst case				54	401	631
Sun reduction				0.24	0.18	0.13
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.62	0.60	0.59
Total reduction				0.15	0.11	0.08
Total, real				8	44	50

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: CL - H90
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for days (1-31) and summary rows (Potential sun hours, Total, worst case, etc.)

Table layout: For each day in each month the following matrix apply

Summary table with 4 columns: Day in month, Sun rise/set, Minutes with flicker, First/Last time with flicker (WTG causing flicker)

SHADOW - Calendar

Calculation: Specimen Turbine **Shadow receptor:** CM - H91

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45 16:37	08:18 17:24	07:25 18:16	07:15 20:10	06:10 21:01	05:25 21:46	05:22 22:00	05:58 21:28	06:48 20:26	07:37 19:17	07:31 17:11	08:21 16:31
2	08:45 16:38	08:17 17:26	07:23 18:18	07:12 20:11	06:08 21:02	05:24 21:47	05:23 22:00	06:00 21:27	06:50 20:24	07:38 19:15	07:32 17:09	08:23 16:30
3	08:45 16:39	08:15 17:28	07:21 18:19	07:10 20:13	06:06 21:04	05:23 21:48	05:23 21:59	06:01 21:25	06:51 20:22	07:40 19:12	07:34 17:07	08:24 16:30
4	08:45 16:40	08:14 17:30	07:19 18:21	07:08 20:15	06:04 21:06	05:22 21:49	05:24 21:59	06:03 21:23	06:53 20:20	07:42 19:10	07:36 17:06	08:26 16:29
5	08:45 16:41	08:12 17:32	07:16 18:23	07:05 20:17	06:02 21:07	05:22 21:50	05:25 21:59	06:04 21:22	06:54 20:17	07:44 19:08	07:38 17:04	08:27 16:29
6	08:44 16:42	08:10 17:34	07:14 18:25	07:03 20:18	06:01 21:09	05:21 21:51	05:26 21:58	06:06 21:20	06:56 20:15	07:45 19:06	07:39 17:02	08:28 16:28
7	08:44 16:44	08:09 17:35	07:12 18:27	07:01 20:20	05:59 21:11	05:21 21:52	05:27 21:57	06:08 21:18	06:58 20:13	07:47 19:03	07:41 17:00	08:29 16:28
8	08:43 16:45	08:07 17:37	07:10 18:28	06:59 20:22	05:57 21:12	05:20 21:53	05:27 21:57	06:09 21:16	06:59 20:10	07:49 19:01	07:43 16:59	08:31 16:27
9	08:43 16:46	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	05:20 21:54	05:28 21:56	06:11 21:14	07:01 20:08	07:50 18:59	07:45 16:57	08:32 16:27
10	08:42 16:48	08:03 17:41	07:05 18:32	06:54 20:25	05:54 21:15	05:19 21:55	05:29 21:55	06:12 21:12	07:03 20:06	07:52 18:57	07:47 16:55	08:33 16:27
11	08:42 16:49	08:01 17:43	07:03 18:34	06:52 20:27	05:52 21:17	05:19 21:56	05:30 21:55	06:14 21:11	07:04 20:04	07:54 18:54	07:48 16:54	08:34 16:27
12	08:41 16:51	08:00 17:45	07:01 18:35	06:50 20:28	05:50 21:19	05:18 21:56	05:32 21:54	06:16 21:09	07:06 20:01	07:55 18:52	07:50 16:52	08:35 16:27
13	08:40 16:52	07:58 17:47	06:58 18:37	06:47 20:30	05:49 21:20	05:18 21:57	05:33 21:53	06:17 21:07	07:07 19:59	07:57 18:50	07:52 16:51	08:36 16:26
14	08:40 16:54	07:56 17:48	06:56 18:39	06:45 20:32	05:47 21:22	05:18 21:58	05:34 21:52	06:19 21:05	07:09 19:57	07:59 18:48	07:54 16:49	08:37 16:27
15	08:39 16:55	07:54 17:50	06:54 18:41	06:43 20:34	05:45 21:23	05:18 21:58	05:35 21:51	06:20 21:03	07:11 19:54	08:01 18:46	07:55 16:48	08:38 16:27
16	08:38 16:57	07:52 17:52	06:51 18:42	06:41 20:35	05:44 21:25	05:18 21:59	05:36 21:50	06:22 21:01	07:12 19:52	08:02 18:43	07:57 16:47	08:39 16:27
17	08:37 16:58	07:50 17:54	06:49 18:44	06:39 20:37	05:42 21:26	05:18 21:59	05:37 21:49	06:24 20:59	07:14 19:50	08:04 18:41	07:59 16:45	08:40 16:27
18	08:36 17:00	07:48 17:56	06:47 18:46	06:37 20:39	05:41 21:28	05:17 22:00	05:39 21:48	06:25 20:57	07:16 19:47	08:06 18:39	08:01 16:44	08:40 16:27
19	08:35 17:02	07:46 17:58	06:45 18:48	06:34 20:40	05:40 21:29	05:18 22:00	05:40 21:47	06:27 20:55	07:17 19:45	08:07 18:37	08:02 16:43	08:41 16:27
20	08:34 17:03	07:44 18:00	06:42 18:49	06:32 20:42	05:38 21:31	05:18 22:00	05:41 21:46	06:28 20:53	07:19 19:43	08:09 18:35	08:04 16:41	08:42 16:28
21	08:33 17:05	07:42 18:01	06:40 18:51	06:30 20:44	05:37 21:32	05:18 22:00	05:43 21:44	06:30 20:50	07:20 19:40	08:11 18:33	08:06 16:40	08:42 16:28
22	08:32 17:07	07:40 18:03	06:38 18:53	06:28 20:45	05:36 21:34	05:18 22:01	05:44 21:43	06:32 20:48	07:22 19:38	08:13 18:31	08:07 16:39	08:43 16:29
23	08:31 17:08	07:38 18:05	06:35 18:54	06:26 20:47	05:34 21:35	05:18 22:01	05:45 21:42	06:33 20:46	07:24 19:36	08:14 18:29	08:09 16:38	08:43 16:29
24	08:30 17:10	07:36 18:07	06:33 18:56	06:24 20:49	05:33 21:36	05:18 22:01	05:47 21:40	06:35 20:44	07:25 19:33	08:16 18:27	08:11 16:37	08:44 16:30
25	08:28 17:12	07:34 18:09	06:31 18:58	06:22 20:51	05:32 21:38	05:19 22:01	05:48 21:39	06:37 20:42	07:27 19:31	08:18 17:25	08:12 16:36	08:44 16:30
26	08:27 17:14	07:32 18:10	06:28 19:00	06:20 20:52	05:31 21:39	05:19 22:01	05:49 21:38	06:38 20:40	07:29 19:29	08:20 17:23	08:14 16:35	08:44 16:31
27	08:26 17:15	07:29 18:12	06:26 19:01	06:18 20:54	05:30 21:40	05:20 22:01	05:51 21:36	06:40 20:38	07:30 19:26	08:22 17:21	08:15 16:34	08:45 16:32
28	08:24 17:17	07:27 18:14	06:24 19:03	06:16 20:56	05:29 21:42	05:20 22:01	05:52 21:35	06:41 20:35	07:32 19:24	08:23 17:19	08:17 16:33	08:45 16:33
29	08:23 17:19	07:21 18:05	06:14 19:05	06:14 20:57	05:28 21:43	05:21 22:01	05:54 21:33	06:43 20:33	07:34 19:22	08:25 17:17	08:18 16:32	08:45 16:33
30	08:21 17:21	07:19 18:06	06:12 19:06	06:12 20:59	05:27 21:44	05:21 22:00	05:55 21:32	06:45 20:31	07:35 19:19	08:27 17:15	08:20 16:32	08:45 16:34
31	08:20 17:23	07:17 18:08	06:11 19:08	06:11 20:08	05:26 21:45	05:20 22:00	05:57 21:30	06:46 20:29	07:36 17:13	08:29 17:13	08:22 16:35	08:45 16:35
Potential sun hours	259	278	367	416	485	499	502	454	381	331	266	244
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month Sun rise (hh:mm) Sun set (hh:mm) Minutes with flicker First time (hh:mm) with flicker Last time (hh:mm) with flicker (WTG causing flicker first time) (WTG causing flicker last time)

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: CN - H92
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Table with columns for months (January to December) and rows for each day of the year (1-31), showing shadow times and reduction percentages. Includes a summary table at the bottom for 'Potential sun hours' and 'Total, real'.

Table layout: For each day in each month the following matrix apply

Day in month Sun rise (hh:mm) Sun set (hh:mm) Minutes with flicker First time (hh:mm) with flicker Last time (hh:mm) with flicker (WTG causing flicker first time) (WTG causing flicker last time)



Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: CO - H93

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan to Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N to Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with 13 columns (January to December) and 31 rows of daily data. Includes columns for sun rise, sun set, and potential sun hours. Bottom section includes summary rows for Total, worst case, Sun reduction, Oper. time red., Wind dir. red., Total reduction, and Total, real.

Table layout: For each day in each month the following matrix apply

Matrix table with 4 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: CP - H94

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for days (1-31) and summary rows (Potential sun hours, Total, worst case, etc.)

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

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+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: CR - H96

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 16:37	08:18 17:24	07:25 18:16	07:14 20:10	06:10 21:00	07:15 (19) 21:46
2	08:45 16:38	08:17 17:26	07:23 18:18	07:12 20:11	06:08 21:02	07:15 (19) 21:47
3	08:45 16:39	08:15 17:28	07:21 18:19	07:10 20:13	06:06 21:04	07:17 (19) 21:48
4	08:45 16:40	08:14 17:30	07:18 18:21	07:08 20:15	06:04 21:05	07:17 (19) 21:49
5	08:44 16:41	08:12 17:32	07:16 18:23	07:05 20:16	06:02 21:07	07:18 (19) 21:50
6	08:44 16:42	08:10 17:33	07:14 18:25	07:03 20:18	06:00 21:09	07:19 (19) 21:51
7	08:44 16:44	08:08 17:35	07:12 18:26	07:01 20:20	05:59 21:10	07:20 (19) 21:52
8	08:43 16:45	08:07 17:37	07:10 18:28	06:59 20:22	05:57 21:12	07:21 (19) 21:53
9	08:43 16:46	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	06:37 (18) 21:54
10	08:42 16:48	08:03 17:41	07:05 18:32	06:54 20:25	07:32 (19) 07:47 (19)	05:53 21:15
11	08:42 16:49	08:01 17:43	07:03 18:34	06:52 20:27	07:29 (19) 07:50 (19)	05:52 21:17
12	08:41 16:50	08:00 17:45	07:00 18:35	07:23 (20) 07:29 (20)	06:50 20:28	05:50 21:18
13	08:40 16:52	07:58 17:47	06:58 18:37	06:47 07:32 (20)	06:47 20:30	05:49 21:20
14	08:40 16:53	07:56 17:48	06:56 18:39	06:45 07:34 (20)	06:45 20:32	05:47 21:22
15	08:39 16:55	07:54 17:50	06:54 18:41	06:43 07:35 (20)	06:43 20:33	05:45 21:23
16	08:38 16:57	07:52 17:52	06:51 18:42	06:41 07:35 (20)	06:41 20:35	05:44 21:25
17	08:37 16:58	07:50 17:54	06:49 18:44	06:39 07:36 (20)	06:39 20:37	05:42 21:26
18	08:36 17:00	07:48 17:56	06:47 18:46	06:36 07:37 (20)	06:36 20:39	05:41 21:28
19	08:35 17:01	07:46 17:58	06:44 18:47	06:34 07:36 (20)	06:34 20:40	05:39 21:29
20	08:34 17:03	07:44 17:59	06:42 18:49	06:32 07:36 (20)	06:32 20:42	05:38 21:31
21	08:33 17:05	07:42 18:01	06:40 18:51	06:30 07:36 (20)	06:30 20:44	05:37 21:32
22	08:32 17:06	07:40 18:03	06:38 18:53	06:28 07:35 (20)	06:28 20:45	05:35 21:33
23	08:31 17:08	07:38 18:05	06:35 18:54	06:26 07:35 (20)	06:26 20:47	05:34 21:35
24	08:29 17:10	07:36 18:07	06:33 18:56	06:24 07:34 (20)	06:24 20:49	05:33 21:36
25	08:28 17:12	07:34 18:09	06:31 18:58	06:22 07:33 (20)	06:22 20:50	05:32 21:38
26	08:27 17:13	07:31 18:10	06:28 18:59	06:20 07:32 (20)	06:20 20:52	05:31 21:39
27	08:26 17:15	07:29 18:12	06:26 19:01	06:18 07:31 (20)	06:18 20:54	05:30 21:40
28	08:24 17:17	07:27 18:14	06:24 19:03	06:16 07:28 (20)	06:16 20:55	05:28 21:41
29	08:23 17:19	07:21 20:05	06:14 08:08 (20)	06:14 08:26 (20)	06:14 20:57	05:27 21:43
30	08:21 17:21	07:19 20:06	06:12 08:11 (20)	06:12 08:24 (20)	06:12 20:59	05:26 21:44
31	08:20 17:22	07:17 20:08	06:11 08:24 (20)	06:11 08:24 (20)	06:11 20:59	05:25 21:45
Potential sun hours	259	278	367	416	485	499
Total, worst case			438	765	914	776
Sun reduction			0.24	0.35	0.37	0.30
Oper. time red.			1.00	1.00	1.00	1.00
Wind dir. red.			0.68	0.66	0.65	0.64
Total reduction			0.17	0.24	0.24	0.19
Total, real			72	180	219	149

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: CR - H96

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July		August		September		October		November		December			
1	05:22	06:33 (18)	05:58	06:40 (18)	06:48	07:28 (19)	07:37	08:02 (20)	07:30	08:21				
	22:00	26	06:59 (18)	21:28	19	06:59 (18)	20:26	21	07:49 (19)	19:17	8	08:10 (20)	17:11	16:31
2	05:22	06:33 (18)	06:00	06:41 (18)	06:49	07:30 (19)	07:38	08:03 (20)	07:32	08:23				
	22:00	27	07:00 (18)	21:27	28	07:49 (19)	20:24	15	07:45 (19)	19:15	3	08:06 (20)	17:09	16:30
3	05:23	06:33 (18)	06:01	06:44 (18)	06:51	07:31 (19)	06:54	07:40	07:34	08:24				
	21:59	27	07:00 (18)	21:25	28	07:52 (19)	20:22	19:12	17:07	16:29				
4	05:24	06:33 (18)	06:03	07:33 (19)	06:53	07:33 (19)	06:53	07:42	07:36	08:25				
	21:59	27	07:00 (18)	21:23	21	07:54 (19)	20:20	19:10	17:05	16:29				
5	05:25	06:33 (18)	06:04	07:31 (19)	06:54	07:31 (19)	06:54	07:43	07:38	08:27				
	21:58	28	07:01 (18)	21:21	25	07:56 (19)	20:17	19:08	17:04	16:28				
6	05:26	06:33 (18)	06:06	07:29 (19)	06:56	07:29 (19)	06:56	07:45	07:39	08:28				
	21:58	28	07:01 (18)	21:20	28	07:57 (19)	20:15	19:05	17:02	16:28				
7	05:26	06:33 (18)	06:08	07:29 (19)	06:58	07:29 (19)	06:58	07:47	07:41	08:29				
	21:57	29	07:02 (18)	21:18	30	07:59 (19)	20:13	19:03	17:00	16:28				
8	05:27	06:33 (18)	06:09	07:27 (19)	06:59	07:27 (19)	06:59	07:48	07:43	08:31				
	21:57	29	07:02 (18)	21:16	32	07:59 (19)	20:10	19:01	16:59	16:27				
9	05:28	06:33 (18)	06:11	07:27 (19)	07:01	07:27 (19)	07:01	07:50	07:45	08:32				
	21:56	30	07:03 (18)	21:14	34	08:01 (19)	20:08	18:59	16:57	16:27				
10	05:29	06:33 (18)	06:12	07:25 (19)	07:02	07:25 (19)	07:02	07:52	07:47	08:33				
	21:55	30	07:03 (18)	21:12	36	08:01 (19)	20:06	18:56	16:55	16:27				
11	05:30	06:33 (18)	06:14	07:25 (19)	07:04	07:25 (19)	07:04	07:54	07:48	08:34				
	21:55	31	07:04 (18)	21:10	37	08:02 (19)	20:03	18:54	16:54	16:27				
12	05:31	06:33 (18)	06:15	07:24 (19)	07:06	07:24 (19)	07:06	07:55	07:50	08:35				
	21:54	31	07:04 (18)	21:08	38	08:02 (19)	20:01	18:52	16:52	16:26				
13	05:33	06:33 (18)	06:17	07:23 (19)	07:07	07:23 (19)	07:07	08:03 (20)	07:57	08:36				
	21:53	31	07:04 (18)	21:07	40	08:03 (19)	19:59	12	08:15 (20)	18:50				
14	05:34	06:33 (18)	06:19	07:22 (19)	07:09	07:22 (19)	07:09	07:59 (20)	07:59	08:37				
	21:52	31	07:04 (18)	21:05	41	08:03 (19)	19:56	17	08:16 (20)	18:48				
15	05:35	06:33 (18)	06:20	07:22 (19)	07:11	07:22 (19)	07:11	07:57 (20)	08:00	08:38				
	21:51	31	07:04 (18)	21:03	41	08:03 (19)	19:54	21	08:18 (20)	18:45				
16	05:36	06:33 (18)	06:22	07:21 (19)	07:12	07:21 (19)	07:12	07:55 (20)	08:02	08:39				
	21:50	32	07:05 (18)	21:01	42	08:03 (19)	19:52	24	08:19 (20)	18:43				
17	05:37	06:33 (18)	06:23	07:21 (19)	07:14	07:21 (19)	07:14	07:54 (20)	08:04	08:39				
	21:49	32	07:05 (18)	20:59	43	08:04 (19)	19:49	26	08:20 (20)	18:41				
18	05:38	06:33 (18)	06:25	07:20 (19)	07:15	07:20 (19)	07:15	07:52 (20)	08:06	08:40				
	21:48	32	07:05 (18)	20:57	43	08:03 (19)	19:47	28	08:20 (20)	18:39				
19	05:40	06:34 (18)	06:27	07:21 (19)	07:17	07:21 (19)	07:17	07:51 (20)	08:07	08:41				
	21:47	31	07:05 (18)	20:54	42	08:03 (19)	19:45	30	08:21 (20)	18:37				
20	05:41	06:34 (18)	06:28	07:20 (19)	07:19	07:20 (19)	07:19	07:51 (20)	08:09	08:42				
	21:45	31	07:05 (18)	20:52	42	08:02 (19)	19:42	30	08:21 (20)	18:35				
21	05:42	06:34 (18)	06:30	07:20 (19)	07:20	07:20 (19)	07:20	07:49 (20)	08:11	08:42				
	21:44	31	07:05 (18)	20:50	43	08:03 (19)	19:40	32	08:21 (20)	18:33				
22	05:44	06:34 (18)	06:32	07:20 (19)	07:22	07:20 (19)	07:22	07:49 (20)	08:13	08:43				
	21:43	31	07:05 (18)	20:48	42	08:02 (19)	19:38	32	08:21 (20)	18:31				
23	05:45	06:34 (18)	06:33	07:20 (19)	07:24	07:20 (19)	07:24	07:49 (20)	08:14	08:43				
	21:42	31	07:05 (18)	20:46	41	08:01 (19)	19:35	32	08:21 (20)	18:29				
24	05:46	06:34 (18)	06:35	07:20 (19)	07:25	07:20 (19)	07:25	07:50 (20)	08:16	08:44				
	21:40	31	07:05 (18)	20:44	40	08:00 (19)	19:33	30	08:20 (20)	18:26				
25	05:48	06:35 (18)	06:36	07:21 (19)	07:27	07:21 (19)	07:27	07:52 (20)	07:18	08:44				
	21:39	29	07:04 (18)	20:42	39	08:00 (19)	19:31	27	08:19 (20)	17:24				
26	05:49	06:36 (18)	06:38	07:22 (19)	07:28	07:22 (19)	07:28	07:53 (20)	07:20	08:44				
	21:37	28	07:04 (18)	20:40	37	07:59 (19)	19:28	25	08:18 (20)	17:22				
27	05:51	06:36 (18)	06:40	07:22 (19)	07:30	07:22 (19)	07:30	07:55 (20)	07:21	08:45				
	21:36	28	07:04 (18)	20:37	36	07:58 (19)	19:26	22	08:17 (20)	17:20				
28	05:52	06:36 (18)	06:41	07:23 (19)	07:32	07:23 (19)	07:32	07:57 (20)	07:23	08:45				
	21:35	27	07:03 (18)	20:35	34	07:57 (19)	19:24	19	08:16 (20)	17:19				
29	05:54	06:37 (18)	06:43	07:23 (19)	07:33	07:23 (19)	07:33	07:58 (20)	07:25	08:45				
	21:33	25	07:02 (18)	20:33	32	07:55 (19)	19:22	16	08:14 (20)	17:17				
30	05:55	06:38 (18)	06:45	07:25 (19)	07:35	07:25 (19)	07:35	08:00 (20)	07:27	08:45				
	21:31	23	07:01 (18)	20:31	29	07:54 (19)	19:19	12	08:12 (20)	17:15				
31	05:57	06:38 (18)	06:46	07:26 (19)		07:26 (19)			07:29	08:45				
	21:30	22	07:00 (18)	20:29	25	07:51 (19)			17:13	16:35				
Potential sun hours	502		454		381		331		266	244				
Total, worst case	900		1088		471		11							
Sun reduction	0.27		0.30		0.28		0.24							
Oper. time red.	1.00		1.00		1.00		1.00							
Wind dir. red.	0.64		0.66		0.68		0.68							
Total reduction	0.17		0.20		0.19		0.16							
Total, real	154		215		90		2							

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: Specimen Turbine **Shadow receptor:** CS - H97

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45	08:18	07:25	07:15	06:10	06:54 (17) 05:25
	16:37	17:24	18:16	20:10	21:01	17 07:11 (17) 21:46
2	08:45	08:17	07:23	07:12	06:08	06:55 (17) 05:24
	16:38	17:26	18:18	20:11	21:02	14 07:09 (17) 21:47
3	08:45	08:15	07:21	07:10	06:06	06:58 (17) 05:23
	16:39	17:28	18:19	20:13	21:04	9 07:07 (17) 21:48
4	08:45	08:14	07:18	07:08	06:04	05:22
	16:40	17:30	18:21	20:15	21:06	21:49
5	08:44	08:12	07:16	07:05	06:02	05:22
	16:41	17:32	18:23	20:17	21:07	21:50
6	08:44	08:10	07:14	07:03	06:01	05:21
	16:42	17:34	18:25	20:18	21:09	21:51
7	08:44	08:09	07:12	07:01	05:59	05:20
	16:44	17:35	18:27	20:20	21:10	21:52
8	08:43	08:07	07:10	06:59	05:57	05:20
	16:45	17:37	18:28	20:22	21:12	21:53
9	08:43	08:05	07:07	06:56	05:55	05:19
	16:46	17:39	18:30	20:23	21:14	21:54
10	08:42	08:03	07:05	06:54	05:54	05:19
	16:48	17:41	18:32	20:25	21:15	21:55
11	08:42	08:01	07:03	06:52	05:52	05:19
	16:49	17:43	18:34	20:27	21:17	21:56
12	08:41	08:00	07:01	06:50	05:50	05:18
	16:50	17:45	18:35	20:28	21:18	21:56
13	08:40	07:58	06:58	06:47	05:49	05:18
	16:52	17:47	18:37	20:30	21:20	21:57
14	08:40	07:56	06:56	06:45	05:47	05:18
	16:53	17:48	18:39	20:32	21:22	21:58
15	08:39	07:54	06:54	06:43	05:45	05:18
	16:55	17:50	18:41	20:34	21:23	21:58
16	08:38	07:52	06:51	06:41	05:44	05:18
	16:57	17:52	18:42	20:35	21:25	21:59
17	08:37	07:50	06:49	06:39	07:02 (17) 05:42	06:12 (16) 05:17
	16:58	17:54	18:44	20:37	9 07:11 (17) 21:26	8 06:20 (16) 21:59
18	08:36	07:48	06:47	06:36	07:00 (17) 05:41	06:10 (16) 05:17
	17:00	17:56	18:46	20:39	13 07:13 (17) 21:28	13 06:23 (16) 21:59
19	08:35	07:46	06:45	06:34	06:58 (17) 05:40	06:07 (16) 05:17
	17:01	17:58	18:47	20:40	16 07:14 (17) 21:29	16 06:23 (16) 22:00
20	08:34	07:44	06:42	06:32	06:56 (17) 05:38	06:06 (16) 05:18
	17:03	17:59	18:49	20:42	19 07:15 (17) 21:31	19 06:25 (16) 22:00
21	08:33	07:42	06:40	06:30	06:54 (17) 05:37	06:06 (16) 05:18
	17:05	18:01	18:51	20:44	22 07:16 (17) 21:32	20 06:26 (16) 22:00
22	08:32	07:40	06:38	06:28	06:53 (17) 05:35	06:05 (16) 05:18
	17:06	18:03	18:53	20:45	23 07:16 (17) 21:33	22 06:27 (16) 22:01
23	08:31	07:38	06:35	06:26	06:53 (17) 05:34	06:04 (16) 05:18
	17:08	18:05	18:54	20:47	23 07:16 (17) 21:35	24 06:28 (16) 22:01
24	08:29	07:36	06:33	06:24	06:52 (17) 05:33	06:03 (16) 05:18
	17:10	18:07	18:56	20:49	24 07:16 (17) 21:36	25 06:28 (16) 22:01
25	08:28	07:34	06:31	06:22	06:52 (17) 05:32	06:03 (16) 05:19
	17:12	18:09	18:58	20:50	24 07:16 (17) 21:38	25 06:28 (16) 22:01
26	08:27	07:31	06:28	06:20	06:52 (17) 05:31	06:02 (16) 05:19
	17:13	18:10	18:59	20:52	23 07:15 (17) 21:39	27 06:29 (16) 22:01
27	08:26	07:29	06:26	06:18	06:52 (17) 05:30	06:02 (16) 05:20
	17:15	18:12	19:01	20:54	23 07:15 (17) 21:40	27 06:29 (16) 22:01
28	08:24	07:27	06:24	06:16	06:52 (17) 05:29	06:03 (16) 05:20
	17:17	18:14	19:03	20:56	22 07:14 (17) 21:41	28 06:31 (16) 22:01
29	08:23	07:21	06:14	06:14	06:53 (17) 05:27	06:03 (16) 05:21
	17:19	18:09	18:58	20:57	20 07:13 (17) 21:43	28 06:31 (16) 22:01
30	08:21	07:19	06:12	06:12	06:53 (17) 05:27	06:02 (16) 05:21
	17:21	18:09	18:59	20:59	19 07:12 (17) 21:44	29 06:31 (16) 22:00
31	08:20	07:17	06:11	06:11	05:26	06:02 (16)
	17:22	18:08	18:59	20:58	21:45	29 06:31 (16)
Potential sun hours	259	278	367	416	485	499
Total, worst case				280	380	873
Sun reduction				0.35	0.37	0.30
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.65	0.63	0.63
Total reduction				0.23	0.23	0.19
Total, real				64	89	166

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Specimen Turbine **Shadow receptor:** CS - H97

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December		
1	05:22	06:08 (16)	05:58	06:48	07:37	07:30	08:21	
	22:00	29 06:37 (16)	21:28	20:26	19:17	17:11	16:31	
2	05:22	06:08 (16)	06:00	06:50	07:38	07:32	08:23	
	22:00	30 06:38 (16)	21:27	20:24	19:15	17:09	16:30	
3	05:23	06:09 (16)	06:01	06:51	07:40	07:34	08:24	
	21:59	29 06:38 (16)	21:25	20:22	19:12	17:07	16:29	
4	05:24	06:09 (16)	06:03	06:53	07:42	07:36	08:26	
	21:59	30 06:39 (16)	21:23	20:20	19:10	17:06	16:29	
5	05:25	06:09 (16)	06:04	06:54	07:43	07:38	08:27	
	21:59	29 06:38 (16)	21:22	20:17	19:08	17:04	16:28	
6	05:26	06:09 (16)	06:06	06:56	07:45	07:39	08:28	
	21:58	29 06:38 (16)	21:20	20:15	19:06	17:02	16:28	
7	05:27	06:09 (16)	06:08	06:58	07:47	07:41	08:29	
	21:57	30 06:39 (16)	21:18	20:13	19:03	17:00	16:28	
8	05:27	06:10 (16)	06:09	06:59	07:49	07:43	08:31	
	21:57	29 06:39 (16)	21:16	20:10	19:01	16:59	16:27	
9	05:28	06:10 (16)	06:11	07:09 (17)	07:01	07:50	08:32	
	21:56	29 06:39 (16)	21:14	5 07:14 (17)	20:08	18:59	16:57	16:27
10	05:29	06:10 (16)	06:12	07:05 (17)	07:02	07:52	07:47	08:33
	21:55	29 06:39 (16)	21:12	12 07:17 (17)	20:06	18:57	16:55	16:27
11	05:30	06:10 (16)	06:14	07:04 (17)	07:04	07:54	07:48	08:34
	21:55	30 06:40 (16)	21:10	15 07:19 (17)	20:04	18:54	16:54	16:27
12	05:31	06:11 (16)	06:16	07:02 (17)	07:06	07:55	07:50	08:35
	21:54	29 06:40 (16)	21:09	18 07:20 (17)	20:01	18:52	16:52	16:26
13	05:33	06:11 (16)	06:17	07:01 (17)	07:07	07:57	07:52	08:36
	21:53	29 06:40 (16)	21:07	20 07:21 (17)	19:59	18:50	16:51	16:26
14	05:34	06:11 (16)	06:19	07:00 (17)	07:09	07:59	07:54	08:37
	21:52	28 06:39 (16)	21:05	21 07:21 (17)	19:57	18:48	16:49	16:26
15	05:35	06:11 (16)	06:20	07:00 (17)	07:11	08:00	07:55	08:38
	21:51	28 06:39 (16)	21:03	22 07:22 (17)	19:54	18:45	16:48	16:27
16	05:36	06:11 (16)	06:22	06:59 (17)	07:12	08:02	07:57	08:39
	21:50	28 06:39 (16)	21:01	23 07:22 (17)	19:52	18:43	16:47	16:27
17	05:37	06:12 (16)	06:24	06:59 (17)	07:14	08:04	07:59	08:40
	21:49	27 06:39 (16)	20:59	23 07:22 (17)	19:50	18:41	16:45	16:27
18	05:39	06:12 (16)	06:25	06:58 (17)	07:15	08:06	08:01	08:40
	21:48	26 06:38 (16)	20:57	23 07:21 (17)	19:47	18:39	16:44	16:27
19	05:40	06:13 (16)	06:27	06:58 (17)	07:17	08:07	08:02	08:41
	21:47	26 06:39 (16)	20:55	24 07:22 (17)	19:45	18:37	16:43	16:27
20	05:41	06:14 (16)	06:28	06:57 (17)	07:19	08:09	08:04	08:42
	21:46	24 06:38 (16)	20:52	24 07:21 (17)	19:43	18:35	16:41	16:28
21	05:42	06:14 (16)	06:30	06:58 (17)	07:20	08:11	08:06	08:42
	21:44	23 06:37 (16)	20:50	23 07:21 (17)	19:40	18:33	16:40	16:28
22	05:44	06:15 (16)	06:32	06:58 (17)	07:22	08:13	08:07	08:43
	21:43	21 06:36 (16)	20:48	21 07:19 (17)	19:38	18:31	16:39	16:29
23	05:45	06:16 (16)	06:33	07:00 (17)	07:24	08:14	08:09	08:43
	21:42	20 06:36 (16)	20:46	19 07:19 (17)	19:36	18:29	16:38	16:29
24	05:47	06:17 (16)	06:35	07:01 (17)	07:25	08:16	08:11	08:44
	21:40	18 06:35 (16)	20:44	16 07:17 (17)	19:33	18:27	16:37	16:30
25	05:48	06:18 (16)	06:37	07:03 (17)	07:27	07:18	08:12	08:44
	21:39	15 06:33 (16)	20:42	12 07:15 (17)	19:31	17:25	16:36	16:30
26	05:49	06:21 (16)	06:38	07:05 (17)	07:29	07:20	08:14	08:44
	21:38	11 06:32 (16)	20:40	8 07:13 (17)	19:29	17:23	16:35	16:31
27	05:51	06:24 (16)	06:40		07:30	07:21	08:15	08:45
	21:36	4 06:28 (16)	20:37		19:26	17:21	16:34	16:32
28	05:52		06:41		07:32	07:23	08:17	08:45
	21:35		20:35		19:24	17:19	16:33	16:33
29	05:54		06:43		07:33	07:25	08:18	08:45
	21:33		20:33		19:22	17:17	16:32	16:33
30	05:55		06:45		07:35	07:27	08:20	08:45
	21:32		20:31		19:19	17:15	16:31	16:34
31	05:57		06:46			07:29		08:45
	21:30		20:29			17:13		16:35
Potential sun hours	502	454		381	331	266	244	
Total, worst case	680		329					
Sun reduction	0.27		0.30					
Oper. time red.	1.00		1.00					
Wind dir. red.	0.63		0.65					
Total reduction	0.17		0.19					
Total, real	115		63					

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: CT - H98

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45 16:36	08:18 17:24	07:25 18:16	07:14 20:10	06:10 21:01	05:24 21:46	05:21 22:00	05:58 21:28	06:48 20:26	07:37 19:17	07:30 17:11	08:21 16:30
2	08:45 16:37	08:17 17:26	07:23 18:17	07:12 20:11	06:08 21:02	05:24 21:47	05:22 22:00	06:00 21:27	06:49 20:24	07:38 19:15	07:32 17:09	08:23 16:30
3	08:45 16:38	08:15 17:28	07:21 18:19	07:10 20:13	06:06 21:04	05:23 21:49	05:23 22:00	06:01 21:25	06:51 20:22	07:40 19:12	07:34 17:07	08:24 16:29
4	08:45 16:40	08:14 17:30	07:18 18:21	07:07 20:15	06:04 21:06	05:22 21:50	05:24 21:59	06:03 21:23	06:53 20:20	07:42 19:10	07:36 17:05	08:26 16:29
5	08:45 16:41	08:12 17:31	07:16 18:23	07:05 20:16	06:02 21:07	05:21 21:51	05:24 21:59	06:04 21:22	06:54 20:17	07:43 19:08	07:38 17:04	08:27 16:28
6	08:44 16:42	08:10 17:33	07:14 18:25	07:03 20:18	06:00 21:09	05:21 21:52	05:25 21:58	06:06 21:20	06:56 20:15	07:45 19:05	07:39 17:02	08:28 16:28
7	08:44 16:43	08:09 17:35	07:12 18:26	07:01 20:20	05:58 21:11	05:20 21:52	05:26 21:58	06:07 21:18	06:57 20:13	07:47 19:03	07:41 17:00	08:29 16:27
8	08:43 16:45	08:07 17:37	07:10 18:28	06:58 20:22	05:57 21:12	05:20 21:53	05:27 21:57	06:09 21:16	06:59 20:10	07:48 19:01	07:43 16:58	08:31 16:27
9	08:43 16:46	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	05:19 21:54	05:28 21:56	06:10 21:14	07:01 20:08	07:50 18:59	07:45 16:57	08:32 16:27
10	08:42 16:47	08:03 17:41	07:05 18:32	06:54 20:25	05:53 21:15	05:19 21:55	05:29 21:56	06:12 21:12	07:02 20:06	07:52 18:56	07:47 16:55	08:33 16:26
11	08:42 16:49	08:01 17:43	07:03 18:33	06:52 20:27	05:52 21:17	05:18 21:56	05:30 21:55	06:14 21:11	07:04 20:03	07:54 18:54	07:48 16:54	08:34 16:26
12	08:41 16:50	08:00 17:44	07:00 18:35	06:49 20:28	05:50 21:19	05:18 21:56	05:31 21:54	06:15 21:09	07:06 20:01	07:55 18:52	07:50 16:52	08:35 16:26
13	08:40 16:52	07:58 17:46	06:58 18:37	06:47 20:30	05:48 21:20	05:18 21:57	05:32 21:53	06:17 21:07	07:07 19:59	07:57 18:50	07:52 16:51	08:36 16:26
14	08:40 16:53	07:56 17:48	06:56 18:39	06:45 20:32	05:47 21:22	05:17 21:58	05:33 21:52	06:18 21:05	07:09 19:56	07:59 18:48	07:54 16:49	08:37 16:26
15	08:39 16:55	07:54 17:50	06:54 18:40	06:43 20:34	05:45 21:23	05:17 21:58	05:35 21:51	06:20 21:03	07:10 19:54	08:00 18:45	07:55 16:48	08:38 16:26
16	08:38 16:56	07:52 17:52	06:51 18:42	06:41 20:35	05:44 21:25	05:17 21:59	05:36 21:50	06:22 21:01	07:12 19:52	08:02 18:43	07:57 16:46	08:39 16:26
17	08:37 16:58	07:50 17:54	06:49 18:44	06:38 20:37	05:42 21:26	05:17 21:59	05:37 21:49	06:23 20:59	07:14 19:49	08:04 18:41	07:59 16:45	08:40 16:26
18	08:36 17:00	07:48 17:56	06:47 18:46	06:36 20:39	05:41 21:28	05:17 22:00	05:38 21:48	06:25 20:57	07:15 19:47	08:06 18:39	08:01 16:44	08:40 16:27
19	08:35 17:01	07:46 17:57	06:44 18:47	06:34 20:40	05:39 21:29	05:17 22:00	05:39 21:47	06:27 20:55	07:17 19:45	08:07 18:37	08:02 16:42	08:41 16:27
20	08:34 17:03	07:44 17:59	06:42 18:49	06:32 20:42	05:38 21:31	05:17 22:00	05:41 21:46	06:28 20:52	07:19 19:42	08:09 18:35	08:04 16:41	08:42 16:27
21	08:33 17:05	07:42 18:01	06:40 18:51	06:30 20:44	05:36 21:32	05:17 22:01	05:42 21:44	06:30 20:50	07:20 19:40	08:11 18:33	08:06 16:40	08:42 16:28
22	08:32 17:06	07:40 18:03	06:37 18:53	06:28 20:45	05:35 21:34	05:18 22:01	05:43 21:43	06:31 20:48	07:22 19:38	08:13 18:30	08:07 16:39	08:43 16:28
23	08:31 17:08	07:38 18:05	06:35 18:54	06:26 20:47	05:34 21:35	05:18 22:01	05:45 21:42	06:33 20:46	07:23 19:35	08:14 18:28	08:09 16:38	08:43 16:29
24	08:30 17:10	07:36 18:07	06:33 18:56	06:24 20:49	05:33 21:36	05:18 22:01	05:46 21:40	06:35 20:44	07:25 19:33	08:16 18:26	08:11 16:37	08:44 16:29
25	08:28 17:11	07:34 18:08	06:31 18:58	06:22 20:50	05:31 21:38	05:18 22:01	05:48 21:39	06:36 20:42	07:27 19:31	08:18 17:24	08:12 16:36	08:44 16:30
26	08:27 17:13	07:31 18:10	06:28 18:59	06:20 20:52	05:30 21:39	05:19 22:01	05:49 21:38	06:38 20:40	07:28 19:28	08:19 17:22	08:14 16:35	08:45 16:31
27	08:26 17:15	07:29 18:12	06:26 19:01	06:17 20:54	05:29 21:40	05:19 22:01	05:51 21:36	06:40 20:37	07:30 19:26	08:21 17:20	08:15 16:34	08:45 16:31
28	08:24 17:17	07:27 18:14	06:24 19:03	06:15 20:56	05:28 21:42	05:20 22:01	05:52 21:35	06:41 20:35	07:32 19:24	08:17 17:18	08:17 16:33	08:45 16:32
29	08:23 17:19	07:21 18:05	06:14 19:05	06:14 20:57	05:27 21:43	05:20 22:01	05:53 21:33	06:43 20:33	07:33 19:21	08:18 17:16	08:18 16:32	08:45 16:33
30	08:21 17:20	07:19 18:06	06:12 19:06	06:12 20:59	05:26 21:44	05:21 22:01	05:55 21:32	06:44 20:31	07:35 19:19	08:19 17:15	08:20 16:31	08:45 16:34
31	08:20 17:22	07:17 18:08	06:11 19:08	06:11 20:08	05:25 21:45	05:21 22:01	05:56 21:30	06:46 20:29	07:37 17:13	08:22 17:13	08:22 16:34	08:45 16:35
Potential sun hours	259	278	367	416	485	499	502	454	381	331	266	244
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)



SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: CU - H99

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for days (1-31) and summary rows (Potential sun hours, Total, worst case, etc.)

Table layout: For each day in each month the following matrix apply

Matrix layout table with 4 columns: Day in month, Sun rise/set, Minutes with flicker, First/Last time with flicker (WTG causing flicker)

SHADOW - Calendar

Calculation: Specimen Turbine **Shadow receptor:** CV - H100

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45 16:37	08:18 17:24	07:25 18:16	07:15 20:10	06:10 21:01	05:25 21:46	05:22 22:00	05:58 21:28	06:48 20:26	07:37 19:17	07:31 17:11	08:21 16:31
2	08:45 16:38	08:17 17:26	07:23 18:18	07:12 20:11	06:08 21:02	05:24 21:47	05:23 22:00	06:00 21:27	06:50 20:24	07:38 19:15	07:32 17:09	08:23 16:30
3	08:45 16:39	08:15 17:28	07:21 18:19	07:10 20:13	06:06 21:04	05:23 21:48	05:23 21:59	06:01 21:25	06:51 20:22	07:40 19:12	07:34 17:07	08:24 16:30
4	08:45 16:40	08:14 17:30	07:19 18:21	07:08 20:15	06:04 21:06	05:22 21:49	05:24 21:59	06:03 21:23	06:53 20:20	07:42 19:10	07:36 17:06	08:26 16:29
5	08:45 16:41	08:12 17:32	07:16 18:23	07:05 20:17	06:02 21:07	05:22 21:50	05:25 21:59	06:05 21:22	06:54 20:17	07:44 19:08	07:38 17:04	08:27 16:29
6	08:44 16:42	08:10 17:34	07:14 18:25	07:03 20:18	06:01 21:09	05:21 21:51	05:26 21:58	06:06 21:20	06:56 20:15	07:45 19:06	07:39 17:02	08:28 16:28
7	08:44 16:44	08:09 17:35	07:12 18:27	07:01 20:20	05:59 21:11	05:21 21:52	05:27 21:57	06:08 21:18	06:58 20:13	07:47 19:03	07:41 17:00	08:29 16:28
8	08:43 16:45	08:07 17:37	07:10 18:28	06:59 20:22	05:57 21:12	05:20 21:53	05:28 21:57	06:09 21:16	06:59 20:10	07:49 19:01	07:43 16:59	08:31 16:27
9	08:43 16:46	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	05:20 21:54	05:28 21:56	06:11 21:14	07:01 20:08	07:50 18:59	07:45 16:57	08:32 16:27
10	08:42 16:48	08:03 17:41	07:05 18:32	06:54 20:25	05:54 21:15	05:19 21:55	05:29 21:55	06:12 21:12	07:03 20:06	07:52 18:57	07:47 16:56	08:33 16:27
11	08:42 16:49	08:01 17:43	07:03 18:34	06:52 20:27	05:52 21:17	05:19 21:56	05:30 21:55	06:14 21:11	07:04 20:04	07:54 18:54	07:48 16:54	08:34 16:27
12	08:41 16:51	08:00 17:45	07:01 18:35	06:50 20:28	05:50 21:19	05:18 21:56	05:32 21:54	06:16 21:09	07:06 20:01	07:55 18:52	07:50 16:52	08:35 16:27
13	08:40 16:52	07:58 17:47	06:58 18:37	06:47 20:30	05:49 21:20	05:18 21:57	05:33 21:53	06:17 21:07	07:07 19:59	07:57 18:50	07:52 16:51	08:36 16:27
14	08:40 16:54	07:56 17:48	06:56 18:39	06:45 20:32	05:47 21:22	05:18 21:58	05:34 21:52	06:19 21:05	07:09 19:57	07:59 18:48	07:54 16:49	08:37 16:27
15	08:39 16:55	07:54 17:50	06:54 18:41	06:43 20:34	05:45 21:23	05:18 21:58	05:35 21:51	06:20 21:03	07:11 19:54	08:01 18:46	07:55 16:48	08:38 16:27
16	08:38 16:57	07:52 17:52	06:51 18:42	06:41 20:35	05:44 21:25	05:18 21:59	05:36 21:50	06:22 21:01	07:12 19:52	08:02 18:43	07:57 16:47	08:39 16:27
17	08:37 16:58	07:50 17:54	06:49 18:44	06:39 20:37	05:42 21:26	05:18 21:59	05:37 21:49	06:24 20:59	07:14 19:50	08:04 18:41	07:59 16:45	08:40 16:27
18	08:36 17:00	07:48 17:56	06:47 18:46	06:37 20:39	05:41 21:28	05:17 22:00	05:39 21:48	06:25 20:57	07:16 19:47	08:06 18:39	08:01 16:44	08:40 16:27
19	08:35 17:02	07:46 17:58	06:45 18:48	06:34 20:40	05:40 21:29	05:18 22:00	05:40 21:47	06:27 20:55	07:17 19:45	08:07 18:37	08:02 16:43	08:41 16:27
20	08:34 17:03	07:44 18:00	06:42 18:49	06:32 20:42	05:38 21:31	05:18 22:00	05:41 21:46	06:28 20:52	07:19 19:43	08:09 18:35	08:04 16:41	08:42 16:28
21	08:33 17:05	07:42 18:01	06:40 18:51	06:30 20:44	05:37 21:32	05:18 22:00	05:43 21:44	06:30 20:50	07:20 19:40	08:11 18:33	08:06 16:40	08:42 16:28
22	08:32 17:07	07:40 18:03	06:38 18:53	06:28 20:45	05:36 21:34	05:18 22:01	05:44 21:43	06:32 20:48	07:22 19:38	08:13 18:31	08:07 16:39	08:43 16:29
23	08:31 17:08	07:38 18:05	06:35 18:54	06:26 20:47	05:34 21:35	05:18 22:01	05:45 21:42	06:33 20:46	07:24 19:36	08:14 18:29	08:09 16:38	08:43 16:29
24	08:30 17:10	07:36 18:07	06:33 18:56	06:24 20:49	05:33 21:36	05:18 22:01	05:47 21:40	06:35 20:44	07:25 19:33	08:16 18:27	08:11 16:37	08:44 16:30
25	08:28 17:12	07:34 18:09	06:31 18:58	06:22 20:51	05:32 21:38	05:19 22:01	05:48 21:39	06:37 20:42	07:27 19:31	08:18 17:25	08:12 16:36	08:44 16:30
26	08:27 17:14	07:32 18:11	06:28 19:00	06:20 20:52	05:31 21:39	05:19 22:01	05:49 21:38	06:38 20:40	07:29 19:29	08:20 17:23	08:14 16:35	08:44 16:31
27	08:26 17:15	07:29 18:12	06:26 19:01	06:18 20:54	05:30 21:40	05:20 22:01	05:51 21:36	06:40 20:38	07:30 19:26	08:15 17:21	08:15 16:34	08:45 16:32
28	08:24 17:17	07:27 18:14	06:24 19:03	06:16 20:56	05:29 21:42	05:20 22:01	05:52 21:35	06:41 20:35	07:32 19:24	08:17 17:19	08:17 16:33	08:45 16:33
29	08:23 17:19	07:21 18:05	06:14 19:05	06:14 20:57	05:28 21:43	05:21 22:01	05:54 21:33	06:43 20:33	07:34 19:22	08:25 17:17	08:18 16:32	08:45 16:33
30	08:21 17:21	07:19 18:06	06:12 19:06	06:12 20:59	05:27 21:44	05:21 22:00	05:55 21:32	06:45 20:31	07:35 19:19	08:27 17:15	08:20 16:32	08:45 16:34
31	08:20 17:23	07:17 18:08	06:11 19:08	06:11 20:08	05:26 21:45	05:26 22:00	05:57 21:30	06:46 20:29	07:36 17:13	08:29 17:13	08:45 16:35	08:45 16:35
Potential sun hours	259	278	367	416	485	499	502	454	381	331	266	244
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: CW - H101

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June	July	August	September	October	November	December		
1	08:45	08:19	07:25	07:15	06:10	05:25	05:22	05:58	06:48	07:37	07:31	08:04 (9)	08:22	09:05 (8)
2	16:36	17:24	18:16	20:10	21:01	21:46	22:00	21:29	20:26	19:17	17:11	08:18 (9)	16:31	09:20 (8)
3	08:45	08:15	07:21	07:10	06:06	05:23	05:23	06:01	06:51	07:40	07:34	08:09 (9)	08:24	09:07 (8)
4	16:41	17:30	18:21	20:15	21:06	21:50	21:59	21:23	20:20	19:10	17:06	08:14 (9)	16:29	09:19 (8)
5	08:45	08:12	07:16	07:05	06:02	05:22	05:25	06:04	06:54	07:44	07:38	08:07 (9)	08:27	09:10 (8)
6	16:42	17:34	18:25	20:18	21:09	21:52	21:58	21:20	20:15	19:05	17:02	08:18 (9)	16:28	09:11 (8)
7	08:44	08:09	07:12	07:01	05:59	05:20	05:26	06:08	06:58	07:47	07:41	08:16 (9)	08:30	09:12 (8)
8	16:43	17:35	18:27	20:20	21:11	21:53	21:58	21:18	20:13	19:03	17:00	08:17 (9)	16:27	09:17 (8)
9	08:44	08:07	07:10	06:59	05:57	05:20	05:27	06:09	06:59	07:49	07:43	08:18 (9)	08:31	09:14 (8)
10	16:46	17:39	18:30	20:23	21:14	21:54	21:56	21:14	20:08	18:59	16:57	08:19 (9)	16:27	09:18 (8)
11	08:43	08:05	07:07	06:56	05:55	05:19	05:28	06:11	07:01	07:50	07:45	08:20 (9)	08:32	09:19 (8)
12	16:48	17:41	18:32	20:25	21:16	21:55	21:56	21:13	20:06	18:57	16:55	08:21 (9)	16:27	09:20 (8)
13	08:41	08:00	07:01	06:50	05:50	05:18	05:31	06:15	07:06	07:55	07:50	08:26 (9)	08:35	09:24 (8)
14	16:50	17:45	18:35	20:29	21:19	21:57	21:54	21:09	20:01	18:52	16:52	08:22 (9)	16:26	09:25 (8)
15	08:40	07:58	06:58	06:47	05:48	05:18	05:32	06:17	07:07	07:57	07:52	08:27 (9)	08:36	09:26 (8)
16	16:52	17:47	18:37	20:30	21:20	21:57	21:53	21:07	19:59	18:50	16:51	08:28 (9)	16:26	09:27 (8)
17	08:39	07:54	06:54	06:43	05:45	05:17	05:35	06:20	07:11	08:01	07:56	08:29 (9)	08:38	09:28 (8)
18	16:55	17:50	18:41	20:34	21:23	21:58	21:51	21:03	19:54	18:46	16:48	08:30 (9)	16:26	09:29 (8)
19	08:38	07:52	06:51	06:41	05:44	05:17	05:36	06:22	07:12	08:02	07:57	08:31 (9)	08:39	09:30 (8)
20	16:56	17:52	18:42	20:35	21:25	21:59	21:50	21:01	19:52	18:43	16:46	08:32 (9)	16:27	09:31 (8)
21	08:37	07:50	06:49	06:39	05:42	05:17	05:37	06:24	07:14	08:04	07:59	08:33 (9)	08:40	09:32 (8)
22	16:58	17:54	18:44	20:37	21:26	21:59	21:49	20:59	19:50	18:41	16:45	08:34 (9)	16:27	09:33 (8)
23	08:36	07:48	06:47	06:36	05:41	05:17	05:38	06:25	07:15	08:06	08:01	08:35 (9)	08:41	09:34 (8)
24	17:00	17:56	18:46	20:39	21:28	22:00	21:48	20:57	19:47	18:39	16:44	08:36 (9)	16:27	09:35 (8)
25	08:35	07:46	06:45	06:34	05:39	05:17	05:40	06:27	07:17	08:08	08:02	08:37 (9)	08:41	09:36 (8)
26	17:01	17:58	18:48	20:40	21:29	22:00	21:47	20:55	19:45	18:37	16:42	08:38 (9)	16:27	09:37 (8)
27	08:34	07:44	06:42	06:32	05:38	05:17	05:41	06:28	07:19	08:09	08:04	08:38 (9)	08:42	09:38 (8)
28	17:03	17:59	18:49	20:42	21:31	22:00	21:46	20:53	19:43	18:35	16:41	08:39 (9)	16:28	09:39 (8)
29	08:33	07:42	06:40	06:30	05:37	05:18	05:42	06:30	07:20	08:11	08:06	08:40 (9)	08:42	09:40 (8)
30	17:05	18:01	18:51	20:44	21:32	22:01	21:45	20:51	19:40	18:33	16:40	08:41 (9)	16:28	09:41 (8)
31	08:32	07:40	06:38	06:28	05:35	05:18	05:44	06:32	07:22	08:13	08:06	08:42 (9)	08:43	09:42 (8)
32	17:06	18:03	18:53	20:46	21:34	22:01	21:43	20:48	19:38	18:31	16:41	08:43 (9)	16:28	09:43 (8)
33	08:31	07:38	06:35	06:26	05:34	05:18	05:45	06:33	07:24	08:15	08:09	08:44 (9)	08:44	09:44 (8)
34	17:08	18:05	18:54	20:47	21:35	22:01	21:42	20:46	19:36	18:29	16:40	08:45 (9)	16:28	09:45 (8)
35	08:30	07:36	06:33	06:24	05:33	05:18	05:46	06:35	07:25	08:16	08:11	08:45 (9)	08:44	09:46 (8)
36	17:10	18:07	18:56	20:49	21:36	22:01	21:41	20:44	19:33	18:27	16:41	08:46 (9)	16:30	09:47 (8)
37	08:28	07:34	06:31	06:22	05:32	05:19	05:48	06:37	07:27	08:18	08:12	08:46 (9)	08:44	09:48 (8)
38	17:12	18:09	18:58	20:51	21:38	22:01	21:39	20:42	19:31	18:25	16:41	08:47 (9)	16:30	09:49 (8)
39	08:27	07:32	06:28	06:20	05:31	05:19	05:49	06:38	07:29	08:20	08:14	08:47 (9)	08:45	09:50 (8)
40	17:13	18:10	19:00	20:52	21:39	22:01	21:38	20:40	19:29	18:23	16:41	08:48 (9)	16:31	09:51 (8)
41	08:26	07:29	06:26	06:18	05:29	05:19	05:51	06:40	07:30	08:22	08:16	08:48 (9)	08:45	09:52 (8)
42	17:15	18:12	19:01	20:54	21:40	22:01	21:36	20:38	19:26	18:21	16:41	08:49 (9)	16:32	09:53 (8)
43	08:24	07:27	06:24	06:16	05:28	05:20	05:52	06:41	07:32	08:23	08:17	08:49 (9)	08:45	09:54 (8)
44	17:17	18:14	19:03	20:56	21:42	22:01	21:35	20:35	19:24	18:19	16:41	08:50 (9)	16:32	09:55 (8)
45	08:23	07:27	06:24	06:14	05:27	05:20	05:54	06:43	07:34	08:25	08:19	08:50 (9)	08:45	09:56 (8)
46	17:19	18:16	19:05	20:57	21:43	22:01	21:33	20:33	19:22	18:17	16:41	08:51 (9)	16:33	09:57 (8)
47	08:22	07:25	06:22	06:12	05:26	05:21	05:55	06:45	07:35	08:27	08:20	08:51 (9)	08:45	09:58 (8)
48	17:21	18:18	19:07	20:59	21:44	22:01	21:32	20:31	19:19	18:15	16:41	08:52 (9)	16:34	09:59 (8)
49	08:20	07:23	06:20	06:10	05:25	05:20	05:57	06:46	07:37	08:29	08:23	08:52 (9)	08:45	09:59 (8)
50	17:22	18:19	19:08	20:58	21:45	22:01	21:30	20:29	19:17	18:13	16:41	08:53 (9)	16:35	09:59 (8)
51	Potential sun hours	259	278	367	416	485	499	502	454	381	331	266	244	75
52	Total, worst case	359	209									315		1.00
53	Sun reduction	0.16	0.21									0.18		0.13
54	Oper. time red.	1.00	1.00									1.00		1.00
55	Wind dir. red.	0.66	0.69									0.66		0.66
56	Total reduction	0.10	0.14									0.12		0.09
57	Total, real	37	29									38		7

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)



Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:11/3.5.584

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: CX - H102

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45 16:36	08:18 17:24	07:25 18:16	07:14 20:10	06:10 21:00	05:24 21:46	05:21 22:00	05:58 21:28	06:48 20:26	07:37 19:17		16:29 (14) 16:30
2	08:45 16:37	08:17 17:26	07:23 18:17	07:12 20:11	06:08 21:02	05:23 21:47	05:22 22:00	05:59 21:27	06:49 20:24	07:38 19:14	12	16:41 (14) 16:30 (14) 16:30
3	08:45 16:38	08:15 17:28	07:20 18:19	07:10 20:13	06:06 21:04	05:23 21:48	05:23 21:59	06:01 21:25	06:51 20:22	07:40 19:12	9	16:39 (14) 16:35 (14) 16:30
4	08:45 16:39	08:13 17:30	07:18 18:21	07:07 20:15	06:04 21:05	05:22 21:49	05:24 21:59	06:03 21:23	06:52 20:19	07:42 19:10	1	16:36 (14) 16:29
5	08:44 16:41	08:12 17:31	07:16 18:23	07:05 20:16	06:02 21:07	05:21 21:50	05:24 21:58	06:04 21:21	06:54 20:17	07:43 19:08		16:36 (14) 16:29
6	08:44 16:42	08:10 17:33	07:14 18:25	07:03 20:18	06:00 21:09	05:21 21:51	05:25 21:58	06:06 21:20	06:56 20:15	07:45 19:05		16:36 (14) 16:29
7	08:44 16:43	08:08 17:35	07:12 18:26	07:01 20:20	05:58 21:10	05:20 21:52	05:26 21:57	06:07 21:18	06:57 20:13	07:47 19:03		16:36 (14) 16:29
8	08:43 16:44	08:07 17:37	07:09 17:04 (14) 18:28	06:58 20:21	05:57 21:12	05:20 21:53	05:27 21:57	06:09 21:16	06:59 20:10	07:48 19:01		16:36 (14) 16:29
9	08:43 16:46	08:05 17:39	07:07 17:10 (14) 18:30	06:56 20:23	05:55 21:14	05:19 21:54	05:28 21:56	06:10 21:14	07:01 20:08	07:50 18:59		16:36 (14) 16:29
10	08:42 16:47	08:03 17:41	07:05 16:59 (14) 18:32	06:54 20:25	05:53 21:15	05:19 21:55	05:29 21:55	06:12 21:12	07:02 20:06	07:52 18:56		16:36 (14) 16:29
11	08:42 16:49	08:01 17:43	07:03 16:58 (14) 18:33	06:52 20:27	05:51 21:17	05:18 21:56	05:30 21:55	06:14 21:10	07:04 20:03	07:53 18:54		16:36 (14) 16:29
12	08:41 16:50	07:59 17:44	07:00 16:57 (14) 18:35	06:49 20:28	05:50 21:18	05:18 21:56	05:31 21:54	06:15 21:08	07:05 20:01	07:55 18:52		16:36 (14) 16:29
13	08:40 16:52	07:58 17:46	06:58 16:56 (14) 18:37	06:47 20:30	05:48 21:20	05:18 21:57	05:32 21:53	06:17 21:06	07:07 19:59	07:57 18:50		16:36 (14) 16:29
14	08:40 16:53	07:56 17:48	06:56 16:56 (14) 18:39	06:45 20:32	05:47 21:22	05:17 21:57	05:33 21:52	06:18 21:05	07:09 19:56	07:59 18:47		16:36 (14) 16:29
15	08:39 16:55	07:54 17:50	06:53 16:56 (14) 18:40	06:43 20:33	05:45 21:23	05:17 21:58	05:34 21:51	06:20 21:03	07:10 19:54	08:00 18:45		16:36 (14) 16:29
16	08:38 16:56	07:52 17:52	06:51 16:56 (14) 18:42	06:41 20:35	05:44 21:25	05:17 21:59	05:36 21:50	06:22 21:01	07:12 19:52	08:02 18:43		16:36 (14) 16:29
17	08:37 16:58	07:50 17:54	06:49 16:57 (14) 18:44	06:38 20:37	05:42 21:26	05:17 21:59	05:37 21:49	06:23 20:58	07:14 19:49	08:04 18:41		16:36 (14) 16:29
18	08:36 16:59	07:48 17:56	06:47 16:58 (14) 18:46	06:36 20:38	05:41 21:28	05:17 21:59	05:38 21:48	06:25 20:56	07:15 19:47	08:05 18:39		16:36 (14) 16:29
19	08:35 17:01	07:46 17:57	06:44 16:59 (14) 18:47	06:34 20:40	05:39 21:29	05:17 22:00	05:39 21:47	06:26 20:54	07:17 19:45	08:07 18:37		16:36 (14) 16:29
20	08:34 17:03	07:44 17:59	06:42 17:00 (14) 18:49	06:32 20:42	05:38 21:31	05:17 22:00	05:41 21:45	06:28 20:52	07:18 19:42	08:09 18:35		16:36 (14) 16:29
21	08:33 17:04	07:42 18:01	06:40 17:03 (14) 18:51	06:30 20:44	05:36 21:32	05:17 22:00	05:42 21:44	06:30 20:50	07:20 19:40	08:11 18:32		16:36 (14) 16:29
22	08:32 17:06	07:40 18:03	06:37 16:57 (14) 18:52	06:28 20:45	05:35 21:33	05:17 22:01	05:43 21:43	06:31 20:48	07:22 19:38	08:12 18:30		16:36 (14) 16:29
23	08:31 17:08	07:38 18:05	06:35 18:54 20:47	06:26 20:47	05:34 21:35	05:18 22:01	05:45 21:42	06:33 20:46	07:23 19:35	08:14 18:28		16:36 (14) 16:29
24	08:29 17:10	07:36 18:07	06:33 18:56 20:49	06:24 20:49	05:33 21:36	05:18 22:01	05:46 21:40	06:35 20:44	07:25 19:33	08:16 18:26		16:36 (14) 16:29
25	08:28 17:11	07:33 18:08	06:30 18:58 20:50	06:21 20:50	05:31 21:38	05:18 22:01	05:48 21:39	06:36 20:42	07:27 19:31	08:12 17:24		16:36 (14) 16:30
26	08:27 17:13	07:31 18:10	06:28 18:59 20:52	06:19 20:52	05:30 21:39	05:19 22:01	05:49 21:37	06:38 20:39	07:28 19:28	08:14 17:22		16:36 (14) 16:31
27	08:25 17:15	07:29 18:12	06:26 19:01 20:54	06:17 20:54	05:29 21:40	05:19 22:01	05:50 21:36	06:39 20:37	07:30 19:26	08:15 17:20		16:36 (14) 16:31
28	08:24 17:17	07:27 18:14	06:23 19:03 20:55	06:15 20:55	05:28 21:41	05:20 22:01	05:52 21:35	06:41 20:35	07:32 19:24	08:17 17:18		16:36 (14) 16:33
29	08:23 17:18	07:27 18:14	06:23 19:03 20:55	06:15 20:55	05:28 21:41	05:20 22:01	05:52 21:35	06:41 20:35	07:32 19:24	08:17 17:18		16:36 (14) 16:33
30	08:21 17:20	07:27 18:14	06:23 19:03 20:55	06:15 20:55	05:28 21:41	05:20 22:01	05:52 21:35	06:41 20:35	07:32 19:24	08:17 17:18		16:36 (14) 16:33
31	08:20 17:22	07:27 18:14	06:23 19:03 20:55	06:15 20:55	05:28 21:41	05:20 22:01	05:52 21:35	06:41 20:35	07:32 19:24	08:17 17:18		16:36 (14) 16:33
Potential sun hours	259	278	367	416	485	499	502	454	381	331		244
Total, worst case		198								171		22
Sun reduction		0.21								0.24		0.18
Oper. time red.		1.00								1.00		1.00
Wind dir. red.		0.63								0.63		0.63
Total reduction		0.13								0.15		0.12
Total, real		26								26		3

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)



SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: CY - H103

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

Table layout: For each day in each month the following matrix apply

Matrix defining day in month, sun rise/set times, minutes with flicker, and first/last times with flicker.

SHADOW - Calendar

Calculation: Specimen Turbine Shadow receptor: DA - H105

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main data table with columns for months (January-December) and rows for each day (1-31) showing sun rise/set times and reduction percentages.

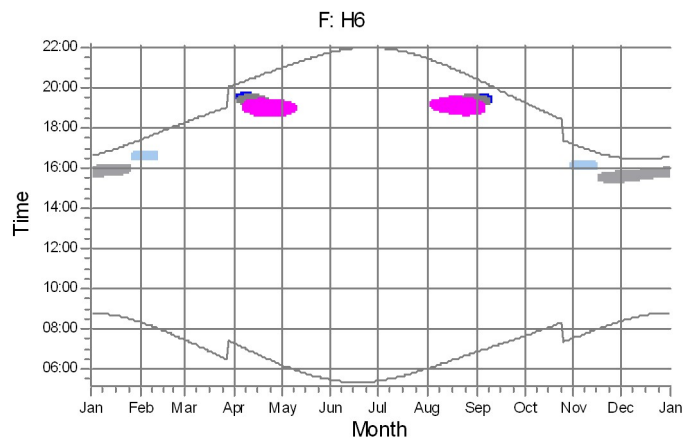
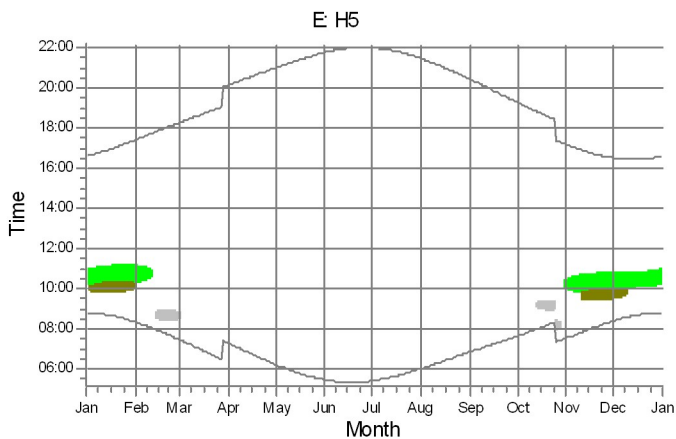
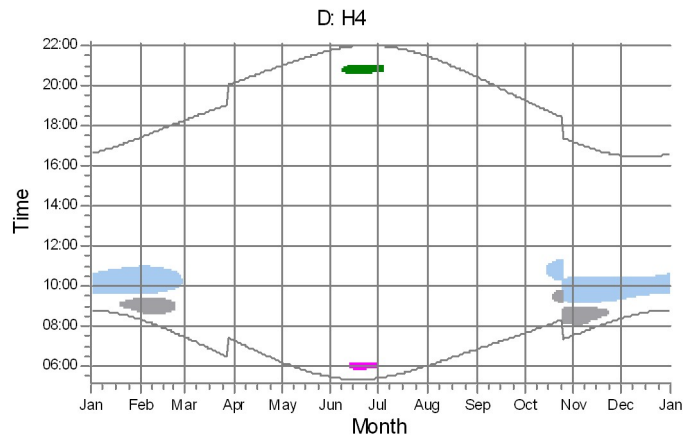
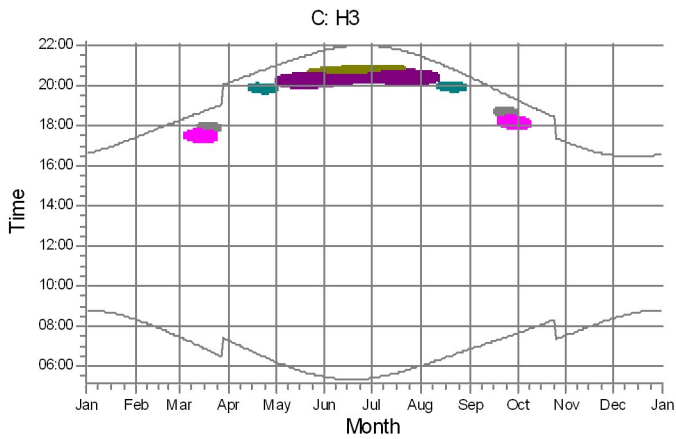
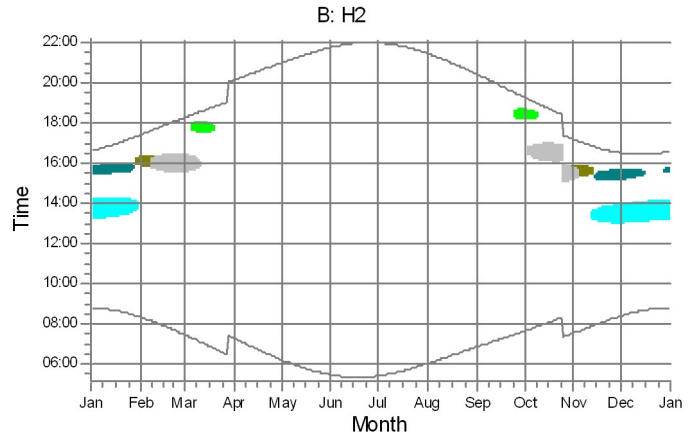
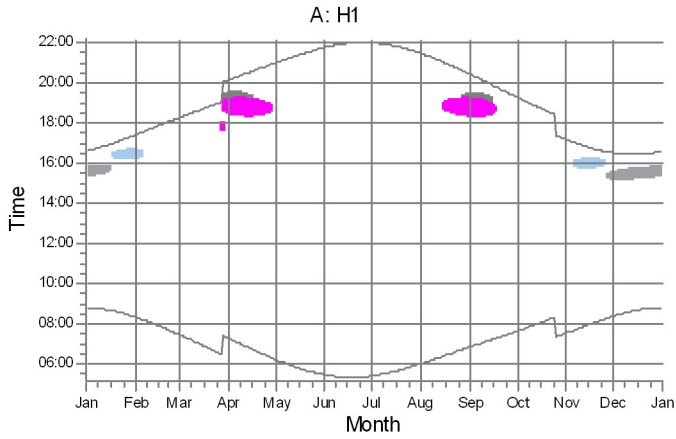
Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), Minutes with flicker, First time (hh:mm) with flicker, Last time (hh:mm) with flicker, (WTG causing flicker first time), (WTG causing flicker last time)



SHADOW - Calendar, graphical

Calculation: Specimen Turbine

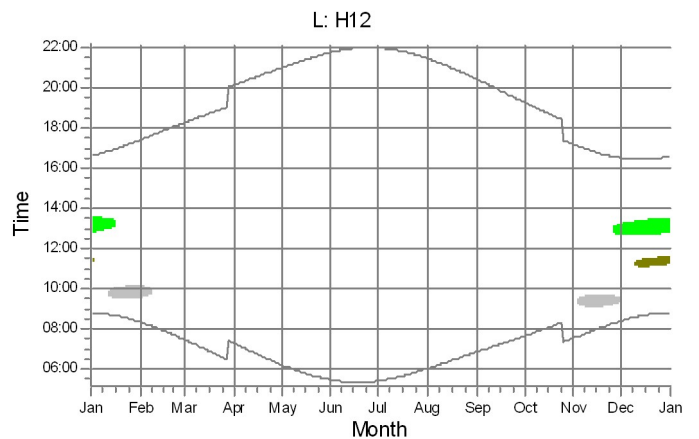
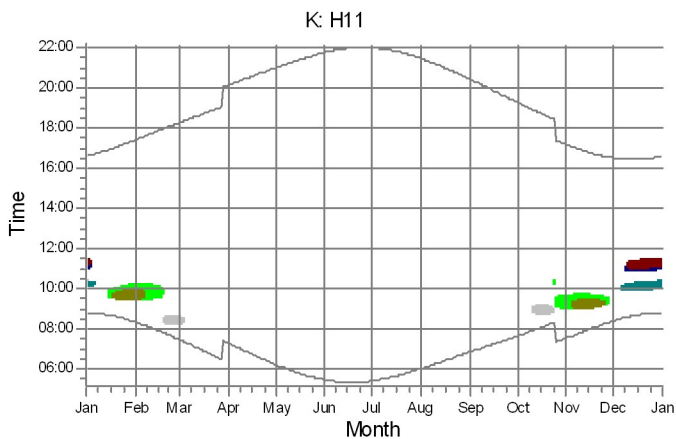
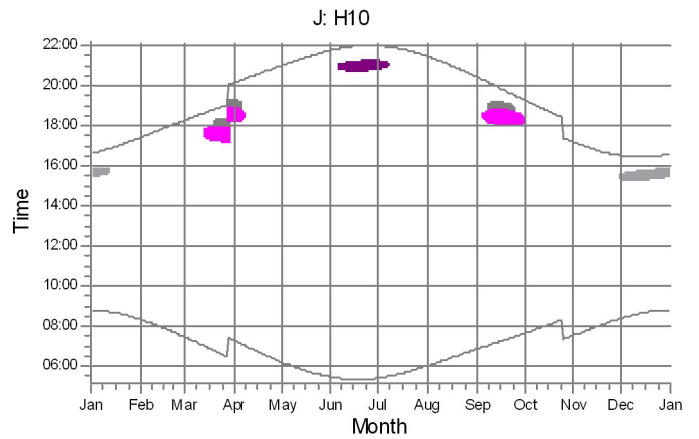
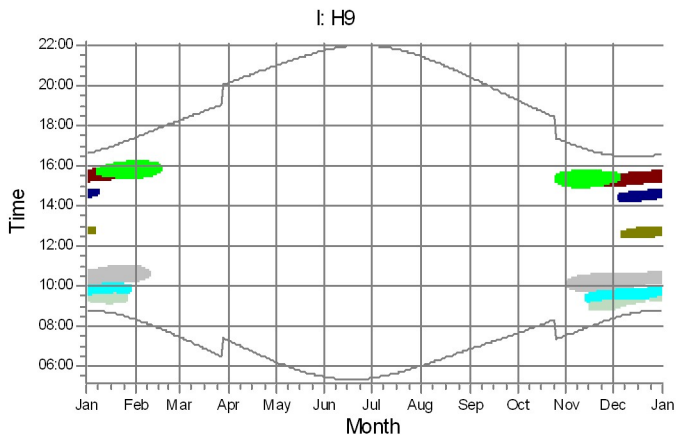
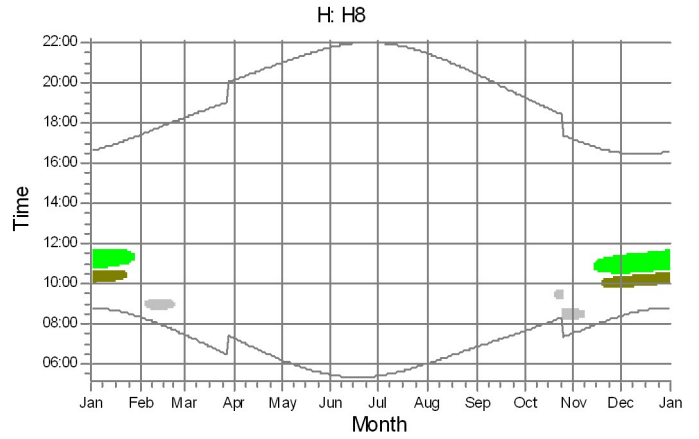
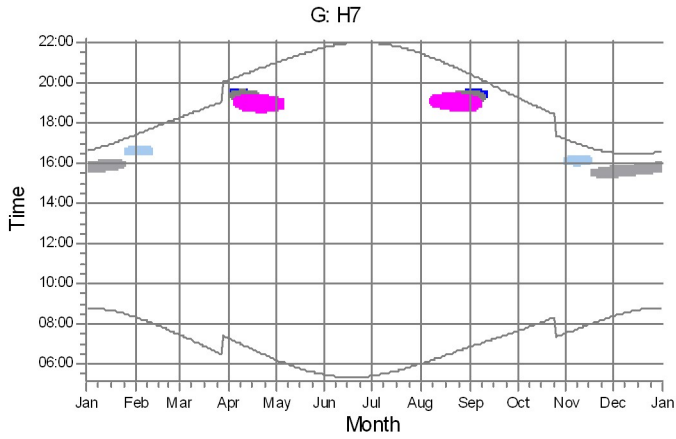


WTGs




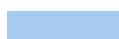










	1: T1		5: T5		10: T10		13: T13
	3: T3		6: T6		11: T11		15: Derragh
	4: T4		9: T9		12: T12		16: Derragh

SHADOW - Calendar, graphical

Calculation: Specimen Turbine

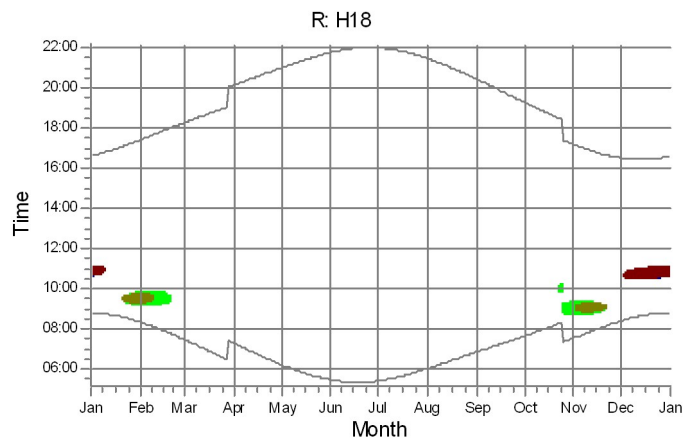
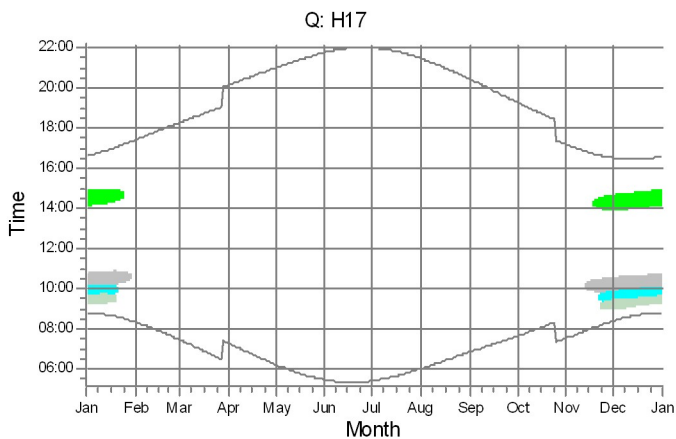
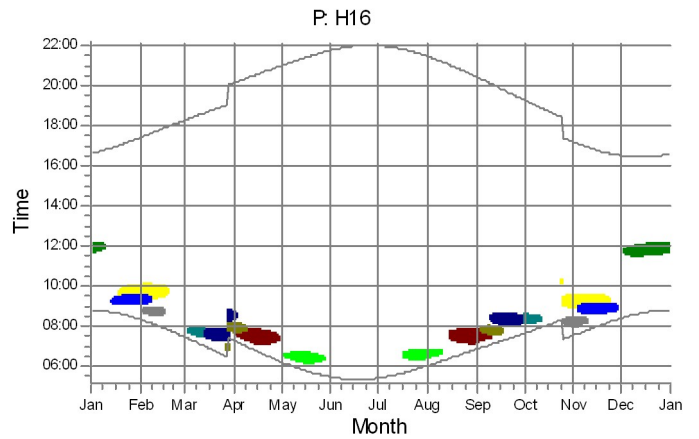
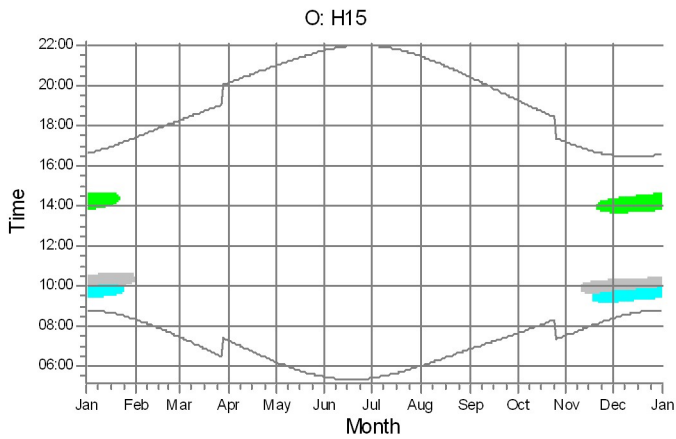
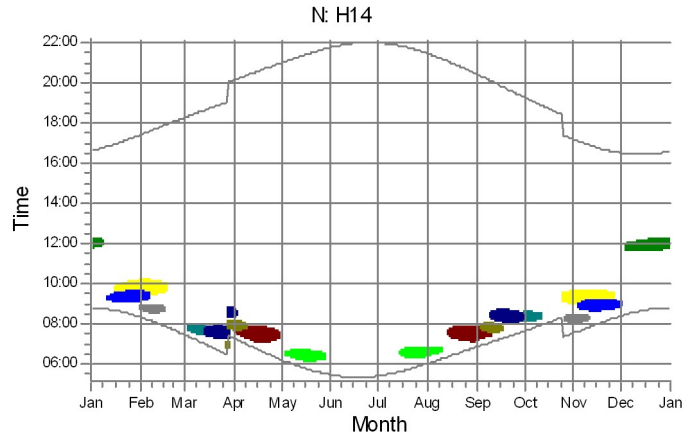
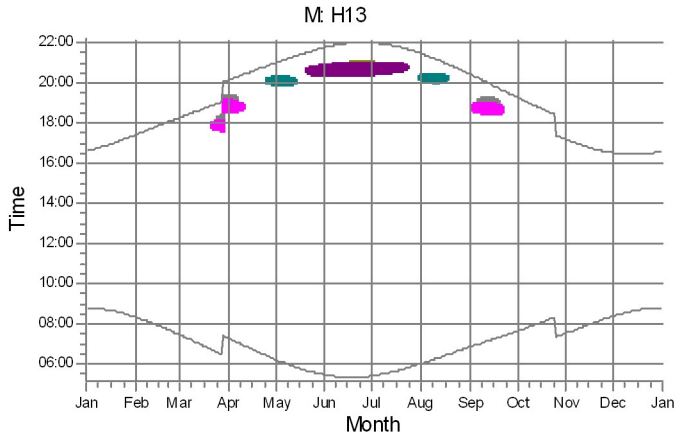


WTGs















 3: T3	 7: T7	 11: T11	 15: Derragh
 4: T4	 8: T8	 12: T12	 16: Derragh
 5: T5	 9: T9	 13: T13	
 6: T6	 10: T10	 14: T14	

SHADOW - Calendar, graphical

Calculation: Specimen Turbine

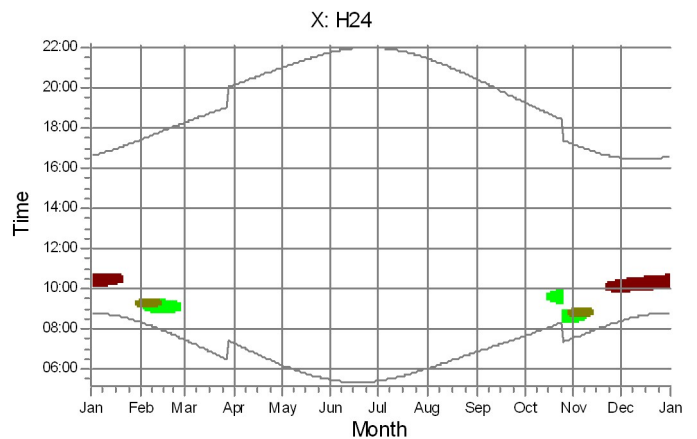
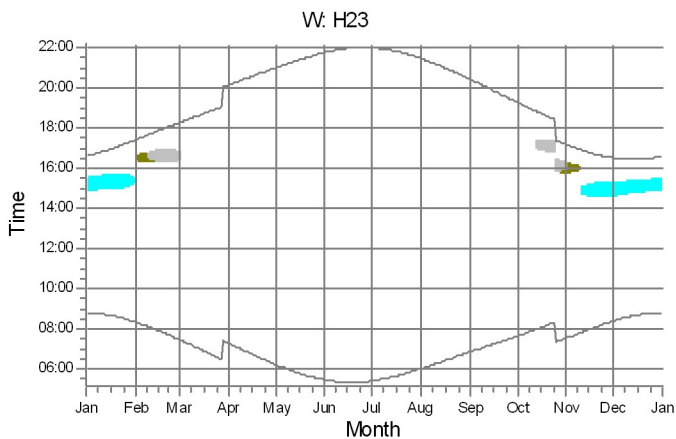
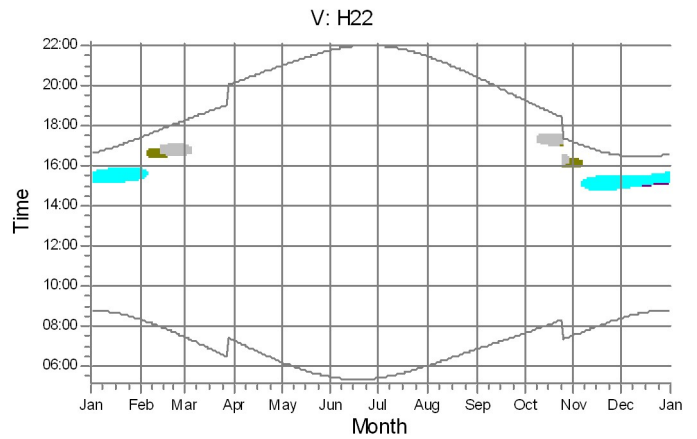
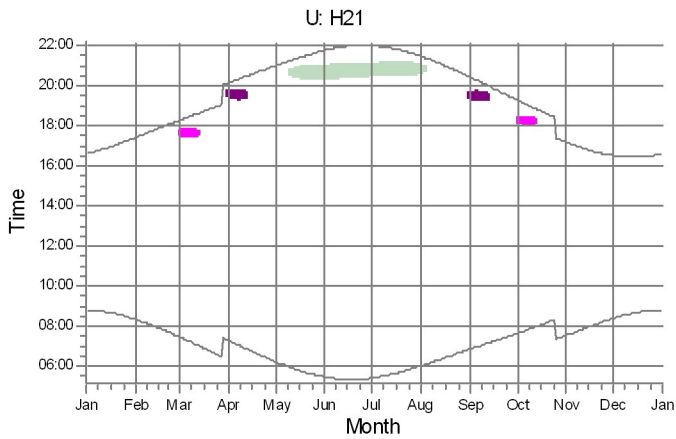
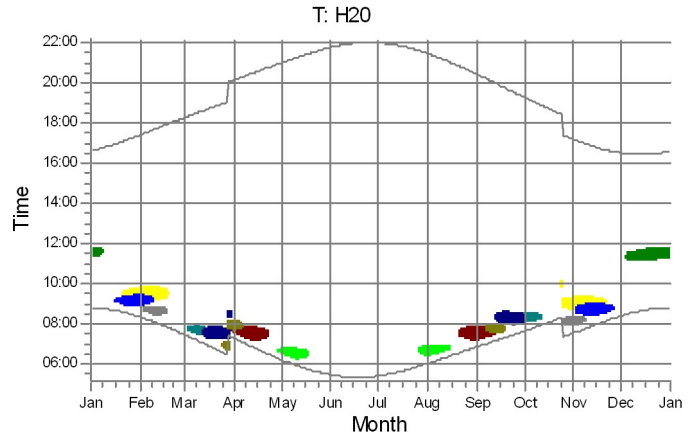
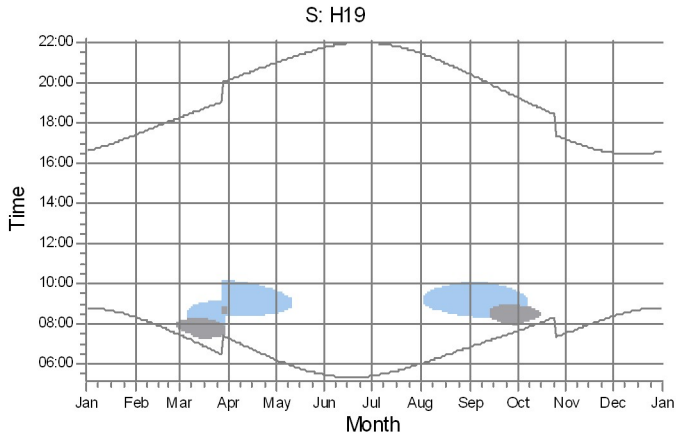


WTGs

	1: T1		5: T5		9: T9		13: T13
	2: T2		6: T6		10: T10		14: T14
	3: T3		7: T7		11: T11		
	4: T4		8: T8		12: T12		

SHADOW - Calendar, graphical

Calculation: Specimen Turbine

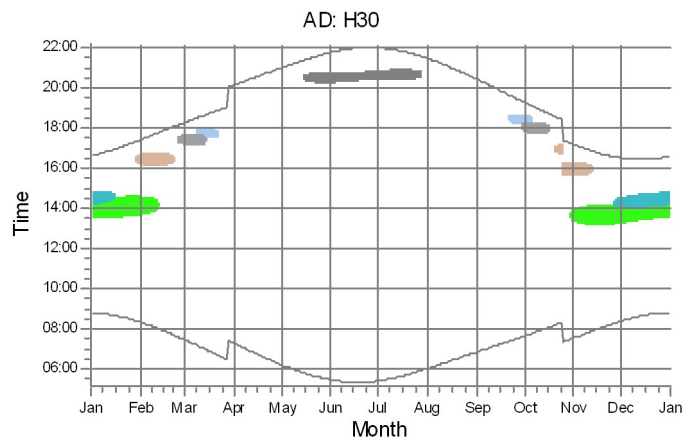
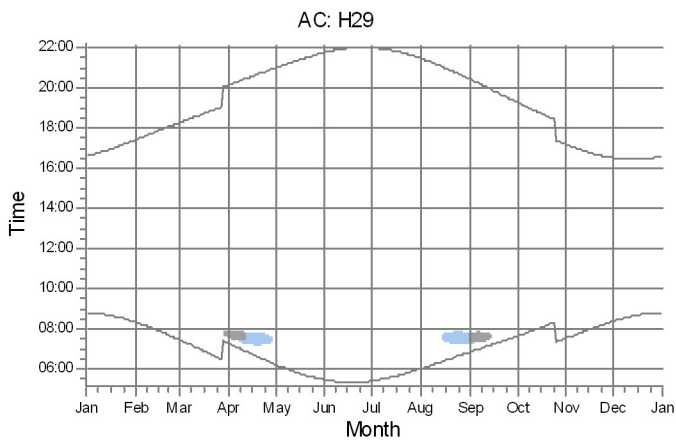
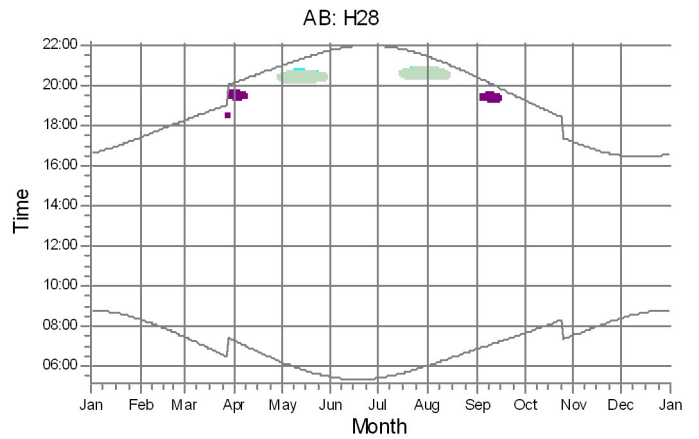
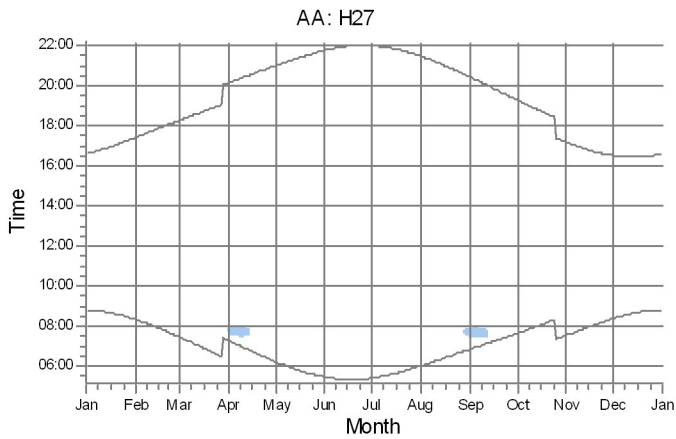
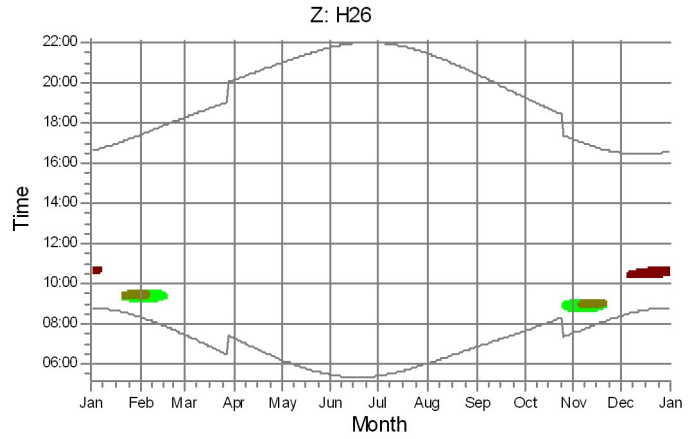
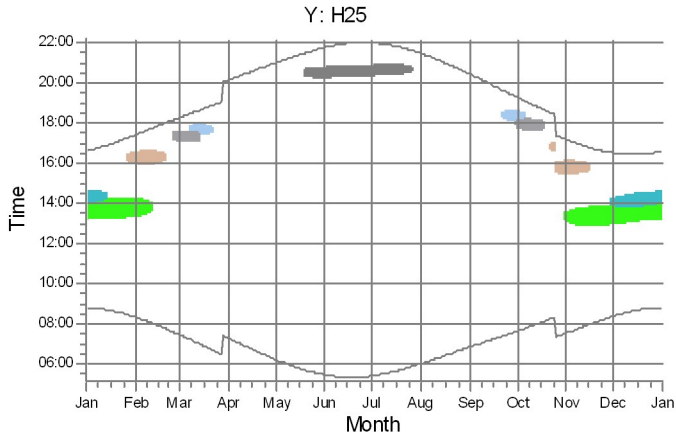


WTGs



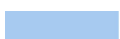










	1: T1		5: T5		9: T9		13: T13
	2: T2		6: T6		10: T10		14: T14
	3: T3		7: T7		11: T11		15: Derragh
	4: T4		8: T8		12: T12		16: Derragh

SHADOW - Calendar, graphical

Calculation: Specimen Turbine

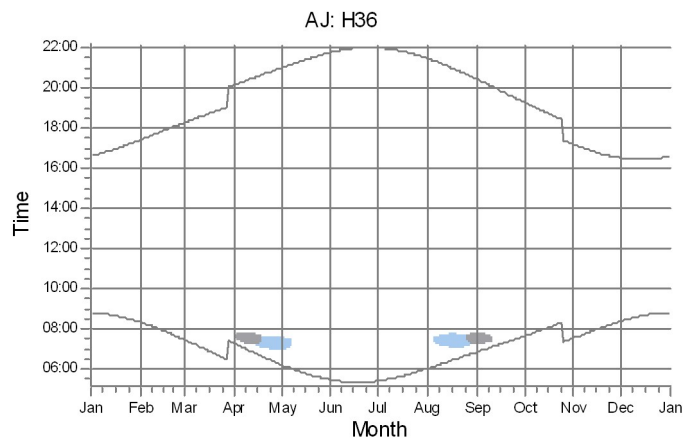
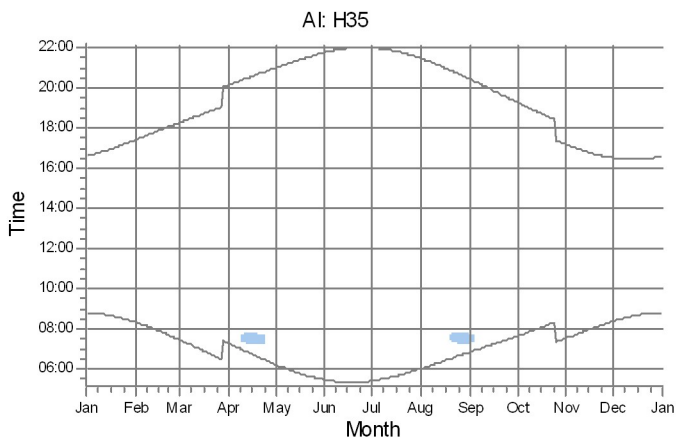
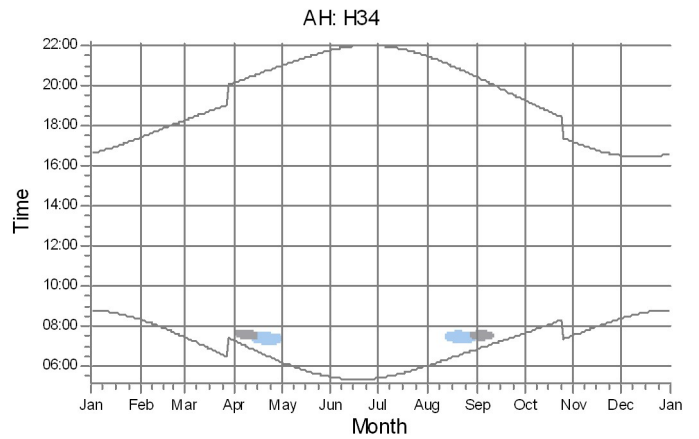
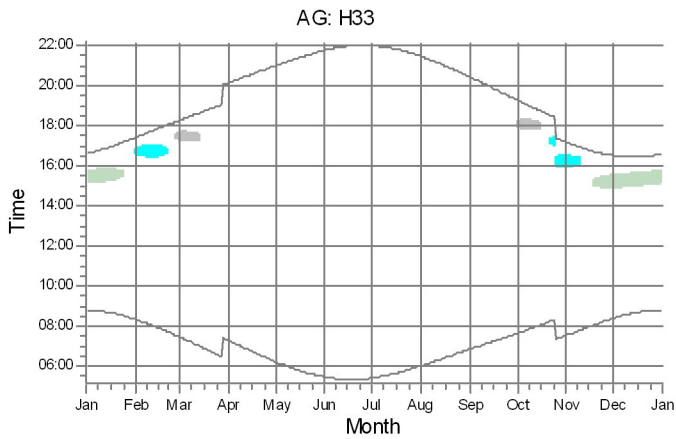
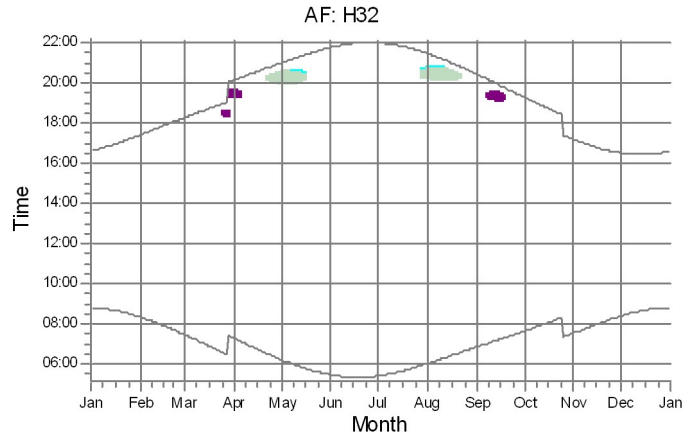
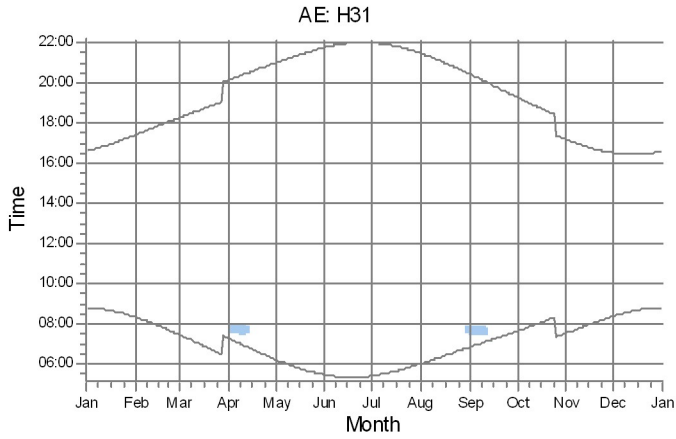


WTGs



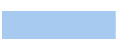



 4: T4	 10: T10	 15: Derragh	 19: Derragh
 7: T7	 11: T11	 16: Derragh	
 8: T8	 13: T13	 17: Derragh	
 9: T9	 14: T14	 18: Derragh	

SHADOW - Calendar, graphical

Calculation: Specimen Turbine

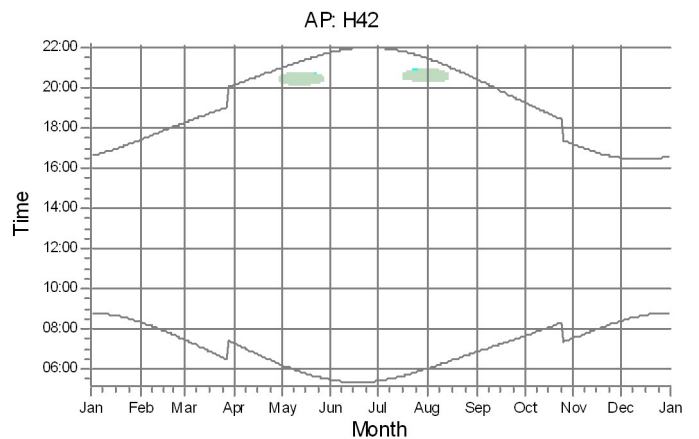
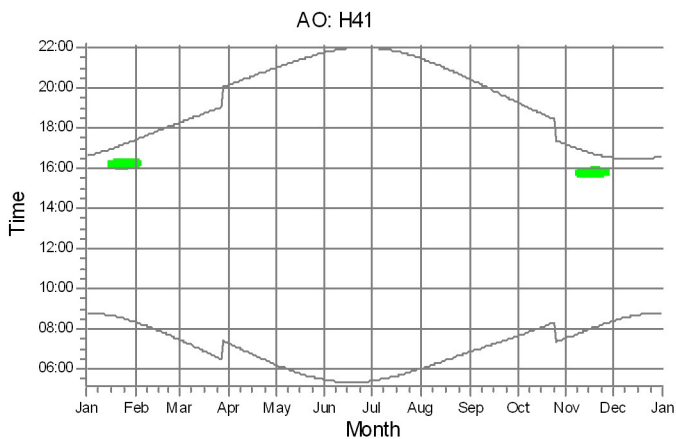
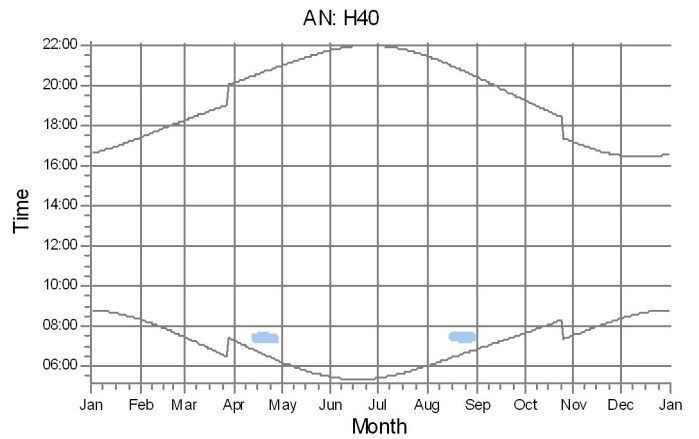
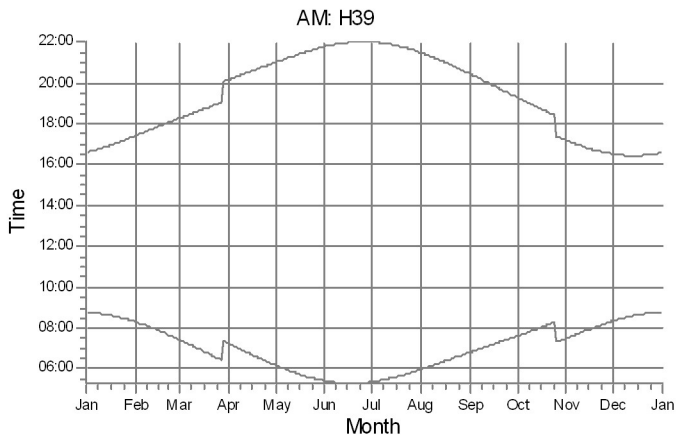
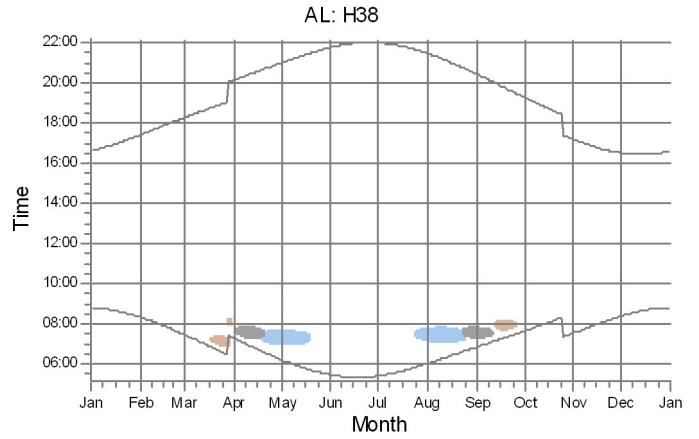
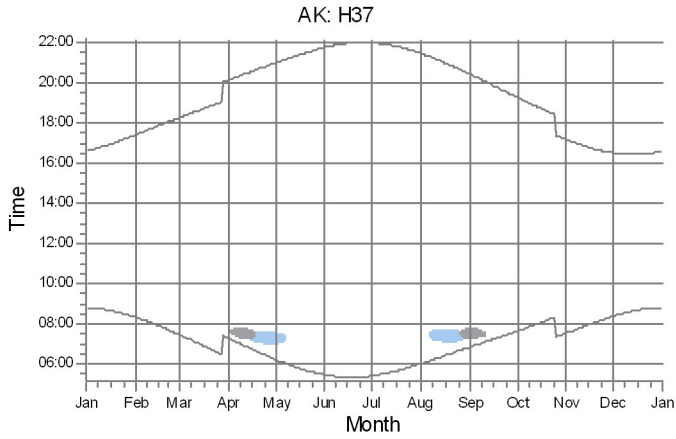


WTGs

	11: T11		13: T13		15: Derragh
	12: T12		14: T14		16: Derragh

SHADOW - Calendar, graphical

Calculation: Specimen Turbine

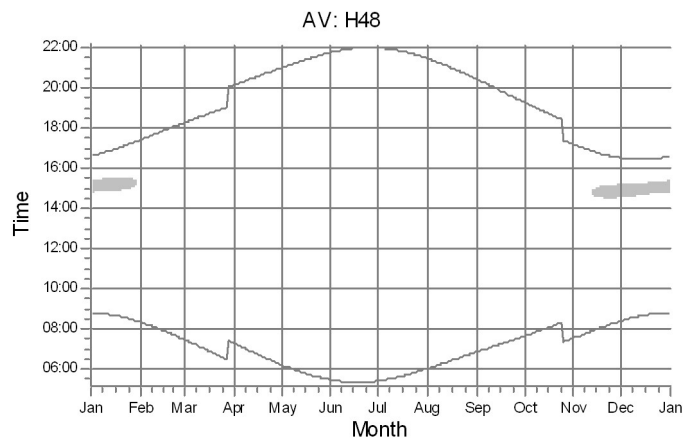
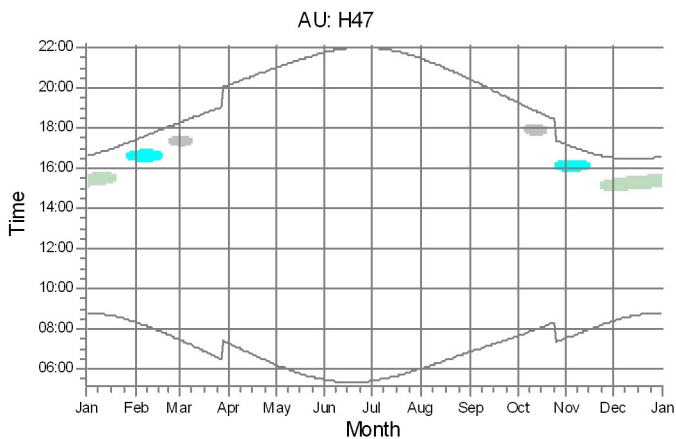
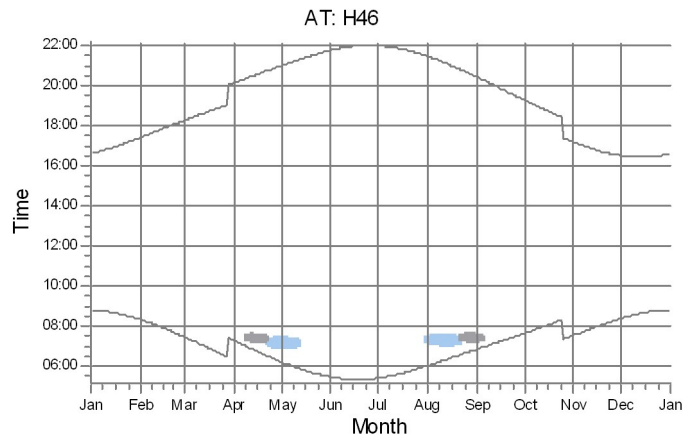
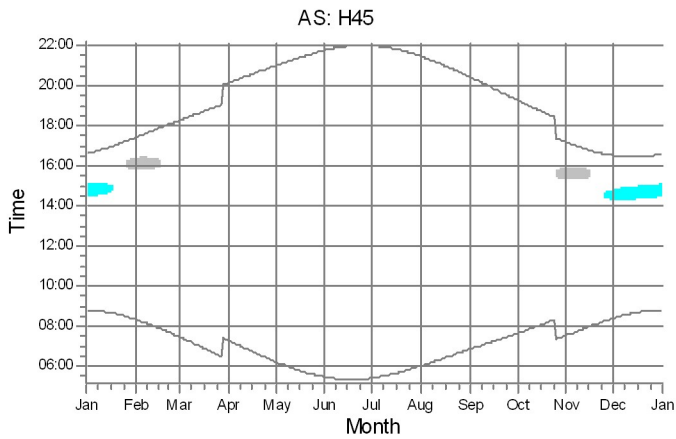
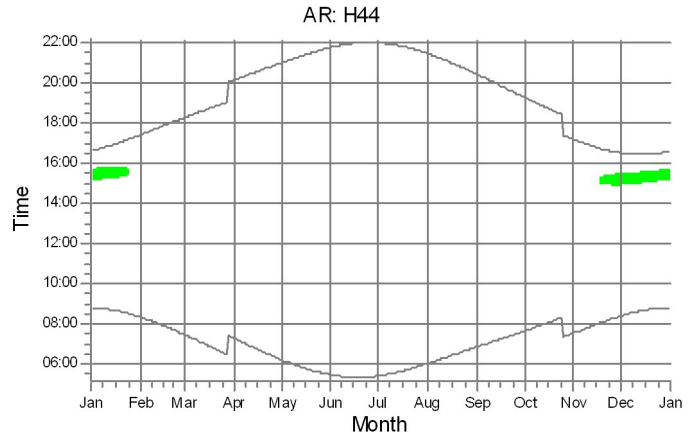
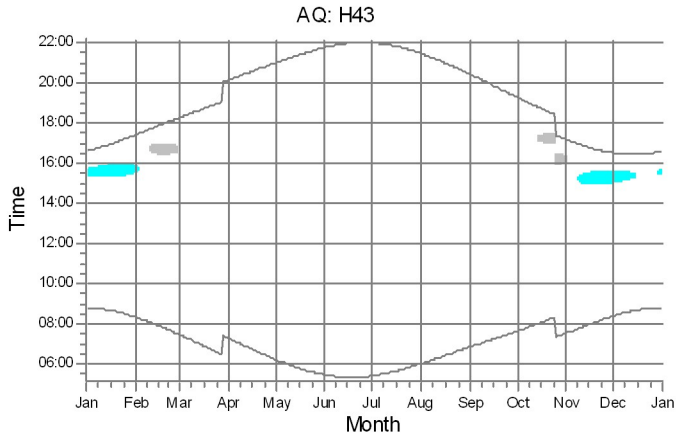


WTGs



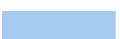



	9: T9		14: T14		16: Derragh
	13: T13		15: Derragh		17: Derragh

SHADOW - Calendar, graphical

Calculation: Specimen Turbine

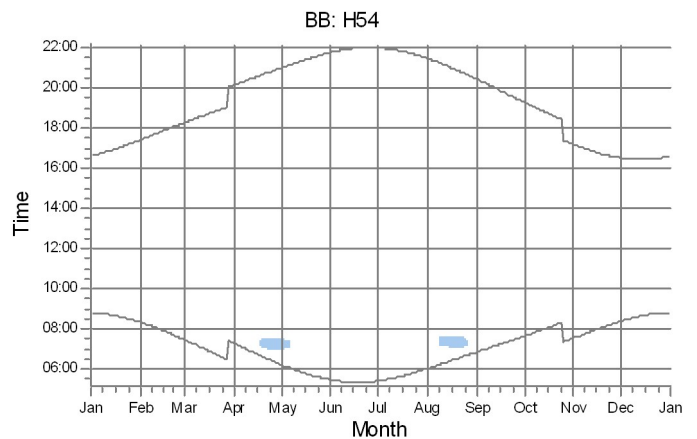
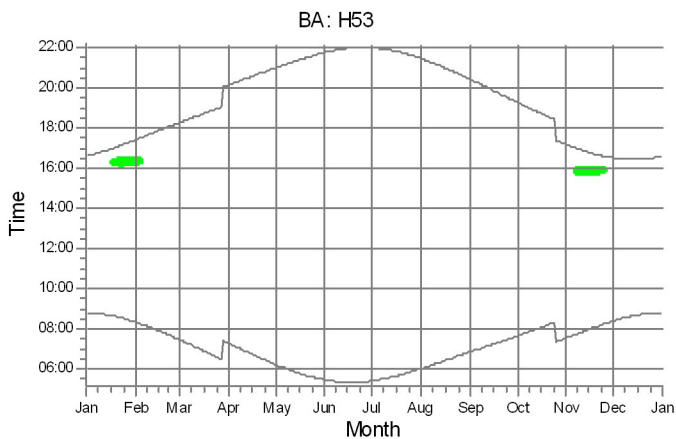
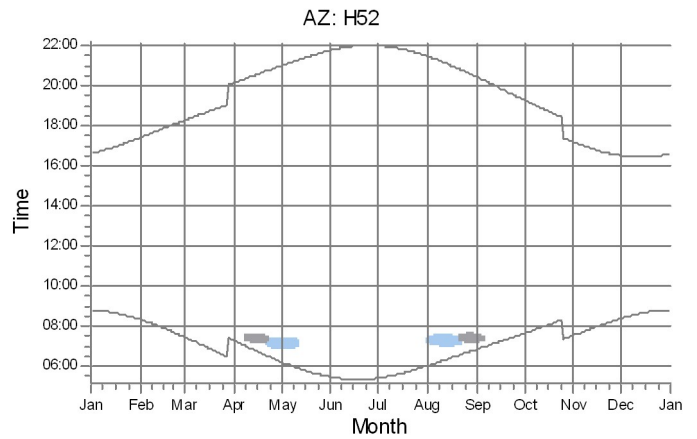
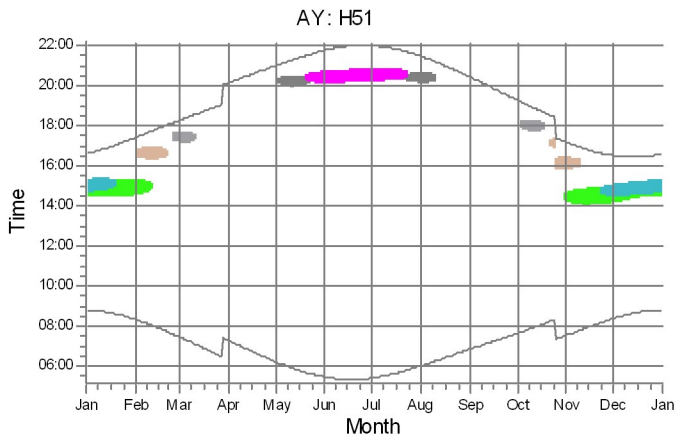
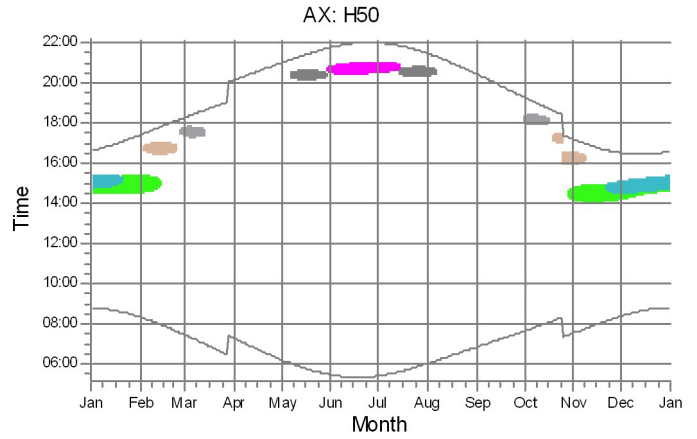
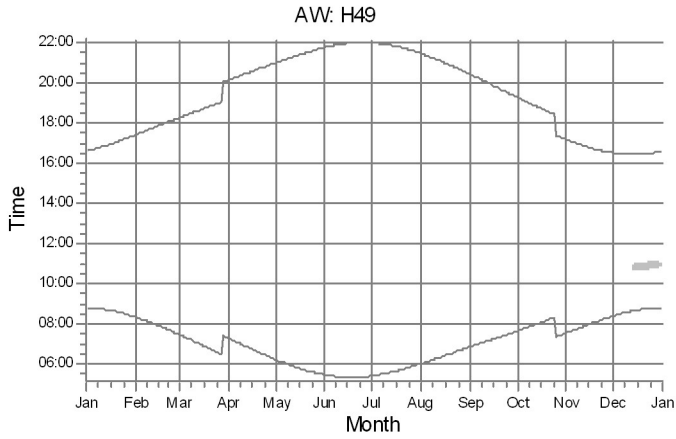


WTGs





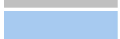




	9: T9		13: T13		15: Derragh
	12: T12		14: T14		16: Derragh

SHADOW - Calendar, graphical

Calculation: Specimen Turbine

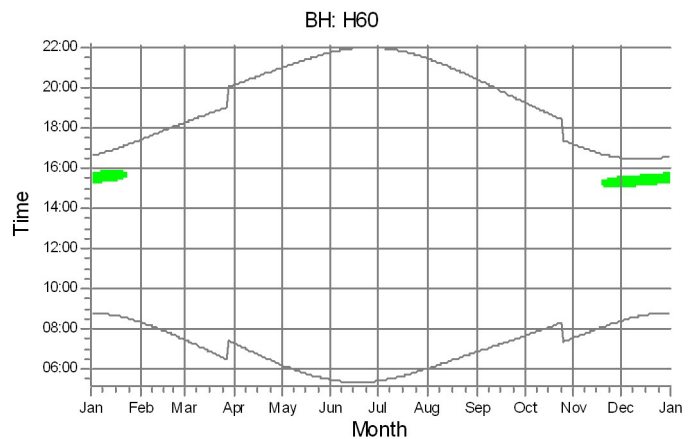
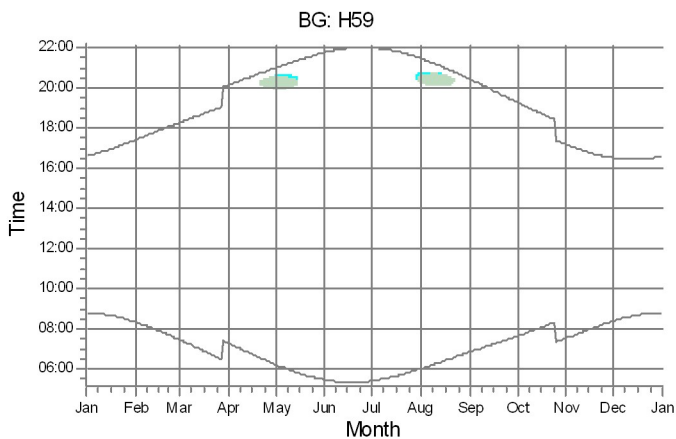
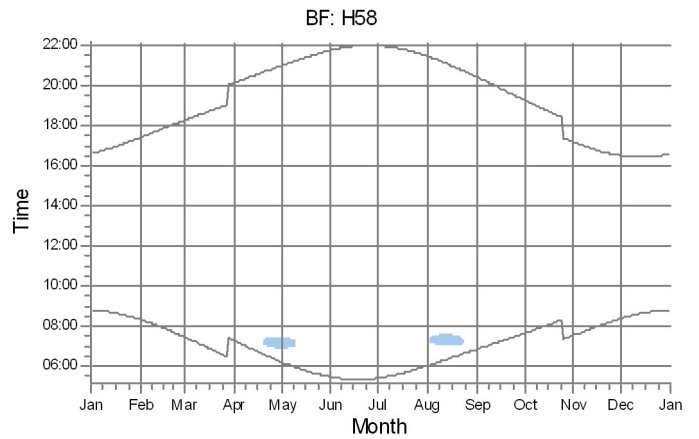
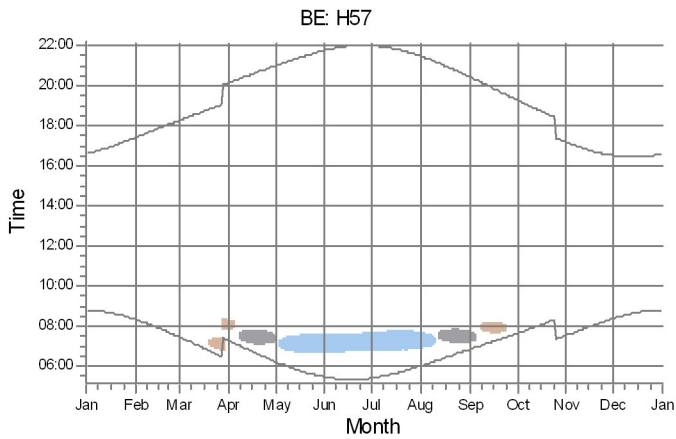
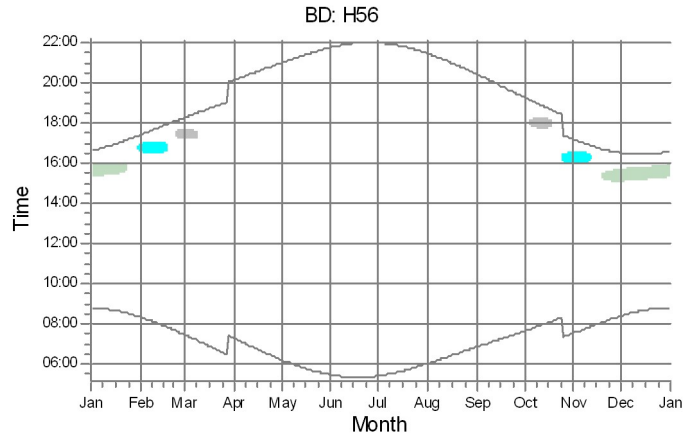
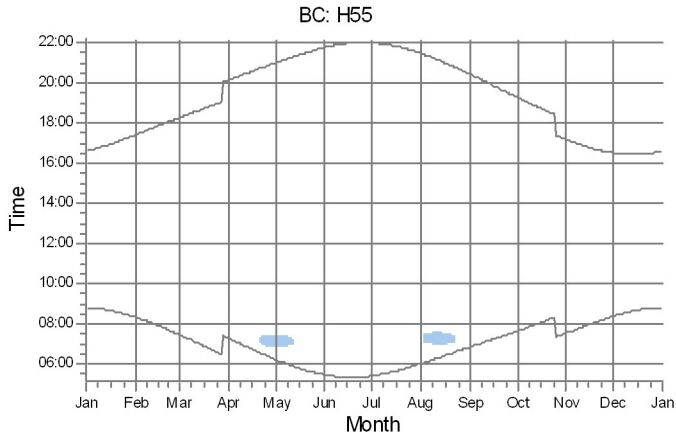


WTGs

	4: T4		12: T12		17: Derragh
	5: T5		15: Derragh		18: Derragh
	9: T9		16: Derragh		19: Derragh

SHADOW - Calendar, graphical

Calculation: Specimen Turbine

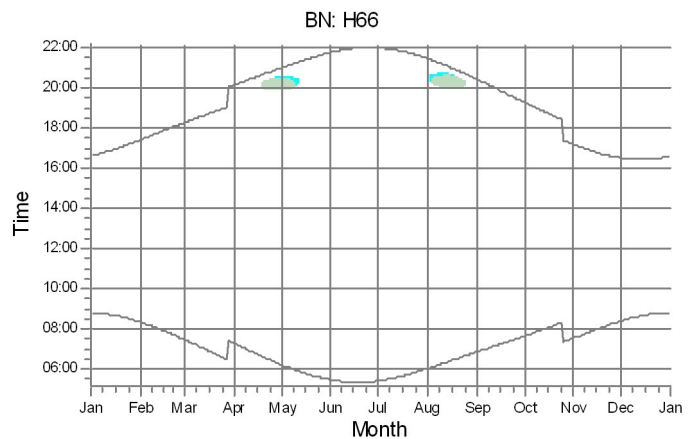
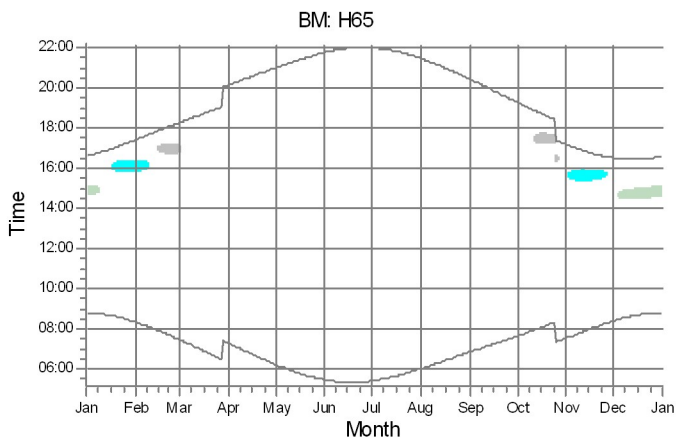
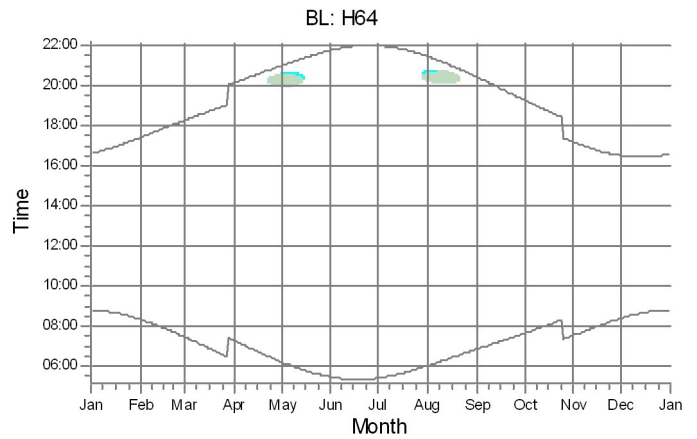
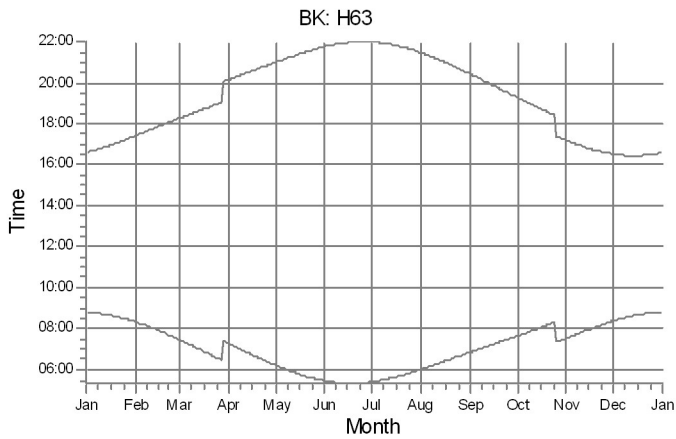
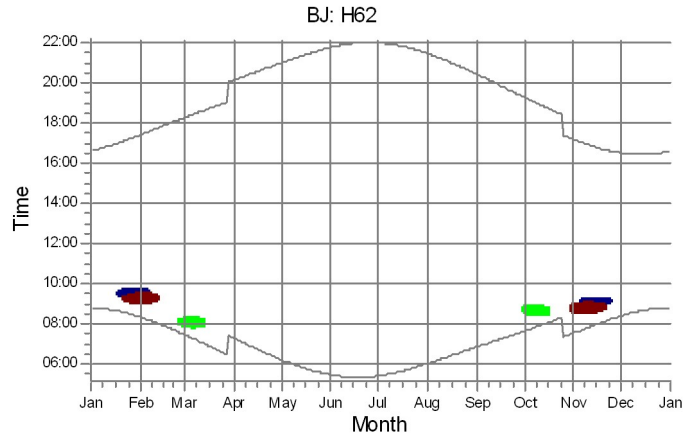
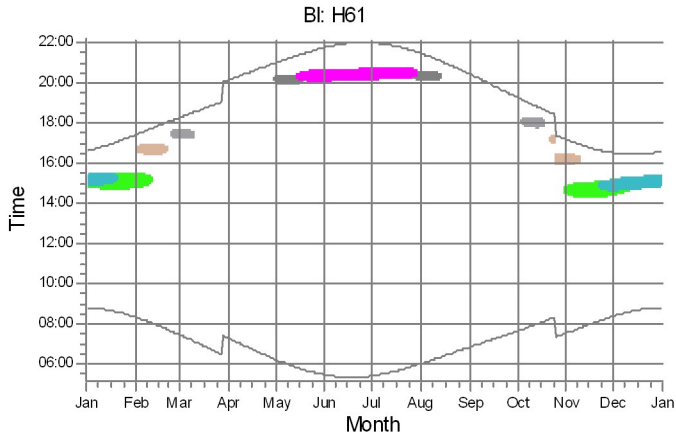


WTGs



SHADOW - Calendar, graphical

Calculation: Specimen Turbine

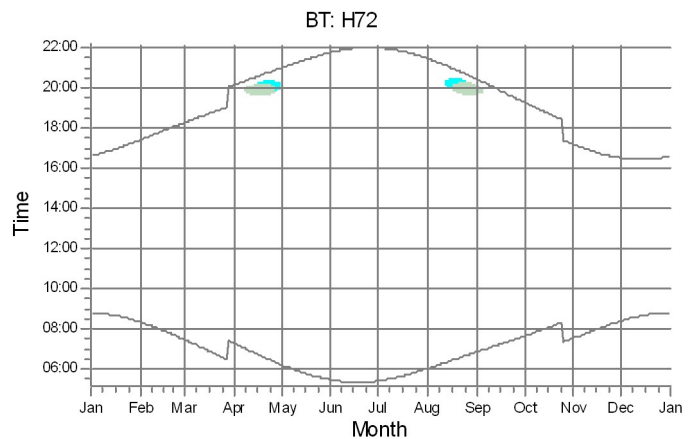
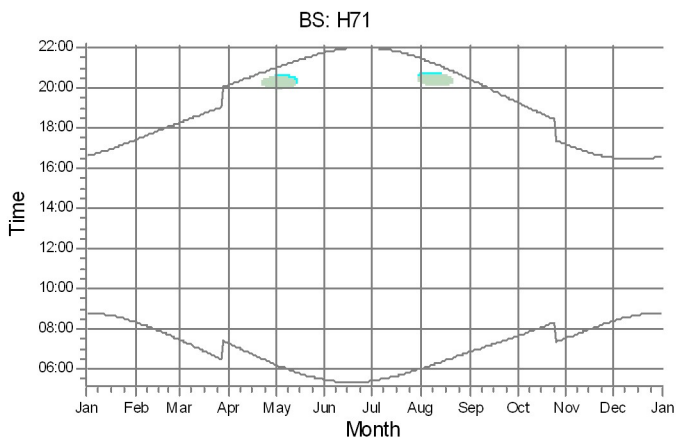
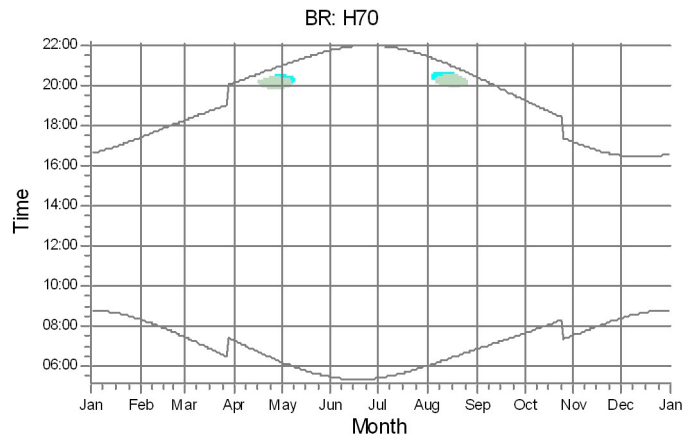
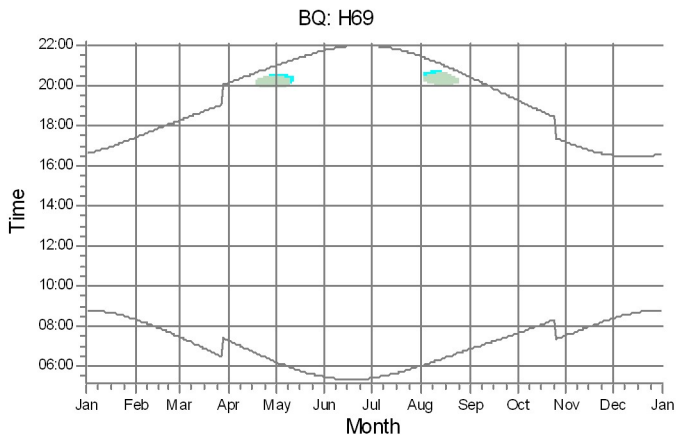
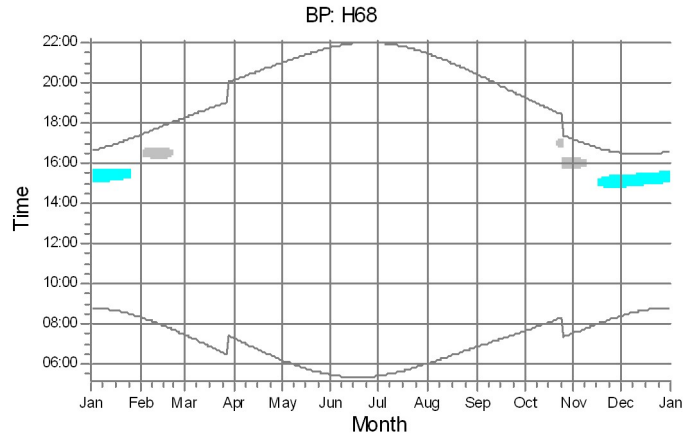
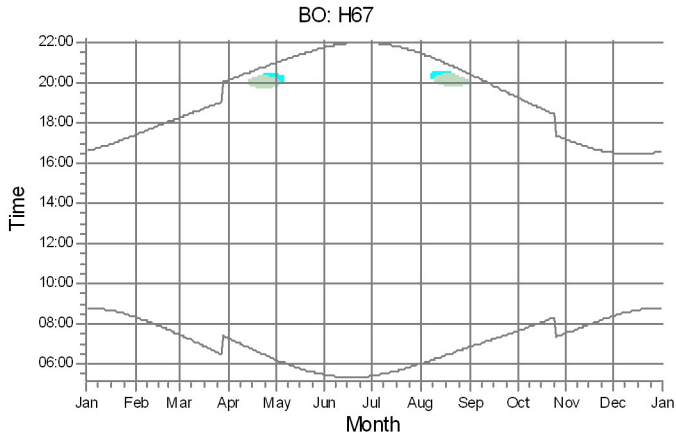


WTGs

 4: T4	 8: T8	 13: T13	 17: Derragh
 5: T5	 9: T9	 14: T14	 18: Derragh
 7: T7	 12: T12	 16: Derragh	 19: Derragh

SHADOW - Calendar, graphical

Calculation: Specimen Turbine

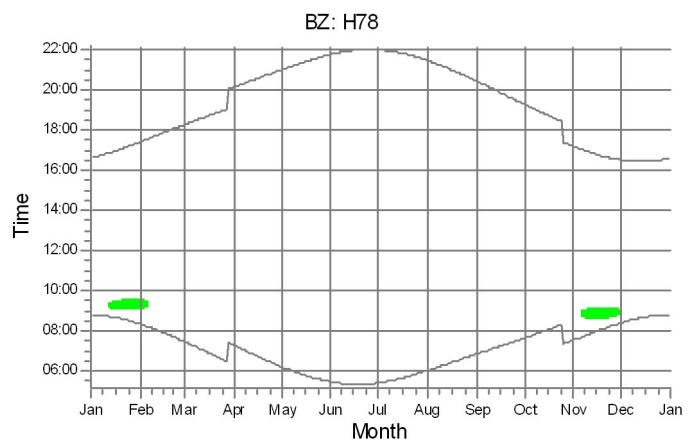
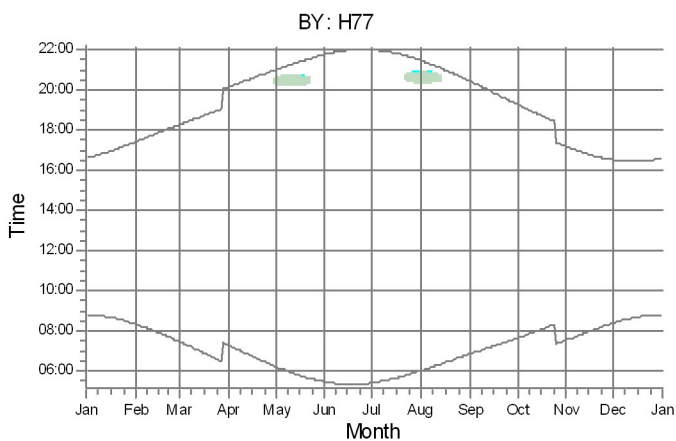
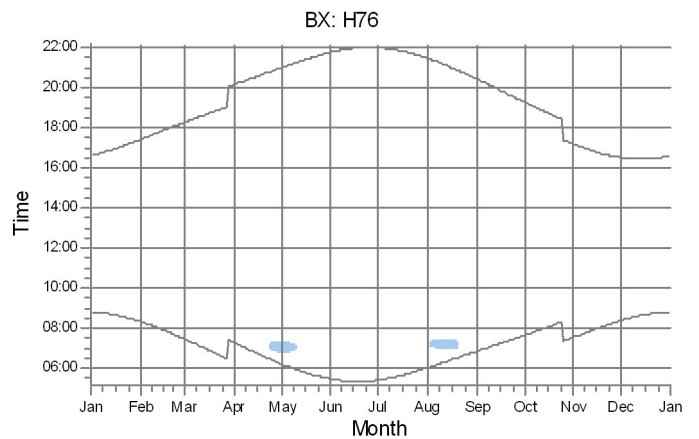
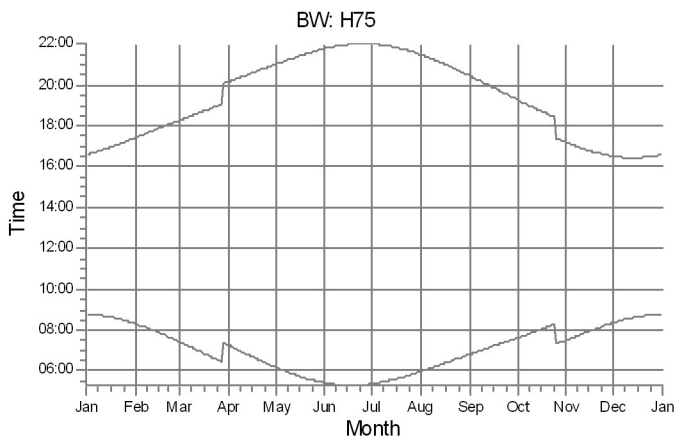
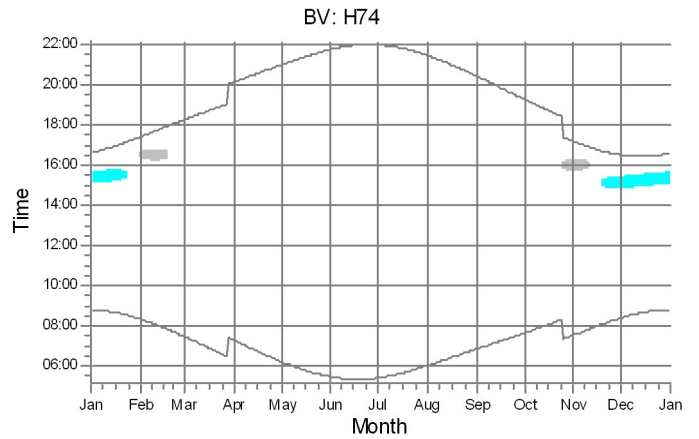
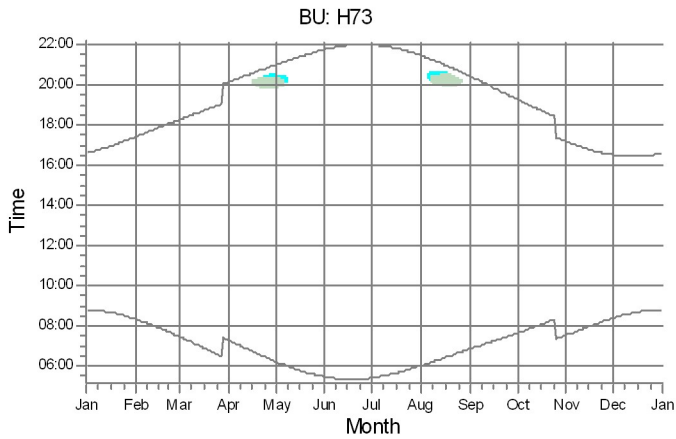


WTGs



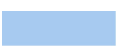




SHADOW - Calendar, graphical

Calculation: Specimen Turbine

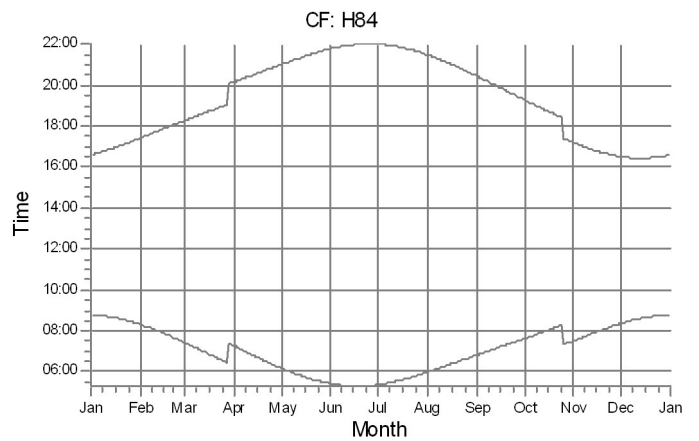
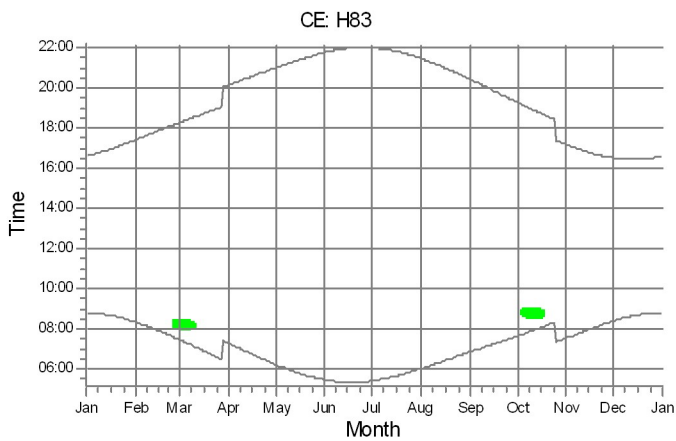
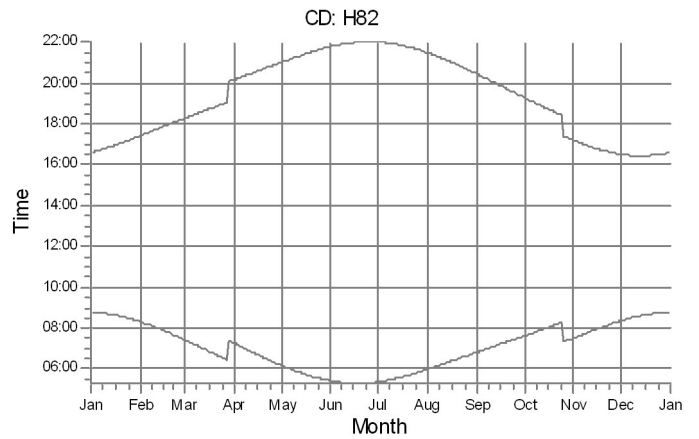
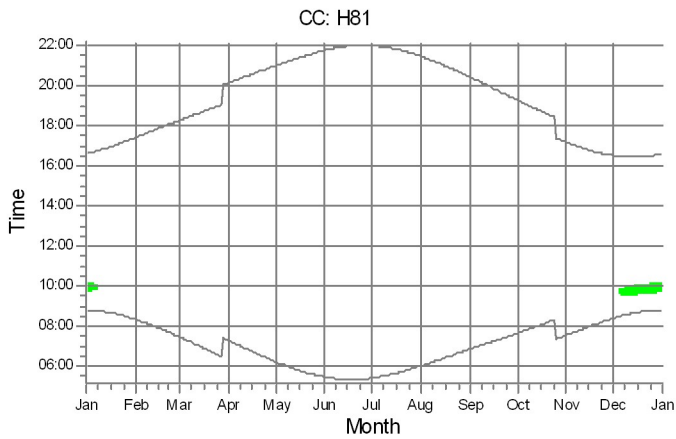
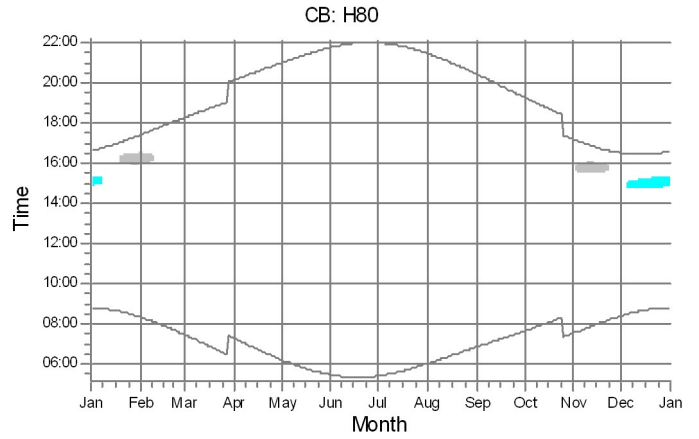
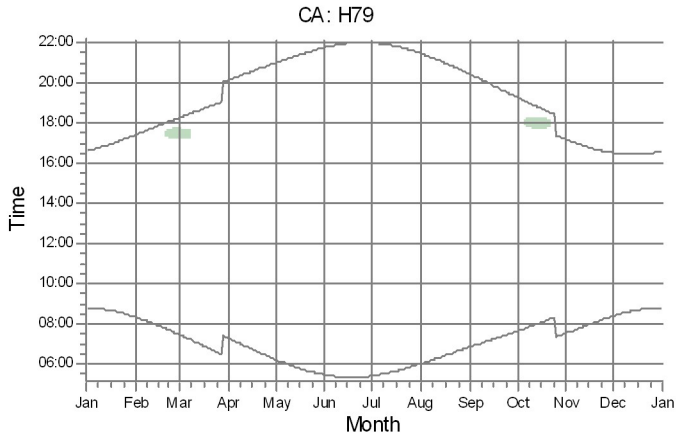


WTGs

	9: T9		13: T13		15: Derragh
	12: T12		14: T14		

SHADOW - Calendar, graphical

Calculation: Specimen Turbine

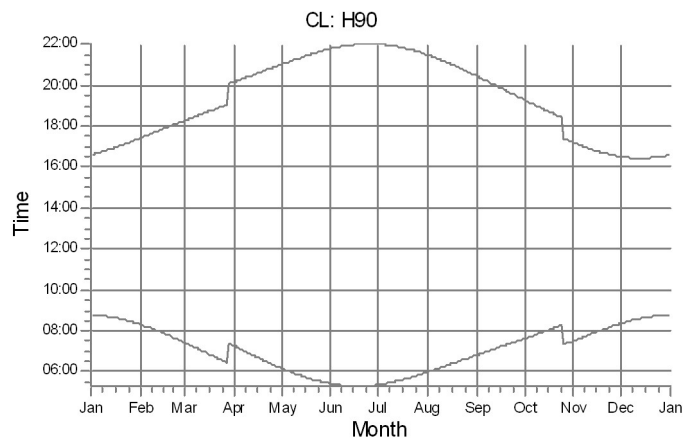
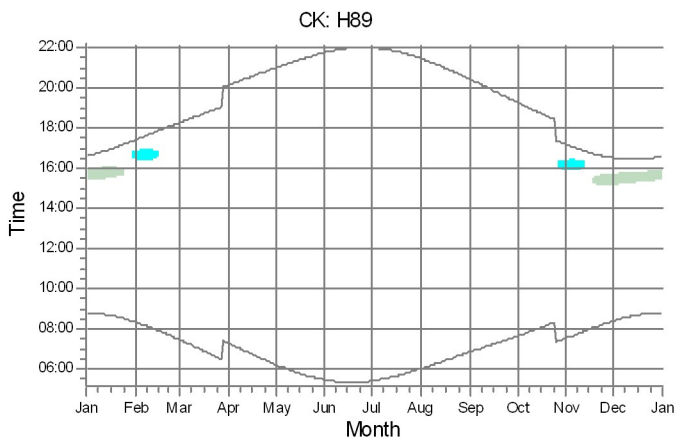
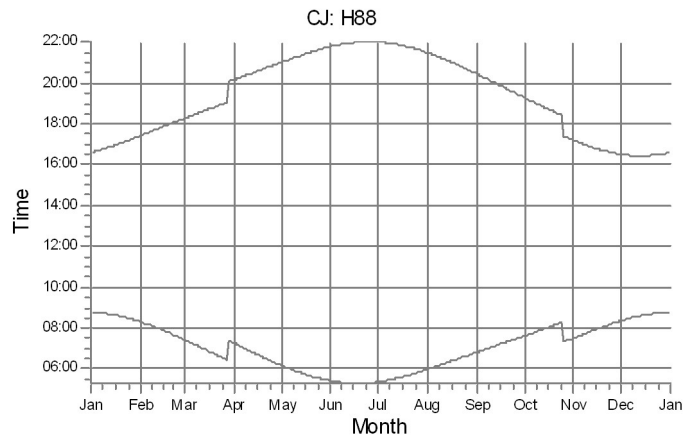
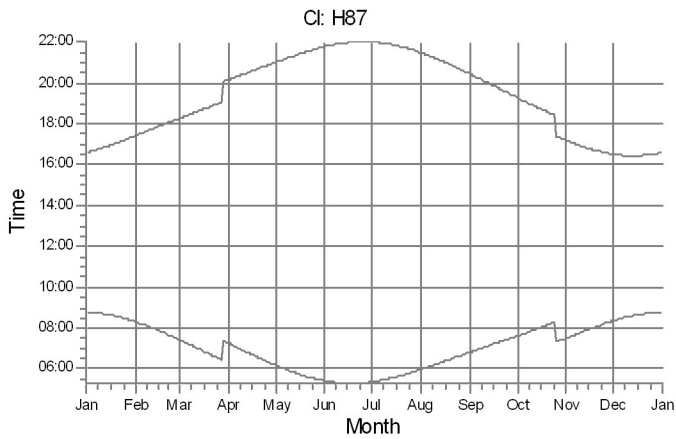
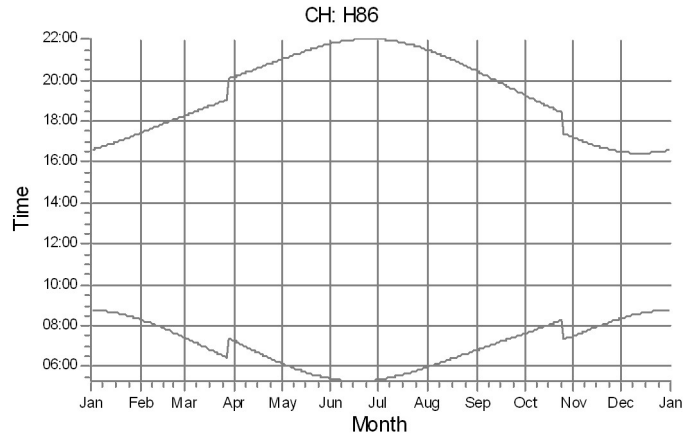
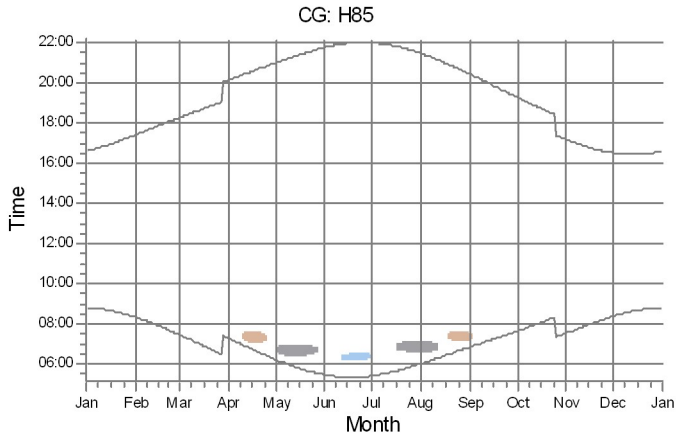


WTGs


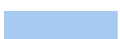





SHADOW - Calendar, graphical

Calculation: Specimen Turbine

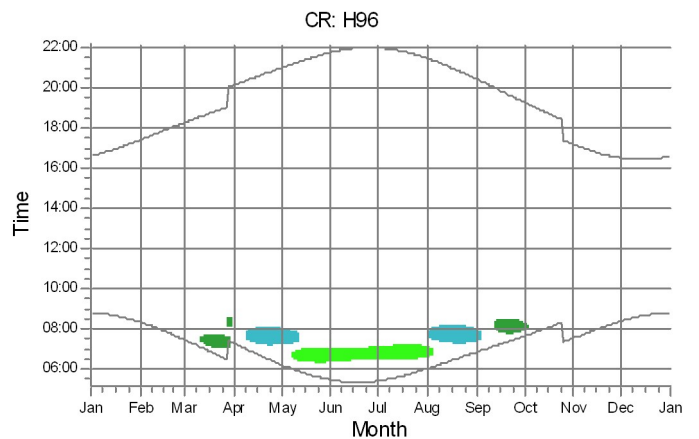
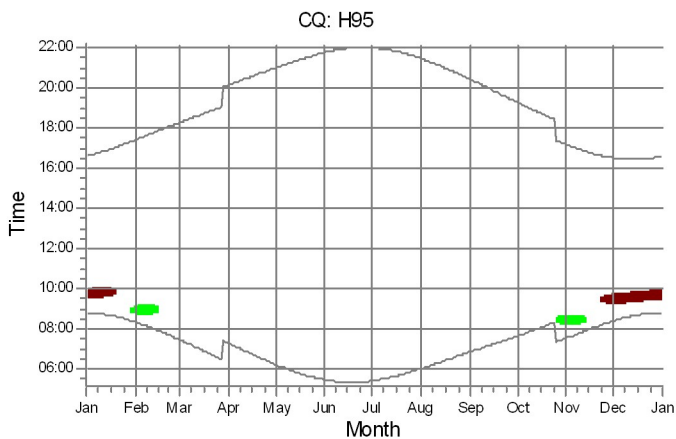
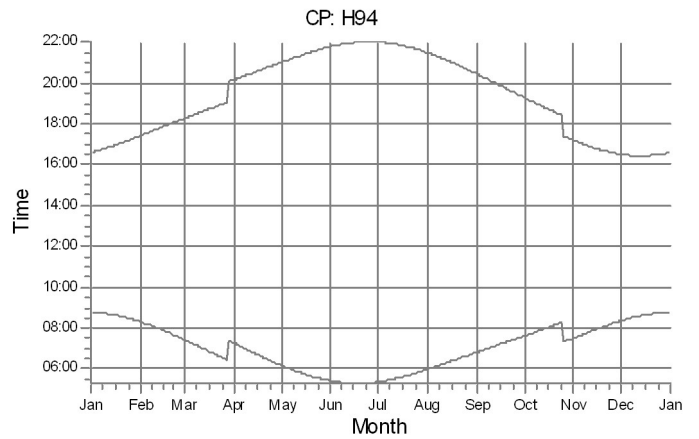
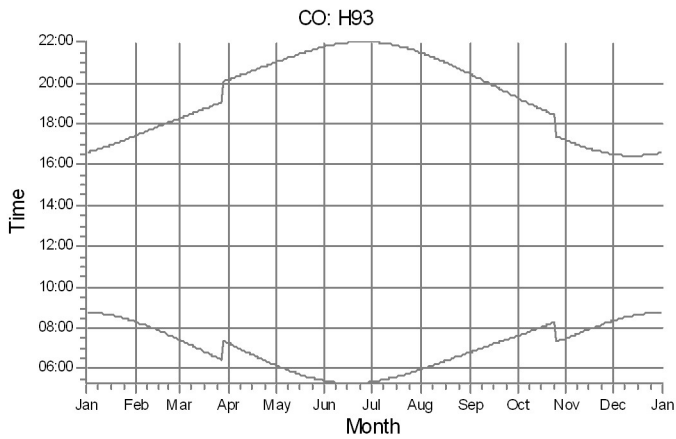
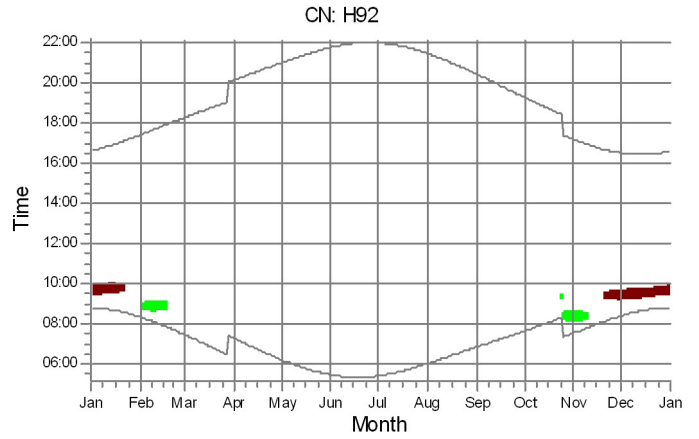
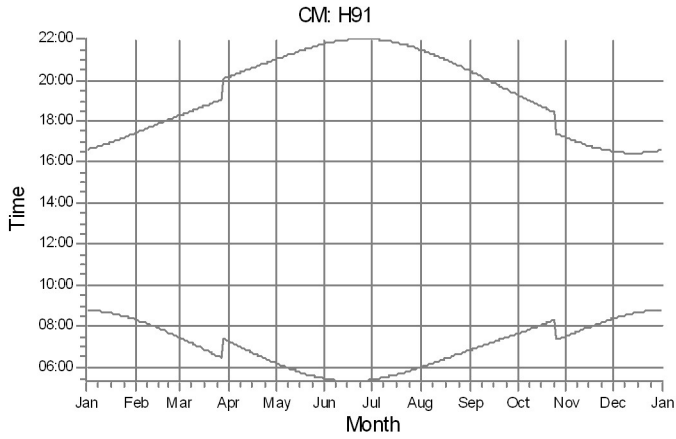


WTGs

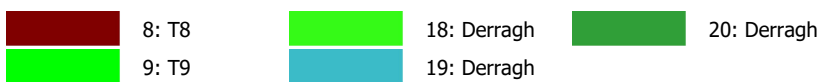
	13: T13		15: Derragh		17: Derragh
	14: T14		16: Derragh		

SHADOW - Calendar, graphical

Calculation: Specimen Turbine

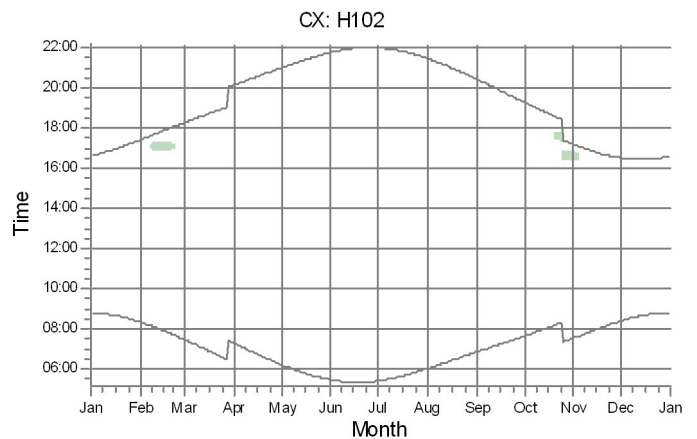
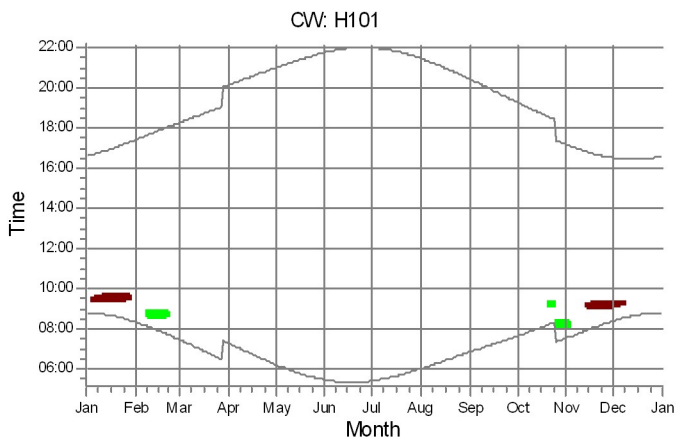
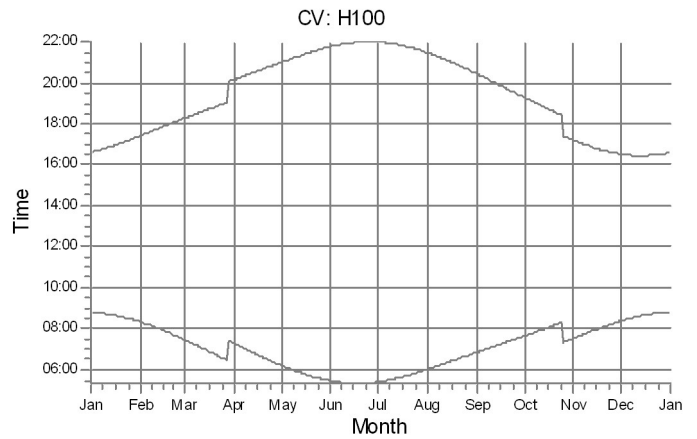
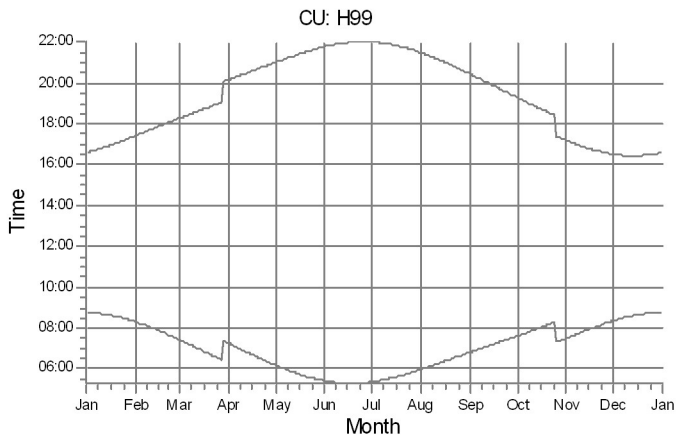
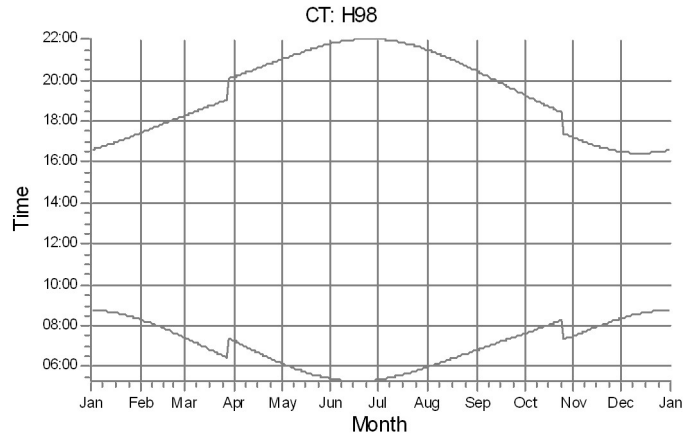
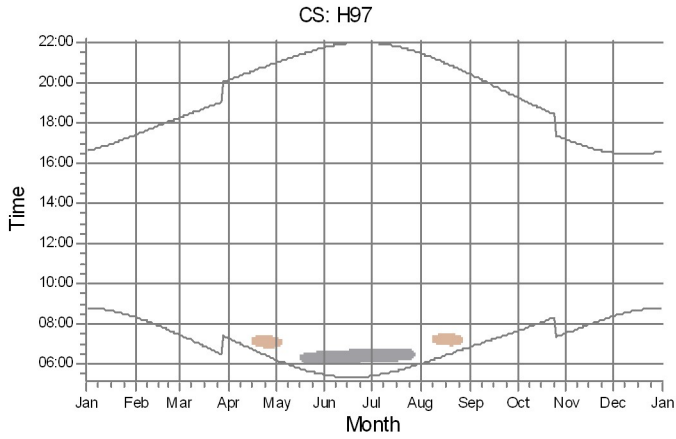


WTGs



SHADOW - Calendar, graphical

Calculation: Specimen Turbine

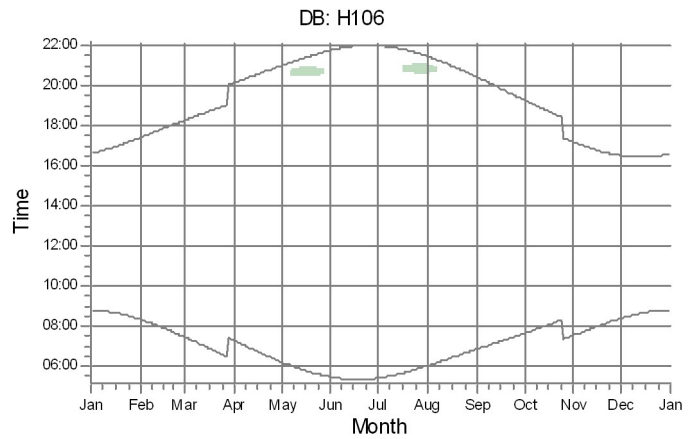
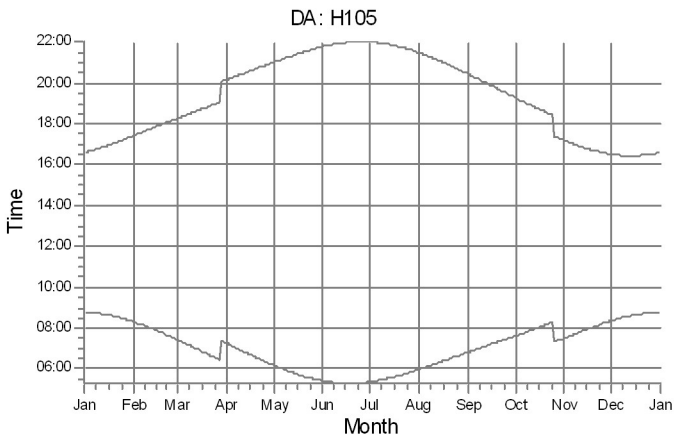
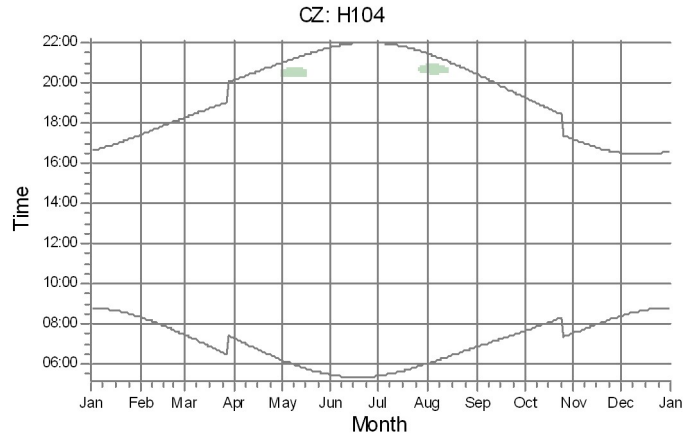
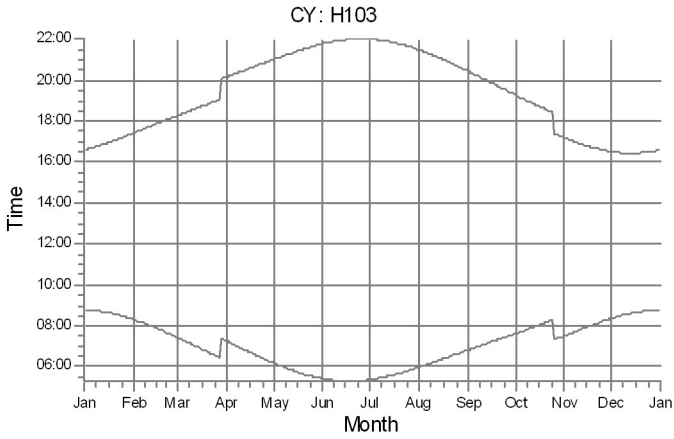


WTGs

- | | | |
|--|---|--|
| 8: T8 | 14: T14 | 17: Derragh |
| 9: T9 | 16: Derragh | |

SHADOW - Calendar, graphical

Calculation: Specimen Turbine



WTGs

14: T14

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:11/3.5.584

SHADOW - Calendar per WTG

Calculation: Specimen Turbine WTG: 1 - T1
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45 11:22-12:12/50	08:18 17:24	07:25 18:16	07:15 20:10	06:10 21:01	05:25 21:46	05:22 20:47-20:57/10	05:58 22:00	06:48 20:26	07:37 19:17	07:31 17:11	08:21 16:31
2	08:45 11:22-12:11/49	08:17 17:26	07:23 18:18	07:12 20:11	06:08 21:02	05:24 21:47	05:22 20:48-20:56/8	06:00 22:00	06:50 20:24	07:38 19:15	07:32 17:09	08:23 16:30
3	08:45 11:24-11:43/19	08:15 17:28	07:21 18:19	07:10 20:13	06:06 21:04	05:23 21:49	05:23 20:51-20:55/4	06:01 22:00	06:51 20:24	07:40 19:12	07:34 17:07	08:24 16:29
4	08:45 11:25-11:43/18	08:14 17:30	07:19 18:21	07:08 20:15	06:04 21:06	05:22 21:50	05:24 21:59	06:03 22:00	06:53 20:20	07:42 19:10	07:36 17:06	08:26 16:29
5	08:45 11:26-11:42/16	08:12 17:32	07:16 18:23	07:05 20:17	06:02 21:07	05:22 21:51	05:25 21:59	06:04 22:00	06:54 20:19	07:43 19:08	07:38 17:06	08:27 16:29
6	08:44 11:28-11:42/14	08:10 17:34	07:14 18:25	07:03 20:18	06:01 21:09	05:21 21:52	05:26 21:58	06:05 22:00	06:56 20:18	07:45 19:06	07:40 17:04	08:28 16:28
7	08:44 11:30-11:40/10	08:09 17:35	07:12 18:27	07:01 20:20	05:59 21:11	05:20 21:52	05:26 21:58	06:08 22:00	06:58 20:18	07:47 19:06	07:41 17:02	08:29 16:28
8	08:43 11:34-11:38/4	08:07 17:35	07:10 18:27	06:59 20:20	05:57 21:11	05:20 21:52	05:27 21:58	06:09 22:00	06:59 20:18	07:49 19:03	07:43 17:00	08:31 16:28
9	08:43 11:52-12:07/15	08:05 17:37	07:07 18:28	06:56 20:22	05:55 21:12	05:19 21:53	05:28 21:57	06:11 22:00	07:01 20:19	07:50 19:01	07:45 16:59	08:32 16:27
10	08:42 16:46	08:03 17:39	07:05 18:30	06:54 20:23	05:53 21:14	05:19 21:54	05:29 21:56	06:12 22:00	07:03 20:08	07:52 18:59	07:47 16:57	08:33 16:27
11	08:42 16:48	08:01 17:41	07:03 18:32	06:52 20:25	05:52 21:15	05:19 21:55	05:30 21:55	06:14 22:00	07:04 20:06	07:54 18:57	07:48 16:55	08:34 16:27
12	08:41 16:50	08:00 17:43	07:01 18:34	06:50 20:27	05:50 21:17	05:18 21:56	05:31 21:55	06:16 22:00	07:06 20:04	07:55 18:54	07:50 16:54	08:35 16:27
13	08:40 16:52	07:58 17:47	06:58 18:37	06:47 20:30	05:49 21:20	05:18 21:57	05:33 21:53	06:17 22:00	07:07 20:05	07:57 18:50	07:52 16:51	08:36 16:26
14	08:40 16:53	07:56 17:48	06:56 18:39	06:45 20:32	05:47 21:22	05:18 21:58	05:34 21:52	06:19 22:00	07:09 20:04	07:59 18:48	07:54 16:49	08:37 16:26
15	08:39 16:55	07:54 17:50	06:54 18:41	06:43 20:34	05:45 21:23	05:18 21:58	05:35 21:51	06:20 22:00	07:11 20:04	08:01 18:46	07:55 16:48	08:38 16:26
16	08:38 16:57	07:52 17:52	06:51 18:42	06:41 20:35	05:44 21:25	05:17 21:59	05:36 21:50	06:22 22:00	07:12 20:04	08:02 18:43	07:57 16:46	08:39 16:27
17	08:37 16:58	07:50 17:54	06:49 18:44	06:39 20:37	05:42 21:26	05:17 21:59	05:37 21:49	06:24 22:00	07:14 20:04	08:04 18:41	07:59 16:45	08:40 16:27
18	08:36 17:00	07:48 17:56	06:47 18:46	06:36 20:39	05:41 21:28	05:17 22:00	05:39 21:48	06:25 22:00	07:15 20:06	08:06 18:39	08:01 16:44	08:40 16:27
19	08:35 17:01	07:46 17:58	06:45 18:48	06:34 20:40	05:39 21:29	05:17 22:00	05:40 21:47	06:27 22:00	07:17 20:05	08:07 18:37	08:02 16:43	08:41 16:27
20	08:34 17:03	07:44 18:00	06:42 18:49	06:32 20:42	05:38 21:31	05:17 22:00	05:41 21:46	06:28 22:00	07:19 20:04	08:09 18:35	08:04 16:41	08:42 16:28
21	08:33 17:05	07:42 18:01	06:40 18:51	06:30 20:44	05:37 21:32	05:18 22:01	05:42 21:44	06:30 22:00	07:20 20:04	08:11 18:33	08:06 16:40	08:42 16:28
22	08:32 17:06	07:40 18:03	06:38 18:53	06:28 20:45	05:35 21:34	05:18 22:01	05:44 21:43	06:32 22:00	07:22 20:04	08:13 18:31	08:07 16:39	08:43 16:29
23	08:31 17:08	07:38 18:05	06:35 18:54	06:26 20:47	05:34 21:35	05:18 22:01	05:45 21:42	06:33 22:00	07:24 20:04	08:14 18:29	08:09 16:38	08:43 16:29
24	08:30 17:10	07:36 18:07	06:33 18:56	06:24 20:49	05:33 21:36	05:18 22:01	05:47 21:40	06:35 22:00	07:25 20:04	08:16 18:27	08:11 16:37	08:44 16:30
25	08:28 17:12	07:34 18:09	06:31 18:58	06:22 20:51	05:32 21:38	05:19 22:01	05:48 21:39	06:37 22:00	07:27 20:04	08:18 17:25	08:12 16:36	08:44 16:30
26	08:27 17:13	07:32 18:10	06:28 19:00	06:20 20:52	05:31 21:39	05:19 22:01	05:49 21:38	06:38 22:00	07:29 20:04	08:20 17:23	08:14 16:35	08:45 16:31
27	08:26 17:15	07:29 18:12	06:26 19:01	06:18 20:54	05:30 21:40	05:20 22:01	05:51 21:36	06:40 22:00	07:30 20:04	08:22 17:21	08:15 16:34	08:45 16:32
28	08:24 17:17	07:27 19:03	06:24 19:03	06:16 20:56	05:28 21:42	05:20 22:01	05:52 21:35	06:41 22:00	07:32 20:04	08:23 17:19	08:17 16:33	08:45 16:33
29	08:23 17:19		07:21 20:05	06:14 20:57	05:27 21:43	05:21 22:01	05:54 21:33	06:43 22:00	07:33 20:04	08:25 17:17	08:18 16:32	08:45 16:33
30	08:21 17:21		07:19 20:06	06:12 20:59	05:26 21:44	05:21 22:00	05:55 21:32	06:45 20:31	07:35 19:19	08:27 17:15	08:20 16:31	08:45 16:34
31	08:20 17:22		07:17 20:08		05:26 21:45		05:57 21:30	06:46 20:29		08:29 17:13		08:45 16:35
Potential sun hours	259	278	367	416	485	499	502	454	381	331	266	244
Sum of minutes with flicker	318	0	0	0	0	293	22	0	0	0	0	1371

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker <td>Last time (hh:mm) with flicker<td>Minutes with flicker</td> </td>	Last time (hh:mm) with flicker <td>Minutes with flicker</td>	Minutes with flicker



Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:11/3.5.584

SHADOW - Calendar per WTG

Calculation: Specimen Turbine WTG: 2 - T2
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Table with columns for months (January to December) and rows for each day of the year (1-31), showing sunrise and sunset times and minutes with flicker.

Table layout: For each day in each month the following matrix apply

Day in month Sun rise (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker



SHADOW - Calendar per WTG

Calculation: Specimen Turbine WTG: 3 - T3
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January to June) and rows for days (1-31). Includes columns for start/end times and potential sun hours.

Table layout: For each day in each month the following matrix apply

Matrix table with 2 columns: Day in month, Sun rise/set times, and First/Last time with flicker/Minutes with flicker.

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:11/3.5.584

SHADOW - Calendar per WTG

Calculation: Specimen Turbine WTG: 3 - T3

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22 22:00	05:58 21:28	06:48 20:26	19:21-19:39/18 19:17	07:30 17:11	08:21 16:31
2	05:22 22:00	06:00 21:27	06:49 20:24	19:19-19:39/20 19:15	07:32 17:09	08:23 16:30
3	05:23 21:59	06:01 21:25	06:51 20:22	19:19-19:39/20 19:12	07:40 17:07	08:35-08:45/10 16:29
4	05:24 21:59	06:03 21:23	06:53 20:20	19:18-19:38/20 19:10	07:42 17:05	08:33-08:54/21 16:29
5	05:25 21:59	06:04 21:22	06:54 20:17	19:18-19:38/20 19:08	07:43 17:04	08:32-08:58/26 16:28
6	05:26 21:58	06:06 21:20	06:56 20:15	19:18-19:37/19 19:06	07:45 17:02	08:31-09:00/29 16:28
7	05:26 21:57	06:07 21:18	06:58 20:13	19:18-19:36/18 19:03	07:47 17:00	08:30-09:02/32 16:28
8	05:27 21:57	06:09 21:16	06:59 20:10	19:19-19:34/15 19:01	07:48 16:59	08:29-09:03/34 16:27
9	05:28 21:56	06:11 21:14	07:01 20:08	19:19-19:32/13 19:01	07:50 16:57	08:29-09:04/35 16:27
10	05:29 21:55	06:12 21:12	07:02 20:06	19:21-19:30/9 18:56	07:52 16:55	08:29-09:05/36 16:27
11	05:30 21:55	06:14 21:11	07:04 20:04	07:54 18:54	07:48 16:54	08:29-09:05/36 16:26
12	05:31 21:54	06:15 21:09	07:06 20:01	07:55 18:52	07:50 16:52	08:29-09:06/37 16:26
13	05:32 21:53	06:17 21:07	07:07 19:59	07:57 18:50	07:52 16:51	08:29-09:07/38 16:26
14	05:34 21:52	06:19 21:05	07:09 19:57	07:59 18:48	07:54 16:49	08:29-09:06/37 16:26
15	05:35 21:51	06:20 21:03	07:11 19:54	08:00 18:45	07:55 16:48	08:29-09:06/37 16:26
16	05:36 21:50	06:22 21:01	07:12 19:52	08:02 18:43	07:57 16:46	08:29-09:07/38 16:27
17	05:37 21:49	06:23 20:59	07:14 19:50	08:04 18:41	07:59 16:45	08:30-09:07/37 16:27
18	05:38 21:48	06:25 20:57	07:15 19:47	08:06 18:39	08:01 16:44	08:31-09:07/36 16:27
19	05:40 21:47	06:27 20:55	07:17 19:45	08:07 18:37	08:02 16:42	08:33-09:07/34 16:27
20	05:41 21:46	06:28 20:52	07:19 19:43	08:09 18:35	08:04 16:41	08:35-09:07/32 16:28
21	05:42 21:44	06:30 20:50	07:20 19:40	08:11 18:33	08:06 16:40	08:37-09:07/30 16:28
22	05:44 21:43	06:32 20:48	07:22 19:38	08:13 18:31	08:07 16:39	08:38-09:06/28 16:28
23	05:45 21:42	06:33 20:46	07:24 19:36	08:14 18:29	08:09 16:38	08:40-09:06/26 16:29
24	05:46 21:40	06:35 20:44	07:25 19:33	08:16 18:26	08:11 16:37	08:42-09:06/24 16:30
25	05:48 21:39	06:36 20:42	07:27 19:31	07:18 17:24	08:12 16:36	08:44-09:06/22 16:30
26	05:49 21:38	06:38 20:40	07:28 19:29	07:20 17:22	08:14 16:35	08:46-09:04/18 16:31
27	05:51 21:36	06:40 20:37	07:30 19:26	07:22 17:20	08:15 16:34	08:48-09:04/16 16:32
28	05:52 21:35	06:41 20:35	19:29-19:34/5 19:24	07:32 17:19	08:17 16:33	08:51-09:03/12 16:32
29	05:54 21:33	06:43 20:33	19:25-19:36/11 19:22	07:33 17:17	08:18 16:32	08:52-09:01/9 16:33
30	05:55 21:32	06:45 20:31	19:24-19:38/14 19:19	07:35 17:15	08:20 16:31	08:55-08:59/4 16:34
31	05:57 21:30	06:46 20:29	19:22-19:38/16 	07:29 17:13		08:45 16:35
Potential sun hours	502	454	381	331	266	244
Sum of minutes with flicker	0	46	172	0	774	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Specimen Turbine WTG: 4 - T4
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-June) and rows for days (1-31). Includes 'Potential sun hours' and 'Sum of minutes with flicker' at the bottom.

Table layout: For each day in each month the following matrix apply

Matrix with 2 rows and 3 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm); First time (hh:mm) with flicker, Last time (hh:mm) with flicker, Minutes with flicker

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:11/3.5.584

SHADOW - Calendar per WTG

Calculation: Specimen Turbine WTG: 4 - T4

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22 20:26-20:49/23 22:00	05:58 20:12-20:43/31 21:28	06:48 19:02-19:35/33 20:26	07:37 19:17	07:30 07:58-08:22/24 17:11	08:21 16:31
2	05:22 20:27-20:49/22 22:00	06:00 20:11-20:41/30 21:27	06:49 19:00-19:34/34 20:24	07:38 19:15	07:32 08:00-08:22/22 17:09	08:23 16:30
3	05:23 20:27-20:50/23 21:59	06:01 20:11-20:41/30 21:25	06:51 19:00-19:34/34 20:22	07:40 19:12	07:34 08:02-08:22/20 17:07	08:24 16:29
4	05:24 20:27-20:49/22 21:59	06:03 20:11-20:39/28 21:23	06:53 18:58-19:32/34 20:20	07:42 19:10	07:36 08:04-08:22/18 17:05	08:26 16:29
5	05:25 20:27-20:50/23 21:59	06:04 20:11-20:37/26 21:22	06:54 18:58-19:31/33 20:17	07:43 19:08	07:38 08:06-08:22/16 17:04	08:27 16:28
6	05:25 20:27-20:50/23 21:58	06:06 20:11-20:32/21 21:20	06:56 18:58-19:30/32 20:15	07:45 19:05	07:39 08:08-08:21/13 17:02	08:28 16:28
7	05:26 20:27-20:51/24 21:57	06:07 20:10-20:31/21 21:18	06:58 18:57-19:28/31 20:13	07:47 19:03	07:41 08:10-08:21/11 17:00	08:29 16:27
8	05:27 20:28-20:51/23 21:57	06:09 20:11-20:30/19 21:16	06:59 18:54-19:26/32 20:10	07:48 19:01	07:43 08:12-08:20/8 16:59	08:31 16:27
9	05:28 20:28-20:51/23 21:56	06:11 20:11-20:28/17 21:14	07:01 18:50-19:23/33 20:08	07:50 18:59	07:45 08:14-08:19/5 16:57	08:32 16:27
10	05:29 20:28-20:51/23 21:55	06:12 20:12-20:27/15 21:12	07:02 18:48-19:23/35 20:06	07:52 18:56	07:47 08:16-08:17/1 16:55	08:33 16:27
11	05:30 20:28-20:52/24 21:55	06:14 20:13-20:25/12 21:10	07:04 18:46-19:21/35 20:03	07:54 18:54	07:48 16:54	08:34 16:26
12	05:31 20:28-20:52/24 21:54	06:15 20:15-20:24/9 21:09	07:06 18:45-19:20/35 20:01	07:55 18:52	07:50 16:52	08:35 16:26
13	05:32 20:28-20:52/24 21:53	06:17 20:15-20:24/9 21:07	07:07 18:43-19:17/34 19:59	07:57 18:50	07:52 16:51	08:36 16:26
14	05:34 20:28-20:52/24 21:52	06:19 20:15-20:24/9 21:05	07:09 18:42-19:15/33 19:57	07:59 18:48	07:54 16:49	08:37 16:26
15	05:35 20:29-20:51/22 21:51	06:20 20:15-20:24/9 21:03	07:11 18:42-19:12/30 19:54	08:00 18:45	07:55 16:48	08:38 16:26
16	05:36 20:29-20:51/22 21:50	06:22 20:15-20:24/9 21:01	07:12 18:41-19:10/29 19:52	08:02 18:43	07:57 16:46	08:39 16:26
17	05:37 20:27-20:51/24 21:49	06:23 20:15-20:24/9 20:59	07:14 18:40-19:09/29 19:50	08:04 18:41	07:59 16:45	08:40 16:27
18	05:38 20:26-20:51/25 21:48	06:25 20:15-20:24/9 20:57	07:15 18:36-19:06/30 19:47	08:06 18:39	08:01 16:44	08:40 16:27
19	05:40 20:25-20:50/25 21:47	06:27 20:15-20:24/9 20:55	07:17 18:34-19:05/31 19:45	08:07 18:37	08:02 16:42	08:41 16:27
20	05:41 20:26-20:51/25 21:46	06:28 20:15-20:24/9 20:52	07:19 18:33-19:04/31 19:43	08:09 18:35	08:04 16:41	08:42 16:28
21	05:42 20:25-20:50/25 21:44	06:30 19:23-19:28/5 20:50	07:20 18:31-19:02/31 19:40	08:11 18:33	08:06 16:40	08:42 16:28
22	05:44 20:21-20:49/28 21:43	06:32 19:19-19:31/12 20:48	07:22 18:31-19:00/29 19:38	08:13 18:31	08:07 16:39	08:43 16:28
23	05:45 20:19-20:49/30 21:42	06:33 19:17-19:33/16 20:46	07:24 18:30-18:57/27 19:35	08:14 18:28	08:09 16:38	08:43 16:29
24	05:46 20:18-20:49/31 21:40	06:35 19:14-19:34/20 20:44	07:25 18:29-18:53/24 19:33	08:16 18:26	08:11 16:37	08:44 16:30
25	05:48 20:17-20:47/30 21:39	06:36 19:13-19:35/22 20:42	07:27 18:30-18:51/21 19:31	07:18 17:24	08:12 16:36	08:44 16:30
26	05:49 20:16-20:46/30 21:38	06:38 19:11-19:35/24 20:40	07:28 18:29-18:50/21 19:29	07:20 08:03-08:13/10 17:22	08:14 16:35	08:44 16:31
27	05:51 20:16-20:45/29 21:36	06:40 19:10-19:36/26 20:37	07:30 18:30-18:49/19 19:26	07:21 08:00-08:17/17 17:20	08:15 16:34	08:45 16:32
28	05:52 20:15-20:44/29 21:35	06:41 19:10-19:37/27 20:35	07:32 18:31-18:48/17 19:24	07:23 07:59-08:19/20 17:18	08:17 16:33	08:45 16:32
29	05:54 20:15-20:44/29 21:33	06:43 19:07-19:36/29 20:33	07:33 18:31-18:46/15 19:22	07:25 07:57-08:19/22 17:17	08:18 16:32	08:45 16:33
30	05:55 20:13-20:43/30 21:32	06:45 19:05-19:36/31 20:31	07:35 18:33-18:43/10 19:19	07:27 07:57-08:21/24 17:15	08:20 16:31	08:45 16:34
31	05:57 20:12-20:43/31 21:30	06:46 19:03-19:36/33 20:29	07:35 18:33-18:43/10 19:19	07:29 07:56-08:21/25 17:13	08:20 16:31	08:45 16:35
Potential sun hours	502	454	381	331	266	244
Sum of minutes with flicker	790	504	862	118	138	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Specimen Turbine **WTG: 5 - T5**
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June	
1	08:45 16:36	08:18 17:24	07:25 18:16	17:37-17:43/6 20:10	07:14 20:10	18:17-19:09/52 21:01	06:10 21:01
2	08:45 16:37	08:17 17:26	07:23 18:18	17:34-17:46/12 20:11	07:12 20:11	18:18-19:10/52 21:02	06:08 21:02
3	08:45 16:39	08:15 17:28	07:21 18:19	17:33-17:47/14 20:13	07:10 20:13	18:19-19:10/51 21:04	06:06 21:04
4	08:45 16:40	08:14 17:30	07:18 18:21	17:32-17:48/16 20:15	07:08 20:15	18:20-19:11/51 21:05	06:04 21:05
5	08:44 16:41	08:12 17:32	07:16 18:23	17:27-17:48/21 20:16	07:05 20:16	18:22-19:12/50 21:07	06:02 21:07
6	08:44 16:42	08:10 17:33	07:14 18:25	17:24-17:48/24 20:18	07:03 20:18	18:25-19:12/47 21:09	06:00 21:09
7	08:44 16:43	08:09 17:35	07:12 18:26	17:21-17:48/27 20:20	07:01 20:20	18:27-19:14/47 21:10	05:59 21:10
8	08:43 16:45	08:07 17:37	07:10 18:28	17:20-17:48/28 20:22	06:58 20:22	18:26-19:16/50 21:12	05:57 21:12
9	08:43 16:46	08:05 17:39	07:07 18:30	17:18-17:47/29 20:23	06:56 20:23	18:26-19:17/51 21:14	05:55 21:14
10	08:42 16:47	08:03 17:41	07:05 18:32	17:17-17:46/29 20:25	06:54 20:25	18:26-19:19/53 21:15	05:53 21:15
11	08:42 16:49	08:01 17:43	07:03 18:34	17:16-17:46/30 20:27	06:52 20:27	18:26-19:20/54 21:17	05:52 21:17
12	08:41 16:50	08:00 17:45	07:00 18:35	17:15-17:45/30 20:28	06:50 20:28	18:25-19:20/55 21:18	05:50 21:18
13	08:40 16:52	07:58 17:46	06:58 18:37	17:14-17:46/32 20:30	06:47 20:30	18:25-19:21/56 21:20	05:48 21:20
14	08:40 16:53	07:56 17:48	06:56 18:39	17:14-17:47/33 20:32	06:45 20:32	18:25-19:22/57 21:22	05:47 21:22
15	08:39 16:55	07:54 17:50	06:54 18:40	17:13-17:49/36 20:33	06:43 20:33	18:25-19:23/58 21:23	05:45 21:23
16	08:38 16:56	07:52 17:52	06:51 18:42	17:13-17:51/38 20:35	06:41 20:35	18:26-19:23/57 21:25	05:44 21:25
17	08:37 16:58	07:50 17:54	06:49 18:44	17:14-17:53/39 20:37	06:39 20:37	18:26-19:24/58 21:26	05:42 21:26
18	08:36 17:00	07:48 17:56	06:47 18:46	17:13-17:53/40 20:39	06:36 20:39	18:27-19:24/57 21:28	05:41 21:28
19	08:35 17:01	07:46 17:58	06:44 18:47	17:14-17:54/40 20:40	06:34 20:40	18:27-19:24/57 21:29	05:39 21:29
20	08:34 17:03	07:44 17:59	06:42 18:49	17:15-17:55/40 20:42	06:32 20:42	18:27-19:23/56 21:31	05:38 21:31
21	08:33 17:05	07:42 18:01	06:40 18:51	17:15-17:55/40 20:44	06:30 20:44	18:28-19:23/55 21:32	05:37 21:32
22	08:32 17:06	07:40 18:03	06:38 18:53	17:17-17:59/42 20:45	06:28 20:45	18:29-19:23/54 21:33	05:35 21:33
23	08:31 17:08	07:38 18:05	06:35 18:54	17:17-18:02/45 20:47	06:26 20:47	18:31-19:23/52 21:35	05:34 21:35
24	08:29 17:10	07:36 18:07	06:33 18:56	17:17-18:03/46 20:49	06:24 20:49	18:32-19:22/50 21:36	05:33 21:36
25	08:28 17:12	07:34 18:09	06:31 18:58	17:16-18:04/48 20:50	06:22 20:50	18:34-19:22/48 21:38	05:32 21:38
26	08:27 17:13	07:31 18:10	06:28 18:59	17:16-18:06/50 20:52	06:20 20:52	18:36-19:21/45 21:39	05:31 21:39
27	08:26 17:15	07:29 18:12	06:26 19:01	17:16-18:06/50 20:54	06:18 20:54	18:40-19:22/42 21:40	05:29 21:40
28	08:24 17:17	07:27 18:14	06:24 19:03	17:15-18:06/51 20:55	06:16 20:55	18:40-19:21/41 21:41	05:28 21:41
29	08:23 17:19		07:21 20:05	18:16-19:06/50 20:57	06:14 20:57	18:41-19:20/39 21:43	05:27 21:43
30	08:21 17:21		07:19 20:06	18:16-19:07/51 20:59	06:12 20:59	18:42-19:19/37 21:44	05:26 21:44
31	08:20 17:22		07:17 20:08	18:16-19:07/51 20:08			05:25 21:45
Potential sun hours	259	278	367	416	485	499	1417
Sum of minutes with flicker	0	0	1088	1532	620	1417	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Specimen Turbine **WTG: 5 - T5**

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22 20:14-20:57/43 22:00	05:58 21:28	06:48 18:25-19:19/54 20:26	07:37 17:54-18:25/31 19:17	07:30 17:11	08:21 16:31
2	05:22 20:15-20:58/43 22:00	06:00 21:27	06:49 18:24-19:17/53 20:24	07:38 17:54-18:24/30 19:15	07:32 17:09	08:23 16:30
3	05:23 20:15-20:58/43 21:59	06:01 21:25	06:51 18:24-19:15/51 20:22	07:40 17:54-18:23/29 19:12	07:34 17:07	08:24 16:29
4	05:24 20:14-20:57/43 21:59	06:03 19:06-19:15/9 21:23	06:53 18:23-19:13/50 20:20	07:42 17:55-18:24/29 19:10	07:36 17:05	08:25 16:29
5	05:25 20:15-20:57/42 21:59	06:04 19:02-19:19/17 21:21	06:54 18:24-19:11/47 20:17	07:43 17:55-18:24/29 19:08	07:38 17:04	08:27 16:28
6	05:25 20:15-20:57/42 21:58	06:06 19:00-19:20/20 21:20	06:56 18:21-19:09/48 20:15	07:45 17:57-18:24/27 19:05	07:39 17:02	08:28 16:28
7	05:26 20:15-20:57/42 21:57	06:07 18:58-19:23/25 21:18	06:58 18:18-19:07/49 20:13	07:47 17:58-18:24/26 19:03	07:41 17:00	08:29 16:27
8	05:27 20:15-20:56/41 21:57	06:09 18:56-19:23/27 21:16	06:59 18:16-19:06/50 20:10	07:48 18:01-18:24/23 19:01	07:43 16:59	08:31 16:27
9	05:28 20:15-20:56/41 21:56	06:11 18:54-19:24/30 21:14	07:01 18:13-19:04/51 20:08	07:50 18:06-18:23/17 18:59	07:45 16:57	08:32 16:27
10	05:29 20:16-20:55/39 21:55	06:12 18:53-19:25/32 21:12	07:02 18:12-19:03/51 20:06	07:52 18:06-18:22/16 18:56	07:47 16:55	08:33 16:27
11	05:30 20:16-20:55/39 21:55	06:14 18:51-19:26/35 21:10	07:04 18:09-19:01/52 20:03	07:54 18:07-18:21/14 18:54	07:48 16:54	08:34 16:26
12	05:31 20:16-20:53/37 21:54	06:15 18:51-19:27/36 21:09	07:06 18:09-19:00/51 20:01	07:55 18:09-18:19/10 18:52	07:50 16:52	08:35 16:26
13	05:32 20:16-20:52/36 21:53	06:17 18:50-19:28/38 21:07	07:07 18:07-18:57/50 19:59	07:57 18:50	07:52 16:51	08:36 16:26
14	05:34 20:16-20:47/31 21:52	06:19 18:48-19:28/40 21:05	07:09 18:06-18:57/51 19:56	07:59 18:48	07:54 16:49	08:37 16:26
15	05:35 20:16-20:46/30 21:51	06:20 18:48-19:29/41 21:03	07:10 18:06-18:56/50 19:54	08:00 18:45	07:55 16:48	08:38 16:26
16	05:36 20:16-20:46/30 21:50	06:22 18:46-19:28/42 21:01	07:12 18:05-18:55/50 19:52	08:02 18:43	07:57 16:46	08:39 16:26
17	05:37 20:16-20:45/29 21:49	06:23 18:43-19:29/46 20:59	07:14 18:04-18:54/50 19:49	08:04 18:41	07:59 16:45	08:40 16:27
18	05:38 20:16-20:44/28 21:48	06:25 18:40-19:29/49 20:57	07:15 18:03-18:52/49 19:47	08:06 18:39	08:01 16:44	08:40 16:27
19	05:40 20:17-20:43/26 21:47	06:27 18:38-19:29/51 20:54	07:17 18:03-18:51/48 19:45	08:07 18:37	08:02 16:42	08:41 16:27
20	05:41 20:18-20:43/25 21:45	06:28 18:36-19:28/52 20:52	07:19 18:04-18:49/45 19:42	08:09 18:35	08:04 16:41	08:42 16:28
21	05:42 20:18-20:42/24 21:44	06:30 18:35-19:29/54 20:50	07:20 18:03-18:45/42 19:40	08:11 18:33	08:06 16:40	08:42 16:28
22	05:44 20:18-20:41/23 21:43	06:32 18:33-19:28/55 20:48	07:22 18:01-18:41/40 19:38	08:13 18:31	08:07 16:39	08:43 16:28
23	05:45 20:19-20:40/21 21:42	06:33 18:32-19:28/56 20:46	07:24 17:59-18:39/40 19:35	08:14 18:28	08:09 16:38	08:43 16:29
24	05:46 20:20-20:40/20 21:40	06:35 18:30-19:27/57 20:44	07:25 17:58-18:38/40 19:33	08:16 18:26	08:11 16:37	08:44 16:30
25	05:48 20:21-20:39/18 21:39	06:36 18:29-19:27/58 20:42	07:27 17:57-18:37/40 19:31	08:18 17:24	08:12 16:36	08:44 16:30
26	05:49 20:21-20:38/17 21:38	06:38 18:28-19:25/57 20:40	07:28 17:56-18:35/39 19:28	08:20 17:22	08:14 16:35	08:44 16:31
27	05:51 20:23-20:37/14 21:36	06:40 18:27-19:25/58 20:37	07:30 17:55-18:33/38 19:26	08:21 17:20	08:15 16:34	08:45 16:32
28	05:52 20:25-20:35/10 21:35	06:41 18:27-19:24/57 20:35	07:32 17:55-18:31/36 19:24	08:23 17:18	08:17 16:33	08:45 16:32
29	05:54 21:33	06:43 18:26-19:23/57 20:33	07:33 17:54-18:28/34 19:22	08:25 17:17	08:18 16:32	08:45 16:33
30	05:55 21:32	06:45 18:26-19:22/56 20:31	07:35 17:54-18:25/31 19:19	08:27 17:15	08:20 16:31	08:45 16:34
31	05:57 21:30	06:46 18:25-19:20/55 20:29	 	08:29 17:13	 	08:45 16:35
	Potential sun hours 502	454	381	331	266	244
	Sum of minutes with flicker 877	1210	1380	281	0	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Specimen Turbine WTG: 6 - T6
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (January-June) and rows for each day (1-31) showing sun rise/set times and minutes with flicker.

Table layout: For each day in each month the following matrix apply

Matrix table with 2 rows and 3 columns: Day in month, Sun rise/set times, First time with flicker, Last time with flicker, Minutes with flicker.

SHADOW - Calendar per WTG

Calculation: Specimen Turbine WTG: 6 - T6

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22 22:00	05:58 20:10-20:22/12 21:28	06:48 20:26	07:37 08:10-08:30/20 19:17	07:30 17:11	08:21 15:15-15:34/19 16:31
2	05:22 22:00	06:00 20:08-20:23/15 21:27	06:49 20:24	07:38 08:09-08:31/22 19:15	07:32 17:09	08:23 15:16-15:35/19 16:30
3	05:23 21:59	06:01 20:07-20:24/17 21:25	06:51 20:22	07:40 08:07-08:30/23 19:12	07:34 17:07	08:24 15:16-15:34/18 16:29
4	05:24 21:59	06:03 20:06-20:24/18 21:23	06:53 20:20	07:42 08:07-08:31/24 19:10	07:36 17:05	08:26 15:17-15:35/18 16:29
5	05:25 21:59	06:04 20:06-20:25/19 21:22	06:54 20:17	07:43 08:09-08:31/22 19:08	07:38 17:04	08:27 15:18-15:34/16 16:28
6	05:25 21:58	06:06 20:05-20:25/20 21:20	06:56 20:15	07:45 08:10-08:29/19 19:05	07:39 17:02	08:28 15:19-15:35/16 16:28
7	05:26 21:57	06:07 20:04-20:25/21 21:18	06:58 20:13	07:47 08:12-08:29/17 19:03	07:41 17:00	08:29 10:00-10:03/3 16:27 15:20-15:34/14
8	05:27 21:57	06:09 20:04-20:26/22 21:16	06:59 20:10	07:48 08:14-08:28/14 19:01	07:43 16:59	08:31 09:58-10:05/7 16:27 15:20-15:34/14
9	05:28 21:56	06:11 20:03-20:25/22 21:14	07:01 20:08	07:50 08:16-08:27/11 18:59	07:45 16:57	08:32 09:58-10:07/9 16:27 15:21-15:34/13
10	05:29 21:55	06:12 20:04-20:25/21 21:12	07:02 20:06	07:52 08:17-08:25/8 18:56	07:47 16:55	08:33 09:58-10:08/10 16:27 15:23-15:34/11
11	05:30 21:55	06:14 20:03-20:24/21 21:11	07:04 20:03	07:54 08:19-08:22/3 18:54	07:48 16:54	08:34 09:58-10:09/11 16:26 15:24-15:34/10
12	05:31 21:54	06:15 20:04-20:24/20 21:09 19:56-20:03/7	07:06 20:01	07:55 18:52	07:50 16:52	08:35 09:58-10:10/12 16:26 15:25-15:34/9
13	05:32 21:53	06:17 19:53-20:23/30 21:07	07:07 19:59	07:57 18:50	07:52 16:51	08:36 09:58-10:11/13 16:26 15:26-15:33/7
14	05:34 21:52	06:19 19:51-20:23/32 21:05	07:09 19:57	07:59 18:48	07:54 16:49	08:37 09:58-10:12/14 16:26 15:27-15:33/6
15	05:35 21:51	06:20 19:50-20:22/32 21:03	07:11 19:54	08:00 18:45	07:55 15:18-15:22/4 16:48	08:38 09:58-10:13/15 16:26 15:29-15:33/4
16	05:36 21:50	06:22 19:49-20:19/30 21:01	07:12 19:52	08:02 18:43	07:57 15:16-15:25/9 16:46	08:39 09:59-10:13/14 16:26
17	05:37 21:49	06:23 20:10-20:17/7 20:59 19:48-20:09/21	07:14 19:50	08:04 18:41	07:59 15:14-15:27/13 16:45	08:40 09:58-10:13/15 16:27
18	05:38 21:48	06:25 19:47-20:09/22 20:57	07:15 19:47	08:06 18:39	08:01 15:13-15:29/16 16:44	08:40 09:59-10:14/15 16:27
19	05:40 21:47	06:27 19:47-20:09/22 20:55	07:17 19:45	08:07 18:37	08:02 15:13-15:30/17 16:42	08:41 09:59-10:15/16 16:27
20	05:41 21:46	06:28 19:46-20:09/23 20:52	07:19 19:43	08:09 18:35	08:04 15:13-15:31/18 16:41	08:42 09:59-10:15/16 16:28
21	05:42 21:44	06:30 19:46-20:09/23 20:50	07:20 19:40	08:11 18:33	08:06 15:12-15:31/19 16:40	08:42 10:00-10:16/16 16:28
22	05:44 21:43	06:32 19:46-20:08/22 20:48	07:22 19:38	08:13 18:31	08:07 15:12-15:32/20 16:39	08:43 10:00-10:16/16 16:28
23	05:45 21:42	06:33 19:46-20:08/22 20:46	07:24 19:35	08:14 18:28	08:09 15:12-15:32/20 16:38	08:43 10:01-10:17/16 16:29
24	05:46 21:40	06:35 19:46-20:07/21 20:44	07:25 19:33	08:16 18:26	08:11 15:12-15:33/21 16:37	08:44 10:01-10:17/16 16:30
25	05:48 21:39	06:36 19:47-20:06/19 20:42	07:27 19:31	08:18 17:24	08:12 15:13-15:34/21 16:36	08:44 10:03-10:18/15 16:30
26	05:49 21:38	06:38 19:47-20:04/17 20:40	07:28 19:29	08:20 17:22	08:14 15:12-15:33/21 16:35	08:44 10:03-10:18/15 16:31
27	05:51 21:36	06:40 19:49-20:03/14 20:37	07:30 19:26	08:21 17:20	08:15 15:13-15:34/21 16:34	08:45 10:03-10:18/15 16:32
28	05:52 21:35	06:41 19:51-20:00/9 20:35	07:32 08:16-08:25/9 19:24	08:23 17:18	08:17 15:14-15:34/20 16:33	08:45 10:04-10:18/14 16:32 15:35-15:38/3
29	05:54 21:33	06:43 08:14-08:28/14 20:33	07:33 08:14-08:28/14 19:22	08:25 17:17	08:18 15:14-15:34/20 16:32	08:45 10:05-10:19/14 16:33 15:34-15:40/6
30	05:55 21:32	06:45 08:11-08:29/18 20:31	07:35 08:11-08:29/18 19:19	08:27 17:15	08:20 15:15-15:35/20 16:31	08:45 10:05-10:19/14 16:34 15:34-15:41/7
31	05:57 20:11-20:19/8 21:30	06:46 20:29	 17:13	08:29 17:13	 16:34	08:45 10:06-10:19/13 16:35 15:34-15:42/8
Potential sun hours	502	454	381	331	266	244
Sum of minutes with flicker	8	601	41	183	280	552

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:11/3.5.584

SHADOW - Calendar per WTG

Calculation: Specimen Turbine **WTG: 7 - T7**

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 10:14-10:58/44 14:28-14:46/18 16:36 11:04-11:13/9	08:18 09:23-09:43/20 17:24	07:25 18:16	07:14 08:21-08:38/17 20:10	06:10 21:01	05:25 21:46
2	08:45 10:13-10:57/44 14:28-14:46/18 16:37 11:04-11:12/8	08:17 09:23-09:42/19 17:26	07:23 18:18	07:12 08:24-08:34/10 20:11	06:08 21:02	05:24 21:47
3	08:45 10:14-10:57/43 14:29-14:46/17 16:39 11:07-11:11/4	08:15 09:24-09:41/17 17:28	07:21 18:19	07:10 20:13	06:06 21:04	05:23 21:49
4	08:45 10:15-10:58/43 16:40 14:31-14:46/15	08:14 09:26-09:41/15 17:30	07:18 18:21	07:08 20:15	06:04 21:06	05:22 21:50
5	08:45 10:15-10:42/27 14:31-14:45/14 16:41 10:44-10:57/13	08:12 09:27-09:39/12 17:32	07:16 18:23	07:05 20:17	06:02 21:07	05:22 21:51
6	08:44 10:16-10:41/25 14:33-14:46/13 16:42 10:45-10:57/12	08:10 09:30-09:36/6 17:33	07:14 18:25	07:03 20:18	06:00 21:09	05:21 21:51
7	08:44 10:16-10:39/23 14:34-14:45/11 16:43 10:46-10:55/9	08:09 17:35	07:12 18:27	07:01 20:20	05:59 21:11	05:20 21:52
8	08:43 10:17-10:39/22 14:37-14:44/7 16:45 10:49-10:54/5	08:07 17:37	07:10 18:28	06:59 20:22	05:57 21:12	05:20 21:53
9	08:43 10:18-10:39/21 16:46	08:05 17:39	07:07 18:30	06:56 20:23	05:55 21:14	05:19 21:54
10	08:42 10:18-10:39/21 16:47	08:03 17:41	07:05 18:32	06:54 20:25	05:53 21:15	05:19 21:55
11	08:42 10:20-10:40/20 16:49	08:01 17:43	07:03 18:34	06:52 20:27	05:52 21:17	05:18 21:56
12	08:41 10:20-10:40/20 16:50	08:00 17:45	07:01 18:35	06:50 20:28	05:50 21:19	05:18 21:56
13	08:40 10:21-10:39/18 16:52	07:58 17:46	06:58 07:27-07:37/10 18:37	06:47 20:30	05:48 21:20	05:18 21:57
14	08:40 10:22-10:39/17 16:53	07:56 17:48	06:56 07:25-07:43/18 18:39	06:45 20:32	05:47 21:22	05:18 21:58
15	08:39 10:23-10:38/15 16:55	07:54 17:50	06:54 07:23-07:46/23 18:41	06:43 20:34	05:45 21:23	05:17 21:58
16	08:38 10:25-10:37/12 16:56	07:52 17:52	06:51 07:20-07:47/27 18:42	06:41 20:35	05:44 21:25	05:17 21:59
17	08:37 10:27-10:36/9 16:58	07:50 17:54	06:49 07:19-07:48/29 18:44	06:39 20:37	05:42 21:26	05:17 21:59
18	08:36 09:28-09:31/3 17:00 10:30-10:34/4	07:48 17:56	06:47 07:18-07:49/31 18:46	06:36 20:39	05:41 21:28	05:17 22:00
19	08:35 09:26-09:34/8 17:01	07:46 17:58	06:44 07:17-07:49/32 18:47	06:34 20:40	05:39 21:29	05:17 22:00
20	08:34 09:23-09:35/12 17:03	07:44 17:59	06:42 07:17-07:50/33 18:49	06:32 20:42	05:38 21:31	05:17 22:00
21	08:33 09:23-09:37/14 17:05	07:42 18:01	06:40 07:16-07:50/34 18:51	06:30 20:44	05:37 21:32	05:18 22:01
22	08:32 09:22-09:39/17 17:06	07:40 18:03	06:38 07:15-07:50/35 18:53	06:28 20:45	05:35 21:34	05:18 22:01
23	08:31 09:22-09:40/18 17:08	07:38 18:05	06:35 07:16-07:50/34 18:54	06:26 20:47	05:34 21:35	05:18 22:01
24	08:30 09:21-09:40/19 17:10	07:36 18:07	06:33 07:16-07:50/34 18:56	06:24 20:49	05:33 21:36	05:18 22:01
25	08:28 09:22-09:41/19 17:12	07:34 18:09	06:31 07:16-07:49/33 18:58	06:22 20:51	05:32 21:38	05:19 22:01
26	08:27 09:21-09:41/20 17:13	07:31 18:10	06:28 07:16-07:48/32 18:59	06:20 20:52	05:31 21:39	05:19 22:01
27	08:26 09:21-09:42/21 17:15	07:29 18:12	06:26 07:17-07:48/31 19:01	06:18 20:54	05:29 21:40	05:19 22:01
28	08:24 09:21-09:42/21 17:17	07:27 18:14	06:24 07:16-07:46/30 19:03	06:16 20:56	05:28 21:42	05:20 22:01
29	08:23 09:22-09:43/21 17:19		07:21 08:17-08:45/28 20:05	06:14 20:57	05:27 21:43	05:20 22:01
30	08:21 09:22-09:43/21 17:21		07:19 08:18-08:43/25 20:06	06:12 20:59	05:26 21:44	05:21 22:00
31	08:20 09:22-09:42/20 17:22		07:17 08:20-08:42/22 20:08		05:25 21:45	
Potential sun hours	259	278	367	416	485	499
Sum of minutes with flicker	835	89	541	27	0	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Specimen Turbine WTG: 7 - T7
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main calendar table with columns for months (July-December) and rows for days (1-31). Each cell contains time ranges and potential sun hours.

Table layout: For each day in each month the following matrix apply

Matrix defining columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), First time (hh:mm) with flicker, Last time (hh:mm) with flicker, Minutes with flicker.

Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:11/3.5.584

SHADOW - Calendar per WTG

Calculation: Specimen Turbine WTG: 8 - T8

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 09:31-09:54/23 11:13-11:24/11 16:36 10:07-11:04/57 15:17-15:43/26	08:18 09:02-09:28/26 17:24	07:25 18:16	07:14 07:37-07:42/5 20:10	06:10 21:01	05:25 21:46
2	08:45 09:31-09:55/24 11:14-11:22/8 16:37 10:07-11:03/56 15:16-15:43/27	08:17 09:02-09:28/26 17:26	07:23 18:18	07:12 07:35-07:44/9 20:11	06:08 21:02	05:24 21:47
3	08:45 09:31-09:54/23 11:18-11:20/2 16:39 10:08-11:03/55 15:17-15:44/27	08:15 09:01-09:28/27 17:28	07:21 18:19	07:10 07:33-07:45/12 20:13	06:06 21:04	05:23 21:49
4	08:45 09:32-09:55/23 15:17-15:45/28 16:40 10:09-11:03/54	08:14 09:02-09:29/27 17:30	07:18 18:21	07:08 07:30-07:45/15 20:15	06:04 21:06	05:22 21:50
5	08:45 09:25-09:29/4 10:09-10:43/34 15:17-15:45/28 16:41 09:31-09:55/24 10:46-11:02/16	08:12 09:03-09:28/25 17:32	07:16 18:23	07:05 07:28-07:46/18 20:17	06:02 21:07	05:22 21:51
6	08:44 09:25-09:56/31 10:47-11:02/15 16:42 10:10-10:42/32 15:18-15:46/28	08:10 09:03-09:28/25 17:33	07:14 18:25	07:03 07:26-07:47/21 20:18	06:00 21:09	05:21 21:52
7	08:44 09:24-09:56/32 10:48-11:01/13 16:43 10:10-10:39/29 15:18-15:46/28	08:09 09:03-09:27/24 17:35	07:12 18:27	07:01 07:24-07:47/23 20:20	05:59 21:11	05:20 21:52
8	08:43 09:24-09:57/33 10:51-11:00/9 16:45 10:11-10:39/28 15:19-15:47/28	08:07 09:04-09:26/22 17:37	07:10 18:28	06:59 07:21-07:47/26 20:22	05:57 21:12	05:20 21:53
9	08:43 09:23-09:56/33 10:54-10:57/3 16:46 10:11-10:39/28 15:19-15:47/28	08:05 09:05-09:25/20 17:39	07:07 18:30	06:56 07:19-07:47/28 20:23	05:55 21:14	05:19 21:54
10	08:42 09:22-09:56/34 15:19-15:47/28 16:47 10:12-10:39/27	08:03 09:07-09:25/18 17:41	07:05 18:32	06:54 07:17-07:47/30 20:25	05:53 21:15	05:19 21:55
11	08:42 09:23-09:57/34 15:20-15:48/28 16:49 10:13-10:40/27	08:01 09:09-09:23/14 17:43	07:03 18:34	06:52 07:15-07:47/32 20:27	05:52 21:17	05:18 21:56
12	08:41 09:23-09:57/34 15:21-15:48/27 16:50 10:14-10:40/26	08:00 09:11-09:21/10 17:45	07:01 18:35	06:50 07:13-07:47/34 20:28	05:50 21:19	05:18 21:56
13	08:40 09:22-09:57/35 15:21-15:49/28 16:52 10:14-10:40/26	07:58 17:46	06:58 18:37	06:47 07:10-07:46/36 20:30	05:48 21:20	05:18 21:57
14	08:40 09:22-09:56/34 15:21-15:49/28 16:53 10:15-10:39/24	07:56 17:48	06:56 18:39	06:45 07:08-07:46/38 20:32	05:47 21:22	05:18 21:58
15	08:39 09:22-09:56/34 15:22-15:49/27 16:55 10:16-10:39/23	07:54 17:50	06:54 18:41	06:43 07:07-07:46/39 20:34	05:45 21:23	05:17 21:58
16	08:38 09:23-09:55/32 15:23-15:49/26 16:56 10:17-10:38/21	07:52 17:52	06:51 18:42	06:41 07:07-07:46/39 20:35	05:44 21:25	05:17 21:59
17	08:37 09:23-09:55/32 15:23-15:49/26 16:58 10:19-10:38/19	07:50 17:54	06:49 18:44	06:39 07:07-07:45/38 20:37	05:42 21:26	05:17 21:59
18	08:36 09:23-09:55/32 15:24-15:49/25 17:00 10:20-10:37/17	07:48 17:56	06:47 18:46	06:36 07:07-07:45/38 20:39	05:41 21:28	05:17 22:00
19	08:35 09:24-09:55/31 15:25-15:49/24 17:01 10:22-10:36/14	07:46 17:58	06:45 18:47	06:34 07:08-07:44/36 20:40	05:39 21:29	05:17 22:00
20	08:34 09:23-09:53/30 15:26-15:48/22 17:03 10:24-10:33/9	07:44 17:59	06:42 18:49	06:32 07:08-07:44/36 20:42	05:38 21:31	05:17 22:00
21	08:33 09:24-09:43/19 15:27-15:48/21 17:05 09:44-09:51/7	07:42 18:01	06:40 18:51	06:30 07:08-07:43/35 20:44	05:37 21:32	05:18 22:01
22	08:32 09:25-09:43/18 15:29-15:47/18 17:06 09:10-09:16/6	07:40 18:03	06:38 18:53	06:28 07:09-07:42/33 20:45	05:35 21:34	05:18 22:01
23	08:31 09:26-09:44/18 15:29-15:46/17 17:08 09:07-09:19/12	07:38 18:05	06:35 18:54	06:26 07:10-07:41/31 20:47	05:34 21:35	05:18 22:01
24	08:30 09:26-09:43/17 15:32-15:45/13 17:10 09:05-09:20/15	07:36 18:07	06:33 18:56	06:24 07:11-07:39/28 20:49	05:33 21:36	05:18 22:01
25	08:28 09:27-09:43/16 15:35-15:43/8 17:12 09:05-09:22/17	07:34 18:09	06:31 18:58	06:22 07:12-07:38/26 20:51	05:32 21:38	05:19 22:01
26	08:27 09:28-09:41/13 17:13 09:03-09:23/20	07:32 18:10	06:28 18:59	06:20 07:13-07:36/23 20:52	05:31 21:39	05:19 22:01
27	08:26 09:30-09:41/11 17:15 09:03-09:25/22	07:29 18:12	06:26 19:01	06:18 07:15-07:33/18 20:54	05:29 21:40	05:19 22:01
28	08:24 09:32-09:38/6 17:17 09:02-09:25/23	07:27 18:14	06:24 19:03	06:16 07:18-07:30/12 20:56	05:28 21:42	05:20 22:01
29	08:23 09:02-09:26/24 17:19			06:14 20:57	05:27 21:43	05:20 22:01
30	08:21 09:02-09:27/25 17:21			06:12 20:59	05:26 21:44	05:21 22:01
31	08:20 09:01-09:27/26 17:22			07:17 07:40-07:41/1 20:08	05:25 21:45	
Potential sun hours	259	278	367	416	485	499
Sum of minutes with flicker	2224	264	1	759	0	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:11/3.5.584

SHADOW - Calendar per WTG

Calculation: Specimen Turbine WTG: 8 - T8
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Table with columns for months (July to December) and rows for each day of the month, showing time intervals and shadow calculations. Includes summary rows for 'Potential sun hours' and 'Sum of minutes with flicker'.

Table layout: For each day in each month the following matrix apply

Day in month Sun rise (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker



Project:

6225Gortyrahill_ShardowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

Finisklin Business Park

IE-F91 RHH9 Sligo

+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:11/3.5.584

SHADOW - Calendar per WTG

Calculation: Specimen Turbine **WTG: 9 - T9**
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June	
1	08:45 09:48-10:03/15 13:55-14:51/56 10:14-11:34/80	08:18 08:47-09:01/14 15:28-16:29/61	07:25 07:53-08:21/28	07:14	06:10 06:34-06:40/6	05:25	
2	08:45 09:49-10:03/14 13:54-14:50/56 10:13-11:34/81	08:17 08:46-09:02/16 15:28-16:28/60	07:23 07:51-08:21/30	07:12	06:08 06:32-06:41/9	05:24	
3	08:45 09:49-10:02/13 13:55-14:51/56 10:14-11:34/80	08:15 08:45-09:03/18 15:28-16:26/58	07:21 07:51-08:21/30	07:10	06:06 06:31-06:42/11	05:23	
4	08:45 09:51-10:02/11 13:56-14:52/56 10:14-11:35/81	08:14 08:44-10:09/85 15:28-16:10/42	07:18 07:50-08:21/31	07:08	06:04 06:29-06:41/12	05:22	
5	08:45 09:51-10:01/10 13:56-14:52/56 10:14-11:35/81	08:12 08:43-10:09/86 10:26-11:02/36	07:16 07:50-08:21/31	07:05	06:02 06:27-06:41/14	05:22	
6	08:44 09:54-10:01/7 13:58-14:52/54 10:15-11:36/81	08:10 08:42-10:09/87 10:27-11:00/33	07:14 07:49-08:19/30	07:03	06:00 06:25-06:41/16	05:21	
7	08:44 09:56-09:58/2 13:58-14:52/54 10:14-11:35/81	08:09 08:41-10:08/87 10:29-10:59/30	07:12 07:49-08:18/29	07:01	05:59 06:24-06:41/17	05:20	
8	08:43 15:17-15:46/29 12:58-13:27/29	08:07 08:38-10:08/90 10:31-10:57/26	07:10 07:50-08:17/27	06:59	05:57 06:22-06:40/18	05:20	
9	08:43 15:17-15:48/31 12:59-13:27/28	08:05 08:36-10:07/91 10:33-10:54/21	07:07 07:50-08:15/25	06:56	05:55 06:21-06:41/20	05:19	
10	08:42 15:17-15:50/33 13:00-13:26/26	08:03 08:35-10:07/92 10:37-10:50/13	07:05 07:50-08:11/21	06:54	05:53 06:19-06:40/21	05:19	
11	08:42 15:18-15:53/35 13:02-13:26/24	08:01 08:34-10:07/93	07:03 07:52-08:10/18	06:52	05:52 06:17-06:39/22	05:18	
12	08:41 15:19-15:54/35 13:03-13:25/22	08:00 08:34-10:06/92	07:01 07:53-08:08/15	06:50	05:50 06:16-06:38/22	05:18	
13	08:40 09:10-09:17/7 14:03-14:53/50 10:15-11:37/82	07:58 08:33-10:05/92	06:58 07:55-08:04/9	06:47	05:48 06:14-06:37/23	05:18	
14	08:40 09:09-09:19/10 14:04-14:53/49 10:15-11:37/82	07:56 08:33-10:03/90	06:56 07:38-17:58/20	06:45	05:47 06:13-06:36/23	05:18	
15	08:39 09:08-09:21/13 16:06-16:13/7 13:10-13:21/11 10:16-11:37/81	07:54 08:33-10:02/89	06:54 07:37-17:57/20	06:43	05:45 06:12-06:36/24	05:17	
16	08:38 09:07-09:22/15 16:05-16:15/10 09:38-09:50/12	07:52 08:33-10:00/87	06:51 07:38-17:56/18	06:41	05:44 06:10-06:35/25	05:17	
17	08:37 09:06-09:23/17 16:04-16:18/14 09:37-09:52/15	07:50 08:34-09:56/82	06:49 07:40-17:54/14	06:39	05:42 06:09-06:35/26	05:17	
18	08:36 09:06-09:24/18 16:04-16:21/17 09:35-09:55/20	07:48 08:33-09:20/47 09:45-09:50/5	06:47 07:41-17:51/10	06:36	05:41 06:09-06:35/26	05:17	
19	08:35 09:05-09:26/21 14:13-14:51/38 10:17-11:36/79	07:46 08:34-08:49/15 09:25-09:34/9	06:44	06:34	05:39 06:09-06:34/25	05:17	
20	08:34 09:04-09:26/22 14:28-14:50/22 09:32-09:57/25	07:44 08:36-08:47/11	06:42	06:32	05:38 06:10-06:34/24	05:17	
21	08:33 09:04-09:27/23 14:30-14:49/19 09:32-09:59/27	07:42 08:39-08:44/5	06:40	06:30	05:37 06:11-06:33/22	05:17	
22	08:32 09:05-09:28/23 14:33-14:47/14 10:17-11:34/77	07:40 08:53-09:17/24	06:38	06:28	05:35 06:11-06:33/22	05:18	
23	08:31 09:05-10:01/56 14:36-14:43/7	07:38 08:54-09:16/22	06:35	06:26	05:34 06:12-06:32/20	05:18	
24	08:30 09:04-10:02/58 10:18-11:31/73	07:36 08:56-09:14/18	06:33	06:24	05:33 06:12-06:31/19	05:18	
25	08:28 09:05-10:04/59 11:08-11:30/22	07:34 08:07-08:17/10	06:31	06:22	05:32 06:13-06:30/17	05:19	
26	08:27 09:05-10:04/59 11:10-11:27/17	07:32 07:59-08:18/19	06:28	06:20	05:31 06:15-06:29/14	05:19	
27	08:26 09:06-10:05/59 11:15-11:24/9	07:29 07:56-08:19/23	06:26	06:18	05:29 06:16-06:27/11	05:19	
28	08:24 09:05-10:06/61 10:19-11:06/47	07:27 07:54-08:20/26	06:24	06:16	05:28 06:18-06:25/7	05:20	
29	08:23 09:06-10:07/61 10:20-11:07/47	07:25 07:53-08:21/28	06:22	06:14	05:27 06:38-06:40/2	05:20	
30	08:21 08:51-08:56/5 15:27-16:29/62	07:23 07:51-08:01/13	06:20	06:12	05:26 06:36-06:40/4	05:21	
31	08:20 08:48-08:58/10 15:27-16:29/62	07:21 07:49-08:17/14	06:18	06:10	05:25 06:17-06:31/21	05:21	
	Potential sun hours	278	367	416	485	499	
	Sum of minutes with flicker	6118	2743	549	6	816	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
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Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:11/3.5.584

SHADOW - Calendar per WTG

Calculation: Specimen Turbine WTG: 9 - T9
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (July-December) and rows for each day of the month, including sunrise, sunset, and shadow data.

Table layout: For each day in each month the following matrix apply

Day in month Sun rise (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
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Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:11/3.5.584

SHADOW - Calendar per WTG

Calculation: Specimen Turbine WTG: 10 - T10
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec. Values range from 1.06 to 2.89.

Operational time

Table with 13 columns: N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum. Values range from 194 to 8,760.

Main shadow calculation table with columns for months (January to June) and rows for each day of the month. Includes columns for start/end times and minutes with flicker.

Table layout: For each day in each month the following matrix apply

Matrix with 2 rows and 3 columns: Day in month, Sun rise (hh:mm) / Sun set (hh:mm), First time (hh:mm) with flicker, Last time (hh:mm) with flicker, Minutes with flicker.



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
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Calculated:
06/07/2022 17:11/3.5.584

SHADOW - Calendar per WTG

Calculation: Specimen Turbine WTG: 10 - T10
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Table with columns for months (July to December) and rows for time intervals (e.g., 05:22-20:34, 20:34-21:01/27). Includes summary rows for 'Potential sun hours' and 'Sum of minutes with flicker'.

Table layout: For each day in each month the following matrix apply

Day in month Sun rise (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker



SHADOW - Calendar per WTG

Calculation: Specimen Turbine WTG: 11 - T11
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Table with columns for months (January to June) and rows for days (1 to 31). Each cell contains sun rise/set times and shadow flicker data.

Table layout: For each day in each month the following matrix apply

Matrix with columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm), First time (hh:mm) with flicker, Last time (hh:mm) with flicker, Minutes with flicker.

SHADOW - Calendar per WTG

Calculation: Specimen Turbine **WTG: 11 - T11**
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22 20:11-21:12/61 22:00	05:58 20:08-20:43/35 21:28	06:48 19:26-19:39/13 20:26	07:37 19:17	07:30 17:11	08:21 15:01-15:15/14 16:31
2	05:22 20:11-21:11/60 22:00	06:00 20:08-20:42/34 21:27	06:49 19:23-19:39/16 20:24	07:38 19:15	07:32 17:09	08:23 14:58-15:16/18 16:30
3	05:23 20:11-21:11/60 21:59	06:01 20:09-20:42/33 21:25	06:51 19:22-19:40/18 20:22	07:40 19:12	07:34 17:07	08:24 14:56-15:17/21 16:29
4	05:24 20:10-21:09/59 21:59	06:03 20:09-20:40/31 21:23	06:53 19:21-19:40/19 20:20	07:42 19:10	07:36 17:05	08:26 14:56-15:18/22 16:29
5	05:25 20:10-21:08/58 21:59	06:04 20:10-20:40/30 21:21	06:54 19:21-19:41/20 20:17	07:43 19:08	07:38 17:04	08:27 14:55-15:19/24 16:28
6	05:25 20:10-21:00/50 21:58 21:01-21:06/5	06:06 20:10-20:39/29 21:20	06:56 19:19-19:40/21 20:15	07:45 19:05	07:39 17:02	08:28 14:56-15:20/24 16:28
7	05:26 20:10-21:00/50 21:57	06:07 20:11-20:37/26 21:18	06:58 19:18-19:40/22 20:13	07:47 19:03	07:41 17:00	08:29 14:55-15:20/25 16:27
8	05:27 20:10-21:00/50 21:57	06:09 20:13-20:36/23 21:16	06:59 19:17-19:40/23 20:10	07:48 19:01	07:43 16:59	08:31 14:55-15:21/26 16:27
9	05:28 20:10-21:00/50 21:56	06:11 20:14-20:34/20 21:14	07:01 19:14-19:38/24 20:08	07:50 18:59	07:45 16:57	08:32 14:55-15:21/26 16:27
10	05:29 20:09-21:00/51 21:55	06:12 20:16-20:32/16 21:12	07:02 19:13-19:37/24 20:06	07:52 18:56	07:47 16:55	08:33 14:56-15:22/26 16:27
11	05:30 20:09-21:00/51 21:55	06:14 20:19-20:27/8 21:10	07:04 19:12-19:35/23 20:03	07:54 18:54	07:48 16:54	08:34 14:56-15:23/27 16:26
12	05:31 20:09-21:00/51 21:54	06:15 20:19-20:27/8 21:09	07:06 19:12-19:33/21 20:01	07:55 18:52	07:50 16:52	08:35 14:56-15:23/27 16:26
13	05:32 20:08-21:00/52 21:53	06:17 20:19-20:27/8 21:07	07:07 19:10-19:31/21 19:59	07:57 18:50	07:52 16:51	08:36 14:56-15:24/28 16:26
14	05:34 20:08-20:59/51 21:52	06:19 20:19-20:27/8 21:05	07:09 19:11-19:30/19 19:56	07:59 18:48	07:54 16:49	08:37 14:56-15:24/28 16:26
15	05:35 20:08-20:59/51 21:51	06:20 20:19-20:27/8 21:03	07:10 19:11-19:28/17 19:54	08:00 18:45	07:55 16:48	08:38 14:57-15:25/28 16:26
16	05:36 20:07-20:58/51 21:50	06:22 20:19-20:27/8 21:01	07:12 19:11-19:25/14 19:52	08:02 18:43	07:57 16:46	08:39 14:57-15:26/29 16:26
17	05:37 20:07-20:57/50 21:49	06:23 20:19-20:27/8 20:59	07:14 19:12-19:23/11 19:49	08:04 18:41	07:59 16:45	08:40 14:57-15:25/28 16:27
18	05:38 20:07-20:56/49 21:48	06:25 20:19-20:27/8 20:57	07:15 19:13-19:20/7 19:47	08:06 18:39	08:01 16:44	08:40 14:58-15:26/28 16:27
19	05:40 20:06-20:55/49 21:47	06:27 20:19-20:27/8 20:54	07:17 19:13-19:20/7 19:45	08:07 18:37	08:02 16:42	08:41 14:58-15:27/29 16:27
20	05:41 20:07-20:55/48 21:46	06:28 20:19-20:27/8 20:52	07:19 19:13-19:20/7 19:42	08:09 18:35	08:04 16:41	08:42 14:58-15:27/29 16:28
21	05:42 20:07-20:53/46 21:44	06:30 20:19-20:27/8 20:50	07:20 19:13-19:20/7 19:40	08:11 18:33	08:06 16:40	08:42 14:59-15:28/29 16:28
22	05:44 20:06-20:51/45 21:43	06:32 20:19-20:27/8 20:48	07:22 19:13-19:20/7 19:38	08:13 18:31	08:07 16:39	08:43 14:59-15:28/29 16:28
23	05:45 20:45-20:47/2 21:42 20:06-20:43/37	06:33 20:19-20:27/8 20:46	07:23 19:13-19:20/7 19:35	08:14 18:28	08:09 16:38	08:43 15:00-15:29/29 16:29
24	05:46 20:07-20:44/37 21:40	06:35 20:19-20:27/8 20:44	07:25 19:13-19:20/7 19:33	08:16 18:26	08:11 16:37	08:44 15:00-15:29/29 16:29
25	05:48 20:06-20:44/38 21:39	06:36 20:19-20:27/8 20:42	07:27 19:13-19:20/7 19:31	07:18 17:24	08:12 16:36	08:44 15:00-15:29/29 16:30
26	05:49 20:06-20:43/37 21:38	06:38 20:19-20:27/8 20:40	07:28 19:13-19:20/7 19:28	07:20 17:22	08:14 16:35	08:44 15:02-15:30/28 16:31
27	05:51 20:07-20:44/37 21:36	06:40 20:19-20:27/8 20:37	07:30 19:13-19:20/7 19:26	07:21 17:20	08:15 16:34	08:45 15:02-15:30/28 16:32
28	05:52 20:06-20:43/37 21:35	06:41 20:19-20:27/8 20:35	07:32 19:13-19:20/7 19:24	07:23 17:18	08:17 15:06-15:10/4 16:33	08:45 15:03-15:31/28 16:32
29	05:54 20:06-20:43/37 21:33	06:43 20:19-20:27/8 20:33	07:33 19:13-19:20/7 19:22	07:25 17:17	08:18 15:03-15:12/9 16:32	08:45 15:03-15:31/28 16:33
30	05:55 20:07-20:43/36 21:32	06:45 20:19-20:27/8 20:31	07:35 19:13-19:20/7 19:19	07:27 17:15	08:20 15:03-15:14/11 16:31	08:45 15:04-15:32/28 16:34
31	05:57 20:07-20:42/35 21:30	06:46 19:28-19:37/9 20:29	07:37 19:13-19:20/7 19:17	07:29 17:13	08:21 15:03-15:14/11 16:30	08:45 15:05-15:32/27 16:35
Potential sun hours	502	454	381	331	266	244
Sum of minutes with flicker	1481	294	333	0	24	819

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
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Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:11/3.5.584

SHADOW - Calendar per WTG

Calculation: Specimen Turbine WTG: 12 - T12
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec. Values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns: N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum. Values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (July to December) and rows for each day of the month. Includes columns for sun rise, sun set, and minutes with flicker.

Table layout: For each day in each month the following matrix apply

Matrix with 2 rows and 3 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm); First time (hh:mm) with flicker, Last time (hh:mm) with flicker, Minutes with flicker



Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:11/3.5.584

SHADOW - Calendar per WTG

Calculation: Specimen Turbine WTG: 13 - T13
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Table with columns for months (January to June) and rows for days (1 to 31). Each row contains time intervals for sunrise and sunset, and a final row for 'Potential sun hours' and 'Sum of minutes with flicker'.

Table layout: For each day in each month the following matrix apply

Day in month Sun rise (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
IE-F91 RHH9 Sligo
+353719161416
Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:11/3.5.584

SHADOW - Calendar per WTG

Calculation: Specimen Turbine WTG: 13 - T13
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Table with columns for months (July to December) and rows for each day of the month, showing sun rise/set times and minutes with flicker.

Table layout: For each day in each month the following matrix apply

Day in month Sun rise (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker



Project:

6225Gortyrahill ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan

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+353719161416

Karen O'Neill / koneill@jodireland.com

Calculated:

06/07/2022 17:11/3.5.584

SHADOW - Calendar per WTG

Calculation: Specimen Turbine WTG: 14 - T14

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 15:09-15:51/42 09:17-09:34/17	08:18	07:25 17:17-17:40/23	07:14	06:10 19:56-20:32/36	05:24 20:25-21:00/35
	16:36 14:43-15:01/18	17:24	18:16	20:10	21:00	21:46
2	08:45 15:10-15:52/42 09:16-09:34/18	08:17	07:23 17:17-17:39/22	07:12	06:08 19:58-20:33/35	05:24 20:24-21:00/36
	16:37 14:43-15:00/17	17:26	18:17	20:11	21:02	21:47
3	08:45 15:11-15:52/41 09:16-09:35/19	08:15	07:21 17:18-17:39/21	07:10	06:06 19:59-20:35/36	05:23 20:25-21:00/35
	16:38 14:44-15:01/17	17:28	18:19	20:13	21:04	21:48
4	08:45 15:12-15:53/41 09:16-09:36/20	08:14	07:18 17:18-17:38/20	07:07	06:04 20:00-20:37/37	05:22 20:25-21:00/35
	16:40 14:46-15:01/15	17:30	18:21	20:15	21:05	21:49
5	08:44 15:12-15:53/41 09:15-09:36/21	08:12	07:16 17:18-17:36/18	07:05	06:02 20:01-20:38/37	05:21 20:26-21:01/35
	16:41 14:46-15:00/14	17:31	18:23	20:16	21:07	21:50
6	08:44 15:13-15:54/41 09:15-09:37/22	08:10	07:14 17:20-17:35/15	07:03	06:00 20:02-20:39/37	05:21 20:26-21:00/34
	16:42 14:48-15:00/12	17:33	18:25	20:18	21:09	21:51
7	08:44 15:13-15:54/41 09:14-09:37/23	08:08	07:12 17:22-17:33/11	07:01	05:59 20:03-20:42/39	05:20 20:27-21:01/34
	16:43 14:50-14:59/9	17:35	18:26	20:20	21:10	21:52
8	08:43 15:14-15:55/41 09:14-09:38/24	08:07 17:04-17:08/4	07:09	06:58	05:57 20:03-20:43/40	05:20 20:26-21:00/34
	16:45 14:53-14:57/4	17:37	18:28	20:22	21:12	21:53
9	08:43 15:14-15:55/41	08:05 17:00-17:10/10	07:07	06:56 19:53-19:57/4	05:55 20:03-20:44/41	05:19 20:27-21:01/34
	16:46 09:13-09:38/25	17:39	18:30	20:23	21:14	21:54
10	08:42 15:15-15:56/41	08:03 16:59-17:12/13	07:05	06:54 19:50-19:59/9	05:53 20:04-20:46/42	05:19 20:27-21:00/33
	16:47 09:12-09:38/26	17:41	18:32	20:25	21:15	21:55
11	08:42 15:15-15:56/41	08:01 16:58-17:13/15	07:03	06:52 19:48-20:01/13	05:52 20:05-20:47/42	05:18 20:27-21:00/33
	16:49 09:12-09:39/27	17:43	18:33	20:27	21:17	21:56
12	08:41 15:17-15:57/40	08:00 16:57-17:14/17	07:00	06:49 19:46-20:01/15	05:50 20:06-20:49/43	05:18 20:28-21:01/33
	16:50 09:11-09:39/28	17:45	18:35	20:28	21:18	21:56
13	08:40 15:18-15:57/39	07:58 16:56-17:15/19	06:58	06:47 19:45-20:03/18	05:48 20:07-20:50/43	05:18 20:29-21:01/32
	16:52 09:10-09:38/28	17:46	18:37	20:30	21:20	21:57
14	08:40 15:19-15:57/38	07:56 16:56-17:15/19	06:56	06:45 19:44-20:05/21	05:47 20:09-20:52/43	05:18 20:29-21:01/32
	16:53 09:09-09:38/29	17:48	18:39	20:32	21:22	21:58
15	08:39 15:19-15:57/38	07:54 16:56-17:15/19	06:54	06:43 19:44-20:07/23	05:45 20:10-20:52/42	05:17 20:28-21:00/32
	16:55 09:09-09:38/29	17:50	18:40	20:33	21:23	21:58
16	08:38 15:20-15:57/37	07:52 16:56-17:15/19	06:51	06:41 19:44-20:08/24	05:44 20:11-20:54/43	05:17 20:29-21:01/32
	16:56 09:09-09:38/29	17:52	18:42	20:35	21:25	21:59
17	08:37 15:21-15:57/36	07:50 16:57-17:14/17	06:49	06:38 19:43-20:10/27	05:42 20:12-20:56/44	05:17 20:29-21:01/32
	16:58 09:10-09:37/27	17:54	18:44	20:37	21:26	21:59
18	08:36 15:22-15:57/35	07:48 16:58-17:14/16	06:47	06:36 19:43-20:12/29	05:41 20:12-20:56/44	05:17 20:29-21:01/32
	17:00 09:10-09:37/27	17:56	18:46	20:39	21:28	21:59
19	08:35 15:23-15:56/33	07:46 16:59-17:13/14	06:44	06:34 19:42-20:13/31	05:39 20:12-20:57/45	05:17 20:30-21:02/32
	17:01 09:11-09:35/24	17:57	18:47	20:40	21:29	22:00
20	08:34 15:24-15:56/32	07:44 17:00-17:11/11	06:42	06:32 19:43-20:14/31	05:38 20:13-20:58/45	05:17 20:31-21:02/31
	17:03 09:11-09:32/21	17:59	18:49	20:42	21:31	22:00
21	08:33 15:26-15:55/29	07:42 17:03-17:08/5	06:40	06:30 19:43-20:16/33	05:37 20:14-20:58/44	05:17 20:31-21:02/31
	17:05 09:12-09:32/20	18:01 17:28-17:31/3	18:51	20:44	21:32	22:00
22	08:32 15:28-15:55/27	07:40 17:24-17:35/11	06:37	06:28 19:44-20:17/33	05:35 20:14-20:58/44	05:18 20:31-21:02/31
	17:06 09:13-09:32/19	18:03	18:53	20:45	21:33	22:01
23	08:31 15:45-15:52/7 09:14-09:31/17	07:38 17:22-17:38/16	06:35	06:26 19:45-20:19/34	05:34 20:15-20:58/43	05:18 20:30-21:02/32
	17:08 15:30-15:40/10	18:05	18:54	20:47	21:35	22:01
24	08:29 09:15-09:30/15	07:36 17:20-17:38/18	06:33	06:24 19:47-20:21/34	05:33 20:16-20:58/42	05:18 20:31-21:03/32
	17:10	18:07	18:56	20:49	21:36	22:01
25	08:28 09:17-09:30/13	07:34 17:19-17:39/20	06:31	06:22 19:49-20:22/33	05:32 20:17-20:59/42	05:18 20:31-21:03/32
	17:11	18:08	18:58	20:50	21:38	22:01
26	08:27 09:19-09:27/8	07:31 17:18-17:40/22	06:28	06:20 19:51-20:24/33	05:30 20:18-20:59/41	05:19 20:31-21:03/32
	17:13	18:10	18:59	20:52	21:39	22:01
27	08:26	07:29 17:18-17:40/22	06:26	06:18 19:51-20:25/34	05:29 20:20-20:59/39	05:19 20:32-21:03/31
	17:15	18:12	19:01	20:54	21:40	22:01
28	08:24	07:27 17:18-17:40/22	06:24	06:16 19:53-20:28/35	05:28 20:22-20:59/37	05:20 20:31-21:03/32
	17:17	18:14	19:03	20:55	21:41	22:01
29	08:23		07:21	06:14 19:54-20:29/35	05:27 20:24-20:59/35	05:20 20:32-21:04/32
	17:19		20:04	20:57	21:43	22:01
30	08:21		07:19	06:12 19:55-20:31/36	05:26 20:25-21:00/35	05:21 20:32-21:05/33
	17:20		20:06	20:59	21:44	22:00
31	08:20		07:17		05:25 20:25-21:00/35	
	17:22		20:08		21:45	
Potential sun hours	259	278	367	416	485	499
Sum of minutes with flicker	1536	332	130	585	1251	984

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

6225Gortyrahilly_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
Finisklin Business Park
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Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:11/3.5.584

SHADOW - Calendar per WTG

Calculation: Specimen Turbine WTG: 14 - T14
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (July-December) and rows for each day of the year (1-31), showing sun rise/set times and minutes with flicker.

Table layout: For each day in each month the following matrix apply

Matrix with 2 rows: Day in month, Sun rise (hh:mm), Sun set (hh:mm), First time (hh:mm) with flicker, Last time (hh:mm) with flicker, Minutes with flicker



SHADOW - Calendar per WTG

Calculation: Specimen Turbine WTG: 15 - Derragh
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

Table with 13 columns: N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum. Values range from 194 to 8,760.

Main calendar table with columns for months (January to June) and rows for each day. Includes sunrise/sunset times and potential sun hours with flicker.

Table layout: For each day in each month the following matrix apply

Matrix table with 2 rows and 3 columns: Day in month, Sun rise (hh:mm), Sun set (hh:mm); First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker.

SHADOW - Calendar per WTG

Calculation: Specimen Turbine WTG: 15 - Derragh
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.30 2.04 2.89 4.92 5.79 4.99 4.32 4.35 3.60 2.54 1.64 1.06

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
357 232 194 296 505 722 799 1,057 876 1,557 847 1,318 8,760

Table with columns for months (July to December) and rows for each day, showing sunrise and sunset times for each turbine. Includes summary rows for 'Potential sun hours' and 'Sum of minutes with flicker'.

Table layout: For each day in each month the following matrix apply

Matrix with 2 rows and 3 columns: Day in month, Sun rise (hh:mm) / Sun set (hh:mm), First time (hh:mm) with flicker - Last time (hh:mm) with flicker / Minutes with flicker.



Project:

6225Gortyrahill_ShadowFlicker_12042022

Description:

14 Turbine Layout, West Cork, FEI/SSE

Licensed user:

Jennings O'Donovan
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Karen O'Neill / koneill@jodireland.com
Calculated:
06/07/2022 17:11/3.5.584

SHADOW - Calendar per WTG

Calculation: Specimen Turbine WTG: 16 - Derragh
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N, NNE, ENE, E, ESE, SSE, S, SSW, WSW, W, WNW, NNW, Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main data table with columns for months (January to June) and rows for each day (1-31). Includes 'Potential sun hours' and 'Sum of minutes with flicker' at the bottom.

Table layout: For each day in each month the following matrix apply

Matrix with 2 rows: Day in month, Sun rise (hh:mm), Sun set (hh:mm), First time (hh:mm) with flicker, Last time (hh:mm) with flicker, Minutes with flicker.



SHADOW - Calendar per WTG

Calculation: Specimen Turbine WTG: 16 - Derragh
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (July-December) and rows for each day (1-31). Includes 'Potential sun hours' and 'Sum of minutes with flicker' at the bottom.

Table layout: For each day in each month the following matrix apply

Matrix with 2 rows: Day in month, Sun rise (hh:mm), Sun set (hh:mm), First time (hh:mm) with flicker, Last time (hh:mm) with flicker, Minutes with flicker.

SHADOW - Calendar per WTG

Calculation: Specimen Turbine **WTG:** 17 - Derragh
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 16:36	08:18 16:04-16:34/30 17:24	07:25 18:16	07:14 20:10	07:53-08:11/18 21:00	06:10 21:46
2	08:45 16:38	08:17 16:04-16:42/38 17:26	07:23 18:18	07:12 20:11	07:55-08:10/15 21:02	06:08 21:47
3	08:45 16:39	08:15 16:03-16:45/42 17:28	07:21 18:19	07:10 20:13	07:57-08:07/10 21:04	06:06 21:48
4	08:45 16:40	08:14 16:02-16:48/46 17:30	07:18 18:21	07:08 20:15	06:04 21:05	05:22 21:49
5	08:44 16:41	08:12 16:02-16:51/49 17:32	07:16 18:23	07:05 20:16	06:02 21:07	05:22 21:50
6	08:44 16:42	08:10 16:02-16:53/51 17:33	07:14 18:25	07:03 20:18	06:00 21:09	05:21 21:51
7	08:44 16:43	08:08 16:02-16:54/52 17:35	07:12 18:26	07:01 20:20	05:59 21:10	05:20 21:52
8	08:43 16:45	08:07 16:02-16:55/53 17:37	07:09 18:28	06:58 20:22	05:57 21:12	05:20 21:53
9	08:43 16:46	08:05 16:02-16:56/54 17:39	07:07 18:30	06:56 20:23	05:55 21:14	05:19 21:54
10	08:42 16:48	08:03 16:02-16:57/55 17:41	07:05 18:32	06:54 20:25	05:53 21:15	05:19 21:55
11	08:42 16:49	08:01 16:02-16:57/55 17:43	07:03 18:34	06:52 20:27	07:16-07:25/9 21:17	05:19 21:55
12	08:41 16:50	07:59 16:02-16:57/55 17:45	07:00 18:35	06:50 20:28	07:13-07:27/14 21:18	05:18 21:56
13	08:40 16:52	07:58 16:03-16:57/54 17:46	06:58 18:37	06:47 20:30	07:11-07:27/16 21:20	05:18 21:57
14	08:40 16:53	07:56 16:03-16:57/54 17:48	06:56 18:39	06:45 20:32	07:10-07:28/18 21:22	05:18 21:57
15	08:39 16:55	07:54 16:04-16:57/53 17:50	06:54 18:40	06:43 20:33	07:09-07:28/19 21:23	05:18 21:58
16	08:38 16:56	07:52 16:05-16:57/52 17:52	06:51 18:42	06:41 20:35	07:09-07:29/20 21:25	05:17 21:59
17	08:37 16:58	07:50 16:07-16:57/50 17:54	06:49 18:44	06:39 20:37	07:02-07:29/27 21:26	05:17 21:59
18	08:36 17:00	07:48 16:09-16:56/47 17:56	06:47 18:46	07:10-07:13/3 20:39	06:36 21:28	05:17 21:59
19	08:35 17:01	07:46 16:12-16:55/43 17:58	06:44 18:47	07:07-07:14/7 20:40	06:34 21:29	05:17 22:00
20	08:34 17:03	07:44 16:35-16:54/19 17:59	06:42 18:49	07:05-07:15/10 20:42	06:32 21:31	05:17 22:00
21	08:33 17:05	07:42 16:36-16:52/16 18:01	06:40 18:51	07:03-07:16/13 20:44	06:30 21:32	05:18 22:00
22	08:32 17:06	07:40 16:39-16:50/11 18:03	06:38 18:53	07:00-07:16/16 20:45	06:28 21:33	05:18 22:01
23	08:31 17:08	07:38 18:05	06:35 18:54	06:58-07:16/18 20:47	06:26 21:35	05:18 22:01
24	08:29 17:10	07:36 18:07	06:33 18:56	06:56-07:16/20 20:49	06:24 21:36	05:18 22:01
25	08:28 17:12	07:34 18:09	06:31 18:58	06:53-07:16/23 20:50	06:22 21:38	05:19 22:01
26	08:27 17:13	07:31 18:10	06:28 18:59	06:53-07:16/23 20:52	06:20 21:39	05:19 22:01
27	08:26 17:15	16:11-16:19/8 18:12	06:26 19:01	06:52-07:16/24 20:54	06:18 21:40	05:19 22:01
28	08:24 17:17	16:09-16:22/13 18:14	06:24 19:03	06:51-07:15/24 20:55	06:16 21:41	05:20 22:01
29	08:23 17:19	16:07-16:24/17 18:15	06:21 19:05	07:52-08:15/23 20:57	06:14 21:43	05:20 22:01
30	08:21 17:21	16:06-16:29/23 18:16	06:19 19:07	07:52-08:14/22 20:59	06:12 21:44	05:21 22:00
31	08:20 17:22	16:05-16:32/27 18:17	06:17 19:08	07:52-08:12/20 20:08	05:26 21:45	05:21 22:00
Potential sun hours	259	278	367	416	485	499
Sum of minutes with flicker	88	1002	246	508	40	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Specimen Turbine WTG: 17 - Derragh
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main shadow calculation table with columns for months (July-December) and rows for days (1-31). Includes sun rise/set times and potential sun hours.

Table layout: For each day in each month the following matrix apply

Matrix with 2 rows: Day in month, Sun rise (hh:mm), Sun set (hh:mm), First time (hh:mm) with flicker, Last time (hh:mm) with flicker, Minutes with flicker.

SHADOW - Calendar per WTG

Calculation: Specimen Turbine WTG: 18 - Derragh
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Table with 12 columns (Jan-Dec) and 1 row of values: 1.30, 2.04, 2.89, 4.92, 5.79, 4.99, 4.32, 4.35, 3.60, 2.54, 1.64, 1.06

Operational time

Table with 13 columns (N-Sum) and 1 row of values: 357, 232, 194, 296, 505, 722, 799, 1,057, 876, 1,557, 847, 1,318, 8,760

Main data table with columns for months (January to June) and rows for each day (1-31) showing sunrise and sunset times for each turbine.

Table layout: For each day in each month the following matrix apply

Matrix with 2 rows: Day in month, Sun rise (hh:mm), Sun set (hh:mm), First time (hh:mm) with flicker, Last time (hh:mm) with flicker, Minutes with flicker.



SHADOW - Calendar per WTG

Calculation: Specimen Turbine WTG: 18 - Derragh

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	July	August	September	October	November	December
1	05:22 06:33-06:59/26 22:00	05:58 06:40-06:59/19 21:28	06:48 07:37 20:26	07:37 19:17 20:26	07:30 14:14-14:44/30 17:11 13:11-13:51/40	08:21 14:16-14:57/41 16:31 13:00-14:06/66
2	05:22 06:33-07:00/27 22:00	06:00 06:41-06:57/16 21:27	06:49 20:24 19:15	07:38 19:15 20:24	07:32 14:12-14:47/35 17:09 13:07-13:53/46	08:23 14:17-14:58/41 16:30 13:01-14:06/65
3	05:23 06:33-07:00/27 21:59	06:01 06:44-06:55/11 21:25	06:51 20:22 19:12	07:40 19:12 20:22	07:34 14:11-14:50/39 17:07 13:05-13:55/50	08:24 14:17-14:57/40 16:29 13:01-14:06/65
4	05:24 06:33-07:00/27 21:59	06:03 21:23 21:23	06:53 20:19 19:10	07:42 19:10 20:19	07:36 14:10-14:51/41 17:05 13:03-13:56/53	08:25 14:19-14:57/38 16:29 13:02-14:06/64
5	05:25 06:33-07:01/28 21:58	06:04 21:21 21:21	06:54 20:17 19:08	07:43 19:08 20:17	07:38 14:09-14:53/44 17:04 13:01-13:58/57	08:27 14:19-14:56/37 16:28 13:03-14:06/63
6	05:25 06:33-07:01/28 21:58	06:06 21:20 21:20	06:56 20:15 19:05	07:45 19:05 20:15	07:39 14:08-14:54/46 17:02 13:00-13:59/59	08:28 14:20-14:55/35 16:28 13:04-14:05/61
7	05:26 06:33-07:02/29 21:57	06:07 21:18 21:18	06:57 20:13 19:03	07:47 19:03 20:13	07:41 14:08-14:55/47 17:00 12:59-14:00/61	08:29 14:22-14:56/34 16:27 13:04-14:06/62
8	05:27 06:33-07:02/29 21:57	06:09 21:16 21:16	06:59 20:10 19:01	07:48 19:01 20:10	07:43 14:07-14:56/49 16:59 12:58-14:01/63	08:30 14:23-14:55/32 16:27 13:05-14:06/61
9	05:28 06:33-07:03/30 21:56	06:11 21:14 21:14	07:01 20:08 18:59	07:50 18:59 20:08	07:45 14:07-14:56/49 16:57 12:57-14:01/64	08:32 14:23-14:54/31 16:27 13:05-14:06/61
10	05:29 06:33-07:03/30 21:55	06:12 21:12 21:12	07:02 20:06 18:56	07:52 18:56 20:06	07:46 14:07-14:57/50 16:55 12:57-14:02/65	08:33 14:24-14:53/29 16:27 13:06-14:06/60
11	05:30 06:33-07:04/31 21:54	06:14 21:10 21:10	07:04 20:03 18:54	07:53 18:54 20:03	07:48 14:06-14:57/51 16:54 12:55-14:02/67	08:34 14:26-14:53/27 16:26 13:07-14:07/60
12	05:31 06:33-07:04/31 21:54	06:15 21:08 21:08	07:06 20:01 18:52	07:55 18:52 20:01	07:50 14:06-14:57/51 16:52 12:55-14:02/67	08:35 14:27-14:52/25 16:26 13:08-14:07/59
13	05:32 06:33-07:04/31 21:53	06:17 21:07 21:07	07:07 19:59 18:50	07:57 18:50 20:07	07:52 14:06-14:58/52 16:51 12:55-14:03/68	08:36 14:28-14:51/23 16:26 13:09-14:07/58
14	05:34 06:33-07:04/31 21:52	06:19 21:05 21:05	07:09 19:56 18:48	07:59 18:48 20:09	07:54 14:06-14:58/52 16:49 12:55-14:03/68	08:37 14:29-14:47/18 16:26 13:09-14:07/58
15	05:35 06:33-07:04/31 21:51	06:20 21:03 21:03	07:10 19:54 18:45	08:00 18:45 20:10	07:55 14:06-14:58/52 16:48 12:55-14:04/69	08:38 14:30-14:47/17 16:26 13:10-14:08/58
16	05:36 06:33-07:05/32 21:50	06:22 21:01 21:01	07:12 19:52 18:43	08:02 18:43 20:12	07:57 14:06-14:59/53 16:46 12:55-14:04/69	08:39 14:30-14:46/16 16:26 13:10-14:07/57
17	05:37 06:33-07:05/32 21:49	06:23 20:59 20:59	07:14 19:49 18:41	08:04 18:41 20:14	07:59 14:07-14:59/52 16:45 12:55-14:04/69	08:39 14:32-14:46/14 16:27 13:11-14:07/56
18	05:38 06:33-07:05/32 21:48	06:25 20:56 20:56	07:15 19:47 18:39	08:06 18:39 20:15	08:00 14:07-14:59/52 16:44 12:55-14:05/70	08:40 14:33-14:46/13 16:27 13:11-14:08/57
19	05:40 06:34-07:05/31 21:47	06:27 20:54 20:54	07:17 19:45 18:37	08:07 18:37 20:17	08:02 14:08-14:59/51 16:42 12:55-14:05/70	08:41 14:34-14:47/13 16:27 13:12-14:09/57
20	05:41 06:34-07:05/31 21:45	06:28 20:52 20:52	07:19 19:42 18:35	08:09 18:35 20:19	08:04 14:08-15:00/52 16:41 12:56-14:05/69	08:42 14:34-14:46/12 16:28 13:12-14:09/57
21	05:42 06:34-07:05/31 21:44	06:30 20:50 20:50	07:20 19:40 18:33	08:11 18:33 20:19	08:06 14:08-14:59/51 16:40 12:55-14:05/70	08:42 14:35-14:47/12 16:28 13:13-14:09/56
22	05:44 06:34-07:05/31 21:43	06:32 20:48 20:48	07:22 19:38 18:31	08:13 18:31 20:22	08:07 14:09-14:59/50 16:39 12:56-14:05/69	08:43 14:35-14:47/12 16:28 13:13-14:09/56
23	05:45 06:34-07:05/31 21:42	06:33 20:46 20:46	07:23 19:35 18:28	08:14 18:28 20:23	08:09 14:10-14:59/49 16:38 12:56-14:05/69	08:43 14:36-14:48/12 16:29 13:14-14:10/56
24	05:46 06:34-07:05/31 21:40	06:35 20:44 20:44	07:25 19:33 18:26	08:16 18:26 20:25	08:10 14:11-14:59/48 16:37 12:57-14:06/69	08:44 14:36-14:48/12 16:30 13:14-14:11/57
25	05:48 06:35-07:04/29 21:39	06:36 20:42 20:42	07:27 19:31 17:24	07:18 17:24 20:27	08:12 14:10-14:58/48 16:36 12:57-14:05/68	08:44 14:36-14:49/13 16:30 13:14-14:11/57
26	05:49 06:36-07:04/28 21:37	06:38 20:40 20:40	07:28 19:28 17:22	07:20 17:22 20:28	08:14 14:11-14:59/48 16:35 12:57-14:05/68	08:44 14:36-14:50/14 16:31 13:15-14:11/56
27	05:51 06:36-07:04/28 21:36	06:40 20:37 20:37	07:30 19:26 17:20	07:21 17:20 20:29	08:15 14:13-14:59/46 16:34 12:58-14:06/68	08:45 14:37-14:51/14 16:32 13:16-14:13/57
28	05:52 06:36-07:03/27 21:34	06:41 20:35 20:35	07:32 19:24 17:18	07:23 17:18 20:30	08:17 14:13-14:58/45 16:33 12:59-14:05/66	08:45 14:36-14:52/16 16:32 13:16-14:13/57
29	05:54 06:37-07:02/25 21:33	06:43 20:33 20:33	07:33 19:21 17:17	07:25 17:17 20:31	08:18 14:14-14:58/44 16:32 12:59-14:06/67	08:45 14:36-14:53/17 16:33 13:16-14:14/58
30	05:55 06:38-07:01/23 21:31	06:45 20:31 20:31	07:35 19:19 17:15	07:27 17:15 13:35-13:43/8	08:20 14:15-14:58/43 16:31 13:00-14:06/66	08:45 14:36-14:55/19 16:34 13:16-14:15/59
31	05:57 06:38-07:00/22 21:30	06:46 20:28 20:28	17:13 13:29-13:48/19	17:13 13:29-13:48/19	17:13 13:29-13:48/19	17:13 13:29-13:48/19
Potential sun hours	502	454	381	331	266	244
Sum of minutes with flicker	900	46	0	81	3344	2534

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Specimen Turbine WTG: 19 - Derragh

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

	January	February	March	April	May	June
1	08:45 14:46-15:22/36 16:36 14:04-14:45/41	08:18 17:24 18:16	07:25 18:16	07:14 20:10	06:10 07:15-07:53/38 21:00	05:25 21:46
2	08:45 14:47-15:22/35 16:38 14:05-14:45/40	08:17 17:26 18:18	07:23 18:18	07:12 20:11	06:08 07:15-07:52/37 21:02	05:24 21:47
3	08:45 14:48-15:23/35 16:39 14:06-14:46/40	08:15 17:28 18:19	07:21 18:19	07:10 20:13	06:06 07:17-07:52/35 21:04	05:23 21:48
4	08:45 14:47-15:23/36 16:40 14:06-14:45/39	08:13 17:30 18:21	07:18 18:21	07:08 20:15	06:04 07:17-07:51/34 21:05	05:22 21:49
5	08:44 14:48-15:23/35 16:41 14:07-14:46/39	08:12 17:32 18:23	07:16 18:23	07:05 20:16	06:02 07:18-07:49/31 21:07	05:22 21:50
6	08:44 14:50-15:24/34 16:42 14:09-14:46/37	08:10 17:33 18:25	07:14 18:25	07:03 20:18	06:00 07:19-07:48/29 21:09	05:21 21:51
7	08:44 14:50-15:24/34 16:43 14:09-14:46/37	08:08 17:35 18:26	07:12 18:26	07:01 20:20	05:59 07:20-07:47/27 21:10	05:20 21:52
8	08:43 14:50-15:24/34 16:45 14:10-14:45/35	08:07 17:37 18:28	07:09 18:28	06:58 20:22	05:57 07:21-07:45/24 21:12	05:20 21:53
9	08:43 14:51-15:25/34 16:46 14:12-14:46/34	08:05 17:39 18:30	07:07 18:30	06:56 20:23	05:55 07:24-07:44/20 21:14	05:19 21:54
10	08:42 14:52-15:25/33 16:47 14:13-14:45/32	08:03 17:41 18:32	07:05 18:32	06:54 07:32-07:47/15 20:25	05:53 07:26-07:41/15 21:15	05:19 21:55
11	08:42 14:52-15:24/32 16:49 14:15-14:45/30	08:01 17:43 18:33	07:03 18:33	06:52 07:29-07:50/21 20:27	05:52 07:29-07:36/7 21:17	05:19 21:55
12	08:41 14:53-15:24/31 16:50 14:17-14:44/27	07:59 17:45 18:35	07:00 18:35	06:50 07:26-07:51/25 20:28	05:50 07:26-07:51/25 21:18	05:18 21:56
13	08:40 14:55-15:25/30 16:52 14:28-14:44/16	07:58 17:46 18:37	06:58 18:37	06:47 07:24-07:53/29 20:30	05:48 07:24-07:53/29 21:20	05:18 21:57
14	08:40 14:56-15:25/29 16:53 14:30-14:42/12	07:56 17:48 18:39	06:56 18:39	06:45 07:22-07:54/32 20:32	05:47 07:22-07:54/32 21:22	05:18 21:57
15	08:39 14:57-15:25/28 16:55 14:33-14:40/7	07:54 17:50 18:40	06:54 18:40	06:43 07:21-07:55/34 20:33	05:45 07:21-07:55/34 21:23	05:18 21:58
16	08:38 14:58-15:24/26 16:56	07:52 17:52 18:42	06:51 18:42	06:41 07:20-07:56/36 20:35	05:44 07:20-07:56/36 21:25	05:17 21:58
17	08:37 15:00-15:24/24 16:58	07:50 17:54 18:44	06:49 18:44	06:39 07:19-07:57/38 20:37	05:42 07:19-07:57/38 21:26	05:17 21:59
18	08:36 15:01-15:22/21 17:00	07:48 17:56 18:46	06:47 18:46	06:36 07:18-07:57/39 20:39	05:41 07:18-07:57/39 21:28	05:17 21:59
19	08:35 15:03-15:21/18 17:01	07:46 17:58 18:47	06:44 18:47	06:34 07:17-07:57/40 20:40	05:39 07:17-07:57/40 21:29	05:17 22:00
20	08:34 15:06-15:18/12 17:03	07:44 17:59 18:49	06:42 18:49	06:32 07:17-07:58/41 20:42	05:38 07:17-07:58/41 21:31	05:17 22:00
21	08:33 17:05 17:05	07:42 18:01 18:51	06:40 18:51	06:30 07:16-07:58/42 20:44	05:37 07:16-07:58/42 21:32	05:18 22:00
22	08:32 17:06 17:06	07:40 18:03 18:53	06:37 18:53	06:28 07:15-07:57/42 20:45	05:35 07:15-07:57/42 21:33	05:18 22:00
23	08:31 17:08 17:08	07:38 18:05 18:54	06:35 18:54	06:26 07:14-07:57/43 20:47	05:34 07:14-07:57/43 21:35	05:18 22:01
24	08:29 17:10 17:10	07:36 18:07 18:56	06:33 18:56	06:24 07:14-07:57/43 20:49	05:33 07:14-07:57/43 21:36	05:18 22:01
25	08:28 17:12 17:12	07:33 18:09 18:58	06:31 18:58	06:22 07:15-07:57/42 20:50	05:32 07:15-07:57/42 21:37	05:19 22:01
26	08:27 17:13 17:13	07:31 18:10 18:59	06:28 18:59	06:20 07:15-07:57/42 20:52	05:31 07:15-07:57/42 21:39	05:19 22:01
27	08:25 17:15 17:15	07:29 18:12 19:01	06:26 19:01	06:18 07:15-07:56/41 20:54	05:29 07:15-07:56/41 21:40	05:19 22:01
28	08:24 17:17 17:17	07:27 18:14 19:03	06:24 19:03	06:16 07:15-07:56/41 20:55	05:28 07:15-07:56/41 21:41	05:20 22:01
29	08:23 17:19 17:19	07:21 19:04 19:53	06:14 19:53	06:14 07:15-07:55/40 20:57	05:27 07:15-07:55/40 21:43	05:20 22:00
30	08:21 17:21 17:21	07:19 19:06 19:55	06:12 19:55	06:12 07:15-07:54/39 20:59	05:26 07:15-07:54/39 21:44	05:21 22:00
31	08:20 17:22 17:22	07:17 19:08 19:57	06:11 19:57	06:11 07:15-07:54/39 21:00	05:25 07:15-07:54/39 21:45	05:21 22:00
Potential sun hours	259	278	367	416	485	499
Sum of minutes with flicker	1063	0	0	765	297	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Specimen Turbine **WTG:** 19 - Derragh
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VALENTIA OBS.]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.30	2.04	2.89	4.92	5.79	4.99	4.32	4.35	3.60	2.54	1.64	1.06

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
357	232	194	296	505	722	799	1,057	876	1,557	847	1,318	8,760

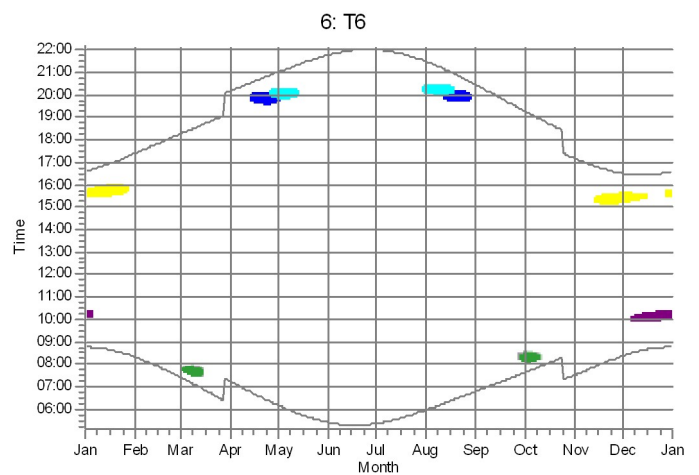
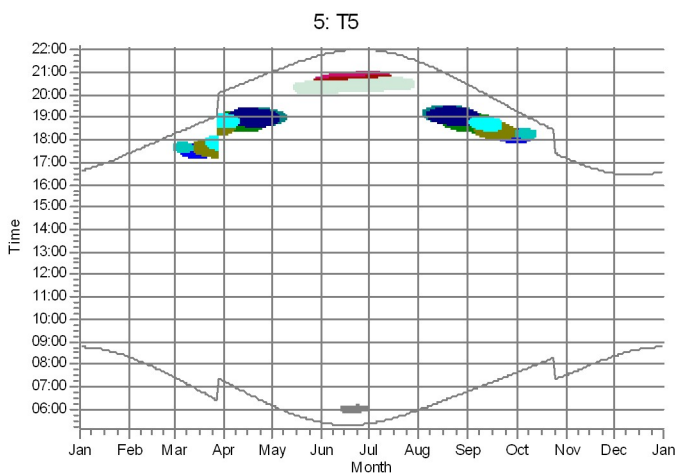
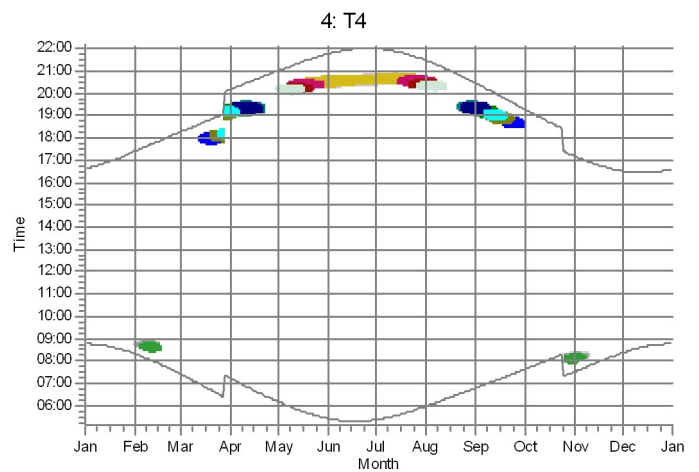
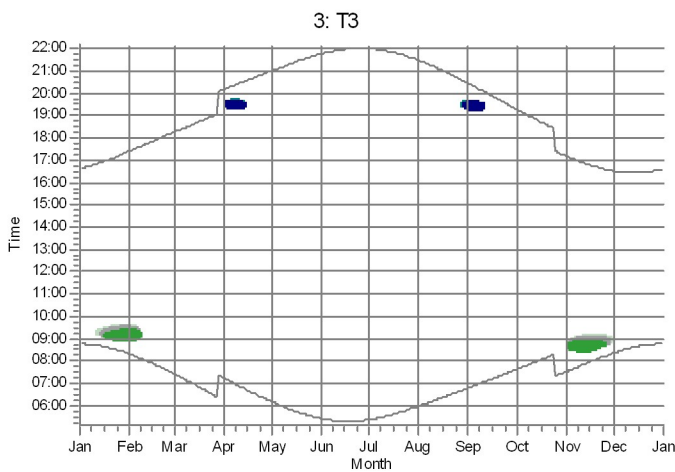
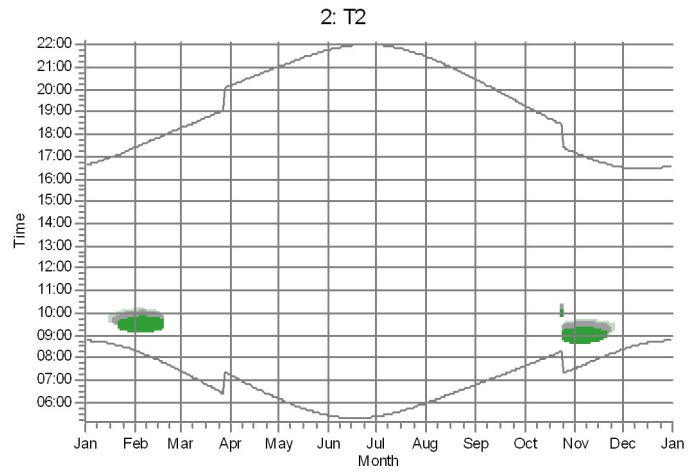
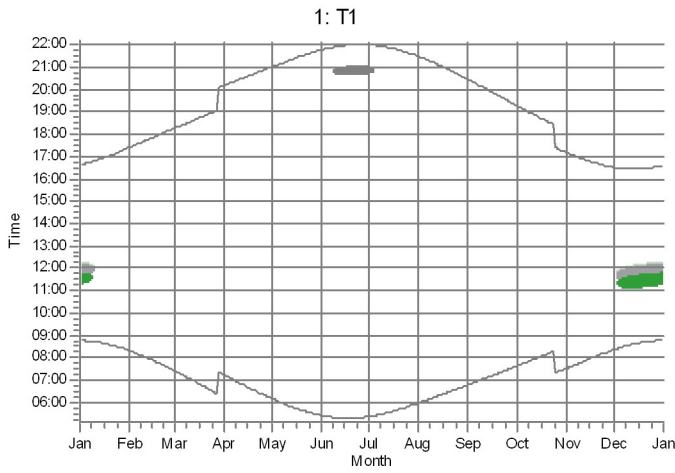
	July	August	September	October	November	December
1	05:22 22:00	05:58 21:28	06:48 20:26	07:28-07:49/21 07:37 19:17	07:30 17:11	08:21 14:35-15:07/32 16:31 13:57-14:27/30
2	05:22 22:00	06:00 21:27	07:37-07:49/12 20:24	06:49 07:30-07:45/15 07:38 19:15	07:32 17:09	08:23 14:35-15:08/33 16:30 13:57-14:28/31
3	05:23 21:59	06:01 21:25	07:35-07:52/17 20:22	06:51 19:12	07:34 17:07	08:24 14:34-15:08/34 16:29 13:55-14:29/34
4	05:24 21:59	06:03 21:23	07:33-07:54/21 20:19	06:53 20:19	07:36 17:05	08:25 14:35-15:09/34 16:29 13:55-14:30/35
5	05:25 21:58	06:04 21:21	07:31-07:56/25 20:17	06:54 20:17	07:38 17:04	08:27 14:35-15:09/34 16:28 13:55-14:31/36
6	05:26 21:58	06:06 21:20	07:29-07:57/28 20:15	06:56 20:15	07:39 17:02	08:28 14:35-15:09/34 16:28 13:55-14:31/36
7	05:26 21:57	06:07 21:18	07:29-07:59/30 20:13	06:58 20:13	07:41 17:00	08:29 14:36-15:11/35 16:27 13:54-14:33/39
8	05:27 21:57	06:09 21:16	07:27-07:59/32 20:10	06:59 20:10	07:43 16:59	08:30 14:36-15:11/35 16:27 13:54-14:33/39
9	05:28 21:56	06:11 21:14	07:27-08:01/34 20:08	07:01 20:08	07:45 16:57	08:32 14:36-15:11/35 16:27 13:54-14:34/40
10	05:29 21:55	06:12 21:12	07:25-08:01/36 20:06	07:02 20:06	07:46 16:55	08:33 14:36-15:11/35 16:27 13:54-14:34/40
11	05:30 21:54	06:14 21:10	07:25-08:02/37 20:03	07:04 20:03	07:48 16:54	08:34 14:37-15:13/36 16:26 13:55-14:36/41
12	05:31 21:54	06:15 21:08	07:24-08:02/38 20:01	07:06 20:01	07:50 16:52	08:35 14:37-15:13/36 16:26 13:55-14:36/41
13	05:32 21:53	06:17 21:07	07:23-08:03/40 19:59	07:07 19:59	07:52 16:51	08:36 14:38-15:14/36 16:26 13:55-14:37/42
14	05:34 21:52	06:19 21:05	07:22-08:03/41 19:56	07:09 19:56	07:54 16:49	08:37 13:55-15:14/79 16:26
15	05:35 21:51	06:20 21:03	07:22-08:03/41 19:54	07:10 19:54	07:55 16:48	08:38 14:39-15:15/36 16:26 13:56-14:38/42
16	05:36 21:50	06:22 21:01	07:21-08:03/42 19:52	07:12 19:52	07:57 16:46	08:39 13:55-15:14/79 16:27
17	05:37 21:49	06:23 20:59	07:21-08:04/43 19:49	07:14 19:49	07:59 16:45	08:39 13:56-15:15/79 16:27
18	05:38 21:48	06:25 20:56	07:20-08:03/43 19:47	07:15 19:47	08:00 16:44	08:40 14:40-15:16/36 16:27 13:56-14:39/43
19	05:40 21:47	06:27 20:54	07:21-08:03/42 19:45	07:17 19:45	08:02 16:42	08:41 13:57-15:16/79 16:27
20	05:41 21:45	06:28 20:52	07:20-08:02/42 19:42	07:19 19:42	08:04 16:41	08:42 13:57-15:16/79 16:28
21	05:42 21:44	06:30 20:50	07:20-08:03/43 19:40	07:20 19:40	08:06 16:40	08:42 13:58-15:17/79 16:28
22	05:44 21:43	06:32 20:48	07:20-08:02/42 19:38	07:22 19:38	08:13 16:39	08:43 13:58-15:17/79 16:28
23	05:45 21:42	06:33 20:46	07:20-08:01/41 19:35	07:23 19:35	08:14 16:38	08:43 13:59-15:18/79 16:29
24	05:46 21:40	06:35 20:44	07:20-08:00/40 19:33	07:25 19:33	08:16 16:37	08:44 13:59-15:18/79 16:30
25	05:48 21:39	06:36 20:42	07:21-08:00/39 19:31	07:27 19:31	08:18 16:36	08:44 14:43-15:18/35 16:30 13:59-14:42/43
26	05:49 21:37	06:38 20:40	07:22-07:59/37 19:28	07:28 19:28	08:14 16:35	08:44 14:00-15:19/79 16:31
27	05:51 21:36	06:40 20:37	07:22-07:58/36 19:26	07:30 19:26	08:15 16:34	08:45 14:01-15:20/79 16:32
28	05:52 21:34	06:41 20:35	07:23-07:57/34 19:24	07:32 19:24	08:17 16:33	08:45 14:45-15:20/35 16:32 14:02-14:44/42
29	05:54 21:33	06:43 20:33	07:23-07:55/32 19:21	07:33 19:21	08:18 16:32	08:45 14:45-15:21/36 16:33 14:02-14:44/42
30	05:55 21:31	06:45 20:31	07:25-07:54/29 19:19	07:35 19:19	08:20 16:31	08:45 14:03-15:21/78 16:34
31	05:57 21:30	06:46 20:28	07:26-07:51/25 19:19	07:35 19:19	08:20 16:31	08:45 14:03-15:21/78 16:34
Potential sun hours	502	454	381	331	266	244
Sum of minutes with flicker	0	1042	36	0	279	2347

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG, graphical

Calculation: Specimen Turbine

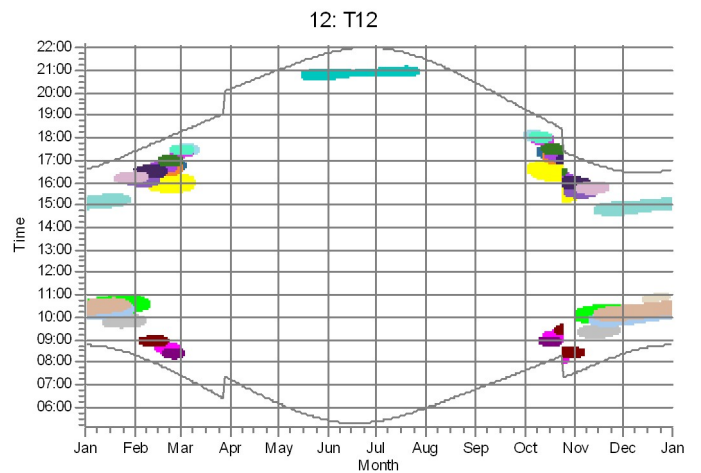
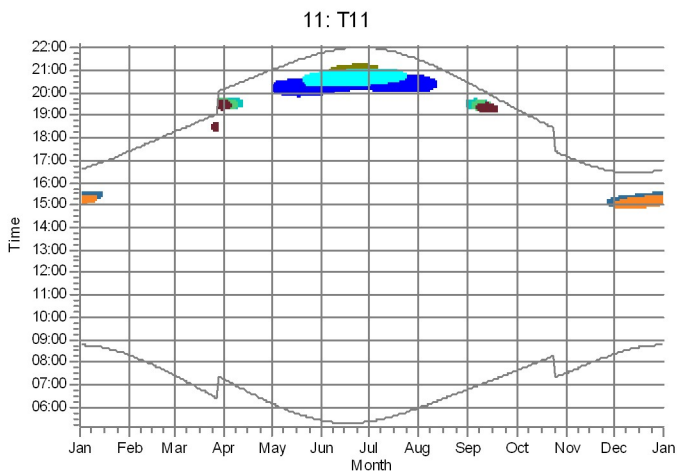
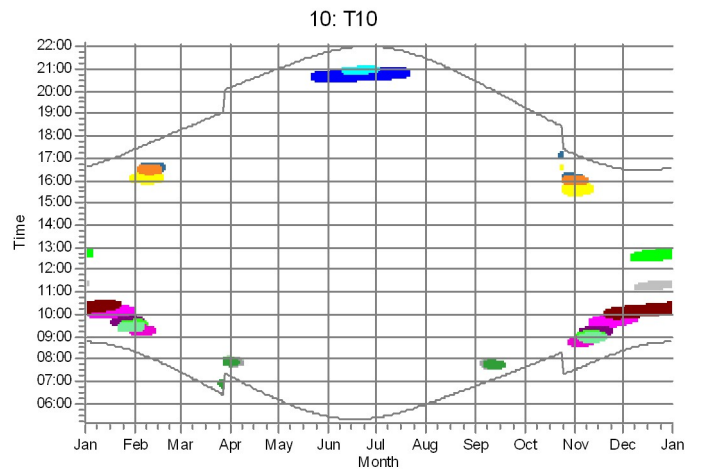
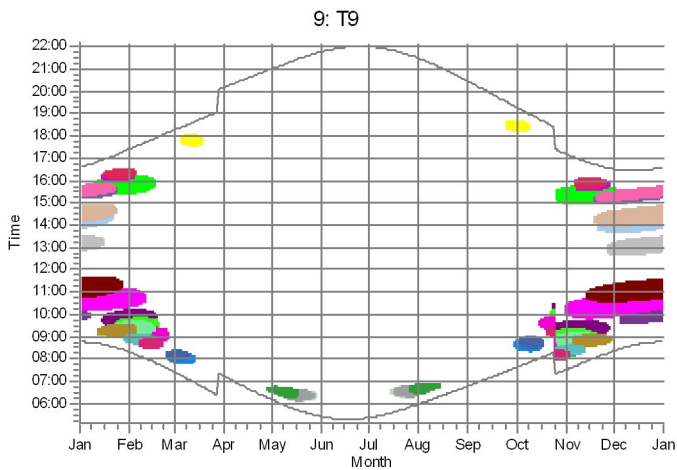
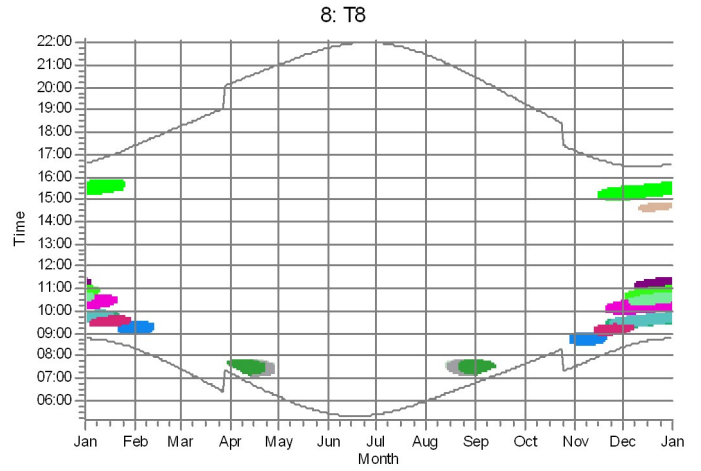
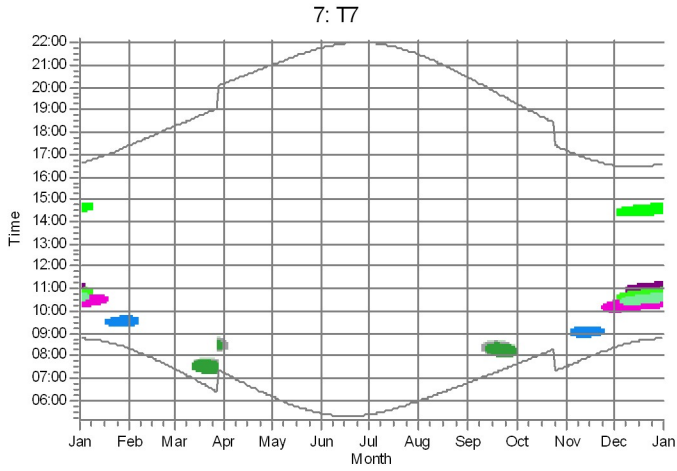


Shadow receptors

A: H1	C: H3	F: H6	J: H10	M: H13	P: H16	U: H21	AD: H30	AY: H51
B: H2	D: H4	G: H7	K: H11	N: H14	T: H20	Y: H25	AX: H50	BI: H61

SHADOW - Calendar per WTG, graphical

Calculation: Specimen Turbine

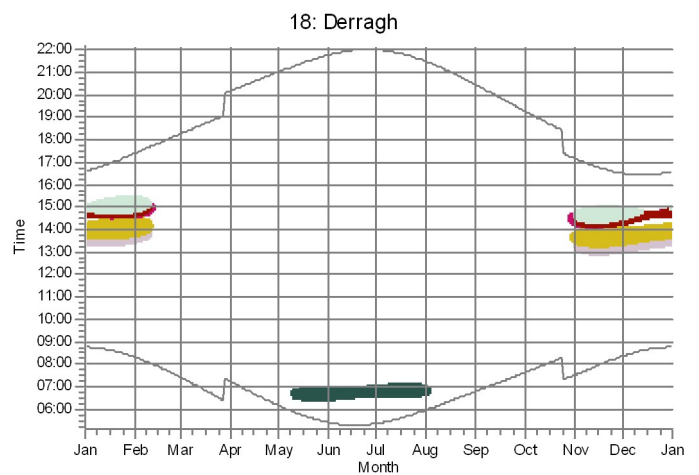
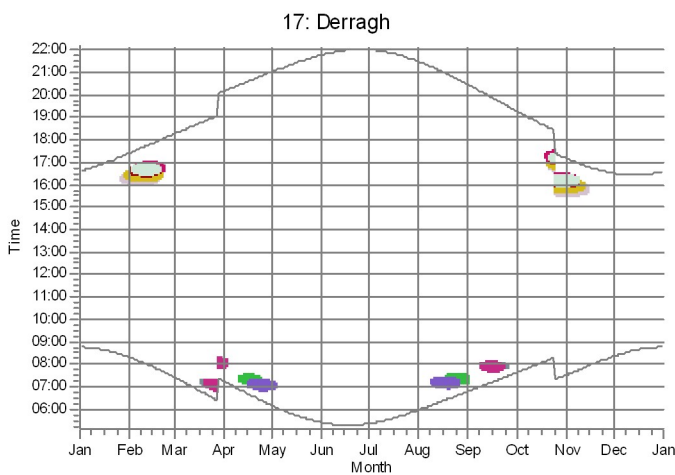
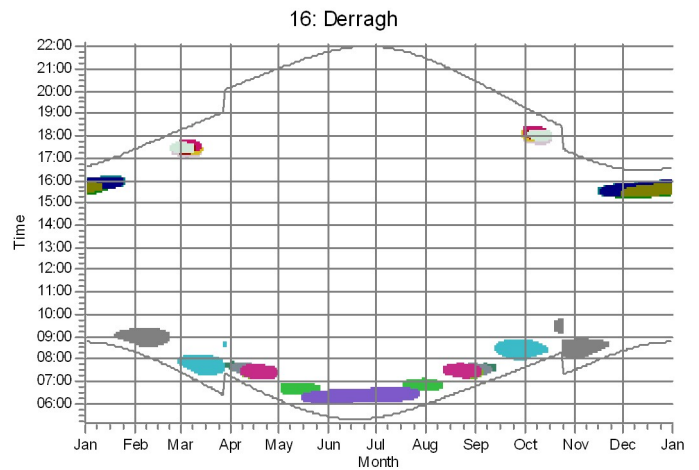
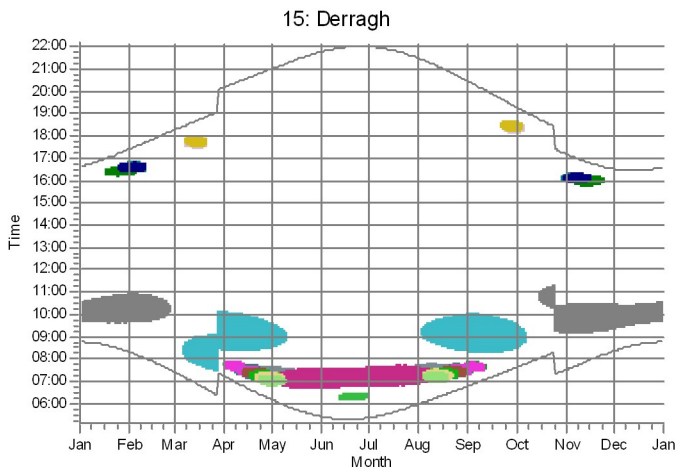
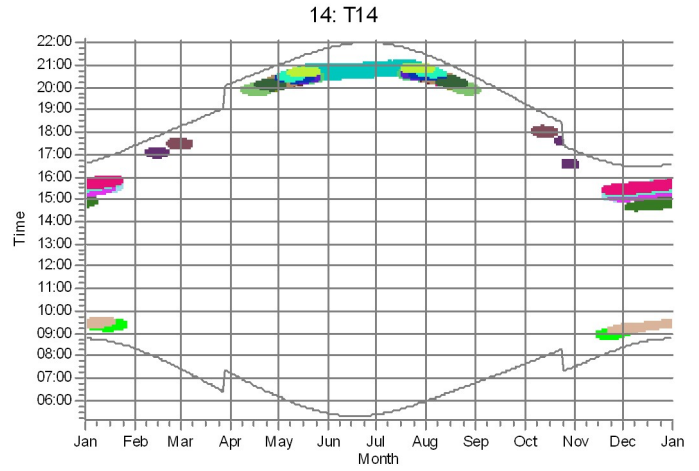
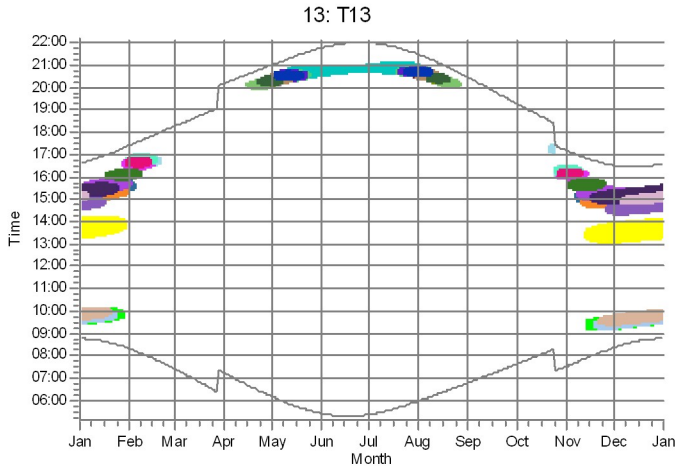


Shadow receptors

B: H2	J: H10	O: H15	U: H21	AB: H28	AR: H44	BA: H53	BP: H68	CE: H83
C: H3	K: H11	P: H16	V: H22	AF: H32	AS: H45	BD: H56	BV: H74	CN: H92
E: H5	L: H12	Q: H17	W: H23	AG: H33	AU: H47	BH: H60	BZ: H78	CQ: H95
H: H8	M: H13	R: H18	X: H24	AO: H41	AV: H48	BJ: H62	CB: H80	CW: H101
I: H9	N: H14	T: H20	Z: H26	AQ: H43	AW: H49	BM: H65	CC: H81	

SHADOW - Calendar per WTG, graphical

Calculation: Specimen Turbine

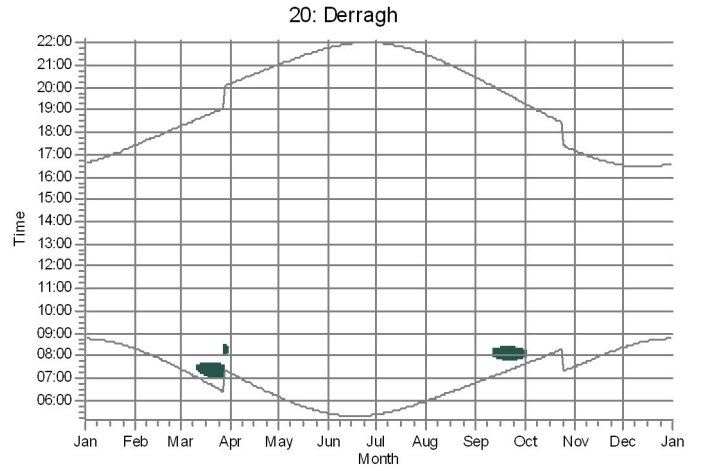
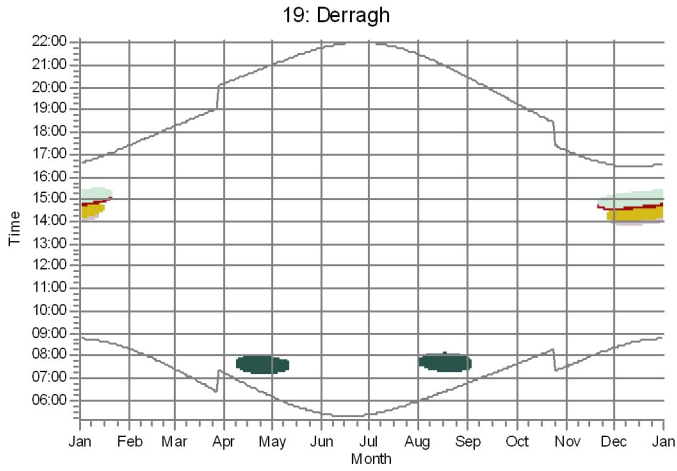


Shadow receptors

A: H1	Q: H17	AC: H29	AK: H37	AX: H50	BG: H59	BR: H70	CB: H80
B: H2	S: H19	AD: H30	AL: H38	AY: H51	BI: H61	BS: H71	CG: H85
D: H4	U: H21	AE: H31	AN: H40	AZ: H52	BL: H64	BT: H72	CK: H89
F: H6	V: H22	AF: H32	AP: H42	BB: H54	BM: H65	BU: H73	CR: H96
G: H7	W: H23	AG: H33	AQ: H43	BC: H55	BN: H66	BV: H74	CS: H97
I: H9	Y: H25	AH: H34	AS: H45	BD: H56	BO: H67	BX: H76	CX: H102
J: H10	AA: H27	AI: H35	AT: H46	BE: H57	BP: H68	BY: H77	CZ: H104
O: H15	AB: H28	AJ: H36	AU: H47	BF: H58	BQ: H69	CA: H79	DB: H106

SHADOW - Calendar per WTG, graphical

Calculation: Specimen Turbine

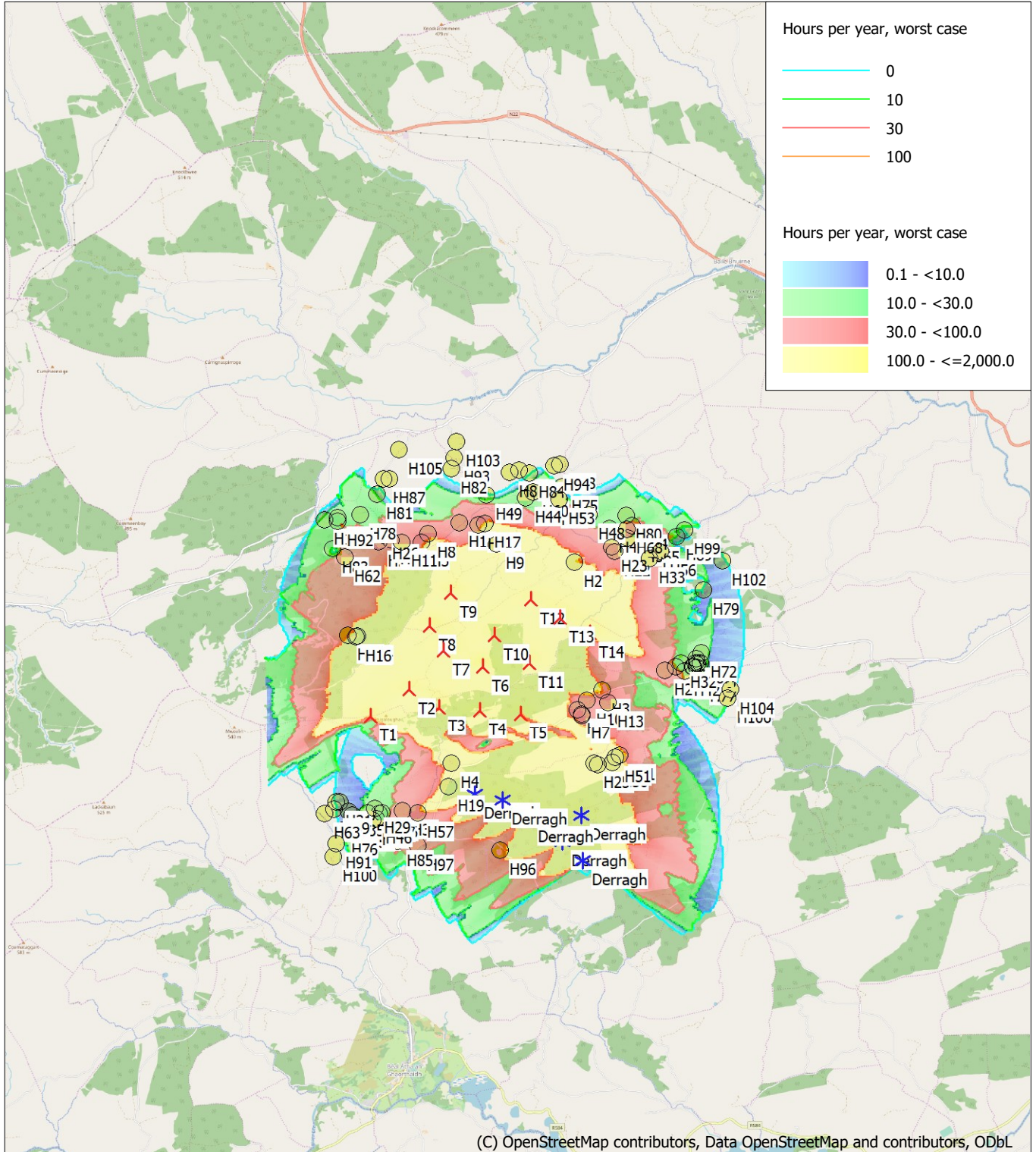


Shadow receptors

- Y: H25
- AD: H30
- AX: H50
- AY: H51
- BI: H61
- CR: H96

SHADOW - Map

Calculation: Specimen Turbine



Map: EMD OpenStreetMap , Print scale 1:75,000, Map center Irish ITM-IRENET95 (IE), geocentric, GRS80 East: 516,660 North: 573,620
 New WTG Existing WTG Shadow receptor
 Flicker map level: Elevation Grid Data Object: Gortyrahilly_ShadowFlicker_12042022_EMDGrid_0.wpg (1)
 Time step: 3 minutes, Day step: 7 days, Map resolution: 20 m, Visibility resolution: 10 m, Eye height: 1.5 m