

SHADOW - Main Result

Calculation: 11474_Shadow assessment_270825

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) [KILKENNY]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.68	2.20	3.08	4.72	5.31	4.94	4.67	4.36	3.78	2.74	2.15	1.32

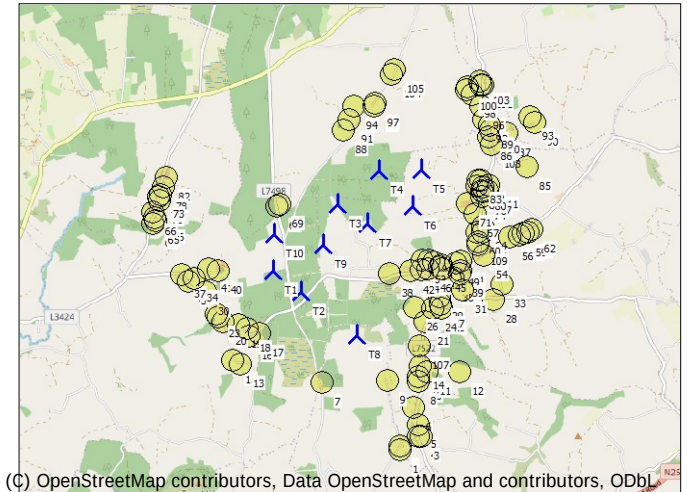
Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
584	248	187	233	749	1,096	1,692	682	613	967	731	978	8,760

Line-of-sight calculation has been deactivated. This means that sheltering from obstacles, areas or hills are not taken into account.

All coordinates are in

Irish ITM-IRENET95 (IE), geocentric, GRS80



New WTG

Scale 1:100,000

Shadow receptor

WTGs

	Easting	Northing	Z	Row data/Description	WTG type			Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Shadow data	
					Valid	Manufact.	Type-generator				Calculation distance [m]	RPM
			[m]									[RPM]
T1	660,473	625,076	161.0	NORDEX N163/6.X 6800 163.0 !O!...Yes	NORDEX	N163/6.X-6,800	6,800	6,800	163.0	98.5	1,789	10.7
T10	660,474	625,571	168.4	NORDEX N163/6.X 6800 163.0 !O!...Yes	NORDEX	N163/6.X-6,800	6,800	6,800	163.0	98.5	1,789	10.7
T2	660,841	624,807	166.1	NORDEX N163/6.X 6800 163.0 !O!...Yes	NORDEX	N163/6.X-6,800	6,800	6,800	163.0	98.5	1,789	10.7
T3	661,312	625,957	195.5	NORDEX N163/6.X 6800 163.0 !O!...Yes	NORDEX	N163/6.X-6,800	6,800	6,800	163.0	98.5	1,789	10.7
T4	661,857	626,410	176.4	NORDEX N163/6.X 6800 163.0 !O!...Yes	NORDEX	N163/6.X-6,800	6,800	6,800	163.0	98.5	1,789	10.7
T5	662,414	626,431	168.0	NORDEX N163/6.X 6800 163.0 !O!...Yes	NORDEX	N163/6.X-6,800	6,800	6,800	163.0	98.5	1,789	10.7
T6	662,309	625,948	197.1	NORDEX N163/6.X 6800 163.0 !O!...Yes	NORDEX	N163/6.X-6,800	6,800	6,800	163.0	98.5	1,789	10.7
T7	661,713	625,715	197.1	NORDEX N163/6.X 6800 163.0 !O!...Yes	NORDEX	N163/6.X-6,800	6,800	6,800	163.0	98.5	1,789	10.7
T8	661,588	624,245	164.8	NORDEX N163/6.X 6800 163.0 !O!...Yes	NORDEX	N163/6.X-6,800	6,800	6,800	163.0	98.5	1,789	10.7
T9	661,124	625,436	188.0	NORDEX N163/6.X 6800 163.0 !O!...Yes	NORDEX	N163/6.X-6,800	6,800	6,800	163.0	98.5	1,789	10.7

Shadow receptor-Input

No.	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]
1	662,188	622,729	148.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
2	662,184	622,787	150.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3	662,460	622,906	148.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
4	662,421	622,907	149.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
5	662,414	623,069	151.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
6	662,347	623,289	156.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
7	661,129	623,602	138.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
8	662,420	623,642	164.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
9	662,008	623,651	171.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
10	662,420	623,706	166.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
11	662,517	623,769	164.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
12	662,949	623,771	133.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
13	660,052	623,832	134.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
14	662,442	623,838	168.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
15	659,950	623,892	132.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
16	660,167	624,211	142.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
17	660,308	624,248	143.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
18	660,128	624,313	143.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
19	660,021	624,361	139.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
20	659,813	624,393	127.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
21	662,490	624,431	170.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
22	659,752	624,465	125.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
23	659,732	624,499	123.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
24	662,586	624,602	170.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0

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SHADOW - Main Result

Calculation: 11474_Shadow assessment_270825

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No.	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]
25	662,708	624,616	167.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
26	662,350	624,619	174.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
27	662,691	624,664	170.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
28	663,395	624,733	158.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
29	662,685	624,763	175.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
30	659,569	624,788	133.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
31	662,989	624,855	176.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
32	659,354	624,921	144.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
33	663,503	624,939	171.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
34	659,420	624,964	144.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
35	662,816	625,007	189.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
36	662,861	625,013	189.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
37	659,261	625,018	152.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
38	662,008	625,057	186.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
39	662,933	625,071	192.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
40	659,750	625,075	142.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
41	659,621	625,096	146.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
42	662,290	625,096	189.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
43	662,963	625,105	192.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
44	662,429	625,115	190.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
45	662,714	625,129	194.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
46	662,514	625,133	191.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
47	662,666	625,146	194.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
48	662,697	625,190	195.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
49	662,889	625,211	198.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
50	662,598	625,225	194.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
51	662,953	625,236	199.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
52	662,522	625,239	192.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
53	662,449	625,242	191.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
54	663,259	625,319	194.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
55	663,174	625,449	201.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
56	663,592	625,561	190.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
57	663,729	625,590	195.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
58	663,240	625,622	198.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
59	663,768	625,625	195.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
60	663,164	625,625	202.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
61	663,836	625,635	197.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
62	663,886	625,666	197.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
63	658,859	625,672	161.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
64	663,233	625,700	198.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
65	658,911	625,724	164.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
66	658,869	625,829	165.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
67	663,139	625,858	206.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
68	660,509	625,929	181.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
69	660,537	625,958	183.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
70	658,955	625,989	175.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
71	663,036	625,996	209.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
72	658,934	626,044	175.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
73	658,967	626,068	177.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
74	663,210	626,093	195.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
75	663,210	626,093	195.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
76	663,233	626,146	193.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
77	663,292	626,165	191.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
78	658,993	626,165	181.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
79	663,219	626,174	194.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
80	663,235	626,219	192.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
81	663,155	626,236	194.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
82	659,036	626,291	187.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
83	663,171	626,297	192.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
84	663,207	626,312	191.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
85	663,813	626,501	160.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
86	663,299	626,889	172.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
87	663,544	626,937	147.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
88	661,371	626,945	203.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0

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SHADOW - Main Result

Calculation: 11474_Shadow assessment_270825

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No.	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]
89	663,312	627,036	162.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
90	663,906	627,077	163.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
91	661,453	627,086	196.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
92	663,237	627,101	163.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
93	663,846	627,150	161.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
94	661,510	627,266	195.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
95	661,772	627,278	177.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
96	663,186	627,297	158.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
97	661,789	627,313	176.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
98	663,084	627,441	159.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
99	663,004	627,502	158.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
100	663,005	627,537	156.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
101	663,225	627,566	138.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
102	663,189	627,569	142.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
103	663,172	627,614	140.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
104	662,007	627,693	159.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
105	662,037	627,760	157.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
106	658,898	625,763	165.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
107	662,426	624,114	168.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
108	663,338	626,783	171.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
109	663,179	625,496	201.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
110	663,325	626,966	166.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
111	663,302	626,245	190.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0

Calculation Results

Shadow receptor

No.	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]	
1	0:00	0	0:00	0:00	
2	0:00	0	0:00	0:00	
3	0:00	0	0:00	0:00	
4	0:00	0	0:00	0:00	
5	0:00	0	0:00	0:00	
6	0:00	0	0:00	0:00	
7	0:00	0	0:00	0:00	
8	9:21	43	0:19	2:00	
9	0:00	0	0:00	0:00	
10	24:58	64	0:34	5:23	
11	44:49	90	0:39	9:41	
12	14:19	46	0:27	3:06	
13	9:24	35	0:24	1:36	
14	52:52	98	0:42	11:24	
15	7:50	32	0:23	1:21	
16	9:48	32	0:27	1:48	
17	12:46	38	0:29	2:20	
18	33:59	83	0:38	5:34	
19	60:19	114	0:44	10:00	
20	40:07	102	0:36	6:53	
21	29:29	102	0:40	4:52	
22	35:47	98	0:34	5:58	
23	39:03	103	0:34	6:28	
24	40:08	138	0:35	7:15	
25	23:55	87	0:31	4:10	
26	47:44	140	0:45	7:45	
27	22:54	83	0:30	3:56	
28	0:00	0	0:00	0:00	
29	20:26	76	0:29	3:23	
30	59:49	113	0:54	10:25	
31	16:59	76	0:20	3:07	
32	59:57	154	0:34	10:17	
33	0:00	0	0:00	0:00	

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SHADOW - Main Result

Calculation: 11474_Shadow assessment_270825

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No.	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]
34	74:19	178	0:37	12:50
35	30:48	117	0:27	5:58
36	34:26	121	0:30	6:49
37	39:05	123	0:31	6:58
38	71:42	197	0:41	14:01
39	31:19	110	0:28	6:19
40	103:29	185	0:57	18:26
41	104:00	203	0:44	18:06
42	49:19	128	0:36	6:48
43	22:46	88	0:28	4:34
44	40:15	155	0:30	5:36
45	45:34	138	0:35	8:58
46	39:01	176	0:28	6:10
47	47:26	141	0:37	9:12
48	53:08	151	0:37	10:32
49	26:55	104	0:33	5:24
50	63:04	180	0:40	11:55
51	17:36	71	0:28	3:27
52	69:12	186	0:44	12:19
53	61:54	173	0:39	10:30
54	25:12	87	0:27	5:24
55	47:12	108	0:43	10:09
56	15:46	74	0:28	3:22
57	21:30	94	0:24	4:36
58	49:08	131	0:40	10:32
59	22:29	101	0:23	4:49
60	64:16	147	0:43	13:47
61	14:43	74	0:22	3:10
62	11:51	64	0:20	2:33
63	10:32	50	0:21	1:49
64	44:05	122	0:40	9:16
65	11:04	50	0:22	1:55
66	9:43	49	0:20	1:41
67	49:37	161	0:45	10:03
68	288:20	257	2:23	43:27
69	266:06	250	2:16	39:43
70	9:35	50	0:20	1:38
71	75:18	187	0:51	14:26
72	5:06	25	0:20	0:52
73	5:13	25	0:20	0:53
74	79:45	193	0:43	15:28
75	79:45	193	0:43	15:28
76	65:06	154	0:43	12:17
77	53:45	133	0:40	9:58
78	5:02	26	0:19	0:50
79	64:16	147	0:44	11:57
80	57:28	132	0:43	10:29
81	70:43	144	0:49	12:56
82	4:50	25	0:19	0:49
83	62:40	130	0:48	11:08
84	55:29	121	0:46	9:45
85	16:55	62	0:26	2:36
86	48:35	129	0:42	6:00
87	33:04	94	0:39	4:15
88	79:40	129	0:56	12:04
89	54:30	141	0:36	6:21
90	5:58	27	0:21	0:46
91	51:08	98	1:00	7:17
92	56:18	132	0:37	6:28
93	6:42	29	0:22	0:52
94	20:21	76	0:29	3:05
95	26:14	54	0:36	3:32
96	48:14	110	0:38	5:16

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SHADOW - Main Result

Calculation: 11474_Shadow assessment_270825

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No.	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]
97	18:45	44	0:32	2:27
98	25:43	82	0:28	2:47
99	14:35	59	0:25	1:37
100	16:05	74	0:25	1:44
101	17:00	46	0:27	1:42
102	23:03	80	0:25	2:29
103	18:17	76	0:23	1:59
104	0:00	0	0:00	0:00
105	0:00	0	0:00	0:00
106	10:30	51	0:22	1:50
107	38:57	92	0:45	8:10
108	43:14	104	0:47	5:38
109	61:04	120	0:49	13:07
110	49:56	144	0:36	6:00
111	46:23	116	0:40	8:20

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

No.	Name	Worst case [h/year]	Expected [h/year]
T1	NORDEX N163/6.X 6800 163.0 !O! hub: 98.5 m (TOT: 180.0 m) (1)	120:06	21:56
T10	NORDEX N163/6.X 6800 163.0 !O! hub: 98.5 m (TOT: 180.0 m) (10)	295:14	42:25
T2	NORDEX N163/6.X 6800 163.0 !O! hub: 98.5 m (TOT: 180.0 m) (2)	181:41	31:26
T3	NORDEX N163/6.X 6800 163.0 !O! hub: 98.5 m (TOT: 180.0 m) (3)	82:08	16:30
T4	NORDEX N163/6.X 6800 163.0 !O! hub: 98.5 m (TOT: 180.0 m) (4)	227:08	35:58
T5	NORDEX N163/6.X 6800 163.0 !O! hub: 98.5 m (TOT: 180.0 m) (5)	326:42	52:35
T6	NORDEX N163/6.X 6800 163.0 !O! hub: 98.5 m (TOT: 180.0 m) (6)	313:32	52:08
T7	NORDEX N163/6.X 6800 163.0 !O! hub: 98.5 m (TOT: 180.0 m) (7)	128:54	25:14
T8	NORDEX N163/6.X 6800 163.0 !O! hub: 98.5 m (TOT: 180.0 m) (8)	264:09	44:29
T9	NORDEX N163/6.X 6800 163.0 !O! hub: 98.5 m (TOT: 180.0 m) (9)	216:27	40:30

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.