Appendix 13

CARBON CALCULATOR

Results

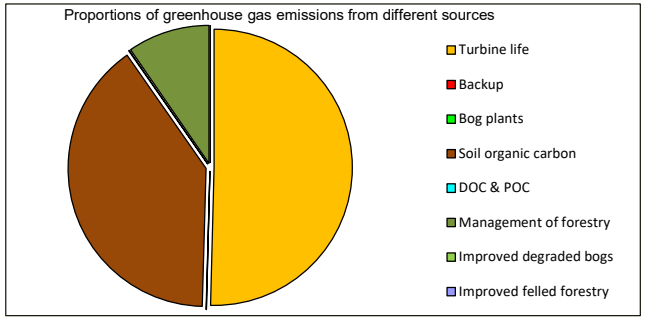
PAYBACK TIME AND CO_2 EMISSIONS

Note: The carbon payback time of the windfarm is calculated by comparing the loss of C from the site due to windfarm development with the carbon-savings achieved by the windfarm while displacing electricity generated from coal-fired capacity or grid-mix.

Click here to return to Input data Click here
Click here to return to Instructions Click here

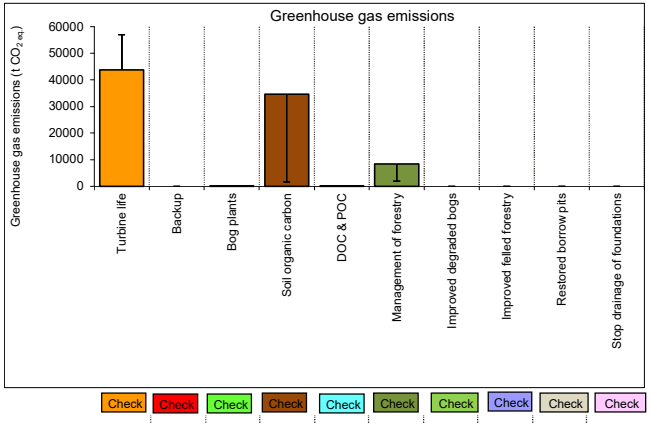
	Exp.	*Min.*	*Max.*
1. Windfarm CO_2 emission saving over…			
…coal-fired electricity generation (tCO_2 yr^{-1})	0	0	0
…grid-mix of electricity generation (tCO_2 yr^{-1})	49669	65043	65043
…fossil fuel - mix of electricity generation (tCO_2 yr^{-1})	0	0	0
Energy output from windfarm over lifetime (MWh)	4635792	6070680	6070680
Total CO_2 losses due to wind farm (t CO_2 eq.)			
2. Losses due to turbine life (eg. manufacture, construction, decomissioning)	43818	56992	56992
3. Losses due to backup	0	0	0
4. Losses due to reduced carbon fixing potential	26	37	37
5. Losses from soil organic matter	34641	1681	1681
6. Losses due to DOC & POC leaching	76	76	76
7. Losses due to felling forestry	8349	1908	1908
Total losses of carbon dioxide	86911	60695	60695
8. Total CO_2 gains due to improvement of site (t CO_2 eq.)			
8a. Change in emissions due to improvement of degraded bogs	0	0	0
8b. Change in emissions due to improvement of felled forestry	0	0	0
8c. Change in emissions due to restoration of peat from borrow pits	0	0	0
8d. Change in emissions due to removal of drainage from foundations & hardstanding	0	0	0
Total change in emissions due to improvements	0	0	0

RESULTS	*Exp.*	*Min.*	*Max.*
Net emissions of carbon dioxide (t $CO_{2\ eq.}$)	**86911**	**60695**	**60695**
Carbon Payback Time			
…grid-mix of electricity generation (years)	1.7	0.9	0.9
Ratio of CO_2 eq. emissions to power generation (g / kWh) (TARGET ratio by 2030 (electricity generation) < 50 g /kWh)	**19**	**10**	**10**



Proportions of greenhouse gas emissions from different sources

	Exp.	*Min*	*Max*
Turbine life	43818	0	13173
Backup	0	0	0
Bog plants	26	0	11
Soil organic carbon	34641	32959	0
DOC & POC	76	0	0
Management of forestry	8349	6441	0
Improved degraded bogs	0	0	0
Restored borrow pits	0	0	0



Check Check Check Check Check Check Check Check Check Check

	Exp.	*Min.*	*Max.*
Turbine life	43818	-13173	13173
Backup	0	0	0
Bog plants	26	-11	11
Soil organic carbon	34641	32959	-32959
DOC & POC	76	0	0
Management of forestry	8349	6441	-6441
Improved degraded bogs	0	0	0
Improved felled forestry	0	0	0
Restored borrow pits	0	0	0
Stop drainage of foundations	0	0	0
	86911		

Results

PAYBACK TIME AND CO_2 EMISSIONS

Note: The carbon payback time of the windfarm is calculated by comparing the loss of C from the site due to windfarm development with the carbon-savings achieved by the windfarm while displacing electricity generated from coal-fired capacity or grid-mix.

Click here to return to Input data Click here
Click here to return to Instructions Click here