ESB Asset Development UK Limited

Chleansaid Wind Farm

Technical Appendix 16.2 – Carbon Calculator Output

662367

MARCH 2021

RSK GENERAL NOTES

Project No.: 662367

Title: Chleansaid Wind Farm Environmental Impact Assessment Report, Technical Appendix 16.2 – Carbon Calculator Output

Client: ESB Asset Development UK Limited

Date: March 2021

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Status: Final

Table 16.2.1: Carbon Calculator Output

Output data	Expected value	Minimum value	Maximum value
1. Windfarm CO2 emission saving over...			
...coal-fired electricity generation (t CO2 / yr)	270,789	193,421	348,157
...grid-mix of electricity generation (t CO2 / yr)	74,638	53,313	95,963
...fossil fuel-mix of electricity generation (t CO2 / yr)	132,451	94,608	170,294
Energy output from windfarm over lifetime (MWh)	10,301,760	7,358,400	13,245,120
Total CO2 losses due to wind farm (tCO2 eq.)			
2. Losses due to turbine life (eg. manufacture, construction, decomissioning)	85,061	85,061	85,061
3. Losses due to backup	66,226	66,226	66,226
4. Lossess due to reduced carbon fixing potential	1,035	780	1,590
5. Losses from soil organic matter	27,435	-2,847	101,860
6. Losses due to DOC & POC leaching	201	0	1,400
7. Losses due to felling forestry	0	0	0
Total losses of carbon dioxide	179,957	149,220	256,137
8. Total CO2 gains due to improvement of site (t CO2 eq.)			
8a. Change in emissions due to improvement of degraded bogs	-6,101	0	-18,727
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	-23	0	-129
Total change in emissions due to improvements	-6,124	0	-18,855
Results			
Net emissions of carbon dioxide (t CO2 eq.)	173,833	130,365	256,137
Carbon Payback Time			
...coal-fired electricity generation (years)	0.6	0.4	1.3
...grid-mix of electricity generation (years)	2.3	1.4	4.8
...fossil fuel-mix of electricity generation (years)	1.3	0.8	2.7
Misc.			
Ratio of soil carbon loss to gain by restoration (not used in Scottish applications)	4.51	-0.15	No gains!
Ratio of CO2 eq. emissions to power generation (g/kWh) (for info. only)	16.87	9.84	34.81