TECHNICAL APPENDIX 14.5.2

Carbon Calculator Outputs

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1 Carbon Calculator Outputs

Payback Time and CO_2 emissions • MHEA-39DJ-9PFR v7

1. Windfarm CO2 emission saving over...	Exp.	Min.	Max.
...coal-fired electricity generation (t CO2 / yr)	216,090	194,481	237,699
...grid-mix of electricity generation (t CO2 / yr)	59,561	53,605	65,517
...fossil fuel-mix of electricity generation (t CO2 / yr)	105,696	95,126	116,266
Energy output from windfarm over lifetime (MWh)	9,395,205	8,455,685	10,334,726

Total CO2 losses due to wind farm (tCO2 eq.)	Exp.	Min.	Max.
2. Losses due to turbine life (eg. manufacture, construction, decomissioning)	90,507	90,033	90,981
3. Losses due to backup	79,471	79,471	79,471
4. Lossess due to reduced carbon fixing potential	2,432	904	3,821
5. Losses from soil organic matter	50,889	11,270	75,919
6. Losses due to DOC & POC leaching	2,341	0	6,025
7. Losses due to felling forestry	64,205	52,006	77,689
Total losses of carbon dioxide	289,844	233,683	333,904

8. Total CO2 gains due to improvement of site (t CO2 eq.)	Exp.	Min.	Max.
8a. Change in emissions due to improvement of degraded bogs	1,153	0	-11,214
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	89	0	-865
8d. Change in emissions due to removal of drainage from foundations & hardstanding	0	0	0
Total change in emissions due to improvements	1,242	0	-12,079

RESULTS	Exp.	Min.	Max.
Net emissions of carbon dioxide (t CO2 eq.)	291,086	221,604	333,904
Carbon Payback Time			
...coal-fired electricity generation (years)	1.3	0.9	1.7
...grid-mix of electricity generation (years)	4.9	3.4	6.2
...fossil fuel-mix of electricity generation (years)	2.8	1.9	3.5
Ratio of soil carbon loss to gain by restoration (not used in Scottish applications)	No gains!	0.93	No gains!
Ratio of CO2 eq. emissions to power generation (g/kWh) (for info. only)	30.98	21.44	39.49

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