

TECHNICAL APPENDIX 14.3.2

Carbon Calculator Output Values



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Table of Contents

1	Carbon Calculator Input Values	3
1.1	Introduction	3

1 Carbon Calculator Input Values

1.1 Introduction

1.1.1 The Scottish Government Carbon Calculator Online Tool Version 1.6.0 was used in the assess the carbon impact of the proposed Development. The output values are outlined below.

Payback Time and CO₂ emissions • J8AL-WNTQ-CUND v9

1. Windfarm CO ₂ emission saving over...	Exp.	Min.	Max.
...coal-fired electricity generation (t CO ₂ / yr)	132,055	118,849	145,260
...grid-mix of electricity generation (t CO ₂ / yr)	36,398	32,758	40,038
...fossil fuel-mix of electricity generation (t CO ₂ / yr)	64,592	58,133	71,051
Energy output from windfarm over lifetime (MWh)	5,741,514	5,167,363	6,315,666

Total CO ₂ losses due to wind farm (tCO ₂ eq.)	Exp.	Min.	Max.
2. Losses due to turbine life (eg. manufacture, construction, decommissioning)	55,128	54,857	55,400
3. Losses due to backup	48,565	48,565	48,565
4. Losses due to reduced carbon fixing potential	1,484	555	2,322
5. Losses from soil organic matter	28,629	5,572	46,573
6. Losses due to DOC & POC leaching	2,194	112	5,226
7. Losses due to felling forestry	3,062	2,481	3,706
Total losses of carbon dioxide	139,063	112,142	161,791

8. Total CO ₂ gains due to improvement of site (t CO ₂ eq.)	Exp.	Min.	Max.
8a. Change in emissions due to improvement of degraded bogs	314	0	-2,675
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	58	0	-494
8d. Change in emissions due to removal of drainage from foundations & hardstanding	0	0	0
Total change in emissions due to improvements	372	0	-3,169

RESULTS	Exp.	Min.	Max.
Net emissions of carbon dioxide (t CO ₂ eq.)	139,435	108,973	161,791
Carbon Payback Time			
...coal-fired electricity generation (years)	1.1	0.8	1.4
...grid-mix of electricity generation (years)	3.8	2.7	4.9
...fossil fuel-mix of electricity generation (years)	2.2	1.5	2.8
Ratio of soil carbon loss to gain by restoration (not used in Scottish applications)	No gains!	1.79	No gains!
Ratio of CO ₂ eq. emissions to power generation (g/kWh) (for info. only)	24.29	17.25	31.31



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