

Ben Sca Redesign Wind Farm SEI - Volume 4
SEI TA9.4 - Carbon Calculator Outputs

	Exp.	Min.	Max.
1. Windfarm CO₂ emission saving over...			
...coal-fired electricity generation (tCO ₂ yr ⁻¹)	121801	119401	124201
...grid-mix of electricity generation (tCO ₂ yr ⁻¹)	26680	26154	27206
...fossil fuel - mix of electricity generation (tCO ₂ yr ⁻¹)	54649	53572	55726
Energy output from windfarm over lifetime (MWh)	5155589	5054001	5257177
Total CO₂ losses due to wind farm (t CO₂ eq.)			
2. Losses due to turbine life (eg. manufacture, construction, decomissioning)	31116	31116	31116
3. Losses due to backup	26921	26921	26921
4. Losses due to reduced carbon fixing potential	605	235	906
5. Losses from soil organic matter	9733	6330	11684
6. Losses due to DOC & POC leaching	58	0	503
7. Losses due to felling forestry	34181	32282	36079
Total losses of carbon dioxide	102613	96884	107210
8. Total CO₂ gains due to improvement of site (t CO₂ eq.)			
8a. Change in emissions due to improvement of degraded bogs	-4831	0	-26098
8b. Change in emissions due to improvement of felled forestry	-2443	0	-13198
8c. Change in emissions due to restoration of peat from borrow pits	0	0	-64
8d. Change in emissions due to removal of drainage from foundations & hardstanding	-353	0	-794
Total change in emissions due to improvements	-7627	0	-40154

RESULTS	Exp.	Min.	Max.
Net emissions of carbon dioxide (t CO₂ eq.)	94986	56730	107210
Carbon Payback Time			
...coal-fired electricity generation (years)	0.8	0.46	0.9
...grid-mix of electricity generation (years)	3.6	2.1	4.1
...fossil fuel - mix of electricity generation (years)	1.7	1.02	2.0
Ratio of soil carbon loss to gain by restoration (TARGET ratio (Natural Resources Wales) < 1.0)	No gains!	No gains!	No gains!
Ratio of CO₂ eq. emissions to power generation (g / kWh) (TARGET ratio by 2030 (electricity generation) < 50 g /kWh)	18	11	21

