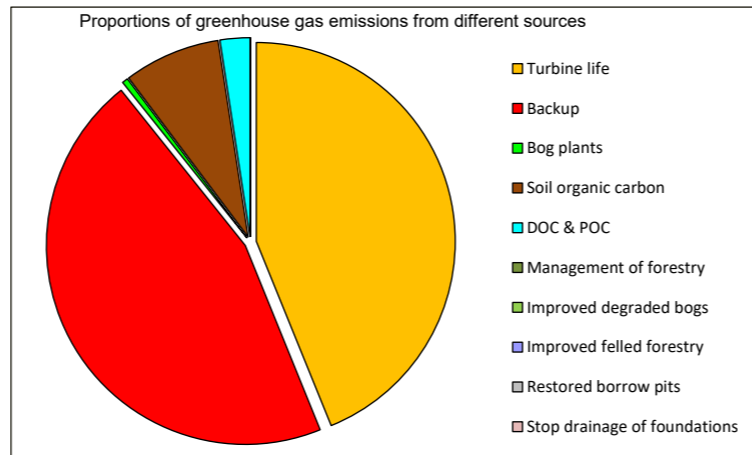


Results
PAYBACK TIME AND CO₂ EMISSIONS
 Note: The carbon payback time of the windfarm is calculated by comparing the loss of C from the site due to windfarm development with the carbon-savings achieved by the windfarm while displacing electricity generated from coal-fired capacity or grid-mix.

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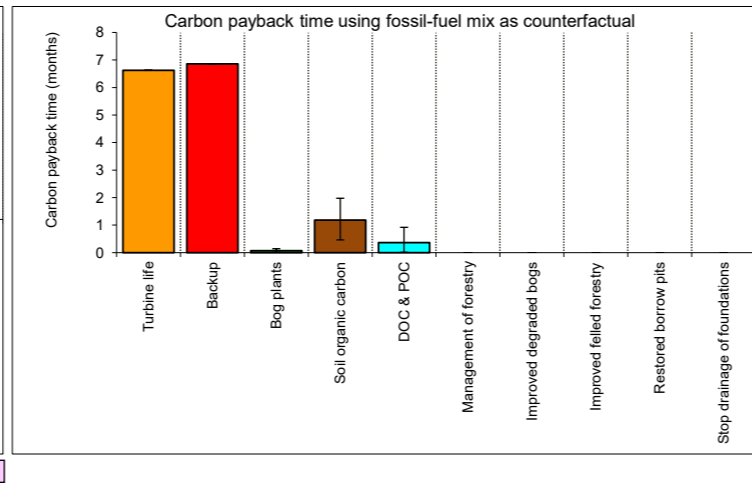
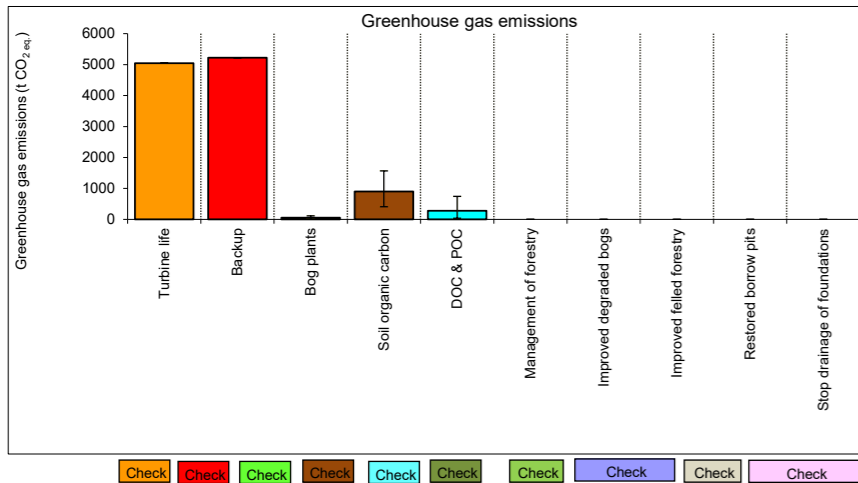
	Exp.	Min.	Max.
1. Windfarm CO₂ emission saving over...			
...coal-fired electricity generation (tCO ₂ yr ⁻¹)	21198	19078	23317
...grid-mix of electricity generation (tCO ₂ yr ⁻¹)	4091	3682	4500
...fossil fuel - mix of electricity generation (tCO ₂ yr ⁻¹)	9139	8225	10053
Energy output from windfarm over lifetime (MWh)	846216	761594	930838
Total CO₂ losses due to wind farm (t CO₂ eq.)			
2. Losses due to turbine life (eg. manufacture, construction, decommissioning)	5044	5044	5044
3. Losses due to backup	5222	5222	5222
4. Losses due to reduced carbon fixing potential	55	13	115
5. Losses from soil organic matter	901	409	1566
6. Losses due to DOC & POC leaching	278	36	744
7. Losses due to felling forestry	0	0	0
Total losses of carbon dioxide	11501	10726	12692
8. Total CO₂ gains due to improvement of site (t CO₂ 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 CO₂ eq.)	11501	10726	12692
Carbon Payback Time			
...coal-fired electricity generation (years)	0.5	0.5	0.7
...grid-mix of electricity generation (years)	2.8	2.4	3.4
...fossil fuel - mix of electricity generation (years)	1.3	1.1	1.5
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)	14	12	17



Data used in barchart of carbon payback time using fossil-fuel mix as counterfactual

Greenhouse gas emissions			
	Exp.	Min.	Max.
Turbine life	5044	0	0
Backup	5222	0	0
Bog plants	55	42	60
Soil organic carbon	901	492	665
DOC & POC	278	242	465
Management of forestry	0	0	0
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



Data used in barchart of carbon payback time using fossil-fuel mix as counterfactual

Greenhouse gas emissions				Carbon payback time (months)		
	Exp.	Min.	Max.	Exp.	Min.	Max.
Turbine life	5044	0	0	7	0	0
Backup	5222	0	0	7	0	0
Bog plants	55	42	60	0	0	0
Soil organic carbon	901	492	665	1	1	1
DOC & POC	278	242	465	0	0	1
Management of forestry	0	0	0	0	0	0
Improved degraded bogs	0	0	0	0	0	0
Improved felled forestry	0	0	0	0	0	0
Restored borrow pits	0	0	0	0	0	0
Stop drainage of foundations	0	0	0	0	0	0
TOTAL	11501			15		

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Results
PAYBACK TIME AND CO₂ 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.

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