ARCUS

ACKRON WIND FARM
VOLUME 3: EIA REPORT TECHNICAL APPENDICES
A15.1: CARBON CALCULATOR RESULTS

NOVEMEBER 2020

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PAYBACK TIME AND CO_2 EMISSIONS

1. Windfarm CO2 emission saving over...	Exp.	Min.	Max.
...coal-fired electricity generation (t CO2 / yr)	164,795	164,408	165,181
...grid-mix of electricity generation (t CO2 / yr)	45,422	45,316	45,529
...fossil fuel-mix of electricity generation (t CO2 / yr)	80,606	80,417	80,795
Energy output from windfarm over lifetime (MWh)	5,373,734	5,361,120	5,386,349

Total CO2 losses due to wind farm (tCO2 eq.)	Exp.	Min.	Max.
2. Losses due to turbine life (eg. manufacture, construction, decomissioning)	42,161	42,161	42,161
3. Losses due to backup	14,191	14,191	14,191
4. Lossess due to reduced carbon fixing potential	826	347	1,153
5. Losses from soil organic matter	22,945	4,989	51,080
6. Losses due to DOC & POC leaching	3,285	850	5,801
7. Losses due to felling forestry	436	275	620
Total losses of carbon dioxide	83,844	62,814	115,007

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	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	-1,557	-1,229	-1,893
Total change in emissions due to improvements	-1,557	-1,229	-1,893

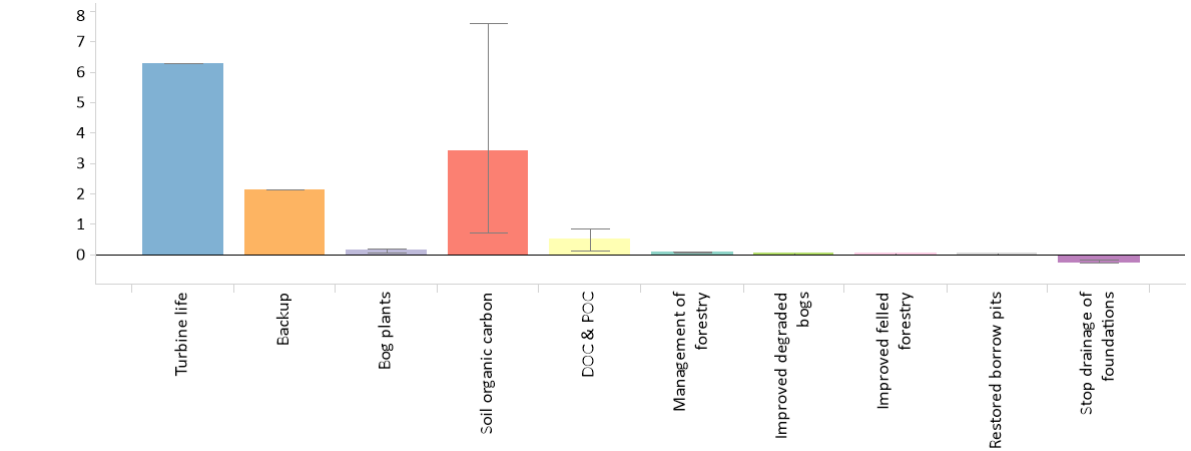
RESULTS	Exp.	Min.	Max.
Net emissions of carbon dioxide (t CO2 eq.)	82,287	60,920	113,778
Carbon Payback Time			
...coal-fired electricity generation (years)	0.5	0.4	0.7
...grid-mix of electricity generation (years)	1.8	1.3	2.5
...fossil fuel-mix of electricity generation (years)	1	0.8	1.4
Ratio of soil carbon loss to gain by restoration (not used in Scottish applications)	16.85	3.08	46.28
Ratio of CO2 eq. emissions to power generation (g/kWh) (for info. only)	15.31	11.31	21.22

PAYBACK TIME CHARTS

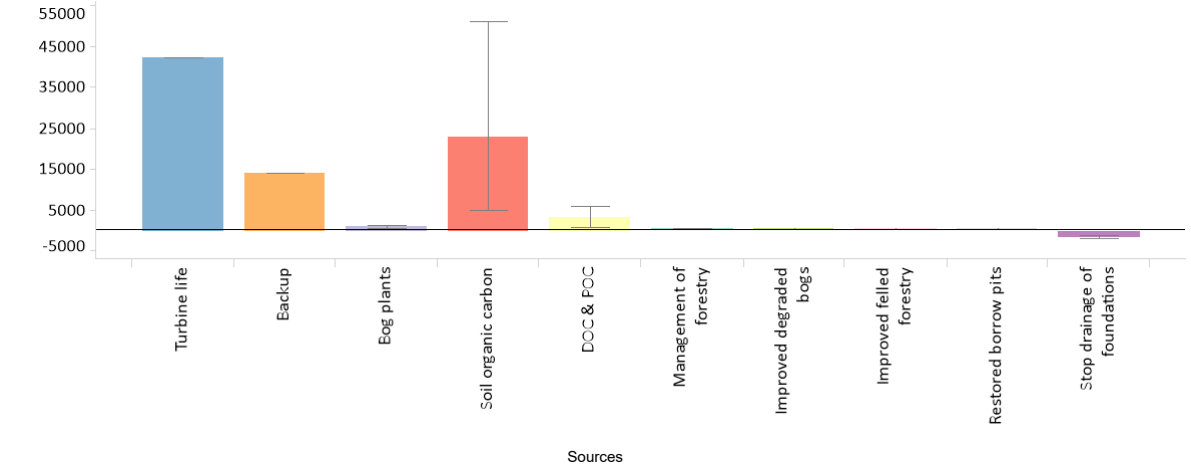
Payback Time - Charts

Payback Time
Payback Time - ChartsInput Data

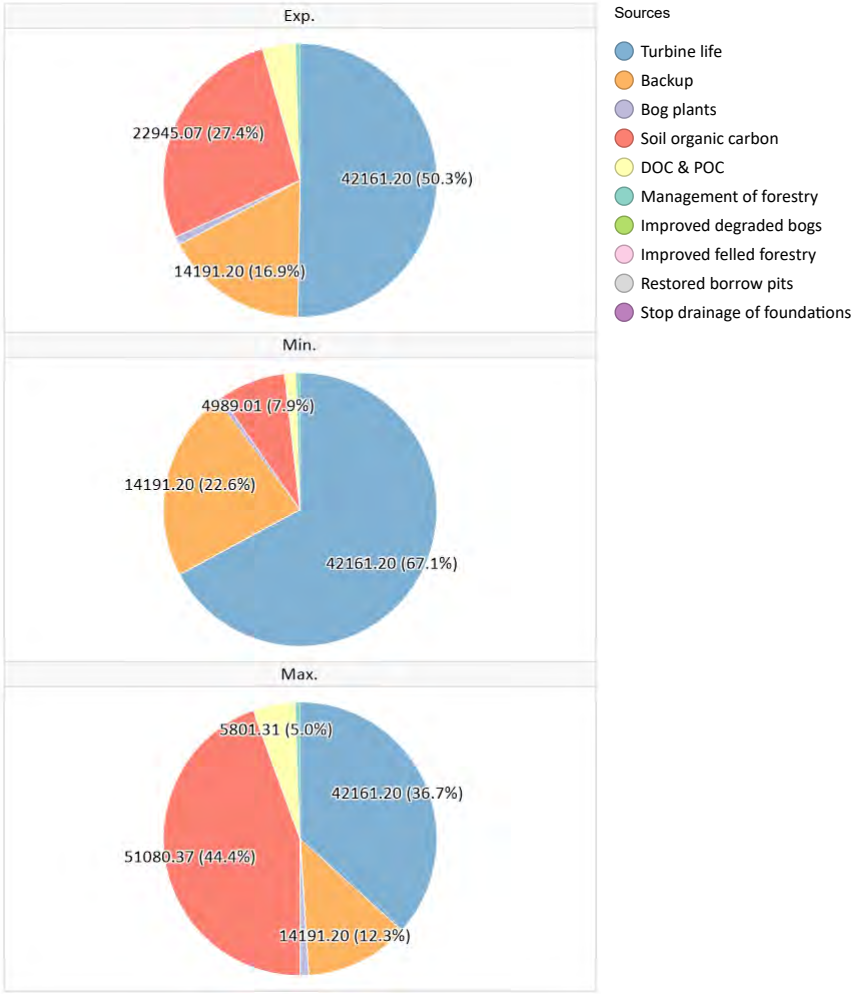
Carbon payback time (months) using fossil-fuel mix as conterfactual



Greenhouse gas emissions (t CO2 eq.)



Proportions of greenhouse gas emissions from different sources



INPUT DATA

Carbon Calculator v1.6.1
Ackron Wind Farm Location: 58.537338 -3.868739
Statkraft UK Ltd

Core input data

Input data	Expected value	Minimum value	Maximum value	Source of data
Windfarm characteristics				
Dimensions				
No. of turbines	12	12	12	EIA Report: Chapter 4
Duration of consent (years)	30	30	30	EIA Report: Chapter 4
Performance				
Power rating of 1 turbine (MW)	4	4	4	EIA Report: Chapter 4
Capacity factor	42.6	42.5	42.7	EIA Report: Chapter 4
Backup				
Fraction of output to backup (%)	2.5	2.5	2.5	Calculated using suggested guidance.
Additional emissions due to reduced thermal efficiency of the reserve generation (%)	10	10	10	Fixed
Total CO2 emission from turbine life (tCO2 MW^{-1}) (eg. manufacture, construction, decommissioning)	Calculate wrt installed capacity	Calculate wrt installed capacity	Calculate wrt installed capacity	
Characteristics of peatland before windfarm development				
Type of peatland	Acid bog	Acid bog	Acid bog	Peat Slide Risk Assessment TA
Average annual air temperature at site (°C)	7	4	14	Calculated from climate averages for area
Average depth of peat at site (m)	0.78	0	5.3	Peat Slide Risk Assessment TA
C Content of dry peat (% by weight)	53.23	19.57	53.24	Scottish Government Guidance - Guidance on Developments on Peatland - Site Surveys
Average extent of drainage around drainage features at site (m)	5	4	6	Technical Estimation - further refined after drainage installed.
Average water table depth at site (m)	0.5	0.4	0.6	Technical Estimation
Dry soil bulk density (g cm^{-3})	0.132	0.072	0.293	Scottish Government Guidance - Guidance on Developments on Peatland - Site Surveys
Characteristics of bog plants				
Time required for regeneration of bog plants after restoration (years)	2	2	2	Technical estimation
Carbon accumulation due to C fixation by bog plants in undrained peats (tC ha^{-1} yr^{-1})	0.25	0.12	0.31	SNH Guidance -Carbon Payback Calculator: Guidelines on Measurements
Forestry Plantation Characteristics				
Area of forestry plantation to be felled (ha)	1.1	1	1.2	EIA Report: Chapter 4
Average rate of carbon sequestration in timber (tC ha^{-1} yr^{-1})	3.6	2.5	4.7	Scottish Government and SNH Guidance
Counterfactual emission factors				
Coal-fired plant emission factor (t CO2 MWh^{-1})	0.92	0.92	0.92	
Grid-mix emission factor (t CO2 MWh^{-1})	0.25358	0.25358	0.25358	
Fossil fuel-mix emission factor (t CO2 MWh^{-1})	0.45	0.45	0.45	
Borrow pits				
Number of borrow pits	2	2	2	Borrow Pit Assessment TA

Input data	Expected value	Minimum value	Maximum value	Source of data
Average length of pits (m)	190	190	190	Borrow Pit Assessment TA
Average width of pits (m)	100	100	100	Borrow Pit Assessment TA
Average depth of peat removed from pit (m)	0.6	0.6	0.6	Peat Slide Risk Assessment TA
Foundations and hard-standing area associated with each turbine				
Average length of turbine foundations (m)	25	25	25	EIA Report: Chapter 4
Average width of turbine foundations (m)	25	25	25	EIA Report: Chapter 4
Average depth of peat removed from turbine foundations(m)	0.53	0.53	0.53	Peat Slide Risk Assessment TA
Average length of hard-standing (m)	70	70	70	EIA Report: Chapter 4
Average width of hard-standing (m)	20	20	20	EIA Report: Chapter 4
Average depth of peat removed from hard-standing (m)	0.58	0.58	0.58	Peat Slide Risk Assessment TA
Volume of concrete used in construction of the ENTIRE windfarm				
Volume of concrete (m^3)	9250	9250	9250	EIA Report: Chapter 4
Access tracks				
Total length of access track (m)	7458	7455	7461	EIA Report: Chapter 4
Existing track length (m)	0	0	0	EIA Report: Chapter 4
Length of access track that is floating road (m)	210	209	211	EIA Report: Chapter 4
Floating road width (m)	6	6	6	EIA Report: Chapter 4
Floating road depth (m)	1.5	1.4	1.6	EIA Report: Chapter 4
Length of floating road that is drained (m)	210	209	211	EIA Report: Chapter 4
Average depth of drains associated with floating roads (m)	0.5	0.5	0.6	EIA Report: Chapter 4
Length of access track that is excavated road (m)	725	724	726	EIA Report: Chapter 4
Excavated road width (m)	5	5	5	EIA Report: Chapter 4
Average depth of peat excavated for road (m)	0.66	0.66	0.66	Peat Slide Risk Assessment TA
Length of access track that is rock filled road (m)	6523	6522	6524	EIA Report: Chapter 4
Rock filled road width (m)	5	5	5	EIA Report: Chapter 4
Rock filled road depth (m)	1	0.91	1.1	EIA Report: Chapter 4
Length of rock filled road that is drained (m)	6523	6522	6524	EIA Report: Chapter 4
Average depth of drains associated with rock filled roads (m)	0.5	0.5	0.5	EIA Report: Chapter 4
Cable trenches				
Length of any cable trench on peat that does not follow access tracks and is lined with a permeable medium (eg. sand) (m)	7458	7458	7458	EIA Report: Chapter 4
Average depth of peat cut for cable trenches (m)	0.66	0.66	0.66	Peat Slide Risk Assessment TA
Additional peat excavated (not already accounted for above)				
Volume of additional peat excavated (m^3)	3937.824	3937.824	3937.824	Peat Slide Risk Assessment TA
Area of additional peat excavated (m^2)	5966.4	5966.4	5966.4	Peat Slide Risk Assessment TA
Peat Landslide Hazard				
Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments	negligible	negligible	negligible	Fixed
Improvement of C sequestration at site by blocking drains, restoration of habitat etc				
Improvement of degraded bog				
Area of degraded bog to be improved (ha)	9.88	9.88	9.88	Technical estimation - further refined prior to restoration.
Water table depth in degraded bog before improvement (m)	0.5	0.5	0.5	Technical estimation
Water table depth in degraded bog after improvement (m)	0	0	0	Technical estimation - further refined following to restoration.

Input data	Expected value	Minimum value	Maximum value	Source of data
Time required for hydrology and habitat of bog to return to its previous state on improvement (years)	5	5	5	Technical estimation
Period of time when effectiveness of the improvement in degraded bog can be guaranteed (years)	5	5	5	Technical estimation
Improvement of felled plantation land				
Area of felled plantation to be improved (ha)	1.1	1	1.2	EIA Report: Chapter 4
Water table depth in felled area before improvement (m)	0.5	0.5	0.5	Technical estimation
Water table depth in felled area after improvement (m)	0	0	0	Technical estimation
Time required for hydrology and habitat of felled plantation to return to its previous state on improvement (years)	5	5	5	Technical estimation
Period of time when effectiveness of the improvement in felled plantation can be guaranteed (years)	5	5	5	Technical estimation
Restoration of peat removed from borrow pits				
Area of borrow pits to be restored (ha)	1.9	1.9	1.9	Borrow Pit Assessment TA
Depth of water table in borrow pit before restoration with respect to the restored surface (m)	0.5	0.5	0.5	Technical estimation
Depth of water table in borrow pit after restoration with respect to the restored surface (m)	0	0	0	Technical estimation - further refined following to restoration
Time required for hydrology and habitat of borrow pit to return to its previous state on restoration (years)	5	5	5	Technical estimation
Period of time when effectiveness of the restoration of peat removed from borrow pits can be guaranteed (years)	5	5	5	Technical estimation
Early removal of drainage from foundations and hardstanding				
Water table depth around foundations and hardstanding before restoration (m)	0.5	0.5	0.5	Technical estimation
Water table depth around foundations and hardstanding after restoration (m)	0	0	0	Technical estimation
Time to completion of backfilling, removal of any surface drains, and full restoration of the hydrology (years)	5	5	5	Technical estimation
Restoration of site after decomissioning				
Will the hydrology of the site be restored on decommissioning?	Yes	Yes	Yes	
Will you attempt to block any gullies that have formed due to the windfarm?	n/a	n/a	n/a	Not applicable
Will you attempt to block all artificial ditches and facilitate rewetting?	n/a	n/a	n/a	Not applicable
Will the habitat of the site be restored on decommissioning?	Yes	Yes	Yes	
Will you control grazing on degraded areas?	n/a	n/a	n/a	Not applicable
Will you manage areas to favour reintroduction of species	n/a	n/a	n/a	Not applicable
Methodology				

Input data	Expected value	Minimum value	Maximum value	Source of data
Choice of methodology for calculating emission factors	IPCC default			

Forestry input data

N/A

Construction input data

N/A

1 WINDFARM CO_2 EMISSION SAVING

Capacity Factor - Direct Input	Exp.	Min.	Max.
Capacity factor (%)	42.6	42.5	42.7

Annual energy output from windfarm (MW/yr)	Exp.	Min.	Max.
Annual energy output from windfarm (MW/yr)			
RESULTS			
Emissions saving over coal-fired electricity generation (tCO2/yr)	164,795	164,408	165,181
Emissions saving over grid-mix of electricity generation (tCO2/yr)	45,422	45,316	45,529
Emissions saving over fossil fuel - mix of electricity generation (tCO2/yr)	80,606	80,417	80,795

2 CO_2 LOSS DUE TO TURBINE LIFE

Calculations of Emissions with Relation to Installed Capacity	Exp.	Min.	Max.
Emissions due to turbine frome energy output (t CO2)	3270	3270	3270
Emissions due to cement used in construction (t CO2)	2923	2923	2923

RESULTS	Exp.	Min.	Max.
Losses due to turbine life (manufacture, construction, etc.) (t CO2)	42161	42161	42161
Additional CO2 payback time of windfarm due to turbine life			
...coal-fired electricity generation (months)	3	3	3
...grid-mix of electricity generation (months)	11	11	11
...fossil fuel - mix of electricity generation (months)	6	6	6

3 CO_2 LOSS DUE TO BACKUP

	Exp.	Min.	Max.
Reserve energy (MWh/yr)	10,512	10,512	10,512
Annual emissions due to backup from fossil fuel-mix of electricity generation (tCO2/yr)	473	473	473
RESULTS			
Total emissions due to backup from fossil fuel-mix of electricity generation (tCO2)	14,191,	14,191	14,191

4 LOSS OF CO_2 FIXING POTENTIAL

Emissions Due to Loss of Bog Plants	Exp.	Min.	Max.
Area where carbon accumulation by bog plants is lost (ha)	28.16	24.64	31.7
Total loss of carbon accumulation up to time of restoration (tCO2 eq./ha)	29	14	36
RESULTS			
Total loss of carbon fixation by plants at the site (t CO2)	826	347	1153
Additional CO2 payback time of windfarm due to loss of CO2 fixing potential			
...coal-fired electricity generation (months)	0	0	0
...grid-mix of electricity generation (months)	0	0	0
...fossil fuel - mix of electricity generation (months)	0	0	0

5 LOSS OF SOIL CO_2

5 Loss of Soil CO2	Exp.	Min.	Max.
CO2 loss from removed peat (t CO2 equiv.)	13622.36	-2468.39	39885.43
CO2 loss from drained peat (t CO2 equiv.)	9322.71	7457.4	11194.94
RESULTS			
Total CO2 loss from peat (removed + drained) (t CO2 equiv.)	22945.07	4989.01	51080.37
Additional CO2 payback time of windfarm due to loss of soil CO2			
...coal-fired electricity generation (months)	1.67	0.36	3.71
...grid-mix of electricity generation (months)	6.06	1.32	13.46
...fossil fuel - mix of electricity generation (months)	3.42	0.74	7.59

5a Volume of Peat Drained	Exp.	Min.	Max.
Peat removed from borrow pits			
Area of land lost in borrow pits (m2)	38000	38000	38000
Volume of peat removed from borrow pits (m3)	22800	22800	22800
Peat removed from turbine foundations			
Area of land lost in foundation (m2)	7500	7500	7500
Volume of peat removed from foundation area (m3)	3975	3975	3975
Peat removed from hard-standing			
Area of land lost in hard-standing (m2)	16800	16800	16800
Volume of peat removed from hard-standing area (m3)	9744	9744	9744
Peat removed from access tracks			
Area of land lost in floating roads (m2)	1260	1254	1266
Volume of peat removed from floating roads (m3)	1890	1755.6	2025.6
Area of land lost in excavated roads (m2)	3625	3620	3630
Volume of peat removed from excavated roads (m3)	2392.5	2389.2	2395.8
Area of land lost in rock-filled roads (m2)	32615	32610	32620
Volume of peat removed from rock-filled roads (m3)	32615	29675.1	35882
Total area of land lost in access tracks (m2)	37500	37484	37516
Total volume of peat removed due to access tracks (m3)	36897.5	33819.9	40303.4
RESULTS			
Total area of land lost due to windfarm construction (m2)	105766.4	105750.4	105782.4
Total volume of peat removed due to windfarm construction (m3)	77354.32	74276.72	80760.22

5b CO2 Loss from Peat Drained	Exp.	Min.	Max.
CO2 loss from removed peat (t CO2)	19929.22	3837.53	46193.25
CO2 loss from undrained peat left in situ (t CO2)	6306.87	6305.91	6307.82
RESULTS			
CO2 loss atributable to peat removal only (t CO2)	13622.36	-2468.39	39885.43

5c. Volume of Peat Drained	Exp.	Min.	Max.
Total area affected by drainage around borrow pits (m2)	6000	4768	7248
Total volume affected by drainage around borrow pits (m3)	1800	1430.4	2174.4
Peat affected by drainage around turbine foundation and hardstanding			
Total area affected by drainage of foundation and hardstanding area (m2)	18000	14208	21888
Total volume affected by drainage of foundation and hardstanding area (m3)	5220	4120.32	6347.52
Peat affected by drainage of access tracks			
Total area affected by drainage of access track(m2)	75840	60894	90798
Total volume affected by drainage of access track(m3)	19540	15686.86	23586.4
Peat affected by drainage of cable trenches			
Total area affected by drainage of cable trenches(m2)	74580	59664	89496
Total volume affected by drainage of cable trneches(m3)	24611.4	19689.12	29533.7
Drainage around additional peat excavated			
Total area affected by drainage (m2)	1447.63	1145.54	1756
Total volume affected by drainage (m3)	955.43	756.05	1158.96
RESULTS			
Total area affected by drainage due to windfarm (m2)	175867.6	140679.5	211186
Total volume affected by drainage due to windfarm (m3)	52126.83	41682.75	62800.9

5d. CO_2 Loss from Drained Peat	Exp.	Min.	Max.
Calculations of C Loss from Drained Land if Site is NOT Restored after Decomissioning			
Total GHG emissions from Drained Land (t CO2 equiv.)	13429.73	2153.55	35920.9
Total GHG emissions from Undrained Land (t CO2 equiv.)	7109.52	1140.06	19016.1
Calculations of C Loss from Drained Land if Site IS Restored after Decomissioning			
Losses if Land is Drained			
CH4 emissions from drained land (t CO2 equiv.)	0	0	0
CO2 emissions from drained land (t CO2)	19809.73	15846.14	23788
Total GHG emissions from Drained Land (t CO2 equiv.)	19809.73	15846.14	23788
Losses if Land is Undrained			
CH4 emissions from undrained land (t CO2 equiv.)	337.92	270.31	405.78
CO2 emissions from undrained land (t CO2)	10149.09	8118.43	12187.3
Total GHG emissions from Undrained Land (t CO2 equiv.)	10487.02	8388.74	12593.1
RESULTS			
Total GHG emissions due to drainage (t CO2 equiv.)	9322.71	7457.4	11194.9

5e. Emission Rates from Soils	Exp.	Min.	Max.
Calculations following IPCC default methodology			
Flooded period (days/year)	178	178	178
Annual rate of methane emission (t CH4-C/ha year)	0.04	0.04	0.04
Annual rate of carbon dioxide emission (t CO2/ha year)	35.2	35.2	35.2
Calculations following ECOSSE based methodology			
Total area affected by drainage due to wind farm construction (ha)	17.59	14.07	21.12
Average water table depth of drained land (m)	0.5	0.6	0.4
Selected emission characteristics following site specific methodology			
Rate of carbon dioxide emission in drained soil (t CO2/ha year)	17.87	19.16	16.69
Rate of carbon dioxide emission in undrained soil (t CO2/ha year)	17.87	19.16	16.69
Rate of methane emission in drained soil (t CH4-C/ha year)	-0.01	-0.02	0.02
Rate of methane emission in undrained soil (t CH4-C/ha year)	-0.01	-0.02	0.02
RESULTS			
Selected rate of carbon dioxide emission in drained soil (t CO2/ha year)	35.2	35.2	35.2
Selected rate of carbon dioxide emission in undrained soil (t CO2/ha year)	0	0	0
Selected rate of methane emission in drained soil (t CH4-C/ha year)	0	0	0
Selected rate of methane emission in undrained soil (t CH4-C/ha year)	0.04	0.04	0.04

6 CO_2 LOSS BY DOC AND POC LOSS

Emissions Due to DOC and POC Loss	Exp.	Min.	Max.
Gross CO2 loss from restored drained land (t CO2)	9660.64	7727.71	11600.7
Gross CH4 loss from restored drained land (t CO2 equiv.)	0	0	0
Gross CO2 loss from improved land (t CO2)	0	0	0
Gross CH4 loss from improved land (t CO2 equiv.)	27.02	21.33	32.86
Total gaseous loss of C (t C)	2635.12	2107.87	3164.32
Total C loss as DOC (t C)	685.13	147.55	1265.73
Total C loss as POC (t C)	210.81	84.31	316.43
RESULTS			
Total CO2 loss due to DOC leaching (t CO2)	2512.17	541.02	4641.04
Total CO2 loss due to POC leaching (t CO2)	772.97	309.16	1160.26
Total CO2 loss due to DOC & POC leaching (t CO2)	3285.14	850.18	5801.31
Additional CO2 payback time of windfarm due to DOC & POC			
...coal-fired electricity generation (months)	0	0	1
...grid-mix of electricity generation (months)	1	0	2
...fossil fuel - mix of electricity generation (months)	1	0	1

7 FORESTRY CO_2 LOSS

Emissions Due to Forest Felling	Exp.	Min.	Max.
Area of forestry plantation to be felled (ha)	1.1	1	1.2
Carbon sequestered (t C ha-1 yr-1)	3.6	2.5	4.7
Lifetime of windfarm (years)	30	30	30
Carbon sequestered over the lifetime of the windfarm (t C ha-1)	108	75	141
RESULTS			
Total carbon loss due to felling of forestry (t CO2)	435.6	275	620.41
Additional CO2 payback time of windfarm due to management of forestry			
...coal-fired electricity generation (months)	0.03	0.02	0.04
...grid-mix of electricity generation (months)	0.11	0.07	0.16
...fossil fuel - mix of electricity generation (months)	0.6	0.04	0.09

8 CO_2 GAIN – SITE IMPROVEMENT

Degraded Bog	Exp.	Min.	Max.
1. Description of site			
Area to be improved (ha)	9.88	9.88	9.88
Depth of peat above water table before improvement (m)	0.5	0	0.5
Depth of peat above water table after improvement (m)	0	0	0
2. Losses with improvement			
Improved period (years)	0	0	0
Selected annual rate of methane emissions (t CH4-C ha-1 yr-1)	0.04	0.04	0.04
CH4 emissions from improved land (t CO2 equiv.)	0	0	0
Selected annual rate of carbone dioxide emissions (t CO2 ha-1 yr-1)	0	0	0
CO2 emissions from improved land (t CO2 equiv.)	0	0	0
Total GHG emissions from improved land (t CO2 eqiv.)	0	0	0
3. Losses without improvement			
Improved period (years)	0	0	0
Selected annual rate of methane emissions (t CH4-C ha-1 yr-1)	0	0	0
CH4 emissions from improved land (t CO2 equiv.)	0	0	0
Selected annual rate of carbone dioxide emissions (t CO2 ha-1 yr-1)	35.2	35.2	35.2
CO2 emissions from unimproved land (t CO2 equiv.)	0	0	0
Total GHG emissions from unimproved land (t CO2 eqiv.)	0	0	0
RESULTS			
4. Reduction in GHG emissions due to improvement of site			
Reduction in GHG emissions due to improvement (t CO2 equiv.)	0	0	0

Felled Forestry	Exp.	Min.	Max.
1. Description of site			
Area to be improved (ha)	1.1	1	1.2
Depth of peat above water table before improvement (m)	0.5	0	0.5
Depth of peat above water table after improvement (m)	0	0	0
2. Losses with improvement			
Improved period (years)	0	0	0
Selected annual rate of methane emissions (t CH4-C ha-1 yr-1)	0.04	0.04	0.04
CH4 emissions from improved land (t CO2 equiv.)	0	0	0
Selected annual rate of carbone dioxide emissions (t CO2 ha-1 yr-1)	0	0	0
CO2 emissions from improved land (t CO2 equiv.)	0	0	0
Total GHG emissions from improved land (t CO2 eqiv.)	0	0	0
3. Losses without improvement			

Improved period (years)	0	0	0
Selected annual rate of methane emissions (t CH4-C ha-1 yr-1)	0	0	0
CH4 emissions from improved land (t CO2 equiv.)	0	0	0
Selected annual rate of carbone dioxide emissions (t CO2 ha-1 yr-1)	35.2	35.2	35.2
CO2 emissions from unimproved land (t CO2 equiv.)	0	0	0
Total GHG emissions from unimproved land (t CO2 eqiv.)	0	0	0
RESULTS			
4. Reduction in GHG emissions due to improvement of site			
Reduction in GHG emissions due to improvement (t CO2 equiv.)	0	0	0

Borrow Pits	Exp.	Min.	Max.
1. Description of site			
Area to be improved (ha)	1.9	1.9	1.9
Depth of peat above water table before improvement (m)	0.5	0.5	0.5
Depth of peat above water table after improvement (m)	0	0	0
2. Losses with improvement			
Improved period (years)	0	0	0
Selected annual rate of methane emissions (t CH4-C ha-1 yr-1)	0.04	0.04	0.04
CH4 emissions from improved land (t CO2 equiv.)	0	0	0
Selected annual rate of carbone dioxide emissions (t CO2 ha-1 yr-1)	0	0	0
CO2 emissions from improved land (t CO2 equiv.)	0	0	0
Total GHG emissions from improved land (t CO2 eqiv.)	0	0	0
3. Losses without improvement			
Improved period (years)	0	0	0
Selected annual rate of methane emissions (t CH4-C ha-1 yr-1)	0	0	0
CH4 emissions from improved land (t CO2 equiv.)	0	0	0
Selected annual rate of carbone dioxide emissions (t CO2 ha-1 yr-1)	35.2	35.2	35.2
CO2 emissions from unimproved land (t CO2 equiv.)	0	0	0
Total GHG emissions from unimproved land (t CO2 eqiv.)	0	0	0
RESULTS			
4. Reduction in GHG emissions due to improvement of site			
Reduction in GHG emissions due to improvement (t CO2 equiv.)	0	0	0

Foundations and Hardstandings	Exp.	Min.	Max.
1. Description of site			
Area to be improved (ha)	1.8	1.421	2.189
Depth of peat above water table before improvement (m)	0.5	0	0.5
Depth of peat above water table after improvement (m)	0	0	0
2. Losses with improvement			
Improved period (years)	25	25	25
Selected annual rate of methane emissions (t CH4-C ha-1 yr-1)	0.04	0.04	0.04
CH4 emissions from improved land (t CO2 equiv.)	27.02	21.328	32.857
Selected annual rate of carbone dioxide emissions (t CO2 ha-1 yr-1)	0	0	0
CO2 emissions from improved land (t CO2 equiv.)	0	0	0
Total GHG emissions from improved land (t CO2 eqiv.)	27.02	21.328	32.857
3. Losses without improvement			
Improved period (years)	25	25	25
Selected annual rate of methane emissions (t CH4-C ha-1 yr-1)	0	0	0
CH4 emissions from improved land (t CO2 equiv.)	0	0	0
Selected annual rate of carbone dioxide emissions (t CO2 ha-1 yr-1)	35.2	35.2	35.2
CO2 emissions from unimproved land (t CO2 equiv.)	1584	1250.3	1926.14
Total GHG emissions from unimproved land (t CO2 eqiv.)	1584	1250.3	1926.14
RESULTS			
4. Reduction in GHG emissions due to improvement of site			
Reduction in GHG emissions due to improvement (t CO2 equiv.)	1556.98	1228.98	1893.29