APPENDIX 16.1: CO_2 ASSESSMENT INPUT VALUES

Input data	Best case scenario	Intermediate scenario	Worst case scenario	Comments
Wind farm characteristics				
Dimensions				
No. of turbines	150	150	150	Site specific data
Life time of wind farm (years)	25	25	25	Site specific data
Performance				
Turbine capacity (MW)	3.6	3.6	3.6	Site specific data
Capacity factor (percentage efficiency)	45	45	45	Site specific data
Backup				
Extra capacity required for backup (%)	5	5	5	Default value
Additional emissions due to reduced thermal efficiency of the reserve generation (%)	10	10	10	Default value
Carbon dioxide emissions from turbine life - (eg. manufacture, construction, decommissioning)				
Total CO_2 emission from turbine life (tCO_2 wind $farm^{-1}$) *(if known use direct input of emissions from turbine life)*	Calculate with regard to installed capacity	Calculate with regard to installed capacity	Calculate with regard to installed capacity	-
Characteristics of peatland before wind farm development				
Type of peatland	Acid bog	Acid bog	Acid bog	Site specific data
Average air temperature at site (^oC)	7	7	7	Met Office (2008)
Average depth of peat at site (m)	1.6	1.6	1.6	Site specific data
C Content of dry peat (% by weight)	55	55	55	From MLURI (1991)
Average extent of drainage around drainage features at site (m)	10	50	100	Assumed values
Average water table depth at site (m)	0.5	0.75	1	Assumed values
Dry soil bulk density (g cm^{-3})	0.60	0.60	0.60	Site specific data
Average soil pH	4.0	4.0	4.0	Site specific data
Characteristics of bog plants				
Time required for regeneration of bog plants after restoration (years)	10	10	10	Default value
Carbon accumulation due to C fixation by bog plants in undrained peats (tC ha^{-1} yr^{-1})	0.25	0.25	0.25	Default value
Forestry Plantation Characteristics				
Area of forestry plantation to be felled (ha)	0	0	0	No trees on site
Average rate of carbon sequesteration in timber (tC ha^{-1} yr^{-1})	0.00	0.00	0.00	n/a
Counterfactual emission factors				
Coal-fired plant emission factor	0.86	0.86	0.86	Default values

Input data	Best case scenario	Intermediate scenario	Worst case scenario	Comments
(t CO_2 MWh^{-1})				
Grid-mix emission factor (t CO_2 MWh^{-1})	0.43	0.43	0.43	Default values
Fossil fuel- mix emission factor (t CO_2 MWh^{-1})	0.607	0.607	0.607	Default values
Borrow pits				
Number of borrow pits	14	14	14	Site specific data
Average length of pits (m)	97	97	97	Site specific data
Average width of pits (m)	126	126	126	Site specific data
Average depth of peat removed from pit (m)	1.6	1.6	1.6	Site specific data
Wind turbine foundations				
Average length of turbine foundations (m)	25	25	25	Site specific data
Average width of turbine foundations(m)	25	25	25	Site specific data
Average depth of peat removed from turbine foundations(m)	1.6	1.6	1.6	Site specific data
Hard-standing area associated with each turbine				
Average length of hard-standing (m)	43.06	43.06	43.06	Site specific data
Average width of hard-standing (m)	43.06	43.06	43.06	Site specific data
Average depth of peat removed from hard-standing (m)	1.6	1.6	1.6	Site specific data
Access tracks				
Total length of access track (m)	117,520	117,520	117,520	Site specific data
Existing track length (m)	0	0	0	Site specific data
Length of access track that is floating road (m)	86,010	86,010	86,010	Site specific data
Floating road width (m)	9.25	9.25	9.25	Average figure
Floating road depth (m)	0.5	0.5	0.5	Site specific data
Length of floating road that is drained (m)	0	58,760	86,010	Assumed values
Average depth of drains associated with floating roads (m)	0	0.5	1	Assumed values
Length of access track that is excavated road (m)	31,510	31,510	31,510	Site specific data
Excavated road width (m)	9.25	9.25	9.25	Average figure
Excavated road depth (m)	1	1	1	Site specific data
Length of access track that is rock filled road (m)	0	0	0	Site specific data
Rock-filled road width (m)	0	0	0	Site specific data
Rock-filled road depth (m)	0	0	0	Site specific data
Length of rock-filled road that is drained (m)	0	0	0	Site specific data
Average depth of drains associated with rock-filled roads (m)	0	0	0	Site specific data
Cable Trenches				
Length of any cable trench that does not follow access tracks and	0	5,876	11,752	Assumed values

Input data	Best case scenario	Intermediate scenario	Worst case scenario	Comments
is lined with a permeable medium (e.g. sand) (m)				
Depth of cable trench (m)	0	0.5	1	Assumed values
Peat Landslide Hazard				
Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments	0	0	0	Peat slide risk assessment has been undertaken
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)	394	394	394	From Ecology chapter/HMP
Water table depth in degraded bog before improvement (m)	0.50	0.75	1	Assumed values
Water table depth in degraded bog after improvement (m)	0.50	0.75	1	Assumed values
Time required for hydrology and habitat of bog to return to its previous state on improvement (years)	10	10	10	Taken from default value above
Improvement of felled plantation land				
Area of felled plantation to be improved (ha)	0	0	0	n/a
Water table depth in felled area before improvement (m)	0.00	0.00	0.00	n/a
Water table depth in felled area after improvement (m)	0.00	0.00	0.00	n/a
Time required for hydrology and habitat of felled plantation to return to its previous state on improvement (years)	0	0	0	n/a
Restoration of peat removed from borrow pits				
Area of borrow pits to be restored (ha)	15.19	15.19	15.19	Site specific data
Water table depth in borrow pit after restoration (m)	0.50	0.75	1	Assumed values
Time required for hydrology and habitat of borrow pit to return to its previous state on restoration (years)	10	10	10	Taken from default value above
Removal of drainage from foundations and hardstanding				
Water table depth around foundations and hardstanding after restoration (m)	0.5	0.75	1	Assumed values
Time to completion of backfilling, removal of any surface drains, and full restoration of the hydrology (years)	25	25	25	Life of wind farm
Restoration of site after decommissioning				
Will the hydrology of the site be restored on decommissioning?	Yes	Yes	Yes	From HMP

Input data	Best case scenario	Intermediate scenario	Worst case scenario	Comments
Will the habitat of the site be restored on decommissioning?	Yes	Yes	Yes	From HMP