

Offshore Transmission Expert Group Great Britain Security and Quality of Supply sub-group

Cable versus OHL connection proposals for offshore wind farms

Summary

1. This paper puts forward the recommendation made by the GB SQSS subgroup for the treatment of the section of offshore transmission networks from the shoreline to the first substation onshore.
2. A review of the connection proposals for all round 1 and 2 wind farms has been carried out to ensure any assumptions made are consistent with any projects currently proposed. This review has been undertaken to ensure availability figures used in the cost benefit analysis appropriately reflect the security of the transmission system to be installed.

Connection proposals

3. The round 1 and 2 wind farms currently in the planning stages fall into 4 main size categories. Each category proposes to connect to an onshore substation in a similar manner, table 1 details the categories and connection proposals for each.

Project size	N ^o of projects	N ^o of cables per project	Connection mode on land (OHL or Cable)	Voltage (kV)
Up to 250MW	4	1 - 2	Cable	132
250MW to 500MW	9	1 - 4	Cable	132 or 220
500MW to 1000MW	2	6-8 or 4-6	Cable	132 or 220
Over 1000MW	1	9-12 or 6-9	Cable	132 or 220

Table 1: Summary of round 1 and 2 wind farms and connection options

4. It can be noted that there are no proposed windfarm connections between 500MW and 750MW.
5. It can be noted that the length of onshore cable required to connect the offshore transmission system to the onshore electricity grid can be up to 20km.

Conclusions

6. It is assumed that all offshore transmission networks will be cable circuits for the connection from the offshore high voltage platform to the first substation on shore.
7. Given the TO obligation to develop an economic and coordinated transmission system whilst having due regard for the environment, it will be necessary to consider the utilisation of overhead lines for this potentially significant circuit length. However, given the number of wind farms requiring connection to the onshore electricity grid, there could be a requirement for up to 24 new double circuit overhead line routes to be constructed around Great Britain. Significant consents issues are highly likely when seeking planning permission for these additional overhead lines, therefore developers are keen to reduce the risks on the project and have chosen cable connections to the onshore electricity network.

September 2006

Appendix A – Full list of Round 2 windfarms

Source – Crown Estates website

Up to 250MW

Gunfleet Sands: 48-64MW

Lincs: 190-250MW

Westermost Rough: 180-240MW

250MW Up to 500MW

Docking Shoal: 375-500MW

Dudgeon East: 230-300MW

Greater Gabbard: 375-500MW

Humber Gateway: 230-300MW

Race Bank: 375-500MW

Sheringham Shoal: 240-315MW

Thanet: 230-300MW

Walney: 340-450MW

West Of Duddon: 375-500MW

500MW up to 1000MW

Gwynt Y Mor: 570-750MW

London Array: 750-1000MW

Over 1000MW

Triton Knoll: 900-1200MW