NORTH FALLS

Offshore Wind Farm

ENVIRONMENTAL STATEMENT

Appendix 4.1 Site Selection Golden Rules

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1. Introduction

The site selection process for the North Falls offshore wind farm project's (herein 'the project') electrical transmission infrastructure involves the assessment of a wide range of environmental, engineering and other criteria to determine preferred options for the location of each element of infrastructure. An important part of the Environmental Impact Assessment (EIA) process is to describe the reasonable alternatives considered during the evolution of the project, such as development design, technology, location, size and scale, and to set out the main reasons for selecting the chosen option. On this basis it is important to define the assumptions and principles that underpin the site selection work to ensure that decisions are transparent and justifiable.

The assumptions and principles ('golden rules') set out in this document are those which will set the framework for the site selection exercise, and which will be adhered to throughout the process. Whilst an extensive range of other environmental and technical parameters will be considered during site selection, the principles presented here represent the starting point for identifying viable options for the location of infrastructure. These assumptions and principles may be further refined as more information is obtained about the scale of the proposed development and the constraints present. The principles presented here have been derived using best practice guide for site selection, including The Crown Estate's Cable Route Protocol[1], the National Grid's Horlock Rules[2] (for the siting of substations) and the Holford Rules[3] (for the siting of transmission infrastructure), as well as National Policy Statements (NPS), in particular EN-1[4], EN-3[5] and EN-5[6] and other relevant planning considerations.

For the purposes of this document, 'electrical transmission infrastructure' comprises all elements of the electrical infrastructure required to connect the project's offshore wind farm array to the National Grid, including the project's onshore substation, onshore cable corridor, landfall and offshore cable corridor.

It is noted that National Grid shall follow their own separate site selection process utilising their own criteria when identifying and subsequently selecting the location of their infrastructure.

2. Site Selection Principles and Assumptions

2.1 Offshore Cable Corridor

The offshore export cable corridor (ECC) area of search was defined based on the northern and southern extent of the offshore array development areas, and the preferred landfall area of search. In order to refine this area of search and to identify and eventually down-select the ECC options, a series of key principles were used to guide

[1] The Crown Estate (2017) Cable Route Protocol.
[2] National Grid Company (NGC) (2006). NGC Substations and the Environment: Guidelines on Siting and Design.
[3] National Grid Company (NGC) (1992). The Holford Rules: Guidelines for the Routeing of New High Voltage Overhead Transmission Lines.
[4] Department for Energy and Climate Change (DECC) (2011). Overarching National Policy Statement for Energy (EN-1).
[5] Department for Energy and Climate Change (DECC) (2011). National Policy Statement for Renewable Energy Infrastructure (EN-3).
[6] Department for Energy and Climate Change (DECC) (2011). National Policy Statement for Electricity Networks Infrastructure.

the selection process. These were adhered to wherever practicable, with selection of the preferred ECC reflecting a balance of the principles:

- The most direct route from the offshore array area to preferred landfall search area should be selected, in balance with the other key selection principles;
- Avoid, or minimise direct impact to, designated/protected environmental sites, including SACs MCZs, SPAs, Ramsar sites and SSSIs, where possible;
- Minimise impact on other sea users and navigational safety;
- Avoid routing through significant sandbank features where a practicable alternative exists;
- Avoid routing through licensed aggregate dredging areas, dumping grounds, explosives dumping grounds and anchorages where possible;
- Avoid routing through offshore oil and gas sites subject to a lease agreement with The Crown Estate, to include offshore fields and infrastructure (including pipelines and offshore platforms);
- Avoid locations, including wrecks, known to be of archaeological importance where practicable;
- Avoid routing within the offshore array development boundaries of existing operational offshore wind farm sites and those currently in planning or under construction;
- Minimise the number of subsea cable/pipeline crossings required;
- Options that could minimise the cable infrastructure 'footprint' by working with other known developers who may be considering a similar route (subject to being able to make realistic assumptions about other developers' proposals).

In addition to the principles above, all offshore cable corridor options will need to be technically and economically feasible and to that end will be subject to a constructability review as part of the site selection process.

2.2 Landfall

A number of engineering assumptions have been identified for the project's cable landfall site selection work. These are presented in the project's Project Description Spreadsheet (Issue 1.6) and will be incorporated into the overall Project Design Statement for the project. The identification of potential landfall options will also adhere to the principles identified below where possible:

- Avoid direct significant impacts to internationally and nationally designated areas (e.g. SACs, SPAs, Ramsar sites, National Nature Reserves (NNRs) and SSSIs);
- Avoid direct significant impacts to mature woodland and ancient woodland;
- Avoid scheduled ancient monuments and listed buildings;
- Avoid historic or active landfill sites;
- Avoid areas with substantial infrastructure or urban land use e.g. areas of housing, coastal defences, other energy infrastructure (including nuclear energy land);
- Minimise number of crossings of existing cables and pipelines;
- Maintain required separation distances with other cables and pipelines;
- Maintain sufficient space for the transition from offshore cable to onshore cable
- Ensure potential Horizontal Directional Drill (HDD) length is achievable.
- Options that could facilitate co-location of cable landfall infrastructure with other known developers who may be connecting to the national grid at a similar location and therefore using a similar landfall (subject to being able to make realistic assumptions about other developers proposals).

In addition to the principles above, all landfall options will need to be technically and economically feasible and to that end will be subject to a constructability review as part of the site selection process.

2.3 Onshore Cable Corridor

A number of engineering assumptions have been identified for the onshore cable corridor site selection work. These are presented in the project's Project Description Spreadsheet (Issue 1.6) and will be incorporated into the overall Project Design Statement for the project.

The identification of potential onshore cable corridors will also adhere to the principles identified below where possible:

- Routing should be kept as straight and as short as practicable – avoiding tight bends;
- Avoid residential titles (including whole garden) where possible;
- Avoid direct significant impacts to internationally and nationally designated areas (e.g. SACs, SPAs, Ramsar sites, NNRs and SSSIs);
- Avoid direct significant impacts to mature woodland and ancient woodland;
- Avoid scheduled ancient monuments and listed buildings;
- Avoid historic or active landfill sites;
- Minimise the number and length of trenchless crossings;
- Minimise the number of crossings of assets (e.g. utilities);
- Minimise the number of road and rail crossings;
- Minimise the number of hedgerow crossings;
- Minimise the number of watercourse crossings and number of ponds affected; and
- Options that could facilitate co-location of cable infrastructure with other known developers who may be connecting to the National Grid at a similar location (subject to being able to make realistic assumptions about other developers' proposals).

In addition to the principles above, all onshore cable route options will need to be technically and economically feasible and to that end will be subject to a constructability review as part of the site selection process.

2.4 Onshore Substation

A number of engineering and design assumptions have been identified for the onshore substation site selection work. These are presented in the project's Project Description Spreadsheet (Issue 1.6) and will be incorporated into the overall Project Design Statement for the project. In addition, the following key engineering principles will underpin the site selection process:

- Options to be located as close as possible to the National Grid substation – with a maximum distance of 3km[7] from the National Grid substation set for site selection purposes;
- Options to include up to 0.2km^2 of land to accommodate the substation for North Falls only, temporary works/construction compound as well as landscaping, environmental enhancements and biodiversity net gain, flood defence and drainage and other necessary infrastructure;
- Options to include a requirement for temporary and permanent access to the highway network;
- To include the option of co-locating with National Grid, by locating within the National Grid connection location footprint[8];
- All factors being equal, to seek to co-locate with National Grid to share land and minimise spatial extent of effects, subject to the agreement of National Grid;

[7] This maximum distance of 3km is set in order to minimise the length of cabling between the project substation and the National Grid Substation. Minimising this distance is necessary to minimise the general impacts from cabling, to minimise electrical losses which improves overall system efficiency, reduce/eliminate the need for additional equipment to compensate for losses and to minimise the overall cost of the connection. The 3km distance was selected on the basis of previous project and industry experience.

[8] NB: for this option to be viable, there must be 0.2km^2 parcel of unconstrained land available within the National Grid substation footprint.

- Options that could facilitate co-location with other known developers who may be connecting to the national grid at a similar location (subject to being able to make realistic assumptions about other developers' proposals);
- All factors being equal, options that result in the least environmental effects when combined with other known developers' proposed substation location;
- If locating outside of National Grid's connection location footprint, all factors being equal to seek to locate as close to National Grid's connection location as possible;
- Options selected are to be technically feasible and economically viable and to that end will be subject to a constructability review as part of the site selection process.

The identification of potential onshore substation options will also adhere to the principles identified below where possible:

- Avoid land within residential titles (including whole garden) where possible;
- Avoid direct significant impacts to internationally, nationally and locally designated areas (e.g. SACs, SPAs, Ramsar sites, NNRs SSSIs, Local Nature Reserves and Local Wildlife Sites);
- Minimise significant impacts to the special qualities of Areas of Outstanding Natural Beauty, National Parks or other designated landscapes;
- Avoid mature woodland and ancient woodland;
- Avoid scheduled ancient monuments and listed buildings;
- Avoid historic or active landfill sites;
- Avoid areas that fall within Flood Zone 3;
- Avoid siting infrastructure within inner (SPZ1) and outer (SPZ2) source protection zones (SPZ), where possible;
- Areas of local amenity value, important existing habitats and landscape features including ancient woodland, historic hedgerows, surface and ground water sources and nature conservation areas should be protected as far as reasonably practicable (specific wording from Horlock Rules);
- Locations should take advantage of the screening provided by land form and existing features and the potential use of site layout and levels to keep intrusion into surrounding areas to a reasonably practicable minimum (specific wording from Horlock Rules);
- Options should keep the visual, noise and other environmental effects to a reasonably practicable minimum (specific wording from Horlock Rules); and
- The space required should be limited to the area required for development consistent with appropriate mitigation measures and to minimise the adverse effects on existing land use and rights of way (specific wording from Horlock Rules).

The requirement for an economic and efficient solution are defined in the NPS EN-1, the National Grid's Guidelines on Substation Siting and Design (Horlock Rules) and The Electricity Act 1989.