The fourth element of floating wind consents

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Through development of multiple commercial-scale offshore fixed-foundation wind projects in the UK, the industry has established approaches to assessment and consenting which consider three principal elements for proposed projects: the offshore windfarm site; the offshore export cable; and the onshore export cable and substation. For floating offshore wind projects, it may be necessary to consider the inclusion of a fourth element to assessment and consenting approaches, namely aspects relating to the port, or ports, and associated infrastructure at which construction and operations and maintenance (O&M) activities are undertaken.

Traditional installation of fixed-foundation offshore wind projects requires foundations that are installed on site, with tower segments lifted into place at the array location, and the nacelle, hub and blades attached thereafter. Major component replacement, if required, would likewise take place on site.

For fixed-foundation wind farm projects construction and O&M activities at port locations are limited to storage and load-out of components. Such activities fall under the competence of existing ports and, therefore, there is no need for an offshore wind farm project to assess potential impacts of port-based construction activities within its environmental impact assessment (EIA) or consider in information provided in for habitats regulations appraisal (HRA).

Selection of a port for construction and O&M of fixed-foundation wind farms does not need to take place during the project design, pre-consent state of the project. This provides a degree of flexibility to the project developer which, like the project design envelope, or Rochdale Envelope, approach, may be used by developers to accommodate the high rate of change in emerging offshore wind technology. This limits the requirement for early-stage commitment on behalf of developers, which in turn lowers project costs and helps to reduce levelised cost of energy (LCoE).

In contrast, the methodology for construction of floating offshore wind projects allows for individual turbines, with their floating foundations, to be assembled ex situ, at ports or coastal locations. These can then be towed to their final position in the offshore array and connected to pre-installed moorings and electrical connection, sometimes referred to as a 'plug and play' approach. Where major component replacement is required, this can also be undertaken by removal of the turbine and floating foundation and return to a port or sheltered coastal location, otherwise known as wet storage areas.

Transfer of turbines between wet storage areas and final array positions is contingent on suitable weather and sea conditions. The nature of floating wind sites, deeper water and generally further from shore than fixed-foundation sites, means that transfer distances and durations may be sizeable. As such, developers may be required to store assembled floating turbines in wet storage areas until sufficient weather window is forecast to allow for the safe transfer and installation.

In addition to assessment of impacts arising from construction, operation and decommissioning of turbine arrays and onshore and offshore export infrastructure, consideration should also be given to impacts associated with floating offshore wind wet storage areas; that is, the 'fourth element' of floating wind consent.

Whilst a wider series of impacts should be considered, to illustrate the point, this article addresses the potential ornithological impacts that may arise through use of wet storage areas for the ScotWind floating offshore windfarms.

ScotWind

The first commercial-scale floating offshore wind projects to come through the ScotWind leasing process could be up to 1GW in capacity and are likely to utilise next generation turbines each of a capacity of around 15MW. Each project of this scale will require at least 60 floating wind turbines, each with a tip height of 300m above sea level, which, across the duration of the construction period, may be required to be kept at a wet storage area before being transferred to site.

Whilst for any individual turbine the duration of containment in wet storage areas may be relatively limited, the duration in which a given wet storage area may contain one or more turbines may be considerably larger; potentially one to two years throughout the duration of the construction period.

The spatial extent of floating wind wet storage areas, although much smaller than the footprints of associated offshore floating wind farm arrays, may be considerable. For example, the footprint of a wet storage area designed to hold up to six turbines, each separated by 1 km, may be in the region of 5 km^2 when fully occupied.

This presence of assembled large turbines in coastal environments during the temporal and spatial scales described above has the potential to result in adverse impacts upon ornithological receptors within those environments, principally as a consequence of disturbance and displacement effects.

Wet storage areas would ideally be located in sheltered, coastal waters, outside of areas strongly influenced by tidal currents

and ideally in proximity to existing assembly ports and offshore array areas. When the distribution of locations with desirable characteristics for siting wet storage areas in Scottish waters is compared to the distribution of ornithologically designated European sites, i.e. special protection areas (SPAs) and proposed special protection areas (pSPAs)) there appears to be considerable overlap.

On the Scottish east coast areas such as the Shetland Voes, Scapa Flow and other Orkney waters, the Moray and Cromarty Firths, the Moray and Aberdeenshire coasts and the Tay and the Forth basins, may all present opportunities for siting potential wet-storage areas. However, these areas also contain SPAs or pSPAs which include non-breeding diver and/or sea ducks as designated features.

Species from both groups are generally considered moderately or highly susceptible to experiencing disturbance and displacement impacts in relation to marine development activities, with divers in particular demonstrated to show displacement effects across large distances from OWF turbines.

As such, the siting of wet storage areas within or close to SPAs or pSPAs, may result in disturbance or displacement impacts which could be considered as having the potential to adversely affect the integrity of those designated sites, and consequently require detailed assessment in relation to the habitats regulations.

With developers and original engineering manufacturers (OEMs) exploring site-specific wet storage strategies, it is prudent for regulators, advisory groups, developers and their ornithological consultants, and other relevant third parties to more fully explore the ornithological implications associated with wet storage solutions for floating offshore wind farms so as to have consenting pathways and associated advice in place in good time for upcoming developments.

Commercial Implications

Ornithological baseline data collection for offshore wind is considered to be a long-lead item within the consent process, requiring surveys throughout multiple seasons. To facilitate assessment of ornithological impacts arising from all elements of a proposed floating offshore wind project, ornithological baseline data collection to cover wet storage areas may be required. The specifics of such requirements would be subject to consultation with regulators.

Utilisation of wet storage areas for assembled turbines is expected to be integral to the construction methodology, therefore it is reasonable to assume consent for this will be sought contemporaneously with the offshore windfarm and export infrastructure. This may form a separate consent application and, depending on project requirements, it may be appropriate that consent is progressed by the port operator rather than project promoter. Naturally, a port operator may seek consent for construction and operations and maintenance of multiple projects.

A useful analogy to consider is the 'generator build vs OFTO build' options for consent of export infrastructure for UK offshore windfarms. Offshore wind developers could elect to design, consent and construct transmission infrastructure, or adopt an OFTO build model where a third party could take on this responsibility. The purpose of the regime was to improve coordination between projects, share infrastructure and reduce costs, however project developers preferred to take control over the design, timescale and approach to consent.

Consent for wet storage areas will be tied to a single design and location, necessitating selection of a construction, and potentially O&M facility at a much earlier stage than is required for fixed-bottom offshore wind. To ensure timely build-out of floating offshore wind projects, both offshore wind developers and port operators should seek to engage and understand the commercial implications and responsibilities of such requirements.

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