THE COMPLEXITIES OF EVER LARGER PROJECTS

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THE SCALE OF THE CHALLENGE

The scale of offshore wind projects has increased exponentially since the first projects that were included in Tender Round 1 (TR1). Projects in TR1 mainly ranged in size from 90 MW to 315 MW, with the largest project coming in at 500 MW. TR7 was announced by Ofgem on 12 November 2020, with the two projects taking part clocking in at 900 MW and 857 MW.

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> Offshore Wind Industry Council

The target set by the UK Government in December 2019 for delivery of another 40 GW of offshore wind by 2030 is an ambitious one. Developers of offshore wind are firmly on board with this challenge – the Offshore Wind Industry Council (OWIC) clearly summarised the current position:

…in the context of increasingly ambitious targets, constructing individual point to point connections for each offshore wind farm may not provide the most efficient approach, and could become a major barrier to delivery given the considerable environmental and local impacts, particularly from the associated onshore infrastructure required to connect to the national transmission network.

In November 2019, OWIC published two reports setting out the importance of enabling efficient development of transmission networks to meet these targets, and at the same time, proposing some short term solutions. Most recently, OWIC published a Sector Deal Progress Update, March 2019 – October 2020. The Progress Update confirms that the industry has been "working to meet the Government's new 2030 target of 40 GW, with at least 1 GW of floating wind". We can see this clearly in projects already being delivered, and that will be delivered in the short to medium term. A few of the early projects have already seen "extensions" tendered in later rounds, with these extensions operational well before December 2019. Other projects have been in planning for some time, and while some stages will be delivered in the future, project development and planning started before the Government targets were announced. Please see below for examples (note that this list is not exhaustive).

Multi-phase projects

Burbo Bank (90MW) is one of the earliest projects, operational since 2007. It is connected at distribution voltage (below 132kV), which means the connection can be operated under a distribution exemption and no OFTO is required. Burbo Bank

Extension (258MW) was tendered in TR4 and has been operational since 2017.

Walney (367 MW) was tendered as two separate projects in TR1 (Walney 1 and Walney 2) and has been operational since 2012. Walney Extension (659MW) was tendered in TR5 and has been operational since 2018.

Hornsea Projects – Hornsea One (1.2GW) participated in TR6 and became operational in 2020. It will be followed by Hornsea Two (1.4GW) in 2022, Hornsea Three (2.4GW), which is expecting a consent decision in 2020, and Hornsea Four, which is in early planning stages. If all four projects go ahead, the combined capacity will be well over 5GW.

East Anglia – East Anglia ONE (714MW) participated in TR6 and became operational in 2020. It will be followed by East Anglia THREE (1.4GW), which was granted development consent in 2017, and then by East Anglia ONE North (800MW) and East Anglia TWO (900MW), which are currently in an examination process with the Planning Inspectorate with hearings scheduled to take place virtually through the end of 2020 into early 2021. If all four projects go ahead, the combined capacity will be over 3.8GW.

Dogger Bank Wind Farm – each of Dogger Bank A, B and C will have a capacity of up to 1.2GW, for a total capacity of up to 3.6GW. All three projects obtained planning consent in 2015, and the developers have been contracting for turbines, foundations and installation.

In turn, the Government is playing its part, announcing on 24 November 2020 that it intends to double the capacity in the next Contacts for Difference (CfD) allocation round in 2021 (compared to the third allocation round in 2019) and that offshore wind will have a dedicated budget pot.

The support is no doubt welcome and will certainly assist developers, but further certainty and clarity is needed if the industry is to deliver the most efficient and effective offshore wind farms and transmission connections. The OFTO regime needs to develop to allow this to happen.

THE SIMPLE CONCLUSION

The key constraints and possible solutions are explored in more depth below, but the bottom line boils down to a real need to make the best use of the limited resources we have – in terms of physical space, time and funds. If we are to meet the Government's goals set out in the Sector Deal and also the net zero carbon emissions targets set out in law, the OFTO regime needs to change.

It is an opportune time for the Department for Business, Energy and Industrial Strategy (BEIS) and Ofgem to re-evaluate the structure of the regime – to revisit the alignment of regimes (OFTOs, onshore transmission, interconnectors) and the uptake of the OFTO-build option, and pave the way for investment ahead of the need to deliver efficiencies of scale.

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Offshore wind generation is increasing pace and has matured much sooner than expected. While simple point-to-point connections worked for the early offshore wind projects, these are now relatively small compared to what is being delivered and what needs to be delivered in the future. As we set out above, the size of projects was increasing even before more ambitious targets were set out. Technology and scale have moved on and the large "cluster" type projects (e.g. Dogger Bank and Norfolk) require a more joined up and coordinated approach. BEIS and Ofgem will need to engage with developers and learn from their experience 'at the coal face' (pun intended!). Developers are keen to develop clusters of offshore wind farms and to share the required infrastructure. As the CfD strike prices continue to fall (a decade ago, we could not have imagined offshore wind clearing at under £40/MWh), developers (and their funders) will need to capture every possible efficiency in capital deployment.

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In addition, OFTOs may have a different risk appetite with a decade-long track record behind them. New entrants will be needed as the sheer capital requirements of projects increases; they may be encouraged by a regime "reset" which may level the playing field somewhat with the more experienced OFTOs. The OFTO framework has remained relatively static and it is time for it to catch up.

These efficiencies will trickle through to consumers, helping BEIS and Ofgem deliver on their principal objective to protect the interest of existing and future consumers. As projects are developed further out at sea, OFTO costs become an even more significant consideration.

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THE KEY CONSTRAINTS

There are a number of constraints that make delivery of 40 GW of offshore wind by 2030 challenging. While many issues are challenging, some of them are physical constraints that are harder to address without considerable change to the OFTO regime:

- physical space; and
- physical delivery of manufacturing and installation.

Why is it an issue?

Physical space – fairly obviously, there are only so many landing points on the coast. A true offshore network reduces the need for direct connections to the shore but planning and coordination of the offshore grid is needed to achieve this.

National Grid System Operator takes on this role for the onshore network, but the offshore network currently falls outside its remit. However, extending National Grid's system planning remit to cover offshore network development is certainly something Ofgem should consider. It may be that "anticipatory investment" falls more comfortably into National Grid's price control, or through the Strategic Wider Works mechanism.

Physical delivery of manufacturing and installation – manufacturing lead times can be very long for the cables and transformers required to connect offshore wind to the shore. If a developer can put in an order for four phases of a large project, certainty of demand allows the supply chain to scale up and could speed delivery times.

Equally, installation vessels that are capable of both carrying the loads required and carrying out installation in sometimes difficult conditions are booked far in advance. It would be more efficient for an installation vessel to be booked to install two or three offshore substations while it is in situ, delivering cost and time efficiencies.

This is difficult for developers to do under the current OFTO regime because they in turn do not have certainty that they will be able to recover their costs. See below on the current OFTO cost recovery process, and particularly the clarity that BEIS and Ofgem need to develop regarding anticipatory investment and coordination of the offshore grid.

The first of these was specifically identified by OWIC. Finite space on Great Britain's coastal and nearshore areas present the most immediate constraint. It is not sustainable for the OFTO regime to deliver the radial connections we have seen to date. This is where a true offshore network would make the best use of the finite resources we have, and multi-phased projects present a perfect opportunity to start coordinating offshore construction and interconnection.

There is no interconnection or reinforcement between offshore wind farms, which is what a true network requires. Such interconnection may also mitigate outages on some OFTO transmission connections as, subject to capacity, power generated could be redirected via other close connections. We can look to German model for lessons here; infrastructure in Germany is shared. Many developers active in the German market are developing multi-phased large projects in GB so there is likely to be appetite for shared infrastructure.

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The second of these sweeps up several concerns identified by OWIC. Economies of scale are gained through upfront investment and planning, contracting for large quantities of equipment (e.g. turbines and cables) or long periods of sustained work (e.g. construction and installation). Supply chains develop when demand exists, and a strong pipeline of work allows manufacturers and contractors to scale up operations and acquire the resources to deliver.

Without clarity and certainty, particularly around network planning and cost recovery, developers are unable to deliver cost-efficient and resource-efficient projects.

POSSIBLE SOLUTIONS

The short term view

Contracting structure and strategy is key to obtaining economies of scale and is closely linked to cost recovery. Under the current OFTO regulations, developers may only recover the "the economic and efficient costs which ought to be, or ought to have been, incurred in connection with developing and constructing the transmission assets *in respect of a qualifying project*" (emphasis added). It is the last part of that regulation that causes uncertainty for developers, particularly when different phases of much larger projects are submitted as "qualifying projects" in their own right in different OFTO tender rounds.

Oversizing assets during the initial build (e.g. cable ducting, substations) is one of the key efficiency savings that projects can make. Clearly, a developer building a large project in stages could make cost savings here in the bigger picture. However, the current cost assessment process does not allow for all of the costs to be recovered for the first phase as they do not relate to that specific "qualifying project". In theory, some of those costs could be recovered by the developer in respect of later "qualifying projects" (being the next phase of the build out), but in practice:

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a) it is not always easy or practical to apportion initial costs between the transmission assets for different phases; and

b) adding further complexity to already complex contracts and contracting structures is likely to increase negotiation time and transaction costs.

In the shorter term, clarity and guidance on the following areas could deliver real benefits relatively quickly:

a) co-location of different technologies, e.g. battery storage, hydrogen electrolysers, either onshore or offshore, and their integration into offshore wind farms and transmission assets; and

b) cost recovery, particularly in terms of so called "anticipatory" investment for delivery of large complex projects which require developers to contract for enabling infrastructure for multiple phases, each of which is treated as a separate "qualifying project" for the purposes of the OFTO regime;

Guidance and regulatory certainty on co-location of technologies that may mitigate some of the intermittency of wind power. There is clearly benefit for developers as they can manage some of the imbalance risk they face, and there is also benefit to the overall system in evening out the peaks and troughs of intermittent generation. At present, it is not entirely clear how storage infrastructure (hydrogen or battery) would be treated in the OFTO process, particularly where it needs to share some infrastructure with OFTO assets.

And, crucially, guidance and regulatory certainty on oversizing assets and recovery of anticipatory investment, particularly for large multi-phase projects, would be welcome and would facilitate decision making for the developers. In turn, this will enable developers to deliver the Government's ambitions.

The longer term view

In the longer term, it is not clear whether regulatory certainty can be created through secondary legislation (e.g. amendments to the Electricity (Competitive Tenders for Offshore Transmission Licences) Regulations 2015), or whether enabling amendments to primary legislation would be required first. This is a matter for BEIS and Ofgem to take advice on, but changes to primary legislation take more time to enact and therefore BEIS and Ofgem should be exploring and considering options sooner rather than later.

As part of the longer-term work for BEIS and Ofgem, a reset on policy, incentives and alignment is crucial for the delivery of a coordinated and efficient offshore network. Clearly, this work cannot be done in a vacuum; BEIS and Ofgem will need to work closely with developers to understand what they can do to maximise efficiencies. This engagement would also present another opportunity to explore the OFTO-build model; while developers may welcome an opportunity to get transmission assets off their own balance sheets, losing control over the construction quality and timeline can have disastrous consequences for a project. It would benefit Ofgem to understand the concerns of developers and financiers while exploring how any risks may be mitigated, whether commercially or through regulatory means.

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The policy view should be clear, and we would suggest that the starting point is to stop viewing each "qualifying project" in isolation, but to assess each one in light of developments in the wider region or area, both offshore and onshore. Using this starting point, policy makers and regulators may be better able to set the right incentives for cooperation between OFTOs and their onshore equivalents to ensure delivery of efficient connections, reinforcements and the overall network.

Alignment of various regimes is perhaps the toughest challenge, and one that has been examined by Ofgem before. However, we can no longer afford to delay action, particularly as an island state with interconnection to continental Europe and feasibility studies under way for interconnection from offshore wind farm to offshore wind farm, rather than the traditional shore to shore. This proposal would mean that the interconnector would fall within the legislative definition of "offshore transmission" and therefore it is not clear which licence it would require – a transmission licence, or an interconnector licence.

A SHIFT IN FOCUS

Changes to address the barriers we have identified would help to make the most efficient use of limited resources. Ships that can carry the equipment and assist in construction are few and far between and booked up far in advance. Better use of resource would be to make use of them in zones where they are already deployed, e.g. to install offshore hubs.

This would require a sea change in the view taken by Ofgem in assessing construction costs – looking at efficiency of the overall system in the context of 40 GW of generation, rather than on a GW by GW basis, project by project.

We would be happy to discuss the issues raised and to hear your views on facilitating delivery of 40 GW of offshore wind in the next ten years. Do get in touch!

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