nationalgridESO

Offshore Coordination project
Consultation feedback form

Offshore Wind Developer

Holistic Approach to Offshore Transmission Planning Report

Q1. Do you agree with our assessment of the key technology and system risk barriers coming from the Holistic Approach to Offshore Transmission Planning Report?

Our greatest concern is that the report doesn't really address the risk that offshore wind projects could be delayed by seeking a co-ordinated solution, and it doesn't seem to see the need to accelerate project development timescales if the 2030 target for offshore wind is to be reached. The impression is given that the wind developments will happen by 2030 anyway[1], and hence the task is to connect these projects with as little cost and impact as possible. In reality achieving the 2030 target is a huge national challenge and difficulties with grid connections, and the de-facto end of "connect and manage" due to excessive congestion in popular areas, mean that grid delays are one of the largest problems faced by offshore wind developers. (Indeed, in some parts of the country, grid capacity will undoubtedly be the single largest problem facing new offshore wind projects).

For us the **most important comment** we can make to you is that this review needs to address the huge challenge of timely gird connections for new offshore wind projects. We have a number of suggestions for areas that the review could examine in order to help address these challenges:

i) Can we avoid delays caused by connections being dependent on building new overhead lines? Can co-ordinated solutions help to avoid overhead lines?

ii) Can the "bootstrap" HVDC links being developed by the onshore TOs be accelerated? Should there be less emphasis on cost-reduction and advanced technology for these projects, and more on rapid development and construction?

iii) Are the technologies proposed in the review (e.g. a +/-640kV HVDC substation at Peterhead) too advanced for projects that are supposed to be complete by 2030 – noting that this means placing orders for the new technologies by 2025 at the latest. We appreciate that the authors of the report were looking for advanced technologies that could be applied across the 2030-2050 period, and therefore didn't want to limit themselves by worrying too much about the first few years, but we think that maybe these advanced technologies should only be required for projects that place their orders in and around 2030, and complete around 2035.

iv) While there was a desire expressed to not delay projects that are already "in flight", this seemed to be focussed on Round 3 projects that have been under development for many years. We are aware of newer projects that have already

[1] The amount of generation in 2030 is an exogenous input in the studies, i.e. it is independent of the approach to grid connection taken. In reality grid decisions will be one of the key factors determing how much offshore wind is built by 2030.

done considerable work on designing their grid connections. These should also be considered “in flight”.

v) The potential benefit from co-ordinated solutions varies over a huge range from area to area (in the report regional capex comparisons range from 0% to 30% capex saving). When co-ordinated offshore connections were last considered (2012), Ofgem expressed concern that any analysis based on an implicit assumption of perfect foresight would almost certainly exaggerate the value of co-ordination. Based on this, it seems that there should be a minimum level of savings below which there is no sense in pursuing co-ordination. It would be useful if a such a minimum savings percentage could be published, so that developers in areas where co-ordination is not a sensible approach (e.g. English Channel and Irish Sea) are not needlessly delayed by having to consider it.

Q2. Do you have any proposals on how to most effectively bring the technology to market for when needed?

In our response to Question 1 above we noted our concern that the proposed technologies may be too advanced given that orders will need to be placed by 2025 at the latest. While HVDC technology is progressing rapidly relative to other areas of electricity transmission, doubling the capacity and voltage of HVDC links from wind farms in 5 years or less strikes us as very risky. It should be noted that:

i) Today’s highest voltage level for offshore wind connections (300-320kV DC) was first ordered in 2010 and encountered many delays and challenges in construction. To date no higher voltage has been ordered for offshore wind connections. Far from rapidly increasing, voltages have actually been static for 10 years, while hard-learned lessons about how to design, build and operate offshore converter stations have been applied.

ii) TenneT in Netherlands has commissioned studies for higher voltage HVDC wind farm connections. However, the voltage they are pursuing is 525kV - much lower than the 640kV suggested in the report for UK projects completing in 2030. Furthermore, if a 640kV offshore converter was required for a UK project completing in 2030 it would need to be ordered before any 525kV offshore converters were in service anywhere in the world. Thus lessons from 525kV could not be incorporated into the design.

iii) It is true that higher voltage VSC converters are in service onshore as part of interconnector projects. However – as shown by the Germany experience between 2010 and 2015 – successful operation of onshore converters does not imply that the same technology can be used offshore without extremely high levels of technical risk.

If it is desired to accelerate the development of more advanced HVDC technologies this could be done by transferring the risk associated with at least the first few advanced-technology connections away from the wind farm developer. We note that in Germany the initial moves from AC to HVDC connections were made possible by a commercial structure that transferred cost-overrun risk, delayed-commissioning risk and poor-operational-availability risk to the consumer. This could be a model for accelerating the use of advanced technologies in the UK. Without such an approach, however, we do not

believe that the advanced technologies put forward in the report are feasible for use on 2030 projects due to excessive technical risk.

Cost-benefit Analysis Report

Q1. Do you agree with our assessment of the costs and benefits?

As we have noted above, “advancing wind projects so that the 2030 target is met” is critically important and MUST be in the cost-benefit assessment: there is a climate emergency happening![2] Things that accelerate projects (e.g. no dependence on overhead lines) should be noted as benefits; things that slow projects (e.g. dependence on novel technologies, need to co-ordinate with neighbouring projects, need to wait for new regulatory regimes, higher costs in 2030 with payback only occurring later) should be noted as costs. This might be a rather crude measure, but we note that similar crude measures have already been applied to other areas – notably environmental impact, which we address below.

From my reading of Table 2-3 in the Cost-Benefit Report, the cost of replacing wind with gas-fired power when it’s curtailed off due to lower grid capacity with the integrated option would be (1671.6TWhr – 1615.7TWhr) x £55/MWhr = £3bn, if we assume that gas power costs £55/MWhr on average. This would roughly halve the capex saving from co-ordination (£6bn). Is this correct?

It would be useful if you could disclose more information about where the cost estimates for future advanced-technology HVDC links come from.

How much of the cost saving is from the economies of scale provided by much larger (2.6GW versus 1.3GW, I think) HVDC links from wind farms? In other words, how much of the capex saving could be provided if all future offshore wind projects were 2.6GW in size and so could connect via a single +/-640kV bipole. (i.e. could The Crown Estate provide a large part of the co-ordination benefits just by leasing seabed in 2.6GW blocks?).

Q3. What do you see as the potential impact on the environment of these proposals, particularly the reduction in the number of assets and landing points?

We note that in a number of places “number of assets” seems to be used as a proxy for environmental impact. While we appreciate that at this early stage the use of such simple proxies may be necessary (indeed we suggest some of our own above to help measure impact on project timescales), we feel that not enough is done in the report to emphasise that this is just a simple proxy, and to reassure offshore wind developers that such simplistic measures will not be used in future CION processes. It would be even more reassuring if the report acknowledged that – of the parties involved in the CION process - the wind farm developer has the strongest incentives to accurately measure and minimise environmental impact as their entire financial situation is dependent on obtaining consents.

[2] Rather shockingly, there is no reference to this fact anywhere in the reports.

(A quick analogy. Using the “number of assets” measure, a car has 5 times less environmental impact than a bike, as you need 5 bikes to carry as many people as a full car. I don’t think many people would agree with this!)