Ørsted

Ms. Aida Camacho-Welch, Secretary
New Jersey Board of Public Utilities
44 South Clinton Avenue, 9th Floor
Post Office Box 350
Trenton, NJ 08625

cc. OSW.Stakeholder@bpu.nj.gov

RE Ørsted Response to NJ Offshore Wind Transmission

2nd December 2019

Dear Ms. Camacho-Welch,

Ørsted Wind Power North America (Ørsted) appreciates the opportunity to provide comments regarding planned electric transmission infrastructure for future New Jersey offshore wind procurement.

As the world's leading developer of offshore wind, and the entity entrusted with building and operating New Jersey's first offshore wind farm, the 1,100 MW Ocean Wind Project near Atlantic City, Ørsted has a keen interest in this topic and how it might impact the future of the Offshore Wind industry in New Jersey and beyond.

Please find Ørsted's written responses to the relevant NJ BPU questions and a concluding recommendation for next steps. We would welcome the opportunity to further discuss any element to support New Jersey in its efforts to kick start the U.S. Offshore Wind industry.

Q1. Other Jurisdictions' Efforts

During the Stakeholder Meeting on November 12, 2019, we heard a range of summaries of both U.S. and European experiences with planned transmission. Ørsted cannot speak with expertise on the California or Texas experiences, however we have worked extensively in the European set-up (UK, Germany, Denmark) and can confirm there are pros and cons of all regimes.

New Jersey is unique in terms of its offshore wind ambitions, onshore grid and cable landing constraints, socio-economic policies and incentive structures. This means lessons learned from other jurisdictions are very difficult to apply without very deep knowledge of those frameworks.

Within European transmission, we have seen two basic approaches applied:

1. In the UK, the offshore transmission connection was included in the scope of the offshore wind farm from the start, and therefore is an integrated part of the planning and design of the total project.
2. In Denmark, Germany and the Netherlands, the offshore transmission connection was constructed by the independent, often state owned, Transmission System Operator.

This difference has been a good laboratory for testing different approaches.

We recently sponsored an independent study into the economics of various transmission frameworks for offshore wind in order to understand the costs of the different approaches and indeed the levers which lead to the best overall value for rate payers. This study, authored by economics experts from University of Berlin, is entitled '*Market design for an efficient transmission of offshore wind energy*', and was published May 2019. It is publicly available here: https://diw-econ.de/en/publications/studies/offshore-wind-energy/.

The overall conclusion, both from the qualitative and quantitative analysis is that there are significant synergies and cost savings from integrating the transmission scope together with the offshore wind farm.

The quantitative analysis compared the UK and Germany, which are the two countries with a sufficiently high number of commissioned projects that allows for a meaningful comparison.

The researchers normalised the data, to take account of the project differences (e.g., timing, size, distance to shore, technology). The analysis found that the UK, where 'no regrets' transmission is part of the developers' scope, was at least 30% lower than in Germany.

The data was based on projects commissioned before 2018, which was before the UK transitioned from fixed tariffs into competitive auctions, so the lower costs cannot be attributed to competition. Since 2018, and the introduction of full scope competitive tenders, we have seen costs fall even further.

It is important to note that the original thinking behind the cluster approach in Germany has lost relevance. The rapid scaling up of turbines and project sizes, means we are regularly seeing projects of >900 MW. The same is true of the U.S. market, which essentially leapfrogged the development of smaller scale projects, as evidenced by the recent tenders in New Jersey and other states (e.g., Massachusetts and New York), towards projects of 800 MW and larger. These larger projects provide the scale benefits necessary to assure that offshore transmission capacity is fully utilized without recourse to sharing among multiple, separate projects.

It should also be noted, that Denmark has now decided to include the transmission scope into the next offshore wind tender.

Q2. Offshore Wind Transmission Framework

As discussed in response to question 1, clustering of wind projects is no longer of relevance, due to the scale of the turbines and asset project sizes (1.2-1.3GW considered a normal project size in today's terms).

There may be benefits of either radial or networked transmission, but these largely come down to the specific value that networking of assets brings overall.

For example, if networking of projects is able in some capacity to (i) relieve local onshore congestion; (ii) economically provide system redundancy or (iii) act as a solution to an identified local challenge (e.g., availability of landing sites near a suitable interconnection point), then this may be preferred. However, radial connections of multi-GW projects may also prove the no regrets, least cost solution.

In either scenario, the onshore connection, cable landing and permitting remain the core risks to future Offshore Wind Projects, and further study of the onshore grid's ability to absorb New Jersey's ambitions for 7.5GW of offshore wind should be undertaken before considering the Offshore grid component.

Ørsted supports maximizing competition to drive down costs and this includes transmission. However there are three important caveats intended to protect the long-term interests of the rate payer and the offshore wind industry:

1. It is critical that as part of any transmission development framework, offshore wind developers have the opportunity to submit bids for transmission and generation combined. There are considerable synergies in integrated asset development, and it is important these remain on the table for selection.

2. It is also critical that any entity awarded opportunity to construct transmission assets have robust track record and credibility to deliver (financial & technical). These assets are critical single points of failure, and thus there needs to be a robust assessment of any entity's ability to deliver onshore and offshore assets.

3. It is also critical in a competitive process that revenue recovery mechanisms are in place to provide certainty to generators in the case that transmission assets are delayed or unavailable due to outage. It has proven very challenging to align these incentives in offshore environments and this would need to be in place well in advance of a competitive process, to ensure the risk and uncertainty is not priced into the projects which could have a negative impact for rate payers and indeed ability of industry to bring down costs. Axiomatic to this principle is that in any competitive tender in which a stand-alone transmission option (in conjunction with stand-alone generation) is evaluated against a full-scope proposal, the risks and costs of disaggregation are fully quantified and considered in the evaluation process.

Q3. Technical Considerations

Ørsted believes New Jersey will achieve the best outcome by remaining open to a broad variety of proposed solutions and technologies. We take a systems approach to design and consider HVAC, HVDC, and other supportive technologies to optimise our projects and facilitate integration into the grid.

Conclusions

In summary, we conclude the following:

1. There are significant synergies and cost savings from integrating the transmission scope together with the offshore wind farm.

2. Clustering of wind projects is no longer of relevance, and the value of networking offshore wind assets depends on the specific situation (e.g., market economics at the connection points, system constraints).

3. Maximizing competition is a significant cost lever, but with three important caveats (i) developers have opportunity to bid for transmission and generation combined, (ii) entity constructing and operating the assets has a robust track record (financially and technically) and (iii) revenue recovery mechanisms are in place to provide certainty to generators in the case that transmission assets are delayed or unavailable due to outage.

4. Further study is needed, focusing on the key constraints faced by the Offshore Wind Industry in New Jersey; namely the onshore grid congestion, interconnection and landing points.

Thus, Ørsted recommends that New Jersey, in conjuncture with PJM, undertakes a full system integration study (thermal and reliability) assessing the ability of the existing infrastructure to support the 7.5GW target, taking into account the wider energy landscape in New Jersey and, where relevant, neighbouring states.

This should allow New Jersey and PJM to identify some critical issues (or needs) preventing NJ from reaching its public policy goals (for example, a new interconnection point). New Jersey could then consider utilizing existing mechanisms, like PJM's Public Policy transmission Planning process, to utilise the market to identify solutions to these specific problems and utilize competition to drive down and cap costs.

Yours sincerely,
Ørsted

Kirsty Townsend
Head of Special Projects

kirto@orsted.com
Tel +1 8579726007