ATLANTIC SHORES offshore wind

November 14, 2022

Aida Camacho-Welch
Secretary of the Board
New Jersey Board of Public Utilities
Docket No. QO22080481
Submitted electronically to: Board.Secretary@bpu.nj.gov

Re: IN THE MATTER OF THE OPENING OF NEW JERSEY'S THIRD SOLICITATION FOR OFFSHORE WIND RENEWABLE ENERGY CERTIFICATES (OREC) - Docket No. QO22080481

Dear Ms. Camacho-Welch,

Atlantic Shores Offshore Wind, LLC, a 50/50 joint venture between EDF-RE Offshore Development, LLC (a subsidiary of EDF Renewables, Inc.), and Shell New Energies US LLC ("Atlantic Shores"), currently holds one of the largest portfolios of offshore wind lease areas in the US, adding up to a total of 262,604 acres and an expected capacity potential of over 5 GW ("Portfolio"). Atlantic Shores' Portfolio is made of Lease OCS-A 0499 and Lease OCS-A 0549, which amount to 183,253 acres and host Project 1, a 1,510 MW project awarded an OREC from the New Jersey Bureau of Public Utilities ("NJBPU") in June 2021; and Lease OCS-A 0541, which totals 79,351 acres and was awarded to Atlantic Shores by BOEM pursuant to the recent ATLW 8 Bight Auction. Out of the full Atlantic Shores' Portfolio, 1.5 GW is under firm offtake agreement, leaving over 3.5 GW of uncommitted capacity strategically positioned to meet the offshore wind procurement goals of its target markets, including New Jersey.

Atlantic Shores congratulates the New Jersey Board of Public Utilities (NJBPU) for taking a proactive step, through its Order on the State Agreement Approach (SAA) solicitation (the "SAA Decision"), issued on October 26, 2022, to implement planned transmission to support New Jersey Offshore Wind goals. Atlantic Shores supports the need for transmission solutions that will help integrate offshore wind energy ("OSW") into the grid at a lower cost to the ratepayers, and with lower risks, consolidated landfalls, and less impact on the environment and local communities.

Atlantic Shores appreciates the opportunity to submit comments concerning the above referenced matter, in accordance with guidance provided in the Request for Additional Information issued on October 28, 2022.

Sincerely,

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Joris Veldhoven,
Chief Executive Officer
Atlantic Shores Offshore Wind, LLC

Design Considerations for the Prebuild Infrastructure

As set forth in the SAA Decision, the Board directed Board Staff to require the "Prebuild" in the Third Solicitation. The Prebuild would require a single offshore wind developer to construct the necessary transmission infrastructure ("Prebuild Infrastructure"), which includes duct banks and access cable vaults, for its own project as well as the additional project(s) (up to four total cables) needed to fully utilize the SAA capability made available as a result of the Larrabee Tri-Collector Solution.

1. Please identify any requirements that should be included in the SGD to support the design and timely construction of the Prebuild Infrastructure. Please provide any recommendations for specification of these requirements.

Atlantic Shores recommends the NJBPU provides the following specifications to support inclusion of the Prebuild Infrastructure requirement in the SGD:

- Design specifications:
    - Number of extra circuits to be considered, and the associated number of conduits
    - Capacity (MW) per circuit and minimum / maximum voltage
    - Transmission Technology, i.e., HVDC or HVAC
    - Single trench requirement, or alternatively (preferred) flexibility to build two trenches to fit more circuits
    - HDD conduit specifications
- Scope extent - Does the Prebuild Infrastructure include:
    - The landfall trenchless installation (individual HDD conduits, landing vault, etc.)
    - The anticipated prebuild scope at the property associated with the Larrabee Tri-Collector Solution
- Exact location and dimensions of the interconnection (substation) property associated with the Larrabee Tri-Collector Solution, to be assessed by applicants for appropriate design and development of access, site plans and routing. Any internal setbacks, environmental (such as for stormwater management or for screening) or for the allowances of other projects, safety and or operations and maintenance facilities within the parcel should also be provided.
- Circuits co-location and resiliency requirements

Generally, the NJBPU should provide all details required to avoid the 'worst case scenario', where a selected applicant implements a Prebuild Infrastructure that cannot be maximized. For example, a bidder may install 4 sets of conduits with a spacing that optimizes their use of the Prebuild Infrastructure, but limits connectivity of a separate bidder due to design limitations. We recommend that the NJBPU request supporting studies to demonstrate that the Prebuild Infrastructure design will be suitable to accommodate the additional circuits at their maximum capacity.

2. Are there major challenges or significant limitations to installing up to four circuits for independent projects in a common ROW? If yes, please summarize the nature of these challenges/limitations.

Challenges identified at this stage pertain to (1) ROW limitations, (2) construction schedule coordination and risks to existing cables, and (3) stakeholder engagement:

- Depending on the capacity per circuit (i.e., cable size, capacity and voltage) it may not be feasible to fit this many circuits in one single duct bank and still fit into a ROW that is environmentally acceptable and feasible to the local municipalities. If space is limited to fit up to four circuits in a single trench, flexibility for adding a second trench should be considered. There may be more land disturbance with a second trench, but it will still provide the benefits of simultaneous permitting and construction to minimize impacts on communities.
- Coordinating construction schedules could be challenging, especially if the projects are driven by similar COD timelines. Independent projects installing cables in a common ROW could be a challenge with limited access to the duct bank, restricted space to pull the cable safely due to size of crews and required numbers of construction equipment. Those projects should coordinate and sequence their construction schedule to avoid overlap.
- Each project installing their individual circuit must also ensure that cables that are already installed in the common ROW are not disturbed, damaged or interrupted from normal operation. A common duct bank with multiple parties needing access clearly creates operational risks for all.
- Community outreach is usually handled separately by each project, there should be clear expectations on how outreach and communication should be done during circuit installation, and later during operations, to avoid stakeholder fatigue.

Cost Recovery Structure for Costs Associated with the Prebuild Infrastructure

3. Board Staff expects to require applicants to submit separate an OREC schedule for their offshore wind project with and without the Prebuild Infrastructure included. Over what period of years should the cost of the Prebuild Infrastructure be recovered?

Because of its critical and 'communal' nature, the Prebuild Infrastructure should be managed separately from the awarded applicant's OSW project. The cost of the infrastructure itself should indeed be separated from the OSW OREC schedule, and timeline and risks should also be treated differently (with regards to timeline, a separately awarded OSW project may need the infrastructure built more quickly than the awarded associated OSW project; with regards to risks, building the infrastructure ahead of future awards may require redesign, or other changes that would not have been taken into account in the original price).

Recovery should also have its own stream of revenues over a set number of years and not be connected directly to the OREC award which is based on generation.

Atlantic Shores recommends the NJBPU leverages commercial and legal insights from the State Agreement Approach process to define the most optimal cost recovery solution.

Construction and Operating Considerations for the Prebuild Infrastructure

Awardees in future New Jersey offshore wind solicitations (and other awardees in the Third Solicitation, if multiple projects are selected) will be required to utilize the Prebuild Infrastructure. As part of project construction efforts, awardees would be required to install their transmission cables in the Prebuild Infrastructure, utilizing the prebuilt duct banks and cable vaults designated to their project. To the extent possible, please consider these questions from the perspective of both the entity that constructs the Prebuild Infrastructure and an entity that will utilize the Prebuild Infrastructure.

4. What terms and conditions for construction of the Prebuild Infrastructure between the Board and constructor should be specified in the SGD?

As mentioned above, clear scope and design specifications are required to enable optimal use of the Prebuild Infrastructure. However, following the Third Solicitation award, as feasibility studies, environmental studies, permitting, stakeholder engagements and detailed design progress, the awarded applicant may come across challenges that would limit land and ROW availability, ROW width, etc., with an impact on the Prebuild Infrastructure's ability to handle all projects flowing into Larrabee, and force future projects to find an alternative route to Larrabee or incur additional, un-planned costs (de-rating, rerouting, etc.).

The SGD should require applicants to provide a proposed Prebuild Infrastructure route, a clear plan for designing, securing land and permits, and a preliminary view of risks, opportunities and mitigations associated to the route and plan. Awarded applicants should be allowed to propose alternative routes as they mature the proposed Prebuild Infrastructure. In addition, third party validation of the infrastructure must be included to ensure that cable capacity, ampacity and cable spacing assumptions take into account future projects.

Additionally, users of the Prebuild Infrastructure (as opposed to the awarded applicant building it) will need third party quality and control verification of all manholes and conduits installed. This includes concrete testing, compaction reports, photographic and video conduit recordings. As-built documentation will need to be provided to bidders awarded in future rounds after the Prebuild Infrastructure has been completed.

Note as well that if the Prebuild Infrastructure awarded applicant were to have an OSW Facility COD later than other projects utilizing the Prebuild Infrastructure, the NJBPU must ensure that the Prebuild Infrastructure's in-service date is aligned with all projects CODs to limit project-on-project risks.

Lastly, by tying the Prebuild Infrastructure to the development actions of an OSW developer, the NJBPU has extended jurisdictional authority of this infrastructure - that would solely be built on state lands/waters - to the Bureau of Ocean Energy Management (BOEM).

5. What terms and conditions for operation of the Prebuild Infrastructure between the Board, constructor and future users should be specified in the SGD?

A common set of operations assumptions should be set that includes equal access, maintenance plans, responsible parties, assumptions of liability, and operations costs. Drafts of this type of language should be prepared by a third party hired by the NJBPU that includes legal, commercial, and technical analysis. The importance of these terms and conditions cannot be minimized.

6. Are there any potential challenges for cable installation in the Prebuild Infrastructure for future solicitation awardees? If yes, how might they be mitigated?

Considering the limitations identified in response to questions 1, 2, and 4, future solicitation awardees cannot be guaranteed an access to the Larrabee substation via the Prebuild Infrastructure. Atlantic

Shores' responses include potential mitigations, from clear design specifications to terms and conditions allowing for design flexibility.

However, if a future awardee is indeed able to connect to Larrabee via the Prebuild Infrastructure, the main challenges they would face reside with the:

- Offshore export cable corridor to the designated landfall, which may present risks of cable crossings, cable de-ratings if others are built too close, and generally, access (i.e., the first one or two OSW project cables are installed in such a way that no further offshore cables could be feasibly routed to the identified landfall location, a particularly high risk at the designated landfall location due to A) the number of existing cables already in place nearby and B) the various and overlapping offshore constraints of artificial reefs, shipwrecks, and sand resource areas that funnel the offshore approach to only one very small corridor);
- HDD design for beach landing, where multiple accesses may cause heavy disruption to coastal communities. Mitigations for both may include, at a minimum, early engagement between future awardees and the awarded applicant in charge of the Prebuild Infrastructure to optimize design, combined stakeholder engagement; and at best, installation of empty conduits under the beach, to be sealed and inspected regularly to ensure continued viability between projects.

7. Please identify any potential adverse cost or schedule implications ascribable to the Prebuild Infrastructure as it relates to awardees of future New Jersey offshore wind solicitations. How might these impacts be mitigated?

The NJBPU should provide as much information as possible on the property associated with the Larrabee Tri-Collector Solution, and the selected Prebuild Infrastructure's permit approval coordination and processes. As stated in response to Question #4, transparency on the status and strategy for the acquisition of Local, State and Federal permitting as well as any associated assurances, minimization or mitigation measures should be provided to assure costs and schedules and environmental and stakeholder commitments are appropriately accounted for by each developer using the Prebuild Infrastructure.

Additionally, OSW projects that are currently under active development may require redesign to align to the location and specifications of the selected Prebuild Infrastructure. Additional time and resources will likely be need to ensure compatible designs and to modify project survey, permitting and agency review strategies already underway.

Finally, per the newly issued BOEM guidelines (NOI Checklist), all benthic data and reporting must be available at the filing for the COP to initiate the NEPA Process. If offshore routing revisions are required for a project already under NEPA review, the "clock" for these reviews will pause until the new data and reporting is complete. Often, offshore surveys are planned seasons in advance, require significant coordination and contracting efforts to secure vessels and qualified staff, and are subject to weather windows. The potential remobilization of environmental studies adds time and cost to the proposed projects. Potential mitigation for this may include sharing of benthic studies (data and reports) to ensure the selected project is provided the appropriate information to supplement into the NEPA processes with relatively limited schedule delays.

Enabling Potential Future Development of a Mesh Network

A mesh network is an offshore transmission configuration in which the offshore substations for individual offshore wind projects are linked by connecting several offshore platforms. Board Staff is considering requiring projects bidding in the Third Solicitation to be built with design elements that will enable future connection to a mesh network.

8. Do you have any general recommendations regarding how preparation for a future mesh network can be implemented in the Third Solicitation?

If mesh-ready offshore substations are required, applicants and HVDC equipment OEM's need adequate time to develop designs for the OSS topside and substructure. Based on recent outreach to OEMs, our understanding is that the typical bid timeline of past NJBPU Solicitations is not adequate time for OEMs to provide a mature design solution. Atlantic Shores recommends the NJBPU provides draft technical requirements of the mesh ready network as part of the SGD to provide clear expectations and allow enough time for applicants to work with OEMs to support proposal preparation. To avoid delaying the solicitation, NJBPU could consider making the mesh ready design an additional optional scope as opposed to a requirement. At a minimum, the additional cost be treated in a separate cost line item to the OREC schedule.

9. What additional equipment would need to be specified and installed at the time of project construction in order to enable future connectivity to a mesh network, as opposed to equipment that would not need to be installed until the mesh network is implemented?

Major equipment would need to be specified during the engineering phase and installed at the time of OSW Facility construction in order to enable future connectivity to a mesh network. The additional equipment would include transformers, GIS circuit breakers, and shunt reactors.

10. What physical requirements would enable the offshore substation to support the additional equipment, including additional platform space?

This could include a larger foundation, more deck space, and potential design changes to the nearby collector system to handle additional cables as we seek to minimize cable crossings.

11. How would your suggestions regarding what engineering, operational and/or regulatory information should be specified in the SGD to support a future mesh network differ if the mesh network includes (i) only New Jersey projects, (ii) New Jersey and other PJM states' projects, or (iii) New Jersey, other PJM states' and downstate New York projects?

The mesh ready network concept shows strong technical promise, but the regulatory, legal, and commercial aspects have not been fully vetted or solved. We strongly suggest a full analysis be developed by reputable third parties for the NJBPU before including it as a requirement in the solicitation, for the State to secure optimal proposal and cost estimates.

12. What might be the advantages or disadvantages associated with the Board's adoption of the mesh network framework put forth by NYSERDA in ORECRFP22-1?

Atlantic Shores respectfully notes that many of the regulatory issues brought up with mesh network in New York have not yet been solved, and that clear direction on these items is crucial to setting up a viable commercial and legal construct.

Additionally, it is important to note that based on discussions with the major HVDC OEMs, there is currently no commercially available mesh-ready solution. This requirement would introduce both cost and schedule risk for projects.

Question put forth to NYSERDA as part of the ORECRFP22-1 Q&A process include:

- Operation considerations:
  - Is a Meshed Grid Coordinated Controller (MGCC) concept feasible and compliant from a FERC perspective? From an OREC, energy and capacity revenues structure perspective?
  - How does the power dispatch impact the power generated by each wind farm, their pricing, metering and curtailment? Where would energy be metered and which party would be responsible for the incremental losses?
  - What would the operability rules of the HVDC radial lines with a meshed AC grid be?
  - Would the independent system operator take control of both the meshed grid and HVDC radial lines? If so, how would the HVDC radial line be compensated for?
- Commercial considerations are directly related to the technical design and warrant further study. By having 4 projects (HVDC Convert & Cable System, Windfarm, AC Meshed Ready Substation, and Meshed Connection) come together as one, the costs, risks, and coordination from all these entities must be accounted for in project pricing & schedule. If cost ownership isn't clearly defined (who pays for which scopes) it could lead to unnecessary cost provisions caried by multiple projects. Additionally, this extended scope may have legal and financial implications, adding to project cost. Atlantic Shores believe these challenges can be overcome through further industry coordination but underlines that the meshed-ready concept adds a layer of complexity to projects that warrants further engagement with the Board. ·

Atlantic Shores acknowledges the overall value of the 'mesh ready' concept and supports NJ's approach to facilitate integration of 11GW of offshore wind into the State with reasonable impact to the ratepayer. However, we caution against making mesh readiness a hard requirement. Indeed, as most projects bid into State procurements at an early development stage, assessing feasibility, challenges and most of all, the cost of mesh readiness will be a serious challenge for developers. Alternatively, (1) the Board could propose mesh-readiness as a bid case option, providing a detailed technical scope is provided, or our preference, is (2), the Board could continue working with developers within a working group outside of the upcoming Solicitation process to mature the solution with the next (Round 4) Solicitation in mind, or future adjustments to the OSW projects awarded pursuant to the upcoming Solicitation. Potential incremental costs for adjusting the awarded projects' designs for substations and other transmission scopes – which are ongoing at that stage – to "mesh" can then be adjusted post-selection by the Board.

13. What voltage would you recommend for the future mesh network and why?

The voltage level would be driven by the distance between projects and the amount of power expected to be transmitted per circuit. Therefore, it is difficult to recommend a voltage level.

Other

14. Please provide any additional information that you would like Board Staff to consider in development of the SGD.

<u>Other mesh ready technical considerations:</u>

- The mesh ready concept makes sense from a technical design point of view but leads to many commercial and grid scheduling considerations (see Question #12)

- Offshore substations are not typically made with extra deck space for the meshed equipment, therefore, addition of multiple cables runoffs would require overbuilding the substations, and/or adding foundations, incurring cost and design impacts. Inter-array cable layout is intricate and accounts for distance, subsea conditions, and other ocean floor constraints. The additional ocean space needed to run the meshed grid cables may lead to circuitous routes between projects or more complex inter-array cable designs with additional cable crossing locations. This will decrease project and mesh grid efficiency.

- Projects at the "end" of the mesh will only have one mesh-ready connection versus others which will have two, resulting in underutilized space on an offshore platform or giving an advantage to projects with two connections. A project with two meshed connections will have the opportunity to export twice the energy if their main export cable goes down, as a project with one since it can send power in two directions simultaneously. This decreases export risk and opens up additional market opportunities that the "end of line" projects will not have in this new market.

- A future proof solution is critical in the mesh ready design. For example, 66kV is the current voltage used for collecting power from WTGs. In a near future, it is expected that this voltage will be increased to 132kV to accommodate for larger wind turbine capacity.

- A separate transformer, potentially installed on a separate platform, could provide additional flexibility to future proof the design. The connection could then be performed either on the MV side (66 or 132kV), or on the intermediate HVAC voltage on the HVDC platform at the required voltage, which varies based on the HVDC vendor design. The costs for this additional and separate platform could be applied to the construction of the meshed grid and would reduce the costs for the initial project. Initial project investment would be limited to additional Gas-Insulated Switchgear (GIS) cable bays and extra space.

- An alternative would be to connect the HVDC radial lines through HVDC interlinks. This would, however, require significant coordination of the design from the HVDC manufacturer.

<u>Other items to be considered in the SGD:</u>

- Clarify interconnection plan requirements in terms of landfall location, onshore route requirements, POI selection (i.e., could a future project connect via a radial connection at the existing Larrabee substation if the interconnection cost is efficient and attractive for ratepayers?)

- Clarify the extra capacity option in the SAA order and what it entails (future OSW generators may also explore selective additional upgrades to take advantage of the excess transmission system headroom at select POIs).

- Define interfaces and responsibility, i.e., SCADA scope and integration and an overall DOR for all scope.

- Confirm that the selected property associated with the Larrabee Tri-Collector Solution will be for future converter stations, located in separate enclosures (i.e., each HVDC converter station will have its own building and then connect underground to thew new Larrabee Tri-Collector Solution AC substation).