July 20, 2018

VIA ELECTRONIC FILING

Aida Camacho-Welch
Office of the Secretary
New Jersey Board of Public Utilities
44 South Clinton Avenue 3rd Floor, Suite 314, CN 350
Trenton, New Jersey 08625

Email: Rule.Comments@bpu.nj.gov

RE: Comments Regarding Offshore Wind Solicitation of 1,100 Megawatts, Docket No. QX18040466

Dear Secretary Camacho-Welch,

Atlantic Grid Operations A LLC ("Atlantic") respectfully offers the follow Comments in response to the Offshore Wind Solicitation of 1,100 Megawatts.

Atlantic is an independent transmission development company that develops well-planned, highly efficient, lower cost, open-access offshore wind transmission facilities that link offshore wind generating facilities to regional power grids. Atlantic's investors are Google, Bregal Energy, Marubeni and Elia. Google is the world's largest buyer of renewable energy. Marubeni owns UK offshore wind farms and installation vessels. Elia owns and operates the high-voltage power grid in Belgium and Germany and is building offshore transmission to serve Belgian offshore wind farms.

Atlantic is developing the New Jersey Energy Link ("NJEL"), an offshore wind transmission network that would combine a coordinated offshore wind transmission system with the land-based grid upgrades that will be needed to accommodate the 1100MW-3500MW of offshore wind generation that the State seeks to develop. NJEL is a planned transmission system of the kind that has proven successful in allowing large scale, efficient development of land-based wind in California and Texas, and offshore wind in Europe.

1. **How should BPU stagger/phase in New Jersey's offshore wind procurements to realize the State's goal of 3,500 megawatts? Should this schedule be announced before any solicitations are released?**

A series of solicitations staggered at 12-month intervals with each solicitation requesting 400 MW of offshore wind capacity will meet New Jersey's goal of 3,500 MW by 2030. A predictable series of 400 MW projects sets a steady pace of offshore wind projects that would be ideal for attracting supply chain investments in New Jersey. Industry responds with investments that create the capacity to build offshore wind projects if the expected work flow is steady or gradually building. If the pace is too slow, the case for investment is weak. If the pace is unpredictable, with the type of boom and bust cycles that

have plagued solar development, long-term investment in New Jersey will be discouraged. The requirements of the boom years will be met with imported resources, personnel and equipment that are easily re-deployed to other markets during the bust years.

European experience shows us that robust competition among many wind developers holds the greatest promise of reducing the cost of offshore wind to ratepayers. New Jersey will maximize the number of interested wind developers by announcing the procurement schedule early – before the first solicitation. A long-term procurement schedule also would be noted by suppliers who would factor in the state's commitment to offshore wind in deciding where to located facilities.

2. **How should the BPU structure the initial solicitation for 1,100 megawatts of offshore wind capacity as called for under EO8?**

The first three 400 MW solicitations would provide substantially the amount of capacity called for under EO8. As noted above, predictability and pacing lessen the cyclical boom and bust disruptions that would attend larger solicitations. A steady stream of work over many years would provide the best conditions for investments in specialized equipment and workforce training, because it allows adequate time to recover the investment. Nine solicitations of 400 MW each over 10-11 years gives the ratepayers the benefit of multiple competitions. In each competition developers will learn, adapt their approaches and use the best technology available at that time to drive down costs, improve efficiencies and lessen ratepayer impacts. European success in driving down the cost of offshore wind is a result of progressively improving technology and experience gained over time and was driven by multiple rounds of competitive solicitations.

OWEDA is about New Jersey job creation and economic development as much as it is about clean, offshore wind energy. The state will generate more local jobs with a moderate, but steady level of procurement as compared to fewer, larger procurements that lead to boom and bust employment cycles. Competition in a series of solicitations that occur over time will enable the state to take full advantage of improvements in technology and cost decreases, and allow for local experience in building offshore wind projects to grow. Solicitations larger than 400 MW will have a greater individual rate impact creating the potential for rate shock and result in fewer opportunities for the competitive process to reduce costs.

If we start with an initial 1,100 MW solicitation, New Jersey will not have developed the broad supply chain capabilities necessary to serve this project and the wind developer(s) building this first 1,100 MW will therefore be compelled to rely heavily on foreign suppliers located out of state.

3. **Should the BPU request proposals scaled at 1,100 megawatts, or should the BPU request proposals in smaller blocks of capacity (i.e., 400 megawatts)?**

We recommend that the BPU should request proposals in smaller blocks of capacity such as 400 MW. For the reasons noted above, a steady, moderate level of development occurring over a longer time horizon would be more attractive to the job creators that are weighing whether to invest in equipment, facilities and worker training in the state. A moderate approach gives investors more opportunities to supply projects with goods or services and a longer time to recover costs. A moderate approach would lead to greater New Jersey job creation, more robust competition, facilitate planning, increase

efficiencies and lower ratepayer impact than a boom and bust approach involving a handful of larger 1,100 MW projects.

New Jersey ratepayer impact must also be an important consideration. A 400 MW project at approximately $4,000/kW capacity cost would represent a $1.6 billion investment that would be recovered from ratepayers through the OREC subsidy. An 1,100 MW project at the same capacity cost would represent a $4.4 billion investment. Procuring a series of 400 MW projects over about a decade spreads out the rate impact and is less likely to induce rate shock than pursuing the procurement through three 1,100 MW tranches.

4. How may a solicitation be structured to ensure strong competition from multiple OSW developers?

We recommend that the BPU require offshore wind developers to propose projects in standard size, 400 MW increments. A project of this size is large enough to be built efficiently because development and construction mobilization costs are spread over many megawatts of capacity while being small enough to minimize customer rate shock. Just as important, standardization fosters comparability between projects – i.e., apples-to-apples comparisons that will enhance competition. We note that the Massachusetts offshore wind solicitation required 400 MW project proposals (with optional proposals for larger or smaller projects) which resulted in vigorous competition for that solicitation. A standard 400 MW project size also is approximately the capacity of a 230kV submarine transmission circuit and consequently this project size would promote efficient, scalable transmission solutions that can be more easily compared.

The solicitation should also require the establishment of an independent, non-discriminatory open-access off shore transmission system. As in other parts of the country, the electric transmission network in New Jersey is operated on an open-access basis to provide all generators and loads with fair, unrestrained access to transmission services. Open access enhances competition by allowing all generators to transmit power to customers without market access barriers. A level playing field is essential to the vigorous competition that will provide substantial ratepayer savings.

New Jersey ratepayers will receive the most competitive, lowest cost offshore wind supplies if the open access transmission model is extended offshore. To ensure non-discriminatory access to the transmission system, transmission facilities should be procured separately from generation since an offshore wind generator that also controls the design and operation of offshore transmission infrastructure would have an incentive to restrict a competitor's access to the grid or provide grid access on a discriminatory or unequal basis that places other generators at a competitive disadvantage.

To avoid fostering discriminatory transmission access, which will in turn foster increased ratepayer costs due to inefficient system planning and upgrades, the BPU should use parallel processes to procure transmission and offshore wind facilities competitively. Because the processes could be conducted simultaneously, they could be completed within nine months of the solicitation, allowing any selected wind project to qualify for the investment tax credit. The BPU's solicitation would solicit separate proposals utilizing fixed price offers to develop either the transmission or offshore wind facilities. To facilitate the evaluation, the BPU would use its Independent Evaluator and PJM, the independent operator of the region's high-voltage grid, to review each of the proposals according to criteria set by the Board.

Our recommended process is explained more fully in **Appendix A** attached hereto.

Any perceived risks of separating transmission and generation have been demonstrated in other contexts to be manageable and outweighed by the large savings and benefits of a well-planned, open-access transmission system. Unbundled transmission has been proven to be workable in the clear majority of European offshore wind projects that use transmission owned and operated by unaffiliated entities. The FERC-approved form of Standard Large Generator Interconnection Agreement (LGIA) already addresses the needed coordination and risk allocation between the transmission provider and generation owner/interconnection customer. The LGIA can be adapted for offshore-specific technical details to avoid stranded offshore generation.

5. What conditions should be included to ensure maximum competition in terms of OREC price?

To ensure maximum competition, the key conditions should require proposals to match a standardized project size (e.g., 400 MW) and to have generation and transmission procured separately. These two conditions would facilitate competition for projects on a level competitive playing field as well as BPU review of the competing proposals.

The following two examples highlight the difference in competitive outcomes.

<u>Removing grid barriers to entry</u>.

Wind developer A has taken a PJM transmission interconnection queue position and proposes to interconnect a 400 MW offshore wind project at the Cardiff substation near Atlantic City. Wind developer B also has taken a PJM queue position at Cardiff, but it is behind developer A in the queue. Developer B also wants to interconnect a 400 MW project. Interconnection studies show that the transmission system can accept 600 MW of wind energy delivery at Cardiff without triggering costly upgrades, but deliveries in excess of 600 MW would cause overloads, requiring upgrades such as reconductoring an existing circuit with a higher capacity line and higher capacity circuit breakers in South Jersey. The study process assumes that Project A is built when Project B is being studied, so it is known that Project B would trigger upgrades estimated to cost $250 million.

Developer A and B are similarly proficient wind developers and they know these facts. Developer A's more advantageous position in the PJM queue gives it a $250 million pricing advantage as compared to Developer B's position. Even if both A and B can build a 400 MW wind farm for $1.6 billion (before grid upgrade costs), Developer A can seek a larger subsidy from ratepayers (somewhere between $1 and $249 million more) than Developer B which has a disadvantageous queue position that increases its costs by $250 million. Note that Developer A did not create the headroom on the grid that provides it with an advantage. That headroom simply reflects the current state of the grid that ratepayers have funded through rates.

The BPU will not see this information or understand its impact on bidding behavior unless it requests separate wind generation and transmission proposals. By requiring generation-only proposals from Developer A and Developer B, the BPU places them on a level competitive field. Without the handicap of a bad queue position and an upgrade cost penalty Developer B may be willing to bid more aggressively at $1.5 billion to Developer A's $1.6 billion. Note that in the European offshore wind market, transmission is generally unbundled and provided separately by unaffiliated utilities or

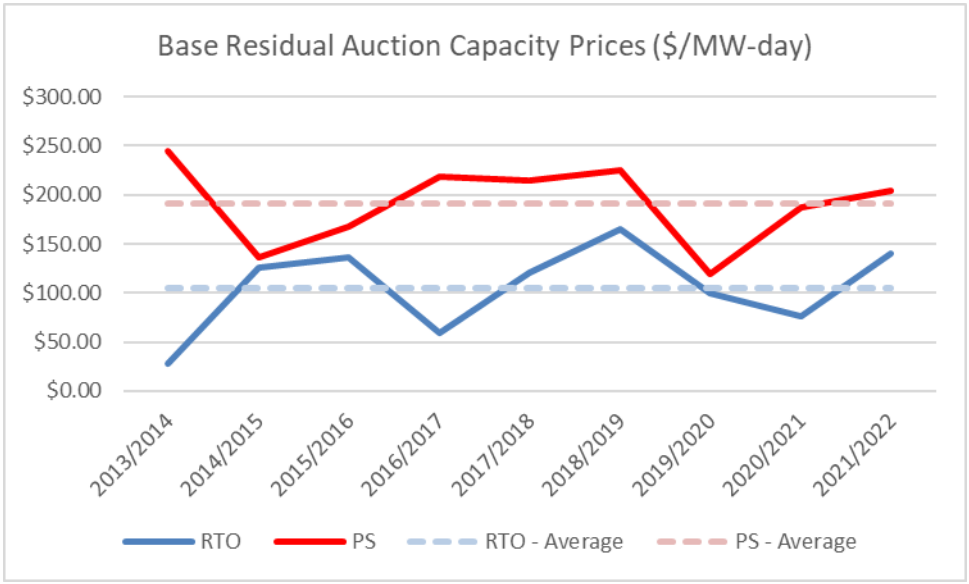
independent transmission owners. This has boosted competition and today zero-subsidy offshore wind supply bids are being made in Germany and the Netherlands.

Interconnection points with different capacity value.

As in the example above, Developers A and B both propose 400 MW offshore wind generation projects connected to Cardiff substation near Atlantic City. But in this example the BPU also has solicited separate, unbundled competitive transmission proposals. One of the competitive transmission proposals features a transmission link to northern New Jersey ending at a substation in the PS North zone. PJM capacity prices for delivery year 2021/2022 are $166/MW-day in Southern New Jersey and $204/MW-day in PS North. This is reflective of a persistent trend in capacity prices where Northern New Jersey prices are on average $100/MW-day higher than in most of the rest of the PJM footprint with this difference due in part to transmission constraints. As shown in the table and graph below, this historical difference between New Jersey and the rest of the PJM regional transmission organization (RTO) imposes a penalty on New Jersey ratepayers that amounts to hundreds of millions of dollars in some years.

	Annual Resource Clearing Price ($/MW-day)									
LDA	**2013/2014**	**2014/2015**	**2015/2016**	**2016/2017**	**2017/2018**	**2018/2019**	**2019/2020**	**2020/2021**	**2021/2022**	**Average**
RTO	$27.73	$125.99	$136.00	$59.37	$120.00	$164.77	$100.00	$76.53	$140.00	**$105.60**
EMAAC	$245.00	$136.50	$167.46	$119.13	$120.00	$225.42	$119.77	$187.87	$165.73	**$165.21**
PS	$245.00	$136.50	$167.46	$219.00	$215.00	$225.42	$119.77	$187.87	$204.29	**$191.15**
PS North	$245.00	$225.00	$167.46	$219.00	$215.00	$225.42	$119.77	$187.87	$204.29	**$200.98**
RTO - Average	$105.60	$105.60	$105.60	$105.60	$105.60	$105.60	$105.60	$105.60	$105.60	**$105.60**
PS - Average	$191.15	$191.15	$191.15	$191.15	$191.15	$191.15	$191.15	$191.15	$191.15	**$191.15**
Total Resources Cleared (MW)	8,019	7,583	6,730	6,299	6,111	5,301	5,455	5,097	5,368	**6,218**
Capacity Market Penalty to Rate Payers*	**$635,943,098**	**$29,089,525**	**$77,277,620**	**$366,987,614**	**$211,888,523**	**$117,345,135**	**$39,363,553**	**$207,145,621**	**$125,955,296**	**$201,221,776**

**Capacity Market Penalty to Rate Payers = (PS Given Year Price - RTO Given Year Price) x Given Year Total Resources Cleared x 365*



The competitive transmission project that provides transmission to North Jersey offers the BPU an option to address the persistent high capacity cost problem facing New Jersey. This new transmission line could relieve transmission constraints and direct some of the State's new offshore wind supply and capacity to Northern New Jersey. Since New Jersey ratepayers would be credited with the higher capacity value in Northern New Jersey the net OREC price (i.e., OREC price minus the value of energy and capacity) paid by ratepayers would be lower than if the offshore wind was delivered to Southern

New Jersey. In this example the process of soliciting competitive unbundled transmission proposals has uncovered additional value for New Jersey ratepayers.

6. **OWEDA requires the OREC Price to be an all-in price that includes the full cost of the construction, operation and decommissioning of the project with all revenues being refunded to ratepayers. What measures can be included in project proposals to optimize all revenues over the life of the project?**

This question reveals an important concept. Since ratepayers effectively pay the OREC price, net of benefits such as the energy and capacity revenues, the net OREC price is a more useful measure for ranking projects. Capacity and energy costs vary by location in New Jersey as the example above demonstrated in the case of capacity prices between the PS North zone and Southern New Jersey. Well-planned transmission would allow ratepayers to realize the locational value of energy and capacity in the state.

We recommend a solicitation that separates generation and transmission proposals, with the generation proposals delivering offshore wind to an offshore substation. This allows comparison of generation projects on their merits – apples to apples, and similarly allows an oranges-to-oranges comparison of transmission projects. We recommend that both generation and transmission proposals should be competitive with all-in prices that reflect the full cost of construction, operation and decommissioning. This ensures that ratepayers are protected with fully disclosed prices.

7. **OWEDA requires that offshore wind developers demonstrate a net economic benefit for the State. How should the BPU ensure net economic benefits in order to be able to compare applications?**

A standardized project size such as 400 MW would make project proposals more easily comparable.

8. **What other elements should BPU consider including in the 1,100 megawatt offshore wind solicitation called for under EO8 (e.g., storage, other adjunct technologies)?**

It is not clear that storage (or other technologies) should be combined with offshore wind proposals. Storage may be more valuable to New Jersey when integrated into local microgrids or when located at the distribution system level or directly at customer facilities. In such applications storage can supply increased reliability to users that value it most highly, such as at jails, hospitals, and water treatment plants. Storage at the distribution level also can be used to address specific local grid constraints and defer the need to invest in costly grid upgrades. The variability of offshore wind is manageable at the low penetration levels that we will experience in the foreseeable future simply through well-planned transmission interconnections and upgrades. At this time there does not seem to be a strong reason to combine storage with offshore wind.

9. **Should the BPU request bids for expandable, nondiscriminatory, open-access offshore transmission facilities for the efficient delivery of power to the onshore transmission system?**

Yes. A well-planned, open access and non-discriminatory transmission system for offshore wind is key to ensuring a level competitive playing field that reduces prices. Wind developer-controlled transmission is closed access, meaning that wind developers can exclude their competitors entirely or charge higher prices for access.

As competitors, wind developers will not coordinate to develop a well-planned offshore transmission system or the land-based upgrades needed to integrate a large, variable offshore wind resource into New Jersey's power grid. The absence of coordination leads to duplication and waste, greater environmental impact and a missed opportunity to build a more resilient transmission network.

Planned transmission provided on an open-access basis by non-discriminatory transmission providers is the best alternative. FERC requires the land-based transmission network to be operated this way, as are highways, railroads and other common carriers. Non-discriminatory, open-access transmission ensures equal access to the grid — a level playing field that improves competition. California and Texas have had great success in the land-based wind energy markets with well-planned, open access transmission and in Europe it is the prevailing grid access model that has fostered lower offshore wind costs and even zero-subsidy bids.

The BPU could use a two parallel path process to procure transmission and offshore wind competitively. Because the processes run in parallel they can be completed within nine months of the solicitation, allowing any selected wind project to qualify for the investment tax credit. The BPU's solicitation would call for separate transmission and offshore wind proposals with fixed price offers. To facilitate the evaluation, the BPU would use its Independent Evaluator and PJM, the independent operator of the region's high-voltage grid, to review each of the transmission proposals according to criteria set by the Board.

Our recommended process is explained more fully in **Appendix A** attached hereto.

Sincerely,

Markian Melnyk
Secretary
Atlantic Grid Operations A LLC
8606 Second Ave.
Silver Spring, MD 20910
301-256-4423
mmelnyk@AtlanticWindConnection.com

Appendix A

Process Recommendations for NJBPU Offshore Wind Energy and Transmission Procurement

July 20, 2018

Contact:
Markian Melnyk
Atlantic Grid Operations A LLC
8606 Second Ave.
Silver Spring, MD 20910
301-256-4423
mmelnyk@AtlanticWindConnection.com

Executive Summary

Improve Competition. A well-planned, open access and non-discriminatory transmission system for offshore wind is key to ensuring a level competitive playing field that reduces prices. Wind developer-controlled transmission is closed access, meaning that wind developers can exclude their competitors and charge higher prices.

Avoid Duplication and Waste. As competitors, wind developers cannot coordinate on a well-planned offshore transmission system or the land-based upgrades needed to integrate a large, variable offshore wind resource into New Jersey's power grid. Without coordination there is duplication and waste, greater environmental impact and a missed opportunity to build a more resilient transmission network.

The Accepted Model. Planned transmission provided on an open-access basis by non-discriminatory transmission providers is the best alternative. FERC requires the land-based transmission network to be operated this way, as are highways, railroads and other common carriers. Non-discriminatory, open-access transmission ensures equal access to the grid — a level playing field that improves competition. California and Texas have had great success in the land-based wind energy markets with well-planned, open access transmission and in Europe it is the prevailing grid access model that has fostered lower offshore wind costs and even zero-subsidy bids.

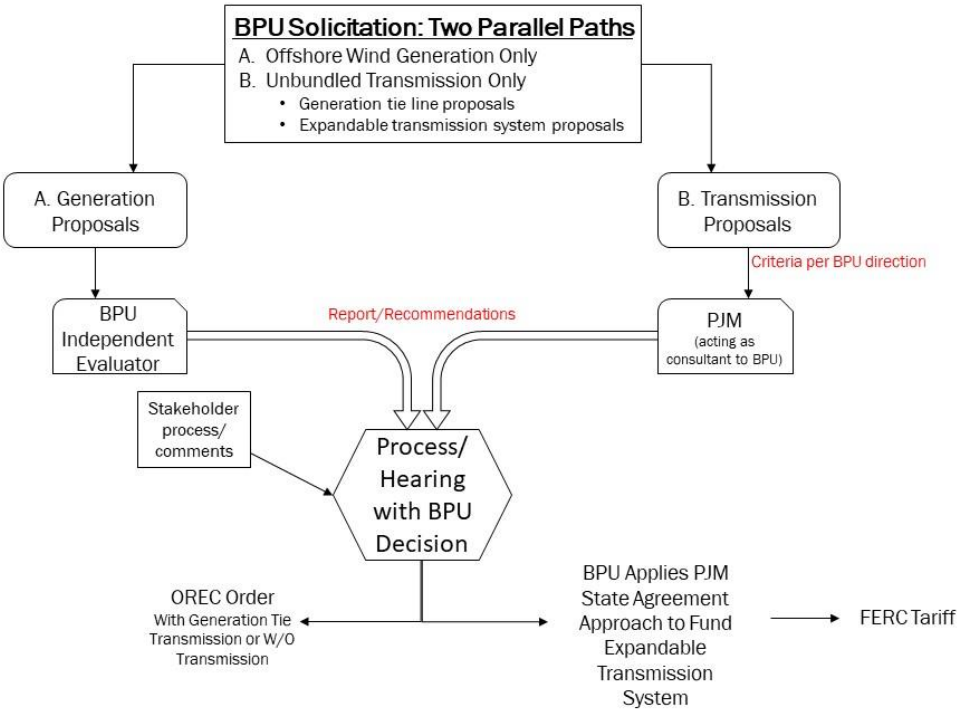
A Two Parallel Path Process. The BPU could use a two parallel path process to procure transmission and offshore wind competitively. Because the process runs in parallel it can be completed within nine months of the solicitation, allowing any selected wind project to qualify for the investment tax credit. The BPU's solicitation would call for separate transmission and offshore wind proposals with fixed price offers. To facilitate the evaluation, the BPU would use its Independent Evaluator and PJM, the independent operator of the region's high-voltage grid, to review each of the transmission proposals according to criteria set by the Board.

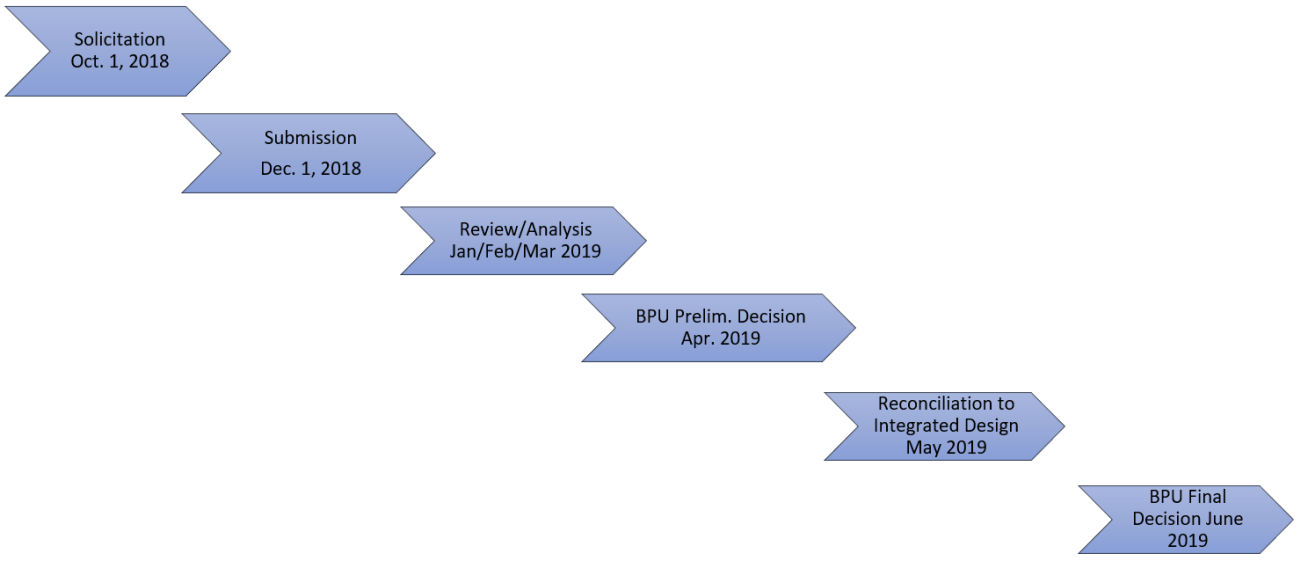
Reconcile Differences into an Integrated Design. The BPU would make its preliminary selection and ask PJM to convene a meeting between the selected wind and transmission project developers to reconcile the differences between the projects and arrive at a coordinated, integrated system design. This design would be presented to the BPU and, if acceptable, could then receive final BPU approval.

Transmission Funded through PJM or the OREC. The transmission would be funded like other land-based transmission through a PJM tariff provision designed to support state-sponsored public policy transmission projects. This is ideal for an expandable transmission system designed to serve ratepayers (and several wind projects) over the long-term. Alternatively, if the BPU selects a generator-specific interconnection line, it could be funded by a larger, all-in OREC subsidy for that generation project.

Coordinating Transmission and Generation is Manageable and Not Unusual. Any risks of separating transmission and generation are manageable and outweighed by the large savings and benefits of a well-planned, open-access transmission system. Unbundled transmission is workable as proven by the clear majority of European offshore wind projects that use transmission owned and operated by unaffiliated entities. The FERC-approved form of Standard Large Generator Interconnection Agreement (LGIA) already addresses the needed coordination and risk allocation between the transmission provider and generation owner/interconnection customer. And this agreement can be adapted for offshore-specific technical details to avoid stranded offshore generation.

The graphic below and timeline illustrate the recommended two-path procurement process.





Solicitation Overview

We support the Board's immediate goal of a competitive, cost-effective and timely procurement of energy from 1,100 MW of offshore wind generation capacity, and the state's longer-term goal of 3,500 MW of offshore wind capacity. Achieving those goals requires a well-planned approach to upgrading land-based transmission infrastructure to accommodate this new resource and a smart approach to extending the grid offshore to interconnect with the new offshore wind generation. We recommend a process involving the competitive procurement of both offshore wind energy and transmission capacity. This process would occur over approximately nine months from the issuance of the BPU solicitation and conclude in time for any selected wind developer to qualify for the federal investment tax credit.

As in other parts of the country, the electric transmission network in New Jersey is operated on a non-discriminatory, open-access basis to provide all generators and loads with fair, unrestrained access to transmission services. Open access enhances competition in power generation by allowing all generators to transmit power to customers without market access barriers. The level playing field created by open access is essential to vigorous competition and is responsible for substantial ratepayer savings.

New Jersey ratepayers will receive the most competitive, lowest cost offshore wind supplies if the open access transmission model is extended offshore. To ensure non-discriminatory access to the transmission system, transmission facilities should be procured separately from generation since an offshore wind generator that also controls the design and operation of offshore transmission infrastructure would have an incentive to restrict or handicap a competitor's access to the grid.

For these reasons, we recommend a parallel process for the Board's procurement of offshore wind energy and transmission. The Board would solicit proposals for offshore wind generation and separate proposals for offshore wind transmission. Both the generation and transmission proposals would be competitive and required to offer a fixed price. The proposals would be evaluated in parallel to avoid any delay to the procurement process.

The Board's Independent Evaluator would assist BPU staff to analyze the generation proposals and report back to the Board regarding the relative merits of each proposed offshore wind generation project under the Offshore Wind Economic Development Act (OWEDA) and the Board's regulations. The Board also would refer the transmission proposals to PJM for analysis under PJM's usual reliability criteria and, additionally, public policy criteria specified by the Board. The Independent Evaluator and BPU staff would also evaluate the transmission proposals' non-electrical aspects such as job creation and environmental impact. We note that even when a generator tie line is proposed to be bundled with generation, that approach requires generation developers to go through the PJM interconnection process, including certain studies. Our proposal builds on the work that PJM is already doing to ensure that criteria important to the State also are included in transmission planning.

The Board would receive reports from PJM and the Independent Evaluator which, together with stakeholder, staff and other input would inform the Board's selection. The BPU would make its preliminary selection and ask PJM to convene a meeting between the BPU staff and the selected wind and transmission project developers to reconcile the differences between the projects and arrive at a coordinated, integrated system design. The reconciliation process would be focused on needed

adjustments to each project's "reference design" to resolve technical differences and integrate the design of the generation and transmission facilities into a unified, coordinated system that could receive the final approval of the Board. The integrated design would be presented to the BPU and, if acceptable, the Board could provide its final approval.

Any BPU-approved generation project would receive an OREC subsidy award covering the generation only unless the Board also approves a generator lead transmission line proposed by that offshore wind developer. In that case the Board would allow an increased OREC subsidy award to allow for recovery of the cost of the generator tie transmission line. If instead the Board approves an expandable transmission proposal, it would designate the transmission project to PJM as a State Agreement Approach transmission project with its cost funded through PJM's transmission tariff.

- **Recommendation 1:** Apply the current open access, non-discriminatory transmission model to offshore wind transmission to level the competitive playing field and ensure the lowest-priced, most competitive offshore wind supplies**.**
- **Recommendation 2:** Solicit competitive proposals for both offshore wind generation and transmission and evaluate them on separate, parallel paths**.**
- **Recommendation 3:** Use the Independent Evaluator to analyze the generation proposals and the non-electrical aspects of the transmission proposals. In addition, use PJM to evaluate the electrical aspects of the transmission proposals, including under specific public policy criteria specified by the Board.
- **Recommendation 4:** Reconcile technical differences between the Board's preliminarily-approved offshore generation and transmission projects by using PJM to convene the generation and transmission developers to discuss how to adjust each project's design to produce a unified, coordinated system.
- **Recommendation 5:** Fund the offshore generation through the OREC. Fund the offshore transmission like other transmission facilities, *i.e.*, through the PJM tariff by using the State Agreement Approach.

Analyzing the Transmission Proposals

OWEDA and the Board's rules provide criteria for evaluating offshore wind proposals that focus mainly on project "net benefits". We will not elaborate on those criteria here, except to request that the Board require offshore wind developers to propose projects in a standard size increment such as 400 MW. A project of this size is large enough to be built efficiently, with development and construction mobilization costs spread over many megawatts of capacity, while being small enough to minimize customer rate shock. Just as important, standardization fosters comparability between projects – i.e., apples-to-apples comparisons that will enhance competition. We note that the Massachusetts offshore wind solicitation required 400 MW project proposals (with optional proposals for larger or smaller projects) and there appears to have been vigorous competition in that solicitation. A 400 MW project also matches the approximate capacity of a 230kV submarine transmission circuit and consequently this project size would promote efficient, scalable transmission solutions that can be more easily compared.

We recommend that the Board adopt a process with two parallel tracks for analyzing offshore wind generation and transmission proposals. For the generation track, the solicitation would clarify that

generation proposals would deliver offshore wind to an offshore substation. The generation project scope would include offshore wind turbines and the medium voltage collector system (e.g., 33kV or 69kV). The generator would lay the medium voltage cable system to the offshore substation where the transmission provider would perform the interconnection.

For the transmission track, the solicitation would request transmission proposals with a scope including one or more offshore substations, high-voltage submarine circuits, land-based grid interconnection facilities, and necessary grid upgrades. Fiber optic communication capacity also would be provided by the transmission provider to the offshore substation.

Any person, including independent transmission developers, local utilities and wind project developers may submit transmission proposals. However, proposals submitted by wind project developers should be limited to a generator owned and developed gen-tie line (for their offshore wind project only), since it is inconsistent with the goal of non-discriminatory open access to have other wind developers' projects subject to the vagaries of a transmission owner that also is a competing wind developer.

Transmission proposals should include information similar to what is required of generation proposals under OWEDA including a detailed description of the project, a completed financial analysis of the project including proposed return on equity and capital structure, and an operations and maintenance plan. PJM, the region's independent transmission system operator, is available to assist the BPU with expert analysis of transmission alternatives. We recommend that the Board refer the transmission proposals to PJM for analysis under PJM's usual interconnection reliability criteria and Board-specific criteria related to New Jersey's energy-related public policies. PJM's findings would be summarized in a report to the Board describing the performance of each project proposal under the criteria.

For example, the Board could direct PJM to evaluate proposals under the following criteria:

- Project cost, including required grid interconnection facilities and upgrades.
- Constructability, including access to/control of rights of way, minimizing siting conflicts with coastal landowners and communities related to cable landfalls, and environmental impacts.
- Resiliency benefits, if any.
- Expandability, i.e., how well does the project accommodate the state's overall offshore wind program?
- Impact on, or efficiencies in connection with, replacement of existing grid infrastructure that has reached or is approaching its end-of-life or has poor operational performance history.
- Energy and/or capacity market impacts or benefits such as may flow from increased or reduced grid congestion.
- Any other criteria the BPU believes is critical.

We expect that the Independent Evaluator and Board staff would work in parallel to evaluate the generation proposals and the non-electrical aspects of the transmission proposals and their findings would be presented to the Board. For example, the Independent Evaluator would analyze the job creation benefits and environmental impacts of the transmission proposals that are not evaluated by PJM.

The Board would retain the full authority as the decision maker to approve or reject a project.

- **Recommendation 6:** Require offshore wind project proponents to propose in a standard size increment such as 400 MW, since standardization fosters comparability between projects.
- **Recommendation 7:** Clarify the scope of offshore generation proposals which should include turbines and the medium-voltage collector circuits, and transmission proposals which should include offshore substations, high voltage circuits, interconnection facilities and upgrades.
- **Recommendation 8:** Limit proposals submitted by wind project developers to generator lead transmission lines (i.e., gen-ties) for their own offshore wind projects to avoid having wind developer control over transmission needed by a competitor.
- **Recommendation 9:** Require transmission proposals to include information similar to what is required of generation proposals under OWEDA and what is required by PJM in a competitive transmission solicitation.
- **Recommendation 10:** The Board's referral of the transmission proposals to PJM for analysis should include specific evaluation criteria that are designed to further New Jersey's public policy goals such as improved grid resiliency and lower congestion to promote lower energy and capacity costs.

Hearing Process

The reports provided by the Independent Evaluator and PJM would supplement the record in the Board's offshore wind proceeding and allow the Board to make an informed decision. Section C.48:3-87.1 of OWEDA provides that "The board may hire consultants or other experts if the board determines that obtaining such outside expertise would be beneficial to the review of the proposal." The Board also has additional authority, independent of OWEDA, to initiate transmission projects for construction that advance New Jersey's renewable energy and other public policy goals. This authority is found in PJM's FERC-approved Operating Agreement which incorporates the State Agreement Approach (SAA) transmission planning process.[1]

[1] PJM Operating Agreement, Schedule 6, Section 1.5.9, available at https://www.pjm.com/directory/mergedtariffs/oa.pdf and reprinted below.

1.5.9 State Agreement Approach.

(a) State governmental entities authorized by their respective states, individually or jointly, may agree voluntarily to be responsible for the allocation of all costs of a proposed transmission expansion or enhancement that addresses state Public Policy Requirements identified or accepted by the state(s) in the PJM Region. As determined by the authorized state governmental entities, such transmission enhancements or expansions may be included in the recommended plan, either as a (i) Supplemental Project or (ii) state public policy project, which is a transmission enhancement or expansion, the costs of which will be recovered pursuant to a FERC-accepted cost allocation proposed by agreement of one or more states and voluntarily agreed to by those state(s). All costs related to a state public policy project or Supplemental Project included in the Regional Transmission Expansion Plan to address state Public Policy Requirements pursuant to this Section shall be recovered from customers in a state(s) in the PJM Region that agrees to be responsible for the projects. No such costs shall be recovered from customers in a state that did not agree to be responsible for such cost allocation. A state public policy project will be included in the Regional Transmission Expansion Plan for cost allocation purposes

The SAA process is a flexible tool that the Board can use to benefit from PJM's independent transmission engineering and planning expertise and to pay for the transmission needed to advance New Jersey's public policy goals. Under the SAA, the Board has the power to direct PJM to include a transmission project in PJM's transmission plan with the costs recovered through a FERC-accepted cost allocation. PJM will include any such project provided that the state (or states) sponsoring the project agree that all costs related to the project would be recovered from customers in the sponsoring state (or states).

Based on all the information in the record, the Board may:

1) Reject all or some of the proposals, or
2) Issue:
   a) An order providing OREC subsidies for generation only, coupled with
   b) An order that instructs PJM to work with a transmission developer to build unbundled transmission facilities under the SAA tariff mechanism, or
3) Issue an order providing OREC subsidies for both generation and a generator lead transmission line proposed by the offshore wind developer to serve its project.

If the Board chooses to follow the unbundled approach, i.e. Decision Option 2 above, the Board would make its preliminary determination of a selected offshore wind developer and transmission developer. The BPU staff and the selected parties would then meet with PJM staff to rationalize the differences between each party's "reference" project design. This reconciliation process will result in appropriate adjustments to each project to integrate the design of the generation and transmission facilities into a unified, coordinated system. For example, PJM, BPU staff, the Board-selected wind developer, and the Board-selected transmission developer would convene to discuss and agree on details such as the offshore substation location that minimizes overall system costs, collector system voltage and number of circuits, and other design details such as the wind developer's needs for control system communications capability. After the reconciliation process the project proponents would revert to the Board with an update filing and the Board would make its final decision.

Under Decision Option 2 an approved generation project would be awarded an OREC subsidy contract that covers generation only. The cost of transmission built and paid for separately under the SAA tariff mechanism would be excluded from the OREC payment. Upon receipt of the Board's order designating a transmission developer to build certain unbundled transmission facilities, PJM would prepare a proposed tariff schedule in close consultation with BPU staff. If the Board agrees with the tariff filing PJM would file it with FERC for approval. Unlike other transmission facilities, the BPU is closely involved in determining what is built under the SAA and how it is funded because SAA facilities are driven by

---

only if there is an associated FERC-accepted allocation permitting recovery of the costs of the state public policy project consistent with this Section.

(b) Subject to any designation reserved for Transmission Owners in Section 1.5.8(l) of this Schedule 6, the state(s) responsible for cost allocation for a Supplemental Project or a state public policy project in accordance with Section 1.5.9(a) in this Schedule 6 may submit to the Office of the Interconnection the entity(ies) to construct, own, operate and maintain the state public policy project from a list of entities supplied by the Office of the Interconnection that pre-qualified to be Designated Entities pursuant to Section 1.5.8(a) of this Schedule 6.

state public policy goals. As required by the SAA, the proposed tariff schedule would address the rate recovery of the transmission facilities and the allocation of costs in New Jersey.

The allocation of risks and responsibilities between the offshore wind developer and transmission developer is also well managed under Decision Option 2. The offshore wind developer and transmission developer would enter into a form of the FERC-approved Standard Large Generator Interconnection Agreement (LGIA) that is used for large generators to obtain transmission interconnection service from transmission providers. This is the same agreement that would be used by an offshore wind generator that makes an interconnection with the land-based grid. Under the Decision Option 2 unbundled scenario, the principal difference is that the generator's point of interconnection with the grid would be an offshore substation operated by the transmission provider instead of a land-based substation.

The LGIA requires the parties to perform all of their obligations under the LGIA "in accordance with Applicable Laws and Regulations, Applicable Reliability Standards, and Good Utility Practice." The LGIA also provides for negotiation of the schedule for the construction of the required interconnection facilities and grid upgrades and provides for liquidated damages paid by the transmission provider to the generator if the agreed in-service date for the transmission facilities is not achieved. These risk allocation conventions are standard industry practice and they are designed to protect interconnecting generators as well as the transmission providers and ratepayers that own and operate (and have paid for) the bulk power transmission network.

Wind developers have expressed concerns about the risks of separating transmission and generation. They claim that delays in completing the transmission facilities could leave a wind farm stranded, unable to deliver its energy and losing revenue. They also claim that a fault in the transmission system during operations could interrupt revenues while the system is under repair. These risks are manageable and outweighed by the savings and benefits of a well-planned, open-access transmission system. Certain risks, such as a submarine cable fault, could even be reduced in a well-planned offshore network that provides a second path to deliver power, as compared to a radial generator tie line that has only a single path. The proof that unbundled transmission is workable is that transmission is separately owned and operated in the clear majority of European offshore wind projects and for US land-based wind and nearly all other US generation projects.

The LGIA can be structured to ensure coordination between the transmission provider and the generation owner/interconnection customer on project construction schedules so that there are no surprises regarding in-service dates that would lead to stranded assets. Wind farm in-service delays also could lead to stranded transmission assets, so it is beneficial to both parties to have established, regular communication channels. It also would be good practice to have agreement between the wind project owner and transmission provider on offshore maintenance practices to ensure that wind farm maintenance activities don't harm transmission operations and vice versa. This is common practice between transmission providers and land based generation today. To address the generator's concern that a transmission system fault (for example due to an anchor striking a cable) is promptly repaired, the transmission provider may contract for O&M services from the supplier of offshore transmission equipment (e.g., GE, Siemens), contract for standby cable repair services, maintain a stock of spare cable and other spares at a nearby warehouse, and maintain an O&M reserve account to fund infrequent, but potentially costly repairs.

PJM has traditionally acted as an independent expert and convener to assist the industry in developing design standards and procedures that support grid reliability and resiliency. Acting in this role PJM also could assist the parties to create offshore transmission standards covering technical details such as the appropriate target transmission service availability levels and desired redundancy to avoid stranded offshore generation. These details could be incorporated into the LGIA and become enforceable obligations of the parties that supplement the existing liquidated damages and "Good Utility Practice" provisions of the LGIA.

Lastly, we note that business interruption insurance purchased by the wind generator also would cover potential revenue losses under either model during the variety of events that may affect wind farm operations, including but not limited to, interruptions in transmission service. Since European offshore wind farms typically are served by unbundled transmission provided by unaffiliated entities, the related risks and appropriate mitigation strategies are well understood by insurance companies and providers of project financing. There is no reason why what has worked in Europe and for the vast majority of the 85,000 MW of operating onshore wind in the US could not also work in New Jersey.

Under the Decision Option 3 alternative the Board would award an approved generation project an "all-in" OREC subsidy contract that includes the cost of generation and a project-specific generator lead transmission line (including related grid upgrade costs).

- **Recommendation 11:** The Board should take the opportunity to use PJM as an expert, independent evaluator that can assist the Board in developing a complete record as it relates to offshore wind and its impact on the New Jersey and regional power grid.
- **Recommendation 12:** The Board may use the SAA to procure unbundled transmission or use the OREC subsidy mechanism to acquire generator lead transmission that is bundled with a selected offshore wind project.
- **Recommendation 13:** Like different House and Senate bills that must be reconciled in conference committee, a reconciliation process hosted by PJM with representation from BPU staff and the preliminarily selected generation and transmission developers would allow for appropriate adjustments to each selected project to integrate the design of the generation and transmission facilities into a unified, coordinated system.
- **Recommendation 14:** The FERC-approved Standard Large Generator Interconnection Agreement provides a readily financeable format for generators to obtain interconnection service from transmission providers that can readily be applied to offshore transmission, including agreement on the schedule for constructing the transmission facilities and liquidated damages for failure to meet the agreed in-service date.

Throughout the United States and in New Jersey the power grid is operated on a non-discriminatory, open-access basis to provide all generators and loads with fair, unrestrained access to transmission services. The level playing field created by open access is pro-competitive and will give New Jersey ratepayers the lowest cost offshore wind supplies.

The process that we recommend here supports the competitive procurement of both offshore wind energy and transmission capacity. And, because it runs on parallel paths, this process could occur over approximately nine months from the issuance of the BPU solicitation and conclude in time for any selected wind developer to qualify for the federal investment tax credit.