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Agenda Item: 8A

**STATE OF NEW JERSEY**  
**Board of Public Utilities**  
**44 South Clinton Avenue, 1<sup>st</sup> Floor**  
**Trenton, New Jersey 08625-0350**  
[www.nj.gov/bpu/](http://www.nj.gov/bpu/)

CLEAN ENERGY

IN THE MATTER OF DECLARING	)	ORDER ON THE STATE
TRANSMISSION TO SUPPORT OFFSHORE	)	AGREEMENT APPROACH
WIND A PUBLIC POLICY OF THE STATE OF	)	SAA PROPOSALS
NEW JERSEY	)	
	)	DOCKET NO. QO20100630

**Parties of Record:**

- Brian O. Lipman, Esq., Director**, New Jersey Division of Rate Counsel
- Suzanne Glatz**, PJM Interconnection LLC
- Stephen Tutor**, Jersey Central Power & Light Company
- Michael Donnelly**, Atlantic City Electric Company
- Matthew Virant**, Mid-Atlantic Offshore Development, LLC
- Eric Hayes**, LS Power Grid Mid-Atlantic, LLC
- Shadab Ali**, PPL Electric Utilities
- Jodi Moskowitz**, Public Service Electric and Gas Company,
- Maria J. Malguarnera**, Transource Energy, LLC

New Jersey took a monumental step on November 18, 2020, becoming the first state to integrate its offshore wind ("OSW") transmission objectives with the regional grid's planning and development process. To position the State to reach Governor Phil Murphy's ambitious OSW goals, the New Jersey Board of Public Utilities ("Board") formally requested inclusion of its OSW public policy into PJM's regional transmission expansion analysis through the State Agreement Approach ("SAA"). In response to the SAA solicitation, transmission developers submitted 80 unique, competitive, ready-to-build designs seeking to integrate New Jersey's OSW resources into the PJM system.

By this Order, the Board awards a series of projects to construct the on-shore transmission facilities necessary to successfully deliver offshore wind to New Jersey customers. The awards include a variety of projects needed to strengthen the regional and near-shore transmission grids, including the identification of a preferred point of interconnection ("POI") for future offshore wind projects off the coast of New Jersey. The Board finds that this "transmission-first" approach to offshore wind, undertaken in partnership with its regional grid operator, PJM Interconnection LLC ("PJM"), will lower costs, reduce the chance of delays in offshore wind projects, and minimize community and environmental impacts.

The Board selects Mid-Atlantic Offshore Development, LLC's ("MAOD") and Jersey Central Power & Light Company's ("JCP&L") jointly submitted Larrabee Tri-Collector Solution<sup>1</sup> ("Larrabee Tri-Collector Solution") for New Jersey's inaugural OSW coordinated transmission solution under PJM's SAA. In addition, the Board selects a number of projects that will upgrade the PJM system to accommodate New Jersey's OSW goals. After a thorough evaluation, the Larrabee Tri-Collector Solution and upgrades to the larger PJM transmission grid were determined to best meet New Jersey's stated SAA goals of reducing community disruption, environmental impacts, and customer costs, while minimizing risks. Ultimately, the Larrabee Tri-Collector Solution results in an innovative transmission solution, creating a single onshore POI while leveraging existing rights of ways, an outcome that would not have been possible without coordinated planning and a competitive solicitation.

The savings New Jersey ratepayers realize from the selection of these transmission projects are estimated to be over \$900 million. In addition, the scope of the Larrabee Tri-Collector Solution was tailored to maximize federal tax incentives moving forward, preserving an additional \$2.2 billion of ratepayer benefits. The awarded projects also position the State to seek direct federal funding for future expansions of the OSW transmission grid, including the potential to award a full OSW backbone in connection with the Board's future OSW solicitations, and preserves preferable interconnection locations and transmission corridors for future use.

The Board and its Staff ("Staff") will continue their efforts to ensure OSW energy can be brought to New Jersey customers as cost efficiently as possible, while reducing environmental and community impacts and maintaining safe and reliable electric service. First, this Order authorizes Staff to incorporate and, if appropriate, require, in the Board's next OSW generation solicitation, any additional facilities required to enable coordinated and impact-reducing access to the Larrabee Tri-Collector Solution. Second, the Board directs Staff to begin a second round of coordinated transmission planning to meet the newly announced 11,000 megawatts ("MW") OSW target, potentially including a new SAA solicitation to ensure that both the onshore and offshore transmission systems are ready to meet the full scope of New Jersey's OSW objectives. Combined with today's award, this Order marks the continued efforts of New Jersey that lead the nation in OSW development and comes on the heels of Governor Murphy's recent announcement to increase the State's OSW goal to 11,000 MW of OSW energy generation by 2040.

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<sup>1</sup> For an in-depth discussion of MAOD and JCP&L's jointly submitted Larrabee Tri-Collector Solution, see infra, "Recommended SAA Solution: Larrabee Tri-Collector Solution."

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## **Select Terms & Acronyms**

**Atlantic Shores Offshore Wind Project 1, LLC** (“Atlantic Shores 1” or “ASOW 1”), a joint venture between EDF Renewables Offshore Development, LLC and Shell New Energies US, LLC, which plans to construct a 1,510 MW OSW project awarded by the Board on June 30, 2021.

**Baseline Scenario**, the transmission facilities that would be necessary to achieve New Jersey’s 7,500 MW OSW energy goal in the absence of the SAA solicitation.

**Bureau of Ocean Energy Management** (“BOEM”), the federal agency which manages the development and permitting of the United States’ offshore energy and mineral resources, including the OSW lease areas.

**Cable Route**, the pathway a transmission cable(s) will follow or use from the OSW project to the Point of Interconnection onto the regional electric grid.

**Cable Vaults**, physically-separate underground vaults (accessible through manhole covers), located at certain distances (such as every 2,000 feet) along the Cable Route, to allow each OSW generator to install and maintain its own transmission cables without impacting other OSW generators’ transmission cables.

**Capacity Interconnection Rights** (“CIRs”), the rights to input generation as a capacity resource into the transmission system at the point of interconnection where the facility connects to the PJM transmission system.

**Coordinated Transmission Corridor**, the planning and consolidation of construction efforts to support more than one OSW generation project in a single onshore transmission Cable Route.

**Corridor**, the Cable Route from the landfall location on the shoreline to the point of interconnection into the regional electric grid.

**Designated Entity Agreement** (“DEA”), a *pro forma* agreement under the PJM Tariff that is entered into, as required under Schedule 6 of PJM’s Operating Agreement, between PJM and the developer designated to construct and own and/or finance a transmission project included in the RTEP.<sup>2</sup>

**Duct Banks**, the concrete structure between Cable Vaults that house the necessary number of physically-separate conduits (empty pipes) in which transmission cables can be installed (pulled through, from one point to another).

**Energy Master Plan** (“EMP”), the State’s plan that sets forth a strategic vision for the production, distribution, consumption, and conservation of energy in New Jersey. The State’s energy policy reflects the full scope of New Jersey’s current energy sector, creating new jobs, industries, and

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<sup>2</sup> While use of the DEA is not required under PJM’s SAA process, at the request of the Board, PJM has elected to follow its competitive solicitation procedures including use of a DEA for those greenfield portions of SAA Solutions.

workforce development as the state expands its green economy, providing exciting new opportunities for New Jersey's residents and business community.

**Executive Order No. 307** ("EO 307"), the Executive Order Governor Murphy issued on September 22, 2022 that increased New Jersey's goal for OSW energy generation from 7,500 MW by 2035 to 11,000 MW by 2040. This Executive Order further directs the Board to study the feasibility of further increasing the OSW goal.

**Executive Order No. 8** ("EO 8"), the Executive Order Governor Murphy issued on January 31, 2018, directing the Board and all State agencies with responsibility under OWEDA to "take all necessary action" to fully implement OWEDA and begin the process of moving New Jersey towards a goal of 3,500 MW of OSW energy generation by the year 2030.

**Executive Order No. 92** ("EO 92"), the Executive Order Governor Murphy issued on November 19, 2019, that increased the State's OSW goal for OSW energy generation from 3,500 MW by 2030 to 7,500 MW by 2035.

**Federal Energy Regulatory Commission** ("FERC"), the federal agency with jurisdiction over wholesale sales and interstate transmission of electric energy, including a mandate to guarantee just and reasonable rates for these services. FERC exercises regulatory jurisdiction over PJM.

**First Solicitation (or "Solicitation 1")**, the Board's first OSW generation solicitation for Offshore Wind Energy Certificates held in 2018-2019.

**High Voltage Alternating Current** ("HVAC").

**High Voltage Direct Current** ("HVDC").

**Interconnection Service Agreement** ("ISA"), an agreement between PJM, an electric generator, and all impacted transmission owners that details developer cost responsibility and confers rights necessary for PJM market participation.

**Investment Tax Credits** ("ITC"), a federal investment tax credit (currently 30% of eligible project costs) that is provided under the Internal Revenue Code on eligible property, available for renewable energy projects, including any OSW generation projects that commence construction prior to December 31, 2025.

**Megawatt** ("MW"), the equivalent of 1,000 kilowatts, or 1 million watts. This measurement is used for purposes of quantifying the electric output of a power plant.

**Network Upgrade**, upgrades to existing PJM Grid facilities, similar in scope to Option 1a system upgrades, but identified through the PJM interconnection queue study process for individual generators.

**New Jersey Board of Public Utilities** ("Board" or "BPU").

**New Jersey Department of Environmental Protection** ("DEP").

**New Jersey Department of Military and Veterans Affairs** (“DMAVA”).

**New Jersey Division of Rate Counsel** (“Rate Counsel”).

**New Jersey Offshore Wind Strategic Plan** (“Strategic Plan”).

**New Jersey Pinelands Commission** (“Pinelands Commission”).

**Ocean Wind I, LLC** (“Ocean Wind I”), the joint venture between Ørsted and PSEG Renewable Generation, LLC, which plans to construct an 1,100 MW OSW project awarded by the Board on June 21, 2019.

**Ocean Wind II, LLC** (“Ocean Wind II”), a subsidiary of Ørsted, which plans to construct a 1,148 MW OSW project awarded by the Board on June 30, 2021.

**Offshore Wind** (“OSW”).

**Offshore Wind Economic Development Act** (“OWEDA”), N.J.S.A.48:3-87.1 et seq.

**Offshore Wind Renewable Energy Certificate** (“OREC”), as defined in N.J.A.C. 14:8-6.1, a certificate issued by the Board or its designee, representing the environmental attributes of one megawatt hour of electric generation from a qualified offshore wind project.

**Option 1**, SAA proposals for system upgrades to the existing PJM Grid and for new onshore transmission facilities to extend the PJM Grid toward the New Jersey shoreline.

**Option 1a**, SAA proposals for system upgrades and additions to the existing PJM Grid required as a result of PJM’s study of the planned injections of SAA-related OSW generation at proposed POIs.

**Option 1b**, SAA proposals for any additional onshore transmission facilities that would extend the PJM Grid to more efficiently enable the coordinated connection of offshore transmission facilities.

**Option 1b+**, SAA proposals including all elements of Option 1b (except the electrical cable), land for HVDC converter stations, the Duct Banks, and access Cable Vaults to enable access to a coordinated Point of Interconnection.

**Option 2**, SAA proposals for new transmission facilities from the onshore transmission facilities to the OSW Projects in available BOEM OSW lease areas.

**Option 3**, SAA proposals for transmission links between the offshore substations of Option 2 transmission facilities or OSW wind farms.

**PJM Grid**, the high voltage transmission system operated by PJM Interconnection, LLC, covering New Jersey and all or part of 13 other states and the District of Columbia.

**PJM Interconnection, LLC** (“PJM”), the regional transmission organization that coordinates the dispatch of wholesale electricity and the operation of the bulk electric system in all or parts of thirteen states and the District of Columbia, including New Jersey.

**PJM Regional Transmission Expansion Plan** (“RTEP”), the PJM process to identify and address changes to the bulk electric grid in the PJM territory, including to maintain future reliability and economic performance.

**PJM Transmission Owner** (“TO”), an entity that owns or leases, with rights equivalent to ownership, transmission facilities and is a signatory to the PJM Transmission Owners Agreement. TOs must adhere to applicable technical requirements and standards.

**Point of Interconnection** (“POI”), a specific location where an OSW Project seeks interconnection to the PJM Grid.

**Prebuild Infrastructure**, the Duct Banks and Cable Vaults associated with the Prebuild.

**Prebuild**, a concept that would require a single OSW generator to construct the necessary Duct Banks and access Cable Vaults for its own OSW project as well as the additional OSW projects needed to fully utilize the SAA Capability at the selected POI. For clarity, the Prebuild involves only the necessary infrastructure (Duct Banks and Cable Vaults) to house the transmission cables, but not the cables themselves.

**SAA Agreement**, PJM Rate Schedule 49, approved by FERC in 179 FERC ¶ 61,024 (2021).

**SAA Capability**, as set out in the FERC-approved PJM Rate Schedule 49 § 1.2, all transmission capability created by approved SAA Solutions as studied by PJM, including the capability to integrate resources injecting energy up to their maximum facility output, capability which may become CIRs through the PJM interconnection process, and any other capability as consistent with studies performed by PJM for the SAA.

**SAA Developer**, any developer whose SAA project is selected herein and is listed in Appendix A.

**SAA Proposal (or “SAA Bid”)**, a specific proposal for an SAA Option 1a, Option 1b, Option 2, or Option 3 facility, submitted by a qualified entity, along with all supporting documents provided to the Board and PJM, including, but not limited to, any initial bid documents or other submissions, all responses to clarifying questions, any additional documents submitted or official statements made to PJM, and all subsequent communication between the SAA Developer and the Board and/or Staff.

**SAA Scenario**, the specific combination of POIs and SAA Proposals specified by the Board and analyzed by PJM.

**SAA Solution**, a package of separate SAA Proposals that, when combined, provides SAA Capability associated with the related SAA Scenario.



**SAA Study Agreement**, an executed agreement, between the Board and PJM, and approved by FERC in 174 FERC ¶ 61,090 (2021) that sets out PJM's ability to use its existing competitive solicitation process to implement the SAA, and sets out milestones and obligations on both PJM and the Board.

**Second Solicitation (or "Solicitation 2")**, the Board's second OSW generation solicitation for ORECs, held in 2020-2021.

**Shore Crossing**, the specific part of the Cable Route which brings the transmission cables from the ocean onto land at the New Jersey shoreline.

**State Agreement Approach ("SAA")**, as set out in PJM's Operating Agreement, Section 1.5.9(a) of Schedule 6, the authorization of states, to select and include transmission facilities in the RTEP to solve public policy needs identified by each of those states, and to voluntarily accept allocation of all associated costs.

**Third Solicitation (or "Solicitation 3")**, the Board's future OSW generation solicitation scheduled to be held in 2023.

**Transmission Corridor**, the onshore Cable Route used by one or multiple OSW generators between the landfall location on the shoreline, including the Shore Crossing, to the POI into the PJM Grid.

**Transmission System Upgrade Cost ("TSUC")**, the costs for construction of necessary upgrades, as identified by PJM, assigned to OSW generators to enable interconnection of the OSW project to the transmission system. As set forth in the terms and conditions of the Board's Orders approving Atlantic Shores 1 and Ocean Wind II, the TSUC mechanism allows Qualified Offshore Wind Projects to share some portion of their downside Network Upgrade cost risk with New Jersey ratepayers.

**Violation**, a violation of the minimum planning standards monitored by PJM throughout the transmission planning process, as described in Section 1.5 of PJM Manual 14b.

## BY THE BOARD:

### Background and History of New Jersey's Offshore Wind Industry

#### *New Jersey's Offshore Wind Regulatory Landscape & Public Policy*

On August 19, 2010, OWEDA was signed into New Jersey law.<sup>3</sup> OWEDA directed the Board to establish a program for ORECs to support at least 1,100 MW of OSW generation capacity from Qualified Offshore Wind Projects.<sup>4</sup>

Within his first of month of taking office, on January 31, 2018, Governor Phil Murphy signed EO 8, which directed the Board to fully implement OWEDA and begin the process of moving the State toward a goal of 3,500 MW of OSW by 2030.<sup>5</sup> To achieve these goals, EO 8 also directed the Board to develop and implement a Strategic Plan to examine the critical components of OSW development.

On November 19, 2019, Governor Murphy more than doubled the State's OSW goal when he signed EO 92.<sup>6</sup> EO 92 directed the Board to take "all necessary actions to implement OWEDA in order to promote and realize the development of wind energy off the coast of New Jersey to meet a goal of 7,500 megawatts of offshore wind energy generation by the year 2035."

The 2019 EMP recommends expanding New Jersey's electric grid to accommodate New Jersey's 7,500 MW of OSW by 2035. The EMP explains how "planned transmission to accommodate the State's OSW goals provides the opportunity to decrease ratepayer costs and optimize the delivery of OSW generation into the State's transmission system."<sup>7</sup> The EMP further states that "[c]oordinating transmission from multiple projects may lead to considerable ratepayer savings, better environmental outcomes, better grid stability, and may significantly reduce permitting risk."<sup>8</sup> The EMP directs that the Board "should endeavor to collaborate with PJM to ensure that transmission planning and interconnection rules accommodate [OSW] resources."<sup>9</sup> The EMP also recognizes that transmission must be planned and that the Board must exercise its regulatory authority to "actively engage in transmission planning."<sup>10</sup> The same week that Governor Murphy

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<sup>3</sup> See N.J.S.A. 48:3-87 et seq.

<sup>4</sup> OWEDA defines an OREC as representing the environmental attributes of one MWh of electric generation from an OSW project. For each MWh delivered to the transmission grid, an OSW project will be credited with one OREC.

<sup>5</sup> See EO 8. In 2018, the Legislature also directed the Board to establish an OREC program to support "at least 3,500 MW" of OSW generation by 2035. See OWEDA, supra note 4.

<sup>6</sup> EO 92.

<sup>7</sup> EMP, Goal 2.2.1 at 117.

<sup>8</sup> Id.

<sup>9</sup> Id.

<sup>10</sup> Id.; EMP, Goal 5.2.1 at 182.

issued the EMP, he also signed legislation authorizing the Board to conduct one or more competitive solicitations for open access OSW transmission facilities.<sup>11</sup>

In 2020, the Board, in close coordination with other State agencies, issued the Strategic Plan.<sup>12</sup> The Strategic Plan found that “[i]nvestments in planning and infrastructure are necessary to build the transmission infrastructure and regional markets needed for offshore wind energy to support a clean energy future.”<sup>13</sup> Specifically, the Strategic Plan recommends that meeting New Jersey’s 7,500 MW OSW goal requires “[c]ollaborat[ing] with PJM, as set forth in the EMP, to assure transmission infrastructure accommodates renewable energy such as offshore wind.”<sup>14</sup> The Strategic Plan also recommends “[w]ork[ing] with PJM and local utilities to develop a grid transmission study to integrate 7,500 MW of offshore wind energy by 2035.”<sup>15</sup>

On September 21, 2022, Governor Murphy signed EO 307, increasing the OSW goal to 11,000 MW by 2040.<sup>16</sup>

### *New Jersey’s Offshore Wind Generation Solicitations*

With the clear directives from the State Legislature and the Governor, and after having adopted rules creating the OREC, on September 17, 2018, the Board issued its First Solicitation. This solicitation sought a target of 1,100 MW of OSW capacity and invited interested OSW generators to submit competitive bids for what was, at the time, the nation’s largest OSW solicitation.

At the close of the First Solicitation, the Board received a total of fourteen project bids from three OSW generators, as follows: (i) Atlantic Shores 1; (ii) Boardwalk Wind, sponsored wholly by Equinor Wind US, LLC; and (iii) Ocean Wind I.<sup>17</sup>

After a six month review and evaluation process, the Board awarded ORECs for 1,100 MW of OSW capacity to the Ocean Wind I project on June 21, 2019.<sup>18</sup>

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<sup>11</sup> N.J.S.A. 48:3-87.1(e).

<sup>12</sup> See Strategic Plan at [https://www.nj.gov/bpu/pdf/Final\\_NJ\\_OWSP\\_9-9-20.pdf](https://www.nj.gov/bpu/pdf/Final_NJ_OWSP_9-9-20.pdf).

<sup>13</sup> Strategic Plan at 77 (Sept. 9, 2020).

<sup>14</sup> *Id.* at 78.

<sup>15</sup> *Id.*

<sup>16</sup> EO 307 (2022).

<sup>17</sup> In the Matter of the Board of Public Utilities Offshore Wind Solicitation for 1,100 MW—Evaluation of the Offshore Wind Applications, BPU Docket No. QO18121289, Order dated June 21, 2019 (“June 21, 2019 Order”).

<sup>18</sup> *Id.*

In September 2020, the Board issued its Second Solicitation with a desired target of 1,200 MW to 2,400 MW of OSW capacity.<sup>19</sup> At the close of the Second Solicitation window, the Board received a total of six project bids from two OSW generators as follows: (i) Atlantic Shores 1 and (ii) Ocean Wind II.<sup>20</sup> By two Board Orders, each dated June 30, 2021, the Board awarded a total of 2,658 MW of OSW capacity to two projects, Atlantic Shores 1 for 1,509.6 MW and Ocean Wind II for 1,148 MW.<sup>21</sup> Collectively, under the First Solicitation and under the Second Solicitation, the BPU has awarded a total of three OSW projects for a total of 3,758 MW.

The remaining OSW capacity that is needed to meet Governor Murphy’s goal of 11,000 MW of OSW by 2040 is expected to be procured through additional OSW generation project solicitations. The below SAA solicitation schedule was designed to support the 7,500 MW OSW goal in effect at the time the SAA solicitation was issued. This schedule will be updated to account for the new goal set by EO 307.

Solicitation	Capacity Target (MW)	Capacity Awarded (MW)	Issue Date	Award Date	Estimated COD
1	1,100	1,100	Q3 2018	Q2 2019	2024-25
2	1,200 - 2,400	2,658	Q3 2020	Q2 2021	2027-29
3	1,200		Q1 2023	Q4 2023	2030
4	1,200		Q2 2024	Q1 2025	2031
5	1,342		Q2 2026	Q1 2027	2033
6+	<u>3,500</u>		To be determined		
Total	11,000				

As discussed further below, the Board expects to work with PJM to design a second SAA solicitation to support 11,000 MW of OSW by 2040, as recently set forth in EO 307, which may include transmission facilities to support future solicitations and may include both onshore and offshore facilities.

### **Coordinated Transmission Approach to Support New Jersey’s Offshore Wind**

New Jersey is positioning itself as a world leader in promoting OSW development, with a goal of 11,000 MW of OSW generation capacity by 2040. To effectuate this goal, New Jersey plans to hold a series of OSW solicitations every 18-months to 2-years scheduled between now and 2026 to meet the 7,500 MW goal, with additional solicitations to be added to achieve the 11,000 MW goal.

<sup>19</sup> In the Matter of the Opening of Offshore Wind Renewable Energy Certificate (OREC) Application Window for 1,200 to 2,400 Megawatts of Offshore Wind Capacity in Furtherance of Executive Order No. 8 and Executive Order No. 92, BPU Docket No. QO20080555, Order dated September 9, 2020.

<sup>20</sup> In the Matter of the Board of Public Utilities Offshore Wind Solicitation 2 for 1,200 to 2,400 MW – Ocean Wind II, LLC, BPU Docket No. QO21050825, Order dated June 30, 2021 (“Ocean Wind II June 2021 Order”), at 14.

<sup>21</sup> Id.; In the Matter of the Board of Public Utilities Offshore Wind Solicitation 2 for 1,200 to 2,400 MW – Atlantic Shores Offshore Wind Project 1, LLC, BPU Docket No. QO21050824, Order dated June 30, 2021 (“Atlantic Shores 1 June 2021 Order”).

As with any new energy resource, the necessary transmission infrastructure required to support delivering the energy to customers must also be developed. Transmission infrastructure plays the critical role of delivering power, including clean OSW power, to the consumers who need it. Transmission is therefore an essential element, not only for the success of OSW in the State, but also in achieving the State's carbon emissions reduction goals necessary to mitigate climate change.

In New Jersey, the majority of the State's electric transmission infrastructure, or the "grid," runs through central or western New Jersey. Historically, this enabled siting of the State's electric generators close to the majority of the State's electricity needs, while enabling lower-voltage connections to New Jersey's less populated coastline. Further, transmission planning over the last century (at least in PJM) has generally assumed predominantly west-to-east flows of power.<sup>22</sup> As a consequence, the near-shore electric transmission grid in New Jersey is typically less robust than reinforced inland areas, with facilities not designed to facilitate power flows westward from the shoreline. Indeed, New Jersey's 500 kilovolt ("kV") transmission backbone generally runs in a north-south line, about 40 miles inland from the shoreline. While some bulk transmission substations of different voltages are located closer to or further away from the New Jersey coast, the existing transmission network is currently not designed to accommodate the energy injections at its eastern most edge associated with a large amount of OSW. With 11,000 MW of new OSW energy scheduled to be delivered to New Jersey over the next several decades, the State and PJM must now evaluate efficient pathways for the existing grid to successfully accommodate these additional injections.

Under the First Solicitation and the Second Solicitation, all projects, including each of the three approved projects, proposed a *bundled* approach to generation and transmission—that is, each project would individually develop and construct its own transmission facilities to bring electricity onshore from its own OSW turbines. Under this paradigm, the costs of the facilities needed to interconnect the project from the ocean to the POI are included in the OREC price. By utilizing a coordinated transmission approach where some or all of the transmission infrastructure is built by transmission developers (in this case under the SAA) and the electricity generation infrastructure is built by OSW generators, development responsibility is *unbundled*.

While the bundled approach, where each OSW project brings its own transmission onshore, is typically simpler for OSW generators, it can result in inefficient expansion of the transmission grid. For example, upgrading a transmission facility to meet the needs of one wind farm, without considering the needs of subsequent wind farms, can result in multiple and inefficient upgrades to related pieces of infrastructure. Further, the bundled approach creates a situation where there are multiple transmission cables from multiple OSW projects in the ocean reaching the shore.

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<sup>22</sup> See PJM Grid of the Future, PJM's Regional Planning Perspective, at 15 ("The injection of thousands of megawatts from offshore wind will fundamentally change how power flows over the transmission grid in the Northeast and mid-Atlantic. Generation will now be located closer to load centers along the I-95 corridor; this area of the grid was originally served mainly by west-to-east power flow from large mine-mouth coal generating stations in western Pennsylvania and beyond and, later, shale natural gas-fired plants in central Pennsylvania. This unfolding scenario will drive the need for new transmission assets and system configurations to maximize power delivery to onshore load.").

Without advance planning, these landfall locations are unlikely to occur in the same place. They are also less likely to occur in a particular location that is optimal to the State as a whole, since each project will select a location that optimizes their particular project. Thus, without a coordinated landfall location, each OSW generator is likely to use at least one unique Transmission Corridor to access their individually-selected POI, which increases local community impacts. To illustrate, the three currently awarded OSW projects propose to use a total of seven HVAC cables and one HVDC cable that would travel from their respective OSW farms and land on-shore at four different points on the State's coastline. These cables, once making landfall, would then use four Transmission Corridors to travel to four different POIs in the State.<sup>23</sup> If the Board were to maintain the non-coordinated, bundled approach to procuring OSW transmission and OWS generation, future solicitations could result in more than a dozen cables connecting future OSW farms to the coastline at six to ten different POIs to support the delivery of the first 7,500 MW of OSW-generated energy. The State's new goal of 11,000 MW of OSW generation capacity would naturally increase these numbers of cables, landfall locations, Transmission Corridors, and POIs.

### *Stakeholder Input*

To examine the range of commercial, technical, environmental, and operational advantages and disadvantages of OSW transmission options, Staff conducted extensive stakeholder outreach.

On November 12, 2019, Staff held an OSW transmission Technical Conference ("Technical Conference") to solicit input from stakeholders on transmission considerations and solutions. The Technical Conference included four panels of stakeholders to explore the following issues/questions:

- How other jurisdictions connected geographically remote generation through shared transmission facilities;
- Possible frameworks for building open access OSW transmission facilities;
- Technical considerations for offshore transmission facilities; and
- Cost responsibility, risk-sharing, and business model considerations associated with open access OSW transmission solutions.

Several stakeholders at the Technical Conference noted that a planned transmission solution could potentially minimize the environmental footprint of bringing power ashore, particularly by coordinating the number of times transmission facilities would need to cross environmentally-sensitive beach and ocean habitats. Stakeholders also noted the benefits of coordinated transmission upgrades in facilitating the delivery of the power into the PJM system. However,

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<sup>23</sup> The Ocean Wind I project proposed to deliver 1,100 MW by three HVAC cables to two different substations; the Ocean Wind II project proposed to deliver 1,148 MW by three HVAC cables to one substation; and the Atlantic Shores 1 project proposed to deliver 1,500 MW by four HVAC cables to one substation.

others highlighted the potential risks associated with requiring OSW generation resources to depend on third parties to construct open access transmission facilities and, in particular, how this dependency posed certain commercial risks to OSW generators.

In March 2020, the Board retained Levitan & Associates, Inc. (“LAI”) to prepare an OSW transmission study (“Transmission Study”). In order to inform the study, on June 26, 2020, the Board issued a Notice of Information Gathering (Docket No. QO20060463) on OSW transmission options. Approximately 80 representatives from 54 entities provided information. In addition, LAI conducted nine virtual interviews with multiple groups of stakeholders interested in OSW transmission, including generation and transmission developers, utilities, environmental groups, and commercial and recreational fishing representatives to ensure broad participation.

LAI completed the Transmission Study in December 2020, and concluded that a coordinated transmission approach would provide significant benefits. The Transmission Study included the following findings and observations:

1. Any coordinated transmission approach would have to be a regulated PJM asset because the merchant model<sup>24</sup> is not financeable;
2. In order to select an offshore transmission option, New Jersey will have to balance cost, performance, environmental impacts, ratepayer risk, and other unique factors;
3. The Board has the authority to authorize any coordinated transmission approach through PJM’s SAA procurement process;
4. The SAA procurement process would attract enough qualified transmission developers to the bidding process to assure a competitive process and thus a cost-effective coordinated transmission design;
5. Any coordinated transmission project developed separately from OSW generation would impose project-on-project risks<sup>25</sup>; and
6. PJM’s existing SAA procurement process offers a defined but untested path forward that is likely a better means than the bundled approach to achieve Governor Murphy’s 7,500 MW OSW by 2035, by reducing costs, minimizing permitting, reducing construction delays, and reducing environmental impacts.

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<sup>24</sup> The merchant model in this context refers to transmission developers building OSW transmission assets and recovering their costs through commercial contracts with OSW generators who would use the assets.

<sup>25</sup> Project-on-project” risk in the context of OSW transmission and generation is the risk that one component—either the transmission or the generation— would be completed and ready to serve its purpose while the other component would not be ready at the time it is needed or scheduled, resulting in adverse financial impacts to one or both project components that have to be properly apportioned. For example, if the generation component was completed on schedule, but the transmission component was delayed, the generation component would not be able to interconnect. Put differently, “project-on-project” risk exists when the completion of independent projects depend on each other.

## *Potential Benefits of Coordinated Transmission*

Informed by this analysis, Staff identified several potential benefits of coordinated transmission, summarized below. While these potential benefits are encouraging, Staff sought procurement options that would provide ready-to-build transmission options to evaluate the likelihood of any specific solution providing these benefits. Rigorous evaluation of submitted transmission options, discussed further below, is required to evaluate the presence and strength of these benefits to any particular OSW generation project.

### Cost Savings

A key finding of Staff's analysis is that a proactively planned transmission system to accommodate new OSW generation saves ratepayers billions of dollars, compared to the costs of upgrading the transmission grid on a piecemeal basis.<sup>26</sup> A separate transmission solicitation invites a broad pool of regional transmission developers to compete and innovate to provide optimal solutions to specifically-identified transmission needs. In addition, proactively procuring the system upgrades required for a larger amount of OSW (e.g. 7,500 MW as part of this process and potentially up to 11,000 MW in the future) "ahead-of-time" enables identification of needed system upgrades that can be solved by proposals designed specifically for that purpose, enabling significant cost savings. In contrast, the bundled approach would separately identify the system upgrades for each approved OSW generation project, individually, foregoing efficiencies enabled through coordinated procurements.

Beyond the anticipated direct cost savings, unbundling transmission costs from the OREC funding mechanism for OSW generators provides the potential for additional benefits.

By removing the development and construction of some or all of the transmission assets and associated costs from the OSW generators' responsibility, and relying on transmission developers to design and construct those assets, New Jersey will see a decrease in OREC prices for OSW generation. Transmission costs associated with transmission developer projects would be removed from the OREC price and instead be included in the transmission portion of the ratepayer bill, alongside other transmission investments intended to prepare the grid for changing system conditions. Additional cost savings are likely to result from unbundling because OSW generators typically increase their bids (sometimes called "risk premiums") to account for the uncertainty in how much transmission upgrades will cost and how long they will take to implement. Potential impacts on project schedule from outside factors, such as scheduling and approvals at PJM and FERC, would also be removed from the OREC. How much of the costs will be removed from OREC prices will depend on the scope of unbundled transmission facilities procured, and the certainty that the projects will be available to the OSW generators when needed.

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<sup>26</sup> Building for the Future Through Electric Regional Transmission Planning and Cost Allocation and Generator Interconnection, Comments of the Board of Public Utilities at 6-7, FERC Docket No. RM21-17 (Aug. 17, 2022) (citing PJM Interconnection, Offshore Wind Transmission Study: Phase 1 Results 18-20 (2021); Brandon W. Burke, Michael Goggin, & Rob Gramlich, Offshore Wind Transmission White Paper 14 (2020)).



While the Board anticipates OREC prices to be significantly reduced as a result of utilizing a coordinated transmission approach, not all of the OREC price reduction directly results in savings to New Jersey's ratepayers. A portion of the OREC price decrease is simply a transfer of cost recovery from the OREC funding mechanism to transmission rates, which the TOs file and FERC approves, similar to the process used to recover costs of other RTEP transmission projects. Even though some of the costs are in fact transferred from OREC to FERC-regulated transmission rates, Staff's analysis shows substantial net savings to ratepayers resulting from a coordinated transmission approach, as detailed further below.

Additionally, while current federal tax policy favors generator ownership of offshore transmission facilities, all other things being equal, the U.S. Department of Energy ("DOE") is in the process of setting up additional programs that may be available to provide financial support for offshore wind transmission facilities that are not currently available. Thus, as offshore wind transmission technology matures and federal tax policy shifts, Staff anticipates that its analysis of future offshore facilities may yield even more positive savings.

### Reducing Environmental Impact

Developing new transmission infrastructure in a coordinated manner can reduce the adverse impacts on the environment inherent in all new transmission projects. As noted in the EMP, a coordinated transmission approach may substantially improve environmental outcomes by reducing the number of new transmission facilities necessary to interconnect OSW, and may significantly reduce the time and cost needed for permits. As highlighted above, a bundled approach would require a substantial number of unique construction efforts, which could cause environmental impact to a range of communities and municipalities throughout the State. In general, project development is improved when environmental impacts to communities are reduced. This benefit is maximized if impacts can be limited to a single construction effort along the fewest possible Transmission Corridors, instead of multiple construction efforts that may otherwise be necessary to connect to an advantageous POI.

A coordinated approach affords the opportunity to reduce the number of landfall points by developing one or more designated Transmission Corridors that would be utilized by multiple OSW generation projects. Developing a Coordinated Transmission Corridor that can accommodate more than one OSW project and would be permitted and developed in a single construction effort, can reduce the number of regulatory siting proceedings and minimize disruption to communities along that Transmission Corridor. The competitive and advanced nature of a coordinated transmission solicitation provides an opportunity for transmission development experts to propose various cost-effective solutions that minimize environmental disruption, and allows the assessment of these solutions' relative merits and limitations with respect to environmental and permitting concerns. Unbundling OSW transmission and generation further enables New Jersey to leverage the extensive and specific expertise of each type of developer – generation and transmission. Transmission developers have extensive experience obtaining the necessary approvals - federal, state and local - to implement the large-scale transmission projects that the State needs to reliably and efficiently deliver on its OSW goals.

## Reducing Schedule and Regulatory Risk

Under the bundled approach, design and construction of the transmission components are part of the PJM interconnection queue process, and are planned to occur at a specific point in the overall project's schedule, generally years after the development of the generation component begins. Any delays in the PJM interconnection process are not easily accommodated due to the complexity of developing the OSW project as a whole and the interdependence of both the generation and transmission components' schedules. In fact, recently, PJM's interconnection process has been slowed as the regional operator is flooded with many new interconnection requests.

By contrast, unbundled transmission projects are designed prior to the start of the generation project schedule, so that the transmission component is completed and is ready when needed by the generation project. This reduces the overall risk associated with a bundled OSW project schedule. These anticipated benefits are particularly robust for *onshore* system upgrades, which must be constructed in either the bundled or unbundled scenario, and are often a long lead-time item for connecting an OSW project to the grid.

## Reducing the Number of Onshore Corridors

To enable the beneficial environmental and community outcomes described above, coordinated solutions should seek to minimize the number of landfall points and onshore Transmission Corridors utilized to deliver the maximum amount of OSW.

Each landing point and Transmission Corridor involves careful planning, coordination, and construction efforts including Rights of Way ("ROW") disturbance that may take place over several years. It also requires installation of underground Duct Banks and access Cable Vaults to accommodate HVAC or HVDC electric transmission cables.

As highlighted above, a bundled approach would require a substantial number of unique construction efforts, which could impact a range of communities and municipalities throughout the State. In general, project development is improved when impacts to communities are reduced. This benefit is maximized if impacts can be limited to a single construction effort along the fewest possible Transmission Corridors, instead of multiple construction efforts that may otherwise be necessary to connect to an advantageous POI.

Aside from the environmental impact benefits described above, a reduced number of Transmission Corridors also lays the foundation for future growth of OSW goals, including the newly-mandated 11,000 MW of OSW through EO 307. In particular, using a single Transmission Corridor enables other potentially suitable POIs to remain available for future efforts above and beyond current goals.

Therefore, there are tremendous benefits of limiting the number of landfall points and Transmission Corridors by having common, or consolidated, Cable Routes that can serve multiple OSW projects. Limiting the number of Transmission Corridors will limit design risks and can reduce the overall disturbance to both communities and the environment.

## *Transmission Procurement Options*

OWEDA authorizes the Board to conduct transmission-only solicitations for open access OSW transmission facilities designed to deliver OSW electricity.<sup>27</sup> Having outlined the substantial potential benefits of an unbundled, coordinated transmission approach, the Board sought an avenue to procure the widest range of potential options, with the highest degree of ratepayer protections, at the lowest reasonable cost, and determined that incorporating the States' offshore wind transmission goals into the PJM regional planning process represented the best way of moving forward. The PJM tariff allowed for a New Jersey-initiated Transmission Project solicitation through the PJM SAA.

### **New Jersey-Initiated Transmission Solicitation & the PJM SAA Process**

A New Jersey-initiated Transmission Project solicitation requires close coordination between the State, PJM, and transmission-owning utilities both inside and outside of New Jersey. OWEDA specifically allows the Board to identify its transmission needs and conduct a competitive solicitation similar to the OSW generation solicitations, but aimed at achieving the State's transmission-related OSW goals. Any competitive solicitation includes development of a Transmission Project solicitation guidance document, receipt and evaluation of responses to the solicitation, and the Board award of Transmission Projects.

In New Jersey and other Mid-Atlantic states, the transmission planning process is based on a detailed set of FERC-approved rules, implemented by PJM. Therefore, any new transmission facilities need to be conducted in close coordination with PJM, and particularly with the PJM RTEP<sup>28</sup> process. These rules determine how and when to expand and enhance the regional grid and also outline a highly competitive, robust procurement structure to select certain Transmission Projects, specifically those focused on transmission expansion. The annual RTEP identifies the needed transmission enhancements five years into the future, and it projects enhancements likely to be needed over the next fifteen years.<sup>29</sup> RTEP considers changes to grid demand profiles and the availability of power generation facilities.

In order to better accommodate state public policy needs into the regular RTEP cycle, PJM created the SAA to better enable states to incorporate their policy goals into the RTEP and to utilize PJM's competitive transmission solicitation process. The SAA is an optional mechanism enabling pathways for states to pursue their public policy objectives, under the condition that the state or states agree to voluntarily assume responsibility for all costs of the Transmission Project

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<sup>27</sup> N.J.S.A. 48:3-87.1(e) ("Notwithstanding any provision of P.L.2010, c. 57 (C.48:3-87.1 et al.) to the contrary, the Board may conduct one or more competitive solicitations for open access offshore wind transmission facilities designed to facilitate the collection of offshore wind energy from qualified offshore wind projects or its delivery to the electric transmission system in this State.").

<sup>28</sup> See PJM Manual 14B.

<sup>29</sup> For more information, see PJM's Learning Center website, <https://learn.pjm.com/three-priorities/planning-for-the-future>.

selected through the SAA.<sup>30</sup> The PJM Operating Agreement specifies that a state can follow a process, first used under the Board's request described below, to identify and select a public policy project.<sup>31</sup>

### **New Jersey's SAA**

By Order dated November 18, 2020 ("November 2020 Order"), the Board formally requested that PJM incorporate New Jersey's OSW goals into the PJM RTEP transmission planning process via the SAA.<sup>32</sup>

#### *New Jersey's SAA Process*

Prior to the issuance of the November 2020 Order, Staff engaged PJM for approximately six months in collaborative scoping discussions to determine the optimal pathway to achieve the State's then-current OSW goal of 7,500 MW. This effort included a two-phased approach to identifying grid injection locations and corresponding MW amounts in New Jersey to support the State's offshore wind targets through 2035. These efforts allowed identification of default violations (or "problems" with the bulk electric grid) needed to develop a competitive solicitation process. PJM's Phase 1 work commenced in April 2020 and entailed a screening analysis of over 100 potential in-state POIs to identify those most capable of supporting the State's OSW goals.

PJM's Phase 1 analysis<sup>33</sup> was based on standard linear first contingency transfer capability analyses using 2025 RTEP base cases for summer, winter, and light load conditions. PJM's Phase 1 work assumed that Ocean Wind I would install its own transmission cables to the two POIs identified in Ocean Wind I's bid, and that Ocean Wind I would not otherwise be part of an SAA Solution. PJM's Phase 1 results included desktop-level cost estimates for onshore Cable Routes from Shore Crossings to the POIs studied, using generic cost-per-mile values for overhead lines and underground cables. PJM also performed a single generator deliverability analysis to determine required transmission system upgrades and their costs. PJM's Phase 1 results identified a suite of potential POIs capable of enabling New Jersey's 7,500 MW goal.

In order to narrow the identified POIs into a single default case necessary for a potential SAA solicitation, Staff selected three scenarios of multiple POIs, deemed preferred from PJM's Phase 1 analysis, for further study.<sup>34</sup> These Phase 2 studies provided sufficient information for Staff to

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<sup>30</sup> See PJM Operating Agreement, Schedule 6, Section 1.5.9(a); PJM Tariff, Schedule 12(b)(xii)(B).

<sup>31</sup> PJM Operating Agreement, Schedule 6, Section 1.5.9(a); PJM Tariff, Schedule 12(b)(xii)(B).

<sup>32</sup> In the Matter of Declaring Transmission to Support Offshore Wind a Public Policy of the State of New Jersey, BPU Docket No. QO20100630, Order dated November 18, 2020 ("November 2020 Order").

<sup>33</sup> The analysis, not public, is summarized here to show how it informed the Board's early decisions in the SAA process.

<sup>34</sup> Staff determined that any coordinated transmission approach would need to support the full 7,500 MW goal, therefore POIs supporting just 3,500 MW were not selected for further study.

recommend that the Board initiate the SAA process, and enabled identification of violations that would be necessary for PJM to initiate a competitive transmission solicitation under its approved RTEP processes.

Based on these screening analyses, prior stakeholder input, Staff evaluation, and the potential benefits of coordinated transmission for OSW, the Board issued the November 2020 Order, formally setting out the transmission needs of the State to reach its OSW goals to be addressed by a competitive solicitation through the SAA. The November 2020 Order explained the potential benefits of coordinated transmission, as outlined above, identifying key benefits of “more efficient or cost effective transmission solutions,” reduction to “risks of permitting and construction delays,” and “minimiz[ing] environmental impacts associated with [onshore] and potentially offshore upgrades.”<sup>35</sup> The Board also referenced stakeholder-identified benefits, namely “minimiz[ing] the environmental footprint of bringing power ashore, particularly by coordinating the number of times transmission facilities would need to cross environmentally sensitive beach and ocean habitats.”<sup>36</sup> The Board was also focused on limiting downside ratepayer and developer risks identified by stakeholders, encouraging transmission developers to address the “transfer of commercial risk between transmission and [generation] developers...prior to [the Board] approving a final coordinated transmission solution.”<sup>37</sup>

On December 18, 2020, PJM submitted to FERC an executed SAA Study Agreement (“Study Agreement”) between PJM and the Board to begin implementing the SAA.<sup>38</sup> The Study Agreement provides, for the first time, a framework for PJM to utilize its existing competitive solicitation process to receive proposals in response to the Board’s SAA request.<sup>39</sup> PJM’s existing solicitation process is designed to be integrated with regular RTEP cycles, and is the central forum for specialized transmission developers to submit transmission project proposals in the PJM footprint. As described further below, Staff would then work with PJM to review and evaluate the submissions received, and the Board would select which, if any, projects to sponsor under the SAA.<sup>40</sup> The Study Agreement also established a set of milestones and timelines for PJM and the Board.

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<sup>35</sup> November 2020 Order, supra note 33 at 5.

<sup>36</sup> Id. at 2.

<sup>37</sup> Id. at 5, 8 (“Finally, the Board is cognizant of the concerns raised by some stakeholders that a coordinated transmission approach may increase commercial risk on OSW generators by making projects dependent on transmission facilities constructed by third-parties. While the Board continues to see the benefits of exploring a coordinated offshore wind transmission option more fully, the Board notes that it will weigh heavily proposals from transmission developers that utilize the voluntary protections laid out in the SAA to limit down-side risk to New Jersey consumers and to reduce project-on-project risk for [OSW] generation [project] developers.”).

<sup>38</sup> PJM Interconnection, L.L.C., 174 FERC ¶ 61,090 (2021).

<sup>39</sup> Id. at 5; see also PJM Service Agreement No. 5980 at section 2a (citing PJM Operating Agreement, Schedule 6, section 1.5.8(c)).

<sup>40</sup> Id. at 6.

On February 16, 2021, FERC accepted the Study Agreement between PJM and the Board.<sup>41</sup> Based on this approval, PJM was authorized to implement its existing competitive RTEP procurement process to enable New Jersey's SAA and effectuate New Jersey's public policy goals.

On February 26, 2021, Staff held a second technical conference ("Supplemental Technical Conference") to address certain issues referenced in the Board's November 2020 Order.<sup>42</sup> The Supplemental Technical Conference included three panels focused on the following topics:

1. Pre-commercial operation delays, mismatch of construction schedules;
2. Curtailment risk; and
3. Post-commercial operational risk.

Written comments on the topics discussed at the Supplemental Technical Conference were also accepted through March 12, 2021. Information from the Supplemental Technical Conference and written comments informed the design of the SAA solicitation.

The SAA competitive proposal window opened in April 2021 and closed in September 2021. Staff developed and released the SAA Process Guidance Document to provide more detail on the evaluation process and timeline. Namely, this document outlined the process behind the multi-month evaluation in which Staff and PJM reviewed all SAA transmission project proposals to determine which, if any, are best suited for New Jersey's needs and represent the best value for New Jersey consumers.

In January 2022, PJM filed Rate Schedule 49 at FERC, setting out the SAA Agreement between the Board and PJM.<sup>43</sup> The provisions of the SAA Agreement are intended to provide assurances to the Board that New Jersey's selected policy resources, expected to be primarily OSW resources, can efficiently utilize the SAA investment funded in-full by New Jersey ratepayers. The SAA Agreement sets out PJM's ongoing obligation to preserve the transmission capability created by selected SAA projects for the purpose of enabling New Jersey's OSW generation procurements—referred to as "SAA Capability."<sup>44</sup> The SAA Agreement provides a process by

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<sup>41</sup> PJM Interconnection, L.L.C., 174 FERC ¶ 61,090 (2021).

<sup>42</sup> In the Matter of Declaring Transmission to Support Offshore Wind a Public Policy of the State of New Jersey, BPU Docket No. QO20100630, Notice dated January 26, 2021.

<sup>43</sup> PJM Interconnection, L.L.C., 179 FERC ¶ 61,024 (2022).

<sup>44</sup> SAA Agreement at § 6.2(c) ("The SAA Capability will be based, modeled and reserved in a manner (i) consistent with PJM's reliability criteria, study assumptions, and modeling processes for offshore wind turbines as detailed in PJM Manuals, and (ii) as described and identified in any subsequent FERC filings, as well as in Appendix B herein (citing PJM Competitive Planning Webpage, 2021 NJ OSW Proposal Overview, at Appendix).") SAA Capability is defined as "all transmission capability created by a SAA Project(s), including but not limited to the capability to integrate resources injecting energy up to the Maximum Facility Output ("MFO"), capability which may become CIRs through the PJM interconnection process, and any other capability or rights under the PJM Tariff, and consistent with the reliability study

which the Board assigns the SAA Capability to OSW generators selected in future generation solicitations.<sup>45</sup> This assignment of SAA Capability must occur within two years of any OSW generator award, and could occur at the time of the award itself.<sup>46</sup> Lastly, the SAA Agreement established that the Board would later work with PJM and stakeholders to develop a cost allocation methodology and file it for approval at FERC, described further below.<sup>47</sup> FERC approved the SAA Agreement on April 14, 2022.<sup>48</sup>

In March and April 2022, Staff convened a series of four stakeholder meetings to solicit input from stakeholders to help inform Staff's evaluation of the SAA proposals.<sup>49</sup> The stakeholder meetings focused on the following topics:

1. General description of SAA goals and evaluation process, and review of applications;
2. Integration with OSW generation projects;
3. Environmental and permitting issues; and
4. Ratepayer protections and cost controls.

Following the stakeholder meetings, the Board received written comments from stakeholders including OSW generators, transmission developers, Rate Counsel, other organizations, and members of the public. The commenters generally supported the SAA process. Amongst the comments received, Rate Counsel stated that "the strong response during PJM's competitive proposal window, coupled with a variety of bid types and offers, supports our long-held position that competitive processes can be successful in leading to the most economical, efficient, and environmentally sound energy solutions."<sup>50</sup>

On April 27, 2022, the Board issued a Notice requesting additional information.<sup>51</sup>

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criteria applied to the evaluation of a SAA Project(s) as set forth in Paragraph 6 [of the SAA Agreement]."  
See SAA Agreement at § 1.2.

<sup>45</sup> SAA Agreement at § 5.3 ("Following the NJ BPU's selection to assign SAA Capability to an OSW generator, the NJ BPU shall provide written notification to the selected OSW generator of the type and amount of SAA Capability to be assigned to the OSW generator ("NJ BPU Notification"). The NJ BPU Notification shall advise the OSW generator of its responsibility to submit an OSW generator Notification to PJM prior to commencement by PJM of the OSW generator's System Impact Study.").

<sup>46</sup> SAA Agreement at § 6.2(d)(i). The key attributes of the Board's NJ BPU Notification are: Amount of SAA Capability to be awarded (nameplate MW, or nameplate MW and capacity MW); Location of SAA Capability (POI); Obligation of Awardee to notify PJM of SAA Capability award.

<sup>47</sup> Id. at 13-14.

<sup>48</sup> Id.

<sup>49</sup> In the Matter of Declaring Transmission to Support Offshore Wind a Public Policy of the State of New Jersey, BPU Docket No. QO20100630, Revised Notice dated March 7, 2022.

<sup>50</sup> Rate Counsel Comments dated April 29, 2022 at 3.

<sup>51</sup> In the Matter of Declaring Transmission to Support Offshore Wind a Public Policy of the State of New Jersey, BPU Docket No. QO20100630, Notice dated April 27, 2022.

On July 18, 2022, PJM held a special session of its Transmission Expansion Advisory Committee to update PJM stakeholders on the progress of the SAA solicitation window. PJM summarized its reliability, economic, constructability, financial, and legal analyses of the SAA Proposals, and allowed stakeholders to provide input into its analysis.

Throughout the SAA process, Staff relied upon input from several entities, most notably its consultant – The Brattle Group (“Brattle”),<sup>52</sup> PJM, Rate Counsel, and DEP. Staff also engaged the Pinelands Commission and DMAVA to assess potential constructability and permitting issues associated with projects that proposed to utilize property under their control or jurisdiction. Reports and analysis from these entities are provided under this docket on the Board’s public document search tool.<sup>53</sup>

### *Cost Allocation Methodology*

As described above, the SAA requires New Jersey customers to bear the cost of any SAA Transmission Project under a FERC-approved cost allocation agreed to by the State. FERC accepted the SAA Agreement established the process by which the Board would work with PJM to propose a cost allocation methodology for FERC approval. All costs for a selected SAA project must be allocated to New Jersey customers alone.<sup>54</sup>

On June 10, 2022, Staff presented its proposed cost-allocation methodology to the PJM Transmission Owner’s Agreement Advisory Committee (“TOA-AC”) for consideration. The Board proposed to allocate costs to New Jersey customers on a pro-rata basis. On August 19, 2022, after their consultation period with the PJM membership, the TOs filed the proposed cost allocation at FERC.<sup>55</sup> Under FERC and PJM rules, the TOs retain the sole authority to file all cost-allocation mechanisms at FERC.<sup>56</sup>

### *SAA Solicitation*

The November 2020 Order directed PJM to plan for injections of power into four POIs on the PJM system between 2028 and 2035, based on the preliminary screening studies PJM performed, as described above.<sup>57</sup> The four injection locations and associated capacity were: (i) 900 MW at the Cardiff 230 kV substation in southern New Jersey; (ii) 1,200 MW at the Larrabee 230 kV substation in central New Jersey; (iii) 1,200 MW at the Smithburg 500 kV substation in central New Jersey; and (iv) 3,100 MW at the Deans 500 kV substation in northern New Jersey. However, the Board also required that the SAA solicitation allow transmission developers to

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<sup>52</sup> Brattle assembled an SAA evaluation team that, in addition to Brattle consultants, also included Steven Herling (former Vice President of planning at PJM), Mark C. Kalpin (Partner with Holland & Knight), and environmental permitting consultants led by Douglass Sullivan (Senior Associate with Dewberry).

<sup>53</sup> State of New Jersey Board of Public Utilities, Public Document Search, located at [https://publicaccess.bpu.state.nj.us/CaseSummary.aspx?case\\_id=2109468](https://publicaccess.bpu.state.nj.us/CaseSummary.aspx?case_id=2109468).

<sup>54</sup> PJM Interconnection, LLC, 179 FERC ¶ 61,024, 40-41.

<sup>55</sup> PJM Interconnection, LLC, FERC Docket No. ER22-2690 (Aug. 19, 2022).

<sup>56</sup> Id. at 5, 25.

<sup>57</sup> See November 2020 Order, supra note 33.



propose alternate POIs if they could enable development of the State's OSW industry in a lower-cost or more-efficient fashion.

As a result of the Second Solicitation in June 2021, default injection locations and amounts were revised to account for the Ocean Wind II and ASOW 1 projects. Following the Second Solicitation awards, PJM revised its modeling to a new set of defaults, including 1,510 MW at the Cardiff 230 kV substation accounting for ASOW 1, and 1,148 MW at the Smithburg 500 kV substation accounting for Ocean Wind II. The remaining 3,742 MW were divided between 1,200 MW at the Larrabee 230 kV substation, with the remaining 2,542 at the Deans 500 kV substation. To ensure identification of all necessary facilities to enable seamless interconnection of future facilities, PJM's model included injections from already-awarded projects, as discussed further below.

Throughout this Order, reference is made to 7,500 MW, 6,400 MW and 3,742 MW of capacity to support the SAA and the State's OSW goals. For clarity, these numbers were calculated as follows:

- 7,500 MW reflects the total original amount of desired OSW capacity as set forth in EO 92;
- 6,400 MW reflects the remaining desired OSW capacity after the Ocean Wind I 1,100 MW project was awarded by the Board; and
- 3,742 MW reflects the remaining desired OSW capacity after the Ocean Wind II 1,148 MW project and ASOW 1 1,510 MW project was awarded by the Board.

Additionally, the November 2020 Order declared that any transmission project(s) the Board selected through the SAA solicitation would be a "state public policy project" and that all costs of any Board-selected transmission project(s) would be recoverable from New Jersey customers, in accordance to a FERC-accepted cost allocation.<sup>58</sup> The November 2020 Order also directed that any state or private entity wishing to utilize any SAA selected project, would be expected to bear a fair share of any development and operating costs.<sup>59</sup> The November 2020 Order further declared that the SAA was not intended to impact the first OSW award to Ocean Wind I, nor would the SAA process alter any guidance issued to bidders in the Board's Second Solicitation.

Under the SAA, the Board decides which, if any, of the transmission projects received through the SAA solicitation proceed to construction and may also decide to terminate the SAA process, or select no transmission projects, if those decisions are in the best interest of the State.

The November 2020 Order authorized PJM to include three "options" in a future RTEP solicitation window. The term "option" refers to the expected component parts of an OSW transmission solution. It is not intended to indicate that the options are necessarily exclusive or inclusive of one another.

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<sup>58</sup> November 2020 Order, supra note 33 at 8.

<sup>59</sup> *Id.*

## Option 1, including Option 1a and Option 1b

Option 1 projects are those that would upgrade the onshore portions of the PJM regional transmission system to accommodate the increased power flows from the OSW generation projects. Included within the overall Option 1 universe are Options 1a and 1b. Option 1a involves upgrades to the PJM bulk system, while Option 1b typically involves onshore transmission facilities that would extend the PJM Grid to more efficiently enable the coordinated connection of offshore transmission facilities.

Prior to the SAA solicitation, PJM and Staff further subdivided the Option 1 upgrades into separate classifications. Option 1a projects reflect system upgrades to existing onshore transmission facilities required as a result of PJM's study of the planned injections of OSW generation at proposed POIs. Option 1b projects represent any additional onshore transmission facilities that would extend the onshore PJM Grid to more efficiently enable the coordinated connection of offshore transmission facilities. If an "Option 1 only" solution is selected through the SAA, each generator would be responsible to build the necessary transmission facilities, including offshore substations, onshore and offshore converter stations if employing HVDC cables, and offshore and onshore transmission cables to interconnect at the SAA POI.

Expected benefits of Option 1a and Option 1b projects included:

- Cost effective system upgrades. By identifying and constructing onshore upgrades needed for the planned OSW injection at one time, rather than implementing such upgrades on an OSW generation project by OSW generation project basis – over years – costs, engineering needs, and environmental risks would all be minimized.
- A streamlined interconnection pathway for future OSW generation projects. Under Option 1, onshore upgrades are identified prior to the selection of future OSW generation projects to ensure that power injection into a POI can meet reliability standards. Therefore, subsequent generation developers will have more certainty regarding the cost and schedule for onshore upgrades as a result of these advanced construction efforts.

## Option 2

Option 2 projects would have transmission developers design and construct offshore transmission facilities, including substations, converter stations if needed, and electric transmission cables to connect one or more OSW generation projects to an onshore POI enabled by either an Option 1a or an "Option 1a + Option 1b" solution. Under an Option 2 proposal, OSW generators would be responsible for collecting the energy from each turbine and connecting to the Option 2 offshore substation.

Expected benefits of Option 2 projects included:

- Minimizing the number of offshore and onshore cables. Connecting multiple OSW generation projects to a single offshore substation reduces the number of Shore Crossings and offshore and onshore cable routes.

- Offshore cable and substation infrastructure would have a dedicated team focused on transmission development. An Option 2 project would enable Transmission developers and OSW generators to focus on the work in which they have the most expertise.

### Option 3

Option 3 projects would connect offshore substations to each other, in order to directly interconnect, or network, multiple offshore wind projects, which could improve reliability and market outcomes for OSW generators and ratepayers. Option 3 projects have been referred to as an “offshore backbone.”

Expected benefits of Option 3 projects included:

- Improved reliability and availability of OSW deliverability to onshore POIs.
- Improved access to transmission facilities by future OSW Generation Projects, and market efficiency benefits associated with linking the selected OSW generation projects.

### **SAA Proposals Received**

At the close of the SAA application window, PJM received 80 proposed projects from 13 different applicants - four incumbent TOs, eight independent transmission developers, and one partnership between an independent transmission developer and an incumbent TO. The proposals represented a mixture of conventional as well as creative, novel, and competitive solutions to respond to New Jersey’s OSW transmission challenge.<sup>60</sup>

The 13 applicants were:

1. Anbaric Development Partners, LLC (“Anbaric”);
2. Atlantic City Electric Company (“ACE”);
3. Atlantic Power Transmission, a Blackstone Infrastructure Partners portfolio company (“APT”);
4. Con Edison Transmission, Inc. (“ConEdison”);
5. Jersey Central Power & Light Company (“JCP&L”);
6. LS Power Grid Mid-Atlantic, LLC (“LS Power”);
7. Mid-Atlantic Offshore Development, LLC, a joint venture of EDF Renewables North America and Shell New Energies US, LLC (“MAOD”);
8. NextEra Energy Transmission MidAtlantic Holdings, LLC (“NextEra”);
9. Outerbridge New Jersey, LLC, a subsidiary of Rise Light & Power, LLC (“RILPOW”);
10. PPL Electric Utilities (“PPL”);

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<sup>60</sup> Due to the volume and detail of the proposals, each proposal is not summarized in detail in today’s Order. PJM has released six individual reports detailing all aspects of each submitted proposal ([Economic Analysis](#), [Financial Analysis](#), [Reliability](#), [Option 1a constructability](#), [Option 1b/2 constructability](#), and [Option 3 constructability](#)).

11. PSE&G Renewable Transmission LLC and Ørsted N.A. Transmission Holding, LLC (“Coastal Wind Link”);
12. Public Service Electric & Gas Company (“PSE&G”); and
13. Transource Energy, LLC (“Transource”).

Of the 80 project proposals received, there were 27 Option 1a solutions, 11 Option 1b solutions, 34 Option 2 solutions, and 8 Option 3 solutions.

## **Evaluation Framework and Approach**

### *Baseline Scenario*

As explained in the November 2020 Order, the Board would not select an SAA Solution unless it would likely result in a “more efficient and cost-effective means of meeting the state’s offshore wind goals and decreasing the chance of delays.”<sup>61</sup> Therefore, the first step in the evaluation process is a robust comparison of the proposed SAA Solution against the status quo. To facilitate this comparison, Staff and Brattle developed the baseline scenario (“Baseline Scenario” or “Baseline”).

Generally, the Baseline Scenario included estimated costs and processes associated with the bundled procurement of all offshore and onshore transmission facilities, constructed by an OSW generator, necessary to interconnect up to 7,500 MW of OSW to the transmission and distribution system in the absence of any SAA Solutions. In the Baseline Scenario, this bundled onshore and offshore transmission procurement and development will continue on a project-specific basis until the 7,500 MW goal is met. Each future OSW generator the Board selects would arrange for interconnection of its individual project to the PJM Grid and develop the transmission facilities necessary to connect its project to the existing system. PJM would then identify the system upgrades needed to interconnect each project through its generation interconnection request process.<sup>62</sup> In sum, under the Baseline, each OSW generator would design only the transmission facilities necessary for its project to meet its specific needs, including the transmission technology selected (for example HVAC vs. HVDC), the necessary ratings of the facilities, and the location for Shore Crossing, POI, and onshore and offshore Cable Routes. All of these transmission facilities would be procured in a bundled manner with their generation facilities.

The full costs of building and operating the onshore and offshore transmission facilities would be recovered through the fixed-price OREC payments at the price proposed by the winning OSW generators and approved by the Board, with a true-up mechanism described below for system upgrade costs. The approved OREC prices, so far, have not included the full ratepayers’ final share of the PJM TSUCs, but they do include an estimate. When actual upgrade costs are known, the OREC price will be trued-up to account for the TSUC cost-sharing proposed by the OSW generator and accepted by the Board, which results in a partial sharing of these costs with New

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<sup>61</sup> November 2020 Order, supra note 33 at 8.

<sup>62</sup> When identified through the PJM interconnection queue for an Individual project request, system upgrades are also referred to as Network Upgrades.

Jersey ratepayers.<sup>63</sup> In addition, under the Baseline, it is anticipated that OSW generators will be able to receive a 30% ITC on the OSW generator-owned transmission facilities necessary to deliver the generation to the interconnection point on the PJM Grid.

The first step in the development of the Baseline Scenario is to identify the full set of transmission facilities needed to enable New Jersey's 7,500 MW of OSW by 2035. Under the Board's previous OSW solicitations, the three awarded projects were presumed to use this Baseline approach to develop the necessary transmission upgrades to support their individual projects, totaling 3,758 MW, as follows:

1. Ocean Wind I - 1,100 MW, interconnected at the BL England and Oyster Creek POIs;
2. Ocean Wind II - 1,148 MW, interconnected at the Smithburg POI; and
3. Atlantic Shores 1 - 1,510 MW, interconnected at Cardiff POI.

The Baseline Scenario assumes that OSW generation projects that are selected in the Board's future generation solicitations will interconnect at specific POIs. Following the Second Solicitation, the Baseline assumes 2,542 MW will be interconnected at Deans, and 1,200 MW will be interconnected at Larrabee. To achieve these injections, the Baseline assumes all necessary transmission components of three additional OSW generators will use HVDC technology.

The next step was to estimate costs for the PJM system upgrades necessary to support the interconnection of future OSW projects. PJM system upgrade costs were identified by reviewing required Network Upgrades of current generation interconnection requests (following the completion of Solicitation 1 and Solicitation 2), supplemented with system upgrade cost information for non-PJM interconnection queue facilities identified by PJM through SAA reliability studies. Staff and Brattle reviewed publicly-available PJM interconnection queue data to identify the active projects that could be selected to satisfy the necessary OSW injections, and, accounting for supplemental expected system upgrade cost information, averaged the Network Upgrade costs from the referenced studies.

Next, the full set of facilities required to interconnect OSW generators to the POI, assumed under the Baseline, needed to be identified. Staff and Brattle assumed that each future generator would fill a single HVDC export cable, consistent with the size of the recently procured New Jersey OSW projects (1,100 MW to 1,510 MW). Offshore converter station platforms for each future generator were assumed to be located at the edge of the applicable BOEM OSW lease area, at the point closest to the POI. To identify the cost of these necessary facilities, Staff and Brattle estimated the costs of onshore and offshore Baseline transmission facilities based on a survey of public reports and market data, including information from the National Renewable Energy Laboratory, Offshore Renewables Balance-of-System and Installation Tool ("NREL ORBIT"), NYSERDA 2021 Power Grid Study<sup>64</sup>, PJM construction cost estimates, and other public studies.

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<sup>63</sup> As an example, TSUC provisions are provided and explained in Ocean Wind II June 2021 Order, *supra* note 21 at 27, 16; Atlantic Shores 1 June 2021 Order, *supra* note 22 at 27, 16.

<sup>64</sup> New York State, [New York Power Grid Study](https://www.nyserda.ny.gov/About/Publications/Research-and-Development-Technical-Reports/Electric-Power-Transmission-and-Distribution-Reports/Electric-Power-Transmission-and-Distribution-Reports---Archive/New-York-Power-Grid-Study), <https://www.nyserda.ny.gov/About/Publications/Research-and-Development-Technical-Reports/Electric-Power-Transmission-and-Distribution-Reports/Electric-Power-Transmission-and-Distribution-Reports---Archive/New-York-Power-Grid-Study>.

The total estimated onshore and offshore transmission-related capital cost of the Baseline Scenario is approximately \$8.9 billion (2021 dollars) for 6,400 MW of offshore wind. This does not include the costs for the 1,100 MW Ocean Wind 1 facility.

The \$8.9 billion Baseline capital cost estimate does not account for the 30% federal ITC, which is available for most of the transmission-related portions of OSW projects, provided those portions are constructed as part of the OSW project. Based on the cost estimates and the assumption that projects will be able to qualify for the ITC for all facilities—generation and transmission other than onshore system upgrades—the Baseline cost estimate is reduced by approximately \$2.2 billion (2021 dollars), resulting in an estimated Baseline cost of \$6.7 billion net of ITC.

When comparing SAA projects to the Baseline, cost is only one factor. Other factors that make SAA projects more or less favorable compared to the Baseline are described below.

Factors that make the SAA projects potentially superior against the baseline include the following:

- First, the PJM interconnection queue reform process will likely extend the expected queue completion date of near-term projects under the Baseline Scenario. Any new OSW projects entering the PJM interconnection queue (based on the currently proposed reforms by PJM) would not likely be able to complete their interconnection process until mid-2027.<sup>65</sup> This is a significant disadvantage of the Baseline Scenario versus selecting system upgrades through the SAA (i.e., Option 1a solutions), which could enable construction efforts for the necessary PJM system upgrades to begin upon PJM Board approval of the SAA Projects awarded in today's Order. Some OSW generators have consistently raised schedule delays due to PJM queue reform as a cause of concern.
- Second, in the Baseline Scenario, OSW generators will size their transmission facilities only to meet their specific needs, foregoing the opportunity to take advantage of coordinated planning, economies of scale, and reduced environmental and community impacts (e.g., through means such as the development of POIs and common Transmission Corridors that can serve multiple OSW projects).
- Third, because each generator would build their own transmission facilities in the Baseline Scenario, each OSW project would require a separate onshore Transmission Corridor to reach the existing PJM Grid. To achieve 6,400 MW<sup>66</sup> of OSW generation in the Baseline Scenario, it is estimated that five such corridors would be required, including the two corridors for the Second Solicitation projects and three additional corridors for projects awarded in future solicitations. Each of these corridors would involve large-scale construction efforts taking place over several years and would require installation of underground access Cable Vaults and Duct Banks to facilitate installation and operation of export cables.

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<sup>65</sup> See [PJM Interconnection Queue Reform](#), presented to PJM Interconnection Process Reform Task Force (March 11, 2022).

<sup>66</sup> This excludes the 1,100 MW awarded to Ocean Wind I during the First Solicitation.

- Lastly, in the Baseline Scenario, each OSW project using HVDC technology would need to obtain a plot of land comprising several acres, reasonably close to the POI, in order to construct the needed onshore converter station. This could lead to only specific parties being able to obtain land near desirable POIs, which would place later entrants into the OSW market at a disadvantage and at risk for not being able to obtain the land sought.

Factors that make the Baseline Scenario potentially attractive include:

- OSW generators will select the optimal technologies (such as HVDC cables) specific to their projects at the time their projects are being developed. Since offshore transmission facilities selected through the SAA would rely solely on the technologies that SAA bidders propose (reflecting technologies and costs as of 2022), the Baseline Scenario offers the opportunity to flexibly take advantage of future technological advances.
- The Baseline Scenario requires OSW generators to recover the transmission-related costs through fixed-price OREC payments (with pre-defined escalation over time), beginning only once the OSW project is interconnected and delivering energy to the PJM Grid. In contrast, costs of SAA facilities are recovered through PJM's tariff as soon as the SAA facilities are placed in service and under the terms of any particular transmission developer's cost control mechanism.
- Lastly, Baseline Scenario will result in OSW generators building and operating their own offshore transmission and onshore interconnection facilities, minimizing the potential project-on-project risks during the construction phase and aligning operational and maintenance incentives. Relying on a separate entity to construct and operate the SAA transmission elements creates two types of project-on-project risks not present in the Baseline Scenario: (1) transmission facilities do not reach commercial operation dates in time (as early as 2028) to align with the testing, commissioning, and in service dates of the OSW generators; and (ii) the operations, outages, and repairs (if any) of SAA transmission facilities may not be optimized to allow project owners to achieve the highest value for their generation.

The attributes of the Baseline Scenario described above establish a measure against which to compare the proposed SAA Solutions. This enables the critical initial phase of evaluation - the determination of the appropriate scope of facilities (i.e. which options) to be procured through the SAA. Prior to a direct comparison of any SAA Proposals against one another, the evaluation must first compare each scenario created by the SAA proposals against the Baseline, in an effort to identify the appropriate combination of transmission facilities and procurement methods that maximize benefits to New Jersey ratepayers. The Baseline Scenario approximates a future without the SAA. Because there are many moving parts and evolving variables in OSW generation and transmission, the Baseline Scenario is necessarily an estimate. Using the Baseline Scenario, the Board can assess whether the proposed SAA Solution will, or will not improve upon the Baseline.

### **Evaluation Criteria**

Based on the November 2020 Order, Staff set out detailed evaluation criteria in the SAA solicitation window overview document published by PJM.<sup>67</sup> This document contained guidance to interested bidders on the overall New Jersey ratepayer impact and risk perspective Staff would apply in its evaluation of SAA proposals. These published evaluation criteria were:

- **PJM system reliability** – ability to provide a solution to the needs defined in the problem statements, additional needs identified by the proposing entities, or the needs associated with alternative POIs and to resolve potential reliability criteria violations on PJM facilities in accordance with all applicable planning criteria (PJM, NERC, SERC, RFC, and local TOs), including the solution’s ability to (a) resolve identified PJM reliability violations and satisfy any applicable criteria that may impact the performance measurement of the project, even if it was not explicitly stated as part of the original problem statement; and (b) reduce the need for must-run generation and special operating procedures, extreme weather outages and weather-related multiple unforced outages, reduced probability of common mode outages due to electrical and non-electrical causes, islanding, power quality degradation.
- **Project constructability** – extent to which the proposal identifies, addresses, and mitigates (through technical studies and documentation of experience with similar solutions elsewhere) the financing, constructability, execution, technology, environmental, and permitting challenges of the proposed solution, including the need for construction- or other-related outages on related transmission facilities.
- **Project costs** – total cost of proposed solutions and individual elements (partial solutions); quality of proposed innovative cost control approaches (such as phased-in development of project segments, capped project costs or capped revenue requirements, and cost recovery for excess or unused capacity) or levelized cost recovery options (such as trended original costs, which may improve the intergenerational equity of cost recovery); financial commitments regarding rate of return, specific provisions to protect against cost overruns, or other comparable provisions designed to control costs.
- **Project risk mitigation** – ability of the proposed solution to mitigate environmental, permitting, financing, constructability, timing, project-on-project (including the use of financial assurance mechanisms, guaranteed in-service dates or financial commitments contingent on meeting targeted commercial online dates, and delay damage payment provisions), and any other risks that could increase costs, reduce value, or delay the development and delivery of OSW generation for New Jersey.
- **Environmental benefits** – ability of the proposed solution to minimize potential environmental impacts; minimize impacts to marine, nearshore, and onshore habitats, listed species, cultural resources, air (emissions) including potential benefits, water quality, noise, aesthetics, tourism, and navigation; minimize impacts related to fisheries resources and the fishing community and industry.

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<sup>67</sup> PJM Competitive Planning Webpage, 2021 NJ OSW Proposal Overview, at 7-8, <https://www.pjm.com/planning/competitive-planning-process>.



- **Permitting plan** – ability of the proposed solution to minimize permitting risks, including plan for and likelihood of achieving all State and Federal necessary regulatory agency approvals, permits, or other authorizations; likelihood of meeting projected commercial operation dates, operation and maintenance plans, site control or ability to achieve site control, constructability, project longevity, and project schedule.
- **Quality of proposal and developer experience** – quality of project documentation and proposal description, discussion of commitments and benefits, and supporting analyses and benefits quantifications (including documentation of assumptions and analyses, if any); documentation of developer experience relevant to the successful implementation of the proposed solution.
- **Flexibility, modularity, and option value of solutions** – ability of project proposals to achieve efficient outcomes through combinations of solutions for Option 1a, Option 1b, Option 2 and Option 3 needs, or ways in which proposed solutions, or portions of proposed solutions, can be combined, integrated, and sequenced to more cost effectively achieve the State’s overall public policy and risk mitigation objectives; ability of the proposed solution to accommodate future increases in OSW generation above current plans; innovative solutions that yield a transmission investment schedule that is optimally aligned with the planned schedule of OSW Generation Project procurements.
- **Market value of offshore wind generation** – ability of the proposed solution to maximize the energy, capacity and Renewable Energy Credit (“REC”) values of OSW energy generation delivered to the chosen POIs, including mitigation of curtailment risks, and the level and sustainability of PJM capacity, congestion, or other rights created by the proposed solution that increase the delivered value of the OSW generation or otherwise reduce the total cost of the proposal.
- **Additional New Jersey benefits** – ability of proposed solutions and associated upgrades to provide additional onshore-grid-related benefits, resolve PJM market congestion, and/or otherwise reduce or avoid PJM-related costs and improve PJM market performance; this includes (a) energy market benefits, including energy deliverability of offshore wind production or curtailment, production cost savings, or other benefits; (b) identification of benefits to the transmission system, including synergies with transmission solutions from already-ongoing procurements, opportunistic replacement of aging transmission infrastructure, the creation of valuable transmission-related rights, and other transmission cost savings; (c) capacity market benefits (including Capacity Emergency Transfer Limit (“CETL”) increases), improve resiliency/redundancy, avoid future costs (such as future reliability upgrades or aging facilities replacements); and (d) other benefits, including state energy sufficiency, improvements in local transmission and distribution outage statistics, reduced utilization of aging infrastructure, improvements in local resiliency.

The criteria provide a way by which Staff could consider the optimal SAA Solution. Neither the Board nor Staff provided any relative weighting of any of these evaluation criteria, enabling Staff

to weigh criteria in their recommendation as was deemed appropriate throughout the proposal review process. The Board retained flexibility to consider each criteria apart from one another, or collectively. No single criteria was dispositive. This flexibility was appropriate, due to the first-ever nature of this SAA solicitation, with a large degree of uncertainty related to the nature of proposals that would be received through the solicitation. However, by explaining the criteria in detail, the applicants were provided with a series of goals that would be reflected in an optimal SAA Solution.

To facilitate its review, Staff and Brattle combined the ten criteria into five high-level metrics and associated sub-metrics, described below.

### *Reliability & Other Transmission Benefits*

Regarding reliability, Staff and PJM evaluated whether the proposed SAA transmission facilities will best utilize the existing transmission system and provide the necessary new facilities to support 7,500 MW of offshore wind. PJM studied the impacts of various injection scenarios for new generation facilities on its system to ensure that the grid could accommodate the OSW injections while maintaining system reliability. PJM identified where on its system the injections of OSW energy would cause reliability criteria violations and identified the transmission upgrades necessary to resolve those violations. Based on these analyses and specified upgrades, all SAA Scenarios considered will meet PJM's reliability criteria once the identified system upgrades are completed.

PJM's reliability analysis included its generator deliverability procedures, which is its primary reliability test used in generator interconnection studies to identify reliability violations caused by new OSW generators. By itself, this reliability analysis typically identifies the majority, if not all, of the upgrades needed to reliably interconnect new generation to the PJM system. As part of PJM's reliability analysis, PJM evaluated the Option 1a proposals that were in direct competition with one another, having been designed to solve similar violations. PJM provided performance scores for each of the competitive Option 1a proposals that informed Staff's recommendation. Option 1a proposals that were preferred on the basis of performance and cost were utilized to solve similar violations when they arose across PJM's modeling of different SAA Scenarios.

In addition to PJM's reliability analysis, Staff examined a suite of other transmission benefits and potential impacts, including whether SAA proposals effectively utilized available POIs. New Jersey has a limited number of attractive POIs on the grid to interconnect new, OSW generation. An "attractive" POI may include a variety of considerations, such as availability of excess headroom, location, availability of surrounding land, permitting challenges, and community considerations. In addition, Staff also analyzed whether SAA proposals would ensure healthy competition in future generation solicitations. Ensuring any SAA Solution promotes healthy competition among future OSW generators remains a key element in evaluating the proposals. SAA Solutions that supported competition in future OSW generation solicitations were preferred to those that may stifle competition.

Staff also considered the local economic benefits to New Jersey in its evaluation. Construction of new transmission facilities can provide significant employment and economic benefits to New Jersey as a whole and to local communities within the State. Staff evaluated whether potential

SAA developers proposed and guaranteed ways in which their proposed projects would maximize benefits to New Jersey's economy. SAA proposals that provided higher guaranteed benefits to the State were preferred.

With each proposal, Staff also considered the ability to support a future OSW transmission "backbone." An offshore network, one in which the offshore substations of OSW farms are electrically connected to one another in the ocean, provide potential benefits to New Jersey and the PJM system. These benefits include reducing curtailments of OSW resources, improving system reliability, reducing congestion on the grid, improving OSW availability, and increasing capacity import limits on the onshore system. However, to achieve these benefits, offshore substations and their platforms needed to be designed with the ability to operate in a networked fashion, linked with neighboring offshore substations. Staff evaluated whether the design of the proposed offshore substation was able to facilitate a future "Option 3" offshore backbone network. SAA Solutions that provided the best opportunity to do so were preferred relative to those that would have a limited ability to do so, or no ability at all.

Lastly, Staff examined the operational risks of each SAA bid. Offshore transmission facilities, especially those that are not interconnected to other offshore transmission facilities, can create outage risks for OSW generators if the transmission facilities are disconnected. Staff evaluated whether the SAA proposals provided incentives for maintaining transmission operability in alignment with the needs and incentives of OSW generators. SAA proposals that mitigate outage risks for OSW generators were preferred over those that did not propose an approach or incentives to do so.

#### *Net Ratepayer Cost Impacts*

By utilizing the SAA, New Jersey has the unique opportunity to identify the most cost-effective transmission approach by comparing the total costs of any selected SAA Solution against what would otherwise be needed to enable 7,500 MW of OSW generation. For each SAA Scenario, Staff assessed the expected total ratepayer cost of all necessary OSW-related transmission facilities, the quality of the cost containment provisions proposed by applicants, the proposed cost recovery profile, the PJM energy and capacity market benefits of selecting alternative POIs, and the timing of the cost impacts on ratepayers.

Cost containment mechanisms associated with SAA proposals can limit the risk to ratepayers of cost overruns for transmission projects by creating incentives to complete the proposed projects at the estimated costs. Brattle and PJM conducted a legal review of the strength of submitted cost controls, categorized by their effectiveness, and compared the submissions against the ratepayer cost protections that New Jersey would expect to obtain in its generation procurements (through fixed OREC prices). Staff evaluated the quality of the cost containment mechanisms each bidder proposed by (i) analyzing the scope of the cost cap, if any, on Option 2 facilities, (ii) identifying exclusions and penalties for failing to meet identified commitments, and (iii) reviewing the legal language proposed to enforce the cap in the DEA. SAA proposals that limit the risk of cost overruns to New Jersey ratepayers were preferred to those with weaker or no cost control mechanisms. The final cost allocation, including any cost containment or other commitments would be memorialized as part of the FERC approval process and any authorized costs would flow through to New Jersey ratepayers, as required by the SAA process.

One potential issue that impacted the analysis is that the costs of transmission upgrades are “front-loaded,” meaning that ratepayers may see the costs of any transmission costs in their rates before offshore wind facilities begin generating power. Further, under traditional ratemaking, the costs associated with a new transmission project start higher in the early years of project’s existence, declining over time as the transmission investments are depreciated. On the other hand, a fixed-price payment structure spread out over 20 years—as utilized to recover transmission costs in the Baseline Scenario—distributes total costs equally over time through the OREC schedule. Thus, one consequence of utilizing the PJM transmission planning process is that ratepayers see greater costs in the near term for any selected SAA project, yet those costs would decrease over time. To reduce potential near-term rate impacts, SAA Scenarios with lower near-term costs to ratepayers were preferred to those with more front-loaded cost recovery mechanisms.

Another factor that was taken into consideration was the impact of different SAA Solutions on the revenues that future OSW generation projects would expect to earn in PJM’s markets. Under the OREC structure, any additional revenues earned in the PJM markets are credited to New Jersey customers. PJM identified that using certain POIs could provide additional efficiency benefits in PJM’s energy and capacity markets that thus reduce the net costs of generation to New Jersey ratepayers. SAA Scenarios with higher OSW generation market values (energy and capacity) and lower load payments were preferred, as these items would ultimately offset a portion of the SAA transmission costs.

Staff evaluated the ratepayer cost impacts of the SAA Scenarios in terms of their total installed capital costs and their total (annualized) ratepayer costs. The total installed capital costs include all costs incurred to construct the transmission facilities. These installed costs were then compared on a \$/kW basis to normalize for the differing amount of OSW generation enabled by each proposal. In addition, New Jersey ratepayer costs were calculated in terms of \$/MWh of enabled OSW to estimate what ratepayers would have to pay for the transmission portions of OSW generation in their utility bills over the assumed life of the facilities.

Independently, PJM and its financial consultant assessed the effectiveness of SAA Proposals’ cost containment mechanisms and the lifetime costs to ratepayers, including the total costs of the facilities to ratepayers and OSW generation cost savings. PJM also performed energy market simulations to evaluate the economic performance of selected OSW Scenarios, as well as evaluating the impact of various SAA Scenarios on capacity market parameters, including the CETL. Staff and Brattle reviewed these reports and used their contents to inform their analysis and the evaluation process described above.

Rate Counsel also assisted Staff in evaluating the ratepayer impacts of the SAA proposals. Rate Counsel provided Staff its independent feedback on the ratepayer costs, which Staff closely considered and incorporated into its final analysis.

#### *Schedule Compatibility*

Due to the need for transmission facilities to be built in time for OSW generators to construct, test, commission, and operate their facilities, it is important that the transmission facilities are available

by the time the generator needs them. During the Board's stakeholder meetings regarding the SAA process, OSW generators indicated that project-on-project risk due to a misalignment in the timing of generation and transmission infrastructure is their primary concern with the SAA approach. In fact, the Baseline Scenario (i.e., all OSW-related transmission facilities are constructed by the OSW generator) creates the least project-on-project risk, as the same entity is responsible for coordinating all development of new onshore and offshore facilities related to an individual OSW project (with the exception of required upgrades to existing grid infrastructure).

Staff assessed how well the proposed transmission development schedules aligned with the generation solicitation schedule, and a potential acceleration of the solicitation schedule Staff gave preference to SAA bids with proposed in-service dates of at least 12 months before the generation procurement schedule, and those SAA bids that included flexibility to work with generation developers to ensure schedule alignment.

Additionally, the Baseline Scenario aligns incentives to achieve this coordination, by withholding OREC payments until electricity from an OSW project is flowing to the grid in New Jersey. In its Order instructing PJM to begin the SAA solicitation, the Board emphasized that, "[w]hile the Board continues to see the benefits of exploring a coordinated offshore wind transmission option more fully, the Board notes that it will weigh heavily proposals from Transmission Developers that utilize the voluntary protections laid out in the SAA process to limit down-side risk to New Jersey consumers and to reduce project-on-project risk for [OSW] generation [project] developers."<sup>68</sup> As such, SAA proposals that provided an approach for reducing project-on-project risk were preferred to those that did not.

Schedule commitments can limit the risk of schedule delays by creating incentives or guarantees to complete the proposed projects on schedule. Staff evaluated whether the commitments proposed by the SAA developers were likely to provide assurance that the proposed schedule will be achieved to allow OSW generators to meet their placed in service dates in a manner that is comparable with, or better than, the timeline assurances the Baseline Scenario establishes. SAA proposals with stronger commitments that limit the risk of schedule delays were preferred to those with no or weaker commitments.

### *Environmental Impacts*

Development of transmission lines requires careful consideration of the potential environmental impacts of the construction and operation of these facilities, especially when these facilities are located near environmentally sensitive resources along coastlines and waterways. Staff, Brattle, PJM, and DEP completed an extensive analysis of the potential environmental impacts of the proposed SAA facilities and the permitting process necessary to build these facilities. Each proposal was evaluated both for its impacts on environmental resources as well as the risks associated with receiving the necessary permits to construct the facilities. More generally, SAA proposals were also evaluated based on the number of Transmission Corridors they would create, because of the substantial impact this determination alone has on the ability of proposals to minimize environmental and community impacts.

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<sup>68</sup> November 2020 Order, supra note 33 at 9.

In partnership with Staff, DEP reviewed the pertinent application materials and evaluated each unique proposal as it related to potential environmental impacts and permit feasibility, based on a number of environmental considerations. This analysis included review of the following: wetlands; streams and waterbodies; threatened and endangered species; fisheries; marine and terrestrial habitats; cultural and historic resources; impacts on environmental justice communities; Green Acres-encumbered parklands; and State-owned lands, among other categories. Each proposal was assessed an overall risk level, ranging from low to high. The risk levels were assigned based on the information provided in the SAA bid and any responses to applicable clarifying questions. DEP did not do that because it is early in the proposed project development process, in many cases, sufficient details necessary for a comprehensive environmental assessment were lacking. Thus, the overall risk level assigned in this preliminary review did not necessarily reflect all aspects that determine the actual viability of a project from an environmental and permitting aspect. Due to the relatively early stage of project development of proposals submitted through the SAA, certain elements of the assessment remained subject to future revision, based on evolving developments through the project's life-cycle.

DEP recommended that the Board award projects that minimize the number of cables coming onshore in New Jersey, while also meeting PJM's reliability requirements and the State of New Jersey's transmission needs. DEP further recommended that Cable Routes be sited within existing roads, corridors, and ROWs; avoid Shore Crossings and Cable Routes through back bays and sensitive coastal areas to the greatest extent possible; reduce new impacts to Green Acres-encumbered parkland and State-owned lands, all to the greatest extent possible, while ultimately minimizing the number of radial lines associated with OSW farms.<sup>69</sup> In addition, DEP recommended special consideration be given to applications that avoid impacts to natural resources, minimize impacts where avoidance is not possible, and propose appropriate measures to mitigate impacts when necessary.

In addition to the proposal-specific review, Staff's evaluation also considered the number of Transmission Corridors necessary in each SAA Scenario to achieve the overall New Jersey OSW goal. As described above, having fewer Transmission Corridors provides a number of significant benefits, including potentially greater cost savings, reduced environmental impacts, and fewer community disruptions. Critically, guaranteeing fewer Transmission Corridors through a coordinated transmission approach is the only way to guarantee the wide range of environmental and community benefits outlined above. Although operational risks may exist in having consolidated transmission corridors, SAA proposals enabling achievement of OSW goals with fewer corridors were preferred, due to the substantial benefits enumerated above.

### *Constructability*

To assess whether the transmission facilities could be constructed as designed, Staff, PJM, and DEP evaluated each proposal's design. Many factors contribute to the potential constructability of a proposal, including, but not limited to, supply chain plans, schedule, technology selection,

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<sup>69</sup> Radial lines provide a single pathway from power to travel from a generator to a POI, as opposed to networked facilities, which provide multiple pathways for the power to travel.

developer experience, environmental and permitting challenges, ROWs, and risk mitigation measures.

PJM closely evaluated the proposals and utilized an analysis similar to that of their typical RTEP process. This analysis included reviewing the PJM Proposal Submittal Template (including project description, value proposition to New Jersey, cost control measures, and risk mitigation measures), the Board's Supplemental Offshore Wind Transmission Proposals Data Collection Form, project diagrams and schedules, and the technical analysis files and documentation. PJM's review also included evaluation of project scope, complexity and constructability factors that impact the project cost and/or schedule, including but not limited to ROW acquisition, land acquisition, siting and permitting requirements, project complexity, project coordination complexity, outage coordination, and project schedule.

In addition to including PJM's constructability analysis into its evaluation, Staff and Brattle also closely examined whether the developer had previously built facilities similar to those proposed. A particular emphasis was given to the experience the proposing entities had developing offshore Transmission Projects if they submitted an Option 2 or Option 3 proposal.

Due to the importance of gaining access to the necessary ROW and land to host converter stations near POIs, Staff closely considered the degree to which proposals made use of existing or previously obtained ROW and site control for their proposed facilities. As described above, a coordinated transmission approach requires land for transmission facilities and any associated work OSW generators require for their projects, depending on the scope of the coordinated facilities described in each proposal. Proposals that have already obtained ROW and site control were preferred.

DMAVA staff reviewed proposals that indicated plans to have transmission cables make landfall at the National Guard Training Center ("NGTC") at Sea Girt. DMAVA, who administers the NGTC, assessed potential impacts of SAA Proposals to the grounds and operational mission of this facility. DMAVA staff's review indicates that placing underground infrastructure related to OSW transmission on NGTC grounds is supportable, provided that a number of conditions are met. Those conditions include: (i) Cable Routes that avoid impacts to onsite wetlands; (ii) a construction laydown area that does not disrupt NGTC's activities; (iii) the work to install the transmission infrastructure occurs during a period that would not adversely impact either NGTC's mission or endangered species that are seasonally present at NGTC; (iv) the entity seeking to utilize NGTC as a landfall location endeavors to minimize the number of times heavy construction is required (i.e., seeks to do trenching and earthwork only once); and (v) a long-term easement and a temporary construction easement package must be submitted, processed, and finalized before construction can commence. DMAVA staff's assessment indicated that proposals that contemplate significant above-grade structures and use of an appreciable portion of NGTC's footprint would be disruptive and problematic due to such infrastructure competing with military training site areas and activities on such areas that are routinely conducted at the site. It is important to note that while DMAVA administers the NGTC, the decision to utilize the grounds for any transmission purpose rests with the New Jersey Statehouse Commission.

*Previously Awarded OSW Projects*

The November 2020 Order noted that the Ocean Wind I project, awarded through the First Solicitation, would not be impacted by the SAA solicitation. When the Board awarded projects in its Second Solicitation—Ocean Wind II and ASOW 1 (collectively, “the Second Solicitation Projects”)—it noted that “*interconnection efficiencies for the [Second Solicitation] Project may exist as a result of a selected SAA project...*” (emphasis added),<sup>70</sup> and left open the possibility for the Second Solicitation Projects to utilize an SAA Solution, should the use of the facilities envisioned under the SAA process be in the best interest of New Jersey ratepayers.<sup>71</sup>

In both Orders relating to the Second Solicitation Projects, the Board further noted:

For any deviation from the interconnection plan approved in this Order, including for use of any SAA transmission capability, a mutually acceptable revision to this Order will be required. Prior to the determination by the Board that use of SAA transmission capability is in the best interests of New Jersey ratepayers, [the Second Solicitation Project] will need to pursue its PJM transmission interconnection plan, and will be required to recognize the reasonableness of including such out-of-pocket costs in any mutually acceptable revision to this Order.<sup>72</sup>

More specifically, Staff was instructed that if the determination is made that the utilization of any SAA Solution(s) would increase the benefits to ratepayers and the residents of New Jersey, and would not negatively impact the OSW project, Staff should initiate discussions with each of the Second Solicitation Projects regarding a potential change to its interconnection plan, including the return of any interconnection cost savings to ratepayers in the form of a reduced OREC price.

While not determinative in itself, one additional consideration in Staff’s review of potential SAA Solutions was how well the proposed SAA Solution might work with the Second Solicitation Projects. A key element of this review is the effect of the PJM interconnection queue reform process. All new generators, including OSW projects, must complete PJM’s interconnection queue process. On June 14, 2022, PJM filed revisions to its tariffed interconnection process, proposing to restructure its queue process. The proposed PJM interconnection queue reform rules are currently pending before FERC.

If accepted, the proposed queue reforms are expected to result in significant improvements in the timely processing of interconnection requests over the long-term. However, the proposed queue reforms are expected to impact the two Second Solicitation Projects differently because PJM assigns OSW generation projects into “queue cycles” based on when the OSW generation project submitted to PJM its request for interconnection to PJM. Thus, while ASOW 1’s earlier queue position is expected to complete the interconnection process and receive its ISAs in late 2022, the Ocean Wind II project which has a later queue position is not expected to receive its ISA until

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<sup>70</sup> Atlantic Shores 1 June 2021 Order, supra note 22 at 23; Ocean Wind II June 2021 Order, supra note 21 at 23.

<sup>71</sup> Atlantic Shores 1 June 2021 Order, supra note 22 at 23; Ocean Wind II June 2021 Order, supra note 21 at 23.

<sup>72</sup> Atlantic Shores 1 June 2021 Order, supra note 22 at 24; Ocean Wind II June 2021 Order, supra note 21 at 24.



the latter part of 2026, assuming FERC accepts the proposed queue reforms. Thus, any necessary Network Upgrades needed to interconnect the Ocean Wind II project are unlikely to begin until the latter part of 2026, absent incorporating Ocean Wind II into the SAA process.

The RTEP process has different drivers and separate rules which may result in completion of system upgrades more expeditiously than through the PJM generation interconnection process. While the RTEP planning process and interconnection study queue are coordinated and integrated into a single RTEP, the RTEP process is not constrained by the interconnection study queue and therefore allows for a more expeditious path to building out the PJM system to meet the needs of New Jersey's OSW.

Because of the currently projected timing of the studies for the AG2 PJM interconnection queue position<sup>73</sup> under PJM's proposed transition timing under the proposed interconnection reform rules, Ocean Wind II may significantly benefit from utilizing an SAA Solution rather relying solely on the interconnection process to identify the needed transmission system upgrades. Further, because Ocean Wind II is at an early stage in PJM's interconnection process, the Ocean Wind II project would be able to request and apply SAA Capability to its existing PJM queue position under the terms of the SAA Agreement.<sup>74</sup> This has beneficial timing implications.

The Board and the State of New Jersey are interested in seeing Ocean Wind II and all other projects fully developed and delivering clean energy to New Jersey's grid within the timeframe proposed in its application. The Board explicitly contemplated potential interconnection efficiencies of this type in approving Ocean Wind II. Thus, Staff evaluated the benefits of SAA Solutions that could potentially accommodate the Ocean Wind II project and alleviate the delay concerns related to Ocean Wind II's current queue position, in light of PJM's ongoing interconnection queue reforms and transition timing associated with such reforms.

ASOW 1 has a clear path toward completing the interconnection queue ahead of PJM's proposed reforms, with an ISA expected later in 2022. However, since the SAA Scenarios that PJM studied included all of the targeted 7,500 MW except for the projects that already had executed ISAs as of November 2020, ASOW 1's capacity of 1,510 MW at Cardiff was included in all SAA Scenarios. PJM has provided guidance on how the ASOW 1 interconnection could be impacted by the SAA project.

PJM provided that if the selected SAA projects obviate the need for identified Network Upgrades or reduced scope for ASOW 1, then ASOW 1 would not be required to build and fund those upgrades projects in their ISA and PJM will reconcile costs as appropriate. PJM also noted that there should be no change to the selected SAA projects unless ASOW 1 requires additional system capability in addition to what is provided by the selected SAA projects.

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<sup>73</sup> "[PJM interconnection] Generation request queues are groups of proposed projects, including new units, reratings of existing units, capacity resources and energy only resources. Each queue is open for a fixed amount of time ... Queue AG2 opened on October 1, 2020 and closed on March 31, 2021..." Independent Market Monitor, State of the Market Report 2021 at: 625, [https://www.monitoringanalytics.com/reports/PJM\\_State\\_of\\_the\\_Market/2021/2021-som-pjm-sec12.pdf](https://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2021/2021-som-pjm-sec12.pdf).

<sup>74</sup> See SAA Agreement, sections 4.3 (a), 5.3, 6.2(d)(i).

It is important to recognize that PJM's guidance suggests that the SAA projects, even when not explicitly creating capability for ASOW 1 to utilize in its interconnection study,<sup>75</sup> could impact the actual upgrades needed for interconnection of the ASOW 1 project.<sup>76</sup> Because the SAA project is not yet PJM Board-approved as an RTEP baseline project, the extent of the changes to the Network Upgrades that will be assigned to ASOW 1 cannot be determined at this time. However, PJM has affirmed that it will update its analysis following PJM Board approval to ensure that only the needed transmission upgrades are included in the RTEP and affected ISAs to accommodate the SAA Capability and the queue project interconnection requirements. It is possible that with an SAA project in place, ASOW 1's 1,510 MW injection at Cardiff may be able to rely upon more cost-effective SAA system upgrades in lieu of those identified in its ISA. Because PJM cannot perform a study that integrates the ASOW 1 ISA with approved SAA projects until SAA projects are approved and ASOW 1's ISA is executed, Staff requests flexibility from the Board to continue to closely monitor this integration process and make further recommendations as Staff deems appropriate. This will ensure facilities are built efficiently and costs are not duplicated. ASOW 1 should not see an increase in its costs as a result of the SAA.

### **Evaluation Results**

The evaluation results of the SAA proposals discussed herein are the combined analyses and findings completed by PJM, Brattle, DEP, Rate Counsel, and other relevant State agencies. Staff relied on the following to support its recommendation herein<sup>77</sup>:

- All application materials submitted by all SAA bidders, including Clarifying Question responses;
- Brattle's evaluation report;
- PJM reports;
- DMAVA's memos;
- Rate Counsel's memo;
- DEP's memo; and
- The Pinelands Commission's memo

Staff initially compared the attributes of the four categories of SAA procurement – Option 1a, Option 1b, Option 2, and Option 3 – against the attributes of the Baseline Scenario described above. This comparative evaluation enabled Staff to initially recommend the appropriate scope and attributes of attractive SAA proposals. On the basis of this initial recommendation, Staff identified specific proposals that satisfy these scope and attribute criteria, to be compared against

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<sup>75</sup> ASOW 1 project System Impact studies were completed in February 2020.

<sup>76</sup> The costs may be removed if a Baseline project obviates the need for Network Upgrades, but the Baseline upgrades will need to be listed as Contingent Facilities in the ISA. The OSW generator will not be permitted to go in-service without the upgrades unless an interim deliverability study demonstrates the unit is deliverable. If any Network Upgrades are obviated by a Baseline project, then all affected ISAs that benefit from the same upgrades would be updated.

<sup>77</sup> The following materials were critical in informing Staff's recommendation herein. These materials are located on the Board's Public Document Search, under Docket No. QO20100630, [https://publicaccess.bpu.state.nj.us/CaseSummary.aspx?case\\_id=2109468](https://publicaccess.bpu.state.nj.us/CaseSummary.aspx?case_id=2109468).

one another for final recommendation to the Board. This evaluation framework is supported by the need for a feasible process to sort through a wide range of transmission facilities submitted that were not direct competitors against other project proposals. In addition, this initial recommendation, which will identify attributes of favorable SAA Scenarios, is necessary to ensure that the appropriate scope of SAA facilities are recommended for Board approval, as compared to the Baseline Scenario.

#### *Export cable technology: HVAC vs HVDC*

During the evaluation, Staff and Brattle considered the implications of HVAC and HVDC technology for the connections from the offshore facilities to the onshore grid. The evaluation concluded that HVDC technology is preferable to HVAC technology for the following reasons:

1. Fewer physical cables are needed in the case of HVDC technology, resulting in less impact to the environment and communities, and potentially enabling more capacity to utilize the same Transmission Corridor.
2. HVDC cables can be economically employed over longer distances, and result in fewer line losses, which creates a more even playing field for bidders into future New Jersey OSW solicitations given the distances to most of the BOEM OSW lease areas in the New York Bight.
3. Technology trends inside and outside the U.S. indicate a move towards HVDC technology for larger OSW farms.
4. Other states in the region have made a definitive choice for HVDC technology.

The choice for HVDC requires the construction of converter stations both offshore and onshore. The onshore converter stations will typically be located within a reasonably close distance from the POI, and have a footprint of several acres each. Current HVDC technology requires that the offshore and onshore converter stations need to be compatible, which usually means that they each need to be procured from the same supplier.

A decision with respect to POIs and onshore infrastructure upgrades is necessarily dependent both on whether the Board elects to include offshore options in its SAA decision, as well as on the location of any selected POIs. Thus, the evaluation process entailed a review of the merits of the offshore proposals compared to the Baseline before a determination could be made on the suite of potential onshore solutions. In addition, since all developers submitting Option 3 proposals indicated that they were contingent on the selection of that developer's relevant Option 2 proposal, and because certain Option 2 proposals also required the selection of associated Option 1b proposals, the evaluation of Option 2 proposals informed the decision-making with respect to all other categories of proposals. Therefore, the analysis of Option 2 proposals is presented first.

#### *Option 2*

An Option 2 solution would extend the PJM Grid into the ocean, providing a potential interconnection location for OSW generators that is relatively close to the turbines. When it initiated the SAA solicitation, the Board desired an Option 2 solution that would reduce the number of Shore Crossings to support 7,500 MW of offshore wind. To enable this outcome, offshore

collector stations would need to be designed to collect electricity from more than one OSW farm, and bring the electricity from these projects collectively onshore to associated POIs. However, at the conclusion of Staff's analysis, it was determined that none of the Option 2 proposals offer sufficient benefits to the State to garner Staff's recommendation, and do not improve upon the baseline Scenario. This conclusion rests on the following evaluations.

i. Technological Limitations

The Option 2 proposals submitted provided for individual offshore substations that could collect between 1,200 - 1,500 MW of capacity. Many OSW farms currently being developed, as well as the Ocean Wind I project and the Second Solicitation Projects that the Board has already awarded, are in the same range of capacity as the current substation limits of between 1,200 – 1,500 MW. Staff expects that future OSW generation projects will be comparable in size to the existing projects. Therefore, the SAA bidders' Option 2 designs as proposed would predominantly connect a *single* OSW project to each particular offshore substation and export cable, rather than connect multiple OSW farms.

From the Board's perspective, an important benefit of an Option 2 solution is to reduce the number of export cables required to accommodate future OSW projects, thereby reducing offshore Transmission Corridors and required landfall locations. Because the offshore substations in the Option 2 proposals submitted can only accommodate a maximum of 1,500 MW, or only a single OSW farm project at a time, the Option 2 proposals did not reduce the number of cables to interconnect each OSW generation facility.

However, the Board expects that HVDC technology will advance significantly over the next few years and that a future SAA solicitation provides an opportunity for the technology to mature. For example, it is expected that within the near future, capacity ratings for individual HVDC systems will significantly increase and may very well allow for a single collector station to accommodate multiple offshore wind farms of the size expected to be bid. Further, any future offshore transmission solution must be able to meet the full scope of New Jersey's 11,000 MW OSW goal, potentially enabling an even larger offshore wind grid in the future, as well as potentially accessing federal funding opportunities that are not currently available, but may be available for a future coordinated transmission initiative.

ii. Costs to New Jersey

In order to enable appropriate comparison of the cost of Option 2 solutions against the Baseline Scenario, Staff and Brattle, together with PJM, developed SAA Scenarios. For each SAA Scenario, Staff and Brattle developed cost estimates for the complete set of new transmission facilities needed to integrate 6,400 MW of OSW generation, including the transmission facilities from the OSW generation facilities to the proposed SAA facilities, depending on the specific facilities included in each SAA Proposal. Without this combination of facilities into full SAA

Scenarios, it would be challenging to directly compare the costs of different Option 2 facilities, each of which enables varying amounts of OSW generation in varying configurations.<sup>78</sup>

Notably, transmission-only projects do not currently qualify for the ITC, which provides a federal tax credit for capital investments in renewable energy projects, including OSW. As noted above, Congress established a 30% ITC for any OSW generation project that commences construction by December 31, 2025. If OSW generators construct the transmission necessary to bring their respective projects onshore, costs for these systems, having been part of the project's capital investments, are eligible for the 30% ITC. However, stand-alone transmission projects, including Option 2 proposals, would not have access to the ITC.

Another factor that Staff considered is that the cost containment mechanisms in SAA proposals are weaker than the cost containment provided in OREC awards—which is considered best-in-class in terms of ratepayer protections. ORECs are only awarded once an OSW project begins generating electricity. Further, awards specify a fixed price with exclusions limited only to increases in Network Upgrade costs. Many of the cost commitments of SAA proposals included only soft cost caps that reduced the allowed return on equity, or that contained significant exclusions—all of which would leave additional risk with New Jersey ratepayers compared to the Baseline Scenario with transmission costs recovered through ORECs. Accordingly, no cost containment proposals submitted support a Staff recommendation in favor of Option 2 facilities to be procured through the SAA.

While the Board was hopeful that Option 2 proposals would nonetheless be cost preferred even without receiving the ITC, unfortunately, the Board did not receive such applications in the SAA solicitation process. Staff remains optimistic that the costs of coordinated transmission will continue to decrease, which could open the door to a procurement of Option 2 facilities through a future SAA solicitation. In addition, a revision to the ITC that enables independently-developed OSW transmission facilities to qualify for this tax credit, and/or additional sources of federal funding, would materially improve the comparative cost-effectiveness of independent transmission solutions.

### iii. Locational Implications of the Proposed Offshore Wind Platforms

Under an Option 2 solution, offshore substations would collect the electricity from the wind farms constructed by OSW generators who received awards in New Jersey's OSW solicitations. In their SAA proposals, some developers proposed pre-specified fixed locations for the offshore wind substations ("fixed" locations), while others offered to finalize locations of the offshore substations following the selection of the OSW generation projects through the State's solicitation process ("flexible" locations). Both of these approaches provide distinct benefits and challenges.

One substantial benefit of the flexible substation location approach is that it optimizes the location of the offshore platforms close to OSW generators. While the flexibility of this approach is

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<sup>78</sup> As discussed further below, SAA Scenarios also set out POI and injection amounts, enabling PJM to identify the appropriate Option 1a Network Upgrades to ensure reliability after accounting for the SAA Scenario injections.

attractive, it also presents a potentially considerable delay risk. Rather than immediately starting the necessary processes, the transmission developer could not finalize permitting and construction plans until after the Board awards the OSW generation project. This results in a delay commensurate with the State's procurement schedule for offshore wind.

One of the sought-after benefits of any SAA Solution is the substantial timing advantage, achieved by pre-building transmission facilities to accommodate future OSW generation. A solution using flexible locations for OSW platforms that could not be pursued until after generation facilities are selected fails to achieve this timing advantage. For this reason, a flexible location offshore substation design, initiated upon award of OSW generation bids, significantly increases project-on-project risk associated with delivering OSW generation, as discussed further below.

Alternatively, pre-specified, fixed locations for the OSW substations that could begin permitting immediately present their own set of challenges. Fixed locations for OSW substations could hinder competition in future generation solicitations, as compared to the Baseline Scenario. The Board would have to determine the pre-specified, fixed locations, which would provide significant advantages to nearby offshore wind projects over more distant projects, as having these fixed locations would increase the distance of offshore cables to the substations from the BOEM OSW lease areas more distant from the substation. This could provide significant disadvantages for some OSW generators in competing with others in future OSW solicitations.

A related challenge to the fixed approach is the likely need to build additional offshore platforms when compared against the Baseline. Inter-array cables are generally designed at lower voltage and therefore limited in their maximum length. Therefore, unless the Option 2 offshore substation is located near, or within, an offshore wind project, the project would need to build an additional offshore platform within its lease area in order to interconnect the individual wind turbines. The collector station in the wind farm would then connect to the offshore substation built by the transmission developer at the pre-specified fixed location. As compared with the Baseline approach, where each OSW generator would require only one offshore substation (per 1,200 MW - 1,500 MW) to interconnect its wind turbines, the need for additional offshore platforms and substations could increase the total cost of each OSW project by \$200 - \$300 million.

#### iv. Schedule Guarantees & Project on Project Risk

The unbundling of OSW transmission and generation responsibilities raises coordination challenges and increases project-on-project risk. While all potential SAA Solutions carry a degree of project-on-project risk, OSW generators widely indicated that Option 2 projects would present the largest increase in risk relative to the Baseline Scenario. The November 2020 Order required Staff to fully evaluate this issue, and recommend solutions that mitigated the Board's concerns about ratepayer exposure to downside project-on-project risks.

If an Option 2 SAA Solution were pursued, OSW generators would no longer control the development, and thus timing, of their project's transmission solution. Since an electrical connection is necessary to construct and test the wind turbines, OSW generators have a substantial interest in whether the offshore transmission solution is complete in time for the OSW project to be tested and commissioned to meet the project schedule. In comparison, the Baseline OREC mechanism includes (by design) a mechanism for incentivizing timely project completion,

by withholding project revenues until the project delivers energy to the New Jersey transmission system.

Since New Jersey's OREC payment mechanism allows payments only when the OSW generation project delivers electricity to the grid, any generator will be acutely concerned about ensuring the necessary transmission infrastructure is fully in place by the time their offshore wind project is constructed and ready to generate electricity.

While certain SAA Option 2 bidders did submit schedule commitments and financial penalties for completion delays, no SAA bidder submitted innovative risk sharing proposals that would insulate New Jersey ratepayers from the risk of OSW generation facilities being stranded due to a delay in completing the necessary transmission facilities, particularly compared to the Baseline. Without an appropriate risk-sharing mechanism, the SAA transmission developer's incentive to complete the transmission projects on time is significantly weaker than the generator's incentive under the Baseline. The high level of permitting, logistical, and supply-chain challenges associated with achieving on-time development of offshore transmission facilities further elevates the project-on-project risk.

In addition to scheduling concerns, operational concerns exist when an entity other than the OSW generator is responsible for constructing the transmission solution. In an Option 2 scenario, OSW generators would be fully reliant on the transmission developer to ensure availability of the necessary transmission facilities; without these transmission facilities, the generator cannot deliver their output to the grid and earn revenues. None of the SAA bidders proposed an incentive structure that would tie cost recovery of the transmission facilities to the operational performance of these facilities. While transmission facilities tend to be highly reliable, selecting Option 2 facilities through the SAA creates additional risks for OSW generators due to the misalignment of incentives between OSW generators and the SAA transmission developer. While SAA facility developers face few consequences if their facilities are unavailable or not repaired expeditiously, poor operational performance would be disproportionately consequential for OSW generation projects and New Jersey ratepayers, who would not receive the contracted OSW generation.

v. Summary of Comparison of Option 2 Proposals with the Baseline Scenario

In evaluating these proposals against the Baseline Scenario, Staff concluded that the Option 2 proposals submitted provided limited additional benefits and a higher degree of risk, compared to similar transmission facilities constructed by OSW generators.

Staff recognizes that there are benefits that would come with selection of an Option 2 solution that would not be realized with an Option 1-only solution. These benefits include:

1. Consolidation of offshore cable corridors, including Shore Crossings, and potentially onshore Cable Routes. A consolidation leads to fewer environmental impacts, disturbances to communities, permitting risks, and improved utilization of the POIs on the existing PJM Grid.
2. Inclusion of land that will be required to build the onshore HVDC converter stations into the SAA Solution. As discussed earlier, the footprint of HVDC converter stations is not

trivial, and the Board's selection of specific POIs to which future OSW generation projects will be required to connect, could lead to a land rush for suitable parcels close to the POI.

Currently, these benefits do not override the downside project-on-project risk, operational, technological, and timing attributes outlined above to support a Staff recommendation to procure Option 2 transmission facilities. Further, the proposed Option 2 facilities do not appear to provide cost advantages compared to this baseline, at this time. However, as part of the SAA evaluation, Staff analyzed whether some of the other SAA proposals could enable the main identified benefits of Option 2 as part of the SAA, as discussed further below.

In sum, while all of the Option 2 proposals achieved PJM's reliability criteria and some of the proposals included the capability to integrate into an offshore network, the comparison against the Baseline Scenario make the Option 2 proposals undesirable at this time.

### *Option 3*

Option 3 proposals received were dependent on the selection of Option 2 proposals. Therefore, the Option 3 transmission interlinks could only be evaluated together with their corresponding Option 2 segments. If the Option 3 interlinks had provided substantial value, such benefits could have influenced the evaluation of Option 2 facilities. This was not the case.

#### i. Reliability Benefits

Staff and PJM's analysis determined that Option 3 links will provide some reliability benefit by providing alternative paths to deliver offshore generation if an Option 2 transmission facility is temporarily made unavailable under certain operational configurations. As part of a full package analysis, the benefits of Option 3 proposals were evaluated and included in the incremental costs, ability for future growth, and the net benefits. However, given the determination that an Option 2 is not desirable at this time, there is no basis for an Option 3 procurement at this time, based on the proposals received.

Three SAA bidders proposed Option 3 transmission facilities through the SAA process for the Board's consideration. The HVDC links proposed by two of the developers for their respective, proposed Option 3 facilities do not feature the technical design and operational capability that would allow these links to be controlled and optimized in order to capture any future market efficiency benefits for New Jersey ratepayers. Rather, these links would be "normally-open," unable to create a controllable offshore network—unless additional equipment (such as HVDC circuit breakers) would be added in the future at substantial additional costs. The bidder who submitted an HVAC configuration similarly assumes HVAC cables that are only on "standby" during normal operations and could only be used with significant operational restrictions during outages of some of the interconnected Option 2 facilities. While such Option 3 links will have some value even if used only as backup links to mitigate Option 2 outages and improve the reliability of OSW deliveries to shore, bidders have not provided analyses showing that the backup function would be of sufficient value to justify procuring Option 3 transmission links at this point.



ii. Energy and Capacity Market benefits

PJM's analysis concluded that the Option 3 proposals failed to provide meaningful energy and capacity market benefits, which, under the OREC construct, would be passed on to ratepayers. The PJM simulations of future market conditions suggest that there will be only minor differences in wholesale energy market and capacity market benefits, insufficient to support a recommendation of Option 3 proposals.

iii. Constructability, Technology and Cost

PJM's constructability review determined that all proposed Option 3 projects were potentially feasible and are reasonably capable of being constructed in an offshore environment, provided that proper design and construction methods are used.<sup>79</sup> However, PJM noted several concerns regarding proposed HVDC ties as interlinks between offshore platforms. Since HVDC circuit breaker technology for the voltages and systems contained in the proposals is still in early development by HVDC suppliers, none of the HVDC interlink cables can be switched while energized. This limits reconfiguration of offshore transmission systems to only times when the entire system can be de-energized. This will require curtailment of all OSW generation prior to full de-energization and coordinated startup between the transmission system and available OSW generators. Further, it appears that HVDC breakers will require their own offshore platform due to the size and configuration of the equipment involved which would further increase the cost of the interlinked system when this technology becomes available. Lastly, PJM's evaluation noted that regional system operators are not yet ready for meshed offshore grids in terms of regulatory (planning, open access) frameworks and market integration.

Rate Counsel also noted that Option 3 projects contain significant additional costs relative to Option 1a and 1b proposals, and therefore would not be in ratepayers' interest.

Summary of Comparison of Option 3 Proposals with the Baseline Scenario

When initiating the SAA, the Board was hopeful an Option 3 scenario may be the right solution for New Jersey. However, the Option 3 proposals as bid do not provide benefits to the State that are commensurate with the high costs and do not improve on the Baseline Scenario. Staff remains committed to exploring the option of a full ocean grid as the industry and technology matures. The new 11,000 MW goal announcement provides the opportunity for this exploration and, potentially, future SAAs to support the increased goal. The future option value to build Option 3 facilities can be facilitated by requesting "mesh-ready" offshore substation designs in future OSW solicitations, as other states have done.<sup>80</sup> It is likely that future regulatory developments,

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<sup>79</sup> PJM Constructability Report: Option 2&3 Proposals 2021 SAA Proposal Window to Support NJ OSW at 59, 97, 160.

<sup>80</sup> See NYSERDA, "2022 Offshore Wind Solicitation," <https://www.nyserda.ny.gov/offshore-wind-2022-solicitation>. For its 2022 solicitation, NYSERDA required the use of HVDC transmission links to shore, which have lower right-of-way requirements, lower environment impacts than HVAC cables, and are a precondition for controllable offshore grids. With engineering support and stakeholder input, NYSERDA also developed technical standards for mesh-ready offshore substations that can accommodate at least

including development of tax policy and potential federal funding streams, will continue to enable and enhance the attractiveness of facilities required for a network offshore grid. Perhaps in the future, federal funding and tax policies will apply to transmission-only projects that support OSW growth.

### *Option 1*

Having concluded that neither an Option 2 nor an Option 3 scenario should be included in Staff's recommendation to the Board, Staff examined the Option 1 proposals, which include all transmission upgrades and new facilities that are fully onshore. The proposals were separated into Option 1a proposals, which included system upgrades to existing onshore facilities, and Option 1b proposals, which build out new onshore transmission connection facilities, including upgrades from the default or alternative POIs up to, and including, new onshore substations. After comparison of the attributes of these SAA Bids with the Baseline, Staff analysis demonstrates substantial benefits of Option 1a solutions. Option 1b solutions are also advantageous, and additional design considerations, outlined below, enable Option 1b procurements to provide many benefits of Option 2 outlined above. This analysis and comparison informed Staff's recommendations of the SAA facilities to be procured through the SAA, reflected in the Favorable SAA Scenarios used in Staff's final recommendation below.

### Option 1a

Through a close collaborative process, PJM, Brattle, and Staff selected and analyzed Option 1a Network Upgrade solutions to address PJM-identified reliability needs for each identified SAA Scenario, utilizing the following process.

First, PJM's reliability analysis identified the specific violations associated with the amounts and locations of injections associated with each SAA Scenario. Second, where only one SAA bid was available for a necessary grid upgrade identified in PJM's reliability analysis, that Option 1a solution was selected as the preferred bid.<sup>81</sup> Third, where no SAA bid was available for a necessary Option 1a solution that could resolve an identified reliability violation, PJM requested a solution (including a cost estimate) from the incumbent TO, which was applied as the preferred bid. Lastly, in cases where more than one SAA bid was available to resolve a reliability violation, Staff and Brattle worked with PJM to select the lowest-cost Option 1a bid that (i) provided a complete solution, (ii) was acceptable to PJM from a technological and operational perspective, and (iii) did not raise any significant constructability or permitting issues.

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two HVAC cable links between neighboring wind farms, capable of at least 400 MW per link. The incremental cost of procuring such mesh-ready offshore platforms is estimated to add less than 1% to the total cost of OSW generating plants. See discussion of "Mesh Network Optionality" and "HVDC Transmission" in NYPS&C, Order on Power Grid Study Recommendations, CASE 20-E-0197 et al., January 20, 2022 at 9–15. <https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7b23F0F463-A059-4CFC-9134-4535F660611F%7d>. See also id.

<sup>81</sup> PJM Reliability Analysis Report, 2021 SAA Proposal Window to Support NJ OSW, September 19, 2022 at 8.

Brattle estimated that procuring Option 1a upgrades through the SAA will reduce costs to New Jersey ratepayers by an average of about \$1.1 billion, compared to the Baseline Scenario, for the injection of 6,400 MW. Without the SAA, the PJM system upgrades identified through PJM's conventional interconnection process (i.e. Network Upgrades) are estimated to cost approximately \$1.5 billion. Through the SAA, the Board can obtain similar injection rights at an estimated cost of \$271 million to \$863 million (with an average of \$445 million), depending on the POIs and injection levels selected. The large cost reduction for PJM system upgrades is attributable to utilizing a coordinated and proactive planning approach that simultaneously creates the necessary SAA Capability for all of New Jersey's OSW generation up to 7,500 MW and identifies the most attractive Option 1a upgrades through the SAA solicitation process.

Based on the results of these reliability and cost analyses, along with the attributes of Option 1a proposals explained below, procuring the PJM network system upgrades necessary to allow OSW generators to interconnect at selected POIs through the SAA provides clear cost-savings benefits to New Jersey ratepayers. In addition to these substantial cost savings, Staff found numerous additional benefits of procuring Option 1a facilities through the SAA when compared against the Baseline Scenario.

First, completing a full range of interconnection studies in advance of selecting the OSW generation projects greatly reduces the cost and timing uncertainty inherent in PJM's conventional interconnection process. Timing benefits exist by allowing work to begin on needed Option 1a system upgrade facilities at the time PJM's Board approves the SAA-awarded facilities, as opposed to construction of generator-specific Network Upgrades which would not begin development until the completion of the OSW generators' queue process. This timing changes the critical path milestone for network system upgrade facilities—under the Baseline Scenario, construction of Network Upgrades cannot begin until after the completion of the generator's queue process, whereas under the SAA, the same transmission upgrades can be developed simultaneously with the generator's progression through the queue.

Second, with the selection of Option 1a facilities through the SAA, the Board can identify its preferred POIs and enable SAA Scenarios that most effectively utilize the available SAA Capability of these POIs. In the Baseline Scenario, each generator will propose to interconnect at a POI that best suits their individual project, which may result in inefficient utilization of POIs from a state-wide perspective, including the potential for stranded headroom or the construction of multiple transmission facilities or Transmission Corridors to access the same POI.

Third, selecting Option 1a upgrades through the SAA process will likely increase competition in future OSW generation solicitations. Procuring the Network Upgrades prior to these solicitations will reduce some of the complexity and uncertainty associated with developing OSW generation bids, since obtaining POIs through the conventional PJM interconnection process is associated with significantly higher cost and timing uncertainties. The reduced POI- and interconnection-related risks and cost uncertainty should decrease the cost of OSW procurements by reducing complexity and network-upgrade related cost and timing risk.

Fourth, the incumbent PJM TO will build most of the Option 1a system upgrades selected through the SAA process. These TOs, as per general business practice, have not proposed specific cost-

control mechanisms.<sup>82</sup> The level of uncertainty inherent in the cost of these upgrades is evaluated to be similar both across the available Option 1a solutions, and with respect to the uncertainty in cost estimates that OSW generators would face for system upgrades triggered through PJM's conventional generation interconnection process. Cost uncertainty is, therefore, neither improved nor worsened by procuring Option 1a facilities through the SAA. However, several independent transmission developers have proposed cost control mechanisms for a subset of the selected Option 1a upgrades (for example, those upgrades needed on the Pennsylvania-Maryland border<sup>83</sup>) that provide a degree of cost control benefit relative to upgrades that PJM would identify under the conventional interconnection process. Further, in utilizing PJM's competitive SAA process, the Board could identify the widest range of available alternatives, and select the most cost-effective Option 1a upgrades. This optionality is unavailable to OSW generators requiring Network Upgrades under the Baseline Scenario.

Fifth, none of the Option 1a proposals submitted into the SAA solicitation (including those requested by PJM from the incumbent TOs to address SAA-related needs not addressed by SAA bidders) provided schedule commitments. However, due to the structure of advanced procurement of transmission facilities as part of the SAA, in contrast to the Baseline's timing of Network Upgrade procurement at the completion of the OSW generator's PJM queue process, delivery of coordinated onshore system upgrades selected through the SAA would provide timing benefits including reduced schedule risk relative to the Baseline Scenario.

Sixth, selecting Option 1a facilities through the SAA reduces the total number of upgrades necessary to interconnect OSW generation projects and thus the net environmental impacts and permitting challenges associated with Option 1a upgrades required to achieve the injection 7,500 MW of OSW. These benefits are enabled by evaluating the suite of violations associated with the full 7,500 MW of injection (6,400 MW of SAA Capability) simultaneously, as opposed to in-sequence under the Baseline.

Seventh, selecting POIs and their associated PJM transmission system upgrades through the SAA is a necessary first step in reducing the number of Transmission Corridors needed to deliver OSW generation to the available POIs. Procuring all necessary onshore transmission facilities in a coordinated manner allows for an outcome where fewer Transmission Corridors are required to accommodate the interconnection of several OSW generators. The reduced number of Transmission Corridors, as well as simultaneous construction of all major onshore facilities necessary to accommodate transmission needs, will reduce the impacts of onshore transmission construction on New Jersey communities. The procurement of Option 1a facilities alone are insufficient, but is a necessary prerequisite to reducing the number of Transmission Corridors.

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<sup>82</sup> Under the PJM Operating Agreement, any construction to be performed on facilities owned by an incumbent TO shall be performed by that TO. See 172 FERC ¶ 61,136 (2020) at 84-85.

<sup>83</sup> Upgrades to facilities outside of New Jersey will be required and recommended under today's Order. These facilities were identified by PJM as necessary to integrate 7,500 MW of OSW, with or without the SAA. These facilities are required to enable the full injection capability of the OSW generators modeled in SAA Scenarios, and will not be critical path milestones preventing testing or initial operation of OSW generators.

In sum, Staff's evaluation demonstrates that procuring Option 1a solutions through the SAA reduces cost and schedule risk to OSW generators by allowing earlier initiation of required upgrades on the PJM system. Further, procuring Option 1a facilities provides the Board with the ability to specify POIs and injection amounts that can most fully utilize the capability of the existing grid and enable the reduction of environmental and community impacts. As discussed further below, ensuring the benefits of reduced community impacts requires additional coordination beyond procurement of Option 1a facilities. However, selection of the necessary Option 1a facilities is a necessary prerequisite to enabling any additional scope of procurement that would then capture these benefits.

### Option 1b

Four SAA bidders initially submitted Option 1b-only proposals. Several other bidders provided Option 1b proposals within and as part of their Option 2 proposals.

Through clarifying questions, Staff confirmed whether such transmission developers would be willing to construct the Option 1b-only portion of their Option 2 proposals, including the onshore HVAC components of their solutions and the acquisition of the land adjacent to such components, with sufficient space for future HVDC converter stations, similar to the Option 1b only proposals.

Some developers were amendable to scaling back their Option 2 proposals to construct just the Option 1b elements, including the AC portion of the proposed substation and the acquisition of the adjacent land for the future HVDC converters. Others indicated that this change would not be a good fit for their business model. Still others proposed modifications to the Option 1b-portion of their Option 2 proposals. Notably, some provided a scaled-back version of their Option 2 proposal, but also included the underground Duct Banks and access Cable Vaults between the coordinated POI and the shoreline (landfall site) to house the electric transmission cables of two or more future OSW projects, but without installing the associated electric transmission cables. This approach would allow for a reduced number of Cable Routes and construction efforts. Staff referred to these solutions as "Option 1b+", and more specifically, the prebuilding of Duct Banks and access Cable Vaults that future awarded OSW projects would use was referred to as the "Prebuild Infrastructure." To clarify, the Option 1b+ proposals included the Option 1b upgrades, as well as the Prebuild Infrastructure—the Duct Banks and access Cable Vaults.

In total, 28 Option 1b/1b+ proposals were evaluated. In reviewing the applications and PJM's analysis, Staff made several findings regarding the Option 1b/1b+ proposals.

First, many Option 1b proposals are cost competitive compared to the Baseline. Notably, the Option 1b proposals allow OSW generators to apply the ITC to a larger range of total cost, as compared to an Option 2 proposal.<sup>84</sup>

Second, the selection of Option 1b facilities enables the POI utilization benefits described above

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<sup>84</sup> Further, while a few of the Option 2 proposals were proposed at a cost competitive level, the larger construction commitment for Option 2 increases the risk of cost overruns compared to an Option 1b solution. As noted below, the strongest cost containment mechanism is the OREC.

by coordinating not only the injections at the POI, but also the access to the POI through common Transmission Corridors. The design and scope of specific Option 1b facilities still weigh heavily on the degree of POI utilization benefits available, with facilities that extend POIs closer to shore increasing these benefits. The maximum capacity of Option 1b proposals also indicates the level of reduced community impacts ascribable to each proposal. For instance, the largest Option 1b solutions can reduce the number of onshore Transmission Corridors required to achieve the remaining 3,742 MW of OSW to achieve 7,500 MW from three Transmission Corridors in the Baseline Scenario, to either one or two Transmission Corridors, depending on the size of the Option 1b facility. Option 1b facilities that could reduce the number of Transmission Corridors to one were preferred, in order to avoid the environmental and community impacts of an additional Transmission Corridor.

Third, selecting Option 1b upgrades through the SAA process will likely increase competition in future OSW generation solicitations by providing a single “plug” for OSW generators to attach their own facilities. Any coordinated Transmission Corridor also reduces permitting and land acquisition requirements associated with an OSW generator’s construction of necessary onshore transmission facilities. Further, benefits to competition are expected based on the access provided by Option 1b proposals to land near the POIs for locating HVDC converter stations. Procuring Option 1b proposals that offer sufficient space for this construction encourages robust competition, particularly from offshore leaseholders who may not have already secured land near POIs.

Fourth, similar to Option 2 facilities, the cost containment mechanisms in Option 1b proposals are weaker than the cost containment provided in OREC contracts with OSW generators—which is considered best-in-class. The OREC-approving Board Orders specify a fixed price with exclusions limited only to increases in Network Upgrade costs. In contrast, many of the cost commitments of SAA proposals included only soft cost caps that reduced the allowed return on equity or contained significant exclusions—all of which would leave additional risk with New Jersey ratepayers compared to the Baseline Scenario with OREC cost recovery. This observation supports Staff’s recommendation to procure only the coordinated facilities required to enable the substantial reduction in environmental and community impacts associated with coordinated Transmission Corridors.<sup>85</sup>

Fifth, the proposed schedules for developing Option 1b facilities closely track the specified OSW solicitation dates, with online dates 12-18 months or more prior to the anticipated in-service dates for OSW generation (to allow for power back-feeds for turbine testing). In addition, PJM evaluated each delivery date, including providing an independent estimate of critical path milestones of each project, confirming that the proposed schedule for most Option 1b proposals is feasible.

No SAA bidder submitted innovative risk sharing proposals that would insulate ratepayers or OSW generators from the risk of OSW generation facilities being stranded due to a delay in completing the necessary transmission facilities. In contrast, the entire revenue stream of an OSW generator is contingent upon successful completion of transmission facilities. Staff’s observations support

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<sup>85</sup> Note, the decision of whether to procure these Coordinated Transmission Corridor facilities through the SAA will be discussed further below.

utilizing the Baseline OREC procurement mechanism to the extent possible to enable coordinated Transmission Corridors, which allows for the benefits of coordination while minimizing project-on-project risk, as discussed further below.

### **Staff Recommendation**

As discussed herein, the SAA process has enabled the State to incorporate its public policy requirements within a competitive Transmission Project solicitation. As a result of the Board's decision to participate in the SAA process, Staff was afforded the ability to evaluate 80 proposals designed to enable New Jersey to achieve its goal of integrating 7,500 MW of OSW generation by 2035. Staff considered a multitude of factors in its evaluation as described above. As such, Staff believes that its recommendation in this matter, as further discussed below, will enable New Jersey to pursue its OSW goals while minimizing any potential adverse impacts to customers and the State.

#### *Favorable SAA Scenarios*

When issuing the SAA solicitation, the Board was optimistic that it would receive proposals that would allow the State to realize many of the potential benefits set forth herein of a coordinated transmission approach. Critical to the Board's decision in pursuing the SAA was the ability to select an SAA project (or not select any project at all) that best suits New Jersey's goals while providing a "more efficient and cost-effective means of meeting the State's OSW goals and decreasing the chance of delays."<sup>86</sup> As such, in evaluating the SAA proposals, Staff not only evaluated the proposals against one another, but also against the Baseline Scenario and against achieving the State's overarching SAA goals. For example, a submitted SAA Proposal that does not uphold the desired goals or is found to be inferior to the Baseline Scenario, regardless of the proposal's strength and merit against other submitted proposals, would nonetheless not be selected at this time.

As previously set forth, the Option 2 proposals, while innovative, involved additional risks which outweigh the potential benefits relative to the Baseline Scenario. Some of the challenges included the technological limitations of the offshore substations, the high costs, the ineligibility for the ITC, the locational implications related to the offshore substations, and the high project-on-project risks. As such, Staff recommends that, at this time, an Option 2 solution is not in the best interest of the State. The Option 3 proposals, because they are contingent upon the selection of the associated Option 2 proposals, and because of other considerations discussed above, were also deemed not advisable at this time.

As outlined above, the results of PJM's reliability analysis and Staff's consultant's analysis, showed that many of the Option 1a proposals provided substantial cost savings while reducing the time and uncertainty of the upgrades to existing facilities for OSW generation projects developed through the conventional PJM interconnection queue process. In total, analysis conducted during the evaluation process indicates that the Option 1a proposals would save New Jersey ratepayers about \$1.1 billion dollars compared to the Baseline.

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<sup>86</sup> November 2020 Order, supra note 33 at 8.

Similarly, as outlined above, Staff found significant potential benefits of procuring Option 1b proposals that build out the onshore transmission facilities to enable the interconnection of future OSW projects at the selected POIs created by PJM through SAA-procured Option 1a system upgrades.

In total, there were 28 Option 1b proposals. This includes those proposals initially submitted as Option 1b, as well as the 1b portions of Option 2 proposals that provide similar capabilities and that bidders have confirmed they are willing to construct. These proposals were evaluated against the overarching SAA goals, the Baseline Scenario and the SAA criteria. Staff found that several of the Option 1b proposals were superior to the Baseline Scenario and achieved many of the desired goals of a coordinated transmission approach.

One initial consideration in evaluating the Option 1b solutions was how many potential corridors the proposal included. Option 1b solutions provide an opportunity to reduce the number of additional future onshore corridors required to achieve the 7,500 MW from three Transmission Corridors in the Baseline Scenario to either one or two. Some of the Option 1b proposals that included one Transmission Corridor included smaller injection capacities and would therefore need to be paired with another proposal in order for the Board to achieve the full desired capacity of 6,400 MW, resulting in two corridors. A single corridor allows all the remaining OSW generators required to meet New Jersey's 7,500 MW goal to access the same single POI (or single location created through the SAA to access multiple POIs), enabled through a combination of Option 1a and (depending on the SAA Scenario) Option 1b solutions. A two-corridor solution would entail two POIs and OSW generators would be directed to connect to one or the other POI.

Staff's analysis found that a single Transmission Corridor solution (a "single corridor solution") has the potential to offer substantial permitting efficiency for that singular right of way rather than two Transmission Corridors (a "two-corridor solution") which would require two distinct permitting processes. A two-corridor solution, however, mitigates risk if one of the Transmission Corridors face permitting delays or challenges. Perhaps most importantly in the comparison of one- or two-corridor solutions, is that a single corridor solution has the potential to coordinate shore-crossings (even if multiple cables are needed to make landfall in one coordinated location), and best minimizes community disruptions and environmental impacts. A single corridor solution also better captures economies of scale by reducing the number of installation events. This results in significant benefits, particularly to New Jersey's shores, coastal communities, and communities along proposed Transmission Corridors. DEP also noted that, "[a] single corridor to bring cables to shore would be most beneficial, as long as the corridor location is well planned."<sup>87</sup> Ultimately, Staff found that an SAA Solution that provided for a single Transmission Corridor was preferred.

The full complement of potential benefits of an Option 1b single corridor solution are only conferred if the single corridor solutions involve a single route and single coordinated installation event. In the absence of this type of coordinated approach to interconnection with Option 1b facilities, awarded OSW generators would still need to build the remaining onshore infrastructure

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<sup>87</sup> DEP "State Agreement Approach – OSW Transmission- NJDEP Environmental Review" Memo to Staff, October 7, 2022 at 2.



for their own transmission cables from the landing point at the shore to reach the Option 1b facilities (e.g., a new collector station). This could result in three or more different Cable Routes from the shore to the Option 1b facilities (one for each future OSW generator) or a single Cable Route which all awarded OSW generators would utilize but would nonetheless result in three separate construction efforts occurring approximately every two years, magnifying environmental impacts and community disruption in the Transmission Corridor.

There are two approaches to achieving the full complement of potential benefits of an Option 1b single corridor solution. Both approaches entail procuring the land for the converter stations and the Prebuild Infrastructure (the Duct Banks and Cable Vaults). The Prebuild Infrastructure could either be procured through the Board's Third Solicitation or through the SAA if the Board awards an SAA Proposal which includes the Prebuild Infrastructure.

These procurement options have distinct benefits and risks, even for procuring the same set of facilities. Staff examined which approach—through the SAA or through the Third Solicitation—was best.

Procuring the Prebuild Infrastructure through the SAA enables the use of the existing PJM regulatory structure for procurement of facilities, instead of having to create such a framework for the OSW solicitation. In addition, procuring the Prebuild Infrastructure through the SAA has the benefit of allowing for construction activities for the Prebuild Infrastructure to commence upon SAA award, as opposed to the Third Solicitation award, about 12 months later. While this could have considerable timing advantages, these advantages are not determinative because, when procured through the Third Solicitation, the Prebuild Infrastructure is a part of the critical path milestones for the OSW generator constructing the Prebuild Infrastructure, who retains a strong incentive to complete its transmission solution to receive ORECs. Procuring the Prebuild Infrastructure through the Third Solicitation therefore is likely to improve project-on-project coordination and reduce project-on-project risks by aligning incentives for the OSW generator(s) selected in the Third Solicitation with the construction effort of prebuilding the necessary facilities.

While there are benefits for obtaining the Prebuild Infrastructure through the SAA using the Option 1b+ proposals, some drawbacks and risks exist. Acquiring this infrastructure through the SAA would require the voluntary waiver of the right enjoyed by PJM TOs to build new transmission on their right of way or upgrade existing facilities (to allow OSW generators to utilize the prebuilt infrastructure for their cables). It would also result in less favorable cost-control mechanisms compared to procuring the facilities through OREC awards. Additionally, the Prebuild Infrastructure, if built as part of a transmission-only project, would not currently qualify for the ITC.<sup>88</sup>

In contrast, waiting to obtain the Prebuild Infrastructure through the Third Solicitation allows the OSW generator who constructs the Prebuild Infrastructure to propose mutually agreeable contractual terms for the use of underground facilities by future developers. This approach also

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<sup>88</sup> Note several caveats: (a) Cable Vaults and Duct Banks account for only a small portion of total OSW costs (\$300-400 million) and (b) OSW generators may be unable to offer a fixed-cost OREC bid for the portion of their bids covering the Cable Vaults and Duct Banks.

takes advantage of the more-beneficial cost control mechanism included in the OREC provisions. As described above, procuring the Prebuild Infrastructure through the OREC process also aligns incentives of the OSW generator. Lastly, it provides greater opportunity for OSW generators to propose contractual structures and co-ownership arrangements under which transmission developers could utilize the ITC for the cost of constructing the necessary Cable Vaults and Duct Banks.<sup>89</sup>

In considering all of the factors regarding whether to obtain the Prebuild Infrastructure through the SAA or the Third Solicitation, Staff found that for the reasons stated above, the Prebuild Infrastructure to support a single corridor solution is best constructed by a future OSW generator at this time. Additional details on the procurement of the Prebuild Infrastructure through the Third Solicitation are provided later in this Order.

Three Option 1b SAA Solutions proposed onshore HVAC substations and related onshore transmission facilities to accommodate the HVDC cables and converter stations that would reduce the number of additional onshore corridors required to achieve the 7,500 MW goal by 2035 (that is, the remaining 3,742 MW) from three Transmission Corridors in the Baseline Scenario to one corridor. These proposals include two Option 1b proposals and one Option 1b+ proposal equipped with the onshore HVAC collector substation and a proposal to provide land for OSW generators to construct their HVDC converters. These SAA Solutions for the remaining 3,742 MW of SAA Capability include both proposals initially submitted as Option 1b proposals as well as the 1b portions of Option 2 proposals that provide similar capabilities (and that bidders have confirmed they are willing to construct).<sup>90</sup>

The costs of the Option 1b single corridor solution proposals varied. Some had relatively low capital costs. However, Staff found that although the proposals themselves were lower cost, the OSW generator costs to utilize that solution would be higher, increasing the total cost to New Jersey ratepayers. In the Option 1b proposals which were more expensive, the OSW generator costs to utilize that solution were lower. In looking at the total costs to New Jersey ratepayers, the individual costs of the SAA proposals were not determinative.

A more determinative criteria was the environmental and permitting impact of the Option 1b single corridor solution proposals. Staff, in coordination with DEP, evaluated the environmental impacts, the permitability and the community impacts of these proposals. Proposals which limited these concerns and challenges were preferred.

Of the three Option 1b single corridor solutions, two had significant potential siting concerns associated with their preferred locations, which were identified during the environmental and

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<sup>89</sup> Note, however, that value of the federal tax credit for Duct Banks and Cable Vaults is limited due to Cable Vaults and Duct Banks accounting for only a relatively small share of total costs. The value of the tax credit, estimated at approximately 1% of total OSW generation costs, is expected to be smaller than the savings from Prebuilding Cable Vaults and Duct Banks for multiple OSW generators.

<sup>90</sup> Other Option 1b or Option 2 bidders either did not propose solutions that allowed for multiple cables to be installed in a single corridor or were unwilling to scale back their Option 2 proposals to only the onshore components.

constructability reviews. As noted above, proposals with a robust plan for securing the required land and related permits were preferred.

Finally, Staff also considered the preferred location of the single corridor solution. The Option 1b proposals included POIs across the State—northern, central and southern POIs. PJM reliability analysis found that larger injections in the southern POIs resulted in costly reliability violations. Staff found that northern POIs could benefit northern BOEM OSW lease areas over the more distant southern lease areas, which may reduce competition in future OSW solicitations. Staff also determined that the cost for future OSW generators to interconnect to a northern New Jersey POI were substantially more than if they were to interconnect to a central or southern POI due to the longer Cable Routes needed to reach the northern POIs. Only two of the three single corridor Option 1b solutions proposed central POIs. DEP noted that, “[t]he DEP’s Marine Resource Administration prefers shorter offshore cable routes and would recommend co-location of cables when possible.”<sup>91</sup>

Staff prefers SAA Scenarios which meet the following specific criteria anticipated to maximize benefits and minimize risks to New Jersey ratepayers: (1) create a single collector substation with space to house the onshore converter stations of OSW generators, (2) reduce the number of necessary onshore Transmission Corridors to reduce environmental and community impacts, and (3) increase competition in future OSW solicitations by providing all OSW generation bidders equal access to the necessary land near the selected POIs.

In sum, Staff’s evaluation demonstrates that procuring certain Option 1b facilities through the SAA reduces the number of POIs, reduces cost, has the potential to reduce environmental disruptions and mitigate community impact, and increases competition. Staff, therefore, recommends that the Board award a combination of an Option 1b proposal and Option 1a proposals to support the creation of 6,400 MW of SAA Capability to enable achievement of the State’s OSW goals. In determining precisely which Option 1a proposals to select, Staff examined which combination of Option 1a proposals that most uphold the State’s SAA goals set forth in the criteria, including, but not limited to, desired POIs, capacity injection amounts, reduced environmental disturbances and permitting challenges, reduced community impacts, and the ability for OSW generators to utilize those upgrades. The Option 1a upgrades that best meet the State’s goals are those that support the preferred Option 1b solution.

#### *Recommended SAA Solution: Larrabee Tri-Collector Solution*

In considering all the application materials, PJM’s analysis, DEP’s evaluation, DMAVA’s input, Rate Counsel’s review and Brattle’s analysis, Staff determined that certain elements of the jointly developed MAOD/JCP&L proposal, detailed below, best meet the goals of the SAA and will result in a more efficient and cost-effective means of meeting the State’s OSW goals at this time. Staff determined that Option 1b proposals with the associated Option 1a upgrades, which together enable a single corridor solution with a POI in central New Jersey, and do not include the Prebuild Infrastructure of the Option 1b+ facilities, provide the most advantageous structure at this time.

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<sup>91</sup> DEP “State Agreement Approach – OSW Transmission- NJDEP Environmental Review” Memo to Staff, October 7, 2022 at 3.

When compared against the Baseline Scenario, analysis reveals the Larrabee Tri-Collector Solution features benefits across the stated SAA evaluation criteria, and is the strongest Option 1b single corridor solution when compared to others.

The recommended SAA Solution has several “names” across the reviewers’ evaluations, so for clarity, Staff identifies this solution as the “Larrabee Tri-Collector Solution” or “MAOD-JCP&L Option 1b Solution,” which includes elements of the JCP&L Option 1b proposal as well as scaled-down elements of MAOD’s Option 2 proposal, and the necessary Option 1a upgrades to create the SAA Capability associated with the SAA Scenario evaluating the Larrabee Tri-Collector Solution. The full list of projects associated with the Larrabee Tri-Collector Solution is listed in Appendix A.

The predominant portion of the Larrabee Tri-Collector Solution is a new substation adjacent to the existing JCP&L Larrabee substation (the “Larrabee Collector Station”). MAOD proposes to construct the AC portion of the new Larrabee Collector Station to accommodate three future HVDC circuits. The proposal also includes sufficient land for the future installation of up to four DC converter stations; this parcel of land for the converter station(s) is indicated as being in the process of being acquired.<sup>92</sup> The HVDC cables delivering the output of future OSW generators will interconnect at this new Larrabee Collector Station. Selection of the Larrabee Tri-Collector Solution and associated Option 1a upgrades will enable the 6,400 MW of SAA Capability required to efficiently satisfy New Jersey’s OSW goal pursued under the SAA.

Board Staff will work with MAOD and PJM to ensure future OSW generators have adequate and equal access to the land that will be used for the DC converter stations. This will ensure robust competition is maintained – upholding open-access transmission principles – throughout future OSW solicitations. To facilitate a transparent process, MAOD should enter into a formal agreement with each OSW generator awarded SAA Capability by the Board, to set forth the basic terms and conditions to access the land necessary to construct the DC converters, including construction as well as operations and maintenance (“O&M”) throughout the operating life of the equipment. Staff and PJM should be active in these discussions, as appropriate. Staff expects that these principles should be defined in the DEA filed at FERC (the DEA process is explained in the Looking Forward section below), but Staff is willing to work with MAOD and PJM to explore other avenues to accomplish these principles. Staff will work to ensure MAOD is appropriately compensated for the use of these lands.

The MAOD-JCP&L Option 1b Solution includes a “tri-collector” that distributes up to 4,890 MW from the Larrabee Collector Station to three existing POIs on PJM’s grid (the Smithburg 500 kV substation (“Smithburg”), the Larrabee 230 kV substation (“Larrabee”), and the Atlantic 230 kV substation (“Atlantic”)), utilizing JCP&L’s existing transmission ROWs. To provide a complete Option 1b solution, Staff recommends that the Board select MAOD’s Larrabee Collector Station in combination with JCP&L’s tri-collector proposal.

The MAOD-JCP&L Option 1b solution was originally intended to connect three 1,200 MW HVDC systems built by MAOD, but PJM indicates that the ratings of the equipment in the AC substation

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<sup>92</sup> PJM Constructability Report: Option 2 & 3 Proposals 2021 SAA Proposal Window to Support NJ OSW at 44.

can handle up to 4,530 MW of future injections from DC converter stations, and thus provide a single corridor solution for the remaining 3,742 MW of SAA Capability (after accounting for the First Solicitation and Second Solicitation). This approach leverages JCP&L's existing ROWs to create a single point for connecting OSW projects and maximizes use of available headroom at existing POIs, while offering a single corridor solution preferred by Staff. Creating the SAA Capability also requires additional Option 1a Network Upgrades, as discussed further below.

Whether procured through the SAA or through the OSW solicitations, transmission upgrades are necessary to inject 7,500 MW of OSW onto the grid. The driving question then becomes which approach is more cost effective, results in fewer environmental and community disturbances, and provides the greatest benefit to New Jersey ratepayers. Staff's analysis found that procuring the necessary transmission upgrades through the SAA by selecting the Larrabee Tri-Collector Solution provides the best approach.

The MAOD-JCP&L Option 1b Solution is estimated to cost \$504 million. The necessary Option 1a upgrades PJM identified are estimated to cost an additional \$575 million. Therefore, the total cost for the onshore Option 1 upgrades for the full Larrabee Tri-Collector Solution is \$1.08 billion, or \$1.03 per month for the average residential customer.

By procuring the Larrabee Tri-Collector Solution through the SAA, it is estimated that ratepayers will realize approximately \$900 million in savings compared to procuring these transmission upgrades through the Baseline Scenario.

The savings are comprised of two elements. First, the Larrabee Tri-Collector Solution costs \$630 million less than the comparable onshore upgrades required under the Baseline Scenario. Under the Baseline Scenario, onshore Option 1 upgrades are estimated to be \$1.71 billion, compared to the \$1.08 billion cost of the Larrabee Tri-Collector Solution. Second, the selection of the Larrabee Tri-Collector Solution reduces the amount of cabling necessary to deliver the OSW energy to the grid, resulting in an additional \$288 million in savings compared against the Baseline.<sup>93</sup>

In addition, the scope of the Larrabee Tri-Collector solution was tailored to maximize federal tax incentives by increasing the share of upgrades eligible to receive the Investment Tax Credit. The difference between receiving and not receiving the Investment Tax Credit could be as much as \$2.2 billion. The Larrabee Tri-Collector's receiving the Investment Tax Credit would provide additional ratepayer benefits. In addition to the significant cost savings, there are substantial environmental and permitting benefits, as well as reduced community impacts this solution provides. OSW generators will also benefit greatly from this recommended solution, as it minimizes cost and delay uncertainty, ensuring a clearer path forward for developing their OSW projects.

MAOD designed the Larrabee Collector Station to operate during normal conditions with each transmission circuit electrically separate, feeding the output of one OSW generation project into one of the three HVAC cables of the Larrabee Tri-Collector Solution. This design provides a single collector station for three OSW generators to physically connect their DC converter stations

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<sup>93</sup> \$630 million savings plus \$288 million savings equals the estimated total \$900 million in savings.

to the grid, but then keeps those injections electrically separate and connected to three separate POIs.

The SAA Capability associated with the Larrabee Tri-Collector Solution, including the necessary Option 1a Network Upgrades, is specific to each POI based on PJM's SAA study assumptions. Namely, aside from the projects awarded in the Second Solicitation, the Larrabee Tri-Collector Solution provides 1,200 MW of SAA Capability each at the Larrabee and Atlantic substations, and an additional 1,342 MW of SAA Capability at the Smithburg substation. PJM's analysis suggests that this provides an excellent platform for accessing additional headroom on the PJM system with modest additional upgrades in the future. Thus, Staff anticipates that future OSW generators utilizing SAA Capability will have the flexibility to tailor the size of their projects by interconnecting at one or more of these points of interconnection. Future OSW generators may also explore selective additional upgrades to take advantage of the excess transmission system headroom at these locations.

While Staff found proposals that comprise the Larrabee Tri-Collector Solution are in the best interest of New Jersey ratepayers in accordance with the evaluation criteria, transmission development is a long-term process materializing over many years with a degree of uncertainty. In addition, uncertainties in the development of OSW farms could trigger the need for changes. Accordingly, Staff recommends that the Board retain the flexibility to issue further Board Orders in this docket should significant revisions to the scope, configuration or cost of awarded projects be required to optimize the use of the SAA Solution.

Updates to approved PJM RTEP projects are typical. Allowing for the modification of this Board Order in the future to reflect significant updates will ensure that the specific configuration of the awarded SAA facilities remain optimal and beneficial to ratepayers over time. In the interest of administrative efficiency, Staff also recommends the Board delegate routine project review and oversight, including updates or revisions to projects that do not entail significant changes to the scope, configuration or cost, to Staff and/or PJM as appropriate. Staff anticipates ongoing work with PJM to identify additional flexibility or other configurations that would increase the benefits of the Larrabee Tri-Collector Solution to New Jersey ratepayers.

The environmental review rated this project as "moderate" risk.<sup>94</sup> The potential for the project to intersect Green Acres encumbered lands, cultural resources, and wetlands were the primary concerns raised by DEP. However, based on the information provided in the application, it is anticipated that the proposed work is primarily within existing right of way routes and substation properties. PJM also noted that "given that the project uses pre-disturbed ROW, the impacts are expected to be minimal."<sup>95</sup> JCP&L indicated that New Jersey Historic Preservation Office concurrence would be pursued, as applicable, with respect to cultural resources. Finally, with respect to Green Acres encumbered lands, JCP&L stated in their response to a clarifying question posed by Staff: "No Green Acres impact is anticipated based on the current scope of this proposal."

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<sup>94</sup> The environmental review was the collective evaluation of DEP, Staff, Brattle and PJM.

<sup>95</sup> PJM's NJOSW Constructability Report for Option 1b Proposals September Final at 20.

Notably, compared against other Option 1b single corridor proposals that utilize a central New Jersey POI, the Larrabee Tri-Collector Solution provides the least environmental, permitting, and community impact risks. These risks are critical in the evaluation as they can pose significant cost and delay overruns, as well as jeopardize the project altogether.

Additionally, PJM favorably noted that, overall, the MAOD portion of the Tri-Collector Solution system uses technology that is currently commercially available and has examples in service at several other locations.<sup>96</sup>

For the JCP&L portion of the Tri-Collector Solution, PJM noted the project is constructible as proposed and compatible with the land uses crossed. Since much of the construction will occur in JPC&L's existing transmission line ROW, conflicts with land use are expected to be minimal. PJM also noted that it does not anticipate any adverse effects to the economic wellbeing of any "Special Urban Areas" which are areas the New Jersey Department of Community Affairs defines as municipalities in urban aid legislation qualified to receive State aid to enable them to maintain and upgrade municipal services and offset local property taxes. Further, this portion of the Tri-Collector Solution is not located on any State protected land such as the Hackensack Meadowlands District or the Pinelands Protection Area.

While the Larrabee Tri-Collector Solution does not provide an SAA Shore Crossing solution, the Option 2 portion of the MAOD proposal identified the NGTC facility at Sea Girt as the preferred shore crossing point.

Staff engaged DMAVA to examine the impact of utilizing the Sea Girt NGTC as the anticipated landing point for OSW generators to access the new Larrabee Collector Station. DMAVA stated that the "concept of placing underground infrastructure on the [Sea Girt NGTC] grounds is supportable" provided future considerations are made to avoid significant disruptions to their mission critical operations.<sup>97</sup> DMAVA considered the impacts from both the construction efforts as well as any permanent infrastructure that was proposed to be located on the property. DMAVA was unsupportive of bids that proposed substantial new above-ground infrastructure on the property, which would compete with the military training site areas and would therefore not be conducive to support activities routinely conducted at the site.

To enable the 6,400 MW of SAA Capability associated with the Larrabee Tri-Collector Solution (including the SAA Capability associated with the awarded Second Solicitation projects), necessary Option 1a upgrades must be procured, based on PJM's analysis of this specific suite of injections. As outlined above, Option 1a upgrades through the SAA result in tremendous cost savings, reduced risk, and the ability to pre-specify POIs and injection amounts for OSW generators which reduces environmental and community impacts.

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<sup>96</sup> PJM Constructability Report: Option 2 & 3 Proposals 2021 SAA Proposal Window to Support NJ OSW at 19-36, 47.

<sup>97</sup> Jill Ann Priar, State Deputy CFMO, Sea Girt National Guard Training Facility, DMAVA Review of BPU proposals for wind generated power distribution lines proposed to traverse the Sea Girt National Guard Training Center Mid-Atlantic Offshore Development (MAOD), September 1, 2022 at 1.

In its SAA Reliability Analysis Report<sup>98</sup>, PJM recommended the following Option 1a proposals to support the Larrabee Tri-Collector Solution based on their costs, reliability benefits, and constructability. As set out in PJM's report, these selected Option 1a proposals were chosen from competing proposals seeking to resolve similar violations. In addition to these selections, other projects were selected as needed to enable the Larrabee Tri-Collector Solution, as set out in Attachment A:

- PSE&G's Proposal 180 components 180.1, 180.2 (Brunswick to Deans and Deans subprojects), 180.5, and 108.6 (Windsor to Clarksville subproject);
- LS Power's Proposal 229 (additional Hope Creek-Silver Run 230 kV submarine cable plus upgrade);
- Atlantic City Electric's Proposal 127.10 (Reconductor Richmond-Waneeta 230 kV); and
- Transource's Proposal 63 (North Delta A).

Staff agrees with PJM's recommended selections, set out above, in the SAA Reliability Analysis Report, and in Attachment A. PJM may work with JCP&L and MAOD to evaluate and finalize the planned transmission builds. If there are any material changes to the Option 1a solutions or selection of the Option 1b solution, the Board will make an update in this docket to notify stakeholders.

The components identified by PJM of PSE&G's Proposal 180, LS Power's Proposal 229, and Atlantic City Electric Proposal 127.10 resolve the identified reliability violations; their estimated proposal costs are lower than any of the alternative options, none of which proposed cost containment mechanisms; the anticipated in service dates are sufficient to support generation facilities selected through the OSW solicitation process; all three of the proposals were assigned a "moderate" permitting and environmental impact risk level with no significant concerns identified; and ultimately, PJM found that these proposals were constructible as proposed.

Transource's Proposal 63 included upgrades to resolve the identified reliability violations and "provide the largest reduction in the loading on the Peach Bottom-Conastone 500 kV circuit than any other proposal with a comparable cost," which PJM identifies as the "most challenging and costly of the reliability violations identified for the PA-MD Border Cluster to resolve."<sup>99</sup> In addition, in sensitivity analysis without the Transource 9A project (a project that had been approved as a market efficiency project by PJM, but whose permit application was rejected by the Pennsylvania Public Utilities Commission), this proposal "proved to be the more robust and cost-effective solution once again and was deemed to be the most likely proposal to mitigate the need for further

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<sup>98</sup> PJM's NJOSW Reliability Analysis Report, 2021 SAA Proposal Window to Support NJ OSW, September 19, 2022. The proposals' names and identifying numbers (i.e. "Atlantic City Electric's Proposal 127.10") were created by PJM to identify the specific proposal across of all PJM's analysis; Board Staff references those proposal numbers here for consistency. More information on the specific proposal can be find in PJM's Reliably Analysis Report.

<sup>99</sup> *Id.* at 18.



upgrades.”<sup>100</sup> PJM found that the online date of 2025 is sufficient to support generation facilities selected through the OSW solicitation process. The proposal was assigned a “moderate” permitting and environmental impact risk level with no significant concerns identified. PJM found that this proposal was constructible as proposed.<sup>101</sup>

### *Prebuilding Shore Crossing Infrastructure and Onshore Cable Routes*

Upon review of the different options, including the Baseline Scenario, a key potential benefit of the SAA was found to be that it offers the opportunity to consolidate the number of Shore Crossings and onshore Cable Routes from future projects to interconnect to the grid, so as to limit community disruptions, permitting risks, environmental impacts, delay risks, cost overrun risks and associated OREC risk premiums. DEP also noted that, “[t]hrough a planned transmission approach, and particularly a single corridor, the overall reduction in environmental impacts, permitting, and time, applied to multiple future projects has significant benefits from DEP’s perspective.”<sup>102</sup>

Staff recognizes that by selecting an Option 1b-only SAA Solution (along with applicable Option 1a projects) that provides for a single location for future interconnections, each OSW generator utilizing that SAA Solution will still need to build the necessary electric transmission cables and infrastructure to carry future New Jersey OSW generation projects from the ocean to the POI. Future OSW generators utilizing the SAA could each propose different landing points and/or different routes from their landing points to the Option 1b Larrabee Collector Station, resulting in multiple routes within the same Transmission Corridor to be constructed at separate times. Even if the future projects use the same landing point and the same onshore route, if they are permitted and constructed at different times, many of the risks and adverse impacts identified above would still exist.

In evaluating how to minimize these risks, Staff identified a solution that, when coupled with the Option 1b and associated Option 1a projects, would result in a single Shore Crossing and a single onshore route to the POI, all of which would be permitted and constructed at the same time for use by future OSW generation projects up to the 7,500 MW goal of this SAA.

This concept, referred to as the “Prebuild,” would require a single OSW generator, selected in Solicitation 3, to construct the necessary Duct Banks and associated access Cable Vaults for its own project as well as the additional OSW projects needed to fully utilize the SAA Capability at the selected POI. If more than one project is selected in the Third Solicitation, the Board would specify which awardee would be responsible for constructing the Prebuild Infrastructure, based on schedule, design, cost and other factors. The developer that constructs the Prebuild would utilize one of the Duct Banks/Cable Vaults they are constructing, leaving additional sets of Cable

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<sup>100</sup> *Id.*

<sup>101</sup> *PJM SAA Constructability 1a Report* at 120-121. Note that there is regulatory uncertainty surrounding approvals of Certificates of Public Convenience and Necessity needed from Pennsylvania Public Utility Commissions and Maryland Public Service Commissions for these projects.

<sup>102</sup> DEP “State Agreement Approach – OSW Transmission- NJDEP Environmental Review” Memo to Staff, October 7, 2022 at 2.

Vaults and Duct Banks for use by OSW projects awarded in Solicitation 3 and/or subsequent solicitations. Developers of future OSW projects would then install their cables through the prebuilt Duct Banks utilizing the prebuilt Cable Vaults, with little additional disruptions to the shore or the onshore route resulting in minimal further disruption to communities and a reduction in the risks and potential adverse environmental impacts identified above. For clarity, the Prebuild involves only the necessary infrastructure (Duct Banks and Cable Vaults) to house the electric transmission cables, but not the cables themselves or the related converter stations.

The Board recognizes that the Prebuild would be constructed outside of this SAA award. However, the concept, the infrastructure, and the resulting benefits support the selection of an Option 1b proposal at this time. Staff will pursue the Prebuild concept more fully in the Third Solicitation process, and intends to solicit input from stakeholders and the public on issues related to design, construction, operations and maintenance, how the Prebuild developer will be compensated, insurance, risk management, safety and other relevant considerations.

### **Looking Forward**

PJM will undertake the following activities to effectuate the selected SAA projects selected by the Board and subsequently approved by the PJM Board. PJM will include the elements of the Larrabee Tri-Collector Solution approved in today's Order into the RTEP as baseline public policy projects upon the approval of the PJM Board. This will ensure all future transmission planning conducted by PJM considers the SAA projects and the OSW it was built to support, including the 6,400 MW of created SAA Capability. Also, after the Board identifies and selects the SAA projects, PJM will work with the Board to finalize the details to be included in a DEA,<sup>103</sup> including incorporation of the additional language the Board has identified in this Order. Consistent with its current practice, PJM will negotiate the terms of the DEA with the entities approved by the Board to construct and own and/or finance the system upgrades.

The DEA itself will include the obligations and the commitments the developers made to the Board and PJM when they submitted their proposal to PJM and in their responses to subsequent clarifying questions. If a DEA contains nonconforming provisions, PJM will file the DEA with FERC for approval; if conforming, PJM will report the DEA in its Electric Quarterly Report. Regardless whether conforming or non-conforming, all DEA(s) will be posted on the PJM website.

The projects selected herein by the Board, as PJM baseline public policy RTEP projects, will be included in PJM's RTEP, to be acted upon by the PJM Board in December 2022. By incorporating these projects into the RTEP, the SAA projects are akin to other RTEP projects. For example, if a project included in the RTEP impacts a project identified through the SAA, PJM could determine that an enhancement to the SAA project is needed.

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<sup>103</sup> The DEA is a *pro forma* agreement under the PJM Tariff that is entered into, as required under Schedule 6 of PJM's Operating Agreement, between PJM and the developer designated to construct and own and/or finance a transmission project included in the RTEP. While use of the DEA is not required under PJM's SAA process, at the request of the Board PJM has elected to follow its competitive solicitation procedures including use of a DEA for those greenfield portions of the selected SAA Solution.

The SAA Agreement contains provisions governing the assignment of the SAA Capability to individual public-policy resources selected by the Board.<sup>104</sup> In awarding SAA Capability to OSW generators, the Board must include the amount (nameplate MW), location (POI), and type (resource type) of the SAA Capability, and direct the OSW generator to submit this award to PJM. Although not required, Staff recommends that the Board notes the PJM queue position that will be used by the OSW generator or selected public policy resource to accept the assignment of SAA Capability.<sup>105</sup> Any award of SAA Capability must occur within two years after the OSW generator is selected through a New Jersey OSW solicitation.<sup>106</sup> In addition, SAA Capability must be awarded prior to the date the OSW generator executes its System Impact Study Agreement.<sup>107</sup> To ensure full and efficient use of SAA Capability for New Jersey ratepayers funding the project, careful consideration of the details of transferring, using, and assigning SAA Capability to each generator selected by New Jersey to receive SAA Capability will be required. These details will vary depending on the specifics of the awarded OSW generator, including its PJM interconnection queue position.

OSW generation applicants are expected, although not required, to have a PJM queue position included with their generation application for future OSW solicitations. PJM queue positions should align with the POIs and timeframes associated with the upgrades awarded through the SAA. The Board would expect to award SAA Capability in the Order approving the OSW generation project, pursuant to the process described above. Additionally, existing OSW projects that have already been awarded may petition the Board to use SAA Capability and address how they would hold ratepayers harmless by adjusting their initial OREC recovery mechanism with the goal of putting ratepayers in the financial position they would have been but for the use of the SAA Capability. In either scenario, the OSW generator then must include the Board's SAA Capability award to their PJM queue position ahead of System Impact Study Agreement execution.

Looking further forward, Staff notes the expansion of New Jersey's OSW goals as an exciting development further securing New Jersey's leadership position in the burgeoning OSW industry. However, similar to the initial 7,500 MW OSW goal addressed in today's Order, additional challenges are anticipated in efficiently and cost-effectively delivering the incremental 3,500 MW of OSW required to reach the 11,000 MW OSW goal specified in EO 307. These challenges are similar to the animating factors underlying this SAA process, set forth in detail above. Based on these anticipated challenges, and the robust developer response and creative proposals received through this SAA process, Staff recommends that the Board initiate the necessary preliminary steps to pursue a second SAA process, with the goal of providing an efficient, coordinated transmission approach to reach 11,000 MW and beyond, while minimizing cost to New Jersey ratepayers. Staff also notes that it may be beneficial, prior to initiation of the second SAA, to review with other states, both inside and outside the PJM region, the potential for jointly undertaking an offshore wind planning process and incorporating those larger needs, into this

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<sup>104</sup> SAA Agreement at Section 6.2(d).

<sup>105</sup> Id. at Section 6.2(d)(i) ("...such OSW generator and or NJ BPU-selected Public Policy Resource shall have a position in the PJM New Service Queue at the time of such assignment.").

<sup>106</sup> Id. at Section 6.2(d)(i).

<sup>107</sup> Id. at Section 4.3(a).

future SAA. While such a multi-state process may present additional complexities, it is also likely to reduce costs to ratepayers, by identifying even more robust regional solutions by considering a wider range of public policy needs, and by enabling the sharing of costs with other states who participate in the SAA process.

### *Currently Awarded Offshore Wind Projects*

The Ocean Wind II project presents the most straightforward case for reaching agreement on assigning SAA Capability to the project, due to its primary PJM queue position, AG2--055 with interconnection at Smithburg.<sup>108</sup> In addition to this existing queue position, the Board's award to Ocean Wind II contemplated alternate POIs through the SAA process, should these alternates provide lower-cost or lower-risk solutions.<sup>109</sup> Any revision to the approved Ocean Wind II interconnection plan as approved by the Board would require a mutually acceptable revision to the interconnection plan.<sup>110</sup> Revisions to the interconnection plan would also likely require updates to the approved TSUC mechanism included in the Second Solicitation Order, which originally contemplated OSW generators bearing interconnection costs in full up to a certain amount.<sup>111</sup>

The processing of PJM's interconnection queue is currently on hold due to proposed revisions to PJM's interconnection process, which will keep all AG2 queue positions, including Ocean Wind II's, in the pre-study phase well into 2024.<sup>112</sup> Under the terms of the SAA Agreement, the Board will be able to assign SAA Capability to the Ocean Wind II project during the pendency of this pre-study interconnection phase. Some complexities arise when determining the most efficient interconnection *location* for the Ocean Wind II project. PJM informed Staff and its consultant that any shift in queue position away from the Deans or Smithburg POIs (as reflected in Ocean Wind II's initial interconnection request) could have significant negative schedule ramifications. Without any grant of SAA Capability, Ocean Wind II is currently pursuing its submitted and approved interconnection plan at Smithburg.<sup>113</sup>

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<sup>108</sup> June 21, 2019 Order, supra note 18 at 23-24 (“...OW2 noted its intent to change the OW2 Project's primary POI from Deans to Smithburg”) (internal citations omitted).

<sup>109</sup> Id. at 24 (“Despite the existing interconnection plan, the Board leaves open the potential for the Ocean Wind II Project to utilize newly developed SAA transmission capability. The Board encourages maximum utilization of shared offshore wind facilities, to the extent that the use of those facilities is in the best interest of New Jersey ratepayers, be delivering the OW2 Project in a lower-cost or lower-risk fashion.”).

<sup>110</sup> Id. at 25 (“For any deviation from the interconnection plan approved in this order, including for use of any SAA transmission capability, a mutually acceptable revision to this Order will be required.”).

<sup>111</sup> Id. at 16, 27; Atlantic Shores 1 June 2021 Order, supra note 22 at 16, 27.

<sup>112</sup> PJM IRPSTF at Figure 9 (Transition Cycle #2). <https://www.pjm.com/directory/etariff/FercDockets/6726/20220614-er22-2110-000.pdf> FERC Docket No. ER22-2110.

<sup>113</sup> June 21, 2019 Order, supra note 18, at 25 (“Prior to any determination by the Board that use of SAA transmission capability is in the best interests of New Jersey ratepayers, OW2 will need to pursue its PJM transmission interconnection plan...”).

Despite Ocean Wind II's position in the PJM interconnection queue, other aspects of the SAA Agreement suggest that swift action toward assigning SAA Capability to Ocean Wind II may be in the best interests of New Jersey ratepayers and the Ocean Wind II project. Specifically, the SAA Agreement limits the Board's ability to assign SAA Capability to within two years after the OSW generation award.<sup>114</sup> As both the Ocean Wind II and Atlantic Shores 1 projects were selected by the Board on June 30, 2021, the ability for SAA Capability assignment expires in June of 2023 for these 2 projects, eight months after today's Order awarding SAA facilities.<sup>115</sup> To enable the appropriate revisions to the TSUC mechanism, adherence to tight schedule deadlines will be needed to ensure a final award of SAA Capability can occur within the required timeframe.

The Atlantic Shores 1 project suggests a more intricate process for utilizing SAA Capability. In all SAA Scenarios, Atlantic Shores 1 will inject 1,510 MW at Cardiff, because the project has advanced in the PJM interconnection queue, having already submitted its SIS study agreement<sup>116</sup>. Per the SAA Agreement, this queue progression currently disqualifies the Atlantic Shores 1 project from receiving a direct assignment of SAA Capability. Accordingly, Staff and Brattle worked with PJM to ensure Atlantic Shores 1's approved interconnection plan (1,510 MW at Cardiff) can be accomplished in a cost-effective manner considering any SAA outcome.

Specifically, there needs to be a reconciliation between Atlantic Shores 1's three anticipated ISAs, which will provide injection rights for the ASOW 1 project's 1,510 MW at Cardiff (Atlantic Shores 1 retains three PJM interconnection queue positions that together make up 1,510 MW), and the SAA, which also modeled 1,510 MW at Cardiff. This inclusion was required in the PJM reliability studies to ensure that coordinated solutions could enable the full suite of New Jersey public policy requirements, even with Atlantic Shores 1 pursuing its own interconnection plan. PJM has indicated that, if any Option 1a system upgrades selected through the SAA process obviate the need for Network Upgrades identified in ASOW 1's interconnection study, Atlantic Shores 1's obligation under its ISAs would be reduced—including issuing a scope change to the Atlantic Shores 1 ISAs as necessary—to ensure that Network Upgrades previously identified but no longer required are removed from the project's obligation.<sup>117</sup> This process allows Atlantic Shores 1 to retain its interconnection plan as approved by the Board,<sup>118</sup> including the benefit of its advanced queue positions, while also allowing all parties to benefit from the lower-cost interconnection opportunities created through the proactive SAA process.

The same injection amount for the Atlantic Shores 1 project interconnection study was included in the SAA studies and therefore reconciliation is necessary to ensure only the needed facilities will be built and no unnecessary duplication of transmission facilities. In order to reconcile the

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<sup>114</sup> SAA Agreement at § 6.2(d)(i) ("SAA Capability shall be assigned initially by the NJ BPU to an OSW Generator or NJ BPU-selected Public Policy Resource no later than two (2) years from the actual Solicitation Award Date under a NJ BPU OSW Solicitation....").

<sup>115</sup> See June 21, 2019 Order, supra note 18.

<sup>116</sup> See PJM Manual 14A, Section 5.2, available at <https://www.pjm.com/-/media/documents/manuals/m14a.ashx>.

<sup>117</sup> PJM Confidential April 13, 2022 response to BPU Staff/Brattle questions, at 1.

<sup>118</sup> Atlantic Shores 1 June 2021 Order, supra note 22.

two processes with each other, the SAA Capability available for the Board to assign may be adjusted upon the conclusion of the integration of the Atlantic Shores 1 ISAs with the approved SAA facilities, to ensure SAA Capability representing ASOW 1 is not used twice. This will still ensure the remaining 3,742 MW of SAA Capability remains for future OSW projects. As explained above, because PJM cannot produce a fulsome study of the integration of the ASOW 1 ISA with the approved SAA projects prior to both an SAA approval and ASOW's ISA execution, Staff recommends that the Board retain flexibility to take additional action on the basis of the reconciliation process explained herein.

### **Findings and Discussion**

Based on the review of PJM, Brattle, DEP, Rate Counsel, and DMAVA's evaluation and analysis of the SAA bid proposals and analysis, and based on Staff's resulting recommendation described above, the Board **HEREBY FINDS** that the Larrabee Tri-Collector Solution is the most desirable SAA Solution at this time, and thus, **HEREBY APPROVES** the elements of Larrabee Tri-Collector Solution, and the associated Option 1a facilities to enable 6,400 MW of SAA Capability, as detailed in Appendix A, and further detailed by PJM in its update to the approved SAA Agreement.<sup>119</sup> PJM may work with JCP&L and MAOD to evaluate and finalize the planned transmission builds. If there are any material changes to the Option 1a solutions or selection of the Option 1b solution, the Board will make an update in this docket to notify stakeholders.

The Board agrees with Staff's recommendation that an Option 1b proposal represents the best option for New Jersey ratepayers at this time after carefully weighing all of the various benefits and potential risks. To coordinate on an ongoing basis to ensure active consultation and conflict resolution in accord with the Board's commitment to generators' equal access to the relevant SAA project(s), JCP&L and MAOD are **HEREBY DIRECTED** to coordinate with Staff and OSW generators (or other Board-selected Public Policy Resources as set forth in the SAA Agreement) on awarded SAA Capability.

Additionally, to enable the efficient allocation and distribution of the necessary land to support future HVDC converter stations, to be constructed and maintained by the OSW generators selected by the Board in future solicitations at the site of the Larrabee Tri-Collector Solution, MAOD is **HEREBY DIRECTED** to coordinate with Staff and generators awarded ORECs to ensure each generator has adequate and equal access to such land as is reasonably necessary to develop their individual projects according to the generator's project schedule. The Board **HEREBY DIRECTS** all parties to act in good faith and to ensure that each party is provided the necessary time and information to develop their respective projects as awarded by the Board. To facilitate a transparent process, Staff, MAOD, and PJM should develop a process so that a formal agreement with each OSW generator awarded SAA Capability by the Board has equal and adequate access to the land necessary to construct the DC converters, including construction as well as operations and maintenance ("O&M") throughout the operating life of the equipment. The Board expects Staff, MAOD, and PJM to set forth these terms in a DEA filed at FERC, but is open to the parties developing a separate process. Further, because the costs of the Larrabee Tri-Collector Solution will be recovered through the approved SAA cost-allocation methodology, Staff

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<sup>119</sup> See SAA Agreement at Section 3.0.

and MAOD should ensure that any monies involved in a land-transfer, land-lease, or other land-use transaction best protects ratepayers from unnecessary or duplicative costs. The Board recognizes that eventually, up to four OSW generators may be required to construct their HVDC converter stations on this land.

As such, the Board **HEREBY DIRECTS** MAOD to ensure all such future OSW generators that are awarded SAA Capability selected by the Board are provided equal and adequate access to the land to construct and maintain their respective projects, without hindering another OSW generators' ability to do the same. The Board encourages MAOD to engage with Staff in the interim to design pro-forma site layouts that would ensure access to up to four HVDC converters at the site. Since the costs of the Larrabee Tri-Collector Solution will be recovered through the approved SAA cost-allocation methodology, MAOD must ensure no unnecessary or duplicative costs are borne by ratepayers for any land-use transaction. MAOD shall work with Staff and PJM to ensure these principles are memorialized in a DEA or other agreement. For any monies involved in such a transaction, MAOD is **HEREBY DIRECTED** to either credit these revenues against the revenue requirements of the Larrabee Tri-Collector Solution through the SAA cost allocation or use another mechanism to avoid the double recovery of costs. MAOD is **HEREBY DIRECTED** to submit the details of any transaction to Staff 90 days before any exchange occurs. Staff shall review and, if appropriate and able, provide its approval to MAOD for any transaction related to the use of the land.

The Board recognizes that the development of transmission projects requires years of planning and coordination. Further, even after construction, ongoing O&M could require occasional changes to the projects. Since the components of the Larrabee Tri-Collector Solution are critical to support New Jersey's OSW goals and resulting projects that seek to utilize the Larrabee Tri-Collector Solution, the Board has a unique interest in ensuring all projects that comprise the Larrabee Tri-Collector Solution, and the associated Option 1a facilities, are developed in accordance with the proposed timelines. To ensure the Board remains fully informed on a regular basis, the Board **HEREBY DIRECTS** JCP&L and MAOD to provide, in addition to the reports required in Appendix B: Terms and Conditions to this Order, quarterly progress reports on the projects awarded herein under the Larrabee Tri-Collector Solution until these facilities are placed in-service. These quarterly progress reports shall include, but are not limited to, updates on construction activities, community engagement, all PJM and FERC filings and updates, schedule updates and notification of delays. These reports may take the form of quarterly meetings. Every year, within 90 days following the anniversary of this Order, JCP&L and MAOD shall submit written reports on their projects. Staff may, at its discretion, request additional pertinent information or more frequent updates.

In order to assist in developing the specifications for the Third Solicitation, MAOD, and if deemed appropriate by Staff, any other SAA Developer awarded herein, is **HEREBY DIRECTED** to:

- 1) Meet with Staff within seven calendar days of the effective date of this Order to discuss the parameters and requirements related to the interconnection of future OSW generators, including, but not limited to, the technical requirements and limitations, land access and use, and O&M plans, and the construction and operations of future converter stations that may be constructed on the site;

- 2) Provide in a timely manner all the necessary information to Staff that may be needed to develop the Third Solicitation;
- 3) Provide in a timely manner all the necessary information to potential OSW generators seeking to develop applications for any of New Jersey's OSW solicitations;
- 4) Ensure any OSW generator seeking to develop an application(s) for any of New Jersey's OSW solicitations shall have equal and adequate access to the information needed to develop an OREC application.
- 5) Provide in a timely manner all the necessary information to any existing OSW generator previously awarded in New Jersey's OSW solicitations which may be utilizing any of the facilities awarded herein.

In order to ensure the timely delivery of information to OSW generators seeking to develop an application(s) for New Jersey's Third Solicitation, the Board **HEREBY AUTHORIZES** Staff to hold a technical conference, if Staff deems appropriate, with MAOD and any other SAA transmission developer awarded herein, to provide guidance and clarity on the specifications necessary to interconnect to the projects awarded herein.

The Board **HEREBY DIRECTS** JCP&L and MAOD to submit annual reports on the projects awarded herein under the Larrabee Tri-Collector Solution after CODs of the respective projects. These reports shall be submitted within 90 days following the anniversary of the project's CODs, until such date that the SAA Capability will be fully utilized, or Staff deems these reports no longer necessary. The annual reports shall include relevant O&M developments and any engagement updates with offshore wind developers utilizing the Larrabee Tri-Collector Solution. Staff may, at its discretion, request additional information from the project as it deems necessary.

The Board is committed to ensuring that the Larrabee Tri-Collector Solution awarded herein is developed according to the proposed schedules in order to support the OSW generation projects. Hence the Board **HEREBY DIRECTS** all projects awarded herein as specified in Appendix A under the Larrabee Tri-Collector Solution to notify the Board of any estimated delay longer than three months. Such notification shall be in writing and be submitted to the Board no more than 30 days after discovering such delay exists or may exist. The Board retains the right to share this information with all impacted OSW generators.

The Board **HEREBY DIRECTS** Ocean Wind II and Staff to enter into good faith negotiations to determine whether, and under what conditions, Ocean Wind II may petition the Board to utilize SAA Capability that will become available under the SAA Solution. Should all parties to the June 30, 2021 Order agree that Ocean Wind II shall utilize SAA Capability, all necessary agreements, including modification to the OREC schedule and other requirements contained in the June 30, 2021 Order, must be fully executed such that the Board can assign the SAA Capability no later than two years after the solicitation award date, or before June 30, 2023, in accordance with the PJM SAA Agreement.

The Board **HEREBY DIRECTS** Atlantic Shores 1 and Staff to jointly evaluate the effects of the Board's SAA decision on the planned interconnection of this project, including its costs, and develop a mutually acceptable recommendation for reconciliation of such effects.



The Board finds that future revisions to the awarded projects herein under the Larrabee Tri-Collector Solution may be required depending on changed circumstances unknowable as of the time of award. The Board accepts Staff's recommendation and **HEREBY RETAINS THE RIGHT** to enter further orders in this docket as deemed necessary to reflect significant updates to the scope, configuration and/or cost of projects on the basis of any future changed circumstances. In addition, should PJM or Staff identify routine changes to elements of any awarded projects that would increase the benefits to New Jersey ratepayers, the Board **HEREBY AUTHORIZES** Staff to review and accept these revisions, and notify PJM of the same.

All developers of the approved projects herein ("SAA Developer") must **HEREBY COMPLY** with the terms of this Order, all the relevant terms in the SAA Agreement, and all terms within any applicable DEA with PJM. The terms and conditions specified in Appendix B: Terms and Conditions to this Order, shall apply to all approved SAA Developers and projects. These terms, as appropriate, may be filed with FERC under a DEA.

The Board has reviewed the impacts related to the number of Transmission Corridors. The community disruptions, the environmental impacts, the permitting challenges, the costs and the high risk of delays increase with each Transmission Corridor. As such, the Board **HEREBY FINDS** that there are great benefits in limiting the number of Transmission Corridors for OSW projects. The Board appreciates the novel and innovative approach set forth in Staff's recommended Prebuild concept. As such, the Board **HEREBY DIRECTS** Staff to require the Prebuild concept in the Third Solicitation.

Finally, the Board continues to recognize the potential benefits of a full offshore wind backbone and continues to see the creation of such a grid as a key future area of interest, particularly as additional sources of federal funding become available through the recently enacted Inflation Reduction Act and other measures. The Board **HEREBY DIRECTS** Staff to begin necessary preliminary steps to support a future SAA process, to enable the transmission of New Jersey's new goal of 11,000 MW of OSW energy generation to occur in a coordinated manner, for the benefit of ratepayers. Further given the regional interest in offshore wind, the Board **HEREBY DIRECTS** Staff to continue its engagement with other states, regional grid operators, and other interested stakeholders about how to further advance New Jersey's transmission-first approach to offshore wind.

The effective date of this Order is November 5, 2022.

DATED: October 26, 2022

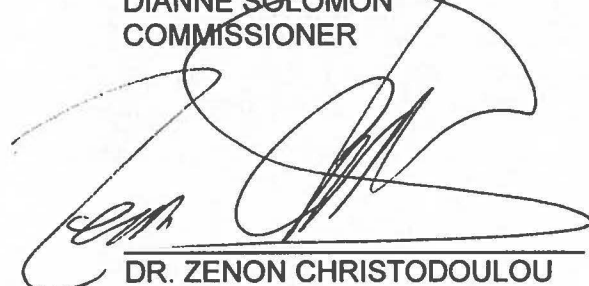
BOARD OF PUBLIC UTILITIES  
BY:

  
\_\_\_\_\_  
JOSEPH L. FIORDALISO  
PRESIDENT

  
\_\_\_\_\_  
MARY-ANNA HOLDEN  
COMMISSIONER

  
\_\_\_\_\_  
DIANNE SOLOMON  
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\_\_\_\_\_  
ROBERT M. GORDON  
COMMISSIONER

  
\_\_\_\_\_  
DR. ZENON CHRISTODOULOU  
COMMISSIONER

ATTEST:   
\_\_\_\_\_  
CARMEN D. DIAZ  
ACTING SECRETARY

I HEREBY CERTIFY that the within  
document is a true copy of the original  
in the files of the Board of Public Utilities.

## **Appendix A: Selected Projects**

This Board Order approves the following projects under PJM's 2021 SAA Proposal Window to Support New Jersey's OSW public policy and as described in the PJM analysis reports,<sup>120</sup> for review and approval by the PJM Board as baseline public policy projects included in PJM's RTEP, under the terms and conditions set forth in Appendix B:

<b>PJM's Proposal IDs</b>	<b>Components</b>	<b>Estimated In-Service Date (ISD)</b>	<b>Estimated Cost (\$MM)</b>
<b><u>ACE</u></b>			
<b>Proposal ID 127</b>	The following components of Proposal 127:	ISD to be aligned with NJBPU solicitation schedule and related JCP&L Proposal 453 project work	
	10. Rebuild the underground portion of Reconductor Richmond – Waneeta 230 kV (1098SN/1247SE, 1150WN/1299WE MVA)		\$16.00
	1. Upgrade Cardiff- – Lewis 138 kV by replacing 1590 kcmil strand bus inside Lewis substation (377SN/478SE, 451WN/478WE MVA)		\$0.10
	3. Upgrade Cardiff- – New Freedom 230 kV by modifying the existing relay settings (650SN/804SE, 748WN/906WE MVA)		\$0.30
	2. Upgrade Lewis No. 2- – Lewis No. 1 138 kV by replacing bus tie with 2000 A circuit breaker (478SN/478SE, 478WN/478WE MVA)		\$0.50
<b><u>MAOD</u></b>			
<b>Proposal ID 551</b>	Construct the AC switchyard portion of MAOD proposal 551, composed of a 230 kV 3 x breaker and a half substation with a nominal current rating of 4000A and four single phase 500/230 kV 450MVA autotransformers to step up the voltage for connection to the Smithburg substation. AC switchyard design and site preparation shall be suitable for expansion to a 230 kV 4 X 230 kV breaker and a half substation and seven single phase 500/230 kV 450 MVA autotransformers to step up voltage for connection of two circuits to Smithburg substation.	ISD to be aligned with NJBPU solicitation schedule and related JCP&L Proposal 453 project work	\$121.00

<sup>120</sup> As discussed in the body of this Order, PJM prepared six comprehensive analysis reports of the proposals submitted in the window. The PJM analysis reports collectively make up a comprehensive evaluation of the proposals, which were studied either individually or in combinations indicated as SAA Scenarios. The reports consist of a reliability analysis report, an economic report, a financial analysis report and constructability analysis reports for options 2/3, 1a, and 1b. The PJM analysis reports were posted on September 19, 2022 on the PJM's TEAC page under the September 6, 2022 meeting date.

	Procure land adjacent to the MAOD AC switchyard, which is a portion of the MAOD proposal 551, and prepare the site for construction of future AC to DC converters for future interconnection of DC circuits from offshore wind generation. Land should be suitable to accommodate installation of four (4) individual converters to accommodate circuits with equivalent rating of 1400MVA at 400 kV. MAOD will commit to work with NJBPU and Staff, PJM, the relevant transmission owners, and all future developers to lease or otherwise make land access available for construction of converters by those future developers to support the integration of OSW generators to achieve the OSW goals of New Jersey	ISD to be aligned with NJBPU solicitation schedule and related JCP&L Proposal 453 project work	MAOD will perform further assessments to improve its refinement of the estimate and scope of work as requested by the NJBPU.
<b>JCP&amp;L</b>			
<b>Proposal ID 453</b>	The following components of Proposal 453:		
	1. Atlantic 230 kV Substation - Convert to Double-Breaker Double-Bus	6/1/2030	\$31.47
	2. Freneau Substation - Update relay settings	6/1/2030	\$0.03
	3. Smithburg Substation - Update relay settings	6/1/2030	\$0.03
	4. Oceanview Substation - Update relay settings	6/1/2030	\$0.04
	5. Red Bank Substation - Update relay settings	6/1/2030	\$0.04
	6. South River Substation - Update relay settings	6/1/2030	\$0.03
	7. Larrabee Substation - Update relay settings	6/1/2030	\$0.03
	8. Atlantic Substation - Install line terminal	6/1/2030	\$4.95
	9. Larrabee Substation - Reconfigure substation	6/1/2029	\$4.24
	10. Larrabee substation: 230 kV equipment for direct connection	6/1/2029	\$4.77
	11. Lakewood Gen Substation - Update relay settings	6/1/2029	\$0.03
	12. G1021 (Atlantic-Smithburg) 230 kV	6/1/2030	\$9.68
	13. R1032 (Atlantic-Larrabee) 230 kV	6/1/2030	\$14.50
	14. New Larrabee Converter-Atlantic 230 kV	6/1/2030	\$17.07
	15. Larrabee-Oceanview 230 kV	6/1/2030	\$6.00
	16. B54 Larrabee-South Lockwood 34.5 kV Line Transfer	6/1/2029	\$0.31
	17. Larrabee Converter-Larrabee 230 kV New Line	6/1/2029	\$7.52
	18. Larrabee Converter-Smithburg No1 500 kV Line (New Asset)	12/31/2027	\$150.35
	24. G1021 Atlantic-Smithburg 230 kV	12/31/2027	\$62.85
	27. Smithburg Substation 500 kV Expansion	12/31/2027	\$5.81

	28. Larrabee Substation	6/1/2030	\$0.86
	29. Smithburg Substation 500 kV 3 Brk Ring	12/31/2027	\$62.44
<b>Proposal ID 17</b>	The following components of Proposal ID 17: Convert the six-wired East Windsor-Smithburg E2005 230 kV line (9.0 mi.) to two circuits. One a 500 kV line and the other a 230 kV line <ul style="list-style-type: none"> <li>- Smithburg-East Windsor 500 kV (3678SN/4541SE, 4262WN/5503WE MVA)</li> <li>- Deans-Smithburg 500 kV (3215SN/3998SE, 3890WN/4334WE MVA)</li> </ul>	ISD to be aligned with NJBPU solicitation schedule and related JCP&L Proposal 453 project work	
	4. East Windsor-Smithburg 500kV Line		\$104.21
	5. East Windsor-Smithburg 230kV Line		\$37.80
	6. East Windsor Substation		\$32.10
	7. T5020 Smithburg-Deans 500kV		\$13.24
	8. K137 Windsor-Twin Rivers-Wyckoff Street 34.5kV		\$6.20
	9. X752 Jerseyville-Smithburg 34.5kV		\$4.58
	10. B158 Gravel Hill Smithburg 34.5kV		\$4.23
	11. Smithburg 230 kV Substation		\$4.12
	18. Add third Smithburg 500/230 kV (1034SN/1287SE, 1036WN/1451WE MVA)		\$13.40
	16. Rebuild approximately 0.8 miles of the D1018 Reconductor Clarksville-Lawrence 230 kV line between Lawrence substation (PSEG) and structure No. 63 (1140SN/1387SE, 1342WN/1495WE MVA)		\$19.00
	19. Reconductor Kilmer I- – Lake Nelson I 230 kV (1136SN/1311SE, 1139WN/1379WE MVA)		\$4.42
<b>PJM Identified Upgrades</b>	Proposal Email 12/30/21: Additional reconductoring required for Lake Nelson I- 1 – Middlesex I 230 kV (1114SN/1285SE, 1116WN/1352WE MVA)	ISD to be aligned with NJBPU solicitation schedule and related JCP&L Proposal 453 project work	\$3.30
	Proposal Email 2/24/22: Rebuild Larrabee- – Smithburg #1 230 kV (1136SN/1311SE, 1139WN/1379WE MVA)		\$52.00
	Proposal Email 2/11/22: Reconductor small section of Raritan River- – Kilmer 1I 230 kV (n6201) (1156SN/1334SE, 1158WN/1403WE MVA)		\$0.20
	Proposal Email 2/11/22: Replace substation conductor at Kilmer & reconductor Raritan River- – Kilmer W 230 kV (n6202) (1156SN/1334SE, 1158WN/1403WE MVA)		\$25.88
	Proposal Email 2/11/22: Reconductor Red Oak A- – Raritan River 230 kV (n6203) (1156SN/1334SE, 1158WN/1403WE MVA)		\$11.05

	Proposal Email 2/11/22: Reconductor Red Oak B- – Raritan River 230 kV (n6204) (1156SN/1334SE, 1158WN/1403WE MVA)		\$3.90
<b><u>LS Power</u></b>			
<b>Proposal ID 229</b>	One additional Hope Creek- – Silver Run 230 kV submarine cable (1364SN/1614SE, 1364WN/1614WE MVA) and rerate plus upgrade line:	ISD to be aligned with NJBPU solicitation schedule and related JCP&L Proposal 453 project work	
	1. Transmission Line Upgrade		\$60.20
	2. Silver Run Substation Upgrade		\$1.00
<b><u>PSE&amp;G</u></b>			
<b>Proposal ID 180</b>	The following components of Proposal ID 180:	ISD to be aligned with NJBPU solicitation schedule and related JCP&L Proposal 453 project work	
	3. Linden Subproject (IP)		\$16.36
	4. Linden Subproject (OP)		\$8.56
	5. Upgrade Lake Nelson W-Middlesex W-Greenbrook W 230 kV line drop and strain bus connections at Lake Nelson 230kV (Lake Nelson W-Greenbrook W 230 kV: 934SN/1080SE, 999WN/1143WE MVA)(OP)		\$4.28
	6. Upgrade Lake Nelson W-Middlesex W-Greenbrook W 230 kV line drop and strain bus connections at Lake Nelson 230kV (Lake Nelson W-Greenbrook W 230 kV: 934SN/1080SE, 999WN/1143WE MVA) (IP)		\$1.49
	7. Bergen Subproject		\$5.53
<b>PJM Identified Upgrades</b>	Proposal PPT 3/11/22: Upgrade inside plant equipment at Lake Nelson I 230 kV (Kilmer I-Lake Nelson I 230 kV: 1378SN/1625SE, 1475WN/1723WE MVA)	ISD to be aligned with NJBPU solicitation schedule and related JCP&L Proposal 453 project work	\$3.80
	Proposal PPT 2/4/22: Upgrade Kilmer W-Lake Nelson W 230 kV line drop and strain bus connections at Lake Nelson 230kV (Kilmer W-Lake Nelson W 230 kV: 934SN/1080SE, 999WN/1143WE MVA)		\$0.16
	Proposal PPT 2/4/22: Upgrade Lake Nelson W-Middlesex W-Greenbrook W 230 kV line drop and strain bus connections at Lake Nelson 230kV (Lake Nelson W-Greenbrook W 230 kV: 934SN/1080SE, 999WN/1143WE MVA)		\$0.12
<b><u>PPL</u></b>			
<b>Proposal ID 330</b>	The following components of Proposal ID 330:	ISD to be aligned with NJBPU solicitation	
	1. Reconductor Gilbert-Springfield 230 kV		\$0.38

		schedule and related JCP&L Proposal 453 project work	
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<b>Transource</b>			
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<b>Proposal ID 63</b>	North Delta Option A:	ISD to be aligned with NJBPU solicitation schedule and related JCP&L Proposal 453 project work	
	1. Graceton Station Upgrade		\$1.55
	2. North Delta Station		\$76.27
	3. Tline Upgrade – Graceton – Cooper - Peach Bottom		\$28.74
	4. Tline Upgrade – North Delta – Cooper Cut-in Lines		\$1.56
	5. Tline Upgrade – Peach Bottom - Delta Cut-in Lines		\$1.56

<b>PECO</b>			
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<b>PJM Identified Upgrades</b>	Replace 4 Peach Bottom 500 kV breakers	ISD to be aligned with NJBPU solicitation schedule and related JCP&L Proposal 453 project work	\$5.6
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<b>BGE</b>			
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<b>PJM Identified Upgrades</b>	Upgrade one Conastone 230 kV breaker	ISD to be aligned with NJBPU solicitation schedule and related JCP&L Proposal 453 project work	\$1.3
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## **Appendix B: Terms and Conditions**

The following terms and conditions will apply to all projects selected under the SAA.

1. For any greenfield portion of a selected project, or to reflect any other commitments associated with a selected project, the SAA Developer shall execute a DEA with PJM that (i) memorializes the design, construction and operation of the project, (ii) fully incorporate the commitments made by the SAA Developer regarding its SAA Proposal, as set forth in Schedule E of the SAA Developer's proposal, and (iii) is consistent with the form and substance reasonably acceptable to PJM and the Board. As a condition of the DEA, the SAA Developer shall not be permitted to amend, modify or terminate (or cause the termination of) the DEA without prior written consent of the Board.
2. Prior to making any filings with PJM under the DEA, the PJM Operating Agreement or the PJM Open Access Transmission Tariff (collectively, the "PJM Governing Documents"), or otherwise, the SAA Developer shall provide a draft of such filing to the Board Secretary and the Deputy Director of the Division of Clean Energy for review and comment, and shall use reasonable efforts to incorporate into such filing any comments received from the Board and/or Staff.
3. The SAA Developer shall provide to Staff a copy of all correspondence submitted by the SAA Developer to PJM, or received by the SAA Developer from PJM, promptly upon such submittal or receipt.
4. Prior to making any filings with FERC pursuant to the DEA, the PJM Governing Documents, the Federal Power Act, or otherwise, the SAA Developer shall provide a draft of such filing to the Board Secretary and the Deputy Director of the Division of Clean Energy for review and comment, and shall use reasonable efforts to incorporate into such filing any comments received from the Board and/or Staff.
5. Unless otherwise agreed to by the Board in writing, all formula rate and similar filings by the SAA Developer with the FERC pursuant to Section 205 or Section 206 of the Federal Power Act shall fully conform to commitments made by the SAA Developer in its SAA Proposal, the DEA, and the requirements of this Order.
6. The SAA Developer shall provide regular, quarterly status reports in writing to the Board. The reports shall contain, but not be limited to, updates and information regarding: (a) current permitting and land acquisition status of the project; (b) current engineering and construction status of the project; (c) project completion percentage, including milestone completion; (d) current target project and phase completion date(s); and (e) cost expenditures to date, including any associated overhead and fringe benefits related costs and revised projected cost estimates for completion of the project.
7. The SAA Developer shall design, construct, operate and maintain the project, as set forth in Appendix A, in accordance with: (a) the provisions of this Order; (b) all applicable laws, regulations, ordinances and permits (collectively, "Applicable Law"); (c) the DEA; (d) the PJM Governing Documents; (e) the Federal Power Act; (f) applicable reliability principles, guidelines, and standards of the Applicable Regional Reliability Council and the North American Electric Reliability Corporation ("NERC"); and (g) Good Utility Practice (as defined in the DEA). The SAA Developer shall promptly notify the Board of any actual, alleged or anticipated failure to comply with the foregoing requirements.
8. The SAA Developer shall be solely responsible for all planning, design, engineering, procurement, construction, installation, management, operations, safety, and compliance



- with Applicable Laws associated with the Project, including but not limited to obtaining all necessary permits, siting, and other regulatory approvals. The Board in its discretion or as set forth in this Order may, but shall have no responsibility to, supervise or ensure compliance or adequacy of same.
9. The SAA Developer may not modify the Project without prior written consent of Board Staff under the terms of this Order, including but not limited to, modifications necessary to obtain siting approval or necessary permits, which consent shall not be unreasonably withheld, conditioned, or delayed.
  10. The SAA Developer shall construct and place into service the Project in accordance with the schedule of milestones set forth in its SAA Proposal. In the event The SAA Developer, despite the exercise of due diligence, fails to meet, or reasonably believes it may fail to meet, any milestones required to meet the delivery timeline set forth in its SAA Proposal, the SAA Developer shall promptly notify the Board and submit a revised Development Schedule that (a) identifies to the remedial measures to be implemented by the SAA Developer to mitigate the delay (or expected delay), and (b) contains revised milestones showing the Project in full operation no later than the Required Project In-Service Date pursuant to SAA Developer's SAA Proposal.
  11. The SAA Developer shall seek and obtain all required government authority authorizations or approvals as soon as reasonably practicable.
  12. Upon reasonable notice, the Board shall have the right to inspect the project for the purposes of assessing the progress of the project and satisfaction of milestones. Such inspection shall not be deemed as review or approval by the Board of any design or construction practices or standards used by the SAA Developer.
  13. The SAA Developer shall, as directed by the Board, perform or permit the engineering and construction necessary to accommodate the interconnection of generation or other facilities that have been identified and selected by the Board in accordance with PJM Rate Schedule FERC No. 49 (State Agreement Approach Agreement) ("Rate Schedule 49") (such facilities, a "Public Policy Project"). Except in accordance with the foregoing or as otherwise may be set forth in a final order issued by the FERC, the SAA Developer shall not allow the interconnection of any other generation, transmission or other facilities to the project.
  14. The SAA Developer will construct, operate and maintain its project in accordance with all submissions made to the Board and/or PJM in the pendency of this SAA solicitation. In connection with the foregoing, the SAA Developer's construction, operation and maintenance of the Project, including recovery of prudently incurred costs associated therewith, shall be subject to the provisions of the DEA, the PJM Governing Documents, and Sections 205 and 206 of the Federal Power Act.
  15. The SAA Developer may not assign, in whole or in part, its rights and obligations under this Order except with the prior written consent of the Board.
  16. The SAA Developer shall pass through to New Jersey ratepayers all federal investment tax credit benefits and accelerated depreciation benefits that are received by the project or the SAA Developer under the Internal Revenue Code.
  17. The SAA Developer shall use reasonable efforts to pursue funding opportunities from the DOE and other governmental sources, and shall pass through to New Jersey ratepayers all funding and economic benefits it receives from any such funding.
  18. The Board shall not be liable to the SAA Developer, any third-party, or any other person for any claims, losses or damages arising or resulting from any acts or omissions

associated in any way with performance under this Order. The SAA Developer shall at all times indemnify, defend, and save the Board and its members, officers and employees harmless from, any and all damages, losses, claims, including claims and actions relating to injury to or death of any person or damage to property, demands, suits, recoveries, costs and expenses, court costs, attorney fees, and all other obligations by or to third-parties, arising out of or resulting from the SAA Developer's acts or omissions associated with the performance of its obligations under this Order.

IN THE MATTER OF DECLARING TRANSMISSION TO SUPPORT OFFSHORE WIND A  
PUBLIC POLICY OF THE STATE OF NEW JERSEY

DOCKET NO. QO20100630

**SERVICE LIST**

**New Jersey Division of Rate Counsel**

140 East Front Street, 4<sup>th</sup> Floor  
Trenton, NJ 08625-0003

Brian O. Lipman, Esq., Director  
[blipman@rpa.nj.gov](mailto:blipman@rpa.nj.gov)

Maura Caroselli, Esq., Managing Attorney  
[mcaroselli@rpa.nj.gov](mailto:mcaroselli@rpa.nj.gov)

T. David Wand, Esq., Managing Attorney  
[dwand@rpa.nj.gov](mailto:dwand@rpa.nj.gov)

Megan Lupo, Esq.  
[mlupo@rpa.nj.gov](mailto:mlupo@rpa.nj.gov)

Robert Glover, Esq.  
[rglover@rpa.nj.gov](mailto:rglover@rpa.nj.gov)

Carlena Morrison  
[cmorrison@rpa.nj.gov](mailto:cmorrison@rpa.nj.gov)

**New Jersey Division of Law**

R.J. Hughes Justice Complex  
Public Utilities Section  
25 Market Street, P.O. Box 112  
Trenton, NJ 08625

Daren Eppley, Section Chief  
[daren.eppley@law.njoag.gov](mailto:daren.eppley@law.njoag.gov)

Pamela Owen, Assistant Section Chief  
[pamela.owen@law.njoag.gov](mailto:pamela.owen@law.njoag.gov)

Paul Youchak, DAG  
[paul.youchak@law.njoag.gov](mailto:paul.youchak@law.njoag.gov)

David Apy, Assistant Attorney General  
[david.apy@law.njoag.gov](mailto:david.apy@law.njoag.gov)

**New Jersey Board of Public Utilities**

44 South Clinton Avenue, 1<sup>st</sup> Floor  
Trenton, NJ 08625-0350

Carmen D. Diaz, Acting Secretary  
[board.secretary@bpu.nj.gov](mailto:board.secretary@bpu.nj.gov)

Bob Brabston, Esq., Executive Director  
[robert.brabston@bpu.nj.gov](mailto:robert.brabston@bpu.nj.gov)

Stacy Peterson, Deputy Executive Director  
[stacy.peterson@bpu.nj.gov](mailto:stacy.peterson@bpu.nj.gov)

Taryn Boland, Chief of Staff  
[taryn.boland@bpu.nj.gov](mailto:taryn.boland@bpu.nj.gov)

Henry Gajda, Deputy Chief of Staff  
[henry.gajda@bpu.nj.gov](mailto:henry.gajda@bpu.nj.gov)

Abe Silverman, Esq.,  
Executive Policy Counsel  
[abe.silverman@bpu.nj.gov](mailto:abe.silverman@bpu.nj.gov)

**General Counsel's Office**

Michael Beck, Esq.  
General Counsel  
[michael.beck@bpu.nj.gov](mailto:michael.beck@bpu.nj.gov)

Carol Artale, Esq.,  
Deputy General Counsel  
[carol.artale@bpu.nj.gov](mailto:carol.artale@bpu.nj.gov)

Kim Diamond, Esq., Legal Specialist  
[kimberly.diamond@bpu.nj.gov](mailto:kimberly.diamond@bpu.nj.gov)

Ian Oxenham, Esq., Legal Specialist  
[ian.oxenham@bpu.nj.gov](mailto:ian.oxenham@bpu.nj.gov)

David Schmitt, Esq., Legal Specialist  
[david.schmitt@bpu.nj.gov](mailto:david.schmitt@bpu.nj.gov)

**Office of the Economist**

Dr. Ben Witherell, Chief Economist  
[benjamin.witherell@bpu.nj.gov](mailto:benjamin.witherell@bpu.nj.gov)

**NJBPU (cont.)**

Division of Clean Energy

Kelly Mooij, Director  
[kelly.mooij@bpu.nj.gov](mailto:kelly.mooij@bpu.nj.gov)

Jim Ferris, Deputy Director  
[jim.ferris@bpu.nj.gov](mailto:jim.ferris@bpu.nj.gov)

Andrea Hart, Esq.  
Senior Program Manager, Offshore Wind  
[andrea.hart@bpu.nj.gov](mailto:andrea.hart@bpu.nj.gov)

Véronique Oomen  
Project Manager Renewable Energy  
[veronique.oomen@bpu.nj.gov](mailto:veronique.oomen@bpu.nj.gov)

Kira Lawrence, Senior Scientist  
[kira.lawrence@bpu.nj.gov](mailto:kira.lawrence@bpu.nj.gov)

NJBPU Consultant

The Brattle Group  
1800 M Street NW, Suite 700  
Washington, DC, 20036

Michael Hagerty  
[michael.hagerty@brattle.com](mailto:michael.hagerty@brattle.com)

Hannes Pfeifenberger  
[hannes.pfeifenberger@brattle.com](mailto:hannes.pfeifenberger@brattle.com)

Joe DeLosa  
[joe.delosa@brattle.com](mailto:joe.delosa@brattle.com)

Carson Peacock  
[carson.peacock@brattle.com](mailto:carson.peacock@brattle.com)

Ethan Snyder  
[ethan.snyder@brattle.com](mailto:ethan.snyder@brattle.com)

Evan Bennett  
[evan.bennett@brattle.com](mailto:evan.bennett@brattle.com)

Steven Herling  
[herling.hpgc@gmail.com](mailto:herling.hpgc@gmail.com)

Mark Kalpin  
[mark.kalpin@hklaw.com](mailto:mark.kalpin@hklaw.com)

**PJM**

2750 Monroe Blvd  
Audubon, PA 19403

Suzanne Glatz  
[suzanne.glatz@pjm.com](mailto:suzanne.glatz@pjm.com)

Sami Abdulsalam  
[sami.abdulsalam@pjm.com](mailto:sami.abdulsalam@pjm.com)

Jonathan Kern  
[jonathan.kern@pjm.com](mailto:jonathan.kern@pjm.com)

Augustine Caven  
[augustine.caven@pjm.com](mailto:augustine.caven@pjm.com)

Stuart Widom  
[stuart.widom@pjm.com](mailto:stuart.widom@pjm.com)

**New Jersey Dept. of Environmental Protection**

P.O. Box 420  
Trenton, NJ 08625

Katherine Nolan  
[katherine.nolan@dep.nj.gov](mailto:katherine.nolan@dep.nj.gov)

Megan Brunatti  
[megan.brunatti@dep.nj.gov](mailto:megan.brunatti@dep.nj.gov)

Elizabeth Lange  
[elizabeth.lange@dep.nj.gov](mailto:elizabeth.lange@dep.nj.gov)

**New Jersey Dept. of Military & Veterans Affairs**

P.O. Box 340  
Trenton, NJ 08625

Jill Ann Priar  
[jill.priar@dmava.nj.gov](mailto:jill.priar@dmava.nj.gov)

Eric Sproesser  
[eric.sproesser@dmava.nj.gov](mailto:eric.sproesser@dmava.nj.gov)

Charles Appleby  
[charles.appleby@dmava.nj.gov](mailto:charles.appleby@dmava.nj.gov)

Paul Rumberger  
[paul.rumberger@dmava.nj.gov](mailto:paul.rumberger@dmava.nj.gov)

Steven Hoffman  
[steven.hoffman@dmava.nj.gov](mailto:steven.hoffman@dmava.nj.gov)

**New Jersey Pinelands Commission**

15 Springfield Road  
New Lisbon, NJ 08064

**Atlantic City Electric Company**

500 N. Wakefield Drive  
Newark, DE 19714-6066

Michael Donnelly  
[michael.donnelly@peco-energy.com](mailto:michael.donnelly@peco-energy.com)

Harsha Jasti  
[harsha.jasti@exeloncorp.com](mailto:harsha.jasti@exeloncorp.com)

Raul Mihai Cosman  
[raulmihai.cosman@exeloncorp.com](mailto:raulmihai.cosman@exeloncorp.com)

**Anbaric Development Partners, LLC**

401 Edgewater Place, Suite 680  
Wakefield, MA 01880

Janice Fuller  
[jfuller@anbaric.com](mailto:jfuller@anbaric.com)

**Atlantic Power Transmission, LLC**

103 Carnegie Center Blvd, Suite 300  
Princeton, NJ 08540

Stephen Boyle  
[stephen.boyle@atlanticpowertransmission.com](mailto:stephen.boyle@atlanticpowertransmission.com)

Andy Geissbuehler  
[andy.geissbuehler@atlanticpowertransmission.com](mailto:andy.geissbuehler@atlanticpowertransmission.com)

**LS Power Grid Mid-Atlantic, LLC**

16150 Main Circle Drive, Suite 310  
Chesterfield, MO 63017

Eric Hayes  
[ehayes@lspower.com](mailto:ehayes@lspower.com)

Lawrence Willick  
[lwillick@lspower.com](mailto:lwillick@lspower.com)

**Con Edison Transmission, Inc.**

4 Irving Pl  
New York, NY 10003

Mallorie Azzolini  
[azzolinim@conedtransmission.com](mailto:azzolinim@conedtransmission.com)

**Ørsted**

399 Boylston St., 12<sup>th</sup> Floor  
Boston, MA 02116

**Jersey Central Power & Light Company**

300 Madison Ave  
Morristown, NJ 07960

Martin C. Rothfelder  
[mrothfelder@rothfelderstern.com](mailto:mrothfelder@rothfelderstern.com)

Stephen Tutor  
[stutor@firstenergycorp.com](mailto:stutor@firstenergycorp.com)

**Mid-Atlantic Offshore Development, LLC**

15445 Innovation Dr  
San Diego, CA 92128

Matthew Virant  
[matthew.virant@edf-re.com](mailto:matthew.virant@edf-re.com)

Jim Laskey  
[jlaskey@norris-law.com](mailto:jlaskey@norris-law.com)

**NextEra Energy Transmission Mid-Atlantic Holdings, LLC**

700 Universe Blvd  
Juno Beach, FL 33408

James King  
[james.king@nexteraenergy.com](mailto:james.king@nexteraenergy.com)

Brian J. Murphy  
[brian.j.murphy@nexteraenergy.com](mailto:brian.j.murphy@nexteraenergy.com)

**PPL Electric Utilities**

2 N. Ninth St.  
Allentown, PA 18101

Shadab Ali  
[sali@pplweb.com](mailto:sali@pplweb.com)

Cleveland Richards  
[crichards@pplweb.com](mailto:crichards@pplweb.com)

**Public Service Electric and Gas Company**

80 Park Plaza, T5  
Newark, NJ 07102

Jodi Moskowitz  
[jodi.moskowitz@pseg.com](mailto:jodi.moskowitz@pseg.com)

Cara Lewis  
[cara.lewis@pseg.com](mailto:cara.lewis@pseg.com)

Yann Manibog  
[yanma@orsted.com](mailto:yanma@orsted.com)

Aaron Bullwinkel  
[aarbu@orsted.com](mailto:aarbu@orsted.com)

Mike Vasconcelos  
[mivas@orsted.com](mailto:mivas@orsted.com)

**Rise Light & Power, LLC**  
Outerbridge New Jersey, LLC  
1 Tower Center Blvd #11  
East Brunswick, NJ 08816

Jim D'Andrea  
[jim.dandrea@riselight.com](mailto:jim.dandrea@riselight.com)

Richmond Young  
[richmond.young@riselight.com](mailto:richmond.young@riselight.com)

**Transource Energy, LLC**  
1 Riverside Plaza  
Columbus, OH 43215

Maria J. Malguarnera  
[mjmalguarnera@aep.com](mailto:mjmalguarnera@aep.com)

**Atlantic Shores Offshore Wind, LLC**  
Atlantic Shores Offshore Wind  
Dock 72  
Brooklyn, NY 11231

Joris Veldhoven  
[joris.veldhoven@atlanticshoreswind.com](mailto:joris.veldhoven@atlanticshoreswind.com)