Evaluation Report

New Jersey Offshore Wind Solicitation #3

prepared for

The New Jersey Board of Public Utilities

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Public Version

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Limitation on Liability

This report has been prepared for the New Jersey Board of Public Utilities ("Board") for the sole purpose of evaluating the applications submitted in response to the Board's Offshore Wind Solicitation. Findings contained herein depend on the assumptions identified in our report. While Levitan & Associates, Inc. ("LAI") believes these assumptions to be reasonable, there is no assurance that any specific set of assumptions will actually be encountered. LAI gives no assurances except those explicitly set forth herein.

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GLOSSARY

Short Form Names

Atlantic Shores: Atlantic Shores Offshore Wind Project 2, LLC

Attentive: Attentive Energy LLC

Board or BPU: New Jersey Board of Public Utilities

CPDQ: Caisse de dépôt et placement du Québec

Community: COSW NJ 1, LLC

EDF: Électricité de France S.A.

EDF Renewables: EDF Renewables, Inc.

Invenergy: Invenergy Wind Offshore, LLC

Invenergy Renewables: Invenergy Renewables LLC

JCP&L: Jersey Central Power & Light Company

LAI: Levitan & Associates, Inc.

MAOD: Mid-Atlantic Offshore Development, LLC

Solicitation Guidance Document or SGD: *New Jersey Offshore Wind, Solicitation #3, Solicitation Guidance Document, Application Submission for Proposed Offshore Wind Facilities*

Acronyms and Abbreviations

ABP	Analysis-by-Parts
ACP	Alternative Compliance Payment
BAFO	Best and Final Offer
BCR	Benefit-cost ratio
BEA	U.S. Bureau of Economic Analysis
BLS	U.S. Bureau of Labor Statistics
BRA	Base Residual Auction
BTM	Behind-the-meter
CAGR	Combined Annual Growth Rate
CBA	Cost-benefit analysis
CCR	Cost Containment Reserve
CELT	Capacity, Energy, Load and Transmission
COD	Commercial operation date
COP	Construction and Operation Plan
CQ	Clarifying Question
CTV	Crew transfer vessel
DEIS	Draft Environmental Impact Statement

ECR	Emissions Containment Reserve
EDC	Electric distribution company
EE	Energy efficiency
EIA	U.S. Energy Information Administration
EMAAC	Eastern Mid-Atlantic Area Council
EO307	Executive Order No. 307
EO8	Executive Order No. 8
EO92	Executive Order No. 92
EPA	U.S. Environmental Protection Agency
EPP	Environmental Protection Plan
FCA	Forward Capacity Auction
FCM	Forward Capacity Market
FIR	Fisheries Industries Representative
FPP	Fisheries Protection Plan
FTE	Full-time employee
GHG	Greenhouse Gas
GW	Gigawatt
GWh	Gigawatt hour
IBEW	International Brotherhood of Electrical Workers
IMPLAN	IMpact PLANning
IO	Input-output
ISA	Interconnection Services Agreement
ITC	Investment Tax Credit
Jones Act	Merchant Marine Act of 1920
kW	Kilowatt
kWh	Kilowatt hour
LCOE	Levelized Cost of Energy
LCS	Larrabee Collector Station
LNOC	Levelized Net OREC Cost
LOPP	Levelized OREC Purchase Price
LRCs	Levelized Revenue Credits
LSEP	Local Supplier Engagement Plan
MAAC	Mid-Atlantic Area Council
MARACOOS	Mid-Atlantic Regional Association Coastal Ocean Observing System
MW	Megawatt
MWh	Megawatt hour
NJ DEP	New Jersey Department of Environmental Protection
NJ SAVI	New Jersey Selective Assistance Vendor Information
NJCCC	New Jersey Community College Consortium
NJEDA	New Jersey Economic Development Authority
NJMEP	New Jersey Manufacturing Extension Partnership
NJSBDC	New Jersey Small Business Development Center

NJWP	New Jersey Wind Port
NOAA	National Oceanic and Atmospheric Administration
NPI	Net positive impact
NPV	Net present value
OBCs	Environmental Justice and Overburdened Communities
OCRP-1	Offshore Compliance Recommended Practices
OCS	Outer Continental Shelf
ORECs	Offshore Wind Renewable Energy Certificates
OWEDA	Offshore Wind Economic Development Act
PBI	Prebuild Infrastructure
PCE	Personal consumption expenditures
PFI	Private fixed investment
PILOT	Payment in Lieu of Taxes
PLA	Project Labor Agreement
PVNOC	Present Value of Net OREC Cost
PVOPP	Present Value of OREC Purchase Price
RODA	Responsible Offshore Development Alliance
ROSA	Responsible Offshore Science Alliance
RPS	Renewable Portfolio Standard
S&P	Standard and Poor's
SAA	State Agreement Approach
SCC	Social cost of carbon
Scenario 1	Portfolio of at least 2,400 MW
Scenario 2	Portfolio of approximately 3,742 MW
Sea Girt NGTC	Sea Girt National Guard Training Center
SLR	Subsequent License Renewal
SMWVBE	Small, Minority, Woman, or Veteran-owned Business Enterprise
SOV	Service operation vessel
ST	Short tons
TP	Transition piece
TSD	Technical Support Document
TSUC	Transmission system upgrade cost
TSUCPA	Transmission System Upgrade Cost Price Adder
VRR	Variable Reserve Requirement
WDP	Workforce Development Plan
XLPE	Cross-linked polyethylene

EXECUTIVE SUMMARY

The main points are these:

- The third solicitation resulted in competitive Applications from three global developers that meet the Board's procurement objectives and result in good economic outcomes from a ratepayer perspective when Applications are compared to each other as well as recently announced selected projects in New York State. A fourth global developer that submitted in August 2023 withdrew its Application, the subtraction of which does not impair the Board's procurement goals and objectives in the current solicitation.
- All three Applications submitted were found to meet or exceed the minimum eligibility thresholds.
- The Board has before it a panoply of Project alternatives differentiated by nameplate, economic impacts and related guarantees, state-wide community spend, and, to a lesser extent, environmental and fisheries impact plans. Invenergy's 2,400 MW Project option has the largest capacity submitted and achieves the greatest scale economy in regard to OREC pricing and ratepayer benefits. On its own, this Project is insufficient to result in the likely success of EEW's Phase 3 expansion of the monopile manufacturing facility at Paulsboro as well as a new tower manufacturing facility at the New Jersey Wind Port. Attentive's 1,342 MW and *BC/[redacted]/EC* Project options provide New Jersey with a valuable complement to a portfolio solution of a size that is likely to achieve supply chain manufacturing capability in New Jersey. In comparison to Invenergy, Attentive's guarantees underlying its purported economic impacts are not as robust but nevertheless adequate in the context of a target portfolio to support Tier 1 manufacturing capability in New Jersey.
- Atlantic Shores' *BC/[redacted]/EC* Project demonstrates strong economic benefits and related guarantees, and is also distinguishable in regard to the strength of its environmental and fisheries mitigation plans. Relative to Invenergy and Attentive, Atlantic Shores has a significant OREC price premium, which the Board may consider in its evaluation of different portfolios.
- Realization of supply chain manufacturing capability in New Jersey is at a crossroads as neighboring states pursue like supply chain formation through state governmental grants and the selection of more expensive Project options that incorporate commitments to local manufacturing capability. Therefore, hardening the supply chain at the New Jersey Wind Port and Paulsboro bears upon the total capacity procurement objective underlying both portfolio composition and size. Procuring *BC/[redacted]/EC* or 3,742 MW that includes the Applicants' respective commitments to fund tower manufacturing at the New Jersey Wind Port and the EEW Phase 3 expansion is likely to be sufficient to ensure the success of tower manufacturing at the New Jersey Wind Port. However, the funding of EEW Phase 3 may hinge on the EEW Phase 2 expansion, which may remain uncertain upon issuance of the Board's decision(s). The decision to buy more offshore wind in this solicitation versus about one year from now in the fourth solicitation turns on OREC pricing dynamics and impacts on New Jersey's supply chain manufacturing goals at Paulsboro and/or the New Jersey Wind Port. Board Staff and LAI agree that it is not reasonable to expect a significant decline in OSW prices in the fourth solicitation.
- A total award of 3,742 MW will result in the full utilization of the Larrabee, Atlantic, and Smithburg circuits at the Larrabee Collector Station that will be constructed as part of New Jersey's State Agreement Approach transmission initiatives. A *BC/[redacted]/EC* portfolio solution would leave unused valuable transmission capability from landfall to the Larabee Collector Station.

- ❑ All Applicants incorporate current state-of-the-art research and mitigation techniques that will lessen environmental and fisheries impacts. It is reasonable to expect environmental mitigation techniques to evolve in the ensuing interval between Project awards and each awardee's final investment decision.

BACKGROUND

On November 19, 2019, Governor Phil Murphy signed Executive Order No. 92 ("EO92"), increasing the State's offshore wind energy generation goal from 3,500 MW by 2030 to 7,500 MW by 2035. On September 21, 2022, Governor Murphy signed Executive Order No. 307 ("EO307"), increasing the State's offshore wind goal from 7,500 MW by 2035 to 11,000 MW by 2040 and directing the Board of Public Utilities ("BPU" or the "Board") to study the feasibility of further increasing the target. To implement Governor Murphy's vision of making New Jersey a leading hub for offshore wind development, the Board initiated this third offshore wind procurement by issuing the *New Jersey Offshore Wind, Solicitation #3, Solicitation Guidance Document, Application Submission for Proposed Offshore Wind Facilities* ("Solicitation Guidance Document" or "SGD") on March 6, 2023, soliciting Applications to secure Offshore Wind Renewable Energy Certificates ("ORECs") targeting at least 1,200 MW and up to approximately 4,000 MW of capacity.

Per N.J.A.C. 14:8-6.5(a)(12), if the pricing proposal satisfies the cost-benefit standards set forth in the statute and the Board's regulations, the Board may approve the Application subject to the Application satisfying other required conditions. Per N.J.A.C. 14:8-6.3(c), the Board may approve, conditionally approve, or deny an application for ORECs. In this solicitation, Board Staff and LAI applied the following weighting criteria in our evaluation of relative merit among rival Applicants and Project options: 70% OREC Purchase Price and Ratepayer Impacts and 30% Non-Price Considerations, including Economic Impacts and Strength of Guarantees for Economic Impacts, and Environmental and Fisheries Impacts. The Board may also reflect in its evaluation the additional benefit of having a diversity of selected Applicants, technology alternatives, economic benefits and guarantees as well as other qualitative considerations that help sustain a workably competitive market in future offshore wind procurement rounds.

SUBMITTED APPLICATIONS

The Application submission deadline was August 4, 2023. The BPU received Applications from four Applicants: Atlantic Shores Offshore Wind Project 2, LLC ("Atlantic Shores"), Attentive Energy LLC ("Attentive"), COSW NJ 1, LLC ("Community") and Invenergy Wind Offshore, LLC ("Invenergy"). Community, which is sponsored by RWE and National Grid, subsequently withdrew its Application. Atlantic Shores is a 50:50 partnership between EDF-RE Offshore Development, LLC, indirectly owned by EDF Renewables, Inc. and Shell New Energies US LLC, indirectly owned by Shell plc. Attentive is sponsored by TotalEnergies and Corio. Invenergy is backed by Forward Power, which is a project developer that is a joint venture between Invenergy Renewables and energyRe. The Projects of each Applicant are mutually exclusive.

*BC/[redacted]

[redacted]/EC* A summary of Project information is shown in Table 1 and a more detailed discussion is presented in Section 1.

Table 1. Summary of Key Project Characteristics
BC//EC

	Atlantic Shores	Attentive	Invenergy
BOEM Lease Area	OCS-A 0499	OCS-A 0538	OCS-A 0542
Nameplate Capacity (MW)	[redacted]	[redacted]	[redacted]
Delivered Capacity (MW)	[redacted]	[redacted] 1,342	[redacted] 2,400
Number of Installation Phases	[redacted]	1	[redacted] 2 (2,400)
Final Phase Commercial Operation Date	[redacted]	7/1/2031	[redacted] 12/31/2032 (2,400)
Nearest WTG Distance from Shore (statute miles)	[redacted]	47.5	40.7
Wind Turbine Manufacturer	[redacted]	[redacted]	[redacted]
WTG Nameplate (MW)	[redacted]	[redacted]	[redacted]
Number of WTG Units	[redacted]	[redacted]	[redacted]
Foundation Technology	[redacted]	Monopile	Monopile
Export Cable Length (miles)	[redacted]	[redacted]	[redacted]
Expected WTG Capacity Factor (net of losses)	[redacted]	[redacted]	[redacted]

PROJECT ELIGIBILITY

As an initial screening step, LAI first reviewed each Application with respect to likelihood of successful commercial operation to determine whether certain Minimum Eligibility Requirements were met. All Applications and Projects were found to be eligible. Each Applicant is backed by global energy companies with strong balance sheets. Each Applicant has demonstrated the management expertise needed to facilitate successful commercial development. Although Invenergy does not have corporate offshore wind experience, it has an extensive portfolio of onshore renewables, and has engaged Key Personnel with offshore wind development experience. Each Applicants' identification of components and suppliers follows industry standards but does not preclude changes if technology progress merits design modifications. Importantly, such changes will not trigger an OREC price increase but any material change in technology would likely necessitate Board approval. The incorporation of new commercial safeguards relative to prior solicitations, in particular, the Inflation Adjustment Factor, supports Board Staff's and LAI's determination that all Applicants are likely to successfully develop their respective projects as there are no known environmental permit obstacles that constitute fatal flaws, or structural weaknesses on the Applicants' respective balance sheets that would undermine capital formation. Each Applicant likely has sufficient financial strength, management know-how and influence to reinforce their respective supply chains to meet scheduled milestones. A detailed discussion of this eligibility review is presented in Section 2.

LAI also confirmed that all Project submissions from each Applicant have a benefit-cost ratio ("BCR") above 1.0, the required threshold to support an OREC award under the Offshore Wind Economic Development Act. Monetizing avoided emissions, particularly CO_2, results in all Project submissions having a BCR far greater than the required threshold. A discussion of the cost-benefit analysis is presented in Section 6.

EVALUATION RESULTS

LAI's evaluation is based on the criteria set forth in Section 4 of the SGD. Based on the Board's decision on October 25, 2023, to separate the Prebuild Infrastructure ("PBI") from the evaluation of Qualified Projects in a separate solicitation, no further consideration of the Applicants' PBI submissions is included in this Evaluation Report. LAI performed quantitative analysis of the Applicants' OREC Purchase Prices and ratepayer impacts. Additional quantitative analysis was performed regarding the economic impacts and the strength of guarantees for economic impacts. Qualitative analysis of environmental and fisheries impacts was also performed.

LAI evaluated the individual Projects on a stand-alone basis using the two weighted categories defined in the SGD. Figure 1 illustrates the category scores for each Project. *BC/

EC*

Figure 1. Project Scores

BC//EC

Quantification of Project scores provides useful data on the overall relative Project merit which consolidates the two evaluation categories. Project scores reveal relative overall strength among rival Applicants and Project options, and are considered alongside other factors within the selection process.

OREC Purchase Price and Ratepayer Impact

BC/ [redacted] EC Inflationary pressures coupled with supply chain constraints, the higher cost of financing, expensive BOEM lease costs, and geopolitical events have caused offshore wind project development costs to materially increase. The results of the procurement nevertheless appear workably competitive as there is a reasonable clustering of OREC Purchase Prices among the Applicants with like Project sizes or similar nameplates. Moreover, the prices are similar to those reported by the New York State Research and Development Authority ("NYSERDA") in their recent third solicitation results covering about 4,000 MW.

Table 2 reports the respective First Energy Year OREC Purchase Prices and associated levelized OREC Purchase Price ("LOPP"), levelized revenue credits ("LRCs") and levelized Net OREC Cost ("LNOC") values. The nominal LOPP and LNOC values include inflation and are levelized over the 20-year OREC term. Within each Project size, the range of prices is the result of variable commitments and Project characteristics.

Table 2. OREC Purchase Price Summary

BC//EC

	Atlantic Shores	Attentive	Invenergy	
	[redacted]	[redacted] 1,342 MW	[redacted]	2,400 MW
First Energy Year		2032	2032	
First Energy Year OREC Purchase Price ($/MWh)		[redacted]	[redacted]	$112.50- [redacted]
Escalation Rate		3.0%	2.5%	
LOPP ($/MWh)		[redacted]	[redacted]	$139.53- [redacted]
LRCs ($/MWh)		[redacted]	[redacted]	[redacted]
LNOC ($/MWh)		[redacted]	[redacted]	$70.05- [redacted]

BC [redacted] EC The OREC Purchase Price and Ratepayer Impacts analysis is presented in Section 3.

Economic Impacts and Strength of Guarantees for Economic Impacts

Economic impacts and strength of guarantees for economic impacts were reviewed in detail by Board Staff, the New Jersey Economic Development Authority ("NJEDA") and LAI.

The Applicants' direct economic benefits and jobs guarantees are summarized in Table 3. Atlantic Shores and Attentive have the highest and lowest levels of guaranteed economic impacts, respectively, with variation based on the included commitments.

Table 3. Direct Economic Benefits Guarantees

BC//EC

	Atlantic Shores	Attentive	Invenergy
	[redacted]		
In-State Total Expenditures ($ Millions)			
Development	[redacted]		
Construction			
Operation Years 1-5			
Operation Years 6-10			
In-State Jobs Creation (FTE-Years)			
Development	[redacted]		
Construction			
Operation Years 1-5			
Operation Years 6-10			

All of the Applicants proposed unconditional guarantees for proposed direct in-State spending and jobs. As per the SGD, all Applicants have committed to apply 90% of any shortfall in spending to a reduction in the OREC price and have proposed spending the remaining 10% on workforce development and community benefits, subject to Board approval. Applicants also proposed workforce development remedies that will apply if the jobs guarantees are not met.

BC [redacted] /EC

LAI and Board Staff reviewed and evaluated the Local Supplier Engagements Plans ("LSEPs"), Workforce Development Plans ("WDPs"), and economic benefits to Environmental Justice and Overburdened Communities ("OBCs"). *BC [redacted]

[redacted]/EC*

A detailed discussion of the evaluation of economic impacts and each Applicant's respective spending and jobs guarantees are discussed in detail in Section 4.

Environmental and Fisheries Impacts

The feasibility and strength of the Environmental Protection Plans ("EPPs") was reviewed in detail by Board Staff, the New Jersey Department of Environmental Protection ("NJ DEP") and LAI.

Atlantic Shores' EPP provides a detailed characterization of the environmental resources and potential impacts, based on site-specific data collection and published scientific studies. *BC/[redacted] EC*

Attentive's EPP relies on its initial field surveys and relevant scientific publications to provide a detailed characterization of the environmental resources in Attentive's lease area and potential impacts of the Project. Attentive confirms that it will adopt all of the required and recommended environmental and fisheries mitigation measures set forth in the SGD. Attentive has a robust stakeholder engagement plan for the fishing community and has developed an innovative turbine grid layout to enhance navigational safety. Attentive provides a detailed fisheries compensation plan. The most economically significant fishing catch in the project area are sea scallop and surfclam dredging. *BC/[redacted]/EC*

Because Invenergy's project is in the early stage of development, the EPP principally relies on published scientific studies and other desktop analysis. The EPP therefore lacks some detail with respect to the characterization of environmental resources and potential impacts, but Board Staff and LAI have concluded that there is adequate time for Invenergy's environmental experts to incorporate the requisite environmental enhancements to support best practices. Invenergy's Project commits to the adoption of all of the required environmental and fisheries mitigation measures. Engagement with fisheries stakeholders is in the early stages, but Invenergy has a detailed fisheries communications plan to expand outreach, including a fisheries compensation plan. The most economically significant fishing catch in the project are sea scallop and surfclam dredging. *BC/[redacted]

[redacted]/EC*

The analysis of the environmental and fisheries impacts is presented in Section 5.

Portfolio Evaluation

In addition to looking at the individual Project submissions, LAI tested the price, economic benefits, and costs attributable to the potential selection of portfolios that include Projects from multiple Applicants. Depending on the selected projects, a portfolio solution has the potential to position New Jersey favorably to achieve greater manufacturing capability to support both New Jersey's and neighboring states' offshore wind procurement goals, while conferring valuable employment and environmental justice benefits.

The portfolio evaluation includes options ranging from *BC/[redacted]/EC* to 3,742 MW. A key benefit of a larger portfolio is the requisite volume that enables the development of in-State supply chain facilities at the New Jersey Wind Port and at the EEW Paulsboro monopile manufacturing facility. Hence, the portfolio evaluation is focused on options that include commitments to invest in and/or purchase from such facilities. *BC/[redacted] EC* All evaluated portfolios have BCRs above the required 1.0 threshold.

A portfolio comprised of up to three projects totaling more than *BC/[redacted]/EC* will result in increased ratepayer cost due to the larger capacity. However, a portfolio consisting of multiple Projects would present substantial economic, environmental, and strategic benefits at an inflection point for New Jersey as targeted offshore wind resource additions rapidly increase along the Atlantic seaboard. Awarding more capacity now versus later would result in faster progress toward the 11,000 MW goal, including earlier incurrence of rate impacts. Awarding less capacity now may delay the incremental rate impacts by one or more years, but it is the evaluation team's assessment that rate impacts would not likely be substantially decreased by awarding capacity later.

Scores for the evaluated portfolios are shown in Figure 2. The Projects included in each portfolio are listed in Table 4, and described in more detail in Sections 1 and 8. Examination of each portfolio's total score is helpful as a comparison tool, but is not intended to be definitive in determining a Project or Projects for selection. Moreover, small differences in total point scores can be challenging to interpret and therefore do not govern the Board's selection process.

Figure 2. Portfolio Scores

BC//EC

Table 4. Portfolio Definition

BC//EC

	Applicant	Project Name	Project Code
1	[redacted]		
2			
3			
4			
5			
6			
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9			
10			
11			
12			
13			
14			

In terms of overall cost, the present value of the 20-year OREC Purchase Price ("PVOPP") for Invenergy's 2,400 Project option, when selected as a standalone Project in Portfolio 1, is *BC/[redacted]/EC* as shown in Figure 3. This represents a present value of net OREC cost ("PVNOC") of $3.9 billion. *BC [redacted] /EC* included Attentive option *BC/[redacted]/EC* to 1,342 MW *BC/[redacted]/EC* and the PVNOC to $7.2 billion, reflected in Portfolio 12. Relative to a *BC/[redacted]/EC* portfolio, a 3,742 MW portfolio has the benefit of fully utilizing the Larrabee, Smithburg and Atlantic SAA circuits at the Larrabee Collector Station ("LCS"). *BC/[redacted] EC*

Figure 3. Present Value of Portfolios

BC//EC

The unit OREC Cost Comparison for individual Projects and selected portfolios are presented in Figure 4. They are expressed on a levelized $/MWh basis (nominal dollars) based on the 20-year OREC term following each Project's commercial operation date. *BC/

/EC*

Figure 4. Unitized Cost of Portfolios

BC//EC

Across the board, the price and ratepayer impacts are higher than those seen in the previous New Jersey solicitations, but are consistent with current market trends. For background, the average residential ratepayer impact in the first New Jersey solicitation that resulted in the selection of Ocean Wind 1 was $1.46 per month (levelized 2019 $). The average residential ratepayer impact in the second New Jersey solicitation that resulted in the selection of Atlantic Shores 1 and Ocean Wind 2 was $3.49 per month (levelized 2021 $). The average residential rate increase ascribable to the selection of Invenergy's 2,400 MW Project and Attentive's 1,342 MW Project are $3.71/month and $3.13/month (levelized 2023 $), respectively, for a total of $6.85/month (Portfolio 12), once both Projects are fully in service in 2033. *BC /EC* Consistent with the calculation method used in the prior solicitations, the average residential bill impact is levelized over 20 years, expressed in current-year (2023) dollars and reflects the expected value of revenue credits derived from the sale of energy, capacity and avoided Tier 1 REC purchases. The results of this analysis are shown in Figure 5. Ratepayer impact is driven by both portfolio size and OREC price.

Figure 5. NJ Residential Electric Bill Impact by Portfolio

BC//EC

In the portfolio analysis, LAI has not attempted to weigh the relative importance of the SGD evaluation criteria beyond the weights applied in the Board's evaluation framework. LAI has performed analysis to inform a Board decision. In the final analysis, the Board will determine what constitutes best value for New Jersey.

1 OVERVIEW OF APPLICATIONS AND PROJECT ALTERNATIVES

New Jersey Governor Phil Murphy signed Executive Order No. 8 ("EO8") on January 31, 2018.[1] The purpose of EO8 was to reinvigorate the implementation of the State's Offshore Wind Economic Development Act ("OWEDA" or the "Act").[2] Noting that New Jersey possesses "some of the best offshore wind resources in the world," Governor Murphy affirmed the Garden State's commitment to "combat the threat of global climate change" to protect New Jersey and also "provide reliability and relief for the regional electric grid, which is the largest, most congested and most costly in the nation."[3] Moreover, the Governor saw that "an aggressive offshore wind energy production goal" could result in the State housing key parts of the offshore wind supply chain for the Atlantic Coast, which would "contribute to a stronger New Jersey economy."[4] To this end, in EO8, Governor Murphy set a "goal of 3,500 MW of offshore wind energy generation by the year 2030."[5]

As required by OWEDA, the Board adopted rules that provided an application process and evaluation framework for wind turbine electric generation facilities.[6] EO8 also directed the BPU to begin the rulemaking process to establish the OREC Funding Mechanism.[7] The rules that were promulgated set forth the method and processes by which New Jersey ratepayers fund offshore wind projects and how revenues from these projects are refunded to ratepayers.[8] In September 2018, the BPU issued a solicitation for 1,100 MW of offshore wind energy generation ("First Solicitation").[9] In June 2019, the BPU approved an Application for a 1,100 MW offshore wind generation project submitted by Ocean Wind LLC.[10]

On November 19, 2019, Governor Murphy signed EO92, increasing the State's offshore wind energy generation goal to 7,500 MW by 2035.[11] Governor Murphy found that as a result of efforts by the State following the issuance of EO8, "offshore wind development is a growing economic sector in the State with increases in supply chain presence, private investment in ports, workforce development efforts, and research and development for offshore wind industry and labor."[12] Governor Murphy found that expanding the offshore wind goal will ensure that the State can "meet the State's goals of 50 percent

[1] See Exec. Order No. 8, 50 N.J.R. 887(a) (Feb. 20, 2018). Executive Order No. 92 and Executive Order No. 307 increased the State's offshore wind goal, as discussed herein. Exec. Order No. 92, 51 N.J.R. 1817(b) (Dec. 16, 2019) ("EO92"); Exec. Order No. 307, 54 N.J.R. 1945(a) (Oct. 17, 2022) ("EO307"). All other provisions of EO8 remained in full force and effect.

[2] N.J.S.A. 48:3-87.1 to -87.2., L. 2010, c. 57, effective Aug. 19, 2010; amended by 2019 c. 440, §2, effective Jan. 21, 2020; 2021, c.178, §1, effective July 22, 2021.

[3] EO8.

[4] Id.

[5] Id.

[6] N.J.A.C. 14:8-6.1 et seq.

[7] See N.J.A.C. 14:8-6.6.

[8] Id.

[9] In the Matter of the Opening of Offshore Wind Renewable Energy Certificate (OREC) Application Window for 1,100 Megawatts of Offshore Wind Capacity in Furtherance of Executive Order No. 8, BPU Docket No. QO18080851, Order dated September 17, 2018 ("Sept. 17, 2018 Order").

[10] 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").

[11] See EO92.

[12] Id.

renewable energy by 2030 and 100 percent clean energy by 2050, in addition to creating a significant number of good-paying jobs."[13]

On September 9, 2020, the BPU issued a solicitation for 1,200 to 2,400 MW of offshore wind generation ("Second Solicitation"). On June 30, 2021, the BPU approved Applications for a 1,510 MW project submitted by Atlantic Shores Offshore Wind Project 1, LLC[14] and a 1,148 MW project submitted by Ocean Wind II, LLC.[15]

On September 21, 2022, Governor Murphy signed EO307, increasing the State's offshore wind goal from 7,500 MW by 2035 to 11,000 MW by 2040 and directing the Board to study the feasibility of increasing the target further.[16]

On October 26, 2022, the Board issued the State Agreement Approach ("SAA") Order,[17] where it found the Larrabee Tri-Collector Solution to be the most desirable SAA solution at this time.[18] In accordance with the SAA Order, each Project submitted in response to the Third Solicitation was required to utilize the SAA solution by interconnecting at the LCS[19] and crossing the shore at the Sea Girt National Guard Training Center ("Sea Girt NGTC"). The SAA Order further directs the Prebuild concept to be required as part of this solicitation. The SGD therefore described that the Applicant selected to construct the PBI from a landfall point at the Sea Girt NGTC to the LCS POI will install the necessary Duct Banks and associated Cable Vaults for its own Project as well as the additional offshore wind projects needed to fully utilize the SAA Capability through the LCS. Future Qualified Projects and any Qualified Project awarded in this solicitation that is not responsible for constructing the Prebuild Infrastructure, would then install their cables through the prebuilt Duct Banks utilizing the prebuilt Cable Vaults, with minimal further disruption to the communities near the Sea Girt NGTC landing point at the shore and along the cable route.

To meet New Jersey's clean energy goals, and to implement Governor Phil Murphy's vision of making New Jersey a leading hub of offshore wind development, the Board issued the SGD for the Third Solicitation on

[13] Id.

[14] 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"). In the Atlantic Shores 1 June 2021 Order, the specific amount awarded is 1,509.6 MW. That number has been rounded here for ease of reference. Id. at 1.

[15] 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").

[16] See EO 307.

[17] 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 Oct. 26, 2022 ("SAA Order").

[18] Id. The Larrabee Tri-Collector Solution is a transmission solution Mid-Atlantic Offshore Development, LLC ("MAOD") and Jersey Central Power & Light Company ("JCP&L") jointly submitted. Id. at 2. The Larrabee Tri-Collector Solution is a "tri-collector" that distributes up to 4,890 MW from the LCS to three existing points of interconnection on PJM's grid, specifically, the Smithburg 500 kV substation, the Larrabee 230 kV substation, and the Atlantic 230 kV substation, using JCP&L's existing transmission rights of way.

[19] Projects that would experience harm by interconnecting to the LCS POI were permitted to also submit one or more options utilizing an alternative POI. No Applicants opted to take advantage of this option.

March 6, 2023.[20] The SGD requested Applications to secure ORECs targeting at least 1,200 MW and up to approximately 4,000 MW of capacity.[21]

Applications were originally due on June 23, 2023. On June 7, 2023, the Board Ordered an extension of the Application submission deadline to August 4, 2023, in order to allow Applicants more time to develop their Applications.[22] The BPU received Applications from four Applicants: Atlantic Shores Offshore Wind Project 2, LLC ("Atlantic Shores"), Attentive Energy LLC ("Attentive"), COSW NJ 1, LLC ("Community") and Invenergy Wind Offshore, LC ("Invenergy"). Community, which is sponsored by RWE and National Grid, subsequently withdrew its Application, which is therefore not addressed in this report.

Acting in the best interest of the public and ratepayers, on October 25, 2023, the Board issued an Order rejecting all of the PBI proposals.[23] This report therefore does not address the Applicants' PBI submissions.

Applicants responded to multiple rounds of Clarifying Questions ("CQs") and were asked to submit a Best and Final Offer ("BAFO") for each Project option for two scenarios: a total award of at least 2,400 MW ("Scenario 1") and a total award of approximately 3,742 MW ("Scenario 2"). These scenarios were designed to result in consistent assumptions regarding cost sharing for EEW Phase 3. Because not all Applicants included a commitment to invest in the capability expansion of EEW Phase 3, Applicants that did include this commitment were further guided to submit responses with different levels of cost sharing for the capability expansion. Each Applicant's array of options submitted in response to the BAFO request is described in the following sections.

Figure 6 shows the relative locations of the lease areas from which Projects are offered, and their respective export cable routes to the Sea Girt NGTC.

[20] https://njoffshorewind.com/third-solicitation/solicitation-documents/Final-Solicitation-Guidance-Document-with-attachments.pdf

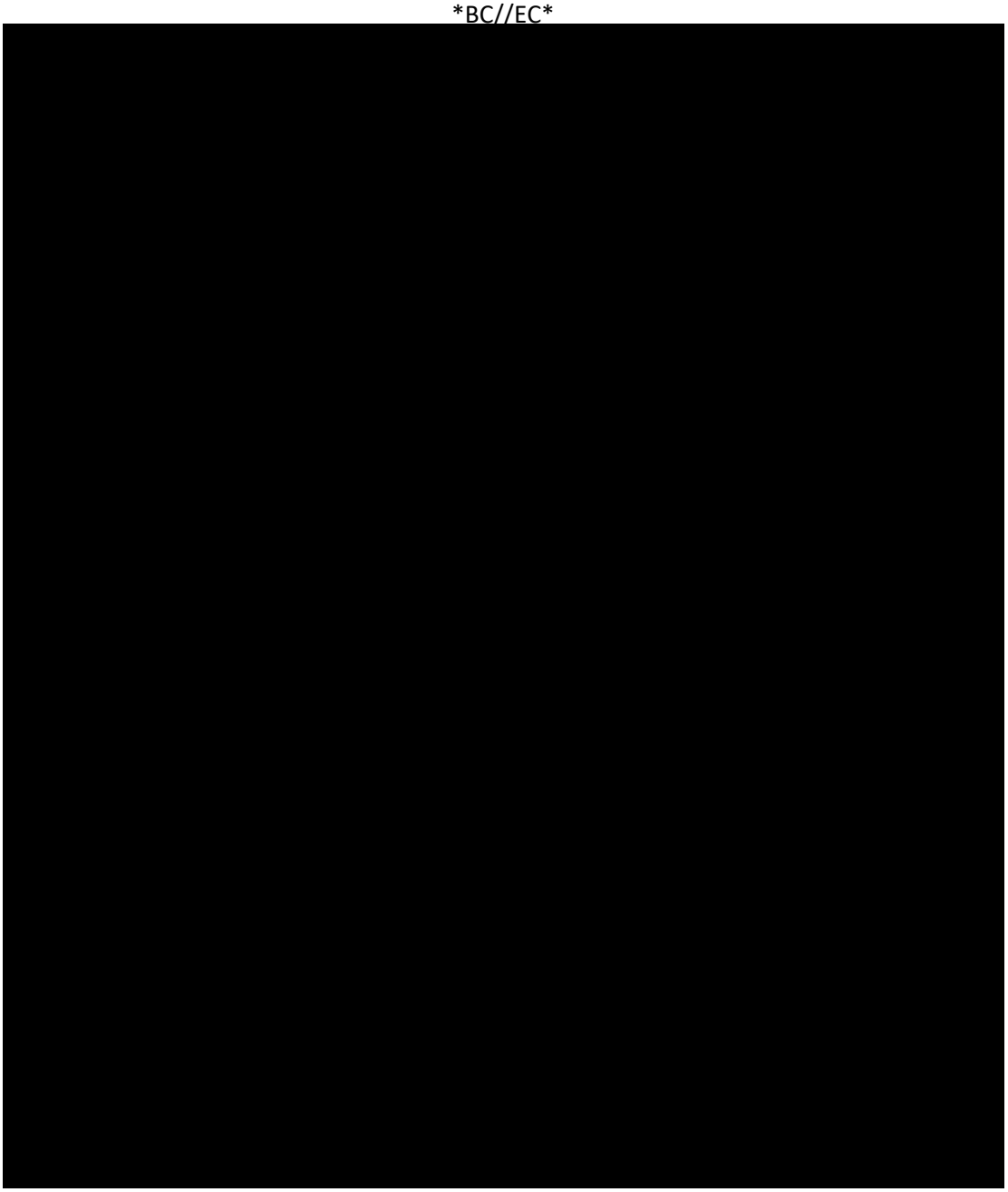
[21] The Board reserved the right to award less than 1,200 MW or more than 4,000 MW of capacity if circumstances warrant.

[22] In the Matter of the Opening of New Jersey's Third Solicitation for Offshore Wind Renewable Energy (OREC), BPU Docket No. QO22080481, Order dated June 7, 2023 ("Application Submission Deadline Extension Order").

[23] In the Matter of the Opening of New Jersey's Third Solicitation for Offshore Wind Renewable Energy (OREC), BPU Docket No. QO22080481, Order dated October 25, 2023, ("PBI Rejection Order").

Figure 6. Lease Areas Bidding Into Third Solicitation

BC//EC



Atlantic Shores submitted *BC/ /EC* Attentive submitted 18 Project options, later reduced to nine Project options following an award from New York State, *BC/ /EC* and Invenergy submitted six Project options *BC/ /EC* which are summarized at a high level in the following three tables.

Table 5. Project Sizes and Production[24]

BC//EC

	Atlantic Shores	Attentive	Invenergy
Nameplate Capacity (MW)			
Injection Capacity (MW)		1,342	2,400
First COD		7/1/2031	12/31/2031
Expected Annual Generation (GWh)			
Expected Annual Delivered Energy (GWh)			
Expected Capacity Factor, net of losses			
Annual OREC Allowance (GWh)		6,604	10,235
Summer Period Peak Hours Capacity Factor, net of losses[25]			

Table 6. Project Configurations

BC//EC

	Atlantic Shores	Attentive	Invenergy
Distance from Shore (statute miles)[26]		47.5	40.7
WTG Model			
Foundation Technology		Monopile	Monopile
Offshore Export Cable Length (statute miles)			

[24] Unless otherwise noted, values in this table are sourced from the Project Summary tab of each Project's Application Form.

[25] Values are calculated from 12x24 matrices of expected generation as submitted in the Application Forms.

[26] The distance between the nearest turbine and the closest point on shore. A "statute mile," 5,280 feet, is used for purposes of measuring distance over land, whereas "nautical mile," 6,076 feet, is used for measuring distances on the ocean. See Nautical Mile, https://www.merriam-webster.com/dictionary/nautical%20mile; Statute Mile, https://www.thefreedictionary.com/statute+mile.

Table 7. Project Costs
(nominal $)
BC//EC

	Atlantic Shores[27]	Attentive[28]	Invenergy[29]
Injection Capacity (MW)	[redacted]	1,342	2,400
Nameplate Capacity (MW)	[redacted]	[redacted]	[redacted]
Annual Delivered Production (GWh/year)	[redacted]	[redacted]	[redacted]
Development Cost ($ millions)	[redacted]	[redacted]	[redacted]
Unitized Development Cost ($/kW)	[redacted]	[redacted]	[redacted]
Capital Cost ($ millions)	[redacted]	[redacted]	[redacted]
Unitized Capital Cost ($/kW)	[redacted]	[redacted]	[redacted]
Operating Cost ($ millions)	[redacted]	[redacted]	[redacted]
Operating Cost ($/kW)	[redacted]	[redacted]	[redacted]
Decommissioning Cost ($ millions)	[redacted]	[redacted]	[redacted]
Total Cost ($ millions)	[redacted]	[redacted]	[redacted]
LCOE over OREC Term ($/MWh)	[redacted]	[redacted]	[redacted]
LCOE over Project Life ($/MWh)	[redacted]	[redacted]	[redacted]
Levelized OREC Purchase Price ($/MWh)	[redacted]	[redacted]	$139.53-[redacted]
Levelized Net OREC Cost ($/MWh)	[redacted]	[redacted]	$70.05-[redacted]

1.1 Atlantic Shores

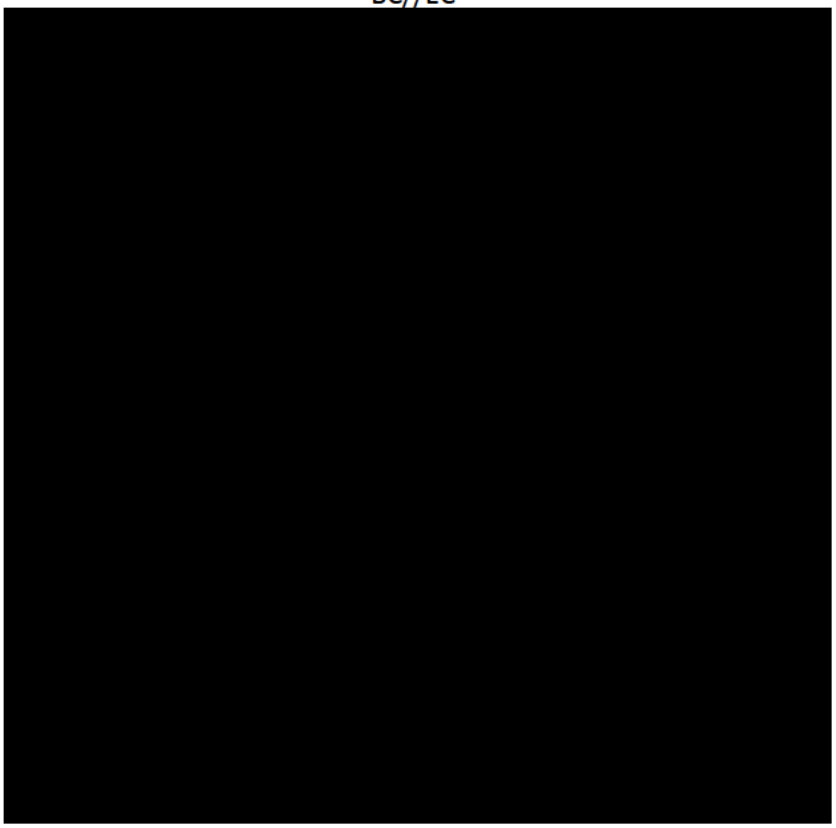
Atlantic Shores is a 50:50 partnership between EDF-RE Offshore Development, LLC, indirectly owned by EDF Renewables, Inc. and Shell New Energies US LLC, indirectly owned by Shell plc.[30] Atlantic Shores was formed in December 2018 to develop BOEM Lease Area OCS-A 0499, which was later separated into two lease areas: OCS-A-0499 and OCS-A-0549. Lease Area OCS-A 0499 hosts Project 1, which was selected for award in New Jersey's second offshore wind solicitation, and Project 2, which is offered in this solicitation.

[27] Atlantic Shores Application, Appendix 4-1.
[28] Attentive Application, Attachment 4-C.
[29] Invenergy Application, p. 162 and Attachment 4-1. Values do not include the storage component.
[30] The ultimate parent company of EDF Renewables, Inc. is EDF Renouvelables S.A., which is based in France. Shell plc is based on the U.K.

*BC [redacted] EC*The WTG that is closest to shore is located *BC/ [redacted] EC* The offshore WTG layout of the Atlantic Shores Projects is shown in Figure 7.

Figure 7. WTG Layout for Atlantic Shores Projects[31]

BC//EC

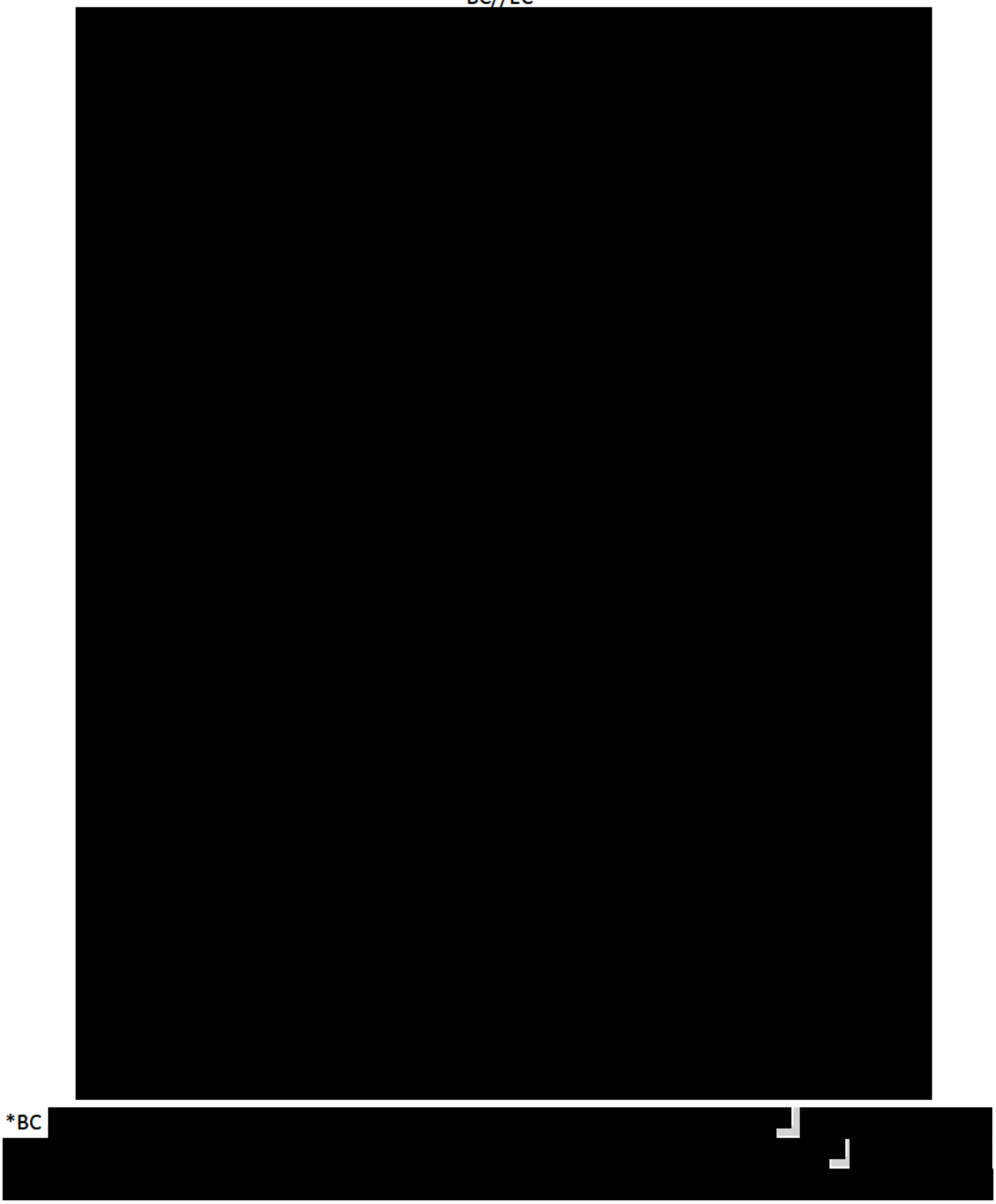


The POI is at the LCS. *BC/ [redacted] /EC* The location of the POI relative to the lease area and the export cable route is shown in Figure 8. *BC/ [redacted] /EC*

[31] Atlantic Shores Application, Figure 2-11, p. 93.
[32] Atlantic Shores Application, p. 409.
[33] Atlantic Shores Application, p. 416.
[34] Atlantic Shores Application, p. 415.
[35] Atlantic Shores Application, p. 122.
[36] Atlantic Shores Application, p. 427.

Figure 8. Export Cable Route for Atlantic Shores Projects[37]

BC//EC



[37] Atlantic Shores Application, Figure 2-1, p. 73. The PBI route shown in this figure is not being evaluated.
[38] Atlantic Shores Application, p. 127.
[39] Atlantic Shores Application, p. 103.

[redacted]

[redacted]

- [redacted]
- [redacted]
- [redacted]
- [redacted] /EC*

As a result of its early lease acquisition and previous BPU award for Project 1, Atlantic Shores is more advanced in its permitting status and also in its identification of potential suppliers and contractors.

BC [redacted] /EC Table 8 defines the Project codes for Atlantic Shores that are used throughout this report.

[40] Atlantic Shores Application, pp. 228-230.
[41] Atlantic Shores Application, Table 8-21, p. 241.
[42] Atlantic Shores Application, p. 130.
[43] Atlantic Shores Application, p. 136.
[44] Atlantic Shores Application, p. 156.

Table 8. Atlantic Shores Project Codes

BC//EC

Project Code	Description
[redacted]	

1.2 ATTENTIVE

Attentive Energy, which is sponsored by TotalEnergies and Corio, is the leaseholder of BOEM Lease Area OCS-A 0538.[45] Attentive Energy secured this lease in early 2022. The lease area is located approximately 42 miles east of Seaside Heights, the nearest onshore point in New Jersey.[46]

BC [redacted] /EC The offshore WTG layouts of the Attentive Projects are shown in Figure 9. The closest WTG is 47.5 miles from shore.[47] *BC/ [redacted] /EC*

[45] TotalEnergies and Corio are based in France and the Netherlands, respectively.

[46] Attentive Application, p. ES-4.

[47] Attentive Application, Table 2-3, p. 2-10.

Figure 9. WTG Layout for Attentive Offshore Wind Projects[48]

BC//EC

The POI is at the Larrabee Collector Station. *BC/ EC* The location of the POI relative to the lease area and the export cable route are shown in Figure 10. *BC/ /EC*

[48] Attentive Application, Figure 2-3, p. 2-8.
[49] Attentive Application, Table 2-1, p. 2-5. *BC/ /EC*
[50] Attentive Application, p. 13-12.
[51] Attentive Application, p. 13-4.
[52] Attentive Application, Table 2-3, p. 2-10.
[53] Attentive Application, Table 2-13, p. 2-28.

Figure 10. Offshore Export Cable Route for Attentive Projects[54]

BC//EC

Marshalling will be conducted out of the NJWP.[55] Attentive also proposes to support localization of a *BC/ /EC* tower manufacturing facility at the NJWP *BC/ /EC* Attentive plans to procure monopiles from an expansion of EEW's foundation manufacturing facility at Paulsboro, *BC /EC* Attentive also plans to have a New Jersey-based local O&M facility to conduct tasks such as warehousing. Attentive has not finalized a location for its O&M port, but is considering Buckeye Partners, L.P.'s Port Reading site.[59] The locations of Attentive's planned New Jersey ports are shown in Figure 11.

[54] Attentive Application, Figure 13-1, p. 13-4. The PBI route shown in this figure is not being evaluated.
[55] Attentive Application, p. 2-42.
[56] Attentive Application, p. 2-46.
[57] Id.
[58] Attentive Application, p. 2-47.
[59] Attentive Application, p. 2-46.

Figure 11. New Jersey Port Locations for Attentive Projects[60]

BC//EC

*BC

[60] Attentive Application, Figure 2-9, p. 2-42.
[61] Attentive Application, Table 8-1, p. 8-5.
[62] Attentive Application, p. 8-3.

- [redacted]
- [redacted]
- [redacted]/EC*

Figure 12 summarizes the Project options offered by Attentive.

Figure 12. Summary of Attentive Project Options[63]

BC//EC

BC/[redacted]/EC Table 9 defines the Project codes for Attentive that are used throughout this report.

[63] Attentive BAFO, p. 16. *BC/[redacted]/EC*

Table 9. Attentive Project Codes

BC//EC

Project Code	Description
[redacted]	

1.3 INVENERGY

Invenergy is backed by Forward Power, which is a project developer that is a joint venture between Invenergy Renewables and energyRe.[64] Invenergy's Leading Light Wind Project will be built within BOEM Lease Area OCS-A 0542. Invenergy secured this lease in February 2022. The lease area is located approximately 48 miles east of Atlantic City, New Jersey.[65]

[64] Both Invenergy Renewables and energyRe are U.S.-based.

[65] Invenergy Application, p. 56.

BC [redacted] EC The offshore WTG layouts of the Invenergy Projects are shown in Figure 13. The closest WTG is 40.7 miles from shore.[68] *BC/ [redacted] /EC* The 2,400 MW Project options will be installed in two 1,200 MW phases, the first phase in December 2031 and the second phase in December 2032.

Figure 13. WTG Layout for Invenergy Projects[69]

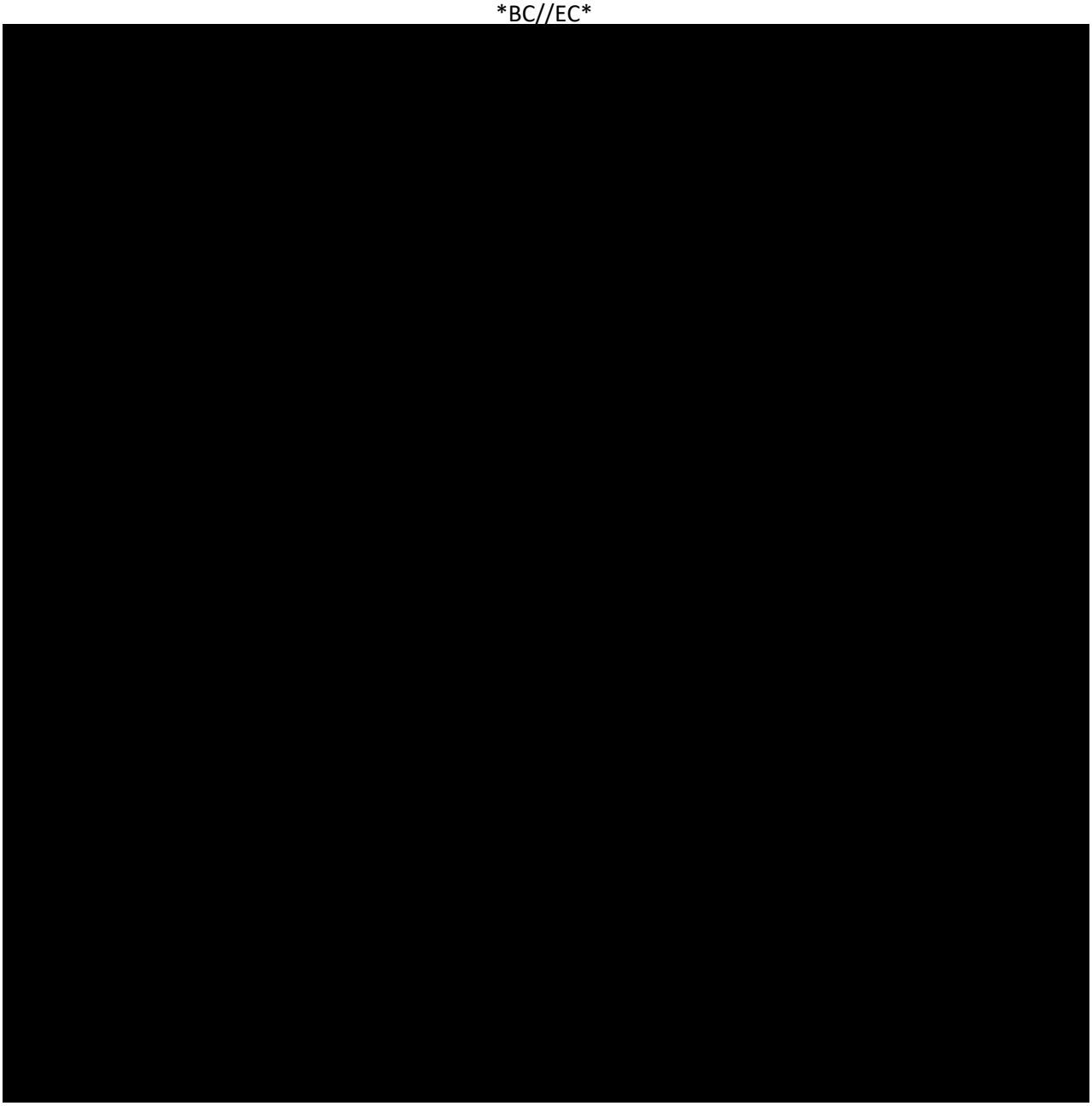
BC//EC

The POI is at the Larrabee Collector Station. *BC/ [redacted] /EC* The location of the POI relative to the lease area and the export cable route are shown in Figure 14. *BC/ [redacted] /EC*

[66] Invenergy Application, Table 2-1, p. 57.
[67] Invenergy Application, p. 100.
[68] Invenergy Application, Attachment 10.1, Appendix A, p. 5.
[69] Invenergy Application, Figures 2-4 through 2-6, pp. 61-62.
[70] Invenergy Application, p. vi.
[71] Invenergy Application, p. 130.
[72] Invenergy Application, p. 99.
[73] Invenergy Application, Table 13-1, p. 318.
[74] Invenergy Application, p. 104.

Figure 14. Offshore Export Cable Route for Invenergy Projects[75]

BC//EC



Marshalling will be conducted out of the NJWP.[76] Invenergy also proposes to support localization of a tower manufacturing facility at the NJWP, *BC/ /EC* Invenergy additionally plans to procure components from RDC that would be fabricated and assembled at the NJWP.[78] Invenergy plans to procure monopiles from EEW's foundation manufacturing facility at Paulsboro, including investment in the expansion of the

[75] Invenergy Application, Figure 13-1, p. 319.
[76] Invenergy Application, p. 122.
[77] Invenergy Application, pp. 191-192.
[78] Invenergy Application, p. 194.

facility.[79] Invenergy's preferred location for its O&M port is the Buckeye Port Reading Facility in Port Reading, New Jersey, but alternative locations at the International-Matex Tank Terminal in Bayonne, New Jersey and the Repuano Port & Rail Terminal in Greenwich Township, New Jersey have been presented as backups.[80] The locations of Invenergy's planned ports are shown in Figure 15.

Figure 15. Ports and Supply Chain Facilities for Invenergy Projects[81]

BC//EC

[redacted]

*BC/[redacted]

[redacted] EC* Table 10 defines the Project codes for Invenergy that are used throughout this report.

[79] Invenergy Application, pp. 192-194.
[80] Invenergy Application, p. 123.
[81] Invenergy Application, Figure ES-1, p. vii.
[82] Invenergy Application, p. viii.

Table 10. Invenergy Project Codes

BC//EC

Project Code	Description
[redacted]	

2 LIKELIHOOD OF SUCCESSFUL COMMERCIAL OPERATION: PROJECT: ELIGIBILITY REVIEW

Likelihood of successful commercial operation, which is dependent on a variety of factors as discussed in detail below, was used to determine whether a Project is eligible to become a Qualified Project. Each Application was reviewed to ensure that it meets the minimum eligibility requirements. Beyond determining eligibility, these factors are not reflected in quantitative scoring, except to the extent that they are included in the identified non-price considerations.

All Projects were determined to meet all Minimum Eligibility Requirements and to be eligible for inclusion in the evaluation.

As per the Evaluation Framework, the likelihood of commercial success is assessed by determining whether a Project meets all Minimum Eligibility Requirements. All projects that meet the Minimum Eligibility Requirements will be considered to have a likelihood of successful commercial operations. A finding of likelihood of commercial success indicates that the project is technically feasible but does not guarantee that the project will remain commercially attractive. The recent cancellation of projects under contract in New Jersey and New York demonstrates how changing market conditions can make a project unattractive and lead to cancellation.

2.1 PROJECT DESIGN

N.J.A.C. 14:8-6.5(a)(2)(i)(2) requires a demonstration by Applicants that "the wind technology is viable, cost competitive, and suitable for use in New Jersey's offshore environment under varying and expected meteorological and climate conditions…" In support of this requirement, Applicants must provide a description of each of the major types of equipment that is planned to be installed as part of the Project, including specifications, warranties, commercial operating history and the ability of the equipment to work in New Jersey's offshore and near shore environments.

2.1.1 WTG Suitability

Minimum Eligibility Requirement: The proposed WTG is commercially available or can reasonably be expected to become commercially available prior to commencement of Project construction. Applicant has provided specifications, warranties, and/or characteristics for the proposed WTG that indicate its ability to work successfully in New Jersey's offshore environment. Applicant has provided suitable documentation that a WTG that is not commercially available at the time of Application submission will be commercially viable in sufficient time to meet the proposed project schedule.

2.1.1.1 Atlantic Shores

*BC/

[83] Atlantic Shores Application, p. 102.
[84] Atlantic Shores Application, Appendix 2-3.
[85] Atlantic Shores Application, p. 105

[redacted]/EC*

Atlantic Shores meets the Minimum Eligibility Requirement.

2.1.1.2 Attentive

BC/[redacted]/EC

Attentive meets the Minimum Eligibility Requirement.

2.1.1.3 Invenergy

BC [redacted]/EC

Invenergy meets the Minimum Eligibility Requirement.

2.1.2 Foundation Suitability

Minimum Eligibility Requirement: The proposed foundation has an established history of use in locations similar to the offshore environment of New Jersey, or, Applicant has provided specifications, warranties and/or characteristics for the proposed foundation that indicate its ability to work successfully in New Jersey's offshore environment.

2.1.2.1 Atlantic Shores

*BC/[redacted]

[86] Atlantic Shores Application, p. 106.
[87] Attentive Application, p. 2-18, *BC/[redacted]/EC* corrected in Attentive Administrative Completeness Review Responses item #1.
[88] Attentive Application, p. 2-17.
[89] Attentive Administrative Completeness Review Responses, Attachment 1.
[90] Attentive Application, p. 2-19.
[91] Invenergy Application, p. 92.
[92] Invenergy Administrative Completeness Review Responses, Appendices D and E.
[93] Atlantic Shores Application, p. 74.

[redacted] /EC*

Atlantic Shores meets the Minimum Eligibility Requirement.

2.1.2.2 Attentive

Attentive proposes to utilize monopile foundations *BC/ [redacted] EC*

Attentive meets the Minimum Eligibility Requirement.

2.1.2.3 Invenergy

Invenergy proposes to use *BC/ [redacted] /EC* monopiles *BC/ [redacted] /EC* Invenergy also notes that "monopiles are the most commonly used offshore wind foundation type, with over 4,000 steel monopiles installed globally since 2010."[99] Monopiles have been widely used in locations similar to the offshore environment of New Jersey. *BC [redacted] EC*

Invenergy meets the Minimum Eligibility Requirement.

2.1.3 Inter-array and Export Cables Suitability

Minimum Eligibility Requirement: The proposed undersea cables have an established history of use in locations similar to the offshore environment of New Jersey, or Applicant has provided specifications,

[94] Atlantic Shores Application, p. 87.
[95] Atlantic Shores Application, p. 88.
[96] Atlantic Shores Application, p. 89.
[97] Attentive Application, p. 2-18.
[98] Attentive Application, p. 2-17.
[99] Invenergy Application, p. 94.
[100] Invenergy Application, p. 97.
[101] Invenergy Application, CONFIDENTIAL_LLW_Section 2 Attachments_Part 2, p. 201.

warranties and/or characteristics for the proposed undersea cables that indicate their ability to work successfully in New Jersey's offshore environment.

2.1.3.1 Atlantic Shores

BC/ [redacted] /EC

Atlantic Shores meets the Minimum Eligibility Requirement.

2.1.3.2 Attentive

BC/ [redacted] /EC

Attentive meets the Minimum Eligibility Requirement.

2.1.3.3 Invenergy

BC/ [redacted] /EC

Invenergy meets the Minimum Eligibility Requirement.

2.1.4 Offshore Substations Suitability

Minimum Eligibility Requirement: The proposed offshore substation equipment has an established history of use in locations similar to the offshore environment of New Jersey, or Applicant has provided

[102] Atlantic Shores Application, p. 90.
[103] Offshore Wind Market Report: 2023 Edition (energy.gov), pp. 118-119.
[104] Atlantic Shores Application, p. 91.
[105] Attentive Application, p. 2-27.
[106] Attentive Application, p. 2-24.
[107] Invenergy Application, p. 99.
[108] Invenergy Application, p. 100.

specifications, warranties and/or characteristics for the proposed equipment that indicate its ability to work successfully in New Jersey's offshore environment.

2.1.4.1 Atlantic Shores

BC/[redacted]/EC The proposed technology is currently in use for global offshore applications, including locations similar to the offshore environment of New Jersey.

Atlantic Shores meets the Minimum Eligibility Requirement.

2.1.4.2 Attentive

BC/[redacted]/EC consisting of a topside, which includes all the electrical equipment and facilities to transform electricity produced by the WTGs and transported through the inter-array cables and convert it from AC to DC, and a foundation to support the topside.[112]

BC/[redacted]EC The proposed technology is currently in use for global offshore applications, including locations similar to the offshore environment of New Jersey.

Attentive meets the Minimum Eligibility Requirement.

2.1.4.3 Invenergy

*BC/[redacted]

[109] Atlantic Shores Application, p. 96.
[110] Atlantic Shores Application, p. 99.
[111] Atlantic Shores Application, p. 506.
[112] Attentive Application, p. 2-25.
[113] Attentive Application, p. 2-57.
[114] Invenergy Application, p. 93.

[redacted] /EC* The proposed technology is currently in use for global offshore applications, including locations similar to the offshore environment of New Jersey.

Invenergy meets the Minimum Eligibility Requirement.

2.1.5 Storage (if applicable)

Minimum Eligibility Requirement: Applicant proposes to utilize a storage technology that is commercially available or can be expected to become commercially available prior to commencement of Project construction. The Applicant demonstrates that storage has a high probability of contributing to reducing peak demand, increasing system reliability, reducing emissions of greenhouse gases, and/or any other benefits identified by the Applicant. Note that if the storage technology does not meet the minimum viability requirements, only the Project alternative with storage will be deemed non-viable, and not any other viable Project alternative included in the Application.

2.1.5.1 Atlantic Shores

No storage proposed.

2.1.5.2 Attentive

No storage proposed.

2.1.5.3 Invenergy

BC/ [redacted] EC or a similar manufacturer's lithium-ion batteries.[118] Lithium-ion battery technology is tested and proven and has been deployed worldwide. Invenergy reports having expertise across the major lithium-ion chemistries, including nickel cobalt manganese, nickel cobalt aluminum, and lithium iron phosphate, and currently has 19 energy storage projects either operating or contracted. *BC [redacted] /EC*

[115] Invenergy Application, p. 110.
[116] Invenergy Application, p. 100.
[117] Invenergy Application, p. 111.
[118] Invenergy Application, p. 125.
[119] Invenergy Application, p. 131.
[120] Invenergy Application, pp. 134-137.

Invenergy meets the Minimum Eligibility Requirement.

2.2 TRANSMISSION

The Project's PJM interconnection request, study schedule and the schedule for construction of the required transmission system upgrades are also an important consideration in determining the Likelihood of Successful Commercial Operation, pursuant to N.J.A.C. 14:8-6.5(a)(14) et seq. All Applicants are required to submit a proposed Project schedule and milestones. The schedule must include the necessary transmission interconnection studies and approvals. The schedule for transmission interconnection studies is influenced by the transmission POI and the required transmission system upgrades.

2.2.1 Interconnection Plan

Minimum Eligibility Requirement: The proposed Project schedules are detailed, complete, and include feasible timelines, providing reasonable assurance that the Project will meet the proposed in-service date.

2.2.1.1 Atlantic Shores

BC/ [redacted] EC

Atlantic Shores meets the Minimum Eligibility Requirement.

2.2.1.2 Attentive

BC/ [redacted] /EC the Project will be considered under PJM's new Cycle #1, *BC/ [redacted] /EC*

Attentive meets the Minimum Eligibility Requirement.

2.2.1.3 Invenergy

*BC [redacted]

[121] Atlantic Shores Application, p. 409.
[122] Attentive Application, p. 13-12.
[123] Invenergy Application, p. 341

[redacted] /EC* it is prepared to submit the necessary application for a queue position in accordance with PJM requirements for interconnection at the LCS.[124] *BC/ [redacted] /EC*

Invenergy meets the Minimum Eligibility Requirement.

2.2.2 OTN Ready Design

Minimum Eligibility Requirement: The proposed OTN Ready design is consistent with the design requirements listed in Attachment 11 to the SGD.

2.2.2.1 Atlantic Shores

Atlantic Shores has proposed an OTN Ready design that is consistent with the design requirements listed in Attachment 11 to the SGD. The offshore platform includes the required space to accommodate the additional equipment to fulfill the OTN requirements. *BC [redacted] /EC*

Atlantic Shores meets the Minimum Eligibility Requirement.

2.2.2.2 Attentive

Attentive has proposed an OTN Ready design that is consistent with the design requirements listed in Attachment 11 to the SGD. The offshore platform includes the required space to accommodate the additional equipment to fulfil the OTN requirements. *BC/ [redacted] /EC*

[124] Id.
[125] Atlantic Shores Application, p. 452.
[126] Atlantic Shores Application, p. 455.
[127] Attentive Application, p. 13-35.

Attentive meets the Minimum Eligibility Requirement.

2.2.2.3 Invenergy

Invenergy has proposed an OTN Ready design that is consistent with the design requirements listed in Attachment 11 to the SGD. The offshore platform includes the required space to accommodate the additional equipment to fulfil the OTN requirements. Invenergy's offshore converter station design will accommodate future additions of OTN equipment in the topside and jacket foundation design.[128] *BC [redacted] EC*

Invenergy meets the Minimum Eligibility Requirement.

2.3 Ports, Infrastructure Development, Logistics and Supply Chain

Each Applicant must identify the ports and other infrastructure needed for each aspect of Project development, including staging, assembly, marshalling, and O&M facilities. Applicants must provide a credible plan for procuring all primary components in a timeframe consistent with the Project schedule.

2.3.1 Construction Phase Ports

Minimum Eligibility Requirement: Applicant identifies any necessary port or ports and affirms that they have sufficient laydown area and can accommodate the required vessels. If the port infrastructure is not already constructed, Applicant proposes an infrastructure development schedule consistent with the overall project schedule, with reasonable allowances for delays. Applicant has executed an MOU or LOI, or otherwise can demonstrate commitment to secure rights to utilize the ports identified in the Application.

2.3.1.1 Atlantic Shores

BC/ [redacted] EC The NJWP and Paulsboro facilities are purpose-build to support offshore wind construction.

Atlantic Shores meets the Minimum Eligibility Requirement.

2.3.1.2 Attentive

Attentive is committed to using the NJWP for marshalling *BC/ [redacted] /EC* Attentive intends to submit a proposal to lease a portion of the NJWP for marshalling in NJ EDA's next Notice to Lease/Sublease. *BC/ [redacted]

[128] Invenergy Application, p. 339.
[129] Atlantic Shores Application, p. 127.
[130] Atlantic Shores Application, p. 241.
[131] Atlantic Shores Application, p. 128.
[132] Atlantic Shores Application, pp. 86, 241.

[redacted]/EC*

Attentive meets the Minimum Eligibility Requirement.

2.3.1.3 Invenergy

Invenergy plans to use the NJWP for marshalling and will participate in NJ EDA's lease RFP following announcement of awards in this Solicitation.[135] Invenergy will also encourage its supply chain partners to localize their manufacturing facilities at the NJWP. Invenergy notes that the NJWP is free of vertical restrictions and is one of few East Coast facilities with the capacity to co-locate both marshalling activities and Tier 1 component manufacturing. The NJWP began construction in 2021 and is scheduled to be fully complete by 2028, at which time it will be able to support the simultaneous marshalling of two offshore wind projects and approximately three Tier 1 WTG manufacturers. *BC [redacted]/EC*

Invenergy meets the Minimum Eligibility Requirement.

2.3.2 Operations Phase O&M Facilities and Related Logistics

Minimum Eligibility Requirement: Applicant provides a feasible plan and identifies the necessary port and other infrastructure for the O&M phase of the project. If the port infrastructure is not already constructed, Applicant proposes an infrastructure development schedule consistent with the overall project schedule, with reasonable allowances for delays. Applicant has executed an MOU or LOI, or otherwise can demonstrate commitment to secure rights to utilize the port and other infrastructure identified in the Application.

2.3.2.1 Atlantic Shores

BC [redacted]/EC

Atlantic Shores meets the Minimum Eligibility Requirement.

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[133] Attentive Application, pp. 2-42 to 2-45.
[134] Attentive Application, p. 2-46.
[135] Invenergy Application, p. 122.
[136] Invenergy Application, p. 124.
[137] Atlantic Shores Application, p. 128.
[138] Atlantic Shores Application, p. 241.

2.3.2.2 Attentive

BC [redacted] EC[139] Attentive is considering use of Buckeye Partners, L.P.'s Port Reading site for its New Jersey O&M port. This site offers adequate quayside acreage, additional acreage for warehousing and storage and sufficient water depth to facilitate service operation vessel ("SOV") operations or other large vessel operations. Attentive is serving as Buckeye's offshore wind technical advisor in the repurposing of this site into a multi-purpose hub for renewables including offshore wind.[140] *BC/ [redacted] EC*

Attentive meets the Minimum Eligibility Requirement.

2.3.2.3 Invenergy

Invenergy plans to locate its O&M facility at either the Buckeye Port Reading Facility (preferred option), the International-Matex Tank Terminal in Bayonne, NJ, or the Repauno Port & Rail Terminal in Greenwich Township, NJ.[145] *BC [redacted] /EC*

Invenergy meets the Minimum Eligibility Requirement.

2.3.3 Supply Chain

Minimum Eligibility Requirement: Application includes a credible plan to procure the primary equipment and components, including the WTGs, foundations, substations, and undersea cables, in a timeframe necessary to meet the targeted construction schedule.

[139] Attentive Application, p. 15-15.
[140] Attentive Application pp. 2-46-to 2-47.
[141] Attentive Application, Attachment 15-1.
[142] Attentive Application, Attachment 10-A, Appendix A (Baseline Environmental Characterization), p. 60.
[143] New York Department of Public Service, Case No. 22-T-0670.
[144] Attentive Application, p. 2-47.
[145] Invenergy Application, p. 123.
[146] Invenergy Application, p. 377.
[147] Invenergy Application, Attachment 15.3.
[148] Invenergy Application, Attachment 15.2, pp. 37-38 and 49-50.

2.3.3.1 Atlantic Shores

BC [redacted] /EC Atlantic Shores indicates that all components can be delivered within the scheduled timeframe.[153]

Atlantic Shores meets the Minimum Eligibility Requirement.

2.3.3.2 Attentive

BC/ [redacted] /EC Attentive indicates that all components can be delivered within the scheduled timeframe.[155]

Attentive meets the Minimum Eligibility Requirement.

2.3.3.3 Invenergy

*BC/ [redacted]

[149] Atlantic Shores Application, p. 106.
[150] Atlantic Shores Application, p. 86.
[151] Atlantic Shores Application, p. 90.
[152] Atlantic Shores Application, p.101.
[153] Atlantic Shores Application, pp. 385-386.
[154] Attentive Application, pp. 2-52 to 2-53.
[155] Attentive Application, pp. 12-5 to 12-6.
[156] Invenergy Application, p. 108.
[157] Invenergy Application, p. 104.

[redacted]/EC* Invenergy indicates that all components can be delivered within the scheduled timeframe.[160]

Invenergy meets the Minimum Eligibility Requirement.

2.3.4 Jones Act

Minimum Eligibility Requirement: Applicant provides a credible plan for conducting construction activities utilizing Jones Act compliant vessels.

The Merchant Marine Act of 1920 (the "Jones Act") is a US federal law regulating maritime commerce. The Jones Act mandates that the sea transport of cargo between U.S. ports must be performed by vessels that are U.S.-built, U.S.-owned, U.S. flagged, and U.S.-crewed.[161] U.S. Customs and Border Protection Ruling HQ H309186 on January 27, 2021, states that: "The plain language of [the Outer Continental Shelf Lands Act of 1953] Section 4, as amended by the 2021 [National Defense Authorization Act], extends U.S. law, to the physical subsoil and seabed of the [Outer Continental Shelf ("OCS")] as well as 'installations and other devices permanently or temporarily attached to the seabed, which may be erected thereon for the purpose of exploring for, developing, or producing resources, including non-mineral energy resources.'"[162] As a result, materials must be moved between domestic marshalling ports and offshore wind lease areas using Jones Act compliant vessels.

2.3.4.1 Atlantic Shores

BC [redacted]/EC

Atlantic Shores meets the Minimum Eligibility Requirement.

[158] Invenergy Application, p. 111.
[159] Invenergy Application, p. 114.
[160] Invenergy Application, p. 305.
[161] See 46 U.S.C. § 55102.
[162] See U.S. Customs and Border Protection H309186: Coastwise Transportation; Coastwise Towing; Scour Protection; 46 U.S.C. § 55102; 46 U.S.C. § 55111; 19 CFR § 4.80(b).
[163] Atlantic Shores Application, p. 124.

2.3.4.2 Attentive

Attentive states its commitment to fully comply with the Jones Act, noting that it is prepared to secure vessels through reservation fees, if necessary, to maintain the Project schedule.[164] *BC/ [redacted] /EC*

Attentive meets the Minimum Eligibility Requirement.

2.3.4.3 Invenergy

BC [redacted] /EC

Invenergy meets the Minimum Eligibility Requirement.

2.4 EXPERIENCE

Experience of the Applicant and the Applicant's team contribute to the likelihood of commercial success of the Project. Corporate experience can be demonstrated by identifying offshore wind projects developed by the Applicant and/or other team members. Relevant offshore experience with oil and natural gas exploration and production can be considered as relevant experience given the strong similarities in environmental permitting, design, engineering, construction techniques, and operating environment. Per N.J.A.C. 14:8-6.5(a)(1), Applicants are also required to submit information on key personnel, specifically regarding offshore wind project development experience. Experience of key personnel can be assessed based on experience in the offshore wind industry, supplemented by onshore wind and offshore oil and gas experience.

2.4.1 Developer Experience

Minimum Eligibility Requirement: The Applicant and/or Project team members have relevant experience developing offshore wind projects or other offshore infrastructure projects demonstrating applicable expertise and experience in offshore logistics and construction. Applicant does not have past experience of defaulting on one or more commitments, forfeiting security for not meeting one or more commitments, and/or sought legal redress through court action to terminate a contract or commitment for convenience or based on a factor that is reasonably within Applicant's control.

2.4.1.1 Atlantic Shores

Atlantic Shores has experience with offshore wind in New Jersey through its development of Atlantic Shores Project 1, which was selected in BPU's second solicitation. Atlantic Shores Project 1 has achieved issuance of the COP DEIS, execution of supplier agreements for WTGs and foundations, execution of a LOI

[164] Attentive Application, p. 2-48.
[165] Invenergy Application, p. 108.

for use of the NJWP with NJ EDA, *BC/[redacted]/EC*[166]

EDF has 11.4 GW of net installed capacity and 6.7 GW under construction, including 1.4 GW of offshore wind in operation and 1.4 GW under construction.[167] EDF's largest offshore wind project under construction is the 497 MW Fécamp project in France. The largest operating offshore wind project is the 480 MW Saint-Nazaire project, also in France. EDF has previous experience with interconnecting onshore wind and solar in the U.S., including through the PJM process. Shell's largest operating offshore wind project is the 731.5 MW Borssele 3&4 project in the Netherlands.[168] Shell also has the 759 MW Hollandse Kust North project under construction in the Netherlands. Shell also has experience with onshore wind in North America.

Atlantic Shores does not have a past experience of defaults.

Atlantic Shores meets the Minimum Eligibility Requirement.

2.4.1.2 Attentive

TotalEnergies and Corio have experience with both bottom-fixed and floating offshore wind. The companies are jointly developing *BC/[redacted]/EC* of offshore wind projects, including the 2 GW West of Orkney project in Scotland and the 2 GW Formosa 3 project in Taiwan.[169] TotalEnergies is active across the U.S. and has previous offshore experience in the Gulf of Mexico, in addition to global offshore oil and gas experience. TotalEnergies' *BC/[redacted]/EC* Seagreen 1 offshore wind project delivered first power in August 2022 and is fully operational as of October 2023.[170] Corio has a 30+ GW offshore wind development portfolio.[171]

Attentive does not have a past experience of defaults.

Attentive meets the Minimum Eligibility Requirement.

2.4.1.3 Invenergy

Invenergy states that Invenergy Renewables LLC ("Invenergy Renewables") "has successfully developed more than 30 GW of power projects across the Americas, Europe and Asia," including over 18 GW of onshore wind.[172] Invenergy Renewables was the lead developer for 19 projects in PJM totaling 3,442 MW of generating capacity.[173] Invenergy Renewables also has significant transmission development experience, including ten transmission facilities inside and outside of PJM. energyRe is involved in renewable energy and real estate development, and has partnered with Invenergy Renewables to develop the Clean Path New York transmission line bringing carbon free energy from upstate New York into New York City.

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[166] Atlantic Shores Application, p. 50.
[167] Atlantic Shores Application, p. 51.
[168] Atlantic Shores Application, p. 57.
[169] Attentive Application, p. 1-4.
[170] Attentive Application, p. 1-18 and https://www.seagreenwindenergy.com/post/scotland-s-largest-offshore-wind-farm-is-now-operational.
[171] Attentive Application, p. 1-11.
[172] Invenergy Application, p. 29.
[173] Invenergy Application, p. 33 and response to Invenergy CQ2 Question 2.

Although neither Invenergy Renewables nor energyRe has corporate experience with offshore wind, several Project team members have previous relevant experience from working for Atlantic Shores, ExxonMobil, Shell, Equinor and Ørsted, as discussed in more detail in Section 2.4.2.3.

Invenergy does not have a past experience of defaults.

Invenergy meets the Minimum Eligibility Requirement.

2.4.2 Key Personnel Experience

Minimum Eligibility Requirement: Key Personnel have demonstrated relevant experience supporting the likelihood of commercial success.

2.4.2.1 Atlantic Shores

Atlantic Shores identifies twelve Key Personnel with "experience in development, construction, financing, and operations of over 50 large scale and complex projects across the Energy business in the US."[174] The Key Personnel are largely the same team that has collaborated with the BPU on Atlantic Shores Project 1. Atlantic Shores' Key Personnel include:

- *BC
- [redacted]

[174] Atlantic Shores Application, p. 31.

- [redacted]
- [redacted] EC*

Atlantic Shores meets the Minimum Eligibility Requirement.

2.4.2.2 Attentive

Attentive identifies ten Key Personnel with "specific expertise or experience in developing, permitting, constructing, and operating large-scale energy infrastructure in New Jersey, the U.S., and abroad."[175] Attentive's Key Personnel include:

- Damian Bednarz, Managing Director, leads the Attentive team and is responsible for day-to-day management of the Project. He previously managed a diverse clean energy and climate portfolio at Kivvit, a nationally ranked public affairs and strategic communications firm. He also previously held several senior leadership roles at the U.S. Department of Energy, including *BC [redacted] EC*
- Christen Wittman, Vice President Project Development, has worked to establish the offshore wind industry in the U.S. through the development of ports and infrastructure, a domestic supply chain, and a local, skilled workforce. Previously, she oversaw the construction of the New Bedford Marine Commerce Terminal in Massachusetts, the first purpose-built port in the U.S. to support the staging, deployment and assembly of offshore wind components.
- Nicolas Cambefort, Vice President Project Delivery, has overseen various offshore oil projects for TotalEnergies, including greenfield deep-water development in the Gulf of Mexico and greenfield offshore development in Norway.
- Murray Greene, General Counsel and Secretary, previously supported the North Platte Project in the Gulf of Mexico for TotalEnergies. He also previously worked for BP, where he led a team supporting all major capital projects in BP's upstream global portfolio. He has experience in environmental regulatory counseling and litigation.
- Alexandra Howell, Workforce & Labor Liaison, works with labor unions and the workforce development community to collaborate on, develop, and meet timely workforce needs. She previously worked as a labor and employment attorney and workforce planning consultant. *BC [redacted] EC*
- Jonathan Howie, Technical Director, oversees the Project's offshore wind transmission and grid interconnection efforts. He has engineering and project execution experience focused on electrical power transmission systems. *BC [redacted] EC*
- Paul Phifer, PhD, Permitting and Development Director, leads Attentive's offshore wind permitting and external affairs strategies to ensure delivery of key project milestones. He previously served as the Permitting Manager for Atlantic Shores Offshore Wind and was responsible for all the federal, state, and local permits required for three offshore wind lease areas. He also previously oversaw the U.S. Fish and Wildlife's New Jersey office for ten years.

[175] Attentive Application, p. 1-33.

- James Pool, Commercial Director, oversees commercial analysis and business case development for the Project. He has experience in renewable energy project finance and merger and acquisition transactions. He has worked on the pricing and structuring project finance transactions for over 1 GW of European offshore wind assets, *BC/[redacted]/EC* and over 500 MW of solar assets in the U.S.
- Kirsty Speirs, Health, Safety, Environment and Quality Manager, is responsible for ensuring that inherent safety by design is achieved and for establishing comprehensive risk management expectations and requirements for contractors and suppliers. *BC [redacted] EC*
- Casey Wiseman, Procurement Manager, oversees the procurement of services and equipment for permitting, site investigation surveys, resource assessments, design and engineering, and major component packages. He previously served in the U.S. Navy. After his service, he worked as a Package Manager for SBM Offshore. He also worked at 2H Offshore supporting multiple projects with Chevron (Bigfoot) and TotalEnergies (Moho Nord) on delivery management. *BC/[redacted]/EC* For TotalEnergies, he was the FPU Procurement Manager for the North Platte Project in the Gulf of Mexico.

Attentive meets the Minimum Eligibility Requirement.

2.4.2.3 Invenergy

Invenergy identifies ten Key Personnel with "unique knowledge and experience across the full spectrum of large-scale power generation project development, including engineering, development, procurement, permitting, external affairs, and energy markets. Many team members have previous experience with offshore wind."[176] Invenergy's Key Personnel include:

- Wesley Jacobs, Senior Project Director, Offshore Development, previously led "strategic supply chain localization initiatives, including design and implementation of the $848 million local spend commitment for Atlantic Shores 1."[177] His resume indicates that *BC/[redacted]/EC* and also previously worked for Atlantic Shores.
- Louis Feldman, Director Renewable Project Management, Offshore Development, has previous experience in project development and project management roles for onshore wind, solar and battery storage projects. He also previously held roles with Shell with "a focus in deepwater offshore transportation and installation."[178]
- Deniz Ozkhan, Ph.D, Senior Commercial Director, Offshore Development, has over 17 years of offshore wind and transmission experience and previously led economic and financial analysis and development of offshore wind projects at Shell and served as Director of Analysis, Research and Systems Engineering at Atlantic Grid Development, an HVDC multi-terminal offshore transmission backbone project.
- Daniel Birmingham, Senior Procurement Manager, Offshore Development, leads interactions with Tier 1 contractors for the Project. He has previous experience supporting the development and construction of renewable energy projects in Mexico and Latin America and in oil and gas operations.

[176] Invenergy Application, p. 18
[177] Invenergy Application, p. 23.
[178] Id.

- Laura Morse, Director, Environmental Compliance and Strategy, leads federal, state and local permitting for offshore wind. She previously worked for Ørsted and was responsible for permitting and environmental compliance for projects including Ocean Wind I and II, Sunrise Wind, Bay State Wind, South Fork Wind, Revolution Wind, Skipjack Wind, Block Island Wind Farm, and Coastal Virginia Offshore Wind *BC [redacted] EC*
- Alberto Osorio-Liebana, Senior Director, Offshore Development, leads the offshore engineering team. He has previous experience managing multidisciplinary engineering and construction teams, including offshore projects, thermal power plants, biofuel facilities and transmission lines.
- Michael Porto, External Engagement Director, Offshore Development, leads the overall communications and engagement strategy for elected and government officials, NGOs, local communities, labor, fisheries, and tribal communities. He was previously the Director of Outreach and Planning at the Waterfront Alliance and created the first version of the Waterfront Edge Design Guidelines, a tool to promote resiliency, ecology, and public access for waterfront sites.
- Aaron Geshiere, Manager, Offshore Wind Origination, supports lease auction preparation and mergers and acquisition activity for Invenergy in the offshore wind space. He has previous experience in energy markets consulting, working on renewable policy development, policy analysis, markets forecasting, and new market entry.
- Nash Tahmaz, Senior Vice President, Offshore Wind, previously led the US East Coast offshore wind business development working group for Equinor, was involved in the development and bankability of Dogger Bank, the world's largest wind farm, where he was head of operations and safety.
- Amy Varghese, Vice President, External Affairs, leads external communications, such as media engagement and content management, for the company's clean energy projects. She previously held several positions in New York City and State public service.

Invenergy meets the Minimum Eligibility Requirement.

2.4.3 EPC Contractor

Minimum Eligibility Requirement: Engineer, Procure, Construct Contractor identified by Applicant has credible relevant experience and expertise.

2.4.3.1 Atlantic Shores

*BC/[redacted]

- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]/EC*

[179] Atlantic Shores Application, p. 113 and Appendix 2-28.

The identified contractors have credible relevant experience and expertise.

Atlantic Shores meets the Minimum Eligibility Requirement.

2.4.3.2 Attentive

BC [redacted] EC Attentive's contracting strategy is shown in Figure 16.

Figure 16. Attentive's Contracting Strategy[180]

BC//EC

[redacted]

Attentive has identified potential T&I contractors with credible relevant experience and expertise, including *BC/ [redacted] /EC*

Attentive meets the Minimum Eligibility Requirement.

[180] Attentive Application, p. 2-55.

[181] Attentive Application, p. 2-53.

2.4.3.3 Invenergy

Invenergy has entered into several strategic commercial arrangements that will support execution of the Project.[182] *BC/ EC* Invenergy has provided letters of support from:[185]

- *BC/
- /EC*

These contractors have credible relevant experience and expertise.

Invenergy meets the Minimum Eligibility Requirement.

2.4.4 Environmental Consultant(s)

Minimum Eligibility Requirement: Environmental consultant(s) identified by Applicant has credible relevant experience and expertise.

2.4.4.1 Atlantic Shores

BC EC

- Epsilon Associates Inc., prepared Atlantic Shores' updated COP submitted to BOEM, *BC/ /EC* Epsilon Associates, Inc. has over five years of experience working with BOEM and offshore wind developers on federal permitting. Epsilon prepared the COP for Vineyard Wind I and five additional COPs for New England and Mid-Atlantic offshore wind projects.
- *BC /EC* has performed site investigations to support the design of offshore wind turbines and associated infrastructure.
- EDR also contributed to the updated COP. EDR is a woman-owned business that was part of the permitting team for Revolution Wind, South Fork Offshore Wind, and Skipjack Wind, focusing on

[182] Invenergy Application, p. 122.
[183] Invenergy Application, p. 105.
[184] Invenergy Application, p. 107 and Attachment 2.7.
[185] Invenergy Application, Attachment 2.7b.
[186] Atlantic Shores Application, pp. 305-307.

visual assessment. EDR also conducted the visual assessment for the North Carolina Wind Energy Lease Areas.

Atlantic Shores meets the Minimum Eligibility Requirement.

2.4.4.2 Attentive

Attentive has retained the following environmental consultants to support site characterization and the state and federal permitting process:

- *BC [redacted]
- [redacted]/EC* has documented experience preparing COPs and SAPs for offshore wind projects.

Attentive meets the Minimum Eligibility Requirement.

2.4.4.3 Invenergy

Invenergy has engaged several environmental consultants to date to support its Application, and expects that many of these firms will continue to support Invenergy in some capacity on work related to the proposed project.[187] These firms include but are not limited to:

- *BC/[redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]

[redacted] EC*

Invenergy meets the Minimum Eligibility Requirement.

2.4.5 Union Engagement

Minimum Eligibility Requirement: Applicant provides a credible plan to use unionized labor for construction and for O&M and has included considerations related to prevailing wages and project labor agreements or similar arrangements with labor organizations.

2.4.5.1 Atlantic Shores

Atlantic Shores has signed an MOU with five key unions: *BC [redacted]

[187] Response to Invenergy CQ3 Question 32, submitted on October 16, 2023.
[188] Atlantic Shores Application, p. 219.

[redacted]/EC*

Atlantic Shores meets the Minimum Eligibility Requirement.

2.4.5.2 Attentive

BC [redacted] /EC

Attentive meets the Minimum Eligibility Requirement.

2.4.5.3 Invenergy

BC/ [redacted] EC

Invenergy meets the Minimum Eligibility Requirement.

2.5 Ownership Structure, Financial Strength and Financing Plan

Financial strength reflects the financial capability of the Project's owners to raise all required funds for the Project without subjecting the owner(s) to financial stress. The Applicant's balance sheet strength must indicate Applicant's capability of supporting the requisite financial guarantees to third-party financing. The financial strength of the Applicant will be gauged in the broader context of the parent company's debt to equity ratio, long term credit rating, and market valuation, among other relevant financial metrics.

2.5.1 Applicant Financial Strength

Minimum Eligibility Requirement: The Applicant or the parent entity has an investment grade credit rating from Standard and Poor's ("S&P") (BBB- or above), Moody's (Baa3 or above), or comparative alternative rating agency.

2.5.1.1 Atlantic Shores

Shell plc and Electricité de France S.A. ("EDF") have long-term credit ratings of Aa2 and Baa1, respectively, from Moody's.[191] *BC/ [redacted] /EC* EDF was previously placed on a credit watch by S&P in May 2022 following EDF's announcements on further outages of its nuclear fleet in France and of issues at its U.K. new-build project, while S&P assessed potential remedy measures, implemented by EDF or the government, that could

[189] Attentive Application, p. 8-43.
[190] Invenergy Application, p. 209.
[191] Atlantic Shores Application, p. v.
[192] Response to Atlantic Shores CQ2 Question 1.

mitigate the impact of the outages on profitability and credit metrics.[193] The credit watch was removed as of December 2022 and the outlook returned to stable based on the increased importance of state support, as "EDF's nuclear generation will remain crucial for France's power mix in coming decades."[194]

BC/ [redacted] /EC Shell plc's balance sheet shows $443 billion in assets for 2022.[197] *BC/ [redacted] /EC* EDF's balance sheet shows €388 billion in assets for 2022.[200]

Atlantic Shores meets the Minimum Eligibility Requirement.

2.5.1.2 Attentive

Credit ratings for Attentive's sponsors are shown in Table 11. Both sponsors have investment grade credit ratings from all three rating agencies. *BC [redacted] /EC* In Q1 2023 financial results, TotalEnergies and Macquarie reported total assets of $293 billion and assets under management of $575 billion, respectively.[202]

Table 11. Attentive Sponsor Credit Ratings[203]

BC//EC

	TotalEnergies SE		[redacted]	
Agency	Rating	Date	Rating	Date
S&P	A+	6/30/2022	[redacted]	
Moody's	A1	3/21/2023		
Fitch	AA-	12/7/2022		

Attentive meets the Minimum Eligibility Requirement.

2.5.1.3 Invenergy

Invenergy's parent companies, Invenergy LLC and energyRe, which are both privately held, are not rated.[204] Invenergy is also supported by a consortium of investors that includes Atlas Renewables LP, indirectly controlled by Blackstone, Caisse de dépôt et placement du Québec ("CPDQ"), FirstLight PSP and Ullico Infrastructure Fund. energyRe has over $60 billion in assets owned or under development. Blackstone is the largest alternative asset manager globally, with $991 billion in assets under

[193] https://www.edf.fr/sites/groupe/files/2022-05/sp-press-release-2022-05-24_0.pdf
[194] https://disclosure.spglobal.com/ratings/en/regulatory/article/-/view/sourceId/12592102
[195] Atlantic Shores Application, p. 168.
[196] Atlantic Shores Application, Appendix 1-5.
[197] https://reports.shell.com/annual-report/2022/consolidated-financial-statements/balance-sheet.html
[198] Atlantic Shores Application, p. 169.
[199] Atlantic Shores Application, Appendix 1-6.
[200] https://www.edf.fr/sites/groupe/files/2023-04/edf-urd-annual-financial-report-2022-en.pdf
[201] Attentive Application, p. 5-6.
[202] Id.
[203] Response to Attentive CQ2 Question 1.
[204] Response to Invenergy CQ2 Question 19.

management. CPDQ is AAA stable rated by S&P, Moody's, Fitch and DBRS and has CA$400 billion in net assets.[205] Ullico, an investment fund to assist in the construction, maintenance, and refurbishment of America's infrastructure, has over $5 billion in investor commitments, FirstLight PSP's parent company PSP Investments has CA$200 billion in assets.

Invenergy meets the Minimum Eligibility Requirement.

2.5.2 Financing Plan

Minimum Eligibility Requirement: Applicant provides a credible financing plan that reasonably specifies the source of equity / debt funds. Applicant proposes experienced financing partners that have strong balance sheets.

2.5.2.1 Atlantic Shores

BC/ [redacted] EC

Atlantic Shores meets the Minimum Eligibility Requirement.

2.5.2.2 Attentive

Attentive will use a combination of debt, tax equity and sponsor equity to finance the Project.[211] *BC/ [redacted] EC* TotalEnergies has a balance sheet exceeding $300 billion in assets. Corio's parent company, Macquarie, reported $575 billion in assets under management as of Q1 2023.[213] *BC/ [redacted]

[205] Invenergy Application, p. 166.
[206] Atlantic Shores Application, p. 164.
[207] Atlantic Shores Application, p. 167.
[208] Atlantic Shores Application, p. 165.
[209] Atlantic Shores Application, p. 168.
[210] Atlantic Shores Application, Appendices 5-2 to 5-9.
[211] Attentive Application, p. 5-2.
[212] Attentive Application, p. 5-3.
[213] Attentive Application, p. 5-1.

[redacted] EC*

Attentive meets the Minimum Eligibility Requirement.

2.5.2.3 Invenergy

During the development phase, Invenergy is funded 100% by sponsor equity.[215] *BC [redacted] EC*

Invenergy meets the Minimum Eligibility Requirement.

2.5.3 Investment Tax Credit ("ITC")

Minimum Eligibility Requirement: Applicant addresses potential of qualifying for ITC, if available, and does not rely on ITC if there is a potential that project may not qualify. Applicant identifies all current eligible State and Federal grants, rebates, tax credits, and programs available to offset the cost of the project or provide tax advantages.

2.5.3.1 Atlantic Shores

*BC [redacted]

[redacted]

[214] Attentive Application, Attachment 5-A.
[215] Invenergy Application, p. 165.
[216] Invenergy Application, p. 167.
[217] Invenergy Application, Attachment 5.1, p. 8.
[218] Invenergy Application, Attachment 5.1, p. 6.
[219] Invenergy Application, Attachment 5.2.
[220] Atlantic Shores Application, p. 173.
[221] Atlantic Shores Application, p. 177.
[222] Atlantic Shores Application, pp. 175-176.

[redacted]

[redacted]/EC*

Atlantic Shores meets the Minimum Eligibility Requirement.

2.5.3.2 Attentive

*BC/[redacted]

[redacted]

[redacted]/EC*

Attentive meets the Minimum Eligibility Requirement.

2.5.3.3 Invenergy

*BC/[redacted]

[223] Atlantic Shores Application, p. 177.
[224] Atlantic Shores Application, p. 173.
[225] Atlantic Shores Application, p. 174.
[226] Attentive Application, p. 6-3.
[227] Attentive Application, pp. 6-4 to 6-8.
[228] Attentive Application, pp. 6-9 to 6-12.
[229] Invenergy Application, p. 171.

[redacted]

EC*

Invenergy meets the Minimum Eligibility Requirement.

2.6 PROJECT SCHEDULE AND STAKEHOLDER ENGAGEMENT

Applicants must provide a sufficiently complete and detailed project development schedule that supports Applicant's proposed COD and is consistent with all elements of the project development plan: site acquisition, interconnection, permitting, procurement/supply chain, port development, and construction schedule. The Applicant must identify the tasks on the critical path and recognize potential impediments to project development. Key to maintaining the project schedule is a comprehensive and thoughtful stakeholder engagement plan.

2.6.1 Project Schedule

Minimum Eligibility Requirement: The Applicant has provided a detailed critical path schedule supported by documentation and information that demonstrates that proposed project development milestones are credible. Project schedule includes adequate slack in the schedule to deal with contingencies.

2.6.1.1 Atlantic Shores

Atlantic Shores notes that it is able to leverage the experience from Atlantic Shores Project 1, including regulatory progress and commercial agreements already in place in the implementation of the Project.[234] Atlantic Shores identified the key milestones for the Project as listed in Table 12.

Table 12. Atlantic Shores Key Milestone Dates[235]

BC//EC

Milestone	Date
[redacted]	

[230] Invenergy Application, pp. 172-173.
[231] Invenergy Application, Attachment 4.1.
[232] Invenergy Application, p. 173.
[233] Id.
[234] Atlantic Shores Application, p. 377.
[235] Atlantic Shores Application, p. 381

A more detailed schedule showing key activities related to design, resource monitoring, impact studies, permitting, and construction is presented in Figure 17.

Figure 17. Atlantic Shores Summary Project Schedule[236]

BC//EC

A narrative description of the assumptions underlying the schedule is provided. Atlantic Shores *BC/ /EC* and identifies and describes key schedule risks and opportunities.[237] *BC/ /EC*

Atlantic Shores meets the Minimum Eligibility Requirement.

[236] Atlantic Shores Application, p. 382.
[237] Atlantic Shores Application, pp. 391-392.
[238] Id.
[239] Atlantic Shores Application, pp. 392-393.

2.6.1.2 Attentive

Attentive states that it engaged in years of pre-development efforts in the New York Bight prior to acquiring the lease area, and that it is able to build on the procurement and executing strength of its sponsors.[240] Attentive has identified dates for the key Project milestones listed in Table 13.

Table 13. Attentive Key Milestone Dates

BC//EC

Milestone	Date
[redacted]	

Attentive's critical path schedule is shown in Figure 18.

Figure 18. Attentive Critical Path Schedule[246]

BC//EC

[redacted]

A narrative description of the assumptions underlying the schedule is provided. *BC/[redacted]

[240] Attentive Application, p. 12-2.
[241] Attentive Application, p. 12-16.
[242] Attentive Application, p. 12-13.
[243] Attentive Application, Attachment 12-A.
[244] Id.
[245] Attentive Application, p. 12-22.
[246] Attentive Application, p. 12-12.
[247] Attentive Application, p. 12-4.

[redacted]/EC* Attentive identifies a number of potential risks and mitigation strategies, and states that it will continue to monitor the risks throughout the duration of the Project.[248]

Attentive meets the Minimum Eligibility Requirement.

2.6.1.3 Invenergy

Invenergy states that its schedule is informed by *BC [redacted] EC* Invenergy has identified dates for the key Project milestones listed in Table 13.

Table 14. Invenergy Key Milestone Dates

BC//EC

Milestone	Date
[redacted]	

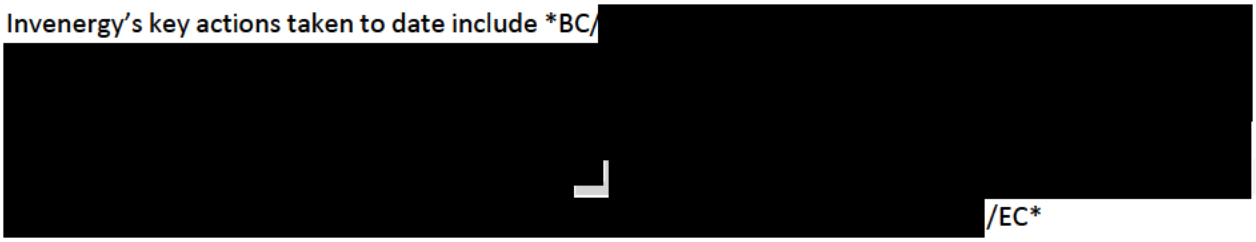
Invenergy's critical path schedule is shown in Figure 19. *BC/[redacted] EC*

[248] Attentive Application, pp. 12-26 to 12-28.
[249] Invenergy Application, p. 297.
[250] Invenergy Application, p. 304.
[251] Invenergy Application, p. 301
[252] Invenergy Application, p. 306.
[253] Invenergy Application, p. 309.
[254] Id.
[255] Invenergy Application, p. 310 and Invenergy BAFO, p. 4.
[256] Invenergy BAFO, p. 4.
[257] Id.
[258] Invenergy Application, p. 311.

Figure 19. Invenergy Project Schedule[259]

BC//EC

A narrative description of the assumptions underlying the schedule is provided. Invenergy has developed several schedule-driven risk management strategies to manage the risk of delay in the schedule. Invenergy's key actions taken to date include *BC/



/EC*

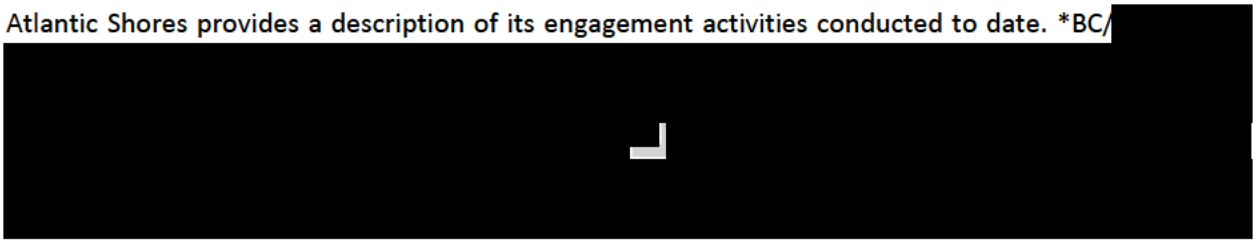
Invenergy meets the Minimum Eligibility Requirement.

2.6.2 Stakeholder Engagement

Minimum Eligibility Requirement: Applicant has provided a comprehensive plan to engage with key stakeholders, including representatives of the fishing community and local residents potentially impacted by the Project.

2.6.2.1 Atlantic Shores

Atlantic Shores provides a description of its engagement activities conducted to date. *BC/



[259] Invenergy Application, p. 301.
[260] Invenergy Application, p. 302.
[261] Invenergy Application, p. 300.
[262] Atlantic Shores Application, p. 273.

[redacted]/EC* Atlantic Shores plans to continue to hold community events, invest further in the Education and Community Outreach Center, conduct supplier forums and training, participate in job fairs, sponsor OBC network events, and hold signature events with strategic partners. Atlantic Shores also has a number of public communications strategies to share Project information.

Atlantic Shores meets the Minimum Eligibility Requirement.

2.6.2.2 Attentive

Attentive provides a detailed stakeholder engagement plan. Attentive reports that prior to acquiring its lease area, it had already met with over 180 unique stakeholders and had conducted more than 250 stakeholder meetings.[264] Attentive states that it has designed its cable routing and interconnection strategy to minimize disruption to onshore communities and coastal private landowners, including residents and business owners. Community-based organizations are the central mechanism that Attentive will utilize to develop a presence in communities across the State.[265] Attentive identifies recreational and fisheries stakeholders as including cruise lines and passenger vessels, coastal resorts, mariners, charter and for-hire fishing vessels, and commercial fishermen operating along the New Jersey coastline, offshore, and in local ports.[266] Attentive has released a Fisheries Communication Plan and the Project's Fisheries Liaison is actively building new partnerships with fishermen across the State.

Attentive meets the Minimum Eligibility Requirement.

2.6.2.3 Invenergy

Invenergy identifies planned stakeholder engagement activities within an overall philosophy and principles of humility, creativity, and connectivity. Invenergy further describes the strategies it will use to identify stakeholders and how each stakeholder group will be engaged. Invenergy will engage residents who live in communities in the vicinity of the Project to share information and solicit input on Project development.[267] Invenergy has published a Fisheries Communication Plan and has a Fisheries Liaison Officer who acts as a direct line of communication with fisheries stakeholders.[268] Invenergy has identified commercial fishermen, recreational fishermen, fishing industry associations and organizations *BC/[redacted]/EC* fisheries science and research institutions, fisheries management councils and offshore wind lessees as relevant stakeholders, with targeted outreach activities for each group.

Invenergy meets the Minimum Eligibility Requirement.

[263] Atlantic Shores Application, pp. 276-277.
[264] Attentive Application, p. 9-1.
[265] Attentive Application, p. 9-13.
[266] Attentive Application, p.9-18.
[267] Invenergy Application, p. 238.
[268] Invenergy Application, p. 284.

3 OREC PURCHASE PRICE AND RATEPAYER IMPACTS

The OREC Purchase Price is defined in the rules at N.J.A.C. 14:8-6.1 and 6.5(a)(12) as the price per OREC in $/MWh paid for a Qualified Offshore Wind Project.[269] The OREC Project Price reflects the all-in costs of the Project, including capital and operating costs offset by any State or Federal tax or production credits and any other subsidies or grants. The OREC Project Price is paid per MWh for delivered energy.

N.J.A.C. 14:8-6.5(a)(12)(iii) and (vii) require Applicants to submit an OREC Pricing Schedule with a fixed OREC price and expected energy output for each Energy Year of the proposed 20-year OREC term. Applicants were allowed to propose a phased commercial operation schedule. Each phase of a multi-phase project will have a distinct 20-year term beginning on the phase's Commercial Operation Date. A single price series, expressed in nominal dollars, and expected energy output series will apply to all phases. This can result in overall price and output series longer than 20 years, if a Project has multiple phases with different Commercial Operation dates. The OREC Price may be the same for all years of the 20-year OREC term(s), or it may increase each year subject to a fixed escalation rate specified by the Applicant. If the Applicant opts to use a fixed escalation rate for the OREC Price, it must be less than or equal to 3%. Applicants were required to submit the all-in OREC Price on an Energy Year basis for the first Energy Year.

The OREC Price was evaluated in terms of the nominal LOPP and nominal LNOC. The difference between LOPP and LNOC is the value of the nominal LRCs. The LOPP is derived from the OREC Pricing Schedule and expected OREC deliveries and represents the total value of the ORECs. The LNOC is derived from the OREC Pricing Schedule, expected OREC deliveries, and value of the revenue credits that reflect the expected value of energy, capacity, and ancillary services in the wholesale market, as well as the avoided cost of Class 1 RECs.[270] The LRC used to calculate the LNOC for evaluation purposes is consistent with LAI's price forecasts rather than those submitted by the Applicants. The LNOC represents the expected net price paid by New Jersey ratepayers for delivered ORECs over the 20-year OREC term, expressed on a nominal dollar basis. The nominal levelized convention used for LOPP and LNOC is consistent with administration of OREC pricing as fixed nominal prices by Energy Year.

Applicants were required to submit a First Energy Year All-In OREC Purchase Price, expressed in $/OREC, and an Escalation Rate.[271] Applicants also had the option to designate parameters to determine the Buyer's share of final PJM transmission system upgrade cost ("TSUC") if they expected additional interconnection costs, which is described in more detail in Section 3.2 below. The TSUC mechanism provides the Applicant with the opportunity to define the amount of transmission interconnection risk the Applicant is willing to internalize in its OREC Purchase Price versus the amount allocable to ratepayers based on the actual TSUC determined by PJM. The OREC Purchase Price calculations are summarized in

[269] For purposes of this solicitation, Applicants were required to submit an OREC Project and an OREC Prebuild Price. Because the Prebuild proposals were all rejected on October 25, 2023, they are not addressed herein.

[270] LNOC is the levelized nominal cost per MWh that, when multiplied by the proposed OREC quantities for each Energy Year of the proposed 20-year term, yields a steam of dollar amounts which has the same present value as the series of Energy Year net costs of the same quantities of ORECs. Using the nominal discount rate of 7%, this present value equivalence reflects the OREC Purchase Price Schedule, including the revenue credits attributable to the estimated market value of energy and capacity, as well as the avoided REC costs.

[271] Per N.J.A.C. 14:6-6.1, an Energy Year is the 12-month period from June 1 through May 31 and is to be numbered according to the calendar year in which it ends.

Table 15. The LOPP is stated in nominal $/MWh.[272] The LNOC is expressed in nominal $/MWh, and includes the effect of the revenue credits, as discussed in Section 3.3.

Table 15. OREC Purchase Price Summary[273]

BC//EC

Project Option	First Energy Year	First Energy Year All-In OREC Purchase Price ($/OREC)	Escalation Rate	LOPP ($/MWh)	LNOC ($/MWh)
[redacted]					
ATT-7-1342-E-S2b	2032	$131.00	3.00%	$165.14	$96.75
[redacted]					

[272] TSUC Price Adders ("TSUCPA") were not included in the evaluation for any Project options, as discussed in Section 3.2.

[273] First Energy Year, First Energy Year All-In OREC Purchase Price, and Escalation Rate were submitted in the OREC Pricing Schedule worksheet of the Application Form. The LOPP and LNOC values were calculated by LAI.

Project Option	First Energy Year	First Energy Year All-In OREC Purchase Price ($/OREC)	Escalation Rate	LOPP ($/MWh)	LNOC ($/MWh)
[redacted]					
INV-5-2400-S2b	2032	$112.50	2.50%	$139.53	$70.05
[redacted]					

The submitted First Energy Year All-In OREC Purchase Price for each Qualified Project will be adjusted for inflation upon BOEM approval of the COP. The inflation adjustment mechanism is presented in Section 1.2 of the SGD. The evaluation does not include the effects of the inflation adjustment. The price evaluation is therefore based on the Applicants' as-submitted, that is, not adjusted for inflation, OREC Purchase Prices.

3.1 LEVELIZED OREC PURCHASE PRICE

OREC quantities were calculated for each month of each Energy Year from the tables of generation and energy delivery provided in the Application Forms. OREC Purchase Prices for each month were determined from the First Energy Year OREC Purchase Price and the escalation rate as submitted in the Application Form. Monthly products of OREC quantity and OREC Purchase Price were aggregated by calendar year. The annual totals were discounted to present value (year-end 2023) using a nominal discount rate of 7.0%. The OREC quantities were similarly aggregated by calendar year and discounted at the same nominal discount rate to year-end 2023. LOPP was calculated as the ratio of the present value of OREC Purchase Price payments to the present value of the corresponding annual OREC quantities.

3.2 TRANSMISSION SYSTEM UPGRADE COST UNCERTAINTY AND RECONCILIATION

Projects that will exclusively utilize SAA Capability are expected to have no or minimal TSUC. Applicants could propose to utilize the 1,200 MW and/or the 1,342 MW LCS circuits. Applicants had the option of agreeing to be responsible for all TSUC or to propose a sharing of certain TSUC. Applicants proposing to utilize the TSUC sharing mechanism were required to designate parameters to determine the Buyer's share of the final PJM TSUC in the Application Form.

The objective of the mechanism presented in the formulas below is to reflect the apportionment of risk between Buyer and Seller related to incremental TSUC associated with connecting to the LCS.

The Buyer's share of the TSUC is represented by the TSUC Price Adder ("TSUCPA"), calculated as shown in the following equations:

$$TSUCPA = \frac{ATSUCR}{EAOQ}$$

$$ATSUCR = BSTSUC \times AF(ROR, 20)$$

$$BSTSUC = TSUC - SSTSUC$$

$$SSTSUC = \min(TSUC, TSUCT1) \times 1.00 + \min(\max(0, TSUC - TSUCT1), TSUCT2 - TSUCT1) \times SS2 + \min(\max(0, TSUC - TSUCT2), TSUCS3 - TSUCT2) \times SS3$$

where:

TSUCPA = Transmission System Upgrade Cost Price Adder (Nominal $/MWh)
EAOQ = Expected Annual OREC Quantity (MWh/year) (P50 annual profile)
ATSUCR = Annual Transmission Upgrade Cost Recovery (Nominal $/year)
ROR = Rate of Return
AF(*ROR*, 20) = Annuity factor of ROR for 20-year term
BSTSUC = Buyer Share of Transmission System Upgrade Cost (Nominal $)
TSUC = Transmission System Upgrade Cost (Nominal $)
SSTSUC = Seller Share of Transmission System Upgrade Cost (Nominal $)
TSUCT1 = TSUC Threshold 1 absorbed 100% by Seller (Nominal $)
TSUCT2 = TSUC Threshold 2 absorbed by Seller at rate *SS2* (Nominal $)
SS2 = Seller Share of TSUC up to TSUCT 2 above TSUCT 1 (fraction)
TSUCT3 = TSUC Threshold 3 absorbed by Seller at rate *SS3* (Nominal $)
SS3 = Seller Share of TSUC up to TSUCT 3 above TSUCT 2 (fraction)

The OREC Purchase Price includes the Seller Share of TSUC. TSUC above TSUC Threshold 3 are apportioned fully to Buyer. In addition to the OREC Purchase Price, Applicants that elected to submit Project options that include TSUC sharing were required to provide values for TSUCT1, TSUCT2, TSUCT3, SS2 and SS3. Applicants were free to set these parameters in accord with their own risk preference. Applicants were free to set the SS2 and SS3 values at decreasing fractions solely at their discretion and based on their own risk tolerance. TSUC sharing allows Applicants to shift all or a portion of the TSUC risk to New Jersey ratepayers. Applicants willing to absorb the incremental TSUC within the submitted OREC Purchase Price schedule, were free to set the SS2 and SS3 values to 1.

3.2.1 Atlantic Shores

BC [redacted] /EC

The values used to calculate the TSUCPA representing the Buyer's Share of estimated risk-adjusted TSUC are summarized in Table 16. *BC [redacted] EC*

Table 16. Atlantic Shores TSUC Inputs[275]

BC//EC

TSUC Threshold 1 ($)	[redacted]
TSUC Threshold 2 ($)	
Seller Share of TSUC between TSUCT1 and TSUCT2	
TSUC Threshold 2 ($)	
Seller Share of TSUC between TSUCT2 and TSUCT3	
Required Rate of Return[276]	
P50 Estimate of Required Project TSUC ($)	
P90 Estimate of Required Project TSUC ($)	

3.2.2 Attentive

BC/ [redacted] /EC

3.2.3 Invenergy

*BC [redacted]

[274] Atlantic Shores Application, p. 411.

[275] TSUC Parameters were submitted in the OREC Purchase Price worksheet of the Application Form.

[276] *BC/ [redacted] /EC*

[277] Attentive Application, p. 13-12.

[278] Response to Attentive CQ4 Question 8.

[279] Invenergy Application, p. 341.

[redacted]/EC*

3.3 NET OREC COST

LNOC is calculated as the PVNOC divided by the same present value of annual OREC quantities used in the calculation of LOPP.[282] PVNOC is determined as the present value of OREC purchase payments less the present value of the revenue credits associated with the sale of energy and capacity, and the avoided cost of Tier 1 RECs. The basis for estimating these credits is presented below. The LNOC model includes financial discounting and levelization over the 20-year OREC term. The algebraic form of the LNOC calculation is presented in Appendix B.

3.3.1 Market Price Projections

Quantitative evaluation of the Applications was completed using market price projections for energy, capacity, and RECs developed by LAI.[283] To simulate wholesale electric market dynamics in PJM, LAI used Aurora, a chronological dispatch simulation model licensed by Energy Exemplar. The revenue credits for energy were calculated using the applicable hourly zonal energy prices from the Offshore Wind case and the expected hourly energy quantities used to calculate LOPP. The revenue credits for capacity were calculated based on a proxy value reflective of the value of capacity over the last three years in PJM's Base Residual Auction ("BRA"). The avoided costs of RECs were calculated using LAI's ACP-based REC supply and demand balance. The inputs and calculation methods underlying these projections are described in Appendix A.[284]

3.3.1.1 Energy Price Projection

LAI's projected prices for the JCPL zone, where the LCS is located, are shown in Figure 20. The projected prices for this solicitation (LAI S#3) are shown in comparison to the projected prices developed by LAI and BPU for the first two solicitations (BPU S#1, LAI S#1, and LAI S#2).[285] Prices are shown in nominal dollars per MWh.

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[280] Invenergy Application, p. 342.

[281] Response to Invenergy CQ4 Question 4.

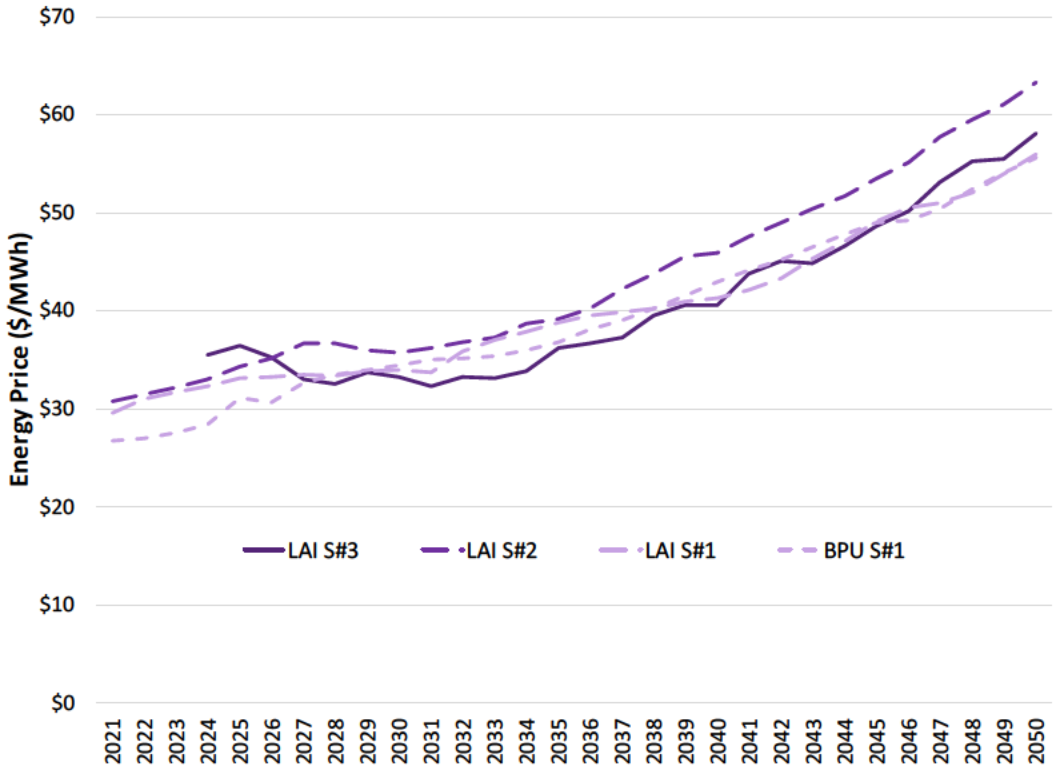
[282] LNOC can also be calculated as LOPP less the levelized unit equivalents of revenue credits for energy, capacity, and avoided Tier 1 REC purchases.

[283] The value of ancillary services is not included in the calculation of revenue credits for purposes of this evaluation. Ancillary services revenue will be credited against the OREC Purchase Price during the OREC term.

[284] The REC price projection was based on equilibrium market assumptions and therefore does not address the potential impact of large increments of offshore wind added to the resource mix and resultant REC clearing prices in New Jersey over the OREC term.

[285] The "BPU S#1" projection was included in the Solicitation Guidance Document for the first solicitation as guidance for the Applicants, and was based on NYMEX futures and the 2018 Annual Energy Outlook. The "LAI S#1" and "LAI S#2" projections were developed as an independent assessment using Aurora.

Figure 20. JCPL Energy Price Projection Benchmark

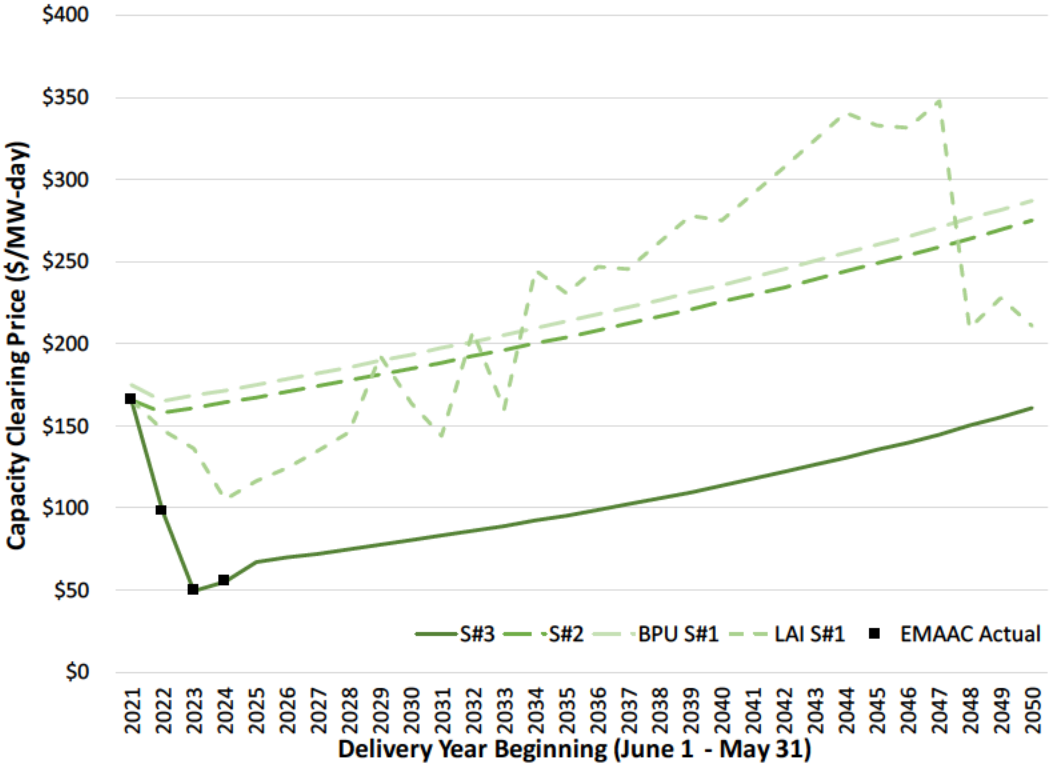


The Aurora results for S#3 were similar to projections developed for previous solicitations. The OREC contract price credits ratepayers the actual market revenue for energy, capacity, and RECs.

3.3.1.2 Capacity Price Projection

LAI's projected capacity prices for EMAAC are shown in Figure 21 alongside the projected prices from previous solicitations. As stated in the SGD, the capacity proxy prices are based on the average of the previous three BRA resource clearing prices. The resource clearing price for the 2025/26 delivery year is the three-year average price, which is then escalated at approximately a 3.5% rate each year thereafter, which reflects an adjustment to reflect the relatively higher cost increases for power plant maintenance relative to general inflation. Capacity prices used in this solicitation were projected using only resource clearing prices from the BRA and did not incorporate adjustments observed in incremental auctions.

Figure 21. EMAAC Capacity Price Projection[286]



Delays in the BRA schedule meant that clearing prices for S#2 were only available for the 2021/22 delivery year and earlier. In contrast, the S#3 projection includes clearing prices through the 2024/25 delivery year. BRA clearing prices fell substantially in the intervening years.

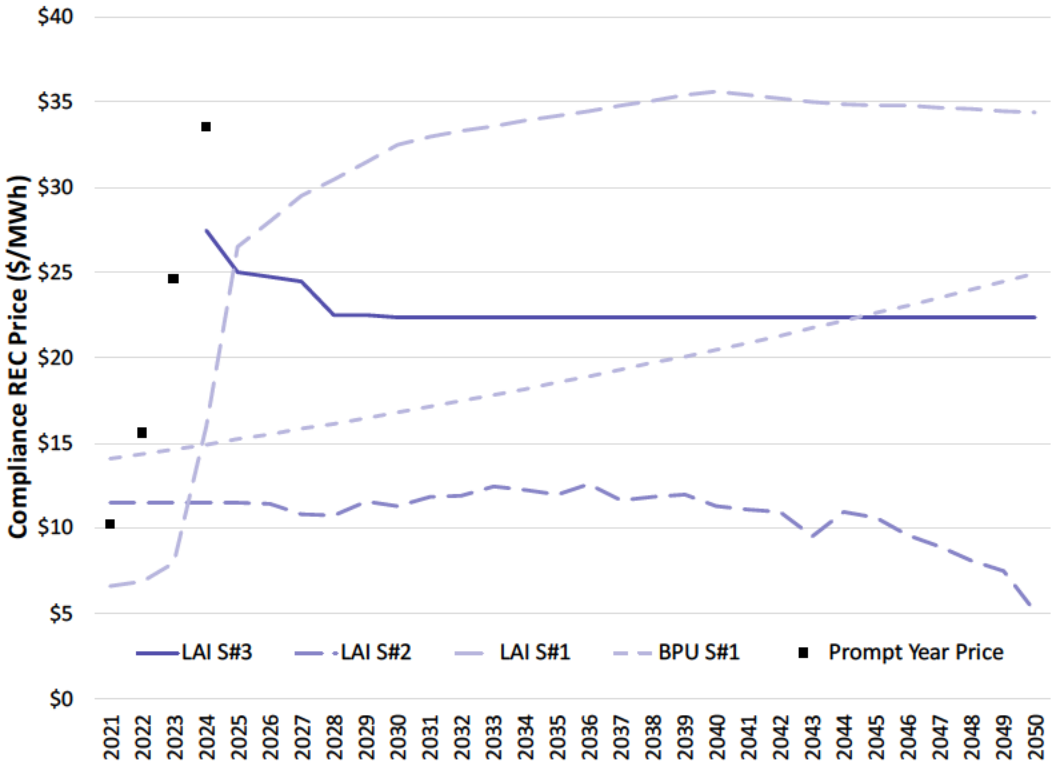
3.3.1.3 New Jersey Class I REC Price Projection

LAI's New Jersey Class I REC Price projection is shown in Figure 22 alongside prices from LAI's S#2 and S#1 projections and the BPU Guidance Document from S#1. REC price forecasts for S#1 and S#2 changed drastically due to the extension of the federal Production Tax Credit for wind, and due to expectations for reduced capital and operating costs for wind.[287] REC prices for S#3 increased due to changes in LAI's modeling technique, which better reflects current REC market trends and limits price increases to the Alternative Compliance Payment ("ACP") thresholds that many states have included in the legislation adopting various Renewable Portfolio Standards. A detailed description of LAI's REC price model is provided in Appendix A.

[286] LAI's forecast in the first solicitation used Aurora modeling of supply and demand fundamentals rather than escalating a historical average as a proxy.

[287] The BPU S#1 forecast simply represents an escalation of the last available settled REC prices at inflation.

Figure 22. New Jersey Class I REC Price Projection Benchmark[288]



3.3.1.4 Total Revenue Credits

The present value of the revenue credits and LRCs associated with each of the commodity products described in the preceding sections are summarized in Table 17. The generation profile for each Project size from each Applicant is the same regardless of other Project characteristics and LOPP, therefore there is only a single set of revenue credit values for each size option.

Table 17. Revenue Credits by Applicant and Project Size
BC//EC

	Atlantic Shores	Attentive	Invenergy
Injection Capacity (MW)			
PV of Revenue Credits ($ Billions)			
Energy Market			
Capacity Market			
Avoided Tier 1 REC			
Total			
Levelized Revenue Credit ($/MWh)			
Energy Market			
Capacity Market			
Avoided Tier 1 REC			
Total			

[288] The prompt year price represents the average price of a REC for compliance in a given year as traded over the prior year, sourced from SNL indices.

3.3.1.5 Comparison to Applicant Forecasts

LAI reviewed the commodity price forecasts submitted by each of the Applicants. LAI found that each Applicant had worked with a reputable vendor to produce its market price forecast, but that descriptions were generally terse and therefore the degree of customization was unclear. Based on the information provided, LAI was not able to make a level comparison between the forecasts. While Applicants provided generally solid reasoning to back higher capacity price expectations, the impact of price increases for capacity is limited relative to energy and avoided Tier 1 RECs.

LAI's forecasts were used for the price evaluation because using each Applicant's respective price forecast would change the LNOCs, and therefore also the price scoring metrics. Reliance on the respective forecasts was therefore determined to be unreasonable and not in good accord with standards of procurement excellence. Applicants should not be rewarded or penalized for having an optimistic or pessimistic view of long-term prices. None of the Applicants presented a novel strategy which significantly differentiates their project alternatives in terms of capturing market revenues, further reinforcing the fact that all Applicants will be participating in the same wholesale markets and therefore subject to the same market prices.

3.3.2 Present Value of Net OREC Cost

Annual and present values for total OREC Payments and market credits were calculated for each Project option. The present values are summarized in Table 18. The same present value measures are also shown in Figure 23, sorted from lowest to highest PVNOC. The corresponding unitized values are discussed in the next section.

Table 18. Present Value of Net OREC Cost

BC//EC

Project Option	PV of OREC Quantity (MWh)	PV of OREC Payments ($ Thousands)	PV of Market Revenue Credits ($ Thousands)			PV of Net OREC Cost ($ Thousands)
			Energy	Capacity	Avoided Tier 1 RECs	
[redacted]						

Project Option	PV of OREC Quantity (MWh)	PV of OREC Payments ($ Thousands)	PV of Market Revenue Credits ($ Thousands)			PV of Net OREC Cost ($ Thousands)
			Energy	Capacity	Avoided Tier 1 RECs	
[redacted]						
ATT-7-1342-E-S2b						$3,261,291
[redacted]						
INV-5-2400-S2b						$3,896,137
[redacted]						

Project Option	PV of OREC Quantity (MWh)	PV of OREC Payments ($ Thousands)	PV of Market Revenue Credits ($ Thousands)			PV of Net OREC Cost ($ Thousands)
			Energy	Capacity	Avoided Tier 1 RECs	
[redacted]						

Figure 23. Present Value of Net OREC Cost

BC//EC

3.3.3 Levelized Net OREC Cost

LNOC can be presented either in levelized nominal dollars or in levelized real (constant) dollars. The nominal levelized convention comports with the intended administration of OREC pricing as fixed nominal prices, which includes inflation, by Energy Year. To promote standardization among Applicants, the real levelized convention represents a fair basis for comparison of Projects with different expected OREC term start dates.[289]

[289] The real LNOC is often used by state entities to report the expected OREC Cost in current day dollars over the OREC term for a project that will not start commercial operation for several years.

In general terms, the LNOC is equal to the Project's OREC Purchase Price adjusted for the TSUCPA, if applicable, and the value of capacity, energy, and RECs. The specific algebraic form is presented in Appendix B.

Nominal dollar LNOC results for each Project are shown in Table 19 and Figure 24.

Table 19. Levelized Net OREC Cost
(Nominal $/MWh)
BC//EC

Project Option	LOPP	Levelized Energy Market Credits	Levelized Capacity Market Credits	Levelized Avoided Tier 1 RECs	LNOC
[redacted]					
ATT-7-1342-E-S2b	$165.14				$96.75
[redacted]					

Project Option	LOPP	Levelized Energy Market Credits	Levelized Capacity Market Credits	Levelized Avoided Tier 1 RECs	LNOC
[redacted]					
INV-5-2400-S2b	$139.53				$70.05
[redacted]					

Figure 24. Levelized Net OREC Cost

BC//EC

3.4 RATEPAYER IMPACTS

Ratepayer impacts, as a function of the Net OREC Cost, were also assessed for each Project. PVNOC is an estimate of the costs which will be borne by ratepayers to allow New Jersey electric distribution companies ("EDCs") to recover the cost of the ORECs and the TSUCPA. Ratepayer impacts for each Project are based on the PVNOC and a PV-adjusted total New Jersey EDC retail load.[290]

To account for the time differences between a Project's monthly delivery periods within its 20-year term(s) and the 2023 retail rate impact, the present value of the projected New Jersey retail load quantities was calculated using the real discount rate. This allows for the determination of a real (constant

[290] This calculation does not include any adjustments for indirect benefits associated with wholesale price effects in the energy, capacity, or REC markets. Likewise, it does not include adjustments for the avoidance of greenhouse gas ("GHG") emissions or for the creation of economic activity benefits.

base year) dollar levelized retail rate impact per MWh of retail load.[291] Retail load for each year is based on the U.S. Energy Information Agency ("EIA") projections used in the Aurora simulation modeling.

The Net OREC cost will affect retail rates in two ways. First, the gross OREC cost and the energy and capacity revenue credits will be included as a non-bypassable component of the EDC delivery charges to all classes of customers. This pass-through is computed as a similar rate for all customer classes. Second, the credit for avoided Class I REC purchases will be passed through to customers via the supply charge, whether supply is provided directly by the EDCs or through competitive retail supplier. The levelized retail rate impact in 2023 $/kWh, shown in Table 20, is calculated as the PVNOC divided by the present value of the retail load quantity.[292]

EIA data covering the 2022 calendar year was used to estimate average monthly usages and total bills for residential, commercial, and industrial/transportation customers in New Jersey.[293] All four NJ EDCs were aggregated for this purpose. The monthly cost impact of an OREC purchase on the typical monthly bill for each rate type was calculated as the product of the levelized retail rate impact (2023 $/kWh) and the appropriate average monthly usage in kWh.[294] The percentage change in the typical monthly bill was calculated as the ratio of the monthly cost impact divided by the baseline average monthly bill.

[291] Formula for present value of retail load quantity:

$$PVERLQ = \sum_{i=2023}^{2052} WLQ_i \times RLLF \times EDCF/(1 - RDR)^{(i-2023)}$$

WLQ_i is the New Jersey Wholesale Load for year i from simulation model (MWh)
RLLF is the Retail Load Loss Factor for New Jersey load
EDCF is the fraction of New Jersey retail load served by EDCs
RDR is the Real Discount Rate = (1 + *NDR*) / (I + *INF*) – 1
NDR is the Nominal Discount Rate (7.00%)
INF is the Inflation Rate (2.50%)

[292] An adjustment from MWh to kWh is made.

[293] https://www.eia.gov/electricity/data/eia861m/

[294] Average monthly usage for residential, commercial, and industrial customers is 681 kWh, 5,844 kWh, and 51,071 kWh, respectively.

Table 20. Retail Rate Impacts
(Levelized 2023 $)
BC//EC

Project Option	Average Rate Impact ($/MWh)	Residential		Commercial		Industrial	
		Bill Impact ($/month)	% of Average Bill	Bill Impact ($/month)	% of Average Bill	Bill Impact ($/month)	% of Average Bill
[redacted]							
ATT-7-1342-E-S2b		$3.13		$26.87		$234.80	
[redacted]							

Project Option	Average Rate Impact ($/MWh)	Residential		Commercial		Industrial	
		Bill Impact ($/month)	% of Average Bill	Bill Impact ($/month)	% of Average Bill	Bill Impact ($/month)	% of Average Bill
[redacted]							
INV-5-2400-S2b		$3.71		$31.86		$278.42	

3.5 COMPARISON TO PREVIOUS NEW JERSEY SOLICITATIONS AND OTHER STATES

In Table 21, the Applicants' proposed LOPPs are compared to the results of the prior New Jersey solicitations and to the results of selected solicitations that have been published by state authorities in Maryland, New York, Massachusetts, Rhode Island, and Connecticut.[295]

[295] Block Island Wind Farm, Bluewater Wind, Cape Wind, and Fishermen's Energy have not been included in this comparison because they are not considered representative of the current offshore wind market.

Table 21. Levelized Pricing Comparison
BC//EC

Year of Selection	State	Project	Capacity (MW)	Commercial Operation Year[296]	LOPP (Nominal $/MWh)
2016	MD	Skipjack Wind	120	2023	$184.52[297]
		U.S. Wind	248	2021	$179.56[298]
2017	NY	South Fork Wind	130	2022	$186.07[299]
2018	MA	Vineyard Wind 1	400	2022	$98.68[300]
		Vineyard Wind 2	400	2023	$88.17[300]
	RI	Revolution Wind (RI)	400	2024	$107.08[301]
	CT	Revolution Wind (CT1)	200	2024	$108.15[301]
2019	CT	Revolution Wind (CT2)	104	2024	$107.08[301]
	NJ	Ocean Wind I	1,104	Cancelled	$116.75[302]
	NY	Empire Wind 1	816	2024	$118.64[303]
		Sunrise Wind	880	2024	$110.37[303]
2020	MA	Mayflower Wind	804	2025	$88.13[304]
	CT	Park City Wind	804	2025	$88.13[304]
2021	NY	Empire Wind 2	1,260	Cancelled	$107.50[305]
		Beacon Wind	1,230	2028	$118.00[306]
	NJ	Atlantic Shores 1	1,510	2027	$114.03[307]
		Ocean Wind II	1,148	Cancelled	$100.65[308]
	MD	Skipjack 2.1	846	2026	$128.26[309]
		Momentum Wind	808	2026	$84.64[309]
2022	MA	Commonwealth Wind	1,200	Cancelled	$85.54[310]
		Mayflower Wind	1,200	Cancelled	$86.15[311]
2023	NY	Attentive Energy	1,404	By 2030	$145.07[312]
		Community Offshore Wind	1,314	By 2030	
		Excelsior Wind	1,314	By 2030	
	NJ	Atlantic Shores 2	[redacted]		
		Attentive Energy			
		Leading Light Wind			$139.53-[redacted]

[296] As announced at time of award. *BC/[redacted] EC*

[297] Calculated from annual prices published in MD PSC Case No. 9431, Skipjack Offshore Wind Energy, LLC - Letter accepting approval on Order No. 88192, May 24, 2017 (https://webapp.psc.state.md.us/newIntranet/Casenum/NewIndex3_VOpenFile.cfm?filepath=//Coldfusion/Casenum/9400-9499/9431/Item_122\SkipjackLetterofAcceptance.PDF).

[298] Calculated from annual prices published in MD PSC Case No. 9431, U.S. Wind, Inc. - Notice of Acceptance of Conditions, May 25, 2017 (https://webapp.psc.state.md.us/newIntranet/Casenum/NewIndex3_VOpenFile.cfm?FilePath=//Coldfusion/Casenum/9400-9499/9431/123.pdf).

[299] Estimated by LAI based on limited public information available about the award.
[300] Calculated from MA DPU Docket Nos. 18-76, 18-77, and 18-78, Vineyard Wind PPAs filed on August 1, 2018. LAI added in the expected value of capacity based on the 2017 RGGI Model Rule Price Scenario to facilitate price comparison.
[301] RI PUC, Docket No. 4929, Direct Testimony of Jeffrey Grybowski on behalf of DWW Rev I LLC, April 5, 2019, p. 6. LAI added in the expected value of capacity based on the 2017 RGGI Model Rule Price Scenario to facilitate price comparison.
[302] Calculated from annual prices published in the BPU's Order in Docket No. QO18121289 (https://www.bpu.state.nj.us/bpu/pdf/boardorders/2019/20190621/6-21-19-8D.pdf).
[303] Calculated from annual prices published in NYSERDA's *Launching New York's Offshore Wind Industry: Phase 1 Report* (https://www.nyserda.ny.gov/-/media/Files/Programs/offshore-wind/osw-phase-1-procurement-report.pdf).
[304] Calculated from Order in MA DPU Docket Nos. 20-16, 20-17, and 20-18, Mayflower Wind PPAs, filed on February 10, 2020. LAI added in the expected value of capacity based on the 2017 RGGI Model Rule Price Scenario to facilitate price comparison.
[305] Level nominal price stated in contract: https://www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Programs/Offshore-Wind/Empire-Offshore-Wind--executed.PDF
[306] Level nominal price stated in contract: https://www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Programs/Offshore-Wind/beacon-wind-executed.pdf
[307] Calculated from annual prices published in the BPU's Order in Docket Nos. QO20080555 and QO21050824 (https://www.nj.gov/bpu/bpu/pdf/boardorders/2021/20210630/ORDER%20Solicitation%202%20Board%20Order%20ASOW%20Revised.pdf).
[308] Calculated from annual prices published in the BPU's Order in Docket Nos. QO20080555 and QO21050824 (https://www.nj.gov/bpu/bpu/pdf/boardorders/2021/20210630/ORDER%20Solicitation%202%20Board%20Order%20OW2%20Revised.pdf).
[309] Calculated from price information published in MD PSC Case No. 9666, Order No. 90011 Granting Offshore Wind Renewable Energy Credits, December 17, 2021 (https://webpsc.psc.state.md.us/DMS/case/9666).
[310] Calculated from Order in MA DPU Docket Nos. 22-70, 22-71, and 22-72, Commonwealth Wind PPAs, filed on May 25, 2022. LAI added in the expected value of capacity based on the 2017 RGGI Model Rule Price Scenario to facilitate price comparison.
[311] Calculated from Order in MA DPU Docket Nos. 22-70, 22-71, and 22-72, Mayflower Wind PPAs, filed on May 25, 2022. LAI added in the expected value of capacity based on the 2017 RGGI Model Rule Price Scenario to facilitate price comparison.
[312] Only the nominal weighted average strike price has been published as of November 13, 2023.

4 DIRECT ECONOMIC IMPACTS AND STRENGTH OF GUARANTEES

The scoring for direct economic impacts is based on the size of guaranteed in-State direct expenditures and job commitments plus qualitative evaluation of each Application's Local Supplier Engagement and Workforce Development Plans. It therefore also includes supply chain investments, and utilization of the New Jersey Wind Port, other wind supply chain infrastructure and manufacturing facilities in New Jersey. The impacts of guaranteed in-State direct expenditures and job commitments on total economic output and employment in New Jersey have been quantified with a regional economic model that calculates the total economic impacts in New Jersey as the sum of direct, indirect, and induced economic impacts.

In addition to the quantitative metrics, each qualitative metric has defined rating levels, discussed below, that correspond to the levels specified in Table 22. Each Project has been assigned a rating for each metric based on a qualitative review by Board Staff, LAI, and NJEDA of each Application's economic effects and associated plans.

Table 22. Rating Levels for Economic Impacts and Strength of Guarantees for Economic Effects

Green	4 points	Excellent
Yellow	2 points	Good
Orange	1 point	Adequate
Red	0 points	Inadequate

4.1 ECONOMIC IMPACTS AND JOB GUARANTEES

The SGD required Applicants to provide values for their economic impacts in terms of New Jersey guaranteed direct expenditures and guaranteed direct jobs during the development, construction, and early (years 1-10) operation phases of the Project. The Application Form included a template for how Applicants should enter their guaranteed minimum in-state direct expenditures and jobs. Expected economic effects not guaranteed are only qualitatively evaluated instead of running those data through IMPLAN as a second, more optimistic case. Consistent with the SGD, near-term economic effects of GDP and jobs are given more weight than later impacts, based on use of the 7% nominal discount rate and the forecasted 2.5% general inflation rate assumption.

Applicants are also required to include a detailed in-State input-output analysis that calculates total economic effects as the sum of direct, indirect, and induced effects. To facilitate objectivity and standardization, LAI has modeled the Applicants' guaranteed in-State direct spending and direct jobs data in a single input-output model to derive consistent estimates of indirect and induced effects of economic benefits across all Applications. In accord with prior practice, LAI used IMPLAN rather than other leading input-output models available to applicants to standardize the comparison. Use of IMPLAN incorporates New Jersey data values available from the licensor.

While N.J.A.C. 14:8-6.5(a)(11)(v) indicates that several economic effects criteria are to be modeled and reported by the Applicant, including income, wages, output, indirect business taxes, and jobs. For economic benefits scoring, only the income or gross domestic product measure and jobs measures have been used. The income or GDP measure represents in-State net value-added. In contrast, output refers to the sales of sectors or industries that would be supplying the Project with materials (such as turbines, steel and concrete for support structures, wire for transmission cables) and services (such as construction and installation services, as well as engineering, legal, finance, and other professional services). Output is a less useful summary metric for in-State economic effects because it includes the value of purchases of goods and services from outside the State in addition to the value-added in-State. Wages and indirect

business taxes are paid out of value-added, so inclusion of either of those two metrics with gross domestic product would double-count those effects in the overall economic benefits measure.

The indirect and induced effects reported by LAI's regional input-output model are reduced with the weighting factors in Table 23 to account for its static equilibrium behavioral assumptions and data limitations to project more realistic and conservative levels of these local economy multiplier effects of direct local expenditures.

Table 23. Economic Impacts Weighting Factors for Guaranteed Expenditures

Economic Effects Category	Source	Weighting Factor
Guaranteed direct economic effects	Submitted by Applicant	100%
Indirect economic effects associated with the guaranteed direct economic effects (expenditures and jobs)	Uniformly calculated by LAI	50%
Induced economic effects associated with the guaranteed direct economic effects (expenditures and jobs)		40%

Total unweighted, weighted, and PV of weighted economic effects by project are summarized in Table 24. The total PV of weighted value-added results are included as benefits in the economic cost-benefit analysis section. The results in Table 15 are positively correlated to the size of each proposed project, as measured by delivered capacity or energy.

Table 24. Total Economic Effects by Project[313]

BC//EC

Project Option	Unweighted Total Value-added (2023 $M)	Weighted Total Value-added (2023 $M)	PV of Weighted Total Value-added (2023 $M)	Guaranteed Direct Employment (FTE-years)	Total Employment (Direct, Indirect & Induced, FTE-Years)
[redacted]					

[313] *BC/[redacted]/EC*

Project Option	Unweighted Total Value-added (2023 $M)	Weighted Total Value-added (2023 $M)	PV of Weighted Total Value-added (2023 $M)	Guaranteed Direct Employment (FTE-years)	Total Employment (Direct, Indirect & Induced, FTE-Years)
[redacted]					

Project Option	Unweighted Total Value-added (2023 $M)	Weighted Total Value-added (2023 $M)	PV of Weighted Total Value-added (2023 $M)	Guaranteed Direct Employment (FTE-years)	Total Employment (Direct, Indirect & Induced, FTE-Years)
[redacted]					

For evaluation purposes, total economic effects for each Project have been calculated on an expected annual delivered energy unitized real cost levelized basis ($/MWh) as the present value sum of the types of effects shown in Table 24 divided by the present value of annual delivered energy.[314] Then the levelized unit economic effects were converted into scoring values.

The rule for conversion of the range of values for guaranteed direct expenditures, calculated as an IMPLAN result of the PV of total value-added in-State on a per MWh energy basis, to final scoring values is shown in Table 25. Guaranteed direct employment reflects the guaranteed minimum total direct in-state jobs in the Economic Impacts tab of the BAFO Application Forms submitted by each Applicant. *BC [redacted] /EC*

Table 25. Guaranteed Direct Expenditures Scoring

Applicant	Rating
Project with the highest level of value-added, measured as the energy unitized ($/MWh) present value of weighted sum of the Direct, Indirect, and Induced effects, where the weights are the effect type factors shown in Table 23	4
Project(s) with lower levels of value-added ($/MWh)	$4 * \frac{Applicant\ Value\ Added}{Highest\ Value\ Added}$

Using the same scoring approach, the rule for conversion of the range of values of guaranteed FTE job-years unitized by expected total OREC delivered energy production (thousand-GWh) to final scoring values is shown in Table 26.

[314] Nominal levelized economic effects were not calculated for three reasons. First, for both the value-added and employment unit measures, real values provide a consistent comparison across projects that have different calendar time profiles. Second, IMPLAN's input-output matrix representation of the local economic system is designed on a real value basis to eliminate the spurious effects of inflation. Third, the denominator of delivered energy can only be discounted with a real discount rate because it's a labor time measure which does not use monetary units.

Table 26. Guaranteed Direct Jobs Scoring

Applicant	Rating
Project with the highest level of guaranteed direct jobs relative to total OREC Production, (FTE-years/million-GWh)	4
Projects with lower level of guaranteed direct jobs relative to total OREC Production (FTE-years/thousand-GWh)	$4 * \frac{Applicant\ Jobs}{Highest\ Jobs}$

A summary of the assigned economic effects scores is presented in Table 27. Additional details are presented in the following sections. The IMPLAN model economic results shown in Table 27 are driven by the Applicants' data on project guaranteed direct expenditures and guaranteed direct jobs for the development, construction (including Tier 1 facility investments), and the first 10 years of operation. The IMPLAN model was run for all the project expected years of operation by extrapolating the applicant data for the first 10 years of operation and included the applicants' expected direct expenditures and jobs for the decommissioning phase. The IMPLAN results shown are total effects, *i.e.*, the sum of direct, indirect, and induced economic effects.[315] The energy measure is expected project delivered energy over its expected operating life.

Table 27. Economic Effects: Value-added and Jobs per Energy Unit and their Ratings[316]

BC//EC

Project Option	PV Levelized Value-added Effects ($/MWh)	Value-added Effects Rating	Levelized Jobs Effects (FTE-years)/ thousand-GWh	Jobs Effects Rating
[redacted]				

[315] The use of the real discount rate PV unit levelized measures gives smaller PV contributions of the operating and decommissioning years after the guarantees from the period beginning at the start of 2024 until the end of the tenth year of operation.

[316] *BC/[redacted]/EC*

Project Option	PV Levelized Value-added Effects ($/MWh)	Value-added Effects Rating	Levelized Jobs Effects (FTE-years)/ thousand-GWh	Jobs Effects Rating
[redacted]				

Project Option	PV Levelized Value-added Effects ($/MWh)	Value-added Effects Rating	Levelized Jobs Effects (FTE-years)/ thousand-GWh	Jobs Effects Rating
[redacted]				

The rank orders of the value-added and Jobs scores by project are shown in the following two charts. While there is a positive correlation between the two economic effects measures, the rank orders for value-added and jobs effects are somewhat different.

Figure 25. Ranked Value-added Effects Scores Related to Guaranteed Direct Expenditures

BC//EC

Figure 26. Ranked Employment Effects Scores Related to Guaranteed Direct Jobs

BC//EC

The detail and quality of data provided by each Applicant in its Bills-of-Goods varied substantially in several respects. LAI selectively adjusted Applicant data using our professional judgment and Applicant-provided source documentation to fill in missing values, improve data quality, and increase consistency between the datasets available from each Applicant to standardize the economic effects analysis. The types of adjustments LAI made to Applicants' Bill-of-Goods data are described in Table 28.

Table 28. Types of Adjustments to Applicants' Bill-of-Goods Data for LAI IMPLAN Analysis
BC//EC

Adjustment	Description	Applicants Adjusted
Fill Missing NAICS Codes[317]	If an Applicant did not follow the instructions to provide an NAICS code for a line item, LAI filled in a suitable NAICS code to enable mapping of the line item to an IMPLAN sector for modeling.	[redacted]
Replace Inaccurate NAICS Codes	If an Applicant used too few unique NAICS codes, LAI replaced certain Applicant-provided NAICS codes with better alternatives based on each line item's (sub)component descriptions to ensure they were mapped to appropriate IMPLAN sectors. For key line items, LAI replaced some Applicant-provided NAICS codes with better alternatives to promote consistency among Applicants and to ensure appropriate mapping.	
Remove Unreasonable Labor Data	If an Applicant provided labor cost and/or labor time values that LAI determined to be unreasonable, LAI removed the labor data for the relevant line item and ran it as total spend only so that IMPLAN's default multipliers could fill in more reasonable values.	
Replace or Fill Labor Data	For key line items, LAI replaced (if the Applicant provided labor data) or filled (if the Applicant did not provide labor data) labor cost values based on our interpretation of the vendor source documents to promote consistency between Applicants.	

The following subsections by Applicant summarize the key issues encountered with each Application and adjustments LAI made in response.

4.1.1 Atlantic Shores

BC/[redacted]/EC

[317] Applicants were required to enter a full six-digit North American Industry Classification System ("NAICS") code for each expenditure and jobs entry in the Application Form. The NAICS is the standard used by Federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy.

[318] *BC [redacted]/EC*

4.1.2 Attentive

BC/ [redacted] /EC

4.1.3 Invenergy

BC/ [redacted] EC

4.2 Strength of Proposed Direct Expenditures and Jobs Guarantees

Applicants are required to provide unconditional guarantees for proposed direct in-State spending and proposed direct in-State jobs.[320] Applicants are also required to propose: (1) the disposition of the remaining 10% of any shortfall in-State spending for the development and construction phases after 90% of the shortfall is applied to a reduction in the OREC price; (2) consequences for shortfalls in guaranteed spending during the operations phase; and (3) workforce development remedies that will apply if the jobs guarantees are not met to support jobs creation in New Jersey equal to or greater than the guaranteed values.

The strength of the proposed guarantees will be evaluated based on the Applicants' proposed consequences if the claimed in-State direct employment and spending benefits do not materialize. The rating levels in this category will be defined as shown in Table 29.

[319] Response to Invenergy CQ1 Question 12.

[320] Responses to Atlantic Shores CQ1 Question 22, Attentive CQ1 Question 14, and Invenergy CQ1 Question 11.

Table 29. Strength of Proposed Guarantees

Green	Applicant proposes robust shortfall cures for both in-State spending and jobs that will result in quantitative and measurable benefits that will make ratepayers and affected stakeholders whole.
Yellow	Applicant proposes reasonable shortfall cures for both in-State spending and jobs that will result in quantitative and measurable benefits that will likely make ratepayers and affected stakeholders whole.
Orange	Applicant proposes a reasonable shortfall cure for in-State spending or jobs that may result in quantitative and measurable benefits that may make ratepayers or affected stakeholders whole, or Applicant proposes a reasonable shortfall cure for either in-State spending or jobs that may result in quantitative and measurable benefits that will make ratepayers or affected stakeholders whole, but the shortfall cure for the other metric is unreasonable or unlikely to make ratepayers or affected stakeholders whole.
Red	Applicant proposes shortfall cures for both in-State spending and jobs that are unlikely to make ratepayers and affected stakeholders whole.

A summary of the assigned scores is presented in Table 30, with more detail presented in the following sections.

Table 30. Strength of Proposed Guarantees Ratings

Applicant	Summary
Atlantic Shores	**Yellow**. Proposed shortfall cures for jobs and spending are reasonable and will likely make ratepayers and affected stakeholders whole.
Attentive	**Yellow**. Proposed shortfall cures for jobs and spending are reasonable and will likely make ratepayers and affected stakeholders whole.
Invenergy	**Orange**. Proposed shortfall cure for jobs is unlikely to make ratepayers or affected stakeholders whole.

4.2.1 Atlantic Shores

*BC/[redacted]

[redacted]EC*

[321] Atlantic Shores Application, p. 223.
[322] Atlantic Shores Application, p. 222.
[323] Atlantic Shores Application, p. 8-33.

Based on the proposed shortfall cures reasonableness and likelihood of making ratepayers and affected stakeholders whole and because the proposed shortfall cures are capped and do not guarantee that ratepayers and affected stakeholders will be made whole, Atlantic Shores is scored Yellow.

4.2.2 Attentive

Based on the conditions set forth in the solicitation guidance document, Attentive has proposed that 90% of any shortfall in guaranteed development and construction phase in-state spend will be cured through a reduction in OREC price over the full OREC term with the remaining 10% going to funding for State-owned offshore wind programs and assets, including, but not limited, to the Wind Institute and/or NJWP, as directed by NJEDA.[324] *BC [redacted] EC*

For shortfalls in guaranteed in-state jobs Attentive has proposed compensation of $85,500/FTE during construction and $61,500/FTE during operations.[325] Attentive Energy proposes to apply a 2.5% escalator to its jobs shortfall remedies for all Project options.[326]

Based on the proposed shortfall cures reasonableness and likelihood of making ratepayers and affected stakeholders whole and because the proposed shortfall cures are capped and do not guarantee that ratepayers and affected stakeholders will be made whole, Attentive is scored Yellow.

4.2.3 Invenergy

Based on the conditions set forth in the solicitation guidance document, Invenergy has proposed that 90% of any shortfall in guaranteed development and construction phase in-state spend will be cured through a reduction in OREC price over the full OREC term with the remaining 10% committed to fund additional programmatic workforce development investments *BC/ [redacted] /EC*

For shortfalls in guaranteed jobs Invenergy has proposed a remedy in which it would provide an additional $2,500 (nominal) in workforce development funding for each FTE-year. Invenergy has proposed that the nominal $2,500 will be escalated at 2.5% per year. Invenergy's proposed remedy reflects its belief that "$2,500 is generally sufficient to provide baseline training for one student to be certified with basic job skills, such as those required for jobs in wind turbine maintenance, the building trades, or advanced manufacturing. The $2,500 amount per trainee will cover typical baseline training costs for a job seeker looking to embark on a career in offshore wind."[328] Invenergy also indicated that its low level of compensation for jobs guarantee shortfall reflects its belief that "since all of LLW's in-state spending

[324] Attentive Application, p. 8-33.
[325] Id.
[326] Attentive BAFO, p. 9.
[327] Invenergy Application, pp. 213-214, 230.
[328] Invenergy BAFO, p. 5.

shortfalls (including any potential labor income expenditures shortfall) are covered by our unconditional in-state spending guarantee, the economic impacts to the state associated with a job creation shortfall, such as loss of labor income, are already compensated."[329]

Invenergy has proposed a reasonable cure for shortfalls regarding in-State spending. Hence, in regard to in-state spending the cure may result in quantitative and measurable benefits that make both ratepayers and affected stakeholders whole. In regard to proposed shortfall cure for jobs, Invenergy' proposed cure is unlikely to make ratepayers or affected stakeholders whole. Therefore, Invenergy is scored Orange.

4.3 Incremental Supply Chain Investments

Applicants have been encouraged to include in-State supply chain commitments in their proposed Projects. Emphasis has been placed on new Tier 1 manufacturing facilities, procurement of components from in-state facilities under development, manufacturing or fabrication of subcomponents, or other local supply chain development opportunities. The rating levels in this category are shown in Table 31.

Table 31. Incremental Supply Chain Investments

Green	Applicant demonstrates a firm commitment to incremental or new investment in a Tier 1 manufacturing facility in New Jersey at the NJWP or another NJ port that does not include contingencies or conditions deemed unreasonable by Board Staff.
Yellow	Applicant commits to support expansion of the local supply chain in the form of expanding an existing (announced or under development) supply chain facility or developing subcomponent manufacturing or fabrication at an in-State facility or Applicant makes a conditional commitment to new Tier 1 investment at the NJWP or another NJ port.
Orange	Applicant commits to utilization of existing in-State supply chain facilities but does not commit to expansion of the local supply chain.
Red	Applicant does not commit to utilization of the in-State supply chain.

A summary of the assigned scores is presented in Table 32, with more detail presented in the following sections.

[329] Invenergy BAFO, p. 5.

Table 32. Incremental Supply Chain Investments Ratings
BC//EC

Applicant	Summary
Atlantic Shores	***BC/[redacted]/EC*: Green.** These Atlantic Shores Projects demonstrate a firm commitment to incremental or new investments in more than one Tier 1 manufacturing facility at the NJWP or another New Jersey port that do not include unreasonable contingencies or conditions.
	***BC/[redacted]/EC*: Yellow.** This Atlantic Shores Project demonstrates a firm commitment to incremental or new investments in more than one Tier 1 manufacturing facility at the NJWP, but one proposed investment includes unreasonable contingencies or conditions.
	***BC/[redacted]/EC*: Green.** This Atlantic Shores Project demonstrates a firm commitment to an incremental or new investment in a Tier 1 manufacturing facility at the NJWP or another New Jersey port that does not include unreasonable contingencies or conditions.
Attentive	***BC/[redacted]/EC*: Red.** These Attentive projects do not commit to utilize the local Tier 1 supply chain.
	***BC/[redacted]/EC*: Green.** These Attentive projects demonstrate a firm commitment to incremental or new investments in at least one Tier 1 manufacturing facility at the NJWP or another New Jersey port that do not include unreasonable contingencies or conditions.
Invenergy	**Green.** Invenergy commits to incremental or new investments in more than one Tier 1 manufacturing facility at the NJWP or another New Jersey port that do not include unreasonable contingencies or conditions.

Table 33 summarizes the Tier 1 investment commitments included in each of the submitted Project options. *BC/ /EC* The values shown in Table 33 represent 33%, 50%, 67% and 100% of the applicable expansion costs, and may shift slightly based on the ratio of each Project's capacity to the total portfolio award capacity/EC*

Table 33. Tier 1 Supply Chain Investment Commitments
BC//EC

Project Option	EEW Phase 3 Investment Commitment	Towers Investment Commitment

[330] Invenergy Application, Attachment 8.2, Annex 2, p. 2. *BC/ EC*
[331] *BC/ /EC*
[332] *BC/ /EC*
[333] *BC/ /EC*
[334] *BC/ /EC*
[335] *BC/ /EC*
[336] *BC/ /EC*
[337] *BC/ /EC*

Project Option	EEW Phase 3 Investment Commitment	Towers Investment Commitment
[redacted]		

[338] *BC/[redacted]/EC*
[339] *BC/[redacted]/EC*
[340] *BC/[redacted]/EC*

4.3.1 Atlantic Shores

*BC [redacted]

[redacted]

- [redacted]
- [redacted]
- [redacted]
- [redacted]

[redacted]

[341] Atlantic Shores Application, pp. 228-230.
[342] Atlantic Shores Application, p. 103.
[343] Atlantic Shores Application, pp. 234-237.
[344] See Atlantic Shores Application, p. 237, Table 8-20 for more detail on the different tower scenarios assumed for each of the Project options.

[redacted]

[redacted] EC*

Based on Atlantic Shores' firm commitment to incremental investment in *BC [redacted] /EC* Atlantic Shores Projects *BC/ [redacted] /EC* are scored Green. Based on the contingencies and conditions on Atlantic Shores' commitment to incremental investment *BC/ [redacted] /EC* Atlantic Shores *BC/ [redacted] /EC* is scored Yellow. Based on Atlantic Shores' firm commitment to incremental investment *BC/ [redacted] /EC* Atlantic Shores *BC/ [redacted] /EC* is scored Green.

4.3.2 Attentive

Depending on the Project option selected, Attentive proposes to provide an anchor order *BC/ [redacted] /EC* to establish a tower facility at the NJWP, and also fund a pro-rata share of EEW's Phase 3 expansion. *BC [redacted] /EC*

BC/ [redacted] /EC Attentive Energy proposes providing an anchor order *BC/ [redacted] /EC* to support the establishment of a new offshore wind tower facility in New Jersey. *BC/ [redacted] EC* The avoidance of direct capital investment by developers in New Jersey necessitates sufficient anchor orders. *BC/ [redacted]

[345] *BC [redacted] EC*
[346] Atlantic Shores Application, pp. 230-233.
[347] Atlantic Shores Application, pp. 238-239.
[348] Atlantic Shores Application, pp. 239-240.
[349] Atlantic Shores BAFO.

[redacted]

[redacted]/EC* Attentive will source its monopiles for the Project from EEW. This funding commitment will support EEW's Phase 3 expansion. Attentive's investment in EEW's Phase 3 expansion will increase the capacity of the facility to supply two offshore wind projects simultaneously while upgrading the capability of the facility to support next generation monopile sizes. *BC/[redacted]/EC* EEW will be the preferred supplier for the fabrication and supply of the project's monopile foundations, *BC/[redacted]

[redacted] EC*

Based on its firm commitment to incremental investment in Tier 1 monopile manufacturing at a New Jersey port and/or new investment in a Tier 1 tower manufacturing facility at the NJWP, Attentive *BC/[redacted]/EC* are scored Green. Based on the absence of any commitment to source from Tier 1 suppliers located in New Jersey, Attentive Projects *BC/[redacted]/EC* are scored Red.

4.3.3 Invenergy

BC/[redacted]/EC Invenergy proposes to fund a *pro rata* share of EEW's Phase 3 expansion *BC/[redacted]/EC* provide an anchor order to *BC/[redacted]/EC* proposed tower facility, and purchase external concrete working platforms, suspended internal platforms, and anode cages from Riggs Distler.

Invenergy proposes to contribute to EEW's Phase 3 expansion to increase both its production capacity and capability via a direct financial commitment and the purchase of monopiles for its project. *BC/[redacted]/EC* The total projected cost of this expansion is $164.1 million. *BC/[redacted]/EC* Invenergy proposes to fund a *pro rata* share of the

[350] Attentive Application, pp. 8-8 to 8-11.
[351] Attentive Application, p. 8-11.

total cost *BC [redacted] /EC*

For towers, Invenergy proposes *BC/ [redacted] /EC* to develop a new tower manufacturing facility in New Jersey. *BC/ [redacted] /EC* Therefore, it is unlikely that any single project's anchor order alone would be sufficient to ensure the establishment of the facility.

Riggs Distler is a steel fabrication company owned by the Centri Group and based out of Cherry Hill, New Jersey. The company is a union-only contractor that has rapidly expanded from its core services of onshore utilities projects into the offshore wind space. Invenergy has proposed to purchase external concrete working platforms, suspended internal platforms, and anode cages from Riggs Distler. These components would be fabricated and assembled at the New Jersey Wind Port *BC [redacted] /EC* It is anticipated that 200 jobs in cold outfitting for concrete platforms and secondary steel work would be supported by this project. *BC/ [redacted] EC*

Based on its firm commitment to incremental investment in monopile manufacturing at a New Jersey port and new investment in a Tier 1 tower manufacturing facility at the NJWP, Invenergy is scored Green.

4.4 Quality of Local Supplier Engagement Plan

The LSEPs submitted by Applicants have been evaluated to assess the quality of and level of detail contained in the approach to engaging with local suppliers, contracting targets, collaboration with stakeholders to support local supplier engagement, and usage of domestically-sourced materials. The rating levels in this category are defined in Table 34.

[352] Invenergy Application, pp. 192-194.
[353] Invenergy Application, pp. 190-192.
[354] Invenergy Application, p. 194.

Table 34. Quality of Local Supplier Engagement Plan

Green	LSEP includes detailed approach to local supplier engagement, including a clear emphasis on SMWVBE engagement, commitments to advertising contracts above smaller amounts than required in the SGD, specific contracting targets and making those targets public, substantive stakeholder engagement, and maximizing usage of domestically sourced materials.
Yellow	Approach to local supplier engagement lacks some detail regarding supplier outreach, contracting targets, stakeholder engagement, usage of domestically sourced materials, and/or does not include a clear emphasis on SMWVBE engagement, commits only to advertising contracts above the amounts required in the SGD, or does not commit to making contracting targets public.
Orange	Approach to local supplier engagement lacks considerable detail regarding supplier outreach, contracting targets, stakeholder engagement, and usage of domestically sourced materials.
Red	LSEP is vague and/or does not contain clear commitments related to local supplier engagement.

A summary of the assigned scores is presented in Table 35, with more detail presented in the following sections.

Table 35. Quality of Local Supplier Plan Ratings
BC//EC

Applicant	Summary
Atlantic Shores	**Green.** *BC [redacted] /EC*
Attentive	**Green.** *BC/ [redacted] /EC*
Invenergy	**Green.** Committed to substantive engagement of New Jersey's SWMVBEs and other stakeholders.

4.4.1 Atlantic Shores

Atlantic Shores has committed to *BC [redacted]

[redacted]

[redacted]

[355] Atlantic Shores Application, p. 226.
[356] Atlantic Shores Application, p. 227.

[redacted]/EC*

Atlantic Shores is scored Green. *BC [redacted]/EC*

4.4.2 Attentive

*BC [redacted]

[redacted]EC*

Attentive Energy is scored Green.

4.4.3 Invenergy

Invenergy has committed to advertise business opportunities to New Jersey firms, including notices to New Jersey companies listed on the New Jersey Offshore Wind Supply Chain Registry for all bids for supplier contracts over $1,000,000. Invenergy has committed to advertise bidding opportunities of all size to New Jersey SMWVBEs for all bids for contracts using NJ SAVI.[360] Invenergy has committed to award at least 15% of total project expenditures to New Jersey companies and utilize SMWVBE and VOB/DVOB firms at rates up to 25% and 5% of identified specific scopes of work related to the development, construction, and operation of the projects where Invenergy believes focused efforts may be applied to achieve significant utilization SMWVBE and VOB/DVOB firms, respectively.[361] In response to CQ3 issued on October 6, 2023, regarding the disclosure of SMWVBE and VOB/DVOB targets in public, Invenergy

[357] Atlantic Shores Interview Transcript, page. 57
[358] Atlantic Shores Application, p. 226.
[359] Attentive Application, p. 8-40
[360] Invenergy Application, p. 200.
[361] Invenergy Application, p. 199.

specified that it "is willing to make its SMWVBE and VOB/DVOB targets public and will seek to comply with any forthcoming guidance from the NJBPU on this matter."[362]

BC/[redacted]/EC Invenergy has committed to maximizing usage of domestically sourced materials through close collaboration with its supply chain partners to find viable solutions to their localization challenges and engagement with various domestic suppliers to develop their capabilities and identify pathways to incorporate their products.[364]

Invenergy is scored Green.

4.5 Quality of Workforce Development Plan

The WDPs submitted by Applicants have been evaluated to assess the quality and level of detail contained in the approach to workforce development, hiring targets, unionized labor, increasing opportunities for New Jersey residents, and stakeholder engagement. The rating levels in this category are defined as shown in Table 36.

Table 36. Quality of Workforce Development Plan

Green	WDP includes detailed approach to workforce development, including commitments to training programs, specific hiring targets and making those targets public, usage of unionized labor, expanding job opportunities for New Jersey residents, and substantive stakeholder engagement.
Yellow	Approach to workforce development lacks some detail with respect to commitments to training programs, specific hiring targets, usage of unionized labor, expanding job opportunities for New Jersey residents, and substantive stakeholder engagement, or does not commit to making hiring targets public.
Orange	Approach to workforce development lacks considerable detail with respect to commitments to training programs, specific hiring targets, usage of unionized labor, expanding job opportunities for New Jersey residents, and substantive stakeholder engagement.
Red	WDP is vague and/or does not contain clear commitments related to workforce development.

A summary of the assigned scores is presented in Table 37, with more detail presented in the following sections.

[362] Response to Invenergy CQ3 Question 23.
[363] Invenergy Application, p. 203-4.
[364] Invenergy Application, p. 189.

Table 37. Quality of Workforce Development Plan Ratings

Applicant	Summary
Atlantic Shores	**Green.** WDP documents a detailed approach to workforce development, including commitments to training programs, specific hiring targets and making those targets public.
Attentive	**Green.** WDP documents a detailed approach to workforce development, including commitments to training programs, specific hiring targets and making those targets public.
Invenergy	**Yellow.** WDP lacks some detail regarding specific hiring targets and stakeholder engagement.

4.5.1 Atlantic Shores

*BC/

[redacted]

/EC*

Atlantic Shores's WDP has documented a detailed approach to workforce development. Atlantic Shores has committed to training programs, specific hiring targets for New Jersey Residents and making those targets public, usage of unionized labor, expanded job opportunities for New Jersey residents, and stakeholder engagement. Atlantic Shores is therefore scored Green.

[365] Atlantic Shores Application, p. 245.
[366] Atlantic Shores Application, p. 245.
[367] Atlantic Shores Application, p. 255.
[368] Atlantic Shores Application, p. 252.
[369] Atlantic Shores Interview Transcript, p. 57
[370] Atlantic Shores Application, p. 252.
[371] Atlantic Shores Application, p. 252.

4.5.2 Attentive

Attentive's WDP includes $8.4 million in funding for NJMEP *BC [redacted] EC* Attentive has also committed to partnering with the NJ Community College Consortium ("NJCCC") *BC/[redacted]/EC* Attentive will also fund the Offshore Wind Reentry Workforce Initiative, a partnership between Attentive Energy and the Returning Citizens Support Group, *BC/[redacted]

[redacted]

[redacted] EC*

Attentive's WDP takes a detailed approach to workforce development, including commitments to training programs, specific hiring targets and making those targets public, usage of unionized labor, expanding job opportunities for New Jersey residents, and substantive stakeholder engagement. Attentive is therefore scored Green.

4.5.3 Invenergy

Invenergy's WDP includes $405,500 of funding for Newark School of Data Science and Information Technology, $1.5 million for Mid-Atlantic States Career & Education Center program to provide instruction to high school students about career opportunities in offshore wind, up to $400,000 for offshore wind training programs at Rowan University, $950,000 of targeted funding to New Jersey educational institutions.[377] Invenergy will also provide $500,000 of support for NJMEP's efforts to train veterans of the armed forces to prepare them for careers in the offshore wind sector.[378]

*BC [redacted]

[372] Attentive Application, p. 8-38.
[373] Attentive Application, p. 9-16.
[374] Attentive Application, p. 9-14.
[375] Attentive Application, p. 8-43.
[376] Attentive Interview Transcript, pp. 57-58.
[377] Invenergy Application, pp. 212-214.
[378] Id.

[redacted]/EC*

Invenergy's WDP lacks detail regarding specific hiring targets and stakeholder engagement and is scored Yellow.

4.6 Economic Benefits to OBCs

Applicants are required to describe the economic benefits to OBCs, as defined in the Environmental Justice Law, N.J.S.A. 13:1D-157, including establishment of education and training opportunities for members of OBCs, and the hiring of residents from these communities. The Workforce Development Plan requirements include:

- Identification of potential job opportunities for residents of OBCs and any associated diversity and inclusion initiatives;
- Specific targets for hiring residents of OBCs, and whether the Applicant will commit to making those targets public; and
- A description of the Applicant's plan to use unionized labor, including participation in community benefit agreements that include commitments to local hiring and skills training for residents of OBCs.

Applications that provide a comprehensive and detailed plan to provide economic benefits to OBCs and residents of OBCs have been scored most favorably. The rating levels in this category are defined as shown in Table 38.

Table 38. Economic Benefits to OBCs

Green	Applicant identifies potential job opportunities for residents of OBCs, commits to substantive targets for hiring New Jersey OBC residents, makes those commitments public, and participates in community benefit agreements.
Yellow	Applicant makes substantive commitments in some but not all areas.
Orange	Applicant makes minimal commitments in some but not all areas.
Red	Applicant does not make commitments in any areas.

A summary of the assigned scores is presented in Table 39, with more detail presented in the following sections.

Table 39. Economic Benefits to OBCs Ratings

Applicant	Summary
Atlantic Shores	**Yellow.** The hiring target levels are modest and community benefits are limited in scope.
Attentive	**Green.** Committed to identifying potential job opportunities for residents of OBCs, substantive targets for hiring New Jersey OBC residents, and participating in substantive community benefit agreements.
Invenergy	**Green.** Committed to identifying potential job opportunities for residents of OBCs, substantive targets for hiring New Jersey OBC residents, and participates in substantive community benefit agreements.

[379] Invenergy Application, pp. 210-1.

4.6.1 Atlantic Shores

*BC/ [redacted]

[redacted] EC*

Based on the modest level of hiring targets and limited scope of community benefits, Atlantic Shores is scored Yellow.

4.6.2 Attentive

Attentive Energy is targeting *BC/ [redacted] EC*

BC/ [redacted] /EC Attentive has committed to providing ongoing funding for future community benefits programs through its Lasting Opportunity fund. Attentive would commit $14.1 million in funding *BC/ [redacted] EC* Funding commitments include $4 million in funding for NJ SHARES to aid New Jersey residents who have experienced a temporary financial crisis and are facing housing emergencies. Attentive has committed $3 million for a grant challenge that aims to provide funding to community-based organizations interested in improving quality of life and addressing environmental injustices in OBCs.[386]

Attentive is scored Green because it has committed to identifying potential job opportunities for residents of OBCs, substantive targets for hiring New Jersey OBC residents, and participating in substantive community benefit agreements.

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[380] Atlantic Shores Interview Transcript, p. 57.
[381] Atlantic Shores Application, pp. 289-290.
[382] Atlantic Shores Application, pp. 213-4, 255-6.
[383] Attentive Application, p. 8-50.
[384] Attentive Interview Transcript, pp. 58-59.
[385] Attentive Application, p. ES-10.
[386] Attentive Application, pp. 9-14, 9-18.

4.6.3 Invenergy

*BC [redacted]

[redacted]/EC* Invenergy has proposed a community benefits package, including $94 million in funding over 20 years to reduce the project's impact on the electricity bill of 200,000 low-income, Energy-Burdened households in New Jersey.[388] Invenergy's community benefits also include a $5 million investment in a charging hub project in Northern New Jersey, $500,000 for the Waterfront Alliance to institute a Maritime Activation Plan competitive grant program, $350,000 in funding for the Children's Environmental Literacy Foundation, $150,000 Gotham Whale's work with citizen scientists to record and study marine mammals, $250,000 to support the Boys & Girls Clubs of Monmouth County to provide its STEM programs for young people in OBCs, $500,000 to fund a Liberty Science Center exhibit related to offshore wind and marine science, and $250,000 for Neighborhoods for a Sustainable Future to expand into North Jersey.[389] Invenergy will also provide $1 million in for a Tribal Support Fund, to support the participation of members of Native American Tribes and Tribal Nations in ongoing environmental, supply chain, and workforce initiatives related to the offshore wind industry and provide $1 million for the creation of a program to provide grants to students in need of financial assistance (with a focus on OBCs) to attend New Jersey colleges and universities.[390]

Invenergy is scored Green because it has committed to identifying potential job opportunities for residents of OBCs, substantive targets for hiring New Jersey OBC residents, and participates in substantive community benefit agreements.

[387] Invenergy Application, p. 199.
[388] Invenergy Application, p. 239.
[389] Invenergy Application, pp. 216-217.
[390] Invenergy Application, pp. 238-240.

5 ENVIRONMENTAL AND FISHERIES IMPACTS

The scoring for environmental and fisheries impacts is based on a qualitative review by Board Staff, LAI, and NJDEP of each Application's protection and permitting plans, quality of data management and infrastructure monitoring plans, and approach to addressing embodied carbon. Each metric has defined rating levels that correspond to those specified in Table 40. Each Project has been assigned a rating for each metric.

Table 40. Rating Levels for Environmental and Fisheries Impacts Metrics

Green	4 points	Excellent
Yellow	2 points	Good
Orange	1 point	Adequate
Red	0 points	Inadequate

5.1 FEASIBILITY AND STRENGTH OF ENVIRONMENTAL PROTECTION PLAN

The EPPs submitted by Applicants were evaluated to assess the level of detail contained in each Applicant's identification of potential environmental impacts and the extent and feasibility of proposed mitigation associated with Project development and construction, including the installation of the turbine foundations, offshore substations, and the array and export cables. Identification and description of anticipated stressors, receptors, effects, and mitigation during construction, operations, and decommissioning of the proposed Project were evaluated. The rating levels in this category have been defined as shown in Table 41.

Table 41. Feasibility and Strength of Environmental Protection Plan

Green	Characterization of biological resources and receptors includes detailed descriptions of species, geographic range, general habitat, temporal changes, listed species, mortality, and relies on up-to-date source data. Applicant incorporates most up-to-date scientific research and other applicable studies. Discussion of effects includes specific direct physical impacts, indirect physical impacts, behavioral impacts, and cumulative impacts to biological receptors, water quality, and sediments. Applicant provides detailed description of field studies completed, underway, or planned.
Yellow	Characterization of biological receptors lacks some detail, is not site-specific, or relies primarily or in part on desk-top studies rather than completed field studies. Discussion of impacts lacks some detail, does not consider all types of impacts or impacts on all potentially affected biological receptors, and/or relies primarily on desk-top studies. Applicant identifies field studies completed, underway, or planned, but field study plan is generic or lacks some site-specific detail. Applicant incorporates up-to-date scientific research, but not all relevant studies are referenced.
Orange	Characterization of biological receptors lacks considerable detail and/or is based entirely on desk-top studies, characterization of impacts to biological receptors is incomplete, lacks detail, and/or relies on out-of-date scientific studies. Applicant identifies proposed field studies but field study plan lacks detail or is generic and not site-specific.
Red	EPP fails to characterize biological receptors, is not based on up-to-date scientific studies, and proposes minimal additional field studies.

A summary of the assigned scores is presented in Table 42, with more detail presented in the following sections.

Table 42. Feasibility and Strength of Environmental Protection Plan Ratings

Applicant	Summary
Atlantic Shores	**Green.** The EPP provides a detailed characterization of the environmental resources and habitats. The EPP includes sufficiently detailed descriptions of potential impacts to applicable categories of resources, based on site-specific data and available published studies.
Attentive	**Green.** The EPP relies on initial field surveys, and extensive desk top studies. The EPP provides a detailed characterization of environmental resources, habitats, and potential impacts during different stages of the project. Relevant and up to date databases and references are cited.
Invenergy	**Orange.** The EPP addresses each category of environmental resource and habitat, but the descriptions lack detail. Descriptions rely on desk top studies but do not incorporate current scientific studies.

5.1.1 Atlantic Shores

Atlantic Shores' site characterization, impact assessment, and assessment of mitigation measures is at a relatively advanced stage. Atlantic Shores has already undertaken five years of data collection, and has relied on this information to provide a detailed and site-specific characterization of the project area, *BC/ [redacted] /EC* The EPP identifies the specific field work and data collection to date, *BC/ [redacted] /EC* Additional field surveys and monitoring programs that will be undertaken pre- and post-construction are described. For each resource type, the EPP provides detailed and comprehensive discussion of potential impacts, resource protection, and impact mitigation strategies.

Based on the maturity, completeness and responsiveness of the EPP, Atlantic Shores is scored Green.

5.1.2 Attentive

Attentive's investigation of the Project site and characterization of biological resources and receptors is largely based on a desktop review of data from publicly available sources, including BOEM's environmental assessment of the wind energy areas of the New York Bight and DEP's Ecological Baseline Studies from 2008 to 2009. *BC/ [redacted] EC* Attentive's Baseline Environmental Characterization provides an extensive and detailed description of the ecological resources and habitats across the project site, and relies on up to date scientific research. The EPP provides a description of potential environmental impacts to fish, fisheries, benthic resources, marine mammals and sea turtles, birds and bats, and submerged aquatic vegetation. For each resource type, the EPP provides detailed and comprehensive discussion of impact mitigation strategies.

Attentive has proposed to voluntarily fund several environmental and fisheries programs, totaling $15 million in investment, above and beyond the required $15 million to RMI. Programs include partnerships with universities and science organizations for research and conservation programs that align with New

Jersey's research priorities. These supplemental programs would focus on marine mammals, surfclam, Red Knots, Roseate Tern, and other habitat and socioeconomic impacts.

Based on the thoughtfulness, level of detail, and responsiveness of the EPP, Attentive is scored Green.

5.1.3 Invenergy

Invenergy's project is in the early stages of development, therefore baseline characterization of the project site and biological receptors is based on publicly available data from desktop analysis. The impacts assessment is generalized and has limited references to recent scientific studies or data. Invenergy acknowledges that it will further assess impacts to biological resources and receptors as part of its COP development and project surveys. The EPP provides a relatively high level and generalized description of the avian and bat species, aquatic invertebrates, seagrass beds, and marine mammals and sea turtles. The description of potential impacts lacks detail. Invenergy has committed to funding $7.5 million for a "Strategic Environmental Initiatives Fund" for environmental initiatives and scientific research, but specific program objectives are not clarified. *BC/[redacted]EC* While these initiatives are still in early planning stages, they are well-intentioned and have sound potential.

Based on the project being in the early stages of development and thus lacking site-specific information, Invenergy is scored Orange.

5.2 Consistency with Minimum Environmental Mitigation Requirements

Applicants are expected to implement the required environmental mitigation measures described in the EPP. Applications were evaluated to verify that Applicants agree to implement each of the mitigation measures that are specifically required unless the Applicant provides a credible explanation why a specific required measure is not feasible or applicable for the project. Applicants that propose to implement mitigation measures that are recommended (but not required) by a jurisdictional federal or state agency or a regional science entity have been viewed more favorably.

Table 43. Consistency with Minimum Environmental Mitigation Requirements

Green	Applicant confirms or acknowledges that all minimum environmental mitigation requirements will be adopted or provides a reasonable explanation why one or more requirement is not feasible or relevant. Applicant additionally proposes to implement several recommended but not required mitigation measures that have benefits across the multiple biological receptors or across a broad footprint of the Project, and/or innovative technologies to avoid, minimize, or mitigate impacts to environmental resources.
Yellow	Applicant confirms or acknowledges that all minimum environmental mitigation requirements will be adopted or provides a reasonable explanation why one or more requirement is not feasible or relevant. Applicant additionally proposes to implement one or more environmental mitigation measures that are recommended but not required, and/or proposes innovative technologies to avoid, minimize, or mitigate impacts, but these measures or technologies apply to a limited Project footprint or apply to receptors or habitats that are not critical to New Jersey.
Orange	Applicant confirms or acknowledges that all minimum environmental mitigation requirements will be adopted or provides a reasonable explanation why one or more requirement is not feasible or relevant.
Red	Applicant does not confirm or acknowledge that all minimum environmental mitigation requirements will be adopted (would not pass gating/completeness step), or proposes mitigation measures that do not appear to be feasible.

A summary of the assigned scores is presented in Table 44, with more detail presented in the following sections.

Table 44. Consistency with Minimum Environmental Mitigation Requirements Ratings

Applicant	Summary
Atlantic Shores	**Green.** All the required minimum environmental mitigation requirements are included in the EPP, as well as all the recommended mitigation approaches, including some innovative technologies to monitor protected species.
Attentive	**Green.** All the required minimum environmental mitigation requirements are included in the EPP, as well as all the recommended mitigation approaches. The recommended mitigation measures across the footprint are informed by up-to-date scientific research.
Invenergy	**Yellow.** All the required minimum mitigation measures are included in the EPP, and some of the recommended measures. Limited detail is provided in the descriptions of how these measures will be deployed.

5.2.1 Atlantic Shores

Atlantic Shores provides a detailed discussion of how it will meet each of the required minimum environmental mitigation requirements as well as each of the recommended mitigation strategies. The proposed mitigation measures for avian and bat species, marine mammals and sea turtles, benthic habitats, and sensitive habitats are detailed and thoughtfully developed. Atlantic Shores has been conducting marine observations since 2019 and has developed innovative marine mammal and sea turtle mitigation and monitoring procedures, *BC [redacted]

[redacted]/EC*

Atlantic Shores has addressed each of the required and recommended mitigation measures and provided specific technologies to be deployed, including some innovative technologies. Based on the completeness and detail, Atlantic Shores is scored Green.

5.2.2 Attentive

Attentive confirms that it will meet each of the requirements and recommendations in SGD Attachment 6 with respect to protection of sensitive seafloor habitats, turbine foundation scour, lighting controls, avian and bat resources, noise and acoustic impacts, marine mammals and sea turtles, and visual impacts. Attentive commits *BC [redacted]/EC* For each resource type (benthic and fish species, marine mammals and sea turtles, birds and bats, and tidal wetlands and submerged aquatic vegetation), Attentive provides a detailed and comprehensive table of potential impacts, the proposed mitigation measures, and the relevant project phase (survey, construction, operation, decommissioning). The mitigation measures reference published guidance and best practices and include discussion of how certain technologies will be deployed.

Attentive has addressed each of the required and recommended mitigation measures and provided detailed explanation of their deployment. Based on the completeness and level of detail, Attentive is scored Green.

5.2.3 Invenergy

Invenergy provides a table that lists each of the required and most of the recommended mitigation measures specified in SGD Attachment 6 that it intends to implement. For each resource type (birds and bats, finfish and shellfish, benthic invertebrates, seagrass, marine mammals and sea turtles, and artificial reefs) Invenergy provides a relatively brief discussion of potential impacts and how each of the applicable mitigation measures will be implemented. The proposed mitigation measures will be consistent with BOEM guidance, but Invenergy's proposal does not mention any innovative technologies or reference scientific studies or research partners to inform deployment of mitigation strategies.

Based on the inclusion of all required mitigation measures and most of the recommended mitigation measures, Invenergy is scored Yellow.

5.3 Feasibility and Strength of Fisheries Protection Plan

Applicants are required to provide a fisheries protection plan ("FPP") that demonstrates a complete understanding of the potential impact of the Project on commercial and recreational fishing, and provides a feasible plan to mitigate such impacts. The rating levels in this category are defined as shown in Table 45.

Table 45. Feasibility and Strength of Fisheries Protection Plan

Green	The FPP is detailed and comprehensive, demonstrates a superior understanding of fisheries resources and potential adverse impacts to commercial and recreational fishing specific to the proposed location of the proposed Project based on recent and appropriate site-specific data and robust stakeholder engagement. Applicant has utilized current, site-specific data on fisheries resources to avoid or minimize potential impacts to these resources in the Project design.
Yellow	The FPP demonstrates a reasonable understanding of fisheries resources and potential adverse impacts to commercial and recreational fishing based on regional data and engagement with stakeholders. Project design avoids or minimizes some impacts to fisheries resources.
Orange	The FPP demonstrates a fair understanding of fisheries resources and potential adverse impacts to commercial and recreational fishing based on regional data and/or limited stakeholder input. Project design does not significantly avoid or minimize impacts to fisheries resources.
Red	The FPP demonstrates an incomplete understanding of fisheries resources and potential adverse impacts to commercial and recreational fishing. The Applicant has not significantly engaged stakeholders to understand potential adverse impacts or how impacts to fisheries can be avoided or minimized.

Each Applicant relied upon different data sources and different timeframes to illustrate the density and commercial value of fishing within their respective lease area. To evaluate the projects on a comparable basis, consistent measures of fishing activity are needed. Table 46 and Table 47 were developed by NJDEP Staff from publicly available NOAA statistics on commercial and recreational fishing, respectively. The NOAA data indicate that the mean annual revenue from commercial fishing activity was markedly lower for the Atlantic Shores lease area compared to the other Applicants. However, as further discussed in Section 5.3.1, this appears to be due to the value of the catch rather than the productivity or overall fishing density. When the total landings are normalized on a per acre basis, there does not appear to be any clear difference among the lease areas in terms of overall impact to fisheries. Therefore, fishing activity is not considered a useful differentiator for the purpose of scoring the Applicants' FPPs.

Table 46. Commercial Fishing Activity, 2008-2021[391]

	Mean Annual Revenue, All States	Mean Annual Revenue/Acre All States	14-Yr Total Landings All States	14-Yr Total Landings NJ only	14-Yr Total Landings/Acre All States	14-Yr Total Landings/Acre NJ only
Atlantic Shores (1 and 2) OCS-A 0499	$796,929	$7.80	13,423,000	11,111,000	131	109
Attentive OCS-A 0538	$4,864,643	$57.68	15,355,000	8,120,000	182	96
Invenergy OCS-A 0542	$3,444,357	$41.02	12,048,000	8,650,000	143	103

[391] NOAA Fishing Footprints, at: https://www.fisheries.noaa.gov/resource/data/socioeconomic-impacts-atlantic-offshore-wind-development.

Table 47. Recreational Fishing Activity, *2008-2021*[392]

	Recreational Fishing, fish count over 14 years	Total No. of Angler Trips over 14 years
Atlantic Shores (1 and 2) OCS-A 0499	7,425	2,522
Attentive OCS-A 0538	10,684	1,502
Invenergy OCS-A 0542	1,105	172

A summary of the assigned scores is presented in Table 48, with more detail presented in the following sections.

Table 48. Feasibility and Strength of Fisheries Protection Plan Ratings

Applicant	Summary
Atlantic Shores	**Green.** Atlantic Shores has built upon its 4.5 years of project development for Project 1 to acquire a superior understanding of fisheries resources and adverse impacts to commercial and recreational fishing across the lease area.
Attentive	**Green.** The FPP is based on extensive outreach to the fishing community and proposes an innovative approach to mitigating adverse impacts to navigational safety and competing use by fishing interests.
Invenergy	**Yellow.** The FPP is based on a reasonable understanding of fisheries resources and potential impacts, and proposes appropriate mitigation strategies.

5.3.1 Atlantic Shores

BC/[redacted]EC

NOAA data in Table 46 indicate that the Atlantic Shores lease area has produced the lowest mean annual commercial fishing revenue for years 2008 through 2021 among all the Applicants' leases, on a mean

[392] NOAA Fishing Footprints, at: https://www.fisheries.noaa.gov/resource/data/socioeconomic-impacts-atlantic-offshore-wind-development.

annual basis and normalized on a per acre basis. However, total landings (in total pounds or in lbs per acre) are similar to landings in the other Applicants' lease areas. *BC/ EC* Table 47 indicates the Atlantic Shores lease area has had the most recreational activity in terms of angler trips, and second highest in terms of fish count, likely because it is the project that is closest to and most accessible from shore.

Based on the completeness and level of detail of the FPP and the robust stakeholder engagement, Atlantic Shores is scored Green.

5.3.2 Attentive

Attentive has proposed a turbine grid layout based on *BC/ /EC* Attentive has a robust stakeholder engagement plan, involving a Fisheries Liaison Officer, commercial and recreational Fisheries Representatives, and Onboard Fisheries Liaison Officers. Attentive has worked with these personnel to coordinate safe survey operations and facilitate communications to avoid fishing gear conflicts. Attentive also articulates a "no net loss of revenue" goal *BC/ /EC*

NOAA data indicate that the total landings for commercial fishing from the Attentive lease area is comparable in magnitude to the other lease areas, and commercial fishing revenues are similar to the Invenergy lease area. The lease area also contains a high degree of recreational fishing activity measured in terms of fish count and angler trips. *BC/ EC*

The most economically significant fishing activities in the project area are sea scallop and surfclam dredging, as well as mackerel, squid, and butterfish. Recreational and for-hire vessels transit the lease area for a variety of species. *BC /EC*

Attentive' FPP provides a detailed description of fishing activities and fisheries resources across the project site, including detailed maps delineating the Essential Fish Habitat for species of commercial and recreational significance. The potential navigational safety and conflicting use concerns are covered in detail. The FPP also discusses in detail the potential socioeconomic impacts to the fishing industry, including supporting shoreside businesses and ports.

Based on the completeness and level of detail of the FPP and the robust stakeholder engagement, Attentive is scored Green.

5.3.3 Invenergy

BC [redacted] /EC

Invenergy has engaged a fisheries liaison officer and is actively seeking to expand the fisheries communications team. Given the early stage of project development, engagement with commercial and recreational fishing stakeholders appears to have been limited to date. However, Invenergy's plan to identify stakeholders and implement a communications plan is thoughtful and detailed.

NOAA data from 2008 through 2021 indicate that commercial fishing activity in Invenergy's lease area is comparable to the other lease areas. Recreational fishing activity is the lowest of all the Applicants in terms of fish count and angler trips. Scallop and surfclam/ocean quahog dredging predominate the landings. Mackerel, squid, and butterfish scup are also fished. Invenergy identified Essential Fish Habitat areas and the ports that derive revenue from the lease area. The FPP identifies the potential impacts on fisheries during each stage of project development and corresponding mitigation strategies.

Invenergy pledges up to $2 million to establish a Fisheries Accelerator Fund to support research and financial assistance to fisheries community to upgrade equipment and technology.

Based on the completeness and level of detail, and the reasonableness of its plans to expand stakeholder engagement, Invenergy is scored Yellow.

5.4 Consistency with Minimum Fisheries Mitigation Requirements

Applicants are expected to implement the required fisheries mitigation measures described in the FPP. Applications were evaluated to verify that Applicants agree to implement each of the mitigation measures that are specifically required unless the Applicant provides a credible explanation why a specific required measure is not feasible or applicable for the project. Applicants that propose to implement other recommended, but not required, mitigation measures will be viewed more favorably. The rating levels in this category are defined as shown in Table 49.

Table 49. Consistency with Minimum Fisheries Mitigation Requirements

Green	Applicant confirms or acknowledges that all minimum fisheries mitigation requirements will be adopted or provides a reasonable explanation why one or more requirement is not feasible or relevant. Applicant additionally proposes to implement several recommended mitigation measures, and/or innovative technologies to avoid, minimize, or mitigate impacts to fisheries resources that have robust benefits to commercial and recreational fisheries. FPP describes an approach to continued commercial and recreational stakeholder engagement and incorporation of that feedback into the adaptive mitigation plans.
Yellow	Applicant confirms or acknowledges that all minimum fisheries mitigation requirements will be adopted or provides a reasonable explanation why one or more requirement is not feasible or relevant. Applicant additionally proposes to implement fisheries mitigation measures that are recommended, but not required, and which provide some benefits to commercial and/or recreational fisheries. FPP describes approach to continued commercial and recreational stakeholder engagement, but the approach has some limitations, and incorporation of that feedback into the adaptive mitigation plan is limited.
Orange	Applicant confirms or acknowledges that all minimum fisheries mitigation requirements will be adopted or provides a reasonable explanation why one or more requirements are not feasible or relevant. FPP describes an approach to continued stakeholder engagement but is insufficient because it is not specific about which stakeholders will be involved, and/or does not explain how stakeholder feedback will be incorporated into the adaptive mitigation plan.
Red	Applicant does not confirm or acknowledge that all minimum fisheries mitigation requirements will be adopted. Applicant proposes mitigation that would only be minimally effective, infeasible, or may be impractical to implement. The mitigation plan does not allow for ongoing stakeholder engagement and/or does not allow for stakeholder feedback to be incorporated into the adaptive mitigation plan. A red score will not pass gating/completeness step without further clarifying questions.

A summary of the assigned scores is presented in Table 50, with more detail presented in the following sections.

Table 50. Consistency with Minimum Fisheries Mitigation Requirements Ratings

Applicant	Summary
Atlantic Shores	**Green.** Atlantic Shores commits to meeting all required and recommended mitigation measures, including detailed plans for navigation safety and a fisheries compensation program.
Attentive	**Green.** Attentive commits to meeting all required and recommended mitigation measures, including detailed plans for navigation safety and a fisheries compensation program.
Invenergy	**Yellow.** Invenergy commits to meeting required and recommended mitigation measures, including a general plan for navigation safety and fisheries compensation.

5.4.1 Atlantic Shores

Atlantic Shores confirms that it will meet all of the minimum fisheries mitigation requirements, and will also incorporate all the recommended measures. Atlantic Shores has assembled Fisheries Communication Team and prepared a detailed Fisheries Communications Plan. The Fisheries Communication Team includes a Fisheries Liaison Officer, Fisheries Support Staff, and Fisheries Industries Representatives

("FIRs"). The FIRs will be nominated to represent different fisheries within the project footprint, but these individuals have not been identified.

BC/[redacted]/EC

Based on the inclusion of all required and recommended fisheries mitigation measures informed by a robust stakeholder engagement plan, Atlantic Shores is scored Green.

5.4.2 Attentive

Attachment A to Attentive's Fisheries Protection Plan provides a table that references each of the required and recommended fisheries mitigation requirements. Attentive confirms that it will meet each of the requirements and recommendations in SGD Attachment 9, and provides concrete examples of how they will be implemented.

AIS will be installed on turbines "per BOEM guidelines" and Attentive will incorporate U.S. Coast Guard and industry recommended navigational safety measures. *BC [redacted] EC* Attentive commits to following BOEM's Guidelines for Mitigating Impacts to Commercial and Recreational Fisheries, and provides a gear claim application form on its website.

Based on the inclusion of all required and recommended fisheries mitigation measures informed by a robust stakeholder engagement plan, Attentive is scored Green.

5.4.3 Invenergy

Invenergy considers a broad range of potential impacts to fisheries and proposes mitigation strategies consistent with the SGD requirements. *BC/[redacted]/EC*

Invenergy supports the ongoing effort to establish a regional compensation fund and participates in discussions within the American Clean Power Fisheries Subcommittee regarding the creation and implementation of this fund. Invenergy has developed a method for processing claims for lost or damaged fishing gear, consistent with BOEM's Guidelines.

Invenergy has employed regional fishermen to act as scouts in advance of survey vessels to identify potential gear and fishing conflicts.

Based on the inclusion of all of the required and some of the recommended fisheries mitigation measures, Invenergy is scored Yellow.

5.5 Offshore Wind Infrastructure Monitoring Plan

Applicants are required to develop a plan for the use of offshore wind infrastructure including turbine arrays, foundations, and substations as environmental and ecological monitoring platforms that can contribute to relevant regional monitoring, observing, and research efforts. Applications that provide a comprehensive, detailed, and scientifically sound plan, and include multiple types of sensors to collect a range of useful data have been scored most favorably.[393] The rating levels in this category are defined as shown in Table 51.

Table 51. Completeness and Strength of the Offshore Wind Infrastructure Monitoring Plan

Green	The Offshore Wind Infrastructure Monitoring Plan is detailed, comprehensive, and identifies multiple sensors, platforms, and data systems that will be installed across the entire wind farm array. The Plan explicitly describes how it will contribute to relevant regional monitoring, observing, and research efforts.
Yellow	The Offshore Wind Infrastructure Monitoring Plan is detailed and identifies sensors, platforms, and data systems that will be installed across the wind farm array. The Plan lacks some detail on how it will contribute to relevant regional monitoring, observing, and research efforts.
Orange	The Offshore Wind Infrastructure Monitoring Plan provides reasonable detail regarding sensors, platforms, and data systems that will be installed across the wind farm array. There is limited detail about how the plan will contribute to relevant regional monitoring, observing, and research efforts.
Red	The Offshore Wind Infrastructure Monitoring Plan provides minimal detail and generic information about the sensors, platforms, and data systems that will be installed across the entire wind farm array. The Plan lacks detail on how it will contribute to relevant regional monitoring, observing, and research efforts.

A summary of the assigned scores is presented in Table 52, with more detail presented in the following sections.

Table 52. Completeness and Strength of Offshore Wind Infrastructure Monitoring Plan Ratings

Applicant	Summary
Atlantic Shores	**Green.** Plan is detailed, comprehensive, identifies specific systems and infrastructure for deployment, and aligns with regional research efforts.
Attentive	**Yellow.** Plan identifies potential technologies and deployments and aligns with regional research efforts.
Invenergy	**Yellow.** Plan identifies potential technologies and deployments and aligns with regional research efforts.

[393] The cost of implementing the proposed plan, while not required to be submitted per the Solicitation Guidance Document, may be addressed through CQs and considered as part of the evaluation.

5.5.1 Atlantic Shores

Atlantic Shores' Infrastructure monitoring is thoughtfully developed and built on previous work and lessons learned during development of Atlantic Shores Project 1. Research objectives are informed by ongoing communication with regional science entities, and state and federal agencies. *BC/The Offshore Wind Monitoring Plan notes that Atlantic Shores has already deployed several instruments in its two lease areas, including two Floating LIDAR systems installed in 2019 to collect oceanographic and weather data, and attached specialized receivers and instruments to track tagged sea turtles, migratory fish species, and migratory bird species (using Motus detectors). Two additional LIDAR systems were deployed in 2022 and 2023 for additional oceanographic and weather data. Atlantic Shores has been investigating the feasibility of engaging the fishing community to install fishing vessel-based instruments to acquire bathymetry data./EC*

Atlantic Shores presents a detailed plan for integrating sensors and other types of monitoring equipment on buoys, offshore substations, and select turbine locations. *BC [redacted] EC* The Plan clearly describes how the data will be shared to advance regional research efforts by the scientific community.

Given the maturity and level of detail provided in the plan, Atlantic Shores is scored Green.

5.5.2 Attentive

Attentive provides a preliminary plan that identifies opportunities to use turbine arrays, foundations, and offshore substations as monitoring platforms. *BC/[redacted]/EC* The Plan demonstrates a good understanding of RMI's research priorities, and Attentive has also engaged with regional science entities. Attentive is actively exploring the types of monitoring systems that will contribute data to regional monitoring of target taxa and habitats, *BC/[redacted]/EC*

Based on the preliminary but thoughtful development of the plan, Attentive is scored Yellow.

5.5.3 Invenergy

Invenergy provides a preliminary plan that includes a fairly comprehensive list of potential technologies and types of monitoring data that are under consideration. For each project component *BC/[redacted] EC* Invenergy identifies a set of potential monitoring parameters that could be collected from these different platforms, but does not provide much specificity of what instrumentation would be deployed on what infrastructure

components. The plan demonstrates a good understanding of the regional research priorities. It provides a thoughtful framework for how the infrastructure monitoring systems will contribute to various research initiatives *BC [redacted] /EC* Invenergy acknowledges that the plan is preliminary, and will be refined based on further engagement with state and federal agencies, academic institutions, and regional science entities.

Based on the preliminary but thoughtful development of the plan, Invenergy is scored Yellow.

5.6 Data Management and Availability Plan

Applicants are required to develop and submit a Data Management and Availability Plan that conforms to the requirements in Attachment 7 of the SGD. Data Management and Availability Plans that are more mature and provide more detail and more data transparency have been viewed more favorably. The rating levels in this category are defined as shown in Table 53.

Table 53. Completeness and Transparency in Data Management and Availability Plan

Green	The Data Management Plan is detailed and reflects a high degree of understanding of data collection best practices and QA/QC standards. Applicant provides a comprehensive catalogue of data to be collected which allows for updates to the plan as additional field information becomes available. The Plan explicitly describes the frequency and timeline for each dataset's collection. Applicant commits to share all non-proprietary data with NJBPU, NJDEP, and other regional science entities no later than when COP is approved by BOEM.
Yellow	The Data Management Plan is detailed and reflects a reasonable degree of understanding of data collection best practices and QA/QC standards. Applicant provides a catalogue of data to be collected but may not explain how the plan will be updated as additional data become available. The Plan lacks some detail on the frequency and timeline for each dataset's collection. Applicant commits to share all non-proprietary data with NJBPU, NJDEP, and other regional science entities when the COP is approved by BOEM.
Orange	The Data Management Plan includes a limited understanding of data collection best practices and QA/QC standards. Applicant's catalogue of data to be collected lacks information on some data sets and/or doesn't consider updates to the plan as additional field information becomes available. The Plan includes limited detail on the frequency and timeline for each dataset's collection. Applicant commits to share all non-proprietary data with NJBPU, NJDEP, and other regional science entities when the COP is approved by BOEM.
Red	The Data Management Plan is incomplete and demonstrates insufficient understanding of data collection best practices or QA/QC standards. The Plan lacks detail on the frequency and timeline for each dataset's collection. Applicant imposes restrictions or limitations on sharing non-proprietary data with NJBPU, NJDEP, and other regional science entities.

A summary of the assigned scores is presented in Table 54, with more detail presented in the following sections.

Table 54. Completeness and Transparency in Data Management and Availability Plan Ratings

Applicant	Summary
Atlantic Shores	**Green.** Plan is detailed, complete, and demonstrates a commitment to transparency and timeliness of data sharing.
Attentive	**Green.** Plan is detailed, complete, and demonstrates a commitment to transparency and timeliness of data sharing.
Invenergy	**Green.** Plan is detailed, complete, and demonstrates a commitment to transparency and timeliness of data sharing.

5.6.1 Atlantic Shores

Atlantic Shores' Data Management and Availability Plan has applied relevant best practices and standards for data management and data collection *BC/[redacted]/EC* Atlantic Shores has established data sharing agreements *BC[redacted]EC* and is exploring ways to collaborate *BC/[redacted]EC* to share relevant data. *BC/[redacted]/EC* Atlantic Shores also notes that oceanographic data collected by the metocean buoy is publicly available real-time on the Atlantic Shores Project website.

Based on the completeness and level of detail provided in the Data Management and Availability Plan, Atlantic Shores is scored Green.

5.6.2 Attentive

Attentive's Data Management and Availability Plan provides a framework for data collection and management consistent with best practices *BC/[redacted]EC* Attentive commits to transparency with respect to non-proprietary baseline and monitoring data with the BPU, NJ DEP, and other interested stakeholders, and will collaborate with regional science entities to advance the understanding of the impacts of offshore wind on fisheries and wildlife resources. *BC[redacted]/EC*

Based on the completeness and level of detail provided in the Data Management and Availability Plan, Attentive is scored Green.

5.6.3 Invenergy

BC [redacted] /EC The Plan provides a detailed framework for standardizing data templates, metadata, archiving, QA/QC, and reporting, consistent with best practices. Invenergy recognizes that amendments to the Plan will be required. *BC/ [redacted] /EC*

Invenergy commits to coordinating and sharing baseline and project monitoring data with NJ DEP, BPU, and regional science entities on an ongoing basis as soon as practicable, but no later than the public release of the COP. Of note, Invenergy identifies specific measures to ensure accessibility of data in compliance with the Americans with Disabilities Act, to the greatest extent practicable.

Based on the completeness and level of detail provided in the Data Management and Availability Plan, Invenergy is scored Green.

5.7 Permit Status and Potential Obstacles to Obtaining Permits

Each Application was reviewed to evaluate the overall status and inherent risks of the Permitting Plan. Projects which have already secured key initial permits have received higher ratings. The proposed turbine arrays, export cable routes , and substation locations were reviewed to analyze whether the Applicant would be likely to encounter significant obstacles in obtaining certain permits, potentially jeopardizing development milestones, and/or causing additional mitigation and/or compliance costs. The rating levels in this category are defined as shown in Table 55.

Table 55. Permit Status and Potential Obstacles to Obtaining Permits

Green	Applicant has prepared a Site Assessment Plan or a Construction and Operations Plan and/or applied for one or more permits that are required to begin Project development. It is reasonably expected that there will not be significant obstacles in obtaining permits in time to meet the expected COD, as long as complete applications are submitted with adequate time for review, and any additional mitigation or compliance costs are not expected to be significant.
Yellow	Applicant has begun preparation of one or more permit applications required to begin Project development. Some permitting risks are identified but can be addressed with feasible modifications to the Project and/or additional mitigation or compliance costs that will not jeopardize Project viability or the proposed COD.
Orange	Applicant has not initiated any permits or approvals. Permitting risks appear to be significant and there is a risk of significant delay in the expected COD, but the project is still considered viable.
Red	Project contains significant permitting risks that cannot be remedied without jeopardizing the viability of the Project.

A summary of the assigned scores is presented in Table 56, with more detail presented in the following sections.

Table 56. Permit Status and Potential Obstacles to Obtaining Permits Ratings

Applicant	Summary
Atlantic Shores	**Yellow**. Applicant has submitted a COP but there are some permitting risks that can be addressed by modifications to Project
Attentive	**Green**. Applicant has submitted a SAP to BOEM and COP preparation is advanced. There are no apparent permitting obstacles at this time.
Invenergy	**Yellow**. Applicant has initiated permits for surveys and sampling and has initiated preparation of BOEM permit. There are no apparent permitting obstacles at this time.

5.7.1 Atlantic Shores

BC [redacted] EC Atlantic Shores' SAP was approved by BOEM in April 2021, and its COP was submitted in 2021 with an update in May 2023. In May 2023, BOEM released the DEIS, which summarizes the environmental conditions and identifies the environmental protection and mitigation measures that will be undertaken during the development, construction, operation, and decommissioning of the Project. *BC/ [redacted] EC*Atlantic Shores has made significant advancement in the permitting process.

BC/ [redacted] /EC

Based on Atlantic Shore's advanced permitting status, *BC/ [redacted] /EC* Atlantic Shores is scored Yellow.

5.7.2 Attentive

BC [redacted] /EC Attentive submitted its SAP in January 2023 *BC/ [redacted]

[redacted]

[redacted]

EC*

Attentive's permitting plan demonstrates a good understanding of the required permits and certifications from NJDEP.

Based on Attentive's current permit status and lack of specific permit concerns at this time, Attentive is scored Yellow.

5.7.3 Invenergy

*BC/[redacted]

[redacted]

[redacted]

EC*

Invenergy's permitting plan demonstrates a good understanding of the required permits and certifications from NJDEP.

Based on Invenergy's current permit status and lack of specific permit concerns at this time, Invenergy is scored Yellow.

5.8 DIRECT EMISSIONS AND EMBODIED CARBON

Applicants are required to include data related to direct emissions produced from vehicles, vessels, and machinery during construction, operation, and decommissioning of the Project as part of the Application Form. Applicants are also required to describe any innovative measures that will be employed to minimize embodied carbon, that is, carbon and other greenhouse gas emissions associated with the manufacture, transportation, installation, maintenance, and disposal of materials comprising the Project. The rating levels in this category are defined as shown in Table 57.

Table 57. Direct Emissions and Embodied Carbon

Green	Application explains how Applicant has considered embodied carbon metrics as a basis for construction decisions and supply chain and/or Original Equipment Manufacturer ("OEM") selections. Applicant proposes a feasible method or methods to mitigate direct emissions from vehicles and/or vessels during construction, operation, or decommissioning. Applicant commits to use of specific low-emissions equipment during construction, operation or decommissioning.
Yellow	Applicant proposes a feasible method to mitigate direct emissions from vehicles and/or vessels during construction, operation, or decommissioning. Applicant proposes to use low-emissions equipment, if feasible, during construction or operation. Applicant proposes to consider embodied carbon metrics as a basis for construction decisions and supply chain and/or OEM selections.
Orange	Applicant proposes to seek methods of minimizing direct emissions during construction and utilize if feasible. Applicant does not consider embodied carbon metrics as a basis for construction decisions and supply chain and/or OEM selections.
Red	Applicant does not describe methods for reducing direct emissions during construction, operation or decommissioning. Applicant, does not consider embodied carbon metrics as a basis for construction decisions or supply chain and/or OEM selections.

A summary of the assigned scores is presented in Table 58, with more detail presented in the following sections.

Table 58. Direct Emissions and Embodied Carbon Ratings

Applicant	Summary
Atlantic Shores	**Yellow.** Applicant proposes several strategies to reduce direct emissions during project development and operation, and in the community.
Attentive	**Green.** Applicant considers embodied carbon in design decisions and requires measures to be implemented in supply chain.
Invenergy	**Green.** Applicant considers embodied carbon in design decisions and prefers suppliers that will reduce embodied carbon.

5.8.1 Atlantic Shores

Atlantic Shores proposes several strategies to minimize direct emissions from vehicles and vessels, *BC/[redacted]

[redacted]

[redacted]/EC*

Based on proposed reduction strategies proposed for embodied carbon, Atlantic Shores is scored Yellow.

5.8.2 Attentive

Attentive proposes to implement multiple strategies for reducing embodied carbon as well as direct emissions from vessels. *BC/[redacted]

[redacted]/EC*

Based on the number of proposed strategies to reduce embodied carbon, the established carbon metrics, and intent to impose similar requirements on its supply chain, Attentive is scored Green.

5.8.3 Invenergy

Invenergy proposes to adhere to U.S. Environmental Protection Agency ("EPA") standards to minimize pollutant emissions from helicopters, vessels, and other vehicles by using low sulfur fuels. To the extent practicable, Invenergy will select engines designed to reduce air pollution, and will minimize engine idling time. Invenergy will comply with international standards regarding air emissions from vessels.

BC/[redacted]/EC

Based on the proposed strategies to reduce embodied carbon, the proposed carbon metrics and intent to impose similar preferences on supply chain, Invenergy is scored Green.

6 COST-BENEFIT ANALYSIS

The cost-benefit analysis ("CBA") represents a consolidation of the quantitative socio-economic components of the evaluation, including OREC Purchase Price, ratepayer impact offsets, local secondary economic impacts, and environmental impacts.[394] While N.J.A.C. 14:8-6.5(a)(11) et seq. requires each Applicant to include a CBA as part of the Application, an independent CBA was conducted to ensure that Projects are compared on a consistent basis.[395]

The individual components included in the CBA are shown in Table 59.[396]

Table 59. Project CBA Components

Category	Component
OREC Costs	OREC Purchase Price (Project-only)
	TSUCPA (if applicable)
Revenue Credits	Value of energy revenue credit
	Value of capacity revenue credit
	Value of ancillary services revenue credit
	Value of avoided REC purchases
	Value of change in retail electric rates
Environmental Impacts	Value of net avoided CO_2 emissions
	Value of net avoided NO_x emissions
	Value of net avoided SO_2 emissions
	Value of net avoided $PM_{2.5}$ emissions
Economic Impacts	Value of development phase spending
	Value of construction phase spending
	Value of operation phase spending

OREC Costs are the costs associated with the OREC Purchase Price over the 20-year OREC term.[397]

Ratepayer impact offsets include the Project's expected revenue credits based on the commodity price forecasts prepared by LAI as described in Section 3.3.1. The ratepayer impact calculations are described in Section 3.4. The relationship between retail electricity prices and impact on the diverse economic sectors in New Jersey is subject to considerable uncertainty. The change in retail electric rates component therefore has a value of zero in the CBA.

[394] Local secondary economic impacts refer to the direct, indirect, and induced economic effects within New Jersey resulting from project expenditures targeted for workers, businesses, government, and community economic and environmental justice organizations. Such beneficial effects are secondary to the primary economic impacts on the wholesale and retail electric prices. Secondary effects only have additional economic value to the extent that local labor and business establishment resources would otherwise be under-employed or under-utilized. Secondary economic impacts may include economic justice or equity distributional considerations in addition to the aggregate macro effects.

[395] Content provided by the Applicants helped inform LAI's independent CBA. LAI's values are not based on the Applicants' submitted CBAs, however. The calculations described in this section were conducted based on LAI's independent CBA.

[396] While there may be other costs and benefits, they are speculative and difficult to quantify, and have therefore not been included in the CBA.

[397] Buyer's expected share of TSUC would also be included if applicable, but it is not applicable in any cases for this solicitation, as discussed in Section 3.2.

The calculation of local secondary economic impacts is described in Section 4.1. Only the aggregate, macro quantitative effects resulting from the IMPLAN regional economic model have been included here. The promotion of economic justice in certain communities and demographic groups have not been monetized in the CBA.

As described in Section 6.1.3, only the quantitative component of environmental impacts is included in the CBA, representing the monetization of net avoided emissions. N.J.A.C. 14:8-6.5(a)(11)(xiv) et seq. requires that the CBA include "an analysis of the anticipated environmental benefits and environmental impacts" and that "the comparative environmental impacts shall be monetized, to the extent possible." A "but-for" test performed by LAI using the Aurora wholesale electric simulation model was utilized to estimate the emissions displaced by incremental offshore wind. The but-for test included only the 1,100 MW Ocean Wind I project that was selected in New Jersey's first offshore wind solicitation and the 1,510 MW Atlantic Shores and 1,148 MW Ocean Wind II projects selected in the second offshore wind solicitation ("the No New Offshore Wind case").[398]

Net benefits in the CBA are calculated as the present value of the net OREC costs over the 20-year term using LAI's market price forecasts, local secondary economic impacts, and emissions impacts over a 30-year operation period.

$$Net\ Benefits = (Ratepayer\ Impact\ Offsets - OREC\ Costs) + Economic\ Impacts\ + Environmental\ Impacts$$

The benefit-cost ratio is calculated as the sum of ratepayer impact offsets over the 20-year term, economic impacts over a 30-year operation period, and environmental impacts over a 30-year operation period, divided by the OREC costs over the 20-year term.[399] The present values of all costs and benefits have been used in computing the ratio.

$$Benefit\text{–}Cost\ Ratio = \frac{Ratepayer\ Impact\ Offsets + Economic\ Impacts + Environmental\ Impacts}{OREC\ Costs}$$

Because the CBA is a consolidation of the other evaluation criteria, it does not contribute to the ranking of Projects for the purpose of selecting one or more Qualified Offshore Wind Projects. However, to be selected, a Project must have a benefit-cost ratio greater than one, that is, a positive net benefit.

6.1 Air Quality Impacts and Embodied Carbon

As part of the cost-benefit analysis, the rules at N.J.A.C. 14:8-6.5(a)(11)(xiv)(1) and (3) require Applicants to document the environmental impacts of the Project, from pre-construction through decommissioning. Air impacts include "emissions of combustion by-products," and "direct emissions impacts of the Project, including carbon dioxide, sulfur dioxide, [and] particulate emissions." N.J.A.C. 14:8-6.5(a)(8) also requires Applicants to provide "[t]he anticipated carbon dioxide emissions impact of the Project." In accordance

[398] Ørsted's decision to cease development of Ocean Wind I and Ocean Wind II, as announced on October 31, 2023, has not been incorporated in the but-for test. This change has not been reflected in the but-for test because it occurred after the Application submission deadline. From a directional standpoint, the removal of Ørsted's OREC awards, with subsequent generic development assumed in future solicitations to "backfill" to the 11 GW goal, would be likely to slightly increase the energy revenues and environmental benefits attributable to the Project options evaluated in the current solicitation. Therefore, the inclusion of the Ocean Wind I and Ocean Wind II projects in the but-for test should not be considered to be problematic

[399] A standard 30-year expected operational life has been used for all projects. The 30-year asset depreciation range is often used by project developers and turbine manufacturers to reflect technology progress before potential repowering of the WTG.

with N.J.A.C 14:8-6.5(a)(11)(xiv), Applicants were required to provide analyses of the anticipated environmental benefits and impacts associated with each Project. Applicants provided annual values of direct emissions of CO_2, NO_x, SO_2, and $PM_{2.5}$ during the development, construction, operation, and decommissioning of the Project. Avoided emissions displaced from fossil-fired generation by offshore wind were also submitted, along with the monetization of net emissions impacts.

Emissions were quantified in two categories: (1) emissions directly related to operation of equipment (marine vessels, on-road trucks, non-road equipment such as excavators, stationary generators, worker transportation, and other machinery) during construction, operation, and decommissioning of the Project; and (2) the emissions avoided through the displacement of fossil-fueled generation ascribable to the operation of the Project. Emissions from vessels, vehicles and machinery represent a very small offset to the avoided stack emissions from fossil generation and may not be fully incremental, that is, vessels, vehicles, and other equipment used for construction could be used otherwise on other construction Projects in the region.

6.1.1 Direct Emissions

With respect to category 1 emissions, the Application Form includes entries for Applicants to submit their emissions estimates by defined units of measure to ensure consistency. The values were accepted as submitted. The Applicant was required to provide supporting information for the estimates of direct emissions that describes how they were calculated. The direct emissions and supporting information submitted by the Applicant were reviewed as part of the Administrative Completeness review but did not contribute to the qualitative evaluation. Table 60 summarizes the direct emissions by phase reported by each Applicant in their respective Application Forms.[400]

The assumptions underlying each Applicant's direct emissions analysis are presented in their respective Applications as follows:

- Atlantic Shores: Appendix 10-11
- Attentive: Attachment 10-A Appendix B
- Invenergy: Attachment 10.1 Section 2.4.

The Invenergy direct emissions analysis assumes that vessel engines will be in continuous operation during scheduled usage durations.[401] Invenergy expects that its suppliers' vessels "will be providing significant reduced emissions than what is reported here as the new generation of low NOx emitting diesel engines, and zero greenhouse gas emitting synthetic fuels come online in the next few years."[402]

[400] *BC [redacted] /EC*

[401] Invenergy Application Attachment 10.1, p. 24.

[402] Invenergy Application Attachment 10.1, p. 23.

Table 60. Direct Emissions by Phase
(short tons)
BC//EC

	Atlantic Shores	Attentive	Invenergy
	[redacted]	1,342	[redacted] 2,400
Development			
CO_2	[redacted]		
SO_2			
NO_x			
$PM_{2.5}$			
Construction			
CO_2	[redacted]		
SO_2			
NO_x			
$PM_{2.5}$			
Operation			
CO_2	[redacted]		
SO_2			
NO_x			
$PM_{2.5}$			
Decommissioning			
CO_2	[redacted]		
SO_2			
NO_x			
$PM_{2.5}$			
Total (all emissions)	[redacted]	601,137	2,089,631 (w/o storage) [redacted]
Project Life (years)	[redacted]		
Average Direct Emissions per year of Project Life (ST/yr)	[redacted]		

6.1.2 Average Annual Avoided Emissions

With respect to category 2 emissions, to compare the avoided emissions across Projects on a consistent basis, LAI estimated the avoided emissions ascribable to each Project using a "but for" test. LAI modeled the regional electric system and the emissions from generation with and without the proposed offshore wind Projects. The Offshore Wind case includes the full New Jersey planned buildout of 11,000 MW of offshore wind capacity by 2040. The No New Offshore Wind case includes the 1,100 MW Ocean Wind I project that was selected in New Jersey's first offshore wind solicitation, and the 1,510 MW Atlantic Shores and 1,148 MW Ocean Wind II projects selected in the second offshore wind solicitation.[403] It did not include any offsetting development of Renewable Portfolio Standard ("RPS")-eligible resources such as land-based wind or solar. LAI calculated the annual differences in CO_2 between the Offshore Wind case and the No New Offshore Wind case across the model footprint. Monthly differences in emissions of NO_x, SO_2, and $PM_{2.5}$ were calculated over the MAAC portion of PJM in order to account for in-state and upwind sources that contribute to air quality and health outcomes in New Jersey.[404] The avoided emissions was assigned *pro rata* to each proposed Project by multiplying the expected MWh by a unitized annual emission factor for each pollutant, expressed as avoided tons per MWh of offshore wind. Emission factors were computed annually for CO_2 and monthly for NO_x, SO_2 and $PM_{2.5}$.

For each Project, the avoided emissions were adjusted annually over the life of the Project by the small offset ascribable to the direct category 1 emissions from vessels, vehicles, and machinery during construction, operation, and decommissioning, as estimated by each Applicant. Table 61 summarizes the average annual avoided emissions for each Project and calculates the net avoided emissions by subtracting annualized total direct emissions as calculated in Table 60 above.

[403] The potential for skewed or distorted results attributable to the inclusion of Ocean Wind I and Ocean Wind II in the but-for test is addressed in footnote 398.

[404] Monthly values allow us to separately calculate avoided emissions for ozone season versus non-ozone season.

Table 61. Average Annual Avoided Emissions

BC//EC

Applicant	Atlantic Shores	Attentive	Invenergy	
Capacity (MW)		**1,342**		**2,400**
Average Annual Delivered Energy (MWh)				
Average Annual Avoided Emissions (ST/yr)				
Study Area CO_2				
MAAC NO_x				
MAAC SO_2				
MAAC $PM_{2.5}$				
Avoidance Rate				
Study Area CO_2 (ST/MWh)				
MAAC NO_x (lb/MWh)				
MAAC SO_2 (lb/MWh)				
MAAC $PM_{2.5}$ (lb/MWh)				
Total Average Annual Avoided Emissions (ST/yr)		2,335,352		4,121,708
Average Direct Emissions per year of Project Life (ST/yr)[405]				
Net Average Annual Avoided Emissions (ST/yr)		2,318,177		4,054,301 (w/o storage)

[405] From Table 60.

6.1.3 Monetization of Net Emissions

Avoided CO_2 emissions were monetized by applying the social cost of carbon ("SCC") from the EPA Report on the Social Cost of Greenhouse Gases, which monetizes damages associated with an incremental increase in carbon emissions in each year through 2080.[406] The average case estimated using a 2% real discount rate was used and converted to dollars per short ton.[407] To avoid double-counting, the embedded cost of RGGI allowances has been subtracted from the SCC. The calculation method is discussed in more detail in the modeling input assumptions presented in Appendix A.

Health effects associated with direct $PM_{2.5}$ emissions and for NO_x and SO_2 as precursors to $PM_{2.5}$ were monetized using EPA's Technical Support Document ("TSD") *Estimating the Benefit per Ton of Reducing Directly-Emitted $PM_{2.5}$, $PM_{2.5}$ Precursors and Ozone Precursors from 21 Sectors*.[408] The TSD presented dollar values in terms of mortality and morbidity per short ton of avoided NO_x, SO_2, and direct $PM_{2.5}$ for the years 2025, 2030, 2035, and 2040. LAI used the values cited in the TSD and extrapolate them beyond 2040 for this analysis. The annual nominal social costs for CO_2, NO_x, and were netted against the generation-weighted average market emissions allowance costs used in the Aurora simulations to calculate the net externality annual values per ton to apply against the change in emissions.

The same emissions and monetization factors were applied to all Applications. As a result, on a MWh-unitized basis, all Projects were very similar. Net avoided emissions were therefore not used as a differentiator in the comparison between Applications or the ranking of Project options. The absolute magnitude of avoided emissions among Projects is directly related to the expected annual output – larger Projects displace more fossil generation over the evaluation period. The present value of the total avoided emissions was therefore an input to the benefit-cost ratio, as discussed in Section 6.2. It was also used during the portfolio phase of the evaluation.

Table 62. Present Value of Net Avoided Emissions

BC//EC

Project Option	Present Value of Net Emissions Benefit (2023 $M)	Levelized Net Emissions Benefit ($/MWh)
[redacted]		

[406] "Report on the Social Cost of Greenhouse Gases: Estimates Incorporating Recent Scientific Advances" U.S. Environmental Protection Agency, November 2023. https://www.epa.gov/system/files/documents/2023-12/epa_scghg_2023_report_final.pdf. This report was published after the Evaluation Framework was developed, and supersedes the prior Interagency Working Group on the Social Cost of Greenhouse Gases, issued February 2021.

[407] The current federal SCC report provides SCC values for three different discount rates: 1.5%, 2%, and 2.5%. Consistent with the prior methodology, this analysis utilized the intermediate value of 2%.

[408] U.S. EPA, "Technical Support Document Estimating the Benefit per Ton of Reducing Directly-Emitted PM2.5, PM2.5 Precursors and Ozone Precursors from 21 Sectors," January 2023. https://www.epa.gov/system/files/documents/2021-10/source-apportionment-tsd-oct-2021_0.pdf

Project Option	Present Value of Net Emissions Benefit (2023 $M)	Levelized Net Emissions Benefit ($/MWh)
[redacted]		

Project Option	Present Value of Net Emissions Benefit (2023 $M)	Levelized Net Emissions Benefit ($/MWh)
[redacted]		

6.2 BENEFIT-COST RATIOS

Table 63 summarizes the expected benefits and costs of each of the Project options as sole awards. The ratepayer impacts are the present value of the revenue credits, as discussed in Section 3.3.1.4 and shown in Table 18. The environmental benefits are the present value of the net emissions benefit, as discussed in Section 6.1.3 and shown in Table 62. The economic benefits are the present value of the discount-weighted direct, indirect, and induced economic impacts, as discussed in Section 4.1 and shown in Table 27.

Table 63. Expected Cost-Benefit Analysis Comparison
(NPV Millions of 2023 $)
BC//EC

Project	Revenue Credits	Environmental Benefits	Economic Benefits	OREC Costs	Net Benefits	*B/C Ratio*
[redacted]						

Project	Revenue Credits	Environmental Benefits	Economic Benefits	OREC Costs	Net Benefits	*B/C Ratio*
[redacted]						
ATT-7-1342-E-S2b						*2.20*
[redacted]						
INV-5-2400-S2b						*2.39*

Project	Revenue Credits	Environmental Benefits	Economic Benefits	OREC Costs	Net Benefits	*B/C Ratio*
[redacted]						

The relative contributions of each component are illustrated in Figure 27.

Figure 27. Project Benefit-to-Cost Ratios

BC//EC

[redacted]

7 PROJECT RANKING

Within each of the two scored categories – OREC Purchase Price and Ratepayer Impacts and Non-Price Considerations – the maximum available points were awarded to the Project with the best category score:

- The Project with the lowest price metric was awarded 70 points and
- The Project with the highest non-price raw score was awarded 30 points.

7.1 OREC PURCHASE PRICE AND RATEPAYER IMPACTS

Projects with higher price scores received points based on the inverse of the ratio of the price score to the lowest price score for the criterion. The LOPP and LNOC criteria scores are weighted equally, that is, 50:50, in the quantification of price scores. The highest scoring Project received 70 points and lower scoring Projects were normalized relative to the highest score:

$$S_{PR,p} = \frac{1}{\frac{PM_p}{PM_{min}}} \times S_{PR,max}$$

$$PM_p = \sum_{C=1}^{c} \frac{S_{C,p}}{S_{C,min}} \times W_C$$

where:

$S_{PR,p}$ = Price score for Project *p*
PM_p = Price metric for Project *p*
PM_{min} = Lowest (best) price metric among all Projects
$S_{PR,max}$ = Highest price score (available price points, i.e., 70)
$S_{C,p}$ = Raw score for criterion *c* for Project *p*
$S_{C,min}$ = Lowest (best) raw score for criterion *c*
W_C = Weight assigned to criterion *c*

7.2 NON-PRICE CONSIDERATIONS

A weighting factor was assigned to each of the metrics described in Sections 4 and 5, as shown in Table 64.

Table 64. Non-Price Weighting Factors

BC//EC

Metric	Weighting Factor
Economic Impacts	[redacted]
Job Guarantees	
Strength of Proposed Guarantees	
Incremental Supply Chain Investments	
Quality of Local Supplier Engagement Plan	
Quality of Workforce Development Plan	
Economic Benefits to OBCs	
Feasibility and strength of Environmental Protection Plan	
Consistency with Minimum Environmental Mitigation Measures	
Feasibility and strength of Fisheries Protection Plan	
Consistency with Minimum Fisheries Mitigation Measures	
Offshore Wind Infrastructure Monitoring Plan	
Data Management and Availability Plan	
Permit status and potential obstacles to obtaining permits	
Direct Emissions and Embodied Carbon	

Each Project was awarded points for each metric based on the zero-to-four scale shown in Table 22 and Table 40 multiplied by the weighting factors shown in Table 64. A total of 412 raw points are available. The conversion of these points to the final scoring is described in Section 7.3.

For each scored non-price criterion, Projects with lower raw scores were scored based on the ratio relative to the highest raw score for the criterion. The normalized criteria scores were weighted as shown in Table 64 and summed. The highest scoring Project received 30 points and lower scoring Projects were normalized relative to the highest score:

$$S_{NP,p} = \frac{NPM_p}{NPM_{max}} \times S_{NP,max}$$

$$NPM_p = \sum_{C=1}^{c} \frac{S_{C,p}}{S_{C,max}} \times W_C$$

where:

$S_{NP,p}$ = Non-price score for Project *p*
NPM_p = Non-price metric for proposal *p*
NPM_{max} = Highest (best) non-price metric among all Projects
$S_{NP,max}$ = Highest non-price score (available price points, i.e., 30)
$S_{C,p}$ = Raw score for criterion *c* for Project *p*
$S_{C,max}$ = Highest (best) raw score for criterion *c*
W_C = Weight assigned to criterion *c*

7.3 CONSOLIDATED SCORES

The points awarded to each Project were summed across the two categories (Price and Non-Price) as summarized in Table 65.

Table 65. Total Raw and Final Scores by Project

BC//EC

Project Option	Raw Price Score	Price Points (out of 70)	Raw Non-Price Score	Non-Price Points (out of 30)	Total Points (out of 100)	Rank
[redacted]						

Project Option	Raw Price Score	Price Points (out of 70)	Raw Non-Price Score	Non-Price Points (out of 30)	Total Points (out of 100)	Rank
[redacted]						

Project options are listed in rank order in Table 66. Project options that are ineligible for award due to having negative net benefits are indicated by strikethrough.

Table 66. Project Rank Order

BC//EC

Project Option	Rank	Tier 1 Supply Chain Commitments
[redacted]		

Project Option	Rank	Tier 1 Supply Chain Commitments
[redacted]		

Project Option	Rank	Tier 1 Supply Chain Commitments
[redacted]		

8 PORTFOLIO EVALUATION

Following Project ranking, summary statistics were calculated for combinations of Projects. As noted in Section 6, all Project options have a benefit-cost ratio greater than one and are eligible for inclusion in a portfolio.

In performing the portfolio evaluation, individual Projects that meet the target award volume on a standalone basis were also included for comparison. Only one Project from each Applicant can be included in a given portfolio insofar as the selection of one Project necessarily precludes selection of an alternative from the same Applicant. Possible total portfolio nameplate options are therefore 1,200 MW, 1,342 MW, 2,400 MW, 2,542 MW, 2,684 MW, 3,600 MW, 3,742 MW and 3,884 MW.

The SGD states that the target volume is at least 1,200 MW and up to approximately 4,000 MW. In performing this evaluation, Board Staff and LAI have determined that the award portfolio must be sufficient to support further development of EEW's monopile manufacturing facility at Paulsboro and a tower facility at the NJWP. Therefore individual Projects with a delivered capacity of less than 2,400 MW have been removed from the portfolio evaluation. The Board has also determined that the LCS circuit capacities associated with the SAA as stated in the SGD should be maintained, that is, two 1,200 MW circuits at Larrabee and Atlantic and one 1,342 MW circuit at Smithburg, further limiting the portfolio size options to 2,400 MW, 2,542 MW, 3,600 MW and 3,742 MW.

The available Project combinations are summarized in Table 67.

Table 67. Portfolios Considered for Award

BC//EC

Portfolio Size	Project Combinations
2,400 MW	[redacted]
2,542 MW	
3,600 MW	
3,742 MW	

*BC/[redacted]

[redacted]

[redacted]

EC*

Figure 28. Incremental Benefit-Cost Ratios for Invenergy Project Options *BC/[redacted]/EC*[409]

BC//EC

[redacted]

[409] *BC [redacted] EC*

8.1 COST-BENEFIT ANALYSIS

Summary portfolio attributes that contribute to the portfolio cost-benefit analysis are the same components discussed in Section 6 for individual Projects, including total ratepayer benefits, total environmental benefits, total economic benefits, and total OREC costs. These summary statistics are summarized for the fourteen portfolio combinations covering one-, two-, and three-Project portfolios in Table 68.[410] Each portfolio has positive net benefits and is therefore eligible for selection.

Table 68. Expected Portfolio Cost-Benefit Analysis Comparison

(NPV MM 2023 $)

BC//EC

Portfolio ID	Project(s)	Delivered Capacity (MW)	Revenue Credits	Environmental Benefits	Economic Benefits	OREC Costs	Net Benefits	*B/C Ratio*
[redacted]								

Figure 29 shows the benefits and costs of the potential portfolios, sorted left to right by increasing total delivered capacity and within each delivered capacity by increasing OREC costs. The combined height of

[410] *BC/[redacted]/EC*

the bars, indicated by the yellow circles, represents the total benefits associated with each portfolio. The red-dashed line represents the total OREC costs associated with each portfolio. As noted above, in all cases the total benefits are greater than the total costs, with both benefits and costs generally increasing with capacity.

Figure 29. Portfolio Benefit and Cost Present Value

BC//EC

Figure 30 shows the benefit-cost ratios for each eligible portfolio, again sorted by total delivered capacity and by total OREC costs.

Figure 30. Portfolio Benefit-Cost Ratios

BC//EC

8.2 PRELIMINARY PORTFOLIO EVALUATION WITH AGGREGATE PROJECT SCORES

Using the same valuation weights as for the individual Project scoring, LAI evaluated the same set of numerical criteria and attributes for each eligible portfolio. This was done by using simple linear aggregation rules of additivity or proportionality, depending on the criterion. The OREC Purchase Price and Ratepayer Impacts scores are based on the delivered energy-weighted average of the LNOCs for the component Projects. The Economic Impacts and Strength of Guarantees for Economic Impacts are the total levelized economic benefits, unitized on a per MWh basis in order to avoid favoring a project with a larger capacity. Environmental and fisheries impacts for the two-Project portfolio values are the delivered energy-weighted average of the attribute points for the individual component Projects. These aggregation rules are designed to maintain the same relative weights across the criteria for a portfolio as for an individual Project. For the one-Project solution, the Project and portfolio scores are identical.

To have Project and portfolio scores adhere closely to the 70:30 criteria weights across the three categories, each criterion's metric was converted into a score. The scoring metric expressed in either dollars or points is based on each Project's or portfolio's value relative to the best realized value across all projects and portfolios using the same methodology described in Section 7. Essentially, this applies the same multi-objective optimization model approach that was used for individual Project scoring to portfolio evaluation. This multi-objective optimization model incorporates the extensive evaluation criteria used by Board Staff under the respective rubric for price, environmental and fisheries impacts,

and the economic benefits and related guarantees used to calibrate relative merit. The scores for the eligible portfolios are shown in Figure 31, again sorted left-to-right by increasing delivered capacity and increasing OREC costs. *BC/While INV-5-2400-S2b is the highest-ranked overall Project, it cannot be selected as a standalone award because it corresponds to Scenario 2, which represents a 3,742 portfolio, and includes cost-sharing with another awardee for the EEW capability expansion. INV-5-2400-S1a, which can be selected as a standalone award because it corresponds to Scenario 1, which represents a 2,400 portfolio, and does not include cost-sharing for the EEW capability expansion, has a slightly lower score, but is still ranked higher than all other Project configurations, and therefore has the highest score out of the portfolios. The highest scoring portfolio out of the 3,600 MW and 3,742 MW options is Portfolio 12, which includes INV-5-2400-S2b and ATT-7-1342-S2b./EC*

Figure 31. Portfolio Scores

BC//EC

Figure 32 illustrates the scores relative to total delivered capacity. The green line shows the scoring frontier, connecting the highest scores at each capacity level.

Figure 32. Project and Portfolio Scores Relative to Capacity

BC//EC

Figure 33 and Figure 34 similarly show the efficient frontiers for PVNOC (total expected net spending) and LNOC (expected net spending per OREC), respectively, relative to total delivered capacity. For these charts, lower prices are preferred, so the efficiency frontier is represented by the lowest values – as compared to Figure 32 where the highest scores are preferred. These figures represent only information relevant to the OREC Purchase Price and Ratepayer Impacts category. They do not incorporate other considerations central to the evaluation regarding economic impacts and environmental and fisheries impacts.

Figure 33. PVNOC Relative to Capacity

BC//EC

Figure 34. LNOC Relative to Capacity

BC//EC

Further comparisons of the OREC Purchase Price and Ratepayer Impacts among the portfolios are shown in the following series of figures. Figure 35 and Figure 36 show PVOPP vs. PVNOC and LOPP vs. LNOC, respectively, for the portfolios. In these figures, the blue bars represent the total spend and per-OREC spend based on the Applicants' pricing. The red bars represent the total spend and per-OREC spend after reducing the value of the blue bar to account for LAI's estimated levelized revenue credits for energy, capacity, and avoided REC costs.

Figure 35. Total Spend Comparison by Portfolio

BC//EC

Figure 36. Unit OREC Cost Comparison by Portfolio

BC//EC

Figure 37 and Figure 38 show the same data sets calibrated relative to *BC/[redacted]/EC* the portfolio with the highest score and the lowest cost. Positive values represent portfolios with higher costs than *BC/[redacted]/EC* and negative values represent portfolios with lower costs than *BC/[redacted]/EC* The blue bars again show the Applicants' pricing, and the red bars reflect the Applicants' pricing less levelized revenue credits. The unit OREC cost comparison is levelized over the 20-year OREC term in nominal dollars.

Figure 37. Total Spend Comparison by Portfolio Relative to *BC/[redacted]/EC*

BC//EC

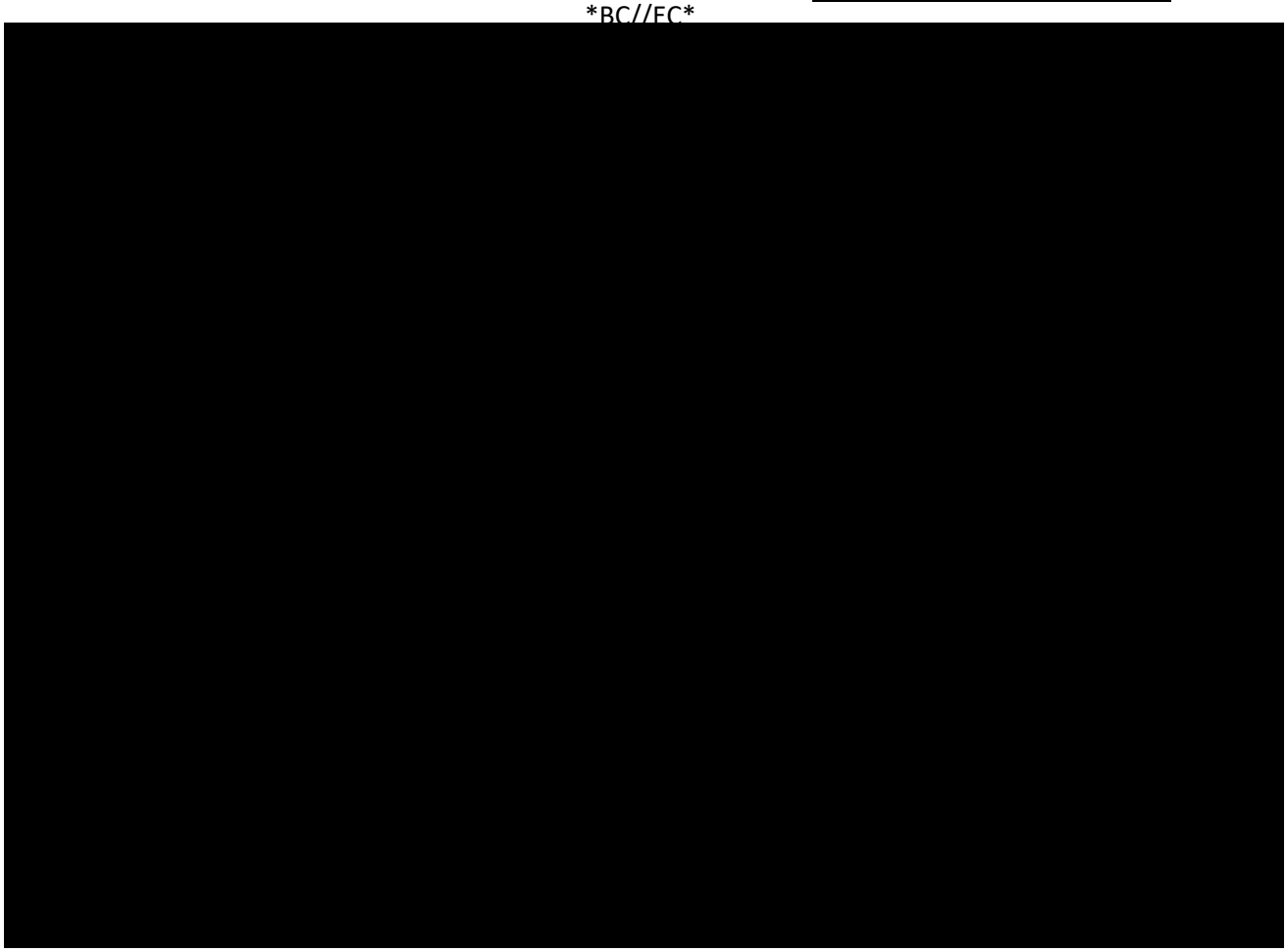


Figure 38. Unit OREC Cost Comparison by Portfolio Relative to *BC/[redacted]/EC*

BC//EC

The retail rate impacts associated with each portfolio are shown in Figure 39. Retail rate impact is directly proportional to PVNOC. It is driven primarily by portfolio capacity, and to a lesser extent by OREC price. The retail rate impact stated in terms of $/MWh affects all customers equally, but will have a different total monthly impact on each customer depending on monthly usage, as discussed in Section 3.4.

Figure 39. Retail Rate Impact by Portfolio – All NJ EDC Load

BC//EC

The impact on a typical residential electric customer monthly bill is based on an average usage of 681 kWh per month and is also proportional to PVNOC. This is shown for each portfolio in Figure 40. *BC/[redacted]/EC* Over the 20-year OREC term, the actual monthly impact would be higher when the impact of inflation is acknowledged.

Figure 40. NJ Residential Electric Bill Impact by Portfolio

BC//EC

8.3 Final Portfolio Evaluation with Additional Diversification Criteria

Portfolio diversification considerations were not part of the quantitative scoring and ranking procedures described above. Therefore, portfolio diversity and composition considerations are addressed in qualitative terms. Board Staff has not attempted to weigh the relative importance of diversifying different attributes. Each attribute is nonetheless important in the examination of portfolio evaluation.

8.3.1 Economic Development Diversification

Diversification of economic development benefits is a top priority for three reasons. First, multiple communities, businesses, and labor occupations desire a share of the benefits consistent with the Board's emphasis on the dissemination of economic benefits in New Jersey. Second, environmental justice requires commitments to communities that have been under-developed or under-served in New Jersey. Third, in addition to the contribution of the development and utilization of the NJWP and other port

infrastructure in New Jersey, there are considerations regarding how best to leverage and use New Jersey's port infrastructure in accord with increased offshore wind development in the decade ahead. Mid-Atlantic and Northeast coastal states have intensified efforts to develop offshore wind, thereby supporting strategic positioning of New Jersey's expansive port infrastructure to accommodate manufacturing requirements in New Jersey and other mid-Atlantic and Northeast developer requirements. Accelerated decarbonization goals in the Atlantic coastal states that feature new offshore wind procurement targets in 2024 heighten the challenge before the Board in the present solicitation to position New Jersey to enable diversified economic development.

BC [redacted] /EC

8.3.2 Technology Diversification

Diversification of generation technologies and performance can help to reduce execution risk associated with reliance on a single technology, while also potentially improving environmental mitigation related to the offshore transmission segment from individual collector arrays to landfall at the Sea Girt NGTC.

BC [redacted] EC

8.3.3 Applicant Diversification

Diversity in selected Applicants has been considered in the evaluation. Atlantic Shores is the only incumbent Applicant, having been awarded a Qualified Project in the second solicitation. Attentive and Invenergy would be new to the New Jersey offshore wind portfolio. While Attentive was recently awarded an OREC contract in NYSERDA's third offshore wind solicitation, Invenergy is the remaining BOEM leaseholder in the New York Bight presently vying for an OREC award in New Jersey or New York that has not received an award. The benefits of Applicant diversity may be considered relative to potential negative decremental BCRs associated with selecting smaller Projects from multiple Applicants rather than a single larger Project, and by buying more offshore wind now versus later. The decision to buy more offshore wind now versus later is addressed in Section 8.4. How best to assess the benefits of awarding multiple Applicants to meet the Board's offshore wind solicitation target range with the additional considerations pertaining to the diversity of technical aspects and economic benefits remains subject to the Board's discretion.

8.4 Portfolio Size Considerations

LAI has assessed the tradeoffs between OREC Purchase Price and incremental economic impacts associated with procuring approximately 2,400 MW and procuring approximately 3,742 MW in this solicitation. The principal incentive to buy more now versus later is the improved prospects for *BC/[redacted]/EC* to manufacture towers at the NJWP and the higher likelihood of EEW Phase 3. A leasehold procurement run by NJ EDA will select the tower manufacturer. The principal incentive to buy less now versus later is the speculative prospect of a less costly OREC in the next solicitation compared to locking in the OREC cost and quantity in early 2024, a time when global supply chain has been challenged and

both inflation and the cost of money are comparatively high. The primary downside of buying more later is the incremental risk associated with failing to harden the Tier 1 supply chain at the NJWP and, to a lesser extent, EEW Paulsboro.

The focus of this analysis is the likelihood of jeopardy to tower manufacturing at the NJWP if the total portfolio size is 2,400 MW, not 3,742 MW.[411] Whether Project commitments to EEW are used to shore up Phase 2 or facilitate Phase 3 expansion, a larger volume of orders for the EEW monopile facility will be beneficial to its viability.

BC [redacted] /EC Procuring 3,742 MW in this solicitation should provide *BC/ /EC* with sufficient order volume to move forward with its NJWP tower manufacturing facility, thereby reducing uncertainty and increasing momentum in the development of NJ's offshore wind supply chain. If the awarded portfolio in this solicitation only includes 2,400 MW, *BC/ [redacted] EC*[413] More important, in the regional competition to harden supply chain OEM capability in New York, elsewhere in the mid-Atlantic and New England, inter-regional competition supply chain coupled with NYSERDA's recent award announcements means that there is a significant chance that the tower manufacturing facility at the NJWP never happens without sufficient volume awarded now.

In comparison, procuring 2,400 MW now and increasing the target quantity of the next solicitation by 1,342 MW could result in a moderate price improvement if the Board were to believe that the Levelized Cost of Energy ("LCOE") for the industry at large will significantly decline between now and when awards are made in the next solicitation *and* that favorable changes in the LCOE are reformed by one or more of the Applicants in terms of lower OREC offer prices in the next solicitation that yield ratepayer benefits.

Modeling conducted by the National Renewable Energy Lab indicates that capital costs represent roughly 80% of offshore wind project costs.[414] Survey data reported by the Department of Energy indicates that

[411] A detailed evaluation of the impact of the award size for this solicitation on EEW at Paulsboro was not conducted.
[412] *BC/ [redacted] /EC*
[413] Assuming only a one-year delay *BC/ [redacted] EC* These results are roughly scalable for a postulated two-year delay.
[414] "Five grand challenges of offshore wind financing in the United States," p. 2, https://www.nrel.gov/docs/fy24osti/87712.pdf.

capital costs in the offshore wind industry have risen by 11-20% since 2021.[415] Based on these data points, and the assumption that 50%-70% of the post-2021 capital cost inflation will be reversed by the time final price offers are submitted in the next solicitation, LAI has estimated that price improvement has the potential to range between 4% to as much as 11% when industry-wide trends over time form the basis for the LCOE price outlook. However, New Jersey's next offshore wind solicitation is now expected to be issued in Q1 2024, with awards announced in Q1-2025. The optimistic change in LCOEs for the industry at large might not be immediately applicable in New Jersey. Hence, there are good reasons to question whether any price improvement in New Jersey would actually materialize within that timeframe. This concern warrants probability weighting future outcomes to put the 4% to 11% price decline in perspective.[416] If we assume a one-in-three chance of OREC Offer prices declining by 4% or up to 11% in the next solicitation, then the notional value of the ratepayer benefit is $74 million when the reduction is tested at 4%. *BC/[redacted]/EC*

In light of accelerated decarbonization efforts in the mid-Atlantic, New York and New England, it is also possible that OREC pricing will stay the same or increase in the next solicitation in light of interest in offshore wind to replace projects that have withdrawn, are in jeopardy, worldwide supply chain challenges, related lags on jack-up vessels and HVDC cable and converters, the yield curve, and continued global chaos, among other things.

As a result of these considerations, LAI discourages delaying the discretionary tranche from this solicitation to the next.

Reducing the size of the award in this solicitation would be likely to delay the installation of tower manufacturing at the NJWP, a highly desirable Tier 1 supply chain goal. It could imperil tower manufacturing in New Jersey from ever happening. The worst case is no tower manufacturing facility at the NJWP *BC/[redacted]/EC*. The worst case should not be considered far-fetched. While there are reasons to expect LCOEs to plateau and ultimately decline later this decade and next, in LAI's opinion, it is not reasonable to expect a significant decline in much less than one year, at a time when New York and other mid-Atlantic and New England states are simultaneously pursuing accelerated offshore wind procurement goals. Industry optimism about technology progress, yield curve, and the restoration of the supply chain to keep pace with global demand for offshore wind development should not distract decision-makers about what is at stake in this solicitation.

[415] *Offshore Wind Market Report: 2023 Edition*, U.S. Department of Energy Office of Energy Efficiency and Renewable Energy, p. 82. https://www.energy.gov/sites/default/files/2023-09/doe-offshore-wind-market-report-2023-edition.pdf

[416] The Board could see a larger decline in OREC Purchase Prices if one or more Applicants in the next solicitation offer larger nameplates. Developers' ability to scale up nameplate to improve price in their responses to the next solicitation is unknown.

APPENDIX A: LAI COMMODITY PRICE FORECASTING MODELS AND KEY ASSUMPTIONS AND DATA

LAI utilizes Aurora, a chronological dispatch simulation model licensed from Energy Exemplar, to forecast power market outcomes, including energy prices, capacity prices, power plant emissions, and natural gas demand for electric generation. This appendix describes the input assumptions and data that LAI implemented in the electric system simulation model used to develop the energy price forecast included in the calculation of net OREC costs. The electric simulation model was also used to estimate avoided emissions benefits. For purposes of deriving LNOCs, consistent with the Board's preference, LAI has incorporated a simplified capacity price proxy method similar to that used for the second solicitation, in lieu of the forecasting technique used previously in the first solicitation. LAI uses the default database provided by Energy Exemplar as a foundation. Energy Exemplar's database is augmented with extensive customization based on public data sources, proprietary calculations, and professional judgment.

According to N.J.A.C 14:8-6.6(a)(3), selected OSW projects will be funded through the OREC mechanism for 20 years. The project(s) selected in this solicitation were assumed to have an in-service date no later than the start of 2030. Therefore, in order to examine market and environmental outcomes associated with the 1,200 MW to 4,000 MW procurement target, LAI ran Aurora from 2024 through 2050.

LAI's assumptions represent "known and knowable" expectations for New Jersey and other states' energy policies. LAI did not model an assumed energy future that meets states' long-term decarbonization targets, as the approaches that various states will take and their abilities to meet targets and standards are uncertain. LAI did model specific policy measures and goals that states have announced, such as procurement targets for large-scale clean energy technologies and settled state procurements. For New Jersey, this approach shares policy assumptions with the "Reference 2" case shown in the Energy Master Plan and Integrated Energy Plan[417] as well as the "Current Policy Pathway" scenario in the Energy Master Plan Ratepayer Impact Study,[418] and other measures per dialogue with BPU Staff:

- 3.5 GW of offshore wind by 2030
- 2 GW of storage by 2030
- 330k EVs on the road by 2025
- 50% Class 1 RPS by 2030
- EE resulting in 9% reduction in non-EV demand from 2020 levels in 2030
- 7,400 MW(dc) solar by 2026, 12 GW total solar by 2030

LAI also included additional buildout reflecting Governor Murphy's Executive Order establishing a goal of 7,500 MW of offshore wind by 2035, and the further expanded goal of 11,000 MW by 2040. LAI conducted a "but-for" test as used in the second solicitation, only updated for the expanded offshore wind development goal. LAI created an Offshore Wind case that meets New Jersey's 11 GW by 2040 goal to estimate energy prices for the LNOC derivation. A No New Offshore Wind case that only includes the Qualified Offshore Wind Projects selected in the first two solicitations was be used to conduct a "but-for"

[417] IEP Public Webinar, page 36.

[418] New Jersey Energy Master Plan Ratepayer Impact Study, page 8. Brattle and New Jersey Board of Public Utilities, August 2022. New Jersey Energy Master Plan (nj.gov)

comparison to estimate environmental benefits. The No New Offshore Wind cases will not include any offsetting renewable energy additions.

Unlike Aurora modeling for previous solicitations, LAI did not perform capacity expansion with a constraint to meet the PJM region's RPS. The method for forecasting REC prices for this solicitation was instead based on a supply/demand forecast. This approach reflects a stricter adherence to the "known and knowable" assumptions principle, which results in a more realistic and internally consistent value for RECs. This change better reflects the realities of renewable generation development, which generally requires long-term contractual arrangements since merchant development has not happened.

STUDY REGION

Aurora was utilized in a zonal configuration with the study region modeled to include PJM, NYISO, and ISO-NE. The three ISOs are further divided into zones to capture the key transmission constraints. LAI modeled PJM's load zones within EMAAC (AECO, JCPL, PSEG, RECO, DPL, and PECO) separately. LAI aggregated other load zones into their respective LDAs (SWMAAC, Rest of MAAC, and Rest of RTO) in order to reduce solve time. NYISO is divided into seven load zones (A through K, with some aggregation upstate). ISO-NE is divided into the 13 sub-areas identified in the Regional System Plan (RSP).

Boundary flows with other regions (including MISO, TVA, IESO, and Quebec) were modeled based on an average weekly profile for each month using three years of historical flow data (168 hours by 12 months, 2019-2021). Imports into New York from Ontario were reduced to reflect the impending refurbishment schedule of IESO's nuclear units.

LAI did not conduct a nodal regression to adjust zonal prices to reflect the LCS POI. Such a regression compares historical LMPs at the various substations to the zonal prices. The SAA upgrades represent significant changes to New Jersey's transmission topology that are not captured in a backward-looking analysis. LAI assumed that Projects that utilize the SAA interconnection will not face significant constraints at the nodal level. The nodal adjustments were also very small, well within the range of uncertainty associated with various other input assumptions that drive the energy price forecast.

TRANSMISSION TRANSFER LIMITS

Inter-zonal transmission transfer limits are defined using several publicly available data sources:

- PJM BRA Planning Parameters
- NYSRC Installed Capacity Requirement Report
- NYISO Reliability Needs Assessment
- ISO-NE FCM Tie Benefits Study
- ISO-NE CONE and ORTP Analysis
- ISO-NE Economic Studies

These sources represent emergency transfer limits that may be used during particularly tight system conditions. LAI adjusted these emergency transfer limits to reflect "normal" system conditions per several sources:

- PJM Day Ahead Interface Flows and Limits
- NYISO Comprehensive Area Transmission Review
- NYISO Comprehensive Reliability Plan
- NYISO Summer and Winter Operating Studies

- ISO-NE Hourly Flows and Limits

In cases where data are not available or data sources conflict, the analysis relies on the default settings provided by Energy Exemplar, as well as LAI's judgment, to determine appropriate limits. Energy Exemplar performs a nodal power flow simulation that informs the zonal transmission limits.

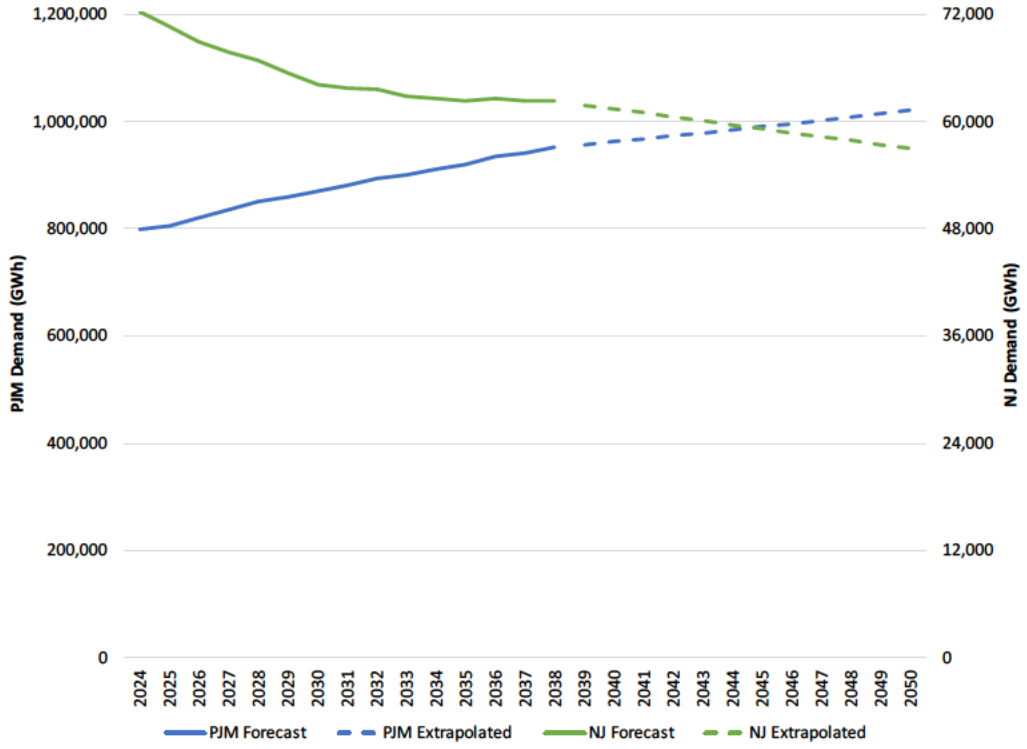
DEMAND FORECAST

LAI relied on RTO planning documents such as PJM's Load Forecast Report, NYISO's 2022 Load Forecast Report ("Gold Book"), and ISO-NE's Capacity, Energy, Load and Transmission ("CELT") Report as the basis for peak and annual energy forecasts. RTO forecasts that include Energy Efficiency ("EE") are utilized. Behind the meter ("BTM") solar, which is also forecasted in planning documents, is defined as a supply-side resource in order to reflect the changes to hourly shape of net load that solar creates, as solar generation does not track demand.

PJM's 2023 Load Forecast Report data includes monthly metered and peak load values by zone through 2035. LAI extrapolated the load forecast for the rest of the study period by reconstituting the net energy for load through adding back in BTM solar generation. LAI then extrapolated those values forward assuming exponential growth consistent with the Combined Annual Growth Rate ("CAGR") over the forecast.[419] BTM solar generation was assumed to grow at a constant MWh rate per the last year's forecasted growth rate. Load growth in PJM at large is mainly driven by the development of data centers in Virginia and other parts of Rest of RTO.

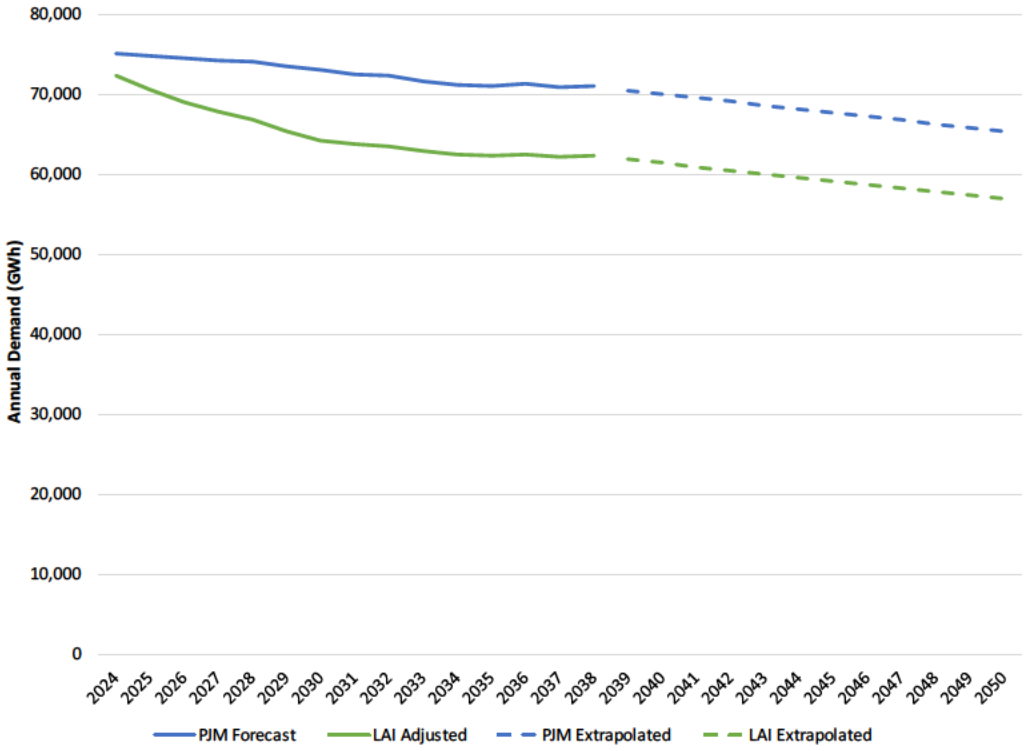
[419] Some CAGR sampling adjustments were made to zones to account for transient changes in demand that individual utilities request (see load-forecast-supplement.ashx (pjm.com) pp 18-22 and other observed near-term growth this is inconsistent with long-term trends.

Figure A1. PJM and New Jersey Net Energy for Load



Several New Jersey policies are not reflected in PJM's load forecast. LAI adjusted non-EV demand in 2030 downward to reflect a 9% reduction relative to 2020 non-EV demand. We assumed that these savings persist throughout the study period. LAI also adjusted PJM's BTM forecast for New Jersey upward to reflect the 7,400 MW(dc) Successor Solar Incentive program goal. Figure A2 shows the effect of adjustments to the PJM forecast to reflect New Jersey policies promoting EE and BTM solar. The 2023 Load Forecast Report does include Plug-in Electric Vehicles (PEVs) and reflects the 330,000 vehicles by 2025 goals set by New Jersey as part of the Multi-State ZEV Task Force.

Figure A2. New Jersey Net Energy for Load



NYISO's Gold Book has four load scenarios that forecast load through 2050. LAI utilized the Baseline Forecast, which represents a middle path for various load modifying activities such as EE, BTM solar, and new sources of demand through electrification. There is no need to perform extrapolations on the Gold Book forecast.

ISO-NE's 2022 CELT report forecasts load through 2029. LAI extrapolated gross load (prior to netting out EE and BTM PV) per the CAGR of the forecast period and extrapolates EE and PDR based on a constant MWh growth rate per the last forecasted year's values. The 2022 CELT forecast of gross load includes EVs and Air Source Heat Pumps, which are extrapolated using a saturation curve.

Fuel Price Forecast

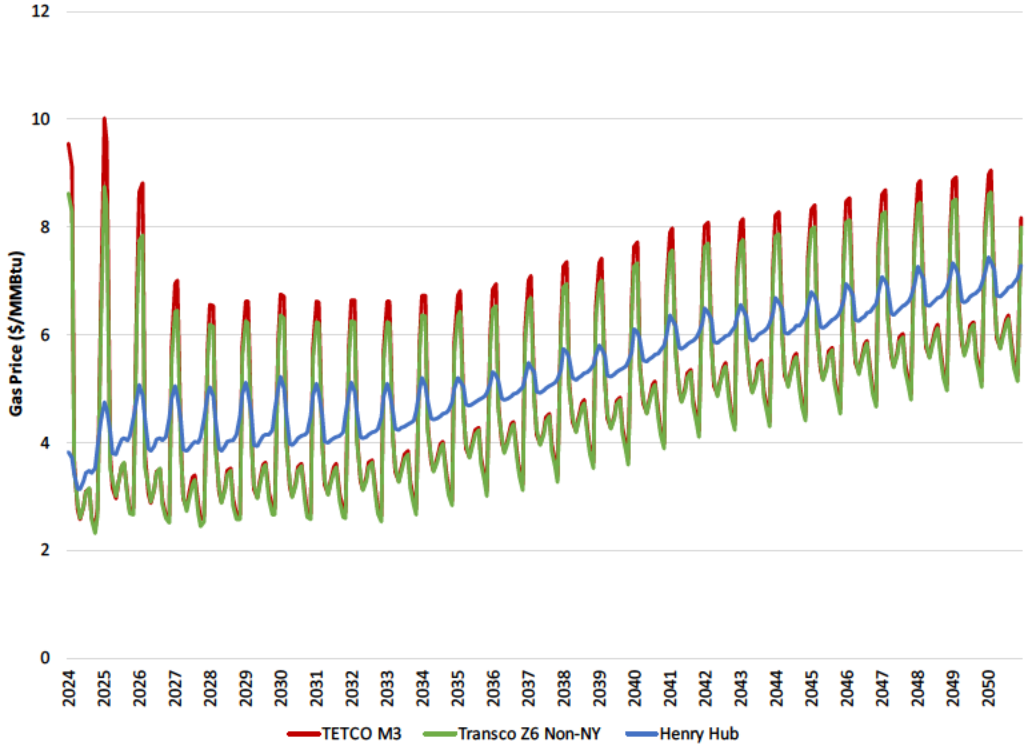
Fuel prices, as delivered to generators, were forecasted for natural gas, oil products, and coal. Nuclear generators are price takers and do not have much dispatch flexibility. We therefore ignored nuclear fuel prices and assume that nuclear plants run fully-loaded aside from scheduled refueling.

Natural Gas Price Forecast

The forecast of delivered natural gas prices started with NYMEX Henry Hub futures and basis projections from S&P Market Intelligence. NYMEX Henry Hub futures are available through 2035. For years 2036 and beyond, prices were escalated annually based on the forecasted annual growth rates of the average price from EIA's 2023 Annual Energy Outlook ("AEO"), Reference and High Oil and Gas Supply cases. Basis projections are generally constant after a few years, which reflects the lack of liquidity in futures markets past the prompt year and significant volatility in pricing due to weather variability.

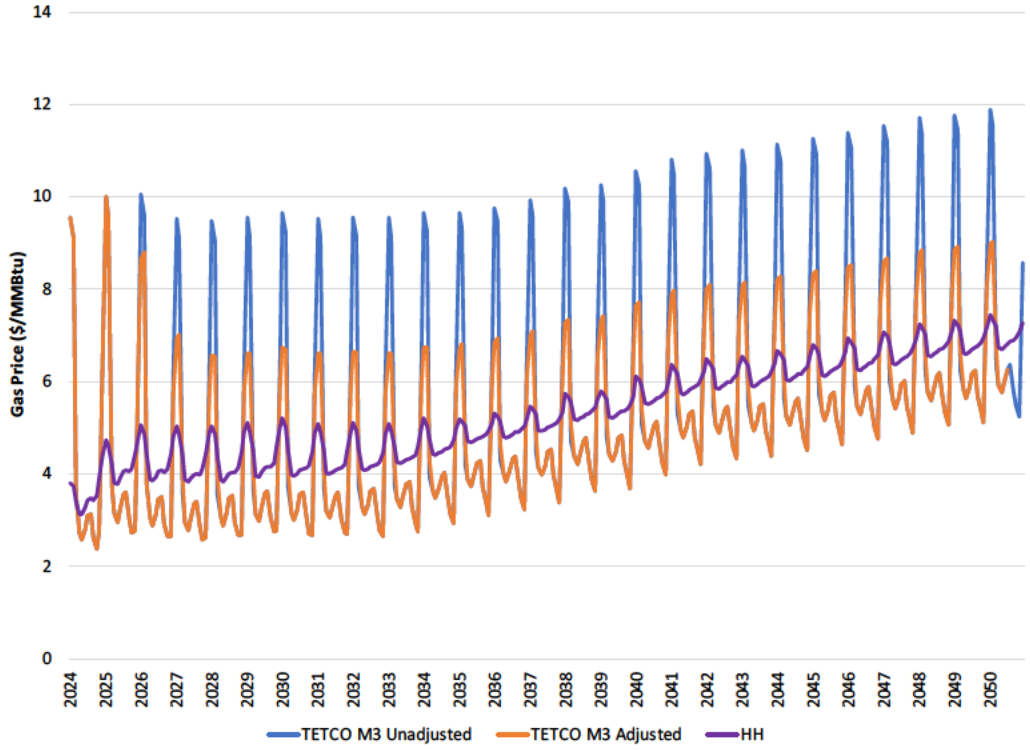
The prevalent price indices for delivered gas into EMAAC, TETCO M3 and Transco Z6 Non-New York, are shown in Figure A3. S&P winter basis projections for downstream indices, including those utilized by generators in EMAAC, were adjusted downward to reflect an eventual softening of global LNG markets.

Figure A3. Monthly Delivered Gas Prices in New Jersey[420]



[420] All prices presented in nominal dollars.

Figure A4. Basis Adjustments Example, TETCO M3



Other Fuel Price Forecast

Delivered oil products prices were forecasted based on the 2023 AEO, consistent with the Henry Hub forecast.

Coal prices were forecasted using the 2023 AEO prices for delivered coal to electric generators as a commodity price. These prices were then adjusted on a unit and state level to reflect local price adders based on basin sourcing and transportation costs. These adders were developed by Energy Exemplar and are primarily based on a review of EIA-923 fuel receipts data.

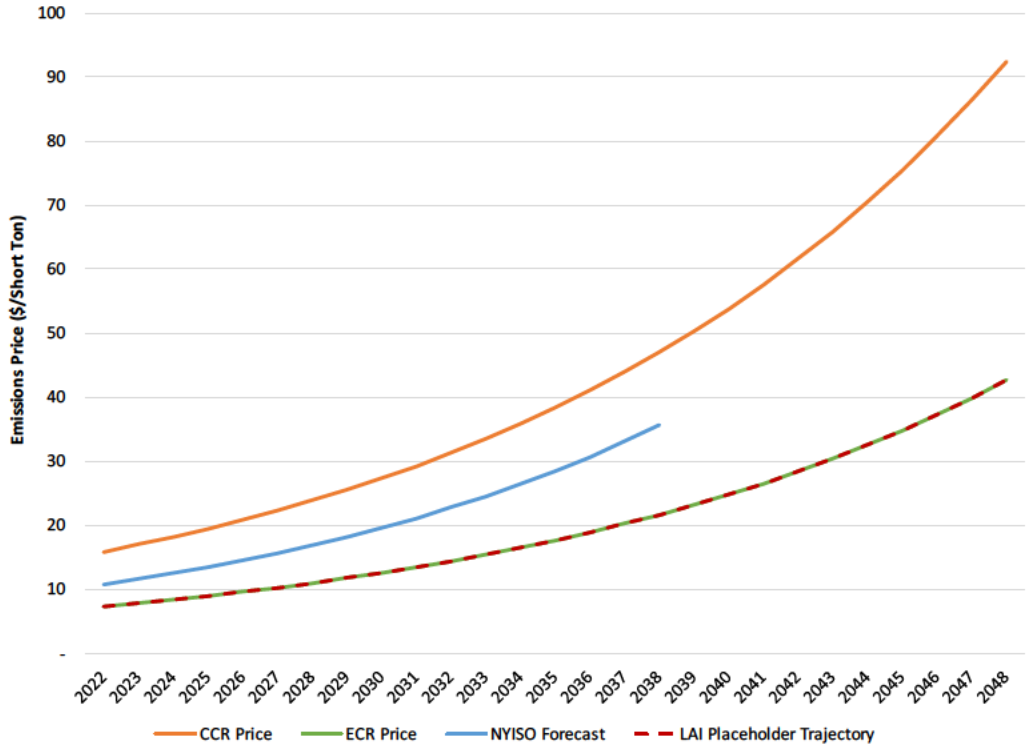
Carbon Allowance Price Cases

At the time that assumptions were developed, RGGI stakeholders were beginning the Third Program Review, but modeling results had not yet been published. A revised Model Rule is scheduled for end of 2023.[421] The Second Program Review was completed in 2017 and hence the modeling that was used to determine prices is dated. The current Model Rule does provide some guardrails that effectively set a range for prices. It includes a set of Cost Containment Reserve ("CCR") and Emissions Containment Reserve ("ECR") that effectively set maximum and minimum clearing prices, respectively, for a given emissions vintage that escalate by 7% annually.[422] Notably, the current Model Rule only runs through 2030. Our working expectation is that RGGI will continue in some fashion post-2030. NYISO's emissions forecast for the System & Resource Outlook takes into account the trigger prices and uses a similar

[421] Program_Review_Timeline_Update_2022-07-05.pdf (rggi.org)
[422] Microsoft Word - 2017 Model Rule_revised (rggi.org) pp 6-7

escalation rate.[423] After consultation with Board Staff, we used the CCR trajectory as a conservative placeholder absent the availability of IPM modeling from the Third Program Review.

Figure A5. RGGI Price Trajectories



Firm Resource Additions and Retirements

LAI assumed that any resource cleared in a capacity auction such as the PJM BRA or ISO-NE Forward Capacity Market ("FCM") will be built and will therefore be a scheduled addition in Aurora. Given the delays in the FCA schedule, facilities identified as "under construction" in the S&P Capital IQ power plant database were included in the base model.

In NYISO there is no three-year forward capacity auction. We reviewed NYISO's interconnection queue for accepted cost allocations (which can require significant financial assurance) and other sources to determine appropriate scheduled additions.

Scheduled Renewable and Clean Energy Resource Additions

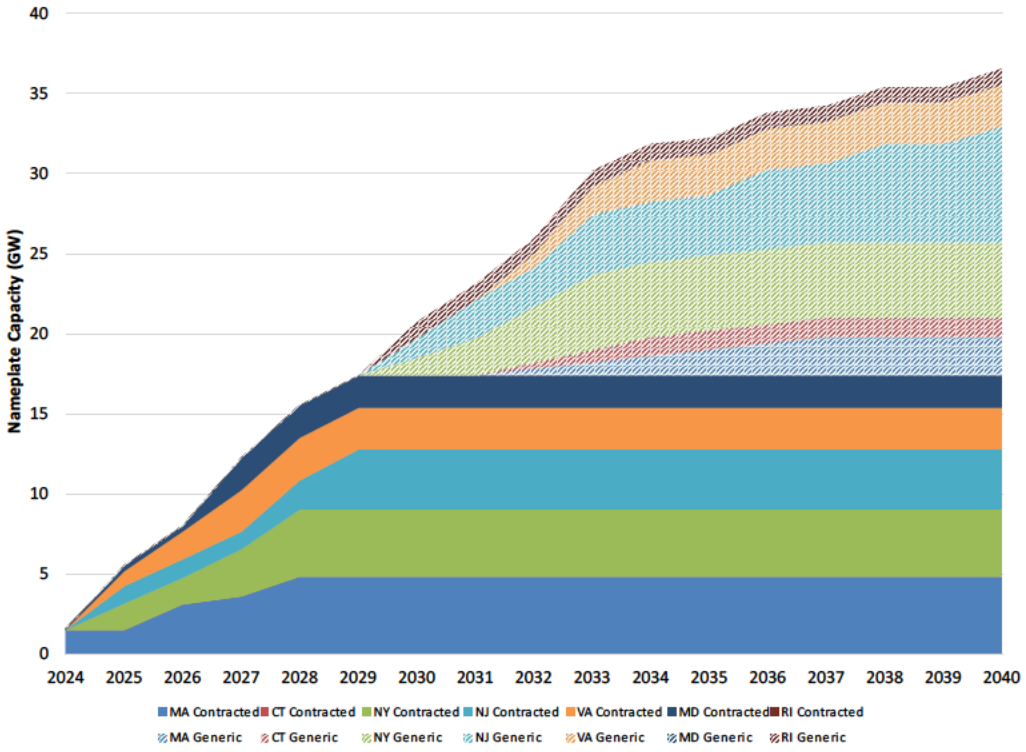
For renewable resources, our forecast assumes that wind and solar with signed Interconnection Service Agreements in PJM or ISO-NE or accepted interconnection cost allocations in NYISO will be built. However, PJM reporting indicates that many solar projects within its interconnection queue complete all required

[423] https://www.nyiso.com/documents/20142/32663964/2021-2040_System_Resource_Outlook_Appendix_DRAFT_v10_ESPWG.pdf/88bcdf99-3e7f-a3ba-0362-4d207ac49ecb p 50

studies and still face attrition. We assigned a 50% derate to all queued projects that are not yet designated "under construction" but have an ISA in hand.[424]

The forecast also includes all renewable and clean energy projects, including OSW, that have approved contracts and/or which have been selected for long-term contract under a state-mandated procurement. All state OSW mandates are fulfilled and make up the bulk of scheduled renewable additions. Over 35 GW of offshore wind is scheduled to come online in PJM, New York, and New England.

Figure A6. OSW Additions in Study Area



Other clean energy procurements for land-based wind and solar were also included. Most of the planned onshore renewables due to contracting are in New York under the Tier 1 large-scale renewables procurements, which are assumed to continue through a 2023 procurement.[425] As vertically integrated utilities, Dominion Virginia Power and Allegheny Power will have more options (long-term contracting, owning facilities) to comply with state clean energy goals than other compliance entities in PJM. LAI added 26 GW of incremental solar development, phased in gradually over the study period, to reflect Alternative Plan B of Dominion Virginia's 2022 Update to the 2020 Integrated Resource Plan.[426] This Alterative Plan reflects Virginia Clean Economy Act goals, which declare 16,100 MW of solar and onshore wind to be in

[424] The 2022 State of the Market Report (2022 State of the Market Report for PJM (monitoringanalytics.com), see Table 12-24) lists historic completion rates of 47.1% for projects that receive an FSA, and 57.4% for projects that receive a CSA.

[425] The 2022 RES solicitation is currently underway, and NYSERDA has issued an RFI for a 2023 solicitation. See Solicitations for Large-scale Renewables - NYSERDA

[426] https://cdn-dominionenergy-prd-001.azureedge.net/-/media/pdfs/global/company/2022-va-integrated-resource-plan.pdf See p. 19.

the public interest.[427] Corporate ESG commitments related to Virginia's future demand for power also support the addition of renewables beyond the current legislative mandate.[428]

Several energy storage goals were modeled:

- New Jersey set a 2,000 MW by 2030 storage goal in the Clean Energy Act.
- Virginia set a 3,100 MW by 2035 goal in law in 2020.
- The New York Public Service Commission has set a 3,000 MW by 2030 storage goal, with an interim target of 1,500 MW by 2025.
- Massachusetts has a storage goal to achieve 1,000 MWh of storage capability by 2025.
- Connecticut has a storage goal to achieve 1,000 MW of storage capability by 2025.

Firm (Scheduled) Retirements

The scenarios include retirements documented by the ISOs in planning documents and notices. PJM deactivations lists are reflected in the resource mix. NYISO retirement notices and ISO-NE permanent de-list bids and non-price retirements through Forward Capacity Auction ("FCA") 17 are also integrated into the retirement assumptions.

Provisions in the Inflation Reduction Act and DOE's Civil Nuclear Credit program, along with state support, reduce near-term economic pressures on the nuclear fleet. LAI assumed that the PSEG nuclear fleet, along with other nuclear units in the study region, will receive Subsequent License Renewals ("SLRs"), which generally bring them to 80 in-service years.[429] While the decision to make capital investments to extend facilities' operating lives is heavily site specific, firms with nuclear assets have taken actions to preserve their ability to receive SLRs. LAI's assumption was also based on discussions with industry experts.

The DEP's carbon dioxide rule sets emissions rate limitations on EGUs within New Jersey. LAI reviewed DEP's impact analysis, as well as emissions data, to set retirement schedules for EGUs that cannot fulfill the rate limits. We assumed that units that cannot meet the 2024 threshold have already submitted deactivation notices to PJM. We retired units that cannot meet the 2027 and 2035 rate thresholds based on a comparison of DEP's emissions rate review to the thresholds, with some deferrals where units may be able to change operations to meet the threshold.[430] The attrition analysis resulted in more than 3,000 MW of retirements, with about 1,300 MW of retirements occurring at the 1,300 lb/MWh threshold in 2027 and about 1,700 MW of retirements at the 1,000 lb/MWh threshold in 2035. Almost all of the combined cycle capability in the state meets the 1,000 lb/MWh threshold and was not scheduled for retirement.

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[427] LIS > Bill Tracking > HB1526 > 2020 session (virginia.gov)

[428] A large portion of the demand increase in PJM is attributable to new data centers planned by Amazon Web Services. Given Amazon's corporate commitments for ESG, along with Virginia state goals, offsetting renewables to "green" this demand may be reasonable.

[429] Several nuclear units in PJM have applied for or intend to apply for NRC SLR, such as Peach Bottom, Surry, and North Anna. Constellation has indicated plans to apply for SLR for the Dresden facility.

[430] Some EGUs may be able to meet rate thresholds by reducing operations at part load. While some of these operations at part (or no) load may garner additional reserves revenues, LAI will not conduct an economic analysis to evaluate these tradeoffs. Delayed retirements were based on LAI's professional judgement coupled with a review of hourly operations via the EPA's Continuous Emissions Monitoring System.

LAI evaluated other unit retirements due to policy considerations in PJM at large, as discussed in PJM's Energy Transition Special Report. The report estimates that as much as 24 GW of fossil capacity may retire as a result of federal, state, and corporate policies.[431]

LAI also assumed significant attrition of downstate New York peaking resources resulting from more restrictive NO_x regulations. Many resources have already submitted retirement or operational changes in response to the interim rates, which began in April 2023, and have indicated likely responses to the final rate restrictions which will require compliance by April 2025.

CAPACITY EXPANSION MODELING

Our capacity expansion forecast utilizes Aurora's Long Term Capacity Expansion functionality to determine an equilibrium path of annual resource additions and retirements beyond scheduled additions and retirements. Under this functionality, Aurora calculates the present value of all existing resources and determines which generators are candidates for retirement based on lowest present value over the forecast period. Expected capacity prices are a direct driver of new build decisions under the simulation logic. LAI can either have capacity prices fixed in Aurora per the calculated proxy prices in the OSW capacity revenue calculation, or otherwise have capacity prices fluctuate per forecasted addition and attrition consistent with PJM's capacity demand curve. The latter option was also used in the second solicitation.

The model iterates to an equilibrium solution given potential candidate new resource options and retirements. In each iteration an updated set of candidate new resource options and retirements is placed into the system and the model performs its chronological commitment and dispatch logic for those resources. The model tracks the economic performance of all new resource options and resources available for retirement based on market prices developed in the iteration. At the end of each iteration the long-term logic decides how to adjust the current set of new builds and retirements, or it determines that the model has converged on an optimal solution. This capacity expansion technique relies on each ISO's capacity demand curve in order to balance supply and demand and determine capacity prices.

Capacity Demand Curve Forecast

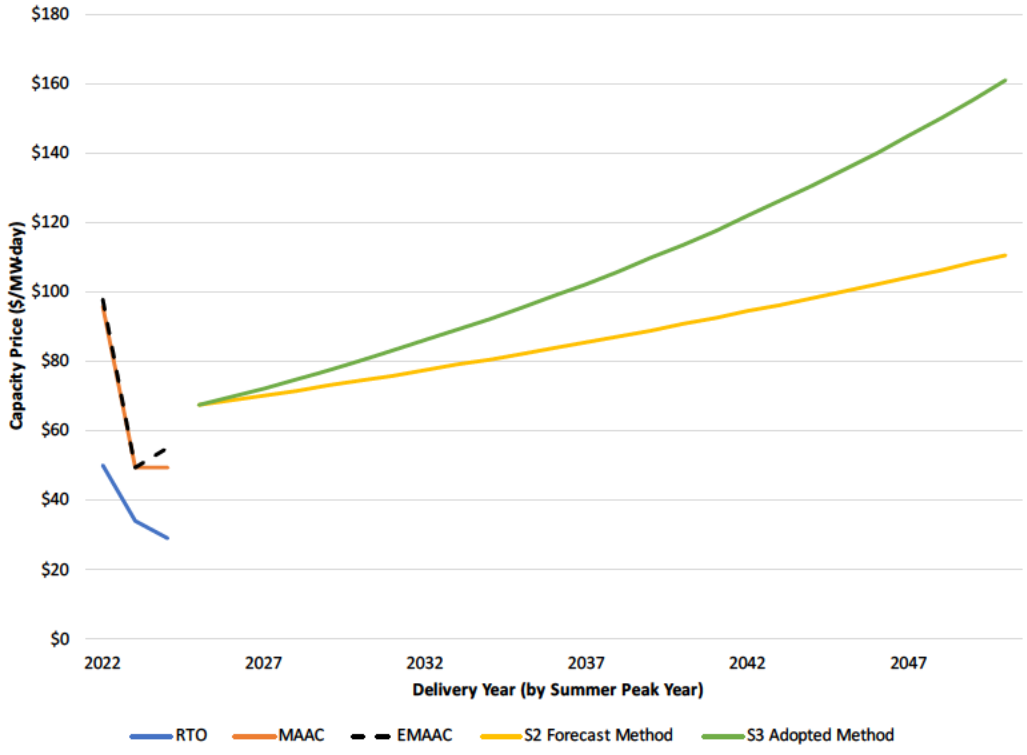
LAI implemented our projection of the PJM demand curve, the Variable Resource Requirement ("VRR"), in the Aurora model to forecast PJM capacity prices. PJM's BRA planning parameters for the 2025/2026 Delivery Year served as the foundation of the VRR forecast. Parameters were adjusted per the latest quadrennial review and future demand from the 2023 Load Forecast Report. Specifically, an adjustment to the points on the VRR curve were made for the ISO and each forecast LDA (MAAC, EMAAC) based on a ratio of the forecasted peak demand net BTM solar to the reported BRA peak for the 2025/2026 Delivery Year. LDA-level requirements were determined using data available on CETL and CETO in the area.

Capacity Price Forecast

As indicated in the SGD, the capacity proxy prices were based on the average of the previous three BRA resource clearing prices. All four of the New Jersey zones cleared as part of the EMAAC LDA in the last three auctions. In the second solicitation, the resource clearing price for the first delivery year was the three-year average price, which was escalated at a 2% annual inflation rate each year thereafter.

[431] energy-transition-in-pjm-resource-retirements-replacements-and-risks.ashx, p. 8.

Figure A7. Capacity Proxy Price Projection



For the third solicitation, LAI adjusted the price escalation rate to reflect the higher escalation rates observed for power generation sector costs relative to a general inflation rate. The nominal escalation rate was set at about 3.5%, which reflects taking the ratio between the last ten years observed in the Handy-Whitman Index that PJM uses to escalate fixed cost estimates for their Avoided Cost Rate, and a general inflation index from the Federal Reserve, and multiplying that ratio against the 2% inflation assumption used previously.

Addition/Attrition Forecasting

Candidate Additions

LAI created candidate resources which Aurora considers for new additions. CONE study CC and CT units, along with battery storage, were modeled as candidate resources. No fossil units were allowed to be sited within New Jersey.

Candidate Retirements

LAI restricted the candidates for retirement to fossil generation which does not serve a cogen purpose. Smaller units (on the order of less than 20 MW) were excluded from the candidate pool to reduce solve iterations needed.

REC Price Forecast

LAI developed a new method to forecast REC prices that better aligns with the "known and knowable" principles used on energy and emissions projections for the first and second solicitations. We eliminated generic additions of renewables, which are unlikely to materialize on a merchant basis. Instead, LAI assumed that absent specific technology goals, EDCs will pay the applicable ACP price. The state with the lowest ACP was assumed to set the Tier 1 REC market price. A preliminary, illustrative example follows. Figure A8 displays 2023 – 2050 annual PJM RPS supply versus state-level demand. If there is a surplus, the

forecasted REC price value is set at $5/MWh to represent low value in the voluntary markets. If there is a shortfall, the price is assumed to clear at the lowest ACP (Maryland in all years) that could be paid to achieve compliance. The price declines in early years as Maryland's ACP declines per statute.

Figure A8. PJM RPS Balance and REC Price Forecast

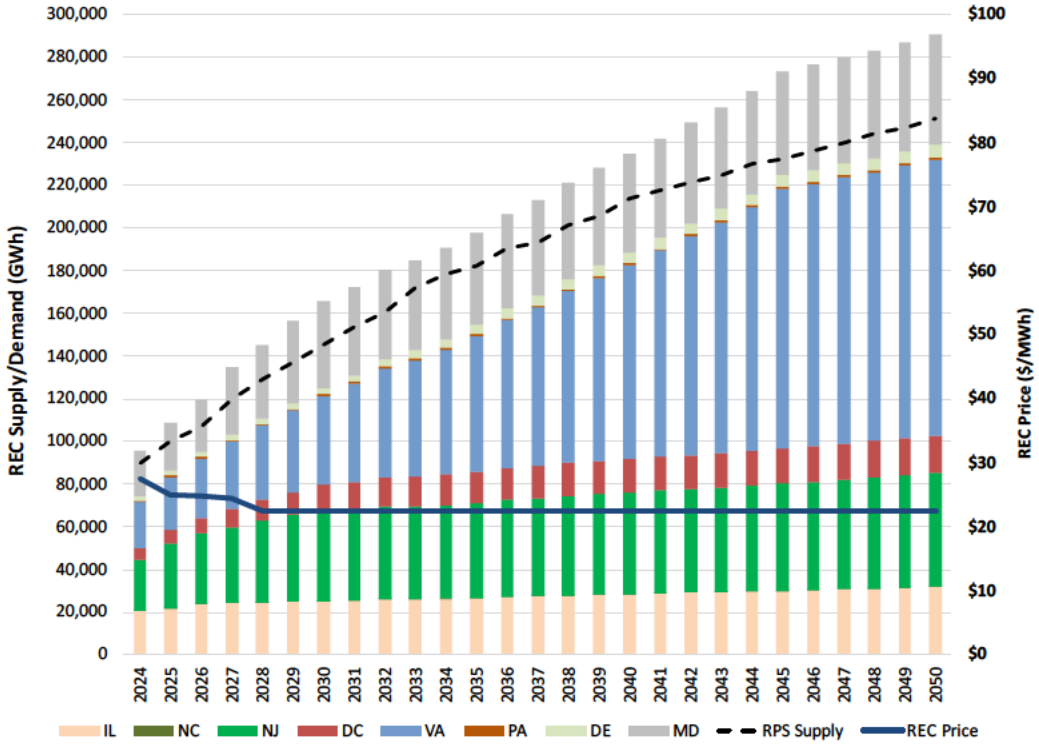
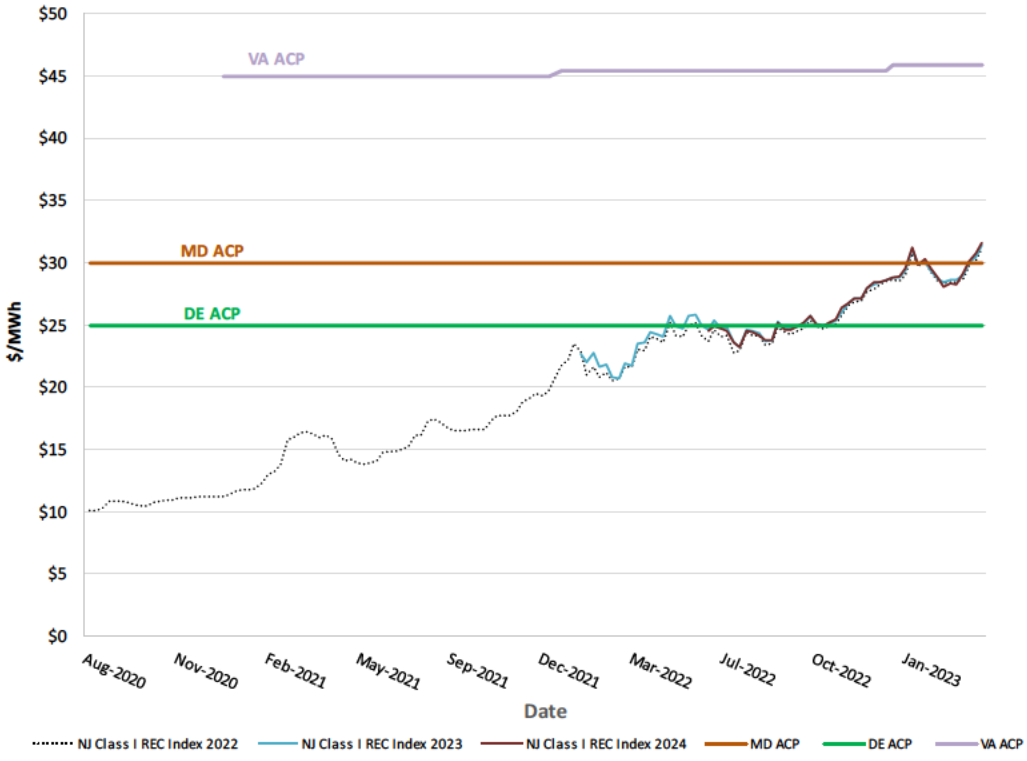


Figure A9 plots available historical REC prices[432] for PJM states in recent years, along with the available ACPs. Note that LAI's projected starting point is consistent with current REC pricing. An Argus report notes recent REC market pressures due to the significant backlog in PJM's interconnection queue and tariff issues with solar products coming from Asia. The report also notes that several states are looking to increase their RPS requirements and exclude some existing resources such as municipal solid waste generators from Tier 1.[433] Nevertheless, by the time that the Projects bid into this solicitation will be in service, LAI's projections indicate a long-term REC shortfall.

[432] S&P Capital IQ NJ RECs are presented in the chart. However, other RECs deliverable within PJM generally track at the same price point.

[433] Viewpoint: PJM clean energy goals up for review | Argus Media

Figure A9. PJM REC Prices and & ACPs ($/MWh)



APPENDIX B: LEVELIZED NET OREC COST CALCULATION

Nominal LNOC for a Project *p* is $PVANC_p$ divided by $PVAQ_p^n$, where PVANC is the Present Value of Annual Net Cost, discounted at the nominal discount rate, *NDR*, and $PVAQ_p^n$ is the Present Value of Annual OREC Quantity, discounted at the nominal discount rate. Annual Net Cost and Annual OREC Quantity are discounted to 2023 from the first OREC contract delivery year, *yf*, to the last delivery year, *yl*.

$$LNOC_p^n = PVANC_p \div PVAQ_p^n$$

$$PVANC_p = \sum_{y=yf}^{yl} \left(OP_{y,p} - ER_{y,p} - CR_{y,p} - RR_{y,p}\right) \div (1 + NDR)^{(y-2023)}$$

$$PVAQ_p^n = \sum_{y=yf}^{yl} OQ_{y,p} \div (1 + NDR)^{(y-2023)}$$

Real LNOC for a project *p* is $PVANC_p$ divided by $PVAQ_p^r$, where $PVAQ_p^r$ is the Present Value of Annual OREC Quantity, discounted at the real discount rate, *RDR*.

$$LNOC_p^r = PVANC_p \div PVAQ_p^r$$

$$PVAQ_p^r = \sum_{y=yf}^{yl} OQ_{y,p} \div (1 + RDR)^{(y-2023)}$$

$$RDR = (1 + NDR) \div (1 + InflationRate) - 1$$

$OQ_{y,p}$ is the total OREC quantity (MWh) for project p in calendar year *y*:

$$OQ_{y,p} = \sum_{m=1}^{12} MOQ_{m,y,p}$$

$MOQ_{m,y,p}$ is the monthly OREC quantity (MWh) for project *p* in month *m* of calendar year *y*:

$$MOQ_{m,y,p} = \sum_{d=1}^{DIM_{m,y}} \sum_{h=1}^{24} HOQ_{h,d,m,y,p}$$

$HOQ_{h,d,m,y,p}$ is the hourly OREC quantity (MWh) for hour *h* of day *d* of month *m* of calendar year *y* for project *p*, and $DIM_{m,y}$ is the number of days in month m of calendar year *y*.

$OP_{y,p}$ is the OREC Payment amount for project *p* in calendar year *y*:

$$OP_{y,p} = \sum_{m=1}^{12} MOQ_{m,y,p} \times OBP_{m,y,p} + MOQ_{m,y,p} \times PBP_{m,y,p}$$

$OBP_{m,y,p}$ is the OREC bid price of the energy year applicable to month *m* of calendar year *y* for project *p*. It may be adjusted for transmission system upgrade cost sharing if appropriate.

$PBP_{m,y,n}$ is the Prebuild bid price of the energy year applicable to month m of calendar year y for project p.

$ER_{y,p}$ is the annual market energy revenue for project *p* in calendar year *y*.

$HEP_{h,d,m,y,l}$ is the hourly market energy price ($/MWh) in hour *h* of day *d* of month *m* in calendar year *y* at location *l*, where location *l* is determined by the project interconnection point.

$$ER_{y.p} = \sum_{m=1}^{12} \sum_{d=1}^{DIM_{m,y}} \sum_{h=1}^{24} HOQ_{h,d,m,y,p} \times HEP_{h,d,m,y,l}$$

$CR_{y,p}$ is the annual market capacity revenue for project *p* in calendar year *y*.

$$CR_{y,p} = \sum_{m=1}^{12} UCAP_{m,y,p} \times DIM_{m,y} \times PC_{m,y.l}$$

$UCAP_{m,y,p}$ is the amount of project *p* UCAP recognized by PJM for month *m* of calendar year *y* (MW).

$PC_{m,y,l}$ is the PJM capacity price applicable to the project location *l* for month *m* of calendar year *y* ($/MW-day).

$RR_{y,p}$ is the annual market REC revenue (avoided cost) for project *p* in calendar year *y*.

RP_y is the New Jersey Class I REC price ($/MWh) for calendar year *y*.

$$RR_{y,p} = RP_y \times OQ_{y,p}$$

To compare portfolios of projects with roughly the same total nominal capacity, first the present value measures $PVANC_p$, $PVAQ_p^n$, and $PVAQ_p^r$ are summed for the *np* included projects. Then, portfolio nominal and real LNOC, and are calculated for each portfolio in the same manner as for individual projects:

$$PLNOC^n = \sum_{p=1}^{np} PVANC_p \div \sum_{p=1}^{np} PVAQ_p^n$$

$$PLNOC^r = \sum_{p=1}^{np} PVANC_p \div \sum_{p=1}^{np} PVAQ_p^r$$

APPENDIX C: IMPLAN INPUT-OUTPUT MODEL DESCRIPTION AND ASSUMPTIONS

LAI first reviewed the information submitted by each Applicant, and then conducted independent analysis using the IMPLAN economic input-output model to support a standard and consistent basis for evaluation.

The purpose of this appendix is to describe key assumptions of the economic input-output model that LAI used to evaluate the economic effects of Project submissions.[434] We first provide background on the conceptual framework of input-output modeling. Then we discuss aspects of IMPLAN and input assumptions relevant to applying it as a standard framework for all project evaluations. Finally, we describe the procedures for preparing project-specific inputs to IMPLAN and for reporting results of the IMPLAN analysis.

ECONOMIC INPUT-OUTPUT MODELING OVERVIEW

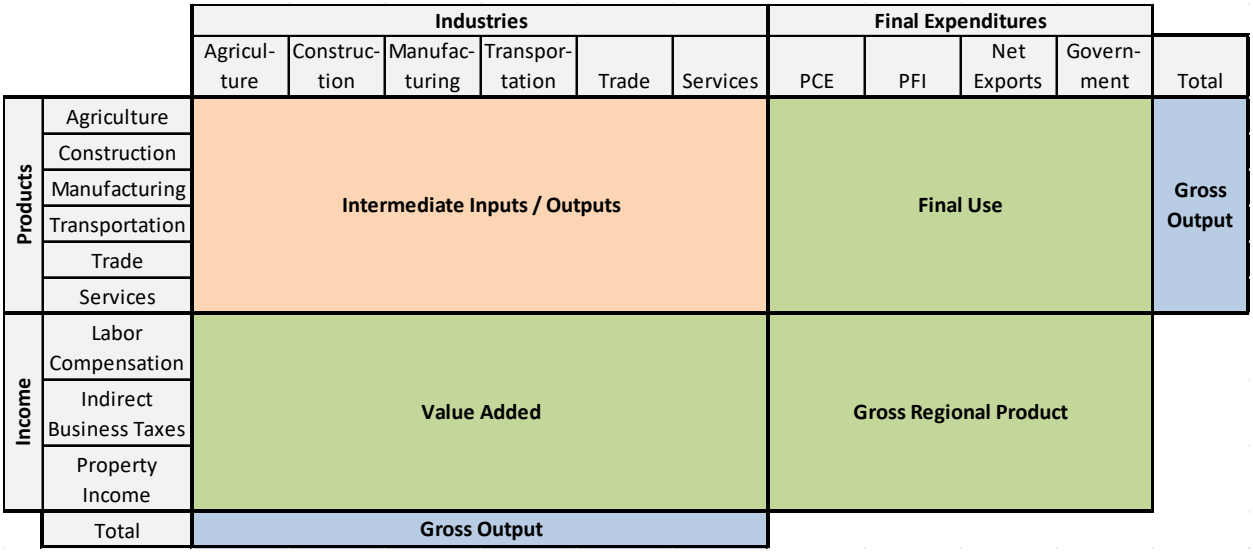
Input-output analysis is a form of economic analysis based on the interdependencies among economic sectors. Input-output analysis is commonly used to estimate the effects of new or incremental project or program spending to a local economy.

An economic input-output ("IO") model contains an inter-industry and inter-institutions matrix of inputs and outputs representing current account flows of economic activity within a defined geographic region. Figure C1 is a schematic of an input-output model matrix of flows. The core of the IO model is the inter-industry matrix, where each column represents an industry's activity, and each row represents outputs of goods or services by the industry. Institutional sectors of households, businesses, and government represent expenditure activities in the right-hand columns, plus next exports as a balancing account. Final demand (use or consumption) in the region is the sum of household personal consumption expenditures ("PCE"), private fixed investment ("PFI"), government spending, and net exports. The bottom rows represent the income or receipts by the institutional sectors. Labor compensation includes employee compensation and proprietor income paid by businesses. Indirect business taxes include excise, sales, and property taxes, and various fees. Property income includes rents, royalties, dividends, and corporate profits. Total value-added equals total expenditures for final use, and gross regional product is equivalent to either measure.[435] In Figure C1, the value added, final use, and gross regional product blocks have the same color to make the point that they are equivalent in total value. Their value does not include the value of intermediate products and services. Rather, gross output value, shown at the bottom of the schematic, does include the value of intermediate production.

[434] A layman's term is economic "impacts", but "effects" is the technical economics term because most of the many changes in the economic system are minor or small and usually spread over a lengthy time interval. In contrast, "impacts" connote the sudden results of a relatively large event,

[435] The equivalent gross regional product term is often called GDP because the latter is a familiar term and the local or regional footprint under study is understood.

Figure C1. Schematic Structure of an Input-Output Model



Value-added is a measure of new economic activity in each stage of production beyond the value of intermediate products and services already produced. Total gross output is a measure of total revenue or sales, which includes the value of intermediate goods and services from earlier stages of production as well as newly created economic value. Hence, for reporting the regional economic effects of a project, value-added is a more appropriate measure than gross output for representing new economic activity.

Economic effects of project expenditures are analyzed in a regional IO model with respect to their local economic interactions in three categories:

- *Direct effects* are the spending or production changes in the industry (industries) used to characterize the events under analysis.
- *Indirect effects* reflect the backward linkage changes in inter-industry purchases in response to the new demands of the directly affected industry (industries).
- *Induced effects* reflect the backward linkage changes in household purchases of goods and services out of the additional income of employees and proprietors that is created by the changes in direct and indirect expenditures.

Total effects are the sum of the direct, indirect, and induced effects.[436]

IMPLAN Model Overview

Due to its minimal project-specific data requirements, ease-of-use, and moderate licensing costs, IMPLAN ("IMpact PLANning") is the predominant tool used to estimate project specific local economic impacts.[437]

[436] Indirect effects are sometimes described as "supply chain" effects but that does not fully reflect the dense, recursive network of multiple rounds of inter-industry purchases. Induced effects are sometimes referred to as "respending" effects, but they arise from increased household income while businesses and governments also respend higher revenues.

[437] IMPLAN has been used for numerous local area evaluations of offshore wind projects by LAI and other consultants on behalf of both project applicants and state procurement or economic development agencies.

The IMPLAN tool is a general economic input-output model comprised of software and regional data sets.[438]

IMPLAN Model Assumptions

The IMPLAN model estimates sector and total effects by assuming that the relationships of the current base data year are maintained. IMPLAN datasets and the model's equations are used to provide a static analysis or snapshot in time (a single year) of the local economy. While estimates of economic activity related to specific demand changes and their associated supply linkages can be estimated with IMPLAN, the model cannot predict the dynamic effects on the local economy in future years. The economy of even a small region is constantly in flux, affected by decisions made by businesses, households, and by local, state, and federal government policies. Uncertainties surrounding technical and demographic changes and the local environmental impacts of climate change further limit the ability to model long-run local economy effects.

IMPLAN also has several other limitations which must be recognized to properly apply the tool and appropriately interpret or adjust its results. First, IMPLAN's static, single-period model assumes that adjustments in the local economy resulting from the direct project expenditures under consideration occur fully and instantly (within the same year), rather than partially with a multi-year distributed time pattern. Second, IMPLAN uses fixed proportions production coefficients (the inputs recipe for making the products of an industry), so it has no factor or product substitution, and assumes constant returns to scale, fixed prices, and unlimited supply availability of inputs (labor, products, capital).

Press releases often report the numbers of "jobs" created without referring to the duration of the jobs. IMPLAN models annual flows of economic activity, so it uses the definition of a "job-year" as one FTE job at 40 hours per week. This FTE job-years definition allows temporary jobs created during the development, construction, and decommissioning phases of a project to be aggregated with the longer-lived jobs created during the operational phase.

IMPLAN Database

A major strength of the IMPLAN database is that it has substantial geographic detail, including state, county, and zip code levels. This allows it to be configured to the desired local study region and to capture product imports and exports between the study region and elsewhere. Inter-area trade is accounted for with regional purchase coefficients that represent the proportion of each dollar of local demand for a given commodity that is purchased from local producers.

IMPLAN data sets are constructed annually by IMPLAN, Inc. Regional data are obtained from many sources, primarily federal agencies responsible for data collection. IMPLAN data contains 546 sectors representing all private industries in the United States, as aggregations of industries defined by the NAICS, plus construction, household, and government sectors. Employment, employee compensation, industry expenditures, commodity demands, and other information are collected to form IMPLAN's database.

The primary sources for data include:

- U.S. Bureau of Labor Statistics ("BLS") Covered Employment and Wages program
- U.S. Bureau of Economic Analysis ("BEA") Regional Economic Information System program

[438] More background information on IMPLAN and its databases is available at www.implan.com.

- U.S. Bureau of Economic Analysis Benchmark I/O Accounts of the U.S.
- BEA Output estimates
- BLS Consumer Expenditure Survey
- U.S. Census Bureau County Business Patterns program
- U.S. Census Bureau Decennial Census and Population Surveys
- U.S. Census Bureau Economic Censuses and Surveys
- U.S. Department of Agriculture Census.

OFFSHORE WIND PROJECT EVALUATION WITH IMPLAN

Applicant Project Data Review

Applicants were requested to provide information regarding local (in-state) expenditures for labor and in total for each item during the development, construction, operations, and decommissioning phases. LAI vetted this information for completeness, consistency, and realism. LAI prepared two sets of CQs to the Applicants to clarify issues related to the input-output model inputs used by the Applicants and other information related to the technical and commercial aspects of the Applicants' projects that would affect estimation of economic development effects. The main objective of the examination of Applicant information is to promote standardization across rival project submissions and to have a firm basis for LAI's independent modeling with IMPLAN.

Sanity checks during the vetting process included, among others:

- Share of locally supplied labor for a direct labor expenditure category, i.e., share of local construction workers engaged in the temporary construction activities (including Tier 1 facilities)
- Share of locally supplied good/service within an industry expenditure category
- Average labor compensation per FTE worker by occupational category relative to that for the current local labor force.

Preparing Project Data Inputs to IMPLAN

As a small, emerging industry, IMPLAN does not have industry sectors specific to offshore wind facility construction or operations. To surmount this limitation, shared with other I-O models, LAI applied the standard Analysis-by-Parts ("ABP") method of formulating composite industry activities to represent in-state expenditures for labor, procurement of materials, products, and services, and transfer payments to organizations that will implement workforce development and other economic development initiatives.[439] The ABP method is basically a budget expenditures recipe to construct the inter-sector economic linkages of a customized industry, such as offshore wind.[440] The four lifecycle phases for an offshore wind project may be thought of as a combination of the offshore wind development, offshore wind construction, offshore wind generation, and offshore wind decommissioning industries. Hence, these four customized industries define the extent of direct effects during the respective project phase.

Direct effects result from project-centric expenditures associated with the development, construction, operations, and decommissioning phases of the project. "Project-centric" expenditures include

[439] The ABP method is also known as the Bill-of-Goods method, but that term does not reflect the fact that labor and other services are also part of the recipe for developing and operating a project.

[440] IMPLAN does not have a sufficiently specific industry for its representation.

contracted services that could be provided by offshore wind project employees in addition to those performed by internal employees. For example, WTG maintenance and inspection activities may be done by local workers that are either direct employees of the offshore wind resource owner or by the OEM service and maintenance contract provider. Another example is that operation and maintenance of a vessel for ferrying workers to the offshore wind site could be done by a subcontractor or by the owner.

The Applicants were requested to specify local expenditures by budget item, and to also provide estimates for labor FTE-years and labor compensation used in their modeling of Project economic effects. The local materials and services expenses were provided separately for the project development, construction, operation, and decommissioning phases. Applicants were required to map the expenditure line items to the appropriate NAICS industry. LAI used the IMPLAN mappings of these detailed NAICS expenditure categories into the much more aggregated IMPLAN industry sectors. In a few cases, LAI used its judgment based on knowledge of the production technology underlying the product procured, to reassign the expenditure to a different NAICS category, but that only resulted in a few instances that altered the IMPLAN industry used for the expenditure item.