The Narragansett Electric Company
d/b/a Rhode Island Energy

2022 Rhode Island Offshore Wind Request For Proposal

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Attachment JMR-1 – RFP & Appendices

REVISED
REQUEST FOR PROPOSALS

FOR

LONG-TERM CONTRACTS FOR OFFSHORE WIND ENERGY

Issuance Date: October 14, 2022
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The Narragansett Electric Company d/b/a Rhode Island Energy

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I. Introduction and Overview

1.1 Purpose of the Request for Proposals ("RFP")

The Narragansett Electric Company d/b/a Rhode Island Energy ("Rhode Island Energy" or the "Company"), an electric distribution company serving customers in Rhode Island, seeks proposals for the supply of offshore wind energy as well as Renewable Energy Certificates and all related environmental attributes[1] (collectively, "RECs") from eligible offshore wind energy projects under one or more long-term power purchase agreements ("PPAs"). This RFP is being issued pursuant to the amendments to the Affordable Clean Energy Security Act, R.I. Gen. Laws ch. 39-31, signed into law by Governor McKee on June 29, 2022 (as so amended, the "ACES"). The ACES, as amended, is included as Appendix B to this RFP.

In this RFP, Rhode Island Energy is soliciting bids to enter into long-term PPAs for energy and RECs from newly developed offshore wind energy. Long-term contract durations should be at least 15 years and may not exceed 20 years. For more details, please refer to Section 2.2.2.4, "Allowable Contract Term." Any PPAs entered into as a result of this solicitation are subject to review and approval by the Rhode Island Public Utilities Commission (the "Commission" or "PUC"). See R.I. Gen. Laws § 39-31-10(c). More information and details about the ACES obligation and its requirements are described in Section 1.2 below.

This RFP includes a draft contract for offshore wind energy generation ("Draft Contract"), as Appendix C, and the terms of any PPAs will be finalized between Rhode Island Energy and successful bidders based on the proposals submitted and selected in accordance with the process set forth in this RFP. Rhode Island Energy reserves the right to reject any or all changes to the Draft Contract included in a selected proposal.

Rhode Island Energy may invite the Pascoag Utility District ("PUD") and the Block Island Power Company ("BIPCo") to purchase a portion of the energy and RECs from any selected project(s) under the ACES.[2]

This RFP outlines the process that Rhode Island Energy plans to follow, sets forth timetables regarding the solicitation process, provides information and instructions to prospective bidders, and describes the evaluation process that will be followed once proposals are received.

1 Such RECs include, but are not limited to, all associated clean energy attribute certificates issued in the New England Power Pool Generation Information System.

2 After any project(s) have been selected by Rhode Island Energy for PPAs, PUD and BIPCo may be allocated a portion of the energy and REC purchases based on their relative load shares, provided that such purchases are specifically authorized by PUD and BIPCo as being in the best interest of their ratepayers, and that such purchases are projected to reduce or have no effect on the cost to Rhode Island Energy's customers. If both PUD and BIPCo are allocated a portion of the energy and RECs, their combined share of the project's total output being purchased pursuant to their RFP would be approximately one percent (1%).

1.2 Statutory and Regulatory Framework of the ACES

The ACES requires an electric distribution company to issue a request for proposals for at least approximately 600 MW and no more than approximately 1,000 MW of newly-developed offshore wind capacity, in consultation with the Rhode Island Office of Energy Resources (the "OER") and the Rhode Island Division of Public Utilities and Carriers (the "Division"). R.I. Gen. Laws §§ 39-31-10. The amount of energy and RECs procured in this solicitation will depend on Rhode Island Energy's evaluation of the proposals submitted, and Rhode Island Energy is not required to enter into negotiations with any bidder if it determines that those negotiations are unlikely to lead to a contract that complies with all of the requirements of §§ 39-31-6 and 39-31-10 of the ACES. See R.I. Gen. Laws §39.31-10(c). A determination by Rhode Island Energy not to enter into negotiations for a PPA as a result of this RFP would require the approval of the Commission. See R.I. Gen. Laws §39.31-10(d).

All PPAs approved under the ACES must be commercially reasonable long-term contracts[3] between electric distribution companies and developers or sponsors of newly developed offshore wind capacity, and are ultimately subject to PUC approval. R.I. Gen. Laws § 39-31-6(a)(1)(iii). Under the ACES, PPAs must also be consistent with the achievement of the state's greenhouse gas reduction targets as specified in chapter 6.2 of title 42 (the "2021 Act on Climate"). R.I. Gen. Laws § 39-31-6(a)(1)(vii)(C). The offshore wind energy resource(s) being sought through this RFP must be a "newly developed renewable energy resource." Although "newly developed offshore wind capacity" is not defined by the ACES, the Long-Term Contracting Standard for Renewable Energy (R.I. Gen. Laws ch. 39-26.1) and the "Rules and Regulations Governing Long-Term Contracting Standards for Renewable Energy" (the "Regulations") promulgated by the Commission define "newly developed renewable resource" as an electric generation unit that uses exclusively an eligible renewable energy resource to generate electricity, and that has neither begun operation, nor have the developers of the units implemented investment or lending arrangements necessary to finance the construction of the unit. R.I. Gen. Laws § 39-26.1-2(7); Section 1.3 of the Regulations. Rhode Island Energy intends to apply this standard to determine the eligibility of generating facilities in this RFP. For more details on the eligibility of a facility under this RFP, please refer to Section 2.2.2.2 below.

All approved projects, regardless of their location, must improve energy system reliability and security; enhance economic competitiveness by reducing energy costs to attract new investment and job growth opportunities and protect the quality of life and environment for all residents and business. R.I. Gen. Laws § 39-31-2. In sum, a PPA must meet the following ACES

3 See R.I. Gen. Laws § 39-31-3 (defining "commercially reasonable"). In the Report and Order in PUC Docket No. 4929 issued June 7, 2019, the PUC found that the Revolution Wind Offshore Wind Power Purchase Agreement was commercially reasonable because: (i) the terms and pricing were reasonably consistent with what an experienced power market analyst would expect to see in transactions involving regional-energy resources and regional-energy infrastructure; (ii) the project had a credible commercial operation date; and (iii) the benefits to Rhode Island, including the total energy security, reliability, environmental and economic benefits to the State of Rhode Island and its ratepayers, were likely to exceed the cost of the project.

requirements for approval by the PUC:

(a) the project must be "newly developed offshore wind capacity";

(b) the project must be qualified as a "newly developed renewable energy resource";

(c) the PPA must be commercially reasonable;

(d) the requirements for the solicitation must be met;

(e) the PPA must be consistent with the achievement of the state's greenhouse gas reduction targets under the 2021 Act on Climate;

(f) the PPA must be consistent with the purposes of the ACES; and

(g) regardless of location, the project must improve energy system reliability and security; enhance economic competitiveness by reducing energy costs to attract new investment and job growth opportunities and protect the quality of life and environment for all residents and business. R.I. Gen. Laws § 39-31-2.

Additionally, the project must operate in a designated wind energy area for which an initial federal lease was issued on a competitive basis after January 1, 2012. The project must be located on the Outer Continental Shelf and no turbine may be located within ten (10) statute miles of any inhabited area. (See Section 2.2.2.2 below)

1.3 Procurement Process and Evaluation Approach

The timeline for evaluation and selection following the issuance of this RFP, as well as the schedule for other steps in the process including approval by the PUC, is set forth below in Section 3.1. The evaluation of bids will be conducted by Rhode Island Energy, in consultation with OER and the Division. The procurement process is designed to have three stages of evaluation, as described in Section II of this RFP.

In Stage One, proposals will be evaluated on the basis of whether eligibility and threshold requirements are satisfied. Eligibility requirements are designed to ensure that the proposals under review offer the appropriate products and PPA tenor from Eligible Facilities (as defined in Section 2.2.2.2). Threshold requirements are designed to ensure that proposed projects satisfy statutory criteria under the ACES, meet minimum standards for viability and don't expose the Company and its customers to unreasonable risk. Rhode Island Energy reserves the right to conduct further evaluation of a proposal, at its discretion, before the Stage One evaluation is complete.

In Stage Two, bids that pass the eligibility and threshold review in Stage One will be evaluated based on specified price and non-price evaluation criteria. This portion of the evaluation will be quantitative in nature (i.e., a quantitative scoring system will be utilized) and is described in more detail in Section 2.3 below. Proposals that meet the eligibility and threshold review and that score favorably in the combined price and non-price scoring of Stage Two will advance to the final stage of the evaluation process.

In Stage Three, further evaluation of the remaining bids will be conducted on matters pertaining to project viability and the extent to which the bids, individually and perhaps considered with others as part of a portfolio, achieve a variety of objectives, including cost-effectiveness and other economic benefits to the state of Rhode Island, impacts on customer bills and other specific goals in the ACES. In addition, any other potential benefits or risks not captured elsewhere in the analysis will be taken into account at this stage. Rhode Island Energy will select a proposal or a portfolio of proposals for PPA consideration and negotiation from this pool unless it determines that no proposal is likely to lead to a contract complying with ACES. All three stages of the evaluation process, including the pertinent criteria, are described in Section II of this RFP.

1.4 Communications between Rhode Island Energy and Bidders

With the exception of the bidders' conference (see Section 3.1 below), all pre-bid contact with prospective bidders and other interested parties will be via email and the Rhode Island Energy energy procurement website provided in Section 3.5 below. Bidders should submit all questions by email, and Rhode Island Energy will post responses to the website. Copies of proposals must be submitted to Rhode Island Energy in the manner and at the mailing/delivery address set forth in Section 3.5 of this RFP.

Following the submission of a proposal, it is the bidder's responsibility to keep Rhode Island Energy informed on a timely basis of any changes in the status of its proposal and/or project for the next 184 days that its bid must remain open. These communications shall not include revisions to the bidder's proposals. Rhode Island Energy retains the right to seek additional information from any bidder, including any proposal clarification, and the right to request that a bidder address changes in circumstances, until a final contract is executed.

II. Bid Evaluation and Selection Criteria and Process

2.1 Overview of Bid Evaluation and Selection Process

Proposals received by Rhode Island Energy will be subjected to a consistent and defined review, evaluation, and selection process, as described in the following sections. Based on the results of the evaluation, Rhode Island Energy will select proposals for contract negotiations, and will file any and all executed contracts for review and approval by the PUC. **Each executed contract will be filed with the PUC in its entirety with sensitive information potentially subject to redaction. Note that the contract price will not be protected as sensitive information.**

2.2 Eligibility, Threshold and Other Minimum Requirements — Stage One

2.2.1 Introduction

In order to qualify for detailed evaluation, a proposal must be timely submitted[4] and satisfy certain minimum requirements, which are: (1) eligibility requirements; (2) a variety of threshold requirements; and (3) other requirements pertaining to participation in this RFP, including bidder certifications and allowable pricing. If a proposal does not satisfy all of these Stage One requirements, it may be disqualified from further review and evaluation.[5] See Sections 2.2.2 through 2.2.4 below.

2.2.2 Eligibility Requirements

All proposals must meet the following eligibility requirements set forth below. Specifically, proposals will be considered from an "Eligible Bidder" with respect to "Eligible Products" generated from an "Eligible Facility." The Eligible Products must be offered for the "Allowable Contract Term" in quantities that are equal or greater than the "Minimum Contract Size." Failure to meet any of these requirements will lead to disqualification of the proposal from further review and evaluation.

2.2.2.1 Eligible Bidder

An "Eligible Bidder" is the developer of an Eligible Facility for offshore wind energy or is in possession of the development rights to an Eligible Facility for offshore wind energy, i.e., the developer of the Eligible Facility for offshore wind energy.

2.2.2.2 Eligible Facility

An "Eligible Facility" must be an offshore wind generation facility that qualifies as both an eligible renewable energy resource as defined in R.I. Gen. Laws §39-26-5 and a "newly developed renewable energy resource." A "newly developed renewable energy resource" is defined in R.I. Gen. Laws § 39-26.1-2(7) as an electrical generation unit that uses exclusively an eligible renewable energy resource, and that has neither begun operation, nor has the developer of the unit implemented investment or lending agreements necessary to finance the construction of the unit. As of the date of contract signing, the generation unit(s) must not have begun operation, and the developers must not have implemented investment or lending

4 For it to be eligible, Rhode Island Energy must receive a bid by 12:00 p.m. (i.e., noon), Eastern Prevailing Time on the due date for proposals, as set forth in Section 3.1 below.

5 Rhode Island Energy reserves the right to conduct further evaluation of a proposal, at its discretion, before the Stage One evaluation is complete.

arrangements to finance construction.[6] An Eligible Bidder must demonstrate that it has a federal lease issued on a competitive basis after January 1, 2012 for an offshore wind energy generation site that is located on the Outer Continental Shelf and for which no turbine is located within 10 miles of any inhabited area.

2.2.2.3 Eligible Products

An Eligible Bidder must propose to sell energy and all associated Environmental Attributes, including RECs, from an Eligible Facility under a PPA (the "Eligible Products"). The structure of the contract must be both unit-specific and unit-contingent (i.e., if the specific wind turbines identified as comprising seller's project produce energy and RECs, then seller must deliver that energy and those RECs to buyer) and the delivery point under the contract must be to existing onshore ISO-NE Pool Transmission Facilities ("PTF") located within ISO-NE. A bidder may propose multiple delivery points, so long as each delivery point satisfies the requirements of this RFP and the Draft Contract and the bidder specifies the generation profile for each delivery point. Unless otherwise directed by the Commission, the Company intends to sell all energy immediately into the wholesale spot market and use the RECs to meet the Rhode Island Renewable Energy Standard. Any excess RECs will be sold into the REC market.

It is the bidder's responsibility to satisfy the delivery requirement. The delivery point must be an existing onshore ISO-NE PTF and located so that Rhode Island Energy is not responsible for wheeling charges to move energy. Rhode Island Energy will not be responsible for any costs associated with delivery other than the payment of the contract price. Similarly, Rhode Island Energy will not be responsible for any scheduling associated with delivery. Rhode Island Energy will not be the Lead Market Participant, as defined by ISO-NE, for any project.

2.2.2.4 Allowable Contract Term

An Eligible Bidder must submit a proposal for the sale of Eligible Products from an Eligible Facility for a term of at least 15 years and no more than 20 years.

2.2.2.5 Minimum/Maximum Contract Size and Allowable Alternative Bids

The Minimum/Maximum Contract Size is the proposed amount of Eligible Products from all or a portion of the net generating capability of an Eligible Facility that is, at a minimum, 100 MW and, at a maximum, approximately 1,000 MW.[7] Each Eligible Bidder is required to submit at

6 The Eligible Facility may be a distinct phase of wind turbines that is co-located with existing wind turbines in the same Federal lease area, so long as the specific turbines under contract with Rhode Island Energy can be identified and satisfy the criteria for being an "Eligible Facility."

7 If a bidder proposes to use wind turbines with a nameplate capacity that would require it to build a project that is greater than 1,000 MW (i.e,. 1,000 MW is not evenly divisible by the nameplate capacity of the turbine), the bidder's proposal must not exceed the 1,000 MW maximum capacity by greater than half of a turbine size (i.e., if the project utilizes 14 MW turbines, the maximum capacity may not exceed 1,007 MW).

least one proposal that is at least 100 MW and no more than approximately 1,000 MW. Eligible bidders are encouraged to offer multiple project sizes and to indicate the extent to which their bids may be scalable to accommodate adjustment if they are conditionally accepted as part of a portfolio of bids, or for other reasons. A bidder may bid the entire production of Eligible Products from its proposed Eligible Facility, or any fixed percentage of the production for its proposed Eligible Facility, provided that if a bidder only proposes a fixed percentage of the production from its proposed Eligible Facility, the pro rata portion of that production must be equivalent to at least 100 MW and must not exceed approximately 1,000 MW (e.g., if a bidder proposes one-half of the production from its Eligible Facility, then the generating capability of that Eligible Facility must be at least 200 MW and must not exceed 2,000 MW) and would allow for unit-specific and unit-contingent allocation in the contract(s).

Two or more Eligible Bidders, together, may submit a joint conforming proposal consisting of two or more Eligible Facilities, provided such bidders propose a sharing, to some extent, of common delivery and interconnection facilities. Rhode Island Energy would be willing to enter into separate contracts with each Eligible Bidder for the purchase of the energy and RECs produced from its Eligible Facility, provided that any agreements required between the Eligible Bidders (e.g., as to their individual and/or shared obligations and responsibilities associated with the construction and operation of their common facilities) shall not involve Rhode Island Energy, nor affect the obligations and responsibilities each Seller will have under its separate PPA with Rhode Island Energy.

2.2.3 Threshold Requirements

2.2.3.1 Introduction

Proposals that meet all the Eligibility Requirements will be evaluated to determine compliance with threshold requirements, which have been designed to screen out proposals that are: insufficiently mature from a project development perspective; lack technical viability; impose unacceptable financial or accounting consequences for Rhode Island Energy; are not in compliance with RFP requirements pertaining to credit support; fail to satisfy minimum standards for bidder experience and ability to finance the proposed project; or fail to include elements required by the ACES. The threshold requirements for this RFP are set forth below.

2.2.3.2 Reasonable Project Schedule

Rhode Island Energy is interested in projects that can demonstrate the ability to develop, permit, finance, and construct the proposed Eligible Facility within a reasonably proximate time. To that end, Eligible Bidders must provide a reasonable schedule that provides deadlines for all of the following events, after the contract execution date:

a. Receipt of all permits necessary to construct and operate the facility;
b. Closing of construction financing;
c. Commencement of construction;
d. Execution of interconnection agreement with ISO-NE and interconnecting utility; and
e. Commercial Operation Date.

Bidders must demonstrate that their projects have a credible operation date. The term "credible operation date" means the project is more likely than not to come on line by the date that is projected within the proposal, as evidenced by documents filed by a bidder showing, at a minimum, the following:

- commencement of permitting processes;
- a plan for completing all permitting processes;
- viable resource assessment;
- environmental assessment/ Environmental and Fisheries Mitigation Plan, which shall include site and environmental data transparency requirements, as further described in Section 2.3.3.3 ("EFMP");
- viable financing plans;
- viable installation and electrical interconnect plans;
- material progress toward acquisition of real property rights; and
- evidence of material vendor activity.

Other considerations for establishing a credible operation date include:

- developer experience in completing projects within New England by proposed dates;
- assignment of an ISO-NE interconnection queue position; and
- developer's ability to secure financing necessary to complete the project by the proposed date.

A proposal that does not have a reasonable schedule for the application for, and receipt of, necessary permits and approvals may be determined not to have satisfied this threshold requirement. In addition, a proposal that is determined to have a "fatal flaw" such that it will be unable to obtain permits or property rights necessary to finance and construct the proposed project may be determined not to have satisfied this threshold requirement.

2.2.3.3 Site Control

An Eligible Bidder must demonstrate that it has a federal lease for an offshore wind energy generation site, as described in Section 2.2.2.2, as well as a valid lease, or option to lease, for marine terminal facilities necessary for staging and deployment of major project components to the project site. The bidder must also detail the proposed interconnection site and both the offshore and the onshore route and describe what rights the bidder has to both, and provide a detailed plan and timeline for the acquisition of any additional necessary rights. The bidder may identify alternative offshore and onshore routes to the proposed delivery point, describing the factors relevant to which route will be ultimately selected.[8] Bidders are encouraged to co-locate transmission cables with existing cables where feasible to minimize the impacts of those cables. For each route the bidder must: (i) specifically describe the portions of the route for which the

[8] Bidders may also propose alternative interconnection points. As described in Section 2.2.4.5, a bid submitted with alternative interconnection points will require a bid fee payment for each proposed alternative interconnection point.

bidder has acquired sufficient rights to locate its Offshore Delivery Facilities proposed,[9] and (ii) provide a reasonable and achievable detailed plan (with a timeline) to acquire sufficient rights to the remainder of the necessary Offshore Delivery Facilities locations. The required information and documentation shall include the following:

i. Plans, including a map of the Eligible Facility site that clearly delineates the perimeter of the area in which offshore wind turbines will be placed, a map showing the location of the marine terminal facility, the proposed water routes to the project site, a map of the proposed interconnection that includes the path from the Eligible Facility site to the interconnection location, all onshore transmission and interconnection locations and details and, to the extent a bid includes or references Offshore Delivery Facilities, a map that shows those facilities' location(s). To the extent that alternative routes for offshore and onshore interconnection facilities have been considered in developing the bid, maps showing these locations should also be provided. Maps should be of scales required to identify significant marine or terrestrial features, e.g. shellfish management areas, parks, highways, etc.;

ii. A description of all government-issued permits, approvals, and authorizations that have been obtained or need to be obtained for the use and operation of the Eligible Facility site, the proposed onshore interconnection and transmission locations, and associated Offshore Delivery Facilities and the location(s) of such facilities. Provide copies of any permits, approvals, and authorizations obtained, and a detailed plan and timeline to secure the remaining permits, approvals, and authorizations for all offshore and onshore routes;

iii. A copy of each of the leases, agreements, easements, and related documents granting the right to use the Eligible Facility site, the marine terminal for deployment of major project components, and, if available, the transmission and interconnection location (and applicable letters of intent if formal agreements have not been executed);

iv. A copy of each of the related leases, agreements, easements, and related documents that have been obtained for the route of the Offshore Delivery Facilities (and applicable letters of intent if formal agreements have not been executed);

v. A description of the area surrounding any land-based project area, including the marine terminal for deployment of major project components (e.g., foundations, towers, blades, rotors, offshore substations) and all transmission and interconnection facility locations, and a copy of each of the related leases, agreements, easements, and related documents that have been obtained (and applicable letters of intent if formal agreements have not been executed); and

vi. A description of the stakeholder engagement plan, including identification of groups of stakeholders to be included, engagement goals for each such group, engagement activities and community partnerships included in the plan, and demonstrated evidence of past and current productive relationships with project stakeholders.

[9] "Offshore Delivery Facilities" is defined as the transmission or interconnection facilities constructed by an Eligible Bidder to transport energy from an Eligible Facility to an existing onshore PTF. Site control information as described above must be provided for all Offshore Delivery Facilities associated with the bid.

2.2.3.4 Interconnection and Delivery Requirements

The delivery of Eligible Products from an Eligible Facility must occur throughout the term of the contract. Substitution of non-Eligible Products is not allowed for delivery or firming of delivery. It is the responsibility of the bidder to satisfy the delivery requirement. Rhode Island Energy will not be responsible for any costs associated with delivery other than the payment of the contract price. Similarly, Rhode Island Energy will not be responsible for any scheduling associated with delivery.

The bidder will be responsible for all costs associated with and/or arising from: (a) interconnecting its project to the PTF at both the Network Capability Interconnection Standard (“NCIS”) and the Capacity Capability Interconnection Standard (“CCIS”) level and (b) for ensuring that the generation is delivered, and recognized in ISO-NE’s settlement system as injected in the ISO-NE energy market, at the specified and agreed upon ISO-NE pricing node. The bidder must agree to deliver energy to Rhode Island Energy in the ISO-NE Settlement Market System by registering Rhode Island Energy as one of the asset owners on the ISO-NE Generation Asset Registration Form for the facility, which registration will also reflect the capacity of any additional offshore wind generation facilities that share an ISO-NE meter with the Eligible Facility.

Rhode Island Energy is seeking projects from which the expected generation delivery profile submitted in its bid can be delivered without material constraints or curtailments. Consequently, bidders must demonstrate that their proposed point of delivery into ISO-NE, along with their proposed interconnection and transmission or distribution system upgrades, is sufficient to ensure full delivery consistent with the proposal’s submitted generation profile. Proposals must include in their pricing all interconnection and transmission or distribution system upgrade costs required to ensure such delivery, including upgrades that may need to occur beyond the point of interconnection.

The expected generation delivery profile submitted by the bidder should reflect any remaining projected non-material constraints or curtailments, if any, associated with the proposal (after inclusion of any network upgrades associated with application of the NCIS and CCIS interconnection standard, and any additional network upgrades proposed by the bidder for the project). If a bidder’s proposal and associated generation delivery profile includes and assumes additional network upgrades (which the bidder would be committed to have built, would be instituted through an elective upgrade process with ISO-NE, and for which the bidder would also have complete cost responsibility), then, as is the case with the required NCIS and CCIS interconnection upgrades, the bidder must include all details of such additional network upgrades, including supporting studies and information, necessary to allow a proper evaluation of the proposal.

The amount paid for any energy and/or RECs under the PPA will be reduced to reflect any costs related to network upgrades and/or the interconnection of the project to the transmission system of the interconnecting utility that are collected under the ISO-NE Tariff or ISO-NE rules or under any tariff or other cost recovery mechanism for regionalized offshore transmission facilities.

The generation unit shall comply with all ISO-NE and FERC interconnection requirements for generation facilities and interregional ties, as applicable. The RECs must be delivered into Rhode Island Energy's NEPOOL Generation Information System ("GIS") accounts.

To meet this requirement, bidders must submit a plan that clearly demonstrates how generation will be delivered from or by the proposed eligible project to the delivery point that is a PTF Node as outlined in Section 6 of Appendix A to this RFP.

The bidder must detail the status (and conclusions, as available) of interconnection applications and studies, as further described in Section 6 of Appendix A to this RFP. Further, bidders must describe how proposals would be affected if the Eligible Facility is connected to regionalized offshore transmission facilities.

All projects submitted by bidders must have filed an interconnection request with ISO-NE, seeking Capacity Network Resource service. Projects that have received their I.3.9 approval from ISO-NE must identify that approval and include such documentation in their proposal. Proposals that do not have I.3.9 approval from ISO-NE must include an ISO-NE Feasibility Study or a study performed by a third party in accordance with the NCIS as defined by the ISO-NE Planning Procedure 5-6. All third-party technical reports or system impact studies should approximate the ISO-NE interconnection process, including but not limited to clear documentation of study technical and cost assumptions, reasoning, and justification of such assumptions.

All technical reports or studies must use the current ISO-NE interconnection process and must also detail any assumptions with respect to projects that are ahead of the proposed project in the ISO-NE interconnection queue and any assumptions as to changes to the transmission system that differ from the current ISO-NE Regional System Plan.

Bidders are strongly encouraged to include a scenario analysis in their studies that shows how changes in the project interconnection queue could impact their interconnection costs using the current ISO-NE interconnection rules. Bidders are encouraged to include additional reports, analysis and studies that support their interconnection and deliverability. To assist in identifying potential additional constraints on the project's deliverability, bidders must perform and provide an Informative Deliverability Study according to the criteria defined in Appendix F. This study is in addition to the required NCIS and CCIS studies discussed above. Its purpose is simply to identify system constraints under specified generation dispatch conditions, not to address the constraints with system upgrades or reductions in proposed delivery profile.

To the extent that ISO-NE is considering changes to the current interconnection rules, bidders may also submit studies using the new ISO-NE proposed process. Any such studies must be accompanied with clear documentation of study technical and cost assumptions, reasoning, and justification of such assumptions. Rhode Island Energy may consider such additional studies during the evaluation process if applicable, but will not consider submissions based on interconnection processes or rules that have not been proposed by ISO-NE. Rhode Island Energy will consider updates to the Federal Energy Regulatory Commission's pro forma large generator interconnection procedures as contemplated by the June 16, 2022 Notice of Proposed Rulemaking to the extent that those updates are effective prior to the selection of one or more bids under this RFP.

The burden is on bidders to provide Rhode Island Energy with information, analysis, and studies required by Rhode Island Energy in order to make a determination that the proposal includes all costs associated with completing the upgrades that would be required by ISO-NE's NCIS and CCIS. Bidders must provide adequate information and analyses regarding the upgrades and must explain how the identified upgrades will satisfy their interconnection standard.

Each proposal must include a commitment to interconnect to the ISO-NE PTF at a CCIS and NCIS level. Each proposal must include a commitment to complete the Forward Capacity Auction Qualification ("FCAQ") process set forth in Section III.13.1 of Market Rule 1 of ISO-NE's Transmission Markets and Services Tariff, and to meet all FCAQ requirements in order to establish its ability to interconnect at this level. Each Bidder's proposal must use the ISO-NE FCA Wind Qualification Template spreadsheet to approximate the qualified capacity associated with its proposed project. The final amount of capacity to be requested and submitted by the bidder under the FCAQ will be determined in the ISO-NE FCA Wind Qualification Template spreadsheet, updated by the bidder with the required time series data for each of the most recent Capability Years for which there is supporting data at that time. In addition, bidders are encouraged to provide any additional data, studies, or information on forecast methodologies they believe would facilitate analysis of their bids' Wind Qualification analysis.

Final determination of the network upgrades and other interconnection features required to support a bidder's CCIS interconnection will be determined by the ISO-NE under the FCAQ process. However, each proposal must include a realistic and specific plan to implement any transmission system upgrades or other work anticipated to be needed to achieve CCIS interconnection, as identified under the FCAQ process. To the extent that ISO-NE studies have not yet been conducted to ascertain the network upgrades and other interconnection costs required to achieve such CCIS interconnection at the time of bidding, a bidder may include a preliminary non-binding overlapping impact study conducted by ISO-NE to identify the potential upgrades and associated costs that would be required by ISO-NE's CCIS interconnection determination, or may identify such costs through relevant studies and analyses performed by them or their consultants that approximate the ISO-NE interconnection process. These studies and their supporting documentation, assumptions and data must match closely ISO-NE study requirements for CCIS interconnection. Rhode Island Energy expects bidders to provide studies that are consistent with ISO-NE's approach and that approximate what the ISO-NE results would be.

Proposals with a Qualification Determination Notification ("QDN") from ISO-NE for their proposed capacity amount and commitment period must include all QDN documentation in their proposal. All projects that do not have a QDN for their proposed capacity amount and commitment period must provide a study performed by ISO-NE or a third party in accordance with ISO-NE Planning Procedure 10 in order to prove ability to interconnect at the CCIS.

While the requirement to interconnect at the CCIS level will require the proposed project to complete the FCAQ process, and qualify for participation in a Forward Capacity Auction ("FCA"), bidders are not required by Rhode Island Energy to participate in an FCA of the ISO-NE Forward Capacity Market in pursuit of clearing with a Capacity Supply Obligation. Rhode Island Energy will not purchase capacity from the project if the project clears in the FCA, and any capacity revenues will accrue to the Lead Market Participant for the project. In any case, the bidder must complete any upgrades that are identified in the FCAQ process to interconnect at the NCIS and CCIS levels.

2.2.3.5 Technical and Logistical Viability; Ability to Finance the Proposed Project

The bidder must demonstrate that the technology it proposes to use is technically viable and that the bidder has the ability to finance the proposed project. Technical viability may be demonstrated by showing that the technology is commercially available and has been used successfully. If a bidder plans to use technology that is not commercially proven, it must provide evidence that the technology is reasonably expected to be commercially available prior to the commencement of project construction, and it must provide a credible plan to finance the project in light of the state of development of the technology. All bidders must demonstrate the logistical viability of the project through a construction plan covering the necessary specialized equipment (e.g. vessels), applicable maritime law (e.g. the Jones Act), and local port facilities to complete project deployment. All bidders must provide a reasonable plan for financing the proposed project, including the funding of development costs and the required development period security, the reasonableness of the transmission/network upgrades project scope and cost estimates, and the ability to acquire the required equipment in the time frame proposed.[10]

2.2.3.6 Experience

The bidder must demonstrate that it has a sufficient amount of relevant experience and expertise to successfully develop, finance, construct, operate and maintain its proposed project. This demonstration can be made by showing that the bidder (or a substantial member of the bidder's development team) has accomplished the following:

a. Successful development and construction of a similar type of project; OR

10 In order to ensure that the bidder uses viable technology and maintains that technology throughout the term of the PPA, the Draft Contract includes a requirement that a project's Real-Time High Operating Limit (as defined in the ISO-NE Rules) is at least 50 percent of its nameplate capacity, measured on a rolling two-year basis.

b. Successful development and construction of one or more projects of similar size or complexity or requiring similar skill sets; AND

c. Experience successfully financing power generation projects and completing complex permitting processes and/or stakeholder engagement processes.

2.2.3.7 Security Requirements

Bidders will be required to post Development Period Security and Operating Period Security. The required level of Development Period Security is $40,000 multiplied by the Contract Maximum Amount (as defined in the Draft Contract, Appendix C). Fifty percent (50%) of the Development Period Security must be provided upon execution of the PPA. The remaining fifty percent (50%) of the Development Period Security must be provided upon PUC approval of the PPA. Any posted Development Period Security will be promptly returned if the PUC does not approve the PPA. Once a project achieves Commercial Operation, the amount of required security (Operating Period Security) will be the same as the required amount of Development Period Security.

Additional Development Period Security may be provided by a bidder in order to extend "Critical Milestone Dates," in the PPA. Those Critical Milestones include: receipt of all permits for construction of the facility' acquisition of all real property rights required for construction, operation and interconnection of the facility; closing of financing and achievement of the commercial operation date. Any additional Development Period Security provided to effect those extensions will be returned to the bidder upon the achievement of the commercial operation date under the PPA.

The required security must be in the form of a letter of credit, either hard copy or electronic copy, as required in the Draft Contract.

2.2.3.8 Additional ACES Requirements

Bidders should be advised that the ACES specifically requires all bidders to provide the following additional information in their bid package:

a. An EFMP, including site and environmental data transparency requirements, as detailed in Section 2.3.3.3;
b. A site layout plan and maps that illustrate the location of all onshore and offshore equipment and facilities (including the estimated spacing and orientation of wind turbines and a discussion of how the plan conforms to federal and state permitting requirements) and clearly delineates the perimeter of the area in which offshore wind turbines will be placed;
c. An annualized estimate for all economic benefits, including the specific in-state expenditures and employment proposed during the development, construction and operation and maintenance phases of the project;
d. A detailed diversity, equity and inclusion plan that, at a minimum, provides the bidder's

proposed strategy to enable access to employment and vendor opportunities for historically marginalized communities, as detailed in Section 2.3.3.4;

e. Identification of Rhode Island vendors and other domestic offshore wind supply chain opportunities associated with the project; and

f. A plan outlining bidder's intentions with respect to the negotiation of a project labor agreement(s) to cover construction activities on the project.

See R.I. Gen. Laws § 39-31-10(a). Per the ACES, the information above must be incorporated in the procurement's evaluation and scoring criteria.

In addition, the ACES requires that each proposal include an explanation of how it advances the objectives of achieving a reliable, clean energy future that is consistent with meeting regional greenhouse gas reduction goals as established by the 2021 Act on Climate.

More information on these requirements is provided in Sections 2.2, 2.3.3.2 and 3.6 below.

2.2.3.9 Commercially Reasonable Standard

Under the ACES, Rhode Island Energy is not obligated to enter into long-term contracts for renewable energy resources on terms which Rhode Island Energy believes to be commercially unreasonable. R.I. Gen. Laws § 39-31-10(d). In the Report and Order in PUC Docket No. 4929 issued June 7, 2019, the PUC found that the Revolution Wind Offshore Wind Power Purchase Agreement was commercially reasonable because: (i) the terms and pricing were reasonably consistent with what an experienced power market analyst would expect to see in transactions involving regional energy resources and regional energy infrastructure; (ii) the project had a credible commercial operation date; and (iii) the benefits to Rhode Island, including the total energy security, reliability, environmental and economic benefits to the State of Rhode Island and its ratepayers, were likely to exceed the cost of the project. Consistent with that Report and Order, Rhode Island Energy will consider both the pricing schedule and non-price terms and conditions in an initial assessment of whether a proposal is commercially reasonable.

2.2.3.10 Timeliness

The bid submitted must be timely submitted, in accordance with Sections 3.1 and 3.5 below.

2.2.4 Other Minimum Requirements

Other RFP requirements pertain to bid certification, allowable pricing and bid completeness, as described in this section.

2.2.4.1 Proposal Certification

Bidders are required to provide firm pricing for 184 days from the date of bid submission. The bidder must also sign the certification form in Appendix A verifying that the prices, terms and conditions of the proposal are valid for at least 184 days. An officer or duly authorized representative of the bidder is required to sign the Proposal Certification Form.

2.2.4.2 Pricing

2.2.4.2.1 Allowable Forms of Pricing:

All bidders must provide a fixed price with separate pricing for energy ($/MWh) and RECs ($/REC) for the term of the contract. Bidders may, but are not required to, submit alternative prices for energy and RECs (in $/MWh and $/REC, respectively) that change by a fixed rate for the term of the contract (e.g., a 2% increase or decrease per year); or by different fixed rates for various periods of the contract (e.g., a 3% change per year for the first 5 years, and then a 2% change per year for the next 5 years, etc.) so long as the maximum change per year does not exceed 3%. All pricing for energy and RECs must align with the market values of those products.

2.2.4.2.2 Additional Pricing Conditions:

All proposals must also conform to the following pricing conditions:

(a) Proposed prices must be firm and may not be subject to increase based upon the availability or receipt of any federal or state tax credit or other government grant or subsidy.

(b) Bidders must address how they would consider Rhode Island Energy customers in the event of the availability or receipt of any tax credit or other government grant or subsidy not contemplated in their proposals. Bidders must state their assumptions regarding the availability of federal or state tax credits, subsidies, or grants or other incentives, including but not limited to those available under the Inflation Reduction Act of 2022. If a bidder assumes that such credits, subsidies, grants or incentives will not be available for its Eligible Facility, it should state how it would propose to share the benefits of those credits, subsidies, grants or incentives with Rhode Island Energy's customers if they subsequently become available. Bidders may propose adjustments to the contract price based on an increase in any state or federal tax credit or other government grant or subsidy.

(c) Pricing must incorporate a price adjustment if the generation ceases to conform to R.I. Gen. Laws § 39-26-5, after which Rhode Island Energy will only purchase the electric energy under that PPA and the seller will be permitted to sell the non-conforming RECs to a third party; and

(d) Pricing must adjust payment to compensate Rhode Island Energy for any energy delivered at negative market clearing prices at the delivery node. In the event that the applicable Real-Time or Day-Ahead Locational Marginal Price ("LMP") for the Energy at the delivery point is less than $0.00 per MWh in any hour, the PPA price for Energy purchased during that hour will be reduced by the amount by which that LMP is below $0.00/MWh.

Examples:

If Delivered Energy equals 1 MWh and Contract Price equals $50.00/MWh:

Hourly LMP at the delivery point equals (or is greater than) $0.00/MWh:
Buyer payment of Price to Seller = $50/MWh
Seller credit/reimbursement for negative LMP to Buyer = $0.00
Net Result: Buyer pays Seller $50/MWh for that hour

Hourly LMP at the delivery point equals -$150.00/MWh:
Buyer payment of Price to Seller = $50.00
Seller credit/reimbursement for negative LMP to Buyer = $150/MWh
Net Result: Seller credits or reimburses Buyer: $150/MWh - $50/MWh = $100/MWh for that hour

The seller may, but is not required to, deliver energy to Rhode Island Energy in the event that the LMP is negative, as detailed in the Draft Contract.

These forms of pricing are conforming under this RFP. Rhode Island Energy may consider other forms of pricing as an alternative, as long as the bidder submits a proposal for the project with conforming pricing and the required bid fee for each pricing proposal. Alternative (i.e., non-conforming) pricing may be considered subject to the following conditions:

- Any pricing formula must be symmetrical. In other words, if an index is used, prices must be allowed to increase or decrease in a symmetrical manner relative to a base price; and
- There must be a price cap for each year under the proposed contract.

Rhode Island Energy is under no obligation to accept any proposal, including without limitation any proposal with any form of alternative (i.e., non- conforming) pricing.

Rhode Island Energy may request a clause in the PPA that will provide Rhode Island Energy with an option to require the Seller to negotiate an agreement for Rhode Island Energy to purchase its Percentage Entitlement of the RECs produced by the Facility for additional one-year terms after the expiration of the PPA. The price of the RECs will be the then market price for RECs. If the Seller wants to sell the RECs for a term greater than one year, Rhode Island Energy will have the right to match the price and other terms obtained by the Seller. If this agreement is entered into, it may be subject to PUC approval.

With respect to any pricing proposal, payments will only be made for Eligible Products delivered to Rhode Island Energy's ISO-NE and NEPOOL GIS accounts as agreed in the PPA.

2.2.4.3 Bid Completeness: Bidder Response Forms and Draft Contract

Bidders must use the forms provided in Appendix A and provide complete responses in each section. Appendix A contains the Bidder Response Forms, which outline the information required from each bidder. If any of the information requested is inconsistent with the type of technology or product proposed, the Bidder should include "N/A" and describe the basis for this designation. If a bidder does not have the information requested in the bid forms and cannot obtain access to that information prior to the bid submittal due date, the bidder should provide an appropriate explanation.

Appendix C to this RFP is the form of the Draft Contract being used in this solicitation. A bidder must include a marked version showing any proposed changes to the Draft Contract with its proposal. Any changes to Appendix C noted in the bid but not marked in the Draft Contract will not be considered by Rhode Island Energy. All changes in the marked version of Appendix C must state the specific contract language requested in the contract and may not refer back to the bid or provide a general statement describing the change. Rhode Island Energy will presume that bidders are willing to execute the marked-up contracts included in their proposals; however selection of a bidder does not constitute acceptance of any proposed edits in the marked-up Draft Contract. If a Bidder fails to include a marked version of the Draft Contract, Rhode Island Energy will presume that bidder is willing to execute the Draft Contract in the form attached. Any exceptions taken in the Draft Contract to threshold and/or eligibility requirements may result in a proposal being rejected. Bidders should submit any proposed changes to the Commitment Agreement or affirm its willingness to accept the draft agreement as is. Bidders are discouraged from proposing material changes to the Draft Contract and the Commitment Agreement.

2.2.4.4 Commitment Agreement

All successful bidders will be required to execute a Commitment Agreement, included as Appendix E of this RFP, at the time of contract execution. This agreement includes a commitment that, in the event future third-party offshore wind developers request interconnection service on the bidder's Interconnection Customer Interconnection Facilities ("ICIF"), the bidder will negotiate in good faith and use commercially reasonable best efforts to enter into a voluntary agreement with such third-party offshore wind developers regarding interconnection to and expansion of such ICIF to accommodate the third-party offshore wind developer's request. In addition, the Commitment Agreement includes a commitment that, in the event regionalized offshore transmission facilities become available to the bidder prior to the Commercial Operation Date for its Facility, the bidder will use commercially reasonable efforts to negotiate a transmission service agreement with the owner of those transmission facilities. Such a voluntary agreement must incorporate study, interconnection, delivery service and other provisions at least as favorable to said third-party offshore wind developers as the provisions of ISO-NE OATT Schedules 22 and 23 applicable to requests of service thereafter.[11]

11 As utilized in this RFP, "Voluntary Agreement" means a voluntary agreement as contemplated in FERC Order No. 807, 150 FERC ¶ 61,211 (2015), at PP 117-18 providing interconnection and/or delivery service to a Third Party Offshore Wind Developer without the need for a FERC order under Sections 210, 211, and 212 of the Federal Power Act ("FPA"). For the avoidance of uncertainty, note that the RFP does not require a bidder to waive any other rights under Order No. 807, including with respect to excess or unused capacity on its ICIF as initially constructed, such as those reserved by FERC regulations at 18 CFR §§ 35.28(d)(2)(ii)(A)-(B). Rather, the RFP requires only that a bidder pursue a voluntary agreement as discussed in FERC Order No. 807 at PP 117-118 if a third party requests studies and potential expansion of the bidder's ICIF to accommodate third party interconnection without the need for said third party to pursue its rights in the first instance via FPA Sections 210, 211, and 212. Such commitment to enter into a Voluntary Agreement (see the Commitment Agreement included as Appendix E hereto)) ultimately executed between the winning bidder and the Distribution Companies, as well as any future Voluntary Agreements shall be filed with FERC for acceptance pursuant to FPA Section 205.

2.2.4.5 Non-Refundable Bid Fees

Each proposal must be accompanied by a non-refundable bid fee, which will be used to offset the costs of evaluation of the proposals and to cover the reasonable invoiced costs of consultants and counsel that may be hired by the OER, the Division, the Rhode Island Commerce Corporation, and/or the Rhode Island Department of Environmental Management ("DEM"), in an amount up to $200,000 per agency. R.I. Gen. Laws § 39-31-12.The minimum bid fee is $500,000. This bid fee includes one pricing offer. If there are changes to any physical aspect of a project, including but not limited to project size, production/delivery profile, in-service date, or delivery location, an additional $100,000 bid fee will be required. Each additional pricing offer for the same project, including those with contingent bids, will cost an additional fixed fee of $25,000.

Bid fees must be sent to Rhode Island Energy. Instructions will be sent upon request to bidders who contact the Official Contact listed in Section 3.5. Bid fees must be received by Rhode Island Energy no later than the final date for the submission of proposals. Proposals that are submitted without a bid fee will not be considered or reviewed. Before submitting proposals and bid fees, bidders are strongly encouraged to verify that the proposal and documentation meets all requirements of this RFP. Submission of a bid fee does not obligate Rhode Island Energy to select a project.

2.3 Stage Two – Price and Non-Price Analysis

As the first step of Stage Two, bids that pass the eligibility and threshold review in Stage One will be evaluated on price and non-price criteria. The results of the price and non-price analysis will be a relative ranking and scoring of proposals. Stage Two scoring will be based on a 100-point scale. Rhode Island Energy plans to weigh price-related factors at seventy-five percent (75%) and non-price factors at twenty-five percent (25%) for purposes of conducting the evaluation. The Company will submit the specific scoring and weighting of each factor included within the price and non-price analysis to the PUC, under seal, prior to the bid submission deadline stated in Section 3.1 below. The increase for non-price factors from twenty percent (20%) in the 2018 Rhode Island RFP to twenty-five percent (25%) in this RFP reflects an increased emphasis on economic benefits to Rhode Island, in particular.

2.3.1 Evaluation Using Price-Related Evaluation Criteria

Bids will be evaluated on their direct and indirect economic and environmental costs and benefits as detailed in the following sections. The metric used will be net $/MWH cost or benefit.

2.3.1.1 Direct Contract Costs & Benefits

Bids will be evaluated on direct contract price costs and benefits. Direct contract price costs and benefits for evaluation may include, but are not limited to:

i. A mark-to-market comparison of the total contract cost of the energy bid to projected market prices at the delivery point with the project in-service; and

ii. A comparison of the total contract cost of RECs bid to the avoided cost, with the project not in-service, if the RECs are to be used for RES compliance by Rhode Island Energy, and their projected market prices with the project in-service if the RECs are projected to be sold.

2.3.1.2 Indirect Costs & Benefits

The price evaluation will include an evaluation of additional economic and environmental costs and benefits, which may include, but may not be limited to:

i. The impacts of changes in LMP paid by ratepayers in the state of Rhode Island;

ii. The impact on RES compliance costs paid by ratepayers in the state of Rhode Island;

iii. Consistency with the achievement of the state's greenhouse gas reduction targets as specified in the 2021 Act on Climate;

iv. Indirect impacts, if any and to the extent Rhode Island Energy determines such impacts are reliably quantifiable, for retail ratepayers on the capacity or ancillary services market prices with the proposed project in service; and

v. The impact on contributing to reducing winter electricity price spikes.

2.3.1.3 Price Evaluation Metrics

The reference case system topology will be based on the most recent ISO-NE Capacity, Energy, Load and Transmission ("CELT") report. The evaluation process will include an evaluation of benefits using the output from an electric market simulation model or models.

Rhode Island Energy plans to use real levelized net $/MWh as the metric for the price evaluation. The discount rate to be used in the evaluation will be equal to the Company's weighted average cost of capital at the time of the evaluation.

The production/delivery profile provided by the bidder will be evaluated for reasonableness. Rhode Island Energy reserves the right to adjust any bidder production/delivery profile in order to produce a reasonable and appropriate evaluation. The bidder is responsible for providing support for the underlying assumptions. Each bidder will be responsible for all costs associated with interconnecting its project to the transmission grid or, if applicable, local distribution facilities.

Proposals will be ranked from highest to lowest present value of net benefit (or lowest to highest present value of net cost) on a dollars per MWh basis based on the result derived through the application of the methodology described above.

2.3.2 Other Direct Economic Benefits to the State of Rhode Island

Per the ACES, all approved projects must provide specific and measurable economic benefits to the State of Rhode Island.[12] The Company will evaluate a project's estimated effect on LMPs and REC market prices in the price analysis of Stage Two, as described above. All other economic benefits will be evaluated in the non-price analysis of Stage Two and must be specific and measurable and supported by documentation from an independent party in order to assess the credibility of the proposed commitments. Bidders must provide annualized estimates for all economic benefits and identify the specific in-state expenditures and employment proposed during the development, construction and operation and maintenance phases of the project. See R.I. Gen. Laws § 39-31-10(a). Rhode Island Energy will conduct an analysis of the value of the respective economic benefits to the State of Rhode Island in relation to the cost and may ask the State of Rhode Island, including but not limited to, the Rhode Island Commerce Corporation, to review any proposed economic benefits to assist in this analysis.

Successful bidders will be required to negotiate and execute a legally binding contractual commitment with the applicable government entity or entities of the State of Rhode Island (i.e., likely in the form of a Memorandum of Understanding) for any specific commitments to economic benefits (e.g. specific grants or specific commitments to industries), diversity, equity and inclusion benefits and environmental justice benefits that are included in the proposal but not reflected in agreements at the time of bidding to ensure that the economic benefits are actually obtained and tracked. The contractual commitment will be required before a final PPA is executed.

2.3.3 Non-Price Evaluation

The non-price evaluation will consist of: (1) siting and permitting; (2) greenhouse gas emissions[13] and statewide environmental impacts; (3) project development status and operational viability; (4) energy security and reliability impacts; (5) interconnection; (6) financing; (7) contract risk; (8) statewide economic impacts resulting from the proposed contract; and (9) proposals for labor agreements to cover the construction of the project. Within each category are a number of related criteria that will be considered in the evaluation. This section of the RFP will identify and describe in more detail the individual criteria within each primary category. The relative importance of each of the criteria in terms of the scoring of the bids will be developed prior to receipt of bids and will be utilized during the bid evaluation process.

2.3.3.1 Purpose of Non-Price Evaluation Criteria

The non-price evaluation criteria other than contract exceptions and other economic benefits to the State of Rhode Island are designed to assess the likelihood of a project coming to fruition

11 The Commission will consider whether the project is in the public interest by determining if the proposed project, among other factors, will enhance the economic fabric of the state. R.I. Gen. Laws § 39-31-7.

13 The Commission will evaluation whether the contract is consistent with achievement of the state's greenhouse gas reduction targets as specified the 2021 Act on Climate.

based on various factors critical to successful project development and the project's compliance with the ACES. The objectives of the criteria are to provide an indication of the feasibility and viability of each project and the likelihood of meeting the proposed commercial operation date. Proposals are preferred that can demonstrate, based on the current status of project development and past experience, that the project will likely be successfully developed and operated as proposed and in compliance with ACES.

2.3.3.2 Factors to be Assessed in Non-Price Evaluation

Within each of the non-price evaluation factors, a variety of project and proposal-related factors will be assessed. They are summarized as follows:

- **Siting and permitting**
  - Credibility of plan to obtain required permit approvals
  - Credibility of project schedule and construction plan, and ability to achieve proposed commercial operation date(s)
  - Identification of required federal, regional, state and local permits and approvals and progress in the associated application and approval processes
  - Status and completeness of project stakeholder engagement plan

- **Environmental Impacts and Environmental and Fisheries Mitigation Plan**
  - Comprehensiveness and credibility of the EFMP addressing how a project plans to avoid, minimize or mitigate, to the maximum extent practicable, environmental impacts, including impacts on commercial and recreational fishery resources (as detailed in Section 2.3.3.3 below)
  - Consistency with achievement of the state's greenhouse gas reduction targets as specified the 2021 Act on Climate

- **Project development status and operational viability**
  - Completeness and credibility of detailed critical path schedule; ability to meet scheduled construction start date and commercial operation date
  - Progress in interconnection process

- **Energy Security and Reliability Impacts**
  - Potential to mitigate energy price volatility for Rhode Island Energy customers

- **Interconnection and Deliverability**
  - Status of interconnection and system impact studies
  - Likelihood that interconnection process will be completed in accordance with schedule for project development

- **Financing**
  - Credibility of financing plan

- **Contract Risk**

- Extent to which the bidder accepts provisions of the Draft Contract that applies to its project or shifts risk to buyer and customers

- **Economic Benefits to Rhode Island**
  - Proposed economic benefits from the development, construction and operation of the project will be evaluated on scale, credibility and demonstrated ability and commitment to create and foster employment and economic development in the State of Rhode Island, where feasible, which may include but is not limited to:
    - Specific and measurable employment benefits associated with the proposed project, including descriptions of the type, duration, and salary bands of the employment created
      - Bidders must also submit a diversity, equity and inclusion plan that, at a minimum, provides their proposed strategy to enable access to employment and opportunities for historically marginalized communities (as detailed in Section 2.3.3.4 below)
      - Bidders must also submit a plan outlining their intentions with respect to the negotiation of project labor agreements to cover construction activities
    - Specific commitments to economic activity (project expenditures), including but not limited to:
      - Investment in offshore wind-related environmental research, monitoring and mitigation sponsored by the DEM and/or the Rhode Island Coastal Resource Management Council.
      - Investment in supply chain and infrastructure improvements to support the offshore wind industry.
      - Investment in workforce development and environmental research facilities to support the offshore wind industry.
      - Commitment to utilize port facilities and office space.
      - Commitment to use Rhode Island vendors and other domestic offshore wind supply chain opportunities associated with the project.
    - Specific development activities and investments that directly benefit economically distressed areas and/or low-income populations.

In completing the Bidder Response Form in Appendix A, Bidders should include reference to direct employment (in full-time equivalent (FTE) positions), wage-related expenditures, project-related expenditures and investments (each in nominal dollars) per year attributable to Rhode Island and to the region in the required summary of annualized economic benefits.

Rhode Island Energy may provide information provided by the bidder such as economic benefits to the State of Rhode Island, environmental assessment, and/or other information for review by the appropriate Rhode Island state agency (for example, Rhode Island Commerce Corporation, the OER, the Division and/or the DEM).

2.3.3.3 Specific Environmental and Fisheries Mitigation Plan Measures

As part of the Stage Two evaluation, bidders must provide an Environmental and Fisheries Mitigation Plan, The EFMP should detail, to the extent practical, specific adverse environmental and fisheries impacts that are likely to result from the proposed Facility and detail measures the Bidder will take to avoid, minimize, and/or mitigate those impacts in the categories identified below. In addition, the EFMP should describe the environmental impacts of the proposed Facility on historically marginalized communities and environmental justice communities and plans to mitigate those impacts. Where specific measures are not known for a specific category of impact at the time of proposing, the Environmental and Fisheries Mitigation Plan must describe how the Bidder will work collaboratively with the state and Federal agencies and other stakeholders to define avoidance, minimization, and mitigation measures. The Environmental and Fisheries Mitigation Plan should provide a roadmap for the environmental and fisheries work to come and provide a degree of certainty that the Bidder is committed to working collaboratively with stakeholders to develop a cost-effective and environmentally responsible Project.

A. *Site and Environmental Data Transparency.* Agreement to make publicly available any information or raw data and supporting metadata that is developed in furtherance of a Facility and relates to environmental characteristics, or use by wildlife, of any offshore, nearshore or onshore areas, as well as any raw data sponsored or developed by a successful bidder relating to the potential impacts of the construction, operation, or decommissioning of its Facility on the environment and wildlife of such areas.

B. *Fisheries Compensation*. Agreement to follow the guidance developed by the Bureau of Ocean Energy Management for the mitigation of impacts from offshore wind energy projects on commercial and recreational fishing communities as further described in its November 22, 2021 Request for Information on Reducing or Avoiding Impacts of Offshore Wind Energy on Fisheries.[14]

C. *Noise Mitigation*. Agreement that the Project shall not commence activities that generate significant noise, including geophysical survey work and impact pile driving, during poor visibility conditions such as darkness, fog and heavy rain, unless an alternative mitigation monitoring plan that does not rely on visual observation has been determined to be effective, to the extent compatible with practicality, worker safety and applicable regulations.

D. *Monitoring Acoustic Attenuation*. If using pile driving or other methods of installation that result in high underwater noise levels, agreement to monitor underwater acoustics during foundation installation in order to: (1) measure changes in sound pressure levels; (2) record sound levels in the water column and vibrations in the sediment; (3) detect particle motion; and (4) assess the effectiveness of a noise mitigation system to reduce underwater noise generated during pile installation. A successful bidder must agree to provide the Company, six (6) months prior to submission of a Construction and Operation

14 *See* https://www.boem.gov/renewable-energy/request-information-reducing-or-avoiding-impacts-offshore-wind-energy-fisheries.

Plan, an "Underwater Acoustic Monitoring Plan" detailing how data will be collected to and made available as soon after collection as is practicable for use by third-parties. The "Underwater Acoustic Monitoring Plan" must include commitments to allow raw and metadata to be publically available no more than six (6) months after installation completion.

E. *Commercial Fishing Gear Loss*. Agreement to report the number and value of claims submitted, number and value of claims paid, and a general description of each incident and resolution in its quarterly Progress Reports using the best available data to assess impacts.

F. *Regional Collaboration*. Agreement, if requested by the DEM or the Coastal Resources Management Council ("CRMC"), to participate in any multi-state or regional coordination and/or collaboration efforts.

Successful bidders will be required to negotiate and execute a contractual commitment (i.e., Memorandum of Understanding) with the DEM and/or CRMC before a final PPA is executed resulting from this solicitation. This Memorandum of Understanding shall include, at a minimum, the Bidders' commitment to use avoidance and minimization measures, Best Management Practices and current industry standards as well as site and environmental data transparency requirements, and may include other commitments made by the bidder.

2.3.3.4 Specific Diversity, Equity and Inclusion Plan Measures

As part of the Stage Two evaluation, bidders must provide a Diversity, Equity and Inclusion Plan. The Diversity, Equity and Inclusion Plan should describe the proposed strategy to actively promote access to employment and contracting opportunities for, and to actively recruit, diverse workers, vendors, contractors, and investors, and include how the direct, specific and measurable employment and contracting benefits created by the proposed project provides employment and procurement/contracting opportunities for minorities, women, veterans, LGBT and persons with disabilities. A Diversity, Equity and Inclusion Plan must contain, at a minimum, the following elements:

- *Workforce Diversity Plan*. Including descriptions of each type, duration and salary bands of the employment created and identify the recruitment efforts aimed at hiring diverse candidates for these employment opportunities.

- *Supplier Diversity Program*. Including descriptions of the subcontracting, vendor, investor and ancillary (operational) business opportunities that will be provided by diverse businesses.

2.4 Stage Three –Portfolio Analysis

Stage Three involves a further review[15] of the bids in order to select the proposal or portfolio that provides the greatest value consistent with the stated objectives and requirements as set forth in this RFP. However, Rhode Island Energy is under no obligation to proceed beyond Stage Two if bids do not meet the eligibility or threshold requirements. In Stage Three, Rhode Island Energy will consider and weight at its discretion the following factors:

- Ranking in Stage Two;
- Commercial reasonableness of the bid(s);
- Risk associated with project viability of the bid(s);
- Contingent bids;
- Customer bill impacts;
- The extent to which the project would satisfy the goals of the ACES;
- The extent to which the bid would create additional economic and environmental benefits within Rhode Island; and
- Portfolio effect: the overall impact of any combinations of proposals.

Stage Three uses Stage Two as a guide and provides for a reasonable degree of considered judgment based on criteria specified in this RFP, which will provide greater assurance that the RFP will lead to successful results.

The objective of Stage Three is to select the proposal or portfolio of proposal(s) that provide the greatest value consistent with the stated objectives and requirements as set forth in the RFP. Generally, Rhode Island Energy prefers viable projects that provide low cost offshore wind energy with limited risk. However, it is recognized that any particular project may not be ranked highly with respect to all of these considerations and the extent to which the stated RFP objectives will be satisfied will depend, in large part, on the particulars of the proposals that are submitted. Rhode Island Energy may perform sensitivity analyses as part of the Stage Three Evaluation. Based on the results of Stage Three, one or more projects will be conditionally selected for contract negotiations, if appropriate.

2.5 Contract Negotiation Process

Any bidders conditionally selected for negotiations by Rhode Island Energy will be required to indicate in writing whether they intend to proceed with their proposals within five business days of being notified. Bidders must be able to begin negotiations immediately upon that notification, including the resolution of any conflicts that their selected counsel may have with

15 In connection with this review, and in evaluation of the pricing, a bidder may be asked to provide pro forma income and cash flow statements for the term of the proposed PPA (including revenue and cost data by major categories, debt service, depreciation expense and other relevant information).

Rhode Island Energy. If negotiations are not successful within a reasonable period of time, Rhode Island Energy may terminate a project's conditional selection.

As part of the contract negotiation process, the bidder must commit to enter into a labor peace agreement with at least one bona fide labor organization either where such bona fide labor organization is actively representing employees providing necessary construction, operations and maintenance services for the project at the time of such agreement or upon notice from a bona fide labor organization that is attempting to represent employees who will provide necessary operations and maintenance services for the renewable energy system employed in the state. The maintenance of such labor peace agreement will be an ongoing material condition of any continuation of payments under the PPA. See R.I. Gen. Laws § 39-31-10(e). Bidders must also commit to pay each construction, operations and maintenance employee wages and benefits that are not less than the prevailing wage and fringe benefit rates at the journeyman level that are prescribed by the Rhode Island Department of Labor and Training, and not less than the prevailing wage rates for employees for which there is no classification prescribed by the Rhode Island Department of Labor and Training. See R.I. Gen. Laws § 39-31-10(f). And, in the case of apprentices, bidders must commit to pay benefits and wages not less than the rate applicable to apprentices for the pertinent classification prescribed by the Rhode Island Department of Labor and Training if the worker is a participant in an approved apprenticeship program and the approved apprenticeship program maintains a direct entry agreement with a certified pre-apprenticeship training program. See R.I. Gen. Laws § 39-31-10(f)(1)-(2).

2.6 Regulatory Approval

If Rhode Island Energy executes any PPA as a result of this RFP process, such PPA(s) will be filed with the PUC for review and approval no later than March 15, 2024.[16] After Rhode Island Energy files the PPA(s), the PUC will accept comments on the PPA(s) for at least 30 days after the filing.[17] During that comment period, DEM will provide an advisory opinion on the expected greenhouse gas emissions and statewide environmental impacts resulting from the PPA, including a determination as to whether the proposed project(s) advance the goals of the 2021 Act on Climate; the Rhode Island Commerce Corporation will provide an advisory opinion on the expected statewide economic impacts resulting from the proposed PPA(s); and OER will provide an advisory opinion on the expected energy security, reliability, environmental and economic impacts from the proposed PPA(s).[18] The PUC will hold public hearings and issue a written order approving or rejecting the PPA within approximately 120 days of the filing.[19]

The PUC will approve the PPA(s) if it determines that:

(1) the PPA(s) is/are commercially reasonable;

16 See R.I. Gen. Laws § 39-31-10(c).
17 See R.I. Gen. Laws § 39-31-6(a)(1)(vi).
18 See R.I. Gen. Laws § 39-31-6(a)(1)(vi)(A)(I) through (III).
19 See R.I. Gen. Laws § 39-31-6(b). If the PUC rejects a contract, it may advise the parties of the reason for the contract being rejected and direct the parties to attempt to address the reasons for rejection in a revised contract within a specified period not to exceed 90 days. R.I. Gen. Laws § 39-31-6(b).

(2) the requirements for the solicitation have been met;

(3) the PPA(s) is/are consistent with the state's greenhouse gas reduction targets as specified in the 2021 Act on Climate; and

(4) the PPA is/are consistent with the purposes of the ACES.[20]

In addition to the criteria for approval outlined above, for any PPA that results from this solicitation, the Company currently intends to seek Regulatory Approval that includes authority to recover reasonable net costs incurred to solicit, evaluate and seek approval of the PPA and reasonable net costs incurred under the PPA once approved by the Commission, pursuant to R.I. Gen. Laws §§ 39-31-7(a)(5) and/or 39-31-7(a)(6). The Regulatory Approval must be final and non-appealable and acceptable to Rhode Island Energy in its sole discretion. Moreover, if Regulatory Approval is obtained sufficient to result in implementation of the PPA, but the PUC determines post-approval that the Company may not recover the net costs of the PPA going forward, the Company's obligations to purchase energy and associated RECs pursuant to the PPA will cease, and the PPA will automatically terminate without any required action by the Company once such determination is final and non-appealable.

Rhode Island Energy is not obligated to execute any PPA on terms which it reasonably believes to be commercially unreasonable; provided that if there is a dispute about whether these terms are commercially unreasonable, the PUC will review the provisions at issue. See R.I. Gen. Laws § 39-31-10(c). Each long-term contract shall contain a condition that it shall not be effective without PUC review and approval. R.I. Gen. Laws § 39-31-6(a)(1)(iii).

III. Instructions to Bidders

3.1 Schedule for the Bidding Process

The proposed schedule for the bidding process is set forth in Chart 1. Rhode Island Energy reserves the right to revise the schedule as necessary. Any changes to the schedule will be posted on the website for this RFP.

Event	Anticipated Dates
Issue RFP	October 14, 2022
Bidders Conference	November 1, 2022
Deadline for Submission of Questions	November 30, 2022
Due Date for Submission of Proposals	March 13, 2023 by 12:00 p.m. (noon) EPT
Review of Bids with Rhode Island OER and Division	March 20, 2023
Conditional selection of Bidder(s) for negotiation	June 21, 2023
Negotiate and Execute Contracts	September 13, 2023

20 R.I. Gen. Laws §§ 39-31-6(a)(vi), 39-31-10(c).

Submit Contracts for PUC	November 13, 2023

3.2 Bidders' Conference; Bidder Questions

A Bidders' Conference will be held for interested persons approximately three (3) weeks from the date of this RFP, and notice will be posted on the RFP website. (See Section 3.6 below) The purpose of the Bidders' Conference is to provide the opportunity to clarify any aspects of the RFP. Prospective bidders may submit questions about the RFP prior to the Bidders' Conference. Rhode Island Energy will attempt to answer questions submitted prior to and during the Bidders' Conference. Although Rhode Island Energy may respond orally to questions posed at the Bidders' Conference, only written answers that are provided in response to written questions will be official responses.

Rhode Island Energy will also accept written questions pertaining to the RFP following the Bidders' Conference up to the date provided in Chart 1. Both the questions and the written responses will be posted on the Rhode Island Energy website (without identifying the person that asked the question).

It is the bidder's responsibility to check the website for news and updates.

3.3 Preparation of Proposals

Each bidder shall have sole responsibility for carefully reviewing the RFP and all attachments and for thoroughly investigating and informing itself with respect to all matters pertinent to this RFP and its proposal, including pertinent ISO-NE tariffs and documents. Bidders should rely only on information provided in the RFP and any associated written updates when preparing their proposal. Each bidder shall be solely responsible for and shall bear all of its costs incurred in the preparation of its proposal and/or its participation in this RFP.

3.4 Submission of Proposals; Confidentiality

Bidders must submit proposals via electronic submission according to the instructions provided in Section 3.5 below. If information contained in the proposal is confidential, bidders must submit both a public version and a confidential version, with each proposal clearly identified. **For it to be eligible, bids must be uploaded with a timestamp of before 12:00 p.m. (i.e., noon), Eastern Prevailing Time on the due date for proposals set forth in Section 3.1, above.** Fax or email submissions will not be accepted. Rhode Island Energy will reject any proposal that is uploaded and has a timestamp after the deadline. Each proposal must contain the full name and business address of the bidder, and the bidder's contact person, and the bid must be signed by an authorized officer or duly authorized representative of the bidder. Copies of the original signature page must be included with the proposal. The public version of the bid should include the words "Public Version" to alert the recipients that the version may be publicly posted. The public proposals must be complete in all respects other than the redaction of confidential information.

With regard to completeness, "complete" proposals must include a properly completed

Certification, Project and Pricing Data ("CPPD") Form, although at the bidder's option the CPPD form submitted as part of the public version may be a PDF instead of a working Excel file so long as the bidder submits the un-redacted CPPD form as a working Excel file with the confidential version of the proposal. If there is conflicting information between the information in the CPPD form and information in other forms, then the information in the CPPD form will be used in the evaluation of the bid. Information elsewhere in the bid cannot be used by the bidder to modify or qualify any information in the CPPD form.

In addition, a bidder may redact the public version of the proposal to remove information that qualifies for confidential treatment pursuant to Rhode Island's requirements. Rhode Island Energy will not redact the public versions of proposals for the bidder. The proposal identified as the "Public Version" will be posted at RICleanEnergyRFP.com and made AVAILABLE TO THE PUBLIC. It is solely bidder's responsibility to redact any portion of its bid that it wishes to remain confidential in the public version of their proposal. For example, if the bidder considers the CPPD form to be confidential, it must redact the form from the public version of the proposal but include the CPPD form in the confidential version as a working Excel file, with all required information included. The confidential version of the proposal will be treated as confidential and sensitive information by the recipients, subject to the treatment of confidential information. Bidders should take care to designate as confidential only those portions of their proposals that genuinely warrant confidential treatment. The practice of marking each and every page of a proposal as "confidential" is discouraged.

Rhode Island Energy agrees to use commercially reasonable efforts to treat the non-public information it receives from bidders in a confidential manner. To the extent that the bid or its attachments contain confidential information, then the bidder must execute with the DEM, the Commerce Corporation, the Division and the OER, a non-disclosure agreement to exchange such confidential information and enable adequate review. Rhode Island Energy will not, except as required by law or in a regulatory proceeding, disclose such information to any third party other than the DEM, the Commerce Corporation, OER, and the Division and their respective agents and/or consultants (i.e., these state agencies will be independently reviewing the evaluation process), or use such information for any purpose other than in connection with this RFP, and it may use a non-disclosure agreement with these agencies and individuals; provided that, in any future regulatory, administrative or jurisdictional proceeding in which confidential information is sought, Rhode Island Energy shall take reasonable steps to limit disclosure and use of said confidential information through the use of non-disclosure agreements or orders seeking protective treatment, and shall inform bidders that their confidential information has been sought in such proceeding.

Notwithstanding the foregoing, in any regulatory proceeding in which such confidential information is sought and a request for confidential treatment is made to the PUC, Rhode Island Energy shall not be responsible in the event that its request for treating information in a confidential manner is not approved, and the information is shared with other parties or made public. Also, the bidder shall be responsible for filing, submitting, and/or providing to Rhode Island Energy for such filing or submission, any motions or other pleadings (including associated affidavits, etc.) for protective orders or other relief to justify withholding the confidential information. Similarly, the bidders shall be required to use commercially reasonable efforts to treat all information received from Rhode Island Energy in a confidential manner and will not, except as required by law or in a regulatory proceeding, disclose such information to any third party; provided, however that if such confidential information is sought in any regulatory or judicial proceeding, the bidders shall take reasonable steps to limit disclosure and use of said confidential information through the use of non-disclosure agreements or requests for orders seeking protective treatment, and shall inform Rhode Island Energy that the confidential information is being sought. See Appendix D for more information.

Bidders also should be aware that Rhode Island Energy will disclose in its entirety each executed PPA submitted to the PUC, with sensitive information potentially subject to redaction. Any Rhode Island state agency may be required to disclose confidential information in response to a public records request, in accordance with the "Access to Public Records Act," R.I. Gen. Laws § 38-2-1 et seq.

In the event that a bidder's confidential information is not afforded confidential treatment by a governmental agency or other entity exercising proper authority, the entities and individuals involved in the evaluation of bids shall not be held responsible, and their employees, agents, and consultants, shall be held harmless for any release of confidential information as long as reasonable efforts to protect the information have been followed. In any event, each entity and individual involved in the evaluation of bids, as well as their employees, agents, and consultants, shall be held harmless for any release of confidential information made available through any public source by any other party.

During the evaluation of bids, ISO-NE will, and other authorities may, be requested to provide information to Rhode Island Energy, DEM, Commerce Corporation, OER, and the Division concerning proposals as part of the proposal evaluation process. Information classified as Critical Energy Infrastructure Information ("CEII") will only be shared with Rhode Island Energy, DEM, Commerce Corporation, OER and Division personnel and consultants who are cleared to receive CEII by ISO-NE or any applicable other authorities. By participating in this RFP, bidders agree that ISO-NE and the other authorities may release information related to the projects which may otherwise be considered confidential under the relevant rules or policies of such organizations, to the entities and individuals involved in the evaluation of bids.

The bidder shall provide written confirmation of its consent for the sharing of this information as part of the bidder certification form, and, if requested by Rhode Island Energy, the bidder shall specifically request that ISO-NE and/or any of the other authorities provide this information to the entities and individuals involved in the evaluation of bids and shall pay any costs imposed by ISO-NE or any of the other authorities associated with providing that information. Failure to comply with this request will result in disqualification of the bid. The entities and individuals involved in the evaluation of bids will treat the information provided as confidential, as described above, in accordance with the policies and practices described within this RFP.

3.5 Official Website and Contacts for the RFP

The official RFP website is: https://RICleanEnergyRFP.com. All updates and notifications will be posted to the website.

Each bid must be uploaded to the designated ShareFile Site. Bidders must request a unique link at least three (3) business days prior to the due date in Section 3.1, above.

Requests for a unique link to upload bids, any questions or correspondence regarding the RFP, including wiring instructions for the Bid Fees, should be sent to the Official Contact at following email address: CleanEnergyRFP@nationalgrid.com. However, only bidders may send questions and correspondence to the Official Contact for this RFP. Any comments, questions, or information sent to the Official Contact by non-bidders will not be considered by Rhode Island Energy. Members of the media should direct their communications to an official Rhode Island Energy spokesperson.

Also, bidders should copy the following recipient on any questions or

correspondence: RIEOSWRFP@pplweb.com

3.6 Organization of the Proposal

Bidders are required to organize their proposal consistent with the contents of the Response Package in Appendix A. The organization and contents of the proposal should be organized as follows:

1. Certification, Project and Pricing Data (CPPD Form)
2. Executive Summary of the Proposal
3. Project Operational Parameters
4. Energy Resource and Delivery Plan
5. Financial/Legal
6. Siting, Interconnection and Delivery
7. Environmental Assessment and Environmental and Fisheries Mitigation Plan, Permit Acquisition Plan and Environmental Attributes Certification
8. Engineering and Technology; Commercial Access to Equipment
9. Project Schedule
10. Construction and Logistics
11. Operations and Maintenance
12. Project Management/Experience
13. Alternatives/Contingent Bids
14. Contribution to Employment and Economic Benefits to Rhode Island
15. Diversity, Equity and Inclusion Plan
16. List of Rhode Island Vendors and Domestic Supply Chain Opportunities
17. Plans for Construction Labor Agreement
18. Exceptions to Form PPAs
19. Exceptions to Commitment Agreement

3.7 Modification or Cancellation of the RFP and Solicitation Process

Following the submission of proposals, Rhode Island Energy may request additional information from bidders at any time during the process. Bidders that are not responsive to such information requests may be eliminated from further consideration. Unless otherwise prohibited, Rhode Island Energy may, at any time up to final award: postpone, withdraw and/or cancel this RFP; alter, extend or cancel any due date; and/or, alter, amend, withdraw and/or cancel any requirement, term or condition of this RFP, any and all of which shall be without any liability to Rhode Island Energy.

By submitting a proposal, a bidder agrees that the sole recourse that it may have with respect to the conduct of this RFP is by submission of a complaint or similar filing to the PUC in a relevant docket pertaining to this RFP.

APPENDIX A

BIDDERS RESPONSE PACKAGE

APPENDIX A

RHODE ISLAND AFFORDABLE CLEAN ENERGY SECURITY ACT FOR RENEWABLE ENERGY

REQUEST FOR PROPOSAL BIDDERS RESPONSE PACKAGE

APPLICANT INFORMATION

Applicant: enter applicant name

Contact: enter name

Address: enter address

Phone: enter phone

Email: enter email

SECTION 1 OF APPENDIX A TO THE RFP
CERTIFICATION, PROJECT AND PRICING DATA

The Certification, Project, and Pricing Data ("CPPD") document is a Microsoft Excel workbook that is provided on the website at www. ricleanenergyrfp.com.

Bidders are required to provide firm pricing for 184 days from the date of bid submission. The bidder must also sign the certification form found in Appendix A verifying that the prices, terms, and conditions of the proposal are valid for at least 184 days. An officer or duly authorized representative of the bidder is required to sign the Proposal Certification Form.

SECTION 2 OF APPENDIX A TO THE RFP
EXECUTIVE SUMMARY OF THE PROPOSAL (INCLUDING THE BASE PROPOSAL AND ANY ALTERNATIVE PROPOSALS)

The bidder is required to provide an executive summary of the project proposal that includes a complete description of the proposed generation bid, the delivery point located within ISO-NE, the proposed contract term and pricing schedule, the interconnection plan, the overall project schedule, the additional ACES requirements detailed in Section 2.2.3.8, and other factors the bidder deems to be important. A table summarizing the proposal(s), including details such as generation project location, interconnection location(s), capacity (MW), commercial operation date, pricing ($/MWh), etc., is encouraged.

SECTION 3 OF APPENDIX A TO THE RFP
OPERATIONAL PARAMETERS

3.1 Maintenance Outage Requirements – Specify partial and complete planned outage requirements in weeks or days for all generation facilities and associated facilities required for the delivery of energy from the generation facilities to the delivery point. Also, list the number of months required for any outage cycle(s) to repeat (e.g., list time interval of minor and major overhauls, and the duration of overhauls).

3.2 Operating Constraints – Specify all the expected operating constraints and operational restrictions for the project (i.e., limits on the number of hours a unit may be operated per year or unit of time), differentiating those that may be variable or situational in nature.

3.3 Reliability – Describe how the proposal would provide enhanced electricity reliability to Rhode Island, including its impact on transmission constraints.

3.4 Moderation of System Peak Load – Describe how the proposal would contribute to moderating system peak load requirements and provide the following information:

i) Estimated average output for each summer period (June- September) from 3:00 - 7:00 pm

ii) Estimated average output for each winter period (October-May) from 4:00 – 9:00 pm

SECTION 4 OF APPENDIX A TO THE RFP
ENERGY RESOURCE AND DELIVERY PLAN

For Eligible Facilities, the bidder is required to provide an energy resource and a production/delivery profile for its proposed project, including supporting documentation, as described in Section 2.2.3.4. The energy resource and profile information should be consistent with the type of technology/resource option proposed and the term proposed. Bidders should respond to all information requests which are relevant to the bid in a timely manner.

4.1 Provide a summary of all collected wind data for the proposed site. Identify when and how (e.g. meteorological mast or LiDAR – for "Light Detection and Ranging") the data was collected and by whom.

Indicate where the data was collected and its proximity to the proposed site. Include an identification of the location and height for the anemometers and/or "range gate" heights for sensing by LiDAR that were used to arrive at an assessment of the site generation capability.

Describe any additional wind collection efforts that are planned or ongoing.

Provide (a) at least one year of hourly wind resource data. Real Data collected from the site is preferred, though projected data is permissible. Methodology must also be included. And (b) a wind resource assessment report for the proposed facility from a qualified unaffiliated third-party wind resource assessment firm. Include an analysis of the available wind data which addresses the relationship between wind conditions and electrical output. Provide a projection of net hourly energy production or net annual energy production, including projections of average net hourly energy production, including projections of average net hourly energy production, including projections of average hourly energy production, based on the wind resource data (hourly 8760 data profile and a 12 x 24 energy projection) at both P50 and P90 levels.

Provide a site-adjusted power curve. Each curve should list the elevation, temperature and air density used.

Identify the assumptions for losses in the calculation of projected annual energy production, including each element in the calculation of losses.

4.2 Offshore Wind Energy Generation Delivery Plan

Please provide an energy delivery plan and production/delivery profile for the proposed project, including supporting documentation. The energy delivery plan and production/delivery profile must provide the expected Offshore Wind Energy Generation to be delivered into the ISO-NE market settlement system and permit the Evaluation Team to determine the reasonableness of the projections for purposes of Sections 2.2.2.3 Eligible Products, 2.2.2.4 Allowable Contract Term, 2.2.2.5 Minimum/Maximum Contract Size and Allowable Alternative Bids, and 2.2.3.4 Interconnection and Delivery Requirements. Such information should be consistent with the energy resource plan and production/delivery profile provided above and considering any and all constraints to physical delivery into ISO-NE.

4.3 REC/Environmental Attribute Delivery Plan

Please provide documentation and information demonstrating that the project will deliver GIS Certificates representing the associated RECs and any other Environmental Attributes, as applicable. Please describe whether transfer of all GIS Certificates is authorized under the current ISO-NE GIS rules and protocols, or if a rule or protocol change is required. To the extent such a change is required, please provide regarding the proposal and the process for implanting the change.

SECTION 5 OF APPENDIX A TO THE RFP
FINANCIAL/LEGAL

Bidders are required to demonstrate the financial viability of their proposed project. Bidders should provide the following information:

5.1 Please submit information and documentation that demonstrates that a long-term contract resulting from this RFP Process would either permit the bidder to finance its proposal that would otherwise not be financeable or assist the bidder in obtaining financing of its proposal.

5.2 Please provide a description of the business entity structure of the bidder's organization from a financial and legal perspective, including all general and limited partners, officers, directors, managers, members and shareholders, involvement of any subsidiaries supporting the project, and the providers of equity and debt during project development. Provide an organization chart showing the relationship between the equity and debt participants and an explanation of the relationships. For jointly owned facilities, identify all owners and their respective interests, and document the bidder's right to submit a binding proposal.

5.3 Please provide a description of the financing plan for the project as described in Section 2.2.3.5, including construction and term financing. The financing plan should address the following:

i. Who will finance the project (or are being considered to finance the project) and the related financing mechanism or mechanisms that will be used (i.e. convertible debenture, equity or other) including repayment schedules and conversion features

ii. The project's existing initial financial structure and projected financial structure

iii. Expected sources of debt and equity financing

iv. Estimated construction costs

v. The projected capital structure

vi. Describe any agreements, both pre- and post-commercial operation date, entered into with respect to equity ownership in the proposed project and any other financing arrangement.

In addition, the financing plan should address the status of the above activities as well as the financing of development and permitting costs. All bidders are required to provide this information.

5.4 Provide documentation illustrating the experience of the bidder in securing financing for projects of similar size and technology as required in Section 2.2.3.6. For each project previously financed, provide the following information:

i. Project name and location

ii. Project type and size

iii. Date of construction and permanent financing

iv. Form of debt and equity financing

v. Current status of the project

5.5 Please provide evidence that the bidder has the financial resources and financial strength to complete and operate the project as planned.

5.6 Provide complete copies of the most recent audited financial statement and annual report for each bidder for each of the past three years; including affiliates of the bidder (if audited statements are not available, reviewed or compiled statements are to be provided). Also, provide the credit ratings from Standard & Poor's and Moody's (the senior unsecured long term debt rating or if not available, the corporate rating) of the bidder and any affiliates and partners.

5.7 Please also include a list of the board of directors, officers, and trustees for the past three years and any persons who the bidder knows will become officers, board members or trustees.

5.8 The bidder should demonstrate its ability (and/or the ability of its credit support provider) to provide the required security as described in Section 2.2.3.7, including its plan for doing so.

5.9 Provide a description of any current or recent credit issues/credit rating downgrade events regarding the bidder or affiliate entities raised by rating agencies, banks, or accounting firms.

5.10 Describe the role of the Federal Production Tax Credit ("PTC") or Investment Tax Credit ("ITC") as newly revised by the Inflation Reduction Act, and any other incentives, on the financing of the project. In the response, please describe (a) your plan to qualify for the ITC/PTC and the level of the ITC/PTC for which you plan to qualify, (b) the facilities, investment in which, the ITC is expected to apply, (c) your plan to utilize the tax credits and the relationship to your financing plan, and (d) how qualification for the ITC/PTC is reflected in your proposed pricing. If a bidder assumes that such credits, subsidies, grants or incentives will not be available for its Eligible Facility, it should state how it would propose to share the benefits of those credits, subsidies, grants or incentives with Rhode Island Energy's customers if they subsequently become available. Bidders may propose adjustments to the contract price based on an increase in any state or federal tax credit or other government grant or subsidy.

5.11 Describe the bidder's plan to adhere to the domestic supply rules set forth in the Build America, Buy America Act and the act's implications on access to federal funding, cost of materials, and supply chains.

5.12 Describe how the bidder would consider Rhode Island Energy customers in the event of the availability or receipt of any tax credit or other government grant or subsidy not contemplated in their proposals. Bidders must state their assumptions regarding the availability of federal or state tax credits, subsidies, or grants or other incentives.

5.13 Bidders must disclose any litigation or disputes in the last three years related to projects developed, owned, or managed by bidder or any of its affiliates in the United States or related to any energy product sale agreement.

5.14 What is the expected operating life of the proposed project? What is the depreciation period for all substantial physical aspects of the bid, including generation facilities, delivery facilities to move power to the grid, and mandatory and voluntary transmission system upgrades?

5.15 Has the bidder already obtained financing, or a commitment of financing, for the project? If financing has not been obtained, explain how obtaining a long-term agreement as proposed will help you in obtaining financing for the proposed project, in obtaining more favorable terms for the financing of the proposed project, or in supporting the future capital investment.

5.16 State whether the bidder or its affiliates have executed agreements with respect to energy, RECs and/or capacity for the proposed project (including any agreements that have been terminated) and provide information regarding the associated term and quantities, and whether bidder has been alleged to have defaulted under or breached any such agreement.

5.17 List all of the bidder's affiliated entities and joint ventures transacting business in the energy sector.

5.18 Has bidder, or any affiliate of bidder, in the last five years, (a) consented to the appointment of, or been taken in possession by, a receiver, trustee, custodian or liquidator of a substantial part of its assets, (b) filed a bankruptcy petition in any bankruptcy court proceeding, (c) answered, consented or sought relief under any bankruptcy or similar law or failed to obtain a dismissal of an involuntary petition, (d) admitted in writing of its inability to pay its debts when due, (e) made a general assignment for the benefit of creditors, (f) was the subject of an involuntary proceeding seeking to adjudicate that Party bankrupt or insolvent, (g) sought reorganization, arrangement, adjustment, or composition of it or its debt under any law relating to bankruptcy, insolvency or reorganization or relief of debtors?

5.19 Briefly describe any known conflicts of interest between bidder or an affiliate of bidder and Rhode Island Energy, or any affiliates of the foregoing.

5.20 Describe any litigation, disputes, claims or complaints involving the bidder or an affiliate of bidder, against Rhode Island Energy or any affiliate of Rhode Island Energy.

5.21 Describe any litigation, disputes, claims or complaints, or events of default or other failure to satisfy contract obligations, or failure to deliver products, involving bidder or an affiliate of bidder, and relating to the purchase or sale of energy, capacity or renewable energy certificates or products.

5.22 Confirm that neither bidder nor any directors, employees or agents of bidder, nor any affiliate of bidder are currently under investigation by any governmental agency, and that none of the above have in the last four years been convicted or found liable for any act prohibited by State or Federal law in any jurisdiction involving conspiracy, collusion or other impropriety with respect to bidding on any contract, or have been the subject of any debarment action (detail any exceptions).

5.23 Identify all regulatory and other approvals needed by bidder to execute a binding sale agreement.

5.24 Describe how the project will conform to FERC's applicable regulatory requirements, including, but not limited to, FERC requirements relating to allocation of transmission capacity and open access, the justness and reasonableness of rates, the potential for undue preference or discrimination, and affiliate dealings, if any. Describe how your proposed approach is consistent with FERC precedent and ratemaking principles.

5.25 Describe and document any and all direct and indirect affiliations and affiliate relationships (contractual, financial, or otherwise) in the past three years between the bidder and Rhode Island Energy and its affiliates, including all relationships in which Rhode Island Energy or its affiliates has a financial or voting interest (direct or indirect) in the bidder or the bidder's proposed project. These relationships include:

- Corporate or other joint arrangements, joint ventures, joint operations whether control exists or not
- Minority ownership (50% or less investee)
- Joint development agreements
- Operating segments that are consolidated as part of the financial reporting process
- Related parties with common ownership
- Credit, debenture, and financing arrangements, whether a convertible equity feature is present or not
- Wholly owned subsidiaries
- Commercial (including real property) relationships with Rhode Island Energy.

SECTION 6 OF APPENDIX A TO THE RFP
SITING, INTERCONNECTION, AND DELIVERABILITY

This section of the proposal addresses project location, siting, real property rights and interconnection issues. Bidders should ensure that the threshold criteria outlined in Section 2.2 of the RFP are verified in their responses.

6.1 Provide site layout plan(s), including map(s), that illustrate the location of all onshore and offshore equipment and facilities (including the estimated spacing and orientation of wind turbines and a discussion of how the plan conforms to federal and state permitting requirements) and clearly delineates the perimeter of the area in which offshore wind turbines will be placed, the location of the marine terminal facility, and the proposed water routes to the project site. Also include a map of the proposed interconnection that includes the path from the Eligible Facility site to the interconnection location, all onshore transmission and interconnection routes, locations, and details and, to the extent a bid includes or references Offshore Delivery Facilities, a map that shows those facilities' location(s). To the extent that alternative routes for offshore and onshore interconnection facilities have been considered in developing the bid, maps showing these locations should also be provided. Maps should be of scales required to identify significant marine or terrestrial features, e.g. shellfish management areas, parks, highways, etc.

Plan included? Yes☐ No☐ If not, please explain:

Describe how the proposed project is sized and designed to efficiently and cost-effectively use available lease area(s), interconnection point(s), transmission cabling, and other infrastructure required for the production and delivery of the offshore wind energy generation.

6.2 Identify any real property rights (e.g., fee-owned parcels, rights-of-way, development rights or easements or leases, or options to purchase or lease) that provide the right to use the Eligible Facility site and offshore facilities locations including for Eligible Facilities and any rights of way needed for interconnection. Note that a demonstrated federal lease must be issued on a competitive basis after January 1, 2012 for an offshore wind energy generation site that is located on the Outer Continental Shelf and for which no turbine is located within 10 miles of any inhabited area.

i. Does the project have a right to use the Eligible Facility site and/or offshore delivery facilities locations for the entire proposed term of the PPA (e.g., by virtue of ownership or land development rights obtained from the owner)?

Yes☐ No☐ If not, please explain:

ii. If so, please detail the bidder's rights to control the Eligible Facility site and/or offshore delivery facilities and interconnection location.

iii. Describe the status of acquisition of real property rights, any options in place for the exercise of these rights and describe the plan for securing the necessary real property rights, including the proposed timeline. Include these plans and the timeline in the overall project timeline.

iv. Identify any joint use of existing or proposed real property rights and/or easements.

v. Provide a copy of each of the leases, agreements, easements, and related documents granting the right to use the Eligible Facility site and Offshore Delivery Facilities and, if available, the transmission and interconnection location (and applicable letters of intent if formal agreements have not been executed).

6.3 Provide evidence of all government-issued permits, approvals, and authorizations that have been obtained or need to be obtained for the use and operation of the Eligible Facility site, the proposed onshore interconnection and transmission locations, and associated Offshore Delivery Facilities and the location(s) of such facilities. For any proposed Eligible Facility sites, offshore delivery facilities, and interconnection locations not currently zoned or permitted properly, identify present and required zoning and/or land use designations and permits and provide a detailed plan and timeline to secure the remaining permits, approvals, and authorizations for all offshore and onshore routes.

Detail the zoning and permitting issues:

Enter appropriate explanation in this space or reference applicable attachment(s)

Permitting plan and timeline:

Enter appropriate explanation in this space or reference applicable attachment(s)

Start Date: End Date:

6.4 Provide a description of the area surrounding any land-based project area, including the marine terminal for deployment of major project components (e.g., foundations, towers, blades, rotors, offshore substations) and all transmission and interconnection facility locations, and a copy of each of the related leases, agreements, easements, and related documents that have been obtained (and applicable letters of intent if formal agreements have not been executed).

6.5 If the bidder does not have interconnection facilities site control, describe the status of the plan to obtain that control.

6.6 Please provide documentation to show evidence of the interconnection request to ISO-NE, the applicable New England Transmission Owner, or any neighboring control areas, to interconnect at the Capacity Capability Interconnection Standard. Please describe the status of any planned interconnection to the grid.

6.7 Please provide studies that describe the Project's electrical system performance, its impact to the reliability of the New England Transmission system, how the project would satisfy ISO-NE's I.3.9 requirements, and how the project will interconnect at an equivalent to the Capacity Capability Interconnection Standard. Projects that do not have I.3.9 approval from ISO-NE must include technical reports or a Feasibility study that approximates the ISO-NE interconnection process, including but not limited to clear documentation of study technical and cost assumptions, reasoning, and justification of such assumptions. Proposals with a Qualification Determination Notification ("QDN") from ISO-NE for their proposed capacity amount and commitment period must include all QDN documentation in their proposal. All projects that do not have a QDN for their proposed capacity amount and commitment period must provide a study performed by ISO-NE or a third party in accordance with ISO-NE Planning Procedure 10 in order to prove ability to interconnect at the CCIS. Provide a copy of an interconnection agreement, if any, executed by the bidder with respect to the proposed project. If an interconnection agreement has not been executed, please provide the steps that need to be completed before an interconnection agreement can be executed and the associated timeline. Please also provide the status and expected completion date of any additional interconnection studies already underway with ISO-NE and/or the transmission owner. All studies must follow the current ISO-NE interconnection procedures and detail any assumptions regarding resources and corresponding network upgrades ahead of the project in the ISO-NE interconnection queue. All network upgrades and assumptions identified in these studies must be clearly documented and included in the bid price.

Attachments:

Performance and its impact:

Enter appropriate explanation in this space or reference applicable attachment(s)

Copy of completed I.3.9 approval or I.3.9-equivalent study attached: ☐

If none, please explain:

Enter appropriate explanation in this space or reference applicable attachment(s)

Copy of completed CCIS-equivalent study attached: ☐

If none, please explain:

Enter appropriate explanation in this space or reference applicable attachment(s)

Copy of Interconnection Agreement attached: ☐ If none, please explain:

Enter appropriate explanation in this space or reference applicable attachment(s)

Additionally, any other studies undertaken by ISO-NE or the bidder must be provided.

Enter appropriate explanation in this space or reference applicable attachment(s)

6.8 Please provide documentation of the deliverability constraint analysis set forth in Appendix F to the RFP. Provide a description of the findings of the deliverability constraint analysis, including but not limited to a list of thermal overloads and voltage violations identified.

Enter appropriate explanation in this space or reference applicable attachment(s)

Attachments:

Copy of completed deliverability constraint analysis: ☐

If the deliverability constraint analysis was performed as a portion of a separate study (i.e. Facility Study), please explain and provide the study:

Enter appropriate explanation in this space or reference applicable attachment(s)

6.9 If multiple interconnection requests have been made, please specify all such active requests which have not been superseded by subsequent requests and information regarding the status of each. Provide copies of any requests made and studies completed. Describe how such studies and information support the costs assumed in preparing your bid and the associated timeline proposed.

Enter appropriate explanation in this space or reference applicable attachment(s)

6.10 Please provide cost estimates for any necessary network upgrades identified in the studies identified in Section 6.7.

Enter appropriate explanation in this space or reference applicable attachment(s)

6.11 To the extent that you provide an alternative interconnection scenario based on ISO-proposed interconnection process changes, you must also include studies using the proposed ISO-NE-proposed process. Any such studies must be accompanied with clear documentation of study technical and cost assumptions, reasoning, and justification of such assumptions.

Enter appropriate explanation in this space or reference applicable attachment(s)

6.12 Provide the electrical models of all energy resources supporting the proposed project in accordance with the filing requirements of the ISO-NE Tariff Schedule 22 and 23.

Electrical models attached: ☐ If none, please explain:

Enter appropriate explanation in this space or reference applicable attachment(s)

6.13 Provide a copy of an electrical one-line diagram showing the interconnection facilities, the relevant facilities of the transmission and/or distribution provider, and any required network upgrades identified in the studies required in section 6.7 of this document.

Electrical one-line diagram attached: ☐ If none, please explain:

Enter appropriate explanation in this space or reference applicable attachment(s)

6.14 Specify and describe the current or new interconnection facilities (lines, transformers, switching equipment, system protection and controls, etc.) that bidder owns or is intending to construct or have constructed in order to deliver the proposed energy.

Enter appropriate explanation in this space or reference applicable attachment(s)

6.15 Incremental data requirements:

1. IDV file(s) in PSSE v34 format modeling all upgrades to the transmission network identified in the studies required in section 6.7 of this document. ☐ If none, please explain:

Enter appropriate explanation in this space or reference applicable attachment(s)

2. If the bidder does not use PSSE, provide in text format necessary modeling data as follows:

- Line Data:

Voltage Thermal Ratings

Impedances (r, X and B)

Line Length: from to
(bus numbers and names)

Enter appropriate explanation in this space or reference applicable attachment(s)

- Transformer data (including Phase shifting transformers if applicable):
  Terminal Voltages Thermal Ratings

  Impedance

  From To
  (bus numbers and names)

Enter appropriate explanation in this space or reference applicable attachment(s)

- Reactive compensation models as necessary

Enter appropriate explanation in this space or reference applicable attachment(s)

- Other changes to the model that would occur due to a Project such as terminal changes for lines/transformer/generator leads/loads etc.

Enter appropriate explanation in this space or reference applicable attachment(s)

6.16 Please detail with supporting information and studies (as available) that the production/delivery profile contemplated in your proposal reflects constraints or curtailment, if any, after the upgrades that are expected to take place pursuant to interconnection at an equivalent to the CCIS. If the project is planning to make any voluntary upgrades beyond those associated with the CCIS-equivalent standard, as more fully described in the RFP, please describe the transmission network upgrades necessary, their estimated cost (for which the bidder would have cost responsibility, and the impact on the proposed generation schedule by reducing remaining constraints or curtailments.

Enter appropriate explanation in this space or reference applicable attachment(s)

SECTION 7 OF APPENDIX A TO THE RFP ENVIRONMENTAL ASSESSMENT AND ENVIRONMENTAL AND FISHERIES MITIGATION PLAN, PERMIT ACQUISITION PLAN AND ENVIRONMENTAL ATTRIBUTES CERTIFICATION

This section addresses environmental and other regulatory issues associated with project siting, development, and operations for all aspects of the project (including generation, delivery, interconnection, etc.) and in all jurisdictions (federal, all interested states, etc.).

7.1 Provide a description of all government-issued permits, approvals, licenses, environmental assessments, and/or environmental impact statements required for the use and operation of the Offshore Wind Energy Generation site, the proposed onshore interconnection and transmission locations, and associated Offshore Delivery facilities and the location(s) of such facilities. Along with this list, identify the governmental agencies and States that are responsible to issuing approval of all the permits, licenses, and environmental assessments and/or environmental impact statements.

i. Provide a list and copies of all Federal, state, and local permits, approvals, authorizations, and environmental assessments and/or environmental impact statements required to construct and operate the project. Detail which permits have already been issued and which permits are in progress/remaining to be obtained.

Enter appropriate explanation in this space or reference applicable attachment(s)

ii. Identify the governmental agencies and States that have issued or will issue the required permits, approvals, authorizations, licenses, and environmental assessments and/or environmental impact statements.

Enter appropriate explanation in this space or reference applicable attachment(s)

7.2 Provide the anticipated timeline for seeking and receiving the required permits, licenses, and environmental assessments and/or environmental impact statements. Include a project permit and approval assessment which describes, in narrative form, each segment of the process, the required permit or approval, the status of the request or application and the basis for projection of success by the milestone date. All requirements should be included on the project schedule in Section 9.

Enter appropriate explanation in this space or reference applicable attachment(s)

7.3 Environmental and Fisheries Mitigation Plan (EFMP)

Provide a preliminary environmental characterization of the site and project, including both construction and operation. In addition, identify environmental impacts associated with the proposed project and any potential impediments to development. Bidders must detail, to the extent practical, specific adverse environmental and fisheries impacts that are likely to result from the proposed Facility and detail measures that will be taken to avoid, minimize, and/or mitigate those impacts in the categories identified in Section 2.3.3.3. Where specific measures are not known for a specific category of impact at the time of proposing, the plan must describe in detail the approach that will be implemented to collaborate with the state and Federal agencies and other stakeholders to define avoidance, minimization, and mitigation measures. The plan should provide a roadmap for the environmental and fisheries work to come and provide a degree of certainty that the Bidder is committed to working collaboratively with stakeholders to develop a cost-effective and environmentally responsible Project.

Plan included? Yes☐ No☐ If not, please explain:

Enter appropriate explanation in this space or reference applicable attachment(s)

7.4 Explain how the proposed project advances the objectives of achieving a reliable, clean energy future that is consistent with meeting regional greenhouse gas reduction goals as established by the 2021 Act on Climate.

Enter appropriate explanation in this space or reference applicable attachment(s)

7.5 Provide documentation demonstrating that the project will be qualified as an eligible renewable energy resource conforming to R.I.G.L. § 39-26-5.

Enter appropriate explanation in this space or reference applicable attachment(s)

7.6 All bidders must include sufficient information and documentation that demonstrates that the bidder will utilize an appropriate tracking system to ensure a unit-specific accounting of the delivery of unit-specific and unit contingent of energy and RECs. The RECs and environmental attributes associated with energy generation must be delivered into Rhode Island Energy's NEPOOL GIS accounts.

Enter appropriate explanation in this space or reference applicable attachment(s)

7.7 Identify any existing, preliminary, or pending claims or litigation, or matters before any federal agency or any state legislature or regulatory agency that might affect the feasibility of the project or the ability to obtain or retain the required permits for the project.

Enter appropriate explanation in this space or reference applicable attachment(s)

7.8 Describe any investments that will be included with your facility to improve its emissions profile.

Enter appropriate explanation in this space or reference applicable attachment(s)

SECTION 8 OF APPENDIX A TO THE RFP
ENGINEERING AND TECHNOLOGY; COMMERCIAL ACCESS TO EQUIPMENT

This section includes questions pertinent to the engineering design and project technology. This section must be completed for a project that includes new facilities or capital investments for both generation and transmission components, if applicable. Bidders should provide information about the specific technology or equipment including the track record of the technology and equipment and other information as necessary to demonstrate that the technology is viable.

8.1 Provide a reasonable but preliminary engineering plan which includes the following information:

i. Type of generation and transmission technology, if applicable

ii. Major equipment to be used

iii. Manufacturer of the equipment

iv. Status of acquisition of the equipment

v. Whether the bidder has a contract for the equipment. If not, describe the bidder's plan for securing equipment and the status of any pertinent commercial arrangements

vi. Equipment vendors selected/considered

vii. History of equipment operations

viii. If the equipment manufacturer has not yet been selected, identify in the equipment procurement strategy the factors under consideration for selecting the preferred equipment

ix. How the proposed equipment adheres to the domestic supply rules set forth in the Build America, Buy America Act.

Enter appropriate explanation in this space or reference applicable attachment(s)

8.2 If the bidder has not yet selected the major equipment for a project, please provide a list of the key equipment suppliers under consideration.

Enter appropriate explanation in this space or reference applicable attachment(s)

8.3 Please identify the same or similar equipment by the same manufacturer that are presently in commercial operation including the number installed, installed capacity and estimated generation for the past three years.

Enter appropriate explanation in this space or reference applicable attachment(s)

8.4 For less mature technologies, provide evidence (including identifying specific applications) that the technology to be employed for energy production is ready for transfer to the design and construction phases. Also, address how the status of the technology is being considered in the financial plan for the project.

Enter appropriate explanation in this space or reference applicable attachment(s)

8.5 Please indicate if the bidder has a full and complete list of equipment needed for all physical aspects of the bid, including generation facilities, transmission lead lines, and mandatory and voluntary transmission system upgrades. If not, identify the areas of uncertainty and when the full and complete list of equipment will be identified.

Enter appropriate explanation in this space or reference applicable attachment(s)

8.6 Please indicate if the bidder has secured its equipment for all physical aspects of the bid, including generation facilities, transmission lead lines, and mandatory and voluntary transmission system upgrades. If not, identify the long-lead equipment and describe the timing for securing this equipment.

Enter appropriate explanation in this space or reference applicable attachment(s)

SECTION 9 OF APPENDIX A TO THE RFP
PROJECT SCHEDULE

A bidder must demonstrate that its proposal can be developed, financed, and constructed and be technically viable within a commercially reasonable timeframe. The bidder is required to provide sufficient information and documentation that shows that the bidder's resources, process, and schedule are adequate for the acquisition of all rights, permits and approvals for all aspects of the project and for the financing of the project consistent with the proposed project milestone dates.

Bidders are required to provide a complete critical path schedule for the project from the notice of selection of the project for contract consideration to the start of commercial operations. For each project element, list the start and end date.

9.1 Identify the elements on the critical path. The schedule should include, at a minimum, the receipt of all permits necessary to construct and operate the facility, the closing of construction financing, the commencement of construction, the execution of an interconnection agreement with ISO-NE and interconnecting utility, and the commercial operation date. Include any other requirements that could influence the project schedule and the commercial operation date (e.g. adherence to Build America, Buy America Act).

Enter appropriate explanation in this space or reference applicable attachment(s)

9.2 Bidders must demonstrate that their projects have a credible proposed operation date by providing, at a minimum, documentation showing the following:

i. commencement of permitting processes

Enter appropriate explanation in this space or reference applicable attachment(s)

ii. a plan for completing all permitting processes

Enter appropriate explanation in this space or reference applicable attachment(s)

iii. viable resource assessment

Enter appropriate explanation in this space or reference applicable attachment(s)

iv. environmental assessment/Environmental and Fisheries Mitigation Plan, which shall include site and environmental data transparency requirements, as further described in Section 2.3.3.3 ("EFMP")

Enter appropriate explanation in this space or reference applicable attachment(s)

v. viable financing plans

Enter appropriate explanation in this space or reference applicable attachment(s)

vi. viable installation and electrical interconnect plans

Enter appropriate explanation in this space or reference applicable attachment(s)

vii. material progress toward acquisition of real property rights

Enter appropriate explanation in this space or reference applicable attachment(s)

viii. evidence of material vendor activity

Enter appropriate explanation in this space or reference applicable attachment(s)

SECTION 10 OF APPENDIX A TO THE RFP
CONSTRUCTION AND LOGISTICS

This section of the proposal addresses necessary arrangements and processes for outfitting, assembly, storage, and deployment of major project components such as turbine nacelles, blades, towers, foundations, and delivery facilities support structures, and other major components associated with delivery facilities and, and the storage facility (as applicable). Please provide a construction plan that captures the following objectives:

10.1 Please list the major tasks or steps associated with deployment of the proposed project and the necessary specialized equipment (e.g. vessels, cranes).

Enter appropriate explanation in this space or reference applicable attachment(s)

10.2 Please provide documentation to demonstrate site control for all marine terminals and other waterfront facilities that will be used to stage, assemble, and deploy the project for each stage of construction.

i. Evidence that the bidder or the equipment/service provider have a valid lease, or option to lease, a marine terminal and/or waterfront facility for construction of the offshore wind energy project (e.g., by virtue of ownership or land development rights obtained from the owner).

Enter appropriate explanation in this space or reference applicable attachment(s)

ii. If not available, describe the status of acquisition of real property rights for necessary marine terminal and/or waterfront facilities, any options in place for the exercise of these rights and describe the plan for securing the necessary real property rights, including the proposed timeline. Include these plans and the timeline in the overall project schedule. Provide any agreements, options, or other materials reflecting the bidder's efforts so far to secure real property rights (and any letters of intent to the extent signed agreements are not in place).

Enter appropriate explanation in this space or reference applicable attachment(s)

iii. Identify any joint use of existing or proposed real property rights for marine terminal or waterfront facilities.

Enter appropriate explanation in this space or reference applicable attachment(s)

10.3 Please describe the proposed approach for staging and deployment of major project components to the project site. Indicate the number, type and size of vessels that will be used, and their respective roles, as well as the projected timing of their use. Please include specific information on how the bidder's deployment strategy will conform to requirements of the Merchant Marine Act of 1920 (the Jones Act).

Enter appropriate explanation in this space or reference applicable attachment(s)

10.4 List the party (e.g. the bidder, or equipment/service providers under contract to the bidder) responsible for each deployment activity and describe the role of each party. Describe the status of bidder's contractual agreements with third-party equipment/service providers.

Enter appropriate explanation in this space or reference applicable attachment(s)

SECTION 11 OF APPENDIX A TO THE RFP OPERATIONS AND MAINTENANCE

Projects that can demonstrate that the operation and maintenance ("O&M") plan, level of funding, and mechanism for funding will ensure reliable operations during the term of the contract or the tariff are preferred.

11.1 Provide an O&M plan for the project that demonstrates the long-term operational viability of the proposed project. The plan should include a discussion of the staffing levels proposed for the project, the expected role of the project sponsor or outside contractor, scheduling of major maintenance activity, and the plan for testing equipment.

Enter appropriate explanation in this space or reference applicable attachment(s)

11.2 Describe in detail the proposed O&M funding mechanism and funding levels to support planned and unplanned O&M requirements.

Enter appropriate explanation in this space or reference applicable attachment(s)

11.3 Describe the terms (or expected terms) of the warranties and/or guarantees on major equipment that the bidder is utilizing or proposing to utilize.

Enter appropriate explanation in this space or reference applicable attachment(s)

11.4 Describe the status of the project sponsor in securing any O&M agreements or contracts. Include a discussion of the sponsor's plan for securing a medium-term or long-term O&M contract, including the expected provider of O&M services.

Enter appropriate explanation in this space or reference applicable attachment(s)

11.5 Provide examples of the bidder's experience with O&M services for other similar projects.

Enter appropriate explanation in this space or reference applicable attachment(s)

SECTION 12 OF APPENDIX A TO THE RFP
PROJECT MANAGEMENT/EXPERIENCE

Bidders are required to demonstrate project experience and management capability to successfully develop (for a project that includes new facilities or capital investment) and operate the project proposed, Rhode Island Energy is particularly interested in project teams that have demonstrated success in projects of similar type, size and technology and, for projects that include new facilities or capital investment, can demonstrate an ability to work together effectively to bring the project to commercial operation in a timely fashion.

12.1 Provide an organizational chart for the project that lists the project participants and identifies the corporate structure, including general and limited partners.

Enter appropriate explanation in this space or reference applicable attachment(s)

12.2 For a project that includes new facilities or capital investment, provide statements that list the specific experience of the bidder and each of the project participants (including, when applicable, the bidder, partners, EPC contractor and proposed contractors), in developing, financing, owning, and operating generating or transmission facilities (as applicable), other projects of similar type, size and technology, and any evidence that the project participants have worked jointly on other projects.

Enter appropriate explanation in this space or reference applicable attachment(s)

12.3 For a bid that includes existing facilities, provide statements that list the specific experience of the bidder and each of the project participants (including, when applicable, the bidder, partners, EPC contractor and proposed contractors), in owning and operating generating or transmission facilities (as applicable), other projects of similar type, size and technology, and any evidence that the project participants have worked jointly on other projects.

Enter appropriate explanation in this space or reference applicable attachment(s)

12.4 Provide a management chart that lists the key personnel dedicated to this project and provide resumes of the key personnel. For Eligible Facilities that are not yet in-service, key personnel of the bidder's development team having substantial project management responsibilities must have:

i. Successfully developed and/or operated one or more projects of similar size or complexity or requiring similar skill sets; **and**

ii. For a project that includes new facilities or capital investment, experience in financing power generation projects (or have the financial means to finance the project on the bidder's balance sheet)

Enter appropriate explanation in this space or reference applicable attachment(s)

12.5 Provide a listing of all projects the project sponsor has successfully developed or that are currently under construction. Provide the following information as part of the response:

i. Name of the project

ii. Location of the project

iii. Project type, size, and technology

iv. Commercial operation date

v. Estimated and actual capacity factor of the project for the past three years

vi. Availability factor of the project for the past three years

vii. References, including the names and current addresses and telephone numbers of individuals to contact for each reference

Enter appropriate explanation in this space or reference applicable attachment(s)

12.6 With regard to the bidder's project team, identify and describe the entity responsible for the following, as applicable:

i. Construction Period Lender, if any

ii. Operating Period Lender and/or Tax Equity Provider, as applicable

iii. Financial Advisor

iv. Environmental Consultant

v. Facility Operator and Manager

vi. Owner's Engineer

vii. EPC Contractor (if selected)

viii. Transmission Consultant

ix. Legal Counsel

Enter appropriate explanation in this space or reference applicable attachment(s)

12.7 Provide details of the bidder's experience in ISO-NE other Markets affected by the bid. With regard to bidder's experience with ISO-NE markets, please indicate the entity that will assume the duties of Lead Market Participant for your Project. Please provide a summary of the proposed Lead Market Participant's experience with each of the ISO-NE markets.

Enter appropriate explanation in this space or reference applicable attachment(s)

SECTION 13 OF APPENDIX A TO THE RFP
ALTERNATIVE BID PROPOSALS

13.1 Per Section 2.2.2.5 of the Request for Proposals, bidders may submit alternative project proposals, based on varying aspects of the proposed project:

- Contract Term Length
- Additional Pricing Offer
- Production/Delivery Profile
- In-service Date
- Project Size
- Technology Type
- Delivery Location

Each submitted proposal must be accompanied by a non-refundable bid fee, which will be used to offset the cost of the evaluation of proposals. Bid fee instructions will be sent upon request to bidders who contact the Official Contact listed in Section 3.5.

SECTION 14 OF APPENDIX A TO THE RFP
CONTRIBUTION TO EMPLOYMENT AND ECONOMIC BENEFITS TO RHODE ISLAND

Bidders must provide annualized estimates for all economic benefits and identify the specific in-state expenditures and employment proposed during the development, construction and operation and maintenance phases of the project. Bidders are also required to fill out the Economic Development Summary Excel Workbook provided as an addendum to this Appendix.

14.1 For the direct economic benefits to the State of Rhode Island, please provide an estimate of the number of jobs to be created directly during project development and construction (for a project that includes new facilities or capital investment), and during operations, and a general description of the types of jobs created, estimated annual compensation, the employer(s) for such jobs, and the location. Please treat the development, construction, and operation periods separately in your response.

Enter appropriate explanation in this space or reference applicable attachment(s)

14.2 Please provide the same information as provided in response to question 14.1 above but with respect to jobs that would be indirectly created, in the State of Rhode Island, as a result of the proposed project.

Enter appropriate explanation in this space or reference applicable attachment(s)

14.3 Describe the proposed project's commitment to the following: investing in offshore wind-related environmental research, monitoring and mitigation sponsored by the DEM and/or the Rhode Island Coastal Resource Management Council; investing in workforce development and environmental research facilities to support the offshore wind industry; utilizing port facilities and office space; and investing in development activities that directly benefit economically distressed areas and/or low-income populations.

Enter appropriate explanation in this space or reference applicable attachment(s)

14.4 Please describe any other direct economic benefits to the State of Rhode Island (either positive or negative) that could result from the proposed project, such as creating property tax revenues or purchasing capital equipment, materials, or services for Rhode Island businesses. Please provide the location(s) where these economic development benefits are expected to occur.

Enter appropriate explanation in this space or reference applicable attachment(s)

14.5 To the extent not already specified elsewhere in your response, please describe any additional benefits or impacts associated with the proposed project.

Enter appropriate explanation in this space or reference applicable attachment(s)

14.6 The Section 14 Addendum: Economic Development Summary Sheet is a Microsoft Excel workbook provided on ricleanenergyrfp.com. Please fill out and submit the Section 14 Addendum to accompany responses in this section.

Attachments:

Copy of completed Section 14 Addendum in Excel format (.xls or .xlsx file): ☐

SECTION 15 TO APPENDIX A TO THE RFP
DIVERSITY, EQUITY, AND INCLUSION PLAN

Bidders are required to demonstrate a diversity, equity and inclusion plan that describes the proposed strategy to actively promote access to employment and contracting opportunities for, and to actively recruit, diverse workers, vendors, contractors, and investors, and include how the direct, specific and measurable employment and contracting benefits created by the proposed project provides employment and procurement/contracting opportunities for minorities, women, veterans, LGBT and persons with disabilities.

15.1 Workforce Diversity Plan

Please include descriptions of each type, duration and salary bands of the employment created and identify the recruitment efforts aimed at hiring diverse candidates for these employment opportunities.

Enter appropriate explanation in this space or reference applicable attachment(s)

15.2 Supplier Diversity Program

Please include descriptions of the subcontracting, vendor, investor, and ancillary (operational) business opportunities that will be provided by diverse businesses.

Enter appropriate explanation in this space or reference applicable attachment(s)

15.3 Stakeholder Engagement Plan

Provide plans to consider how the bidder will engage with project stakeholders. Identify groups of stakeholders to be included (e.g. tribal communities, economically-disadvantaged communities, environmental justice advocates, and fishing communities), project impacts on each stakeholder (and associated mitigation plans), engagement goals for each such group, engagement activities and community partnerships included in the plan, and demonstrated evidence of past and current productive relationships with project stakeholders.

Enter appropriate explanation in this space or reference applicable attachment(s)

SECTION 16 TO APPENDIX A TO THE RFP
LIST OF RHODE ISLAND VENDORS AND DOMESTIC SUPPLY CHAIN OPPORTUNITIES

Bidders are required to identify Rhode Island vendors and other domestic offshore wind supply chain opportunities associated with the project.

16.1 Please identify the Rhode Island vendors associated with supplying the project and provide percentage of Rhode Island-based vendors. Additionally, please provide the percentage of total vendors that are based in the United States.

Enter appropriate explanation in this space or reference applicable attachment(s)

16.2 Please identify the project's plans to invest in supply chain and infrastructure improvements to support the offshore wind industry.

Enter appropriate explanation in this space or reference applicable attachment(s)

SECTION 17 TO APPENDIX A TO THE RFP
PLANS FOR CONSTRUCTION LABOR AGREEMENT

Bidders are required to submit a plan outlining their intentions with respect to the negotiation of project labor agreements to cover construction activities.

17.1 As part of the contract negotiation process, the bidder must commit to enter into a labor peace agreement with at least one bona fide labor organization either where such bona fide labor organization is actively representing employees providing necessary construction, operations and maintenance services for the project at the time of such agreement or upon notice from a bona fide labor organization that is attempting to represent employees who will provide necessary operations and maintenance services for the renewable energy system employed in the state. The maintenance of such labor peace agreement will be an ongoing material condition of any continuation of payments under the PPA. See R.I. Gen. Laws § 39-31-10(e).

Describe the Bidder's plan to enter into a labor peace agreement and/or plan for project employee representation by a labor organization.

Enter appropriate explanation in this space or reference applicable attachment(s)

17.2 Bidders must commit to pay each construction, operations and maintenance employee wages and benefits that are not less than the prevailing wage and fringe benefit rates at the journeyman level that are prescribed by the Rhode Island Department of Labor and Training, and not less than the prevailing wage rates for employees for which there is no classification prescribed by the Rhode Island Department of Labor and Training. Bidders must also commit to pay benefits and wages not less than the rate applicable to apprentices for the pertinent classification prescribed by the Rhode Island Department of Labor and Training if the worker is a participant in an approved apprenticeship program and the approved apprenticeship program maintains a direct entry agreement with a certified pre-apprenticeship training program. See R.I. Gen. Laws § 39-31-10(f).

Describe the Bidder's plan to compensate project employees and apprentices not less than the prevailing wage.

Enter appropriate explanation in this space or reference applicable attachment(s)

SECTION 18 TO APPENDIX A TO THE RFP
EXCEPTIONS TO FORM PPAS

Please attach an explanation of any exceptions to the Form PPA set forth in Appendix C. Comments to the proposed Form PPA must include any specific alternative provisions in a redline format to the Form PPA. **Bidders are discouraged from proposing material changes to the Form PPA.**

SECTION 19 OF APPENDIX A TO THE RFP
EXCEPTIONS TO COMMITMENT AGREEMENT

Please attach an explanation of any exceptions to the Commitment Agreement set forth in Appendix E to this Notice, including any specific alternative provisions in a redline format to the Commitment Agreement.

Bidders must include a marked version showing any proposed changes to the Commitment Agreement with their bid, and it is assumed that bidders would be willing to execute the marked-up agreement included in their bids. **Bidders are discouraged from proposing material changes to the Commitment Agreement**.

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Part I
Guidelines and Instructions

Certification, Project and Pricing Data (CPPD)

This CPPD form comprises Part I through Part VII and is included as Section 1 of Appendix A to the RFP. Parts II through VII of this Attachment must be completed in this Excel spreadsheet and submitted according to the instructions in Part 1 and the remainder of the CPPD form. Additionally, bidders must complete and submit the Bid Fee Submittal Form. Please read these instructions in their entirety.

Proposals will include a net generating capacity of at least 100 MW and up to approximately 1000 MW, a credible commercial operation date, on-shore interconnection point information, and an hourly profile production schedule. With respect to on-shore interconnection points, a proposal in which there will be a single point of interconnection and delivery will be considered a single bid. Similarly, a bid in which there will be two points of interconnection and delivery, with a specified allocation of energy delivered to each point of interconnection, will also be considered a single bid for evaluation purposes. If submitting multiple proposals with different capacity sizes, commercial operation dates, on-shore interconnection points (except, as noted above, where there is a specified allocation of energy between interconnection points), or production schedules, please submit separate CPPD forms for each unique proposal and indicate the name of each CPPD form on the Bid Fee Submittal Form.

Part II - Proposal Certification and Authorization and Bid Contact Information

Proposal Certification, name of the bidder, project name and contact info.

Part III - Proposal Identification and Definitions

Part III requires the bidder to provide a summary of how this proposal meets the Definitions included in the RFP.

Part IV - Eligible Facility Summary Information

Part IV provides technical information about a facility and facility parameters, to be considered in the evaluation. If the bid proposal is for a one phase project, please complete Part IV(a). If the bid proposal includes phases of development, Part IV (a) must be completed for the first phase, and Part IV (b) must be completed for the second phase. Part IV (c) and Part IV (d) must be completed for the third and fourth phases, respectively, if applicable.

Note: This data collection spreadsheet is designed to provide for maximum flexibiliy to bidders; however, it is not intended to suggest the number of phases of developement. The Company urges bidders to seek solutions with the fewest number of phases of developement.

Version v1 10/14/22

Part I (continued)
Guidelines and Instructions

Part V - Operational Information (Expected Hourly, Monthly and Annual Production Data)

The forms are used to convey the information about the quantity and timing of energy and/or RECs to be received at the Delivery Point by Buyer (which would be the net amount at the point of interconnection, accounting for all transmission and equipment losses from the Facility). The data entry must be provided in an 'hourly profile' format. Hourly Profile data is entered in Part V(a)(i), and provides for greater modeling accuracy during the evaluation process. It is requested that the bidder provide hourly production data representative of a specific year (8760 or 8784 data points). Table Part V (a) will be populated automatically from your data entered in Part V(a)(i), creating the project's 12 x 24 annual energy production. Bidders are required to provide an hourly profile specific to 2012 weather patterns. 2012 is chosen as a “typical meteorological year” and assures consistency in evaluation of bids.

If the bid proposal is for a one-phase project, please provide data in tab Part V (phase 1). If a proposal includes phases of development, you must provide separate data for each relevant phase, in tabs 'Part V (phase1)', 'Part V (phase2)', 'Part V (phase3)', 'Part V (phase4)', respectively. As communicated in Part I above, the Company encourages bidders to minimize the number of phases proposed without undermining the operability and/or financial efficacy of the bid proposal.

Part V (b) provides monthly adjustment factors for up to 20 years to adjust for varying maintenance intervals or declining output. The factors are for specific months and years, so the factors should coincide with the expected commercial operation date or the guaranteed delivery start date of the bid. Because of this calendar convention, there are 21 years of factors to accommodate partial years at the beginning and end of a 20 year offer. The values should be expressed in decimal format, where 1 means no change to the output. Any reductions should be reflect as 1 less the outage rate (i.e. a 1% decrease in output should be input as 0.99).

There is also a Part V (Informational) which provides conversion of the hourly generation profile into monthly on- and off-peak quantities prior to the monthly adjustment factors according to standard NERC definitions. This takes the profile for Part V (b), and makes adjustments for the average number of days over a 20 year period.

Part VI - Pricing

Part VI (a) to VI(d) Pricing. These parts are used to capture the energy and REC prices for each contract year in the term. Pricing must conform to Section 2.2.4.2 of the RFP. If the bid proposal is for a one phase project, please complete Part VI (a). If the bid proposal includes additional phases of development, Part VI (a) must be completed for the first phase, Part VI (b) must be completed for the second phase, and Part VI (c) and Part VI (d) must be completed for the third and fourth phases, respectively, if applicable.

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Part I (continued)
Guidelines and Instructions

Part VII - ISO-NE Forward Capacity Auction Qualification

Part VII provides spaces to describe the amount of capacity and the capacity commitment period, for which the bidder expects the generation unit in their proposal to qualify under the Forward Capacity Auction Qualification requirements set forth in Section III.13.1 of Market Rule 1 of ISO-NE's Transmission Markets and Services Tariff and how the bidder expects to meet those requirements.

Part II (a)
Proposal Certification and Authorization (Appendix A.1)

A proposal will be considered incomplete unless all required signatures are provided.

The undersigned certifies that he or she is an authorized officer or other authorized representative of the bidder, and further certifies that:

(1) the bidder has reviewed this RFP and all attachments and has investigated and informed itself with respect to all matters pertinent to this RFP and its proposal; (2) the bidder's proposal is submitted in compliance with all applicable federal, state and local laws and regulations, including antitrust and anti-corruption laws; (3) the bidder is bidding independently and has no knowledge of non-public information associated with a proposal being submitted by another party in response to this RFP other than: (a) a response submitted (i) by an affiliate of bidder or (ii) for a project where bidder is also a project proponent or participant, which in each case must be disclosed in writing to the Evaluation Team with each such bidder's or affiliated bidder's proposal; or (b) a submission of multiple bids for the same Energy; (4) the bidder has no knowledge of any non-public information associated with the development of this RFP; (5) the bidder's proposal has not been developed utilizing knowledge of any non-public information associated with the development of this RFP; (6) the bidder accepts that confidential information about their proposal might be shared with any members of the Evaluation Team, the Evaluation Team Consultant, ISO-NE or Other Authorities personnel; and (7) the bidder will continue to observe these requirements throughout the RFP process.

Violation of any of the above requirements may be reported to the appropriate government authorities and shall disqualify the Bidder from the RFP process.

The undersigned further certifies that the prices, terms and conditions of the bidder's proposal are valid and shall remain open for at least 184 days from the submission date.

The undersigned further certifies that he or she has personally examined and is familiar with the information submitted in this proposal and all appendices thereto, and based on reasonable investigation, including inquiry of the individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of the undersigned's knowledge and belief.

The undersigned understands that a false statement or failure to disclose material information in the submitted proposal may be punishable as a criminal offense under applicable law. The undersigned further certifies that this proposal is on complete and accurate forms as provided without alteration of the text.

Project Title(s) ____________________
(Proposal as Submitted to the Soliciting Party)

Bidder Name ____________________

Bidder or Authorized Representative ____________________

____________________ ____________________
Bidder Representative's Title Date

____
Signature of Bidder or Authorized Representative

Part II (b)
Bidder and Contact Information

Contact Information For Project	
Name	
Mailing Address	
Courier Address (If Different)	
Telephone Number	
E-mail Address	

Alternate Contact (Optional)	
Name	
Mailing Address	
Courier Address (If Different)	
Telephone Number	
E-mail Address	

Part III
Proposal Identification and Definitions

Bidder Name

Project Title

Provide a summary description of the following:

How the developer of this proposal meets the definition of "Eligible Bidder"

How the generation facility meets the definition of "Eligible Facility"

How the generation facility will meet the definition of "Eligible Products"

How this proposal is consistent with the achievement of the state's greenhouse gas reduction targets under the 2021 Act on Climate

How this proposal contributes to improving energy system reliability and security

Describe the delivery facilities and their various components (e.g. high side bus, high voltage cables from the high side bus to the onshore substation)

Part IV (a)
Eligible Facility Summary Information

Project Title ____________________

Does this proposal include phases of development? __________ *(Yes/No)* __________ *(# of Phases)*
(complete part IV (a) thru part IV(d) below as applicable for Phase 1, Phase 2, Phase 3 and Phase 4, respectively)

Guaranteed Commercial Operation Date (of Phase 1) ____________________
(if proposal includes phases of development, enter the Commercial Operation Date of the first phase)

For evaluation purposes, the term is assumed to start on the first day of the first full calendar month beginning on or after the Proposed Delivery Term Start Date or the Guaranteed Commercial Operation Date as applicable, as shown to the right:	01/00/1900

Capacity of the Facility (MW, as proposed), Phase 1 __________ Gross __________ Net

Contract Maximum Amount (as defined in Form PPA), Phase 1 __________ MWh/hr

Estimated Net Capacity Factor (%), Phase 1 __________ %

Expected Annual Availability (%), Phase 1 __________ %

Buyers' Percentage Entitlement of facility output, Phase 1 __________ %
(Enter Percent relative to entire Capacity of the Facility; >0% to max. 100%)

Is the Buyer's Percentage Entitlement scalable downward in the event that acceptance of the full amount offered would result in exceedance of the target procurement amount? *(Yes/No)* __________

What is the minimum acceptable Buyer's Percentage Entitlement? __________ %
(for proposal with multiple phases, scale down is expected to be the same % across all phases)

Confirm that the project will be built to the total Capacity of the Facility, listed above, regardless of the Buyer's Percentage Entitlement accepted? __________

Renewable Energy Lease Number	

Documentation demonstrating that you possess a federal lease for a designated wind generation area for the Eligible Facility site that was issued on a competitive basis after January 1, 2012 must be attached

Designate file /folder name(s)
____

Proposed On-Shore Delivery Point(s)* ______________________________

ISO New England Load Zone for Proposed Delivery Point ______________________________

Please note: The Delivery Point must be the specific Node on the ISO-NE Pool Transmission Facilities, as determined by ISO-NE, where Seller shall transmit its Energy to Buyer, as set forth in Exhibit A to the contract. Seller shall be responsible for all applicable charges associated with transmission interconnection, service and delivery charges, including all related ISO-NE administrative fees and other FERC-approved charges in connection with the Delivery of Energy to the Delivery Point.

*The single Delivery Point proposed by Buyer or if there are multiple proposed Delivery Points, only where there is a specified allocation of energy between the Delivery Points (in contrast to a proposed and alternative Delivery Point).

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Part V (a)

Operational Information - Production Data of Off Shore Wind Project

Project Title Auto-Filled **Data Entry:** Hourly Profile

*Information in Table Part V (a) below is automatically populated. RFP Bidder **must** insert the appropriate Hourly Profile utilizing the tables found to the right - Part V(a)(i). This creates the project's 12 x 24 annual energy production schedule.*

HOURLY DELIVERY in MW *(Averaged)* - 12 Months by 24 Hours For Representative Day For Each Month

HE	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1												
2												
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Note: Intermittent Resources must use the P50 Level (Probability Distribution of Output).

Notes:
The hourly output profile(s) above will be summed into monthly peak and off-peak quantities via a uniform conversion. The conversion factors and resulting amounts, prior to applying the adjustment factors, are shown below in Part V (Informational).

Offshore Wind Resources

Enter the P50 level of output from the resource.

Version: v1 10/14/22

Part V (b)

Operational Information - Maintenance Profile for Off Shore Wind Project

Project Title Auto-Filled

MONTHLY ADJUSTMENT FACTORS AS PERCENTAGE OF EXPECTED PRODUCTION

Enter factors in decimal format, where 1 equals no adjustment (i.e. a decrease of 2% should be entered as 0.98)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1												
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IMPORTANT: These factors are for specific months and calendar years. The first entry must coincide with the project start date.

Notes:
The adjustment factors in each contract month above will be applied to capture changes in monthly output production for variations associated with maintenance, degradation, or other changes in output.

If Part V(a) or V(a)(i) already reflect a forced outage rate or scheduled outage information, then Part V(c) should be left blank or contain a factor of 1.000 for each month.

Version: v1 10/14/22

Part V (informational)
Validation and Conversion Assumptions and Calculations

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Days used to convert hourly profiles into monthly and annual amounts												
Average Number of Weekdays	22.14	20.18	22.14	21.43	22.14	21.43	22.14	22.14	21.43	22.14	21.43	22.14
Average Number of Weekend Days	8.86	8.07	8.86	8.57	8.86	8.57	8.86	8.86	8.57	8.86	8.57	8.86
Average Days	31.00	28.25	31.00	30.00	31.00	30.00	31.00	31.00	30.00	31.00	30.00	31.00
Average NERC Holiday	1.00	-	-	-	1.00	-	1.00	-	1.00	-	1.00	1.00
Generation Conversion Prior to Monthly Adjustment Factors (Daily MWh/day)												
Sum of Generation HE 1-7, 24	0	0	0	0	0	0	0	0	0	0	0	0
Sum of Generation HE 8-23	0	0	0	0	0	0	0	0	0	0	0	0
Sum of Generation HE 1-24	0	0	0	0	0	0	0	0	0	0	0	0
Monthly Generation Summary (MWh)												
Average Monthly On-Peak Generation (prior to monthly adjustment factors)	0	0	0	0	0	0	0	0	0	0	0	0
Average Monthly Off-Peak Generation (prior to monthly adjustment factors)	0	0	0	0	0	0	0	0	0	0	0	0
Total Generation (prior to monthly adjustment factors)	0	0	0	0	0	0	0	0	0	0	0	0
Monthly Balance Check	0	0	0	0	0	0	0	0	0	0	0	0

Total Annual Energy and Capacity Factor (prior to monthly adjustment factors)

	On-Peak Hours	Off-Peak Hours	All Hours	AnnCapFac		Annual Delivery
Generation (MWh)	0	0	0	0.00%		0 MWh

Version: v1 10/14/22

Part V (a)

Operational Information - Production Data of Off Shore Wind Project

Project Title Auto-Filled **Data Entry:** Hourly Profile

Information in Table Part V (a) below is automatically populated. RFP Bidder ***must*** *insert the appropriate Hourly Profile utilizing the tables found to the right - Part V(a)(i). This creates the project's 12 x 24 annual energy production schedule.*

HOURLY DELIVERY in MW *(Averaged)* - 12 Months by 24 Hours For Representative Day For Each Month

HE	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1												
2												
3												
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Note: Intermittent Resources must use the P50 Level (Probability Distribution of Output).

Notes:
The hourly output profile(s) above will be summed into monthly peak and off-peak quantities via a uniform conversion. The conversion factors and resulting amounts, prior to applying the adjustment factors, are shown below in Part V (Informational).

Offshore Wind Resources
Enter the P50 level of output from the resource.

Version: v1 10/14/22

Part V (b)

Operational Information - Maintenance Profile for Off Shore Wind Project

Project Title Auto-Filled

MONTHLY ADJUSTMENT FACTORS AS PERCENTAGE OF EXPECTED PRODUCTION

Enter factors in decimal format, where 1 equals no adjustment (i.e. a decrease of 2% should be entered as 0.98)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1												
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IMPORTANT: These factors are for specific months and calendar years. The first entry must coincide with the project start date.

Notes:
The adjustment factors in each contract month above will be applied to capture changes in monthly output production for variations associated with maintenance, degradation, or other changes in output.

If Part V(a) or V(a)(i) already reflect a forced outage rate or scheduled outage information, then Part V(c) should be left blank or contain a factor of 1.000 for each month.

Version: v1 10/14/22

Part V (informational)
Validation and Conversion Assumptions and Calculations

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Days used to convert hourly profiles into monthly and annual amounts												
Average Number of Weekdays	22.14	20.18	22.14	21.43	22.14	21.43	22.14	22.14	21.43	22.14	21.43	22.14
Average Number of Weekend Days	8.86	8.07	8.86	8.57	8.86	8.57	8.86	8.86	8.57	8.86	8.57	8.86
Average Days	31.00	28.25	31.00	30.00	31.00	30.00	31.00	31.00	30.00	31.00	30.00	31.00
Average NERC Holiday	1.00	-	-	-	1.00	-	1.00	-	1.00	-	1.00	1.00
Generation Conversion Prior to Monthly Adjustment Factors (Daily MWh/day)												
Sum of Generation HE 1-7, 24	0	0	0	0	0	0	0	0	0	0	0	0
Sum of Generation HE 8-23	0	0	0	0	0	0	0	0	0	0	0	0
Sum of Generation HE 1-24	0	0	0	0	0	0	0	0	0	0	0	0
Monthly Generation Summary (MWh)												
Average Monthly On-Peak Generation (prior to monthly adjustment factors)	0	0	0	0	0	0	0	0	0	0	0	0
Average Monthly Off-Peak Generation (prior to monthly adjustment factors)	0	0	0	0	0	0	0	0	0	0	0	0
Total Generation (prior to monthly adjustment factors)	0	0	0	0	0	0	0	0	0	0	0	0
Monthly Balance Check	0	0	0	0	0	0	0	0	0	0	0	0

Total Annual Energy and Capacity Factor (prior to monthly adjustment factors)

	On-Peak Hours	Off-Peak Hours	All Hours	AnnCapFac	Annual Delivery
Generation (MWh)	0	0	0	0.00%	0 MWh

Version: v1 10/14/22

Part V (a)

Operational Information - Production Data of Off Shore Wind Project

Project Title Auto-Filled **Data Entry:** Hourly Profile

*Information in Table Part V (a) below is automatically populated. RFP Bidder **must** insert the appropriate Hourly Profile utilizing the tables found to the right - Part V(a)(i). This creates the project's 12 x 24 annual energy production schedule.*

HOURLY DELIVERY in MW *(Averaged)* - 12 Months by 24 Hours For Representative Day For Each Month

HE	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1												
2												
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Note: Intermittent Resources must use the P50 Level (Probability Distribution of Output).

Notes:
The hourly output profile(s) above will be summed into monthly peak and off-peak quantities via a uniform conversion. The conversion factors and resulting amounts, prior to applying the adjustment factors, are shown below in Part V (Informational).

Offshore Wind Resources
Enter the P50 level of output from the resource.

Version: v1 10/14/22

Part V (b)

Operational Information - Maintenance Profile for Off Shore Wind Project

Project Title Auto-Filled

MONTHLY ADJUSTMENT FACTORS AS PERCENTAGE OF EXPECTED PRODUCTION

Enter factors in decimal format, where 1 equals no adjustment (i.e. a decrease of 2% should be entered as 0.98)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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IMPORTANT: These factors are for specific months and calendar years. The first entry must coincide with the project start date.

Notes:
The adjustment factors in each contract month above will be applied to capture changes in monthly output production for variations associated with maintenance, degradation, or other changes in output.

If Part V(a) or V(a)(i) already reflect a forced outage rate or scheduled outage information, then Part V(c) should be left blank or contain a factor of 1.000 for each month.

Version: v1 10/14/22

Part V (informational)
Validation and Conversion Assumptions and Calculations

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Days used to convert hourly profiles into monthly and annual amounts												
Average Number of Weekdays	22.14	20.18	22.14	21.43	22.14	21.43	22.14	22.14	21.43	22.14	21.43	22.14
Average Number of Weekend Days	8.86	8.07	8.86	8.57	8.86	8.57	8.86	8.86	8.57	8.86	8.57	8.86
Average Days	31.00	28.25	31.00	30.00	31.00	30.00	31.00	31.00	30.00	31.00	30.00	31.00
Average NERC Holiday	1.00	-	-	-	1.00	-	1.00	-	1.00	-	1.00	1.00
Generation Conversion Prior to Monthly Adjustment Factors (Daily MWh/day)												
Sum of Generation HE 1-7, 24	0	0	0	0	0	0	0	0	0	0	0	0
Sum of Generation HE 8-23	0	0	0	0	0	0	0	0	0	0	0	0
Sum of Generation HE 1-24	0	0	0	0	0	0	0	0	0	0	0	0
Monthly Generation Summary (MWh)												
Average Monthly On-Peak Generation (prior to monthly adjustment factors)	0	0	0	0	0	0	0	0	0	0	0	0
Average Monthly Off-Peak Generation (prior to monthly adjustment factors)	0	0	0	0	0	0	0	0	0	0	0	0
Total Generation (prior to monthly adjustment factors)	0	0	0	0	0	0	0	0	0	0	0	0
Monthly Balance Check	0	0	0	0	0	0	0	0	0	0	0	0

Total Annual Energy and Capacity Factor (prior to monthly adjustment factors)

	On-Peak Hours	Off-Peak Hours	All Hours	AnnCapFac	Annual Delivery
Generation (MWh)	0	0	0	0.00%	0 MWh

Version: v1 10/14/22

Part V (a)

Operational Information - Production Data of Off Shore Wind Project

Project Title Auto-Filled **Data Entry:** Hourly Profile

*Information in Table Part V (a) below is automatically populated. RFP Bidder **must** insert the appropriate Hourly Profile utilizing the tables found to the right - Part V(a)(i). This creates the project's 12 x 24 annual energy production schedule.*

HOURLY DELIVERY in MW *(Averaged)* - 12 Months by 24 Hours For Representative Day For Each Month

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Note: Intermittent Resources must use the P50 Level (Probability Distribution of Output).

Notes:
The hourly output profile(s) above will be summed into monthly peak and off-peak quantities via a uniform conversion. The conversion factors and resulting amounts, prior to applying the adjustment factors, are shown below in Part V (Informational).

Offshore Wind Resources
Enter the P50 level of output from the resource.

Version: v1 10/14/22

Part V (b)

Operational Information - Maintenance Profile for Off Shore Wind Project

Project Title Auto-Filled

MONTHLY ADJUSTMENT FACTORS AS PERCENTAGE OF EXPECTED PRODUCTION

Enter factors in decimal format, where 1 equals no adjustment (i.e. a decrease of 2% should be entered as 0.98)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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IMPORTANT: These factors are for specific months and calendar years. The first entry must coincide with the project start date.

Notes:
The adjustment factors in each contract month above will be applied to capture changes in monthly output production for variations associated with maintenance, degradation, or other changes in output.

If Part V(a) or V(a)(i) already reflect a forced outage rate or scheduled outage information, then Part V(c) should be left blank or contain a factor of 1.000 for each month.

Version: v1 10/14/22

Part V (informational)
Validation and Conversion Assumptions and Calculations

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Days used to convert hourly profiles into monthly and annual amounts												
Average Number of Weekdays	22.14	20.18	22.14	21.43	22.14	21.43	22.14	22.14	21.43	22.14	21.43	22.14
Average Number of Weekend Days	8.86	8.07	8.86	8.57	8.86	8.57	8.86	8.86	8.57	8.86	8.57	8.86
Average Days	31.00	28.25	31.00	30.00	31.00	30.00	31.00	31.00	30.00	31.00	30.00	31.00
Average NERC Holiday	1.00	-	-	-	1.00	-	1.00	-	1.00	-	1.00	1.00
Generation Conversion Prior to Monthly Adjustment Factors (Daily MWh/day)												
Sum of Generation HE 1-7, 24	0	0	0	0	0	0	0	0	0	0	0	0
Sum of Generation HE 8-23	0	0	0	0	0	0	0	0	0	0	0	0
Sum of Generation HE 1-24	0	0	0	0	0	0	0	0	0	0	0	0
Monthly Generation Summary (MWh)												
Average Monthly On-Peak Generation (prior to monthly adjustment factors)	0	0	0	0	0	0	0	0	0	0	0	0
Average Monthly Off-Peak Generation (prior to monthly adjustment factors)	0	0	0	0	0	0	0	0	0	0	0	0
Total Generation (prior to monthly adjustment factors)	0	0	0	0	0	0	0	0	0	0	0	0
Monthly Balance Check	0	0	0	0	0	0	0	0	0	0	0	0

Total Annual Energy and Capacity Factor (prior to monthly adjustment factors)

	On-Peak Hours	Off-Peak Hours	All Hours	AnnCapFac	Annual Delivery
Generation (MWh)	0	0	0	0.00%	0 MWh

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Part VI (a)
Pricing Information

Project Title Auto-Filled

	Energy Price	REC Price
Contract Year	$/MWh (nominal$)	$/REC (nominal$)
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Notes:

1) Allowable Contract Term: at least 15 years and no more than 20 years.
2) For the initial bid proposal, Bidder must provide a fixed price with separate pricing for energy ($/MWh) and RECs ($/REC) for the term of the contract (*flat levelized pricing for the Term*).
   - Alternative proposals may be submitted with pricing that change by fixed rates, not to exceed 3% (*see RFP Section 2.2.4.2.1 for additional details*).
3) All pricing for energy and RECs must align with the market values of those products.
4) Alternative (i.e., non-conforming) pricing may be considered (*see RFP Section 2.2.4.2.2 for additional details*).
   - If the Pricing section above is not adequate to use, for your proposal, provide a detailed explanation of the non-conforming pricing proposal below (*pricing formula, index used, price cap, etc.*):

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Part VI (b)
Pricing Information, Phase 2 (if applicable)

Project Title Auto-Filled

	Energy Price	REC Price
Contract Year	$/MWh (nominal$)	$/REC (nominal$)
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Notes:

1) Allowable Contract Term: at least 15 years and no more than 20 years.
2) For the initial bid proposal, Bidder must provide a fixed price with separate pricing for energy ($/MWh) and RECs ($/REC) for the term of the contract (*flat levelized pricing for the Term*).
    - Alternative proposals may be submitted with pricing that change by fixed rates, not to exceed 3% (*see RFP Section 2.2.4.2.1 for additional details*).
3) All pricing for energy and RECs must align with the market values of those products.
4) Alternative (i.e., non-conforming) pricing may be considered (*see RFP Section 2.2.4.2.2 for additional details*).
    - If the Pricing section above is not adequate to use, for your proposal, provide a detailed explanation of the non-conforming pricing proposal below (*pricing formula, index used, price cap, etc.*):

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Part VI (c)
Pricing Information, Phase 3 (if applicable)

Project Title Auto-Filled

	Energy Price	REC Price
Contract Year	$/MWh (nominal$)	$/REC (nominal$)
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Notes:

1) Allowable Contract Term: at least 15 years and no more than 20 years.
2) For the initial bid proposal, Bidder must provide a fixed price with separate pricing for energy ($/MWh) and RECs ($/REC) for the term of the contract (*flat levelized pricing for the Term*).
   - Alternative proposals may be submitted with pricing that change by fixed rates, not to exceed 3% (*see RFP Section 2.2.4.2.1 for additional details*).
3) All pricing for energy and RECs must align with the market values of those products.
4) Alternative (i.e., non-conforming) pricing may be considered (*see RFP Section 2.2.4.2.2 for additional details*).
   - If the Pricing section above is not adequate to use, for your proposal, provide a detailed explanation of the non-conforming pricing proposal below (*pricing formula, index used, price cap, etc.*):

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Part VI (d)
Pricing Information, Phase 4 (if applicable)

Project Title Auto-Filled

Contract Year	Energy Price $/MWh (nominal$)	REC Price $/REC (nominal$)
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Notes:

1) Allowable Contract Term: at least 15 years and no more than 20 years.
2) For the initial bid proposal, Bidder must provide a fixed price with separate pricing for energy ($/MWh) and RECs ($/REC) for the term of the contract (*flat levelized pricing for the Term*).
    - Alternative proposals may be submitted with pricing that change by fixed rates, not to exceed 3% (*see RFP Section 2.2.4.2.1 for additional details*).
3) All pricing for energy and RECs must align with the market values of those products.
4) Alternative (i.e., non-conforming) pricing may be considered (*see RFP Section 2.2.4.2.2 for additional details*).
    - If the Pricing section above is not adequate to use, for your proposal, provide a detailed explanation of the non-conforming pricing proposal below (*pricing formula, index used, price cap, etc.*):

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Part VII
ISO-NE Forward Capacity Auction Qualification

Project Title Auto-Filled

Provide MW of expected qualified capacity for the Facility, by phase, if applicable, determined in accordance with the Forward Capacity Auction Qualification ("FCAQ") process. The Bidder must utilize the ISO-NE FCA Wind Qualification Template spreadsheet to approximate the qualified capacity associated with its proposed Offshore Wind Energy Generation project.

Phase	First Capacity Commitment Period	Summer		Winter	
Phase 1	June 20xx through May 20yy	MW	________	MW	________

(Change xx and yy to reflect first Capacity Commitment Period. Leave blank any of those Phases not utilized per Part IV and Part V)

Have the appropriate studies, as found in RFP Section 2.2.3.4 (Intercnnection and Delivery Requirements) been completed? (Yes/No) ________

For all completed studies, please provide file/folder name reference to those studies, and provide them as part of your bid submission:

Please indicate the status of any study not completed, with a detailed explanation below:

RI ACES RFP: Economic Development Summary Sheet

Please provide data in this sheet to quantify the information provided in Section 14 of the Appendix A to the RFP: Contribution to Employment and Economic Benefits to Rhode Island. Bidders are required to provide detailed information in response to Section 14 in Appendix A (Bidder Response Form) to support the credibility of their estimates and contractual commitments to support the firmness of their estimates.

Bidders should consult the instructions on this tab and fill out all tabs in this sheet (Employment, Expenditures, Investments, and Annual Summary) with responsive data.

Please submit responses to this sheet in Excel (.xls or .xlsx) format, not in PDF or other formats.

Notes

All monetary figures should be in Nominal Dollars

To enhance clarity, Bidders may add sub-rows with their own detailed line-item descriptions of different types of employment, expenditures, or investments, as long as the template rows are still filled in as well.

Cells with calculated values have green fill (as here)

Definitions

"FTE" means Full-Time Equivalent employment for one year, assuming 40 hours per week (1 FTE = 2,080 hours)

"Workforce Diversity Plan" and "Supplier Diversity Plan" are defined in RFP Section 2.3.3.4

"Regional" means New England and New York, excluding Rhode Island

Employment Benefits

	Rhode Island									
	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	-
	Total Jobs	Average Annual Salary	Total Wage-Related Expenditures	Job Duration	Location	Share to Demographically-Targeted Populations	Binding Commitment	% Workforce Diversity Plan	Binding Commitment for Workforce Diversity Plan employment	Verification in Bid
Direct Project-Related Employment	Provide in FTE	Nominal $	Nominal $. Includes wages and associated benefits.	Specify approximate duration of jobs in years	Specify geographic location and note any economically distressed areas, environmental justice communities, and/or low-income populations	Percentage of employment that directly benefits economically distressed areas, environmental justice communities, and/or low-income populations	Yes/No: Is a binding commitment for the promised employment drafted or signed?	Share of jobs that will be targeted through the Workforce Diversity Plan	Yes/No: Is a binding commitment for the promised employment through the Workforce Diversity Plan drafted or signed?	Section or page number in Bidder Response Form where specified employment and contractual commitments are described
Development										
Construction										
Operations & Maintenance										
Additional Direct Employment Through Economic Development Initiatives *If applicable, any additional direct employment generated through investment beyond project development, construction, and O&M, as described in tab 3 (Investments). Does NOT include indirect or induced employment.*										
Investment in supply chain improvements to support the offshore wind industry										
Investment in workforce development to support the offshore wind industry										
Investment in port facilities and infrastructure during project development, construction, and operation and maintenance of the project										
Investment in offshore wind-related research and innovation initiatives or partnerships										
Support for ongoing science and data collection to improve environmental, wildlife, and fisheries performance of offshore wind										
Investments to benefit low-income ratepayers in the State										
Other Investments (specify)										

SUBTOTAL Direct Project-Related Employment - Rhode Island	0
SUBTOTAL Direct Project-Related Employment - Regional	0
SUBTOTAL All Direct Project-Related Employment	0

TOTAL All Employment - Rhode Island	0
TOTAL All Employment - Regional	0
GRAND TOTAL All Employment	0

Employment Benefits

	Regional									
	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	-
	Total Jobs	**Average Annual Salary**	**Total Wage-Related Expenditures**	**Job Duration**	**Location**	**Share to Demographically-Targeted Populations**	**Binding Commitment**	**% Workforce Diversity Plan**	**Binding Commitment for Workforce Diversity Plan employment**	**Verification in Bid**
Direct Project-Related Employment	Provide in FTE	Nominal $	Nominal $. Includes wages and associated benefits.	Specify approximate duration of jobs in years	Specify geographic location and note any economically distressed areas, environmental justice communities, and/or low-income populations	Percentage of employment that directly benefits economically distressed areas, environmental justice communities, and/or low-income populations	Yes/No: Is a binding commitment for the promised employment drafted or signed?	Share of jobs that will be targeted through the Workforce Diversity Plan	Yes/No: Is a binding commitment for the promised employment through the Workforce Diversity Plan drafted or signed?	Section or page number in Bidder Response Form where specified employment and contractual commitments are described
Development										
Construction										
Operations & Maintenance										
Additional Direct Employment Through Economic Development Initiatives *If applicable, any additional direct employment generated through investment beyond project development, construction, and O&M, as described in tab 3 (Investments). Does NOT include indirect or induced employment.*										
Investment in supply chain improvements to support the offshore wind industry										
Investment in workforce development to support the offshore wind industry										
Investment in port facilities and infrastructure during project development, construction, and operation and maintenance of the project										
Investment in offshore wind-related research and innovation initiatives or partnerships										
Support for ongoing science and data collection to improve environmental, wildlife, and fisheries performance of offshore wind										
Investments to benefit low-income ratepayers in the State										
Other Investments (specify)										

Project Expenditures

	Rhode Island							
	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	-
	Total Expenditures	Timing	Location	Share to Demographically-Targeted Populations	Binding Commitment	% Supplier Diversity Program Plan	Binding Commitment for Supplier Diversity Program Plan expenditures	Verification in Bid
Project Expenditures *Does NOT include employment expenditures (salaries) summarized in tab 1 (Employment)*	Nominal $	Approximate contract start and end dates	Specify geographic location and note any economically distressed areas, environmental justice communities, and/or low-income populations	Percentage of expenditures that directly benefit economically distressed areas, environmental justice communities, and/or low-income populations	Yes/No: Is a binding commitment for the promised expenditures drafted or signed?	Share of expenditures that will be spent on suppliers targeted in the Supplier Diversity Program Plan	Yes/No: Is a binding commitment for the promised expenditures targeted through the Supplier Diversity Program Plan drafted or signed?	Section or page number in Bidder Response Form where specified expenditures and contractual commitments are described
Development Period Expenses *(May include but not limited to: Engineering and Design, Legal Services, Ports and Staging, Geological Surveys and Analysis, Permitting, Community Relations/Public Relations, Financial Advisories Services, Procurement, including marine transportation, Management, Administrative)*								
Construction Period Expenses *(May include but not limited to: Materials and Other Equipment, Labor Installation, Insurance During Construction, Development Services)*								
Average Annual Services Term Expenses *(Services term cannot exceed 20 years. May include but not limited to: Operating and Maintenance, Materials and Services, Property Taxes, Leasing Costs, Annual Interconnection Costs, Other State/LocalTaxes.)*								

TOTAL Rhode Island Expenditures	**$0.00**
TOTAL Regional Expenditures	**$0.00**
GRAND TOTAL Expenditures	**$0.00**

Project Expenditures

	Regional							
	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	-
	Total Expenditures	Timing	Location	Share to Demographically-Targeted Populations	Binding Commitment	% Supplier Diversity Program Plan	Binding Commitment for Supplier Diversity Program Plan expenditures	Verification in Bid
Project Expenditures *Does NOT include employment expenditures (salaries) summarized in tab 1 (Employment)*	Nominal $	Approximate contract start and end dates	Specify geographic location and note any economically distressed areas, environmental justice communities, and/or low-income populations	Percentage of expenditures that directly benefit economically distressed areas, environmental justice communities, and/or low-income populations	Yes/No: Is a binding commitment for the promised expenditures drafted or signed?	Share of expenditures that will be spent on suppliers targeted in the Supplier Diversity Program Plan	Yes/No: Is a binding commitment for the promised expenditures targeted through the Supplier Diversity Program Plan drafted or signed?	Section or page number in Bidder Response Form where specified expenditures and contractual commitments are described
Development Period Expenses *(May include but not limited to: Engineering and Design, Legal Services, Ports and Staging, Geological Surveys and Analysis, Permitting, Community Relations/Public Relations, Financial Advisories Services, Procurement, including marine transportation, Management, Administrative)*								
Construction Period Expenses *(May include but not limited to: Materials and Other Equipment, Labor Installation, Insurance During Construction, Development Services)*								
Average Annual Services Term Expenses *(Services term cannot exceed 20 years. May include but not limited to: Operating and Maintenance, Materials and Services, Property Taxes, Leasing Costs, Annual Interconnection Costs, Other State/LocalTaxes.)*								

Economic Development Investments

	Rhode Island						
	(i)	(ii)	(iii)	(iv)	(v)	(vi)	-
	Total Amount	**Timing**	**Location**	**Binding Commitment for Overall Investment**	**Share to Demographically-Targeted Populations**	**Binding Commitment for Demographically-Targeted Investments**	**Verification in Bid**
Specific Investments in Economic Development *Incremental or additional to any project expenditures included in tab 2. These amounts may include employment-related expenditures that are listed in tab 1, rows 11-17.*	Nominal $	Schedule of Payments*	Specify geographic location and note any economically distressed areas, environmental justice communities, and/or low-income populations	Yes/No: Is a binding commitment for the overall investment drafted or signed?	Percentage of investments to economically distressed areas, environmental justice communities, and/or low-income	*If applicable:* Yes/No: Is a binding commitment for the demographically-targeted investment drafted or signed?	Section or page number in Bidder Response Form where investments and contractual commitments are described
Investment in supply chain improvements to support the offshore wind industry							
Investment in workforce development to support the offshore wind industry							
Investment in port facilities and infrastructure during project development, construction, and operation and maintenance of the project							
Investment in offshore wind-related research and innovation initiatives or partnerships							
Support for ongoing science and data collection to improve environmental, wildlife, and fisheries performance of offshore wind							
Investments to benefit low-income ratepayers in the State							
Other Investments (specify)							

**Bidders may provide a more detailed Schedule of Payments in a supporting tab if desired*

TOTAL Rhode Island Investments	**$0.00**
TOTAL Regional Investments	**$0.00**
GRAND TOTAL Investments	**$0.00**

Economic Development Investments

	Regional						
	(i)	(ii)	(iii)	(iv)	(v)	(vi)	-
	Total Amount	**Timing**	**Location**	**Binding Commitment for Overall Investment**	**Share to Demographically-Targeted Populations**	**Binding Commitment for Demographically-Targeted Investments**	**Verification in Bid**
Specific Investments in Economic Development *Incremental or additional to any project expenditures included in tab 2. These amounts may include employment-related expenditures that are listed in tab 1, rows 11-17.*	Nominal $	Schedule of Payments*	Specify geographic location and note any economically distressed areas, environmental justice communities, and/or low-income populations	Yes/No: Is a binding commitment for the overall investment drafted or signed?	Percentage of investments to economically distressed areas, environmental justice communities, and/or low-income	*If applicable:* Yes/No: Is a binding commitment for the demographically-targeted investment drafted or signed?	Section or page number in Bidder Response Form where investments and contractual commitments are described
Investment in supply chain improvements to support the offshore wind industry							
Investment in workforce development to support the offshore wind industry							
Investment in port facilities and infrastructure during project development, construction, and operation and maintenance of the project							
Investment in offshore wind-related research and innovation initiatives or partnerships							
Support for ongoing science and data collection to improve environmental, wildlife, and fisheries performance of offshore wind							
Investments to benefit low-income ratepayers in the State	not applicable						
Other Investments (specify)							

**Bidders may provide a more detailed Schedule of Payments in a suppor*

Summary of Annual Benefits

Totals should reflect only benefits already described and quantified in tabs 1, 2, and 3.

Annual Total Benefits

	Rhode Island				Regional			
Year	**Direct Employment (FTE)**	**Wage-Related Expenditures (Nominal $)**	**Project Expenditures (Nominal $)**	**Investments (Nominal $)**	**Direct Employment (FTE)**	**Wage-Related Expenditures (Nominal $)**	**Project Expenditures (Nominal $)**	**Investments (Nominal $)**
2023								
2024								
2025								
2026								
2027								
2028								
2029								
2030								
2031								
2032								
2033								
2034								
2035								
2036								
2037								
2038								
2039								
2040								
2041								
2042								
2043								
2044								
2045								
2046								
2047								
2048								
2049								
2050								

Cumulative Total Benefits

	Rhode Island				Regional			
Year	Direct Employment (FTE)	Wage-Related Expenditures (Nominal $)	Project Expenditures (Nominal $)	Investments (Nominal $)	Direct Employment (FTE)	Wage-Related Expenditures (Nominal $)	Project Expenditures (Nominal $)	Investments (Nominal $)
2023	0	$0.00	$0.00	$0.00	0	$0.00	$0.00	$0.00
2024	0	$0.00	$0.00	$0.00	0	$0.00	$0.00	$0.00
2025	0	$0.00	$0.00	$0.00	0	$0.00	$0.00	$0.00
2026	0	$0.00	$0.00	$0.00	0	$0.00	$0.00	$0.00
2027	0	$0.00	$0.00	$0.00	0	$0.00	$0.00	$0.00
2028	0	$0.00	$0.00	$0.00	0	$0.00	$0.00	$0.00
2029	0	$0.00	$0.00	$0.00	0	$0.00	$0.00	$0.00
2030	0	$0.00	$0.00	$0.00	0	$0.00	$0.00	$0.00
2031	0	$0.00	$0.00	$0.00	0	$0.00	$0.00	$0.00
2032	0	$0.00	$0.00	$0.00	0	$0.00	$0.00	$0.00
2033	0	$0.00	$0.00	$0.00	0	$0.00	$0.00	$0.00
2034	0	$0.00	$0.00	$0.00	0	$0.00	$0.00	$0.00
2035	0	$0.00	$0.00	$0.00	0	$0.00	$0.00	$0.00
2036	0	$0.00	$0.00	$0.00	0	$0.00	$0.00	$0.00
2037	0	$0.00	$0.00	$0.00	0	$0.00	$0.00	$0.00
2038	0	$0.00	$0.00	$0.00	0	$0.00	$0.00	$0.00
2039	0	$0.00	$0.00	$0.00	0	$0.00	$0.00	$0.00
2040	0	$0.00	$0.00	$0.00	0	$0.00	$0.00	$0.00
2041	0	$0.00	$0.00	$0.00	0	$0.00	$0.00	$0.00
2042	0	$0.00	$0.00	$0.00	0	$0.00	$0.00	$0.00
2043	0	$0.00	$0.00	$0.00	0	$0.00	$0.00	$0.00
2044	0	$0.00	$0.00	$0.00	0	$0.00	$0.00	$0.00
2045	0	$0.00	$0.00	$0.00	0	$0.00	$0.00	$0.00
2046	0	$0.00	$0.00	$0.00	0	$0.00	$0.00	$0.00
2047	0	$0.00	$0.00	$0.00	0	$0.00	$0.00	$0.00
2048	0	$0.00	$0.00	$0.00	0	$0.00	$0.00	$0.00
2049	0	$0.00	$0.00	$0.00	0	$0.00	$0.00	$0.00
2050	0	$0.00	$0.00	$0.00	0	$0.00	$0.00	$0.00

Attachment JMR-2 – Bidder Proposal – Redacted

Long-Term Contract for Offshore Wind Energy and Renewable Energy Certificates Request for Proposals

Prepared for:
The Narragansett Electric Company d/b/a Rhode Island Energy

Submitted by:
Bay State Wind LLC
56 Exchange Terrace
Providence, RI 02903

Portions of this proposal contain confidential, proprietary, and/or commercially sensitive information which has been redacted from the "Public Version" of this proposal. Bay State Wind LLC (d/b/a Revolution Wind) has submitted a Confidential Version of this proposal which includes the redacted information, and which should be treated as a non-public record that is exempt from disclosure to the extent permitted under applicable laws and/or as expressly set forth in the Request for Proposals.

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[redacted]

REDACTED

Concordance With RFP Table

RFP Appendix A Requirements	Bid Package Section
SECTION 1 - CERTIFICATION, PROJECT, AND PRICING DATA	
The Certification, Project, and Pricing Data ("CPPD") document is a Microsoft Excel workbook that is provided on the website at www. ricleanenergyrfp.com. Bidders are required to provide firm pricing for 184 days from the date of bid submission. The bidder must also sign the certification form found in Appendix A verifying that the prices, terms, and conditions of the proposal are valid for at least 184 days. An officer or duly authorized representative of the bidder is required to sign the Proposal Certification Form.	Section 1
SECTION 2 - EXECUTIVE SUMMARY	
The bidder is required to provide an executive summary of the project proposal that includes a complete description of the proposed generation bid, the delivery point located within ISO-NE, the proposed contract term and pricing schedule, the interconnection plan, the overall project schedule, the additional ACES requirements detailed in Section 2.2.3.8, and other factors the bidder deems to be important. A table summarizing the proposal(s), including details such as generation project location, interconnection location(s), capacity (MW), commercial operation date, pricing ($/MWh), etc., is encouraged.	Section 2
SECTION 3 - OPERATIONAL PARAMETERS	
3.1 Maintenance Outage Requirements – Specify partial and complete planned outage requirements in weeks or days for all generation facilities and associated facilities required for the delivery of energy from the generation facilities to the delivery point. Also, list the number of months required for any outage cycle(s) to repeat (e.g., list time interval of minor and major overhauls, and the duration of overhauls).	Section 3.1
3.2 Operating Constraints – Specify all the expected operating constraints and operational restrictions for the project (i.e., limits on the number of hours a unit may be operated per year or unit of time), differentiating those that may be variable or situational in nature.	Section 3.2
3.3 Reliability – Describe how the proposal would provide enhanced electricity reliability to Rhode Island, including its impact on transmission constraints.	Section 3.3
3.4 Moderation of System Peak Load – Describe how the proposal would contribute to moderating system peak load requirements and provide the following information: *i. Estimated average output for each summer period (June- September) from 3:00 - 7:00 pm* *ii. Estimated average output for each winter period (October-May) from 4:00 – 9:00 pm*	Section 3.4

RFP Appendix A Requirements	Bid Package Section
SECTION 4 - ENERGY RESOURCE AND DELIVERY PLAN	
For Eligible Facilities, the bidder is required to provide an energy resource and a production/delivery profile for its proposed project, including supporting documentation, as described in Section 2.2.3.4. The energy resource and profile information should be consistent with the type of technology/resource option proposed and the term proposed. Bidders should respond to all information requests which are relevant to the bid in a timely manner.	Section 4
4.1 Provide a summary of all collected wind data for the proposed site. Identify when and how (e.g. meteorological mast or LiDAR – for "Light Detection and Ranging") the data was collected and by whom. *Indicate where the data was collected and its proximity to the proposed site. Include an identification of the location and height for the anemometers and/or "range gate" heights for sensing by LiDAR that were used to arrive at an assessment of the site generation capability.* *Describe any additional wind collection efforts that are planned or ongoing.* *Provide (a) at least one year of hourly wind resource data. Real Data collected from the site is preferred, though projected data is permissible. Methodology must also be included. And (b) a wind resource assessment report for the proposed facility from a qualified unaffiliated third-party wind resource assessment firm. Include an analysis of the available wind data which addresses the relationship between wind conditions and electrical output. Provide a projection of net hourly energy production or net annual energy production, including projections of average net hourly energy production, including projections of average net hourly energy production, including projections of average hourly energy production, based on the wind resource data (hourly 8760 data profile and a 12 x 24 energy projection) at both P50 and P90 levels.* *Provide a site-adjusted power curve. Each curve should list the elevation, temperature and air density used.* *Identify the assumptions for losses in the calculation of projected annual energy production, including each element in the calculation of losses.*	Section 4.1
4.2 Offshore Wind Energy Generation Delivery Plan *Please provide an energy delivery plan and production/delivery profile for the proposed project, including supporting documentation. The energy delivery plan and production/delivery profile must provide the expected Offshore Wind Energy Generation to be delivered into the ISO-NE market settlement system and permit the Evaluation Team to determine the reasonableness of the projections for purposes of Sections 2.2.2.3 Eligible Products, 2.2.2.4 Allowable Contract Term, 2.2.2.5 Minimum/Maximum Contract Size and Allowable Alternative Bids, and 2.2.3.4 Interconnection and Delivery Requirements. Such information should be consistent with the energy resource plan and production/delivery profile provided above and considering any and all constraints to physical delivery into ISO-NE.*	Section 4.2
4.3 REC/Environmental Attribute Delivery Plan *Please provide documentation and information demonstrating that the project will deliver GIS Certificates representing the associated RECs and any other Environmental Attributes, as applicable. Please describe whether transfer of all GIS Certificates is authorized under the current ISO-NE GIS rules and protocols, or if a rule or protocol change is required. To the extent such a change is required, please provide regarding the proposal and the process for implanting the change.*	Section 4.3

RFP Appendix A Requirements	Bid Package Section
SECTION 5 - FINANCIAL/LEGAL	
Bidders are required to demonstrate the financial viability of their proposed project. Bidders should provide the following information:	
5.1 Please submit information and documentation that demonstrates that a long-term contract resulting from this RFP Process would either permit the bidder to finance its proposal that would otherwise not be financeable or assist the bidder in obtaining financing of its proposal.	Section 5.1
5.2 Please provide a description of the business entity structure of the bidder's organization from a financial and legal perspective, including all general and limited partners, officers, directors, managers, members and shareholders, involvement of any subsidiaries supporting the project, and the providers of equity and debt during project development. Provide an organization chart showing the relationship between the equity and debt participants and an explanation of the relationships. For jointly owned facilities, identify all owners and their respective interests, and document the bidder's right to submit a binding proposal.	Section 5.2
5.3 Please provide a description of the financing plan for the project as described in Section 2.2.3.5, including construction and term financing. The financing plan should address the following: *i. Who will finance the project (or are being considered to finance the project) and the related financing mechanism or mechanisms that will be used (i.e. convertible debenture, equity or other) including repayment schedules and conversion features* *ii. The project's existing initial financial structure and projected financial structure* *iii. Expected sources of debt and equity financing* *iv. Estimated construction costs* *v. The projected capital structure* *vi. Describe any agreements, both pre- and post-commercial operation date, entered into with respect to equity ownership in the proposed project and any other financing arrangement.* *In addition, the financing plan should address the status of the above activities as well as the financing of development and permitting costs. All bidders are required to provide this information.*	Section 5.3
5.4 Provide documentation illustrating the experience of the bidder in securing financing for projects of similar size and technology as required in Section 2.2.3.6. For each project previously financed, provide the following information: *i. Project name and location* *ii. Project type and size* *iii. Date of construction and permanent financing* *iv. Form of debt and equity financing* *v. Current status of the project*	Section 5.4
5.5 Please provide evidence that the bidder has the financial resources and financial strength to complete and operate the project as planned.	Section 5.5

RFP Appendix A Requirements	Bid Package Section
5.6 Provide complete copies of the most recent audited financial statement and annual report for each bidder for each of the past three years; including affiliates of the bidder (if audited statements are not available, reviewed or compiled statements are to be provided). Also, provide the credit ratings from Standard & Poor's and Moody's (the senior unsecured long term debt rating or if not available, the corporate rating) of the bidder and any affiliates and partners.	Section 5.6
5.7 Please also include a list of the board of directors, officers, and trustees for the past three years and any persons who the bidder knows will become officers, board members or trustees.	Section 5.7
5.8 The bidder should demonstrate its ability (and/or the ability of its credit support provider) to provide the required security as described in Section 2.2.3.7, including its plan for doing so.	Section 5.8
5.9 Provide a description of any current or recent credit issues/credit rating downgrade events regarding the bidder or affiliate entities raised by rating agencies, banks, or accounting firms.	Section 5.9
5.10 Describe the role of the Federal Production Tax Credit ("PTC") or Investment Tax Credit ("ITC") as newly revised by the Inflation Reduction Act, and any other incentives, on the financing of the project. In the response, please describe (a) your plan to qualify for the ITC/PTC and the level of the ITC/PTC for which you plan to qualify, (b) the facilities, investment in which, the ITC is expected to apply, (c) your plan to utilize the tax credits and the relationship to your financing plan, and (d) how qualification for the ITC/PTC is reflected in your proposed pricing. If a bidder assumes that such credits, subsidies, grants or incentives will not be available for its Eligible Facility, it should state how it would propose to share the benefits of those credits, subsidies, grants or incentives with Rhode Island Energy's customers if they subsequently become available. Bidders may propose adjustments to the contract price based on an increase in any state or federal tax credit or other government grant or subsidy.	Section 5.10
5.11 Describe the bidder's plan to adhere to the domestic supply rules set forth in the Build America, Buy America Act and the act's implications on access to federal funding, cost of materials, and supply chains.	Section 5.11
5.12 Describe how the bidder would consider Rhode Island Energy customers in the event of the availability or receipt of any tax credit or other government grant or subsidy not contemplated in their proposals. Bidders must state their assumptions regarding the availability of federal or state tax credits, subsidies, or grants or other incentives.	Section 5.12
5.13 Bidders must disclose any litigation or disputes in the last three years related to projects developed, owned, or managed by bidder or any of its affiliates in the United States or related to any energy product sale agreement.	Section 5.13
5.14 What is the expected operating life of the proposed project? What is the depreciation period for all substantial physical aspects of the bid, including generation facilities, delivery facilities to move power to the grid, and mandatory and voluntary transmission system upgrades?	Section 5.14
5.15 Has the bidder already obtained financing, or a commitment of financing, for the project? If financing has not been obtained, explain how obtaining a long-term agreement as proposed will help you in obtaining financing for the proposed project, in obtaining more favorable terms for the financing of the proposed project, or in supporting the future capital investment.	Section 5.15

RFP Appendix A Requirements	Bid Package Section
5.16 State whether the bidder or its affiliates have executed agreements with respect to energy, RECs and/or capacity for the proposed project (including any agreements that have been terminated) and provide information regarding the associated term and quantities, and whether bidder has been alleged to have defaulted under or breached any such agreement.	Section 5.16
5.17 List all of the bidder's affiliated entities and joint ventures transacting business in the energy sector.	Section 5.17
5.18 Has bidder, or any affiliate of bidder, in the last five years, (a) consented to the appointment of, or been taken in possession by, a receiver, trustee, custodian or liquidator of a substantial part of its assets, (b) filed a bankruptcy petition in any bankruptcy court proceeding, (c) answered, consented or sought relief under any bankruptcy or similar law or failed to obtain a dismissal of an involuntary petition, (d) admitted in writing of its inability to pay its debts when due, (e) made a general assignment for the benefit of creditors, (f) was the subject of an involuntary proceeding seeking to adjudicate that Party bankrupt or insolvent, (g) sought reorganization, arrangement, adjustment, or composition of it or its debt under any law relating to bankruptcy, insolvency or reorganization or relief of debtors?	Section 5.18
5.19 Briefly describe any known conflicts of interest between bidder or an affiliate of bidder and Rhode Island Energy, or any affiliates of the foregoing.	Section 5.19
5.20 Describe any litigation, disputes, claims or complaints involving the bidder or an affiliate of bidder, against Rhode Island Energy or any affiliate of Rhode Island Energy.	Section 5.20
5.21 Describe any litigation, disputes, claims or complaints, or events of default or other failure to satisfy contract obligations, or failure to deliver products, involving bidder or an affiliate of bidder, and relating to the purchase or sale of energy, capacity or renewable energy certificates or products.	Section 5.21
5.22 Confirm that neither bidder nor any directors, employees or agents of bidder, nor any affiliate of bidder are currently under investigation by any governmental agency, and that none of the above have in the last four years been convicted or found liable for any act prohibited by State or Federal law in any jurisdiction involving conspiracy, collusion or other impropriety with respect to bidding on any contract, or have been the subject of any debarment action (detail any exceptions).	Section 5.22
5.23 Identify all regulatory and other approvals needed by bidder to execute a binding sale agreement.	Section 5.23
5.24 Describe how the project will conform to FERC's applicable regulatory requirements, including, but not limited to, FERC requirements relating to allocation of transmission capacity and open access, the justness and reasonableness of rates, the potential for undue preference or discrimination, and affiliate dealings, if any. Describe how your proposed approach is consistent with FERC precedent and ratemaking principles.	Section 5.24
5.25 Describe and document any and all direct and indirect affiliations and affiliate relationships (contractual, financial, or otherwise) in the past three years between the bidder and Rhode Island Energy and its affiliates, including all relationships in which Rhode Island Energy or its affiliates has a financial or voting interest (direct or indirect) in the bidder or the bidder's proposed project. These relationships include:	Section 5.25

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** Corporate or other joint arrangements, joint ventures, joint operations whether control exists or not * Minority ownership (50% or less investee) * Joint development agreements * Operating segments that are consolidated as part of the financial reporting process * Related parties with common ownership * Credit, debenture, and financing arrangements, whether a convertible equity feature is present or not * Wholly owned subsidiaries * Commercial (including real property) relationships with Rhode Island Energy*	
SECTION 6 - SITING, INTERCONNECTION, AND DELIVERABILITY	
This section of the proposal addresses project location, siting, real property rights and interconnection issues. Bidders should ensure that the threshold criteria outlined in Section 2.2 of the RFP are verified in their responses.	
6.1 Provide site layout plan(s), including map(s), that illustrate the location of all onshore and offshore equipment and facilities (including the estimated spacing and orientation of wind turbines and a discussion of how the plan conforms to federal and state permitting requirements) and clearly delineates the perimeter of the area in which offshore wind turbines will be placed, the location of the marine terminal facility, and the proposed water routes to the project site. Also include a map of the proposed interconnection that includes the path from the Eligible Facility site to the interconnection location, all onshore transmission and interconnection routes, locations, and details and, to the extent a bid includes or references Offshore Delivery Facilities, a map that shows those facilities' location(s). To the extent that alternative routes for offshore and onshore interconnection facilities have been considered in developing the bid, maps showing these locations should also be provided. Maps should be of scales required to identify significant marine or terrestrial features, e.g. shellfish management areas, parks, highways, etc. Plan included? Yes☐ No☐ If not, please explain: Describe how the proposed project is sized and designed to efficiently and cost-effectively use available lease area(s), interconnection point(s), transmission cabling, and other infrastructure required for the production and delivery of the offshore wind energy generation.	Section 6.1
6.2 Identify any real property rights (e.g., fee-owned parcels, rights-of-way, development rights or easements or leases, or options to purchase or lease) that provide the right to use the Eligible Facility site and offshore facilities locations including for Eligible Facilities and any rights of way needed for interconnection. Note that a demonstrated federal lease must be issued on a competitive basis after January 1, 2012 for an offshore wind energy generation site that is located on the Outer Continental Shelf and for which no turbine is located within 10 miles of any inhabited area. i. Does the project have a right to use the Eligible Facility site and/or offshore delivery facilities locations for the entire proposed term of the PPA (e.g., by virtue of ownership or land development rights obtained from the owner)? Yes☐ No☐ If not, please explain: ii. If so, please detail the bidder's rights to control the Eligible Facility site and/or offshore delivery facilities and interconnection location.	Section 6.2

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iii. Describe the status of acquisition of real property rights, any options in place for the exercise of these rights and describe the plan for securing the necessary real property rights, including the proposed timeline. Include these plans and the timeline in the overall project timeline. *iv. Identify any joint use of existing or proposed real property rights and/or easements.* *v. Provide a copy of each of the leases, agreements, easements, and related documents granting the right to use the Eligible Facility site and Offshore Delivery Facilities and, if available, the transmission and interconnection location (and applicable letters of intent if formal agreements have not been executed).*	
6.3 Provide evidence of all government-issued permits, approvals, and authorizations that have been obtained or need to be obtained for the use and operation of the Eligible Facility site, the proposed onshore interconnection and transmission locations, and associated Offshore Delivery Facilities and the location(s) of such facilities. For any proposed Eligible Facility sites, offshore delivery facilities, and interconnection locations not currently zoned or permitted properly, identify present and required zoning and/or land use designations and permits and provide a detailed plan and timeline to secure the remaining permits, approvals, and authorizations for all offshore and onshore routes.	Section 6.3
Detail the zoning and permitting issues.	Section 6.3.1
Permitting plan and timeline (including start and end dates).	Section 6.3.2
6.4 Provide a description of the area surrounding any land-based project area, including the marine terminal for deployment of major project components (e.g., foundations, towers, blades, rotors, offshore substations) and all transmission and interconnection facility locations, and a copy of each of the related leases, agreements, easements, and related documents that have been obtained (and applicable letters of intent if formal agreements have not been executed).	Section 6.4
6.5 If the bidder does not have interconnection facilities site control, describe the status of the plan to obtain that control.	Section 6.5
6.6 Please provide documentation to show evidence of the interconnection request to ISO-NE, the applicable New England Transmission Owner, or any neighboring control areas, to interconnect at the Capacity Capability Interconnection Standard. Please describe the status of any planned interconnection to the grid.	Section 6.6
6.7 Please provide studies that describe the Project's electrical system performance, its impact to the reliability of the New England Transmission system, how the project would satisfy ISO-NE's I.3.9 requirements, and how the project will interconnect at an equivalent to the Capacity Capability Interconnection Standard. Projects that do not have I.3.9 approval from ISO-NE must include technical reports or a Feasibility study that approximates the ISO-NE interconnection process, including but not limited to clear documentation of study technical and cost assumptions, reasoning, and justification of such assumptions. Proposals with a Qualification Determination Notification ("QDN") from ISO-NE for their proposed capacity amount and commitment period must include all QDN documentation in their proposal. All projects that do not have a QDN for their proposed capacity amount and commitment period must provide a study performed by ISO-NE or a third party in accordance with ISO-NE Planning Procedure 10 in order to prove ability to interconnect at the CCIS. Provide a copy of an interconnection agreement, if any, executed by the bidder with respect to the proposed project. If an interconnection agreement has not been executed, please provide the steps that need to be completed before an	Section 6.7

RFP Appendix A Requirements	**Bid Package Section**
interconnection agreement can be executed and the associated timeline. Please also provide the status and expected completion date of any additional interconnection studies already underway with ISO-NE and/or the transmission owner. All studies must follow the current ISO-NE interconnection procedures and detail any assumptions regarding resources and corresponding network upgrades ahead of the project in the ISO-NE interconnection queue. All network upgrades and assumptions identified in these studies must be clearly documented and included in the bid price. *Performance and its impact.* *Copy of completed I.3.9 approval or I.3.9-equivalent study attached: ☐ If none, please explain.* *Copy of completed CCIS-equivalent study attached: ☐ If none, please explain.* *Copy of Interconnection Agreement attached: ☐ If none, please explain.* *Additionally, any other studies undertaken by ISO-NE or the bidder must be provided.*	
6.8 Please provide documentation of the deliverability constraint analysis set forth in Appendix F to the RFP. Provide a description of the findings of the deliverability constraint analysis, including but not limited to a list of thermal overloads and voltage violations identified. *Copy of completed deliverability constraint analysis: ☐* *If the deliverability constraint analysis was performed as a portion of a separate study (i.e. Facility Study), please explain and provide the study.*	Section 6.8
6.9 If multiple interconnection requests have been made, please specify all such active requests which have not been superseded by subsequent requests and information regarding the status of each. Provide copies of any requests made and studies completed. Describe how such studies and information support the costs assumed in preparing your bid and the associated timeline proposed.	Section 6.9
6.10 Please provide cost estimates for any necessary network upgrades identified in the studies identified in Section 6.7.	Section 6.10
6.11 To the extent that you provide an alternative interconnection scenario based on ISO-proposed interconnection process changes, you must also include studies using the proposed ISO-NE-proposed process. Any such studies must be accompanied with clear documentation of study technical and cost assumptions, reasoning, and justification of such assumptions.	Section 6.11
6.12 Provide the electrical models of all energy resources supporting the proposed project in accordance with the filing requirements of the ISO-NE Tariff Schedule 22 and 23. *Electrical models attached: ☐ If none, please explain:*	Section 6.12
6.13 Provide a copy of an electrical one-line diagram showing the interconnection facilities, the relevant facilities of the transmission and/or distribution provider, and any required network upgrades identified in the studies required in section 6.7 of this document. *Electrical one-line diagram attached: ☐ If none, please explain:*	Section 6.13

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6.14 Specify and describe the current or new interconnection facilities (lines, transformers, switching equipment, system protection and controls, etc.) that bidder owns or is intending to construct or have constructed in order to deliver the proposed energy.	Section 6.14
6.15 Incremental data requirements: *1. IDV file(s) in PSSE v34 format modeling all upgrades to the transmission network identified in the studies required in section 6.7 of this document. ☐ If none, please explain.* *2. If the bidder does not use PSSE, provide in text format necessary modeling data as follows:* *Line Data (voltage and thermal ratings)* *Impedances (r, X and B)* *Line Length (bus numbers and names)* *Reactive compensation models as necessary* *Other changes to the model that would occur due to a Project such as terminal changes for lines/transformer/generator leads/loads etc.*	Section 6.15
6.16 Please detail with supporting information and studies (as available) that the production/delivery profile contemplated in your proposal reflects constraints or curtailment, if any, after the upgrades that are expected to take place pursuant to interconnection at an equivalent to the CCIS. If the project is planning to make any voluntary upgrades beyond those associated with the CCIS-equivalent standard, as more fully described in the RFP, please describe the transmission network upgrades necessary, their estimated cost (for which the bidder would have cost responsibility, and the impact on the proposed generation schedule by reducing remaining constraints or curtailments.	Section 6.16
SECTION 7 - ENVIRONMENTAL ASSESSMENT AND ENVIRONMENTAL AND FISHERIES MITIGATION PLAN, PERMIT ACQUISITION PLAN, AND ENVIRONMENTAL ATTRIBUTES CERTIFICATION	
This section addresses environmental and other regulatory issues associated with project siting, development, and operations for all aspects of the project (including generation, delivery, interconnection, etc.) and in all jurisdictions (federal, all interested states, etc.).	
7.1 Provide a description of all government-issued permits, approvals, licenses, environmental assessments, and/or environmental impact statements required for the use and operation of the Offshore Wind Energy Generation site, the proposed onshore interconnection and transmission locations, and associated Offshore Delivery facilities and the location(s) of such facilities. Along with this list, identify the governmental agencies and States that are responsible to issuing approval of all the permits, licenses, and environmental assessments and/or environmental impact statements.	Section 7.1
i. Provide a list and copies of all Federal, state, and local permits, approvals, authorizations, and environmental assessments and/or environmental impact statements required to construct and operate the project. Detail which permits have already been issued and which permits are in progress/remaining to be obtained.	Section 7.1.1
ii. Identify the governmental agencies and States that have issued or will issue the required permits, approvals, authorizations, licenses, and environmental assessments and/or environmental impact statements.	Section 7.1.2

RFP Appendix A Requirements	Bid Package Section
7.2 Provide the anticipated timeline for seeking and receiving the required permits, licenses, and environmental assessments and/or environmental impact statements. Include a project permit and approval assessment which describes, in narrative form, each segment of the process, the required permit or approval, the status of the request or application and the basis for projection of success by the milestone date. All requirements should be included on the project schedule in Section 9.	Section 7.2
7.3 Environmental and Fisheries Mitigation Plan (EFMP) *Provide a preliminary environmental characterization of the site and project, including both construction and operation. In addition, identify environmental impacts associated with the proposed project and any potential impediments to development. Bidders must detail, to the extent practical, specific adverse environmental and fisheries impacts that are likely to result from the proposed Facility and detail measures that will be taken to avoid, minimize, and/or mitigate those impacts in the categories identified in Section 2.3.3.3. Where specific measures are not known for a specific category of impact at the time of proposing, the plan must describe in detail the approach that will be implemented to collaborate with the state and Federal agencies and other stakeholders to define avoidance, minimization, and mitigation measures. The plan should provide a roadmap for the environmental and fisheries work to come and provide a degree of certainty that the Bidder is committed to working collaboratively with stakeholders to develop a cost-effective and environmentally responsible Project.* *Plan included? Yes☐ No☐ If not, please explain.*	Section 7.3 Attachment 7-1
7.4 Explain how the proposed project advances the objectives of achieving a reliable, clean energy future that is consistent with meeting regional greenhouse gas reduction goals as established by the 2021 Act on Climate.	Section 7.4
7.5 Provide documentation demonstrating that the project will be qualified as an eligible renewable energy resource conforming to R.I.G.L. § 39-26-5.	Section 7.5
7.6 All bidders must include sufficient information and documentation that demonstrates that the bidder will utilize an appropriate tracking system to ensure a unit-specific accounting of the delivery of unit-specific and unit contingent of energy and RECs. The RECs and environmental attributes associated with energy generation must be delivered into Rhode Island Energy's NEPOOL GIS accounts.	Section 7.6
7.7 Identify any existing, preliminary, or pending claims or litigation, or matters before any federal agency or any state legislature or regulatory agency that might affect the feasibility of the project or the ability to obtain or retain the required permits for the project.	Section 7.7
7.8 Describe any investments that will be included with your facility to improve its emissions profile.	Section 7.8

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SECTION 8 - ENGINEERING AND TECHNOLOGY; COMMERCIAL ACCESS TO EQUIPMENT	
This section includes questions pertinent to the engineering design and project technology. This section must be completed for a project that includes new facilities or capital investments for both generation and transmission components, if applicable. Bidders should provide information about the specific technology or equipment including the track record of the technology and equipment and other information as necessary to demonstrate that the technology is viable.	
8.1 Provide a reasonable but preliminary engineering plan which includes the following information: *i. Type of generation and transmission technology, if applicable* *ii. Major equipment to be used* *iii. Manufacturer of the equipment* *iv. Status of acquisition of the equipment* *v. Whether the bidder has a contract for the equipment. If not, describe the bidder's plan for securing equipment and the status of any pertinent commercial arrangements* *vi. Equipment vendors selected/considered* *vii. History of equipment operations* *viii. If the equipment manufacturer has not yet been selected, identify in the equipment procurement strategy the factors under consideration for selecting the preferred equipment* *ix. How the proposed equipment adheres to the domestic supply rules set forth in the Build America, Buy America Act.*	Section 8.1
8.2 If the bidder has not yet selected the major equipment for a project, please provide a list of the key equipment suppliers under consideration.	Section 8.2
8.3 Please identify the same or similar equipment by the same manufacturer that are presently in commercial operation including the number installed, installed capacity and estimated generation for the past three years.	Section 8.3
8.4 For less mature technologies, provide evidence (including identifying specific applications) that the technology to be employed for energy production is ready for transfer to the design and construction phases. Also, address how the status of the technology is being considered in the financial plan for the project.	Section 8.4
8.5 Please indicate if the bidder has a full and complete list of equipment needed for all physical aspects of the bid, including generation facilities, transmission lead lines, and mandatory and voluntary transmission system upgrades. If not, identify the areas of uncertainty and when the full and complete list of equipment will be identified.	Section 8.5
8.6 Please indicate if the bidder has secured its equipment for all physical aspects of the bid, including generation facilities, transmission lead lines, and mandatory and voluntary transmission system upgrades. If not, identify the long-lead equipment and describe the timing for securing this equipment.	Section 8.6

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SECTION 9 - PROJECT SCHEDULE	
A bidder must demonstrate that its proposal can be developed, financed, and constructed and be technically viable within a commercially reasonable timeframe. The bidder is required to provide sufficient information and documentation that shows that the bidder's resources, process, and schedule are adequate for the acquisition of all rights, permits and approvals for all aspects of the project and for the financing of the project consistent with the proposed project milestone dates. *Bidders are required to provide a complete critical path schedule for the project from the notice of selection of the project for contract consideration to the start of commercial operations. For each project element, list the start and end date.*	Section 9
9.1 Identify the elements on the critical path. The schedule should include, at a minimum, the receipt of all permits necessary to construct and operate the facility, the closing of construction financing, the commencement of construction, the execution of an interconnection agreement with ISO-NE and interconnecting utility, and the commercial operation date. Include any other requirements that could influence the project schedule and the commercial operation date (e.g. adherence to Build America, Buy America Act).	Section 9.1
9.2 Bidders must demonstrate that their projects have a credible proposed operation date by providing, at a minimum, documentation showing the following: *i. commencement of permitting processes* *ii. a plan for completing all permitting processes* *iii. viable resource assessment* *iv. environmental assessment/Environmental and Fisheries Mitigation Plan, which shall include site and environmental data transparency requirements, as further described in Section 2.3.3.3 ("EFMP")* *v. viable financing plans* *vi. viable installation and electrical interconnect plans* *vii. material progress toward acquisition of real property rights* *viii. evidence of material vendor activity*	Section 9.1
SECTION 10 - CONSTRUCTION AND LOGISTICS	
This section of the proposal addresses necessary arrangements and processes for outfitting, assembly, storage, and deployment of major project components such as turbine nacelles, blades, towers, foundations, and delivery facilities support structures, and other major components associated with delivery facilities and, and the storage facility (as applicable). Please provide a construction plan that captures the following objectives:	
10.1 Please list the major tasks or steps associated with deployment of the proposed project and the necessary specialized equipment (e.g. vessels, cranes).	Section 10.1
10.2 Please provide documentation to demonstrate site control for all marine terminals and other waterfront facilities that will be used to stage, assemble, and deploy the project for each stage of construction. *i. Evidence that the bidder or the equipment/service provider have a valid lease, or option to lease, a marine terminal and/or waterfront facility for construction of the offshore wind energy project (e.g., by virtue of ownership or land development*	Section 10.2

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rights obtained from the owner). *ii. If not available, describe the status of acquisition of real property rights for necessary marine terminal and/or waterfront facilities, any options in place for the exercise of these rights and describe the plan for securing the necessary real property rights, including the proposed timeline. Include these plans and the timeline in the overall project schedule. Provide any agreements, options, or other materials reflecting the bidder's efforts so far to secure real property rights (and any letters of intent to the extent signed agreements are not in place).* *iii. Identify any joint use of existing or proposed real property rights for marine terminal or waterfront facilities.*	
10.3 Please describe the proposed approach for staging and deployment of major project components to the project site. Indicate the number, type and size of vessels that will be used, and their respective roles, as well as the projected timing of their use. Please include specific information on how the bidder's deployment strategy will conform to requirements of the Merchant Marine Act of 1920 (the Jones Act).	Section 10.3
10.4 List the party (e.g. the bidder, or equipment/service providers under contract to the bidder) responsible for each deployment activity and describe the role of each party. Describe the status of bidder's contractual agreements with third-party equipment/service providers.	Section 10.4
SECTION 11 - OPERATIONS AND MAINTENANCE	
Projects that can demonstrate that the operation and maintenance ("O&M") plan, level of funding, and mechanism for funding will ensure reliable operations during the term of the contract or the tariff are preferred.	
11.1 Provide an O&M plan for the project that demonstrates the long-term operational viability of the proposed project. The plan should include a discussion of the staffing levels proposed for the project, the expected role of the project sponsor or outside contractor, scheduling of major maintenance activity, and the plan for testing equipment.	Section 11.1
11.2 Describe in detail the proposed O&M funding mechanism and funding levels to support planned and unplanned O&M requirements.	Section 11.2
11.3 Describe the terms (or expected terms) of the warranties and/or guarantees on major equipment that the bidder is utilizing or proposing to utilize.	Section 11.3
11.4 Describe the status of the project sponsor in securing any O&M agreements or contracts. Include a discussion of the sponsor's plan for securing a medium-term or long-term O&M contract, including the expected provider of O&M services.	Section 11.4
11.5 Provide examples of the bidder's experience with O&M services for other similar projects.	Section 11.5

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SECTION 12 - PROJECT MANAGEMENT/EXPERIENCE	
Bidders are required to demonstrate project experience and management capability to successfully develop (for a project that includes new facilities or capital investment) and operate the project proposed, Rhode Island Energy is particularly interested in project teams that have demonstrated success in projects of similar type, size and technology and, for projects that include new facilities or capital investment, can demonstrate an ability to work together effectively to bring the project to commercial operation in a timely fashion.	
12.1 Provide an organizational chart for the project that lists the project participants and identifies the corporate structure, including general and limited partners.	Section 12.1
12.2 For a project that includes new facilities or capital investment, provide statements that list the specific experience of the bidder and each of the project participants (including, when applicable, the bidder, partners, EPC contractor and proposed contractors), in developing, financing, owning, and operating generating or transmission facilities (as applicable), other projects of similar type, size and technology, and any evidence that the project participants have worked jointly on other projects.	Section 12.2
12.3 For a bid that includes existing facilities, provide statements that list the specific experience of the bidder and each of the project participants (including, when applicable, the bidder, partners, EPC contractor and proposed contractors), in owning and operating generating or transmission facilities (as applicable), other projects of similar type, size and technology, and any evidence that the project participants have worked jointly on other projects.	Section 12.3
12.4 Provide a management chart that lists the key personnel dedicated to this project and provide resumes of the key personnel. For Eligible Facilities that are not yet in-service, key personnel of the bidder's development team having substantial project management responsibilities must have: *i. Successfully developed and/or operated one or more projects of similar size or complexity or requiring similar skill sets; and* *ii. For a project that includes new facilities or capital investment, experience in financing power generation projects (or have the financial means to finance the project on the bidder's balance sheet)*	Section 12.4
12.5 Provide a listing of all projects the project sponsor has successfully developed or that are currently under construction. Provide the following information as part of the response: *i. Name of the project* *ii. Location of the project* *iii. Project type, size, and technology* *iv. Commercial operation date* *v. Estimated and actual capacity factor of the project for the past three years* *vi. Availability factor of the project for the past three years* *vii. References, including the names and current addresses and telephone numbers of individuals to contact for each reference*	Section 12.5

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12.6 With regard to the bidder's project team, identify and describe the entity responsible for the following, as applicable: *i. Construction Period Lender, if any* *ii. Operating Period Lender and/or Tax Equity Provider, as applicable* *iii. Financial Advisor* *iv. Environmental Consultant* *v. Facility Operator and Manager* *vi. Owner's Engineer* *vii. EPC Contractor (if selected)* *viii. Transmission Consultant* *ix. Legal Counsel*	Section 12.6
12.7 Provide details of the bidder's experience in ISO-NE other Markets affected by the bid. With regard to bidder's experience with ISO-NE markets, please indicate the entity that will assume the duties of Lead Market Participant for your Project. Please provide a summary of the proposed Lead Market Participant's experience with each of the ISO-NE markets.	Section 12.7
SECTION 13 - ALTERNATIVE BID PROPOSALS	
13.1 Per Section 2.2.2.5 of the Request for Proposals, bidders may submit alternative project proposals, based on varying aspects of the proposed project: *• Contract Term Length* *• Additional Pricing Offer* *• Production/Delivery Profile* *• In-service Date* *• Project Size* *• Technology Type* *• Delivery Location* *Each submitted proposal must be accompanied by a non-refundable bid fee, which will be used to offset the cost of the evaluation of proposals. Bid fee instructions will be sent upon request to bidders who contact the Official Contact listed in Section 3.5.*	Section 13

RFP Appendix A Requirements	Bid Package Section
SECTION 14 - CONTRIBUTION TO EMPLOYMENT AND ECONOMIC BENEFITS TO RHODE ISLAND	
Bidders must provide annualized estimates for all economic benefits and identify the specific in-state expenditures and employment proposed during the development, construction and operation and maintenance phases of the project. Bidders are also required to fill out the Economic Development Summary Excel Workbook provided as an addendum to this Appendix.	
14.1 For the direct economic benefits to the State of Rhode Island, please provide an estimate of the number of jobs to be created directly during project development and construction (for a project that includes new facilities or capital investment), and during operations, and a general description of the types of jobs created, estimated annual compensation, the employer(s) for such jobs, and the location. Please treat the development, construction, and operation periods separately in your response.	Section 14.1
14.2 Please provide the same information as provided in response to question 14.1 above but with respect to jobs that would be indirectly created, in the State of Rhode Island, as a result of the proposed project.	Section 14.1
14.3 Describe the proposed project's commitment to the following: investing in offshore wind-related environmental research, monitoring and mitigation sponsored by the DEM and/or the Rhode Island Coastal Resource Management Council; investing in workforce development and environmental research facilities to support the offshore wind industry; utilizing port facilities and office space; and investing in development activities that directly benefit economically distressed areas and/or low-income populations.	Section 14.2
14.4 Please describe any other direct economic benefits to the State of Rhode Island (either positive or negative) that could result from the proposed project, such as creating property tax revenues or purchasing capital equipment, materials, or services for Rhode Island businesses. Please provide the location(s) where these economic development benefits are expected to occur.	Section 14.3
14.5 To the extent not already specified elsewhere in your response, please describe any additional benefits or impacts associated with the proposed project.	Section 14.4
14.6 The Section 14 Addendum: Economic Development Summary Sheet is a Microsoft Excel workbook provided on ricleanenergyrfp.com. Please fill out and submit the Section 14 Addendum to accompany responses in this section. *Copy of completed Section 14 Addendum in Excel format (.xls or .xlsx file): ☐*	Section 14.5

RFP Appendix A Requirements	Bid Package Section
SECTION 15 - DIVERSITY, EQUITY, AND INCLUSION PLAN	
Bidders are required to demonstrate a diversity, equity and inclusion plan that describes the proposed strategy to actively promote access to employment and contracting opportunities for, and to actively recruit, diverse workers, vendors, contractors, and investors, and include how the direct, specific and measurable employment and contracting benefits created by the proposed project provides employment and procurement/contracting opportunities for minorities, women, veterans, LGBT and persons with disabilities.	
15.1 Workforce Diversity Plan *Please include descriptions of each type, duration and salary bands of the employment created and identify the recruitment efforts aimed at hiring diverse candidates for these employment opportunities.*	Section 15.1
15.2 Supplier Diversity Program *Please include descriptions of the subcontracting, vendor, investor, and ancillary (operational) business opportunities that will be provided by diverse businesses.*	Section 15.2
15.3 Stakeholder Engagement Plan *Provide plans to consider how the bidder will engage with project stakeholders. Identify groups of stakeholders to be included (e.g. tribal communities, economically-disadvantaged communities, environmental justice advocates, and fishing communities), project impacts on each stakeholder (and associated mitigation plans), engagement goals for each such group, engagement activities and community partnerships included in the plan, and demonstrated evidence of past and current productive relationships with project stakeholders.*	Section 15.3 Attachment 15-1
SECTION 16 - LIST OF RHODE ISLAND VENDORS AND DOMESTIC SUPPLY CHAIN OPPORTUNITIES	
Bidders are required to identify Rhode Island vendors and other domestic offshore wind supply chain opportunities associated with the project.	
16.1 Please identify the Rhode Island vendors associated with supplying the project and provide percentage of Rhode Island-based vendors. Additionally, please provide the percentage of total vendors that are based in the United States.	Section 16.1
16.2 Please identify the project's plans to invest in supply chain and infrastructure improvements to support the offshore wind industry.	Section 16.2

RFP Appendix A Requirements	Bid Package Section
SECTION 17 - PLANS FOR CONSTRUCTION LABOR AGREEMENT	
Bidders are required to submit a plan outlining their intentions with respect to the negotiation of project labor agreements to cover construction activities.	
17.1 As part of the contract negotiation process, the bidder must commit to enter into a labor peace agreement with at least one bona fide labor organization either where such bona fide labor organization is actively representing employees providing necessary construction, operations and maintenance services for the project at the time of such agreement or upon notice from a bona fide labor organization that is attempting to represent employees who will provide necessary operations and maintenance services for the renewable energy system employed in the state. The maintenance of such labor peace agreement will be an ongoing material condition of any continuation of payments under the PPA. See R.I. Gen. Laws § 39-31-10(e). *Describe the Bidder's plan to enter into a labor peace agreement and/or plan for project employee representation by a labor organization.*	Section 17.1
17.2 Bidders must commit to pay each construction, operations and maintenance employee wages and benefits that are not less than the prevailing wage and fringe benefit rates at the journeyman level that are prescribed by the Rhode Island Department of Labor and Training, and not less than the prevailing wage rates for employees for which there is no classification prescribed by the Rhode Island Department of Labor and Training. Bidders must also commit to pay benefits and wages not less than the rate applicable to apprentices for the pertinent classification prescribed by the Rhode Island Department of Labor and Training if the worker is a participant in an approved apprenticeship program and the approved apprenticeship program maintains a direct entry agreement with a certified pre-apprenticeship training program. See R.I. Gen. Laws § 39-31-10(f). *Describe the Bidder's plan to compensate project employees and apprentices not less than the prevailing wage.*	Section 17.2
SECTION 18 - EXCEPTIONS TO FORM PPAS	
Please attach an explanation of any exceptions to the Form PPA set forth in Appendix C. Comments to the proposed Form PPA must include any specific alternative provisions in a redline format to the Form PPA. ***Bidders are discouraged from proposing material changes to the Form PPA.***	Section 18 Attachment 18-1 Attachment 18-2
SECTION 19 - EXCEPTIONS TO COMMITMENT AGREEMENT	
Please attach an explanation of any exceptions to the Commitment Agreement set forth in Appendix E to this Notice, including any specific alternative provisions in a redline format to the Commitment Agreement. *Bidders must include a marked version showing any proposed changes to the Commitment Agreement with their bid, and it is assumed that bidders would be willing to execute the marked-up agreement included in their bids. Bidders are discouraged from proposing material changes to the Commitment Agreement.*	Section 19 Attachment 19-1 Attachment 19-2

List of Abbreviations

°C	degrees Celsius
°F	degrees Fahrenheit
§	section
AC	alternating current
AEP	annual energy production
AFC	Advanced Foundation Component
AIS	automatic identification system
amsl	above mean sea level
ASIT	Air-Sea Interaction Tower
BMP	best management practice
BOEM	Bureau of Ocean Energy Management
CCIS	Capacity Capability Interconnection Standards
CCPD	Certification, Project, and Pricing Data
CECPN	Certificate of Environmental Compatibility and Public Need
CFR	Code of Federal Regulations
CGP	Construction General Permit
CIM	Crisis Incident Management
CLV	cable lay vessel
CO2	carbon dioxide
COD	commercial operations date
COP	Construction and Operations
CPA	Connecticut Port Authority
CPI	Consumer Price Index
CRMP	Costal Resources Management Program

CTV	Crew Transfer Vessel
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
Daymark	Daymark Energy Advisors
DC	direct current
DEI	diversity, equity, and inclusion
DEIS	Draft Environmental Impact Statement
DoD	Department of Defense
DP	dynamic positioning
DPU	Department of Public Utilities
ECO	Edison Chouest Offshore
EFH	Essential Fish Habitat
EFMP	Environmental and Fisheries Mitigation Plan
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EM&CP	Environmental Management and Construction Plan
EMF	electromagnetic fields
EO EEA	Executive Office of Energy and Environmental Affairs
EPA	United States Environmental Protection Agency
EPC	engineering, procurement, and construction
ERCC	Emergency Response Coordination Center
ERP	Emergency Response Plan
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FAST-41	Fixing America's Surface Transportation Act
FAT	Factory Acceptance Test
FDR	Facility Design Report

FERC	Federal Energy Regulatory Commission
FIR	Fabrication and Installation Report
FLiDAR	floating light detection and ranging buoy
FOC	fiber optic cables
ft	feet
FTE	full-time equivalent
GE	General Electric
GIS	Generation Information System
GLD	geographic location description
GW	gigawatt
GWh	gigawatt hours
HLV	heavy lift vessel
HSE	Health, Safety, and Environment
HTV	Heavy Transport Vessel
HV	high voltage
HVAC	high voltage alternating current
HVDC	high-voltage direct current
IRA	Inflation Reduction Act
IRS	Internal Revenue Service
ISO-NE	ISO-New England
km	kilometer
kV	kilovolt
LERT	Local Emergency Response Team
LGIA	Large Generator Interconnection Agreement
LiDAR	light detection and ranging
LNM	Local Notice to Mariners
LOA	Letter of Authorization

m	meter
m/s	meters per second
MA CZM	Massachusetts Office of Coastal Zone Management
MA EFSB	Massachusetts Energy Facilities Siting Board
MassDEP	Massachusetts Department of Environmental Protection
MATE	Marine Advanced Technology Education
MEC/UXO	munitions and explosives of concern / unexploded ordnance
MEPA	Massachusetts Environmental Policy Act
MESA	Massachusetts Endangered Species Act
mi	mile
MW	megawatt
MWBE	Minority and Women Owned Business Enterprise
MWh	megawatt-hour
NABTU	North America's Building Trades Unions
NEFSC	Northeast Fisheries Science Center
NEPA	National Environmental Policy Act
NEPOOL	New England Power Pool
nm	nautical mile
NOAA	National Oceanic and Atmospheric Administration
NOAA Fisheries	National Oceanic and Atmospheric Administration National Marine Fisheries Service
NOI	Notice of Intent
NOWA	National Offshore Wind Agreement
NPCC	Northeast Power Coordinating Council
NPDES	National Pollutant Discharge Elimination System
O&M	Operations and Maintenance
OCS	Outer Continental Shelf

OEM	original equipment manufacturer
OSRP	Oil Spill Response Plan
PATON	Private Aids to Navigation
PLA	Project Labor Agreement
POI	point of interconnection
PPA	Power Purchase Agreement
ProvPort	Port of Providence
PSO	Protected Species Observer
PSV	Platform Supply Vessel
QMTC	Quonset Multimodal Transportation and Training Center
RCM	Reliability-Centered Maintenance
REC	renewable energy certificates
RFP	request for proposal
RHA	Rivers and Harbors Appropriation Act of 1899
Rhode Island ESA	Rhode Island Endangered Species of Animals and Plants Act
RICC	Rhode Island Commerce Corporation
RI CRMC	Rhode Island Coastal Resources Management Council
RI EFSB	Rhode Island Energy Facility Siting Board
RIDEM	Rhode Island Department of Environmental Management
RIGL	Rhode Island General Laws
RIHPHC	Rhode Island Historical Preservation and Heritage Commission
RIPDES	Rhode Island Pollutant Discharge Elimination System
RI-MA WEA	Rhode Island Massachusetts Wind Energy Area
ROD	Record of Decision
ROSA	Responsible Offshore Science Alliance
ROW	right-of-way

SAP	Site Assessment Plan
SAT	Site Acceptance Test
SBTi	Science Based Target Initiative
SDVOB	Service-Disabled Veteran-Owned Business
SESC Plan	Soil Erosion and Sediment Control Plan
SIS	System Impact Study
SIT	Site Integration Test
SOV	Service Operation Vessel
SPA	Spare Part Agreement
SPCC Plan	Spill Prevention, Control, and Countermeasure Plan
STATCOM	Static Synchronous Compensator
SWA	Service Warranty Agreement
SWPPP	Stormwater Pollution Prevention Plan
T&I	Transport and Installation
TOY	time of year
TP	transition piece
TSA	Turbine Supply Agreement
U.S.C.	United States Code
UK	United Kingdom
USACE	United States Army Corps of Engineers
USCG	United States Coast Guard
USFWS	United States Fish and Wildlife Service
W2W	Walk-to-Work
WEA	Wind Energy Area
WOTUS	Waters of the United States
WQC	Water Quality Certification
WTG	wind turbine generator

XLPE	cross-linked polyethylene

Confidentiality and Enabling Statements

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Section 1

Certification, Project, and Pricing Data

1.0 CERTIFICATION, PROJECT, AND PRICING DATA

The Certification, Project, and Pricing Data ("CPPD") document is a Microsoft Excel workbook that is provided on the website at www. ricleanenergyrfp.com.

Bidders are required to provide firm pricing for 184 days from the date of bid submission. The bidder must also sign the certification form found in Appendix A verifying that the prices, terms, and conditions of the proposal are valid for at least 184 days. An officer or duly authorized representative of the bidder is required to sign the Proposal Certification Form.

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Section 2

Executive Summary

2.0 EXECUTIVE SUMMARY

The bidder is required to provide an executive summary of the project proposal that includes a complete description of the proposed generation bid, the delivery point located within ISO-NE, the proposed contract term and pricing schedule, the interconnection plan, the overall project schedule, the additional ACES requirements detailed in Section 2.2.3.8, and other factors the bidder deems to be important. A table summarizing the proposal(s), including details such as generation project location, interconnection location(s), capacity (MW), commercial operation date, pricing ($/MWh), etc., is encouraged.

Ørsted and Eversource are pleased to submit **Revolution Wind 2**, an 884-megawatt (MW) project, in response to Rhode Island Energy's 2022 offshore wind request for proposal, 'Long Term Contracts for Offshore Wind Energy'.

A climate leader among the states, Rhode Island has committed to using 100% renewable energy by 2033 and achieving a net-zero economy by 2050. As the state's trusted, local partner in offshore wind development, we share Rhode Island's vision of a cleaner future. Together, the Revolution Wind 1 and Revolution Wind 2 projects will meet three quarters of Rhode Island's annual electricity demand with green, local electricity. We're backing a blue and green economy that will put Rhode Islanders to work and secure Rhode Island's leading role in offshore wind.

Working hand in hand with Rhode Island residents, businesses, and communities, Ørsted built Block Island, America's first offshore wind farm. We followed this success with the development of Revolution Wind 1, a joint venture with our partner Eversource. Revolution Wind 1 will soon be generating clean, renewable energy for over 200,000 Rhode Island homes.

These two projects represent Rhode Island's entry into the offshore wind industry and the steppingstones for our Proposal. Building on their success, Revolution Wind 2 is expected to generate over $2 billion in direct economic benefits to Rhode Islanders through investments in ports, workforce development, education and research, biodiversity, supply chain development, and environmental justice. We will also create thousands of jobs in the state during development, construction, and operations.

Our unique Proposal will cement Rhode Island's position as a center of offshore wind expertise, making the state a hub of economic activity. We will open [redacted]

In tandem, we are committed to supporting local [redacted] we will create assets that serve Revolution Wind 2 and alleviate broader industry supply chain bottlenecks. In addition, our bid provides [redacted] This will help Rhode Island [redacted]

All this development will create jobs—new positions to be filled as early as [redacted] Revolution Wind 2 will generate [redacted]. For Rhode Island, this means building out invaluable [redacted].

From day one, we have led and championed the development of offshore wind in Rhode Island. We built the local supply chain, created jobs, and became a trusted partner for workers, businesses, and communities. For us, Rhode Island is home—to our business, to the offshore wind industry, to the energy revolution—and we work hard every day to make our hometown proud.

2.1 OUR FINANCIAL PROPOSAL

The Proposal responds to Rhode Island Energy's needs, as outlined in the Request for Proposal (RFP), by maximizing the benefit versus cost for Rhode Island ratepayers in all direct and indirect economic and environmental attributes. The following schedule and pricing are accurate representations of what it will take to build the Project, based on our extensive experience developing, building, and operating offshore wind projects in Rhode Island and along the Eastern Seaboard. A summary of the Project is provided in Table 2.1.

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There are extensive details below on what the Proposal will deliver in terms of economic benefits. However, it is also worth highlighting the key principles in the Proposal that focus on [redacted]

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

2.2 ADDITIONAL DIRECT ECONOMIC BENEFITS TO RHODE ISLANDERS

Revolution Wind 2 will revolutionize Rhode Island's economy, creating new jobs, expanding local infrastructure and supply chains, and taking climate action. We're prioritizing Rhode Islanders by creating family-sustaining union jobs and training opportunities that benefit local communities. We're helping Rhode Island jumpstart its blue and green economy, making it a sustainable business hub and economic center for clean energy. We are doing all of this while protecting native species and ecosystems across the state, taking a responsible, holistic approach to sustainable development.

2.2.1 Economic Development and Job Creation

Our offshore wind farms are never standalone assets; they are part of a communal ecosystem, bringing jobs and training to locals of all backgrounds. Rhode Island has been foundational to the offshore wind industry in the U.S., and we are committed to delivering a long-term legacy for Rhode Island.

If selected, Revolution Wind 2 will commit to the following:

- [redacted]
- [redacted]

[redacted]

These investments will back workforce development and spur job creation, bringing well-paid union jobs to Rhode Island. Ørsted was the first offshore wind company to sign a nationwide agreement with North America's Building Trades Union (NABTU). This means all our projects—including Revolution Wind 2—are governed by labor agreements and use only union-affiliated labor.

We are also committed to creating opportunities and building career momentum for traditionally marginalized groups, including minorities, women, veterans, LGBTQIA+ individuals, and the differently abled. Our worksites, training programs, and Innovation Hub are designed to be diverse and inclusive of all workers and partners.

Finally, we believe in keeping our work local, creating a well-paid, well-trained, diverse workforce that benefits Rhode Island communities. [redacted] This ensures that the skills we teach and the investments we make stay in Rhode Island, today and tomorrow.

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Ørsted is also targeting a net-positive biodiversity impact on all renewable energy projects commissioned starting in 2030, including Revolution Wind 2. We are already doing so with projects like ReCoral, which supports natural coral growth on offshore wind turbines, creating healthy reefs in tropical waters. For Rhode Island, our efforts will focus on [redacted] with the goal of safeguarding and enhancing our shared hometown.

2.2.4 Trusted Local Partner

Our Unmatched Expertise

As a global leader in developing, financing, constructing, and operating offshore wind farms, Ørsted brings more than 30 years of experience to this project. We have been trusted to build more offshore wind farms than any other developer, with 8.9 gigawatts (GW) of installed capacity, 2.2 GW under construction, and another 11.2 GW under development. By partnering with Eversource—an industry leader in building and maintaining large transmission and distribution projects—we can provide unrivaled expertise.

[redacted] We have a strong track record of successfully siting our assets, obtaining permits, and undergoing construction with minimal challenges to local communities, even during periods of macroeconomic upheaval. An excellent example of this is our Sunrise Wind Project in New York. We are the first and only developer, thus far, to be awarded a New York State Energy Research and Development Authority solicitation to receive transmission line approval from the New York Public Service Commission. This landmark proposal went unopposed by any party.

Our Lasting Contributions

Through Revolution Wind 1, we have invested [redacted] We've injected [redacted] into offshore wind [redacted] We are also investing [redacted] in offshore wind supply chain development, [redacted]

This is complemented by our investment in [redacted]

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Section 3

Operational Parameters

3.0 OPERATIONAL PARAMETERS

[redacted]

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

[redacted]

[redacted]

[redacted] [redacted]

3.1 MAINTENANCE OUTAGE REQUIREMENTS

Specify partial and complete planned outage requirements in weeks or days for all generation facilities and associated facilities required for the delivery of energy from the generation facilities to the delivery point. Also, list the number of months required for any outage cycle(s) to repeat (e.g., list time interval of minor and major overhauls, and the duration of overhauls).

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3.2 OPERATING CONSTRAINTS

Specify all the expected operating constraints and operational restrictions for the project (i.e., limits on the number of hours a unit may be operated per year or unit of time), differentiating those that may be variable or situational in nature.

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[redacted] Ørsted focuses on continuously developing industry leading emergency response provisions, so that if and when emergencies occur, they can be handled in the quickest and safest manner possible while minimizing risk to both humans and the environment.

3.3 RELIABILITY

Describe how the proposal would provide enhanced electricity reliability to Rhode Island, including its impact on transmission constraints.

[redacted]

- [redacted]
- [redacted]

[redacted]

3.4 MODERATION OF SYSTEM PEAK LOAD

Describe how the proposal would contribute to moderating system peak load requirements and provide the following information:

i) Estimated average output for each summer period (June- September) from 3:00 - 7:00 pm

ii) Estimated average output for each winter period (October-May) from 4:00 – 9:00 pm

[redacted]

The generated power from a wind farm depends highly on the present wind conditions and will fluctuate over time. Therefore, the understanding of the wind conditions at the Project location is crucial to be able to predict the general production during System Peak Load. [redacted]

Statistically, the Proposer expects a somewhat lower production during summer periods compared to winter. The Proposer has estimated the following net energy production for an average hour during the specified time frames:

- [redacted]
- [redacted]

[redacted]

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Section 4

Energy Resource and Delivery Plan

4.0 ENERGY RESOURCE AND DELIVERY PLAN

For Eligible Facilities, the bidder is required to provide an energy resource and a production/delivery profile for its proposed project, including supporting documentation, as described in Section 2.2.3.4 (see RFP). The energy resource and profile information should be consistent with the type of technology/resource option proposed and the term proposed. Bidders should respond to all information requests which are relevant to the bid in a timely manner.

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4.1 WIND DATA

Provide a summary of all collected wind data for the proposed site. Identify when and how (e.g. meteorological mast or LiDAR – for "Light Detection and Ranging") the data was collected and by whom.

Indicate where the data was collected and its proximity to the proposed site. Include an identification of the location and height for the anemometers and/or "range gate" heights for sensing by LiDAR that were used to arrive at an assessment of the site generation capability.

Describe any additional wind collection efforts that are planned or ongoing.

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4.1.4 Wind Resource Data

Provide (a) at least one year of hourly wind resource data. Real Data collected from the site is preferred, though projected data is permissible. Methodology must also be included. And (b) a wind resource assessment report for the proposed facility from a qualified unaffiliated third-party wind resource assessment firm. Include an analysis of the available wind data which addresses the relationship between wind conditions and electrical output. Provide a projection of net hourly energy production or net annual energy production, including projections of average net hourly energy production, including projections of average net hourly energy production, including projections of average hourly energy production, based on the wind resource data (hourly 8760 data profile and a 12 x 24 energy projection) at both P50 and P90 levels.

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4.1.5 Power Curve

Provide a site-adjusted power curve. Each curve should list the elevation, temperature and air density used.

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4.1.6 Case Overview

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4.1.7 Annual Energy Production

Identify the assumptions for losses in the calculation of projected annual energy production, including each element in the calculation of losses.

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4.2 OFFSHORE WIND ENERGY GENERATION DELIVERY PLAN

Please provide an energy delivery plan and production/delivery profile for the proposed project, including supporting documentation. The energy delivery plan and production/delivery profile must provide the expected Offshore Wind Energy Generation to be delivered into the ISO-NE market settlement system and permit the Evaluation Team to determine the reasonableness of the projections for purposes of Sections 2.2.2.3 Eligible Products, 2.2.2.4 Allowable Contract Term, 2.2.2.5 Minimum/Maximum Contract Size and Allowable Alternative Bids, and 2.2.3.4 Interconnection and Delivery Requirements (see RFP for Section 2.2.3.4). Such information should be consistent with the energy resource plan and production/delivery profile provided above and considering any and all constraints to physical delivery into ISO-NE.

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4.3 REC/ENVIRONMENTAL ATTRIBUTE DELIVERY PLAN

Please provide documentation and information demonstrating that the project will deliver GIS Certificates representing the associated RECs and any other Environmental Attributes, as applicable. Please describe whether transfer of all GIS Certificates is authorized under the current ISO-NE GIS rules and protocols, or if a rule or protocol change is required. To the extent such a change is required, please provide regarding the proposal and the process for implanting the change.

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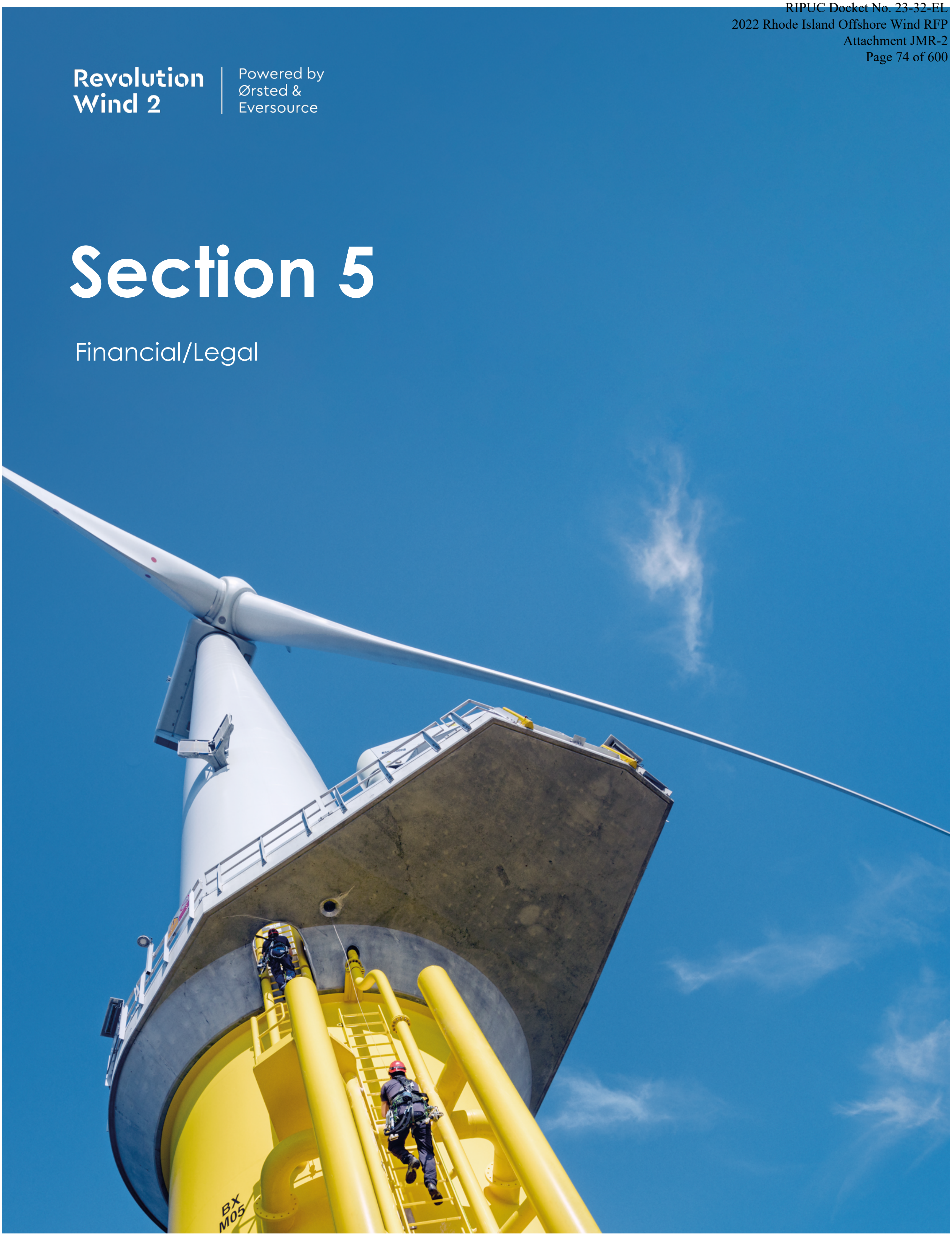
Revolution Wind 2 | Powered by Ørsted & Eversource

Section 5

Financial/Legal



5.0 FINANCIAL/LEGAL

Bidders are required to demonstrate the financial viability of their proposed project. Bidders should provide the following information:

5.1 LONG-TERM CONTRACT FINANCING

Please submit information and documentation that demonstrates that a long-term contract resulting from this RFP Process would either permit the bidder to finance its proposal that would otherwise not be financeable or assist the bidder in obtaining financing of its proposal.

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5.2 BUSINESS ENTITY STRUCTURE

Please provide a description of the business entity structure of the bidder's organization from a financial and legal perspective, including all general and limited partners, officers, directors, managers, members and shareholders, involvement of any subsidiaries supporting the project, and the providers of equity and debt during project development. Provide an organization chart showing the relationship between the equity and debt participants and an explanation of the relationships. For jointly owned facilities, identify all owners and their respective interests, and document the bidder's right to submit a binding proposal.

Ørsted and ESI (together, the Owners) have entered into a 50/50 joint venture through which they control the Proposer and its affiliates that hold the Lease Areas within which the Project will be located. [redacted]

Specifically, the Owners jointly own the Proposer's parent company (and sole member-manager), North East Offshore, LLC.

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5.2.1 Organization Chart

In 2016, Ørsted and ESI formed the Proposer, with each controlling 50% of the Proposer and affiliated entities. An organization chart depicting the corporate structure is provided in [redacted] Ørsted owns, sometimes jointly, more than 100 entities active in the energy sector. Refer to Ørsted's 2022 and Eversource's 2022 Annual Reports in Section 5.6 for a complete list of affiliated entities and joint ventures.

[redacted]

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5.3 FINANCING PLAN

Please provide a description of the financing plan for the project as described in Section 2.2.3.5, including construction and term financing.

i. *Who will finance the project (or are being considered to finance the project) and the related financing mechanism or mechanisms that will be used (i.e., convertible debenture, equity or other) including repayment schedules and conversion features.*

ii. *The project's existing initial financial structure and projected financial structure.*

iii. *Expected sources of debt and equity financing.*

iv. *Estimated construction costs.*

v. *The projected capital structure.*

vi. *Describe any agreements, both pre- and post-commercial operation date, entered into with respect to equity ownership in the proposed project and any other financing arrangement.*

In addition, the financing plan should address the status of the above activities as well as the financing of development and permitting costs. All bidders are required to provide this information.

The Owners are publicly traded companies with a combined market capitalization of approximately $70 billion and combined operating cash flows of approximately $4 billion annually.

Ørsted is the global leader in financing, constructing, and operating offshore wind. It currently has 30.7 GW total installed, under construction, and awarded renewable energy capacity globally, cementing its position as the global leader in offshore wind.

Eversource is an industry leader in the development and operation of large-scale transmission and distribution projects. With more than 8,000 employees, Eversource has significant experience delivering projects throughout the Northeastern U.S.

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5.4 EXPERIENCE

Provide documentation illustrating the experience of the bidder in securing financing for projects of similar size and technology as required in Section 2.2.3.6. For each project previously financed, provide the following information:

Project name and location

ii. Project type and size

iii. Date of construction and permanent financing

iv. Form of debt and equity financing

v. Current status of the project

As a result of more than 20 years of combined development experience, the Proposer's organization is well equipped to successfully develop, finance, construct, operate, and maintain the Project.

Ørsted and Eversource have been close partners, successfully working together since 2016, when they created the joint venture. As a 50/50 joint venture between Ørsted and ESI, the Proposer will benefit from the extensive experience that these organizations have gained over the past two decades in developing, constructing, and operating large energy projects.

Bay State Wind LLC is the product of the dynamic, collective experiences of its parent organizations. As the leading offshore wind developer in the nation, Ørsted has established an unmatched offshore wind experience and project portfolio, complemented by Eversource's broad transmission expertise throughout New England. The partnership is a natural fit, making Bay State Wind LLC a robust member of the U.S. offshore wind market. Information regarding the Proposer's previously financed projects, including project name and location, project type and size, in-service date, permanent financing, form of debt and equity financing, and status are presented in Table 5.1. Refer to Section 12 for additional details regarding projects in various stages of development by Ørsted and Eversource outside of Bay State Wind LLC.

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5.5 FINANCIAL RESOURCES

Please provide evidence that the bidder has the financial resources and financial strength to complete and operate the project as planned.

As described throughout Section 5, Ørsted and Eversource are stable and diverse energy companies with robust balance sheets that reflect the financial strength needed to complete and operate the Project in the ordinary course of their respective businesses.

Financial and cash flow data for Ørsted and Eversource is provided in Table 5.2, Table 5.3, Table 5.4, and Table 5.5. Annual reports are referenced in Section 5.6.

Table 5.2 Ørsted Selected Consolidated Financial Data - Balance Sheet and Income Statement

	(Millions of Dollars)		
	2022	**2021**	**2020**
Balance Sheet Data:			
Total Assets	38,828	38,828	28,250
Capital Employed	15,713	15,713	15,750
Income Statement Data:			
Revenue	18,949	11,154	7,202
EBIT	4,598	2,326	1,294
From Ørsted 2021 Annual Report Assumes DKK to USD exchange rate of 0.14			

Table 5.3 Ørsted Selected Consolidated Cash Flow Data - Funds from Operations and Debt Issuances

	(Millions of Dollars)		
	2022	**2021**	**2020**
Cash flow from operating activities	1,708	1,745	2,365
Interest-bearing net debt	4,384	3,487	1,773
From Ørsted 2021 Annual Report Assumes DKK to USD exchange rate of 0.14			

Table 5.4 Eversource Selected Consolidated Financial Data - Balance Sheet and Income Statement

	(Millions of Dollars)		
	2022	2021	2020
Balance Sheet Data:			
Property, Plant and Equipment, Net	36,113	33,378	30,883
Total Assets	53,231	48,492	46,099
Income Statement Data:			
Operating Revenues	12,289	9,863	8,904
Net Income	1,405	1,228	1,213

Table 5.5 Eversource Selected Consolidated Cash Flow Data - Funds from Operations and Debt Issuances

	(Millions of Dollars)		
	2022	2021	2020
Net Cash Flow Provided by Operating Activities	2,400	1,963	1,683
Issuance of Long-term Debt	4,045	3,230	2,760
Increase/(Decrease) in Short-term Debt	78	256	14
Total Debt Issuances	3,538	3,486	2,774

As demonstrated, both Eversource and Ørsted are large, growing companies and had a combined cash flow of nearly $4 billion and a combined market capitalization of over $70 billion in 2022. Moreover, both possess deep capital-market expertise, as evidenced by their ability to routinely access the public debt and equity markets. For example, in November 2017, Ørsted issued green hybrid capital securities and green senior unsecured bonds totaling €1.25 billion (approximately $1.5 billion); in May 2019, Ørsted issued green senior bonds totaling GBP 900 million (approximately $1.1 billion); and between November 2019 and November 2020, Ørsted issued green senior bonds totaling NTD 27 billion ($885 million).

Eversource successfully issued two series of Senior Notes (Series V and Series W) totaling $1.3 billion in February 2022, and another two series of Senior Notes (Series X and Series Y) totaling $1.5 billion in June 2022.

5.6 FINANCIAL STATEMENTS AND ANNUAL REPORTS

Provide complete copies of the most recent audited financial statement and annual report for each bidder for each of the past three years; including affiliates of the bidder (if audited statements are not available, reviewed or compiled statements are to be provided). Also, provide the credit ratings from Standard & Poor's and Moody's (the senior unsecured long term debt rating or if not available, the corporate rating) of the bidder and any affiliates and partners.

The annual reports for Ørsted (formerly known as DONG Energy) for the past three fiscal years (ending December 31, 2022, are available here: annual-report-2022.ashx (azureedge.net);[1] annual-report-2021.ashx (azureedge.net);[2] and annual-report-2020.ashx (azureedge.net).[3] The annual reports for Eversource for the past three fiscal years (ending December 31, 2022) are available here: 2022-annual-report.pdf (eversource.com),[4] 2021-annual-report.pdf (eversource.com);[5] and 2020-annual-report.pdf (eversource.com).[6] [redacted]

[redacted] The current senior unsecured (long-term) debt ratings of Ørsted and Eversource are provided in Table 5.6.

Table 5.6 Ørsted and Eversource Credit Ratings (as of December 2022)

Sponsor	S&P	Moody's	Fitch
Ørsted	BBB+ (stable)	Baa1 (stable)	BBB+ (stable)
Eversource	BBB+ (positive)[1]	Baa1 (negative)	BBB+ (stable)
[1] Rating for senior unsecured long-term debt. Corporate Credit rating is A-.			

5.7 DIRECTORS, OFFICERS, AND TRUSTEES

Please also include a list of the board of directors, officers, and trustees for the past three years and any persons who the bidder knows will become officers, board members or trustees.

[redacted]

[1] https://via.ritzau.dk/ir-files/13560592/6237/9071/Ørsted annual report 2022.pdf
[2] https://orstedcdn.azureedge.net/-/media/annual2021/annual-report-2021.ashx?rev=9d4904ddf4c44594adab627f7e4c62be&hash=69CE31C5D5935DD0DB46313E3BDEC952
[3] https://orstedcdn.azureedge.net/-/media/annual2020/annual-report-2020.ashx?rev=982c3382c2f0459486e16c7098dd5b57&hash=65A18F91E8A8787DEE74482831321321
[4] https://d18rn0p25nwr6d.cloudfront.net/CIK-0000072741/e9335d5f-bc88-46db-8466-8a34f20cbee0.pdf
[5] https://www.eversource.com/content/docs/default-source/investors/2021-annual-report.pdf
[6] https://www.eversource.com/content/docs/default-source/investors/2020-annual-report.pdf?sfvrsn=e40dc62_6

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5.8 SECURITY REQUIREMENTS

The bidder should demonstrate its ability (and/or the ability of its credit support provider) to provide the required security as described in Section 2.2.3.7, including its plan for doing so.

The Owners have ample resources to provide bid security on behalf of the Proposer. As of September 30, 2022, [redacted]

5.9 CREDIT ISSUES

Provide a description of any current or recent credit issues/credit rating downgrade events regarding the bidder or affiliate entities raised by rating agencies, banks, or accounting firms.

Ørsted does not have any current or recent credit issues or recent rating downgrade events. Ørsted is not aware of any pending credit issues or credit rating downgrade events, nor any other financial issues raised by rating agencies, banks, or accounting firms. As demonstrated in Section 5.6, all three major credit rating agencies rate Ørsted's credit as stable.

Except for Moody's negative credit outlook (which has been in place for over a year) noted in Section 5.6, Eversource has not experienced any current credit issues or recent rating downgrade events, is not aware of any pending credit issues or credit rating downgrade events, nor any other financial issues raised by rating agencies, banks, or accounting firms. Eversource maintains one of the highest credit ratings of any company in the Energy and Utility industry in the U.S.

Both Ørsted and Eversource are well regarded and maintain strong investment grade credit profiles.

5.10 FINANCIAL INCENTIVES

Describe the role of the Federal Production Tax Credit ("PTC") or Investment Tax Credit ("ITC") as newly revised by the Inflation Reduction Act, and any other incentives, on the financing of the project. In the response, please describe
(a) your plan to qualify for the ITC/PTC and the level of the ITC/PTC for which you plan to qualify,
(b) the facilities, investment in which, the ITC is expected to apply,
(c) your plan to utilize the tax credits and the relationship to your financing plan, and
(d) how qualification for the ITC/PTC is reflected in your proposed pricing. If a bidder assumes that such credits, subsidies, grants or incentives will not be available for its Eligible Facility, it should state how it would propose to share the benefits of those credits, subsidies, grants or incentives with Rhode Island Energy's customers if they subsequently become available. Bidders may propose adjustments to the contract price based on an increase in any state or federal tax credit or other government grant or subsidy.

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[redacted]

5.11 DOMESTIC SUPPLY

Describe the bidder's plan to adhere to the domestic supply rules set forth in the Build America, Buy America Act and the act's implications on access to federal funding, cost of materials, and supply chains.

[redacted]

[redacted]

[redacted]

5.12 TAX CREDITS OR SUBSIDIES

Describe how the bidder would consider Rhode Island Energy customers in the event of the availability or receipt of any tax credit or other government grant or subsidy not contemplated in their proposals. Bidders must state their assumptions regarding the availability of federal or state tax credits, subsidies, or grants or other incentives.

[redacted] The provisions of, and definitions in, the OREC Agreement relating to Qualified Federal Support have been adjusted to remove references to the Domestic content bonus credit amount and account for this particular feature of the proposed pricing.

5.13 PROJECT LITIGATIONS OR DISPUTES

Bidders must disclose any litigation or disputes in the last three years related to projects developed, owned, or managed by bidder or any of its affiliates in the United States or related to any energy product sale agreement.

Pending litigation information can be found in the annual reports in Section 5.6, which disclose material litigations involving the Owners' respective affiliates. [redacted]

On August 10, 2020, Eversource Energy Service Company was served with a purported "cookie cutter" class action lawsuit arising out of Tropical Storm Isaias, captioned Krysztof Kosieradzki, et al. v. Eversource Energy Service Company, in Connecticut superior court. The plaintiffs are allegedly two residential customers and one business customer who purport to bring this class action on behalf of themselves and other Connecticut homeowners and business owners who were electrical service customers who lost their electrical power during Tropical Storm Isaias. As of the date of the complaint, the plaintiffs had been out of power for three days. The plaintiffs' law firm brought a similar (nearly identical) putative class action lawsuit against The Connecticut Light and Power Company in 2012 in the aftermath of the October 29, 2011, Winter Storm Alfred. In this new complaint, plaintiffs' law firm cut and pasted from the prior complaint (even asserting that the plaintiffs during this July tropical storm "lost their electrical power following the snowstorm"). The prior class action suit lacked legal and factual merit and resolved for an insignificant amount, prior to the company's filing of dispositive motions. After Eversource removed the case to the U.S. District Court for the District of Connecticut, Plaintiffs withdrew the case and refiled a revised complaint in Connecticut state court but modified the description of the putative class to prevent removal to federal court (Kosieradzki et al. v. CL&P, Docket No.: X06-UWY-CV-21-6061453-S). The parties have completed written discovery to date and expect to begin the deposition phase of the case soon.

[redacted]

[redacted]

[redacted]

Since February 2021, seven lawsuits have been filed against federal, New York State, and local government entities challenging their approvals for the South Fork Wind project, which is currently being constructed by the Proposer's affiliate, South Fork Wind, LLC:

- Citizens for the Preservation of Wainscott v, Town of East Hampton, No. 601847/2021 (N.Y. Sup. Ct. [Suffolk County]) (filed Feb. 2, 2021) ("Town of East Hampton")
- Allco Renewable Energy Ltd. et al. v. Haaland et al., Civ. No. 21-11171 (D. Mass.) (filed July 8, 2021) ("Allco Renewables")
- Kinsella v. N.Y. Pub. Serv. Comm'n & N.Y. Dep't of Pub. Serv., No. 2021-06572 (N.Y. App. Div. [2d Dep't]) (filed Sept. 10, 2021)
- Citizens for the Preservation of Wainscott v, N.Y. Pub. Serv. Comm'n et al., No. 2021-06582 (N.Y. App. Div. [2d Dep't]) (filed Sept. 10, 2021)
- Kinsella et al. v. Long Island Power Auth. et al., No. 621109/2021 (N.Y. Sup. Ct. [Suffolk County]) (filed Nov. 9, 2021)
- Mahoney et al. v. U.S. Dep't of the Interior et al., Civ. No. 22-1305 (E.D.N.Y.) (filed Mar. 9, 2022)
- Kinsella v. Bureau of Ocean Energy Mgmt. et al., Civ. No. 22-2147 (D.D.C.) (filed July 20, 2022)

Two of the lawsuits (*Town of East Hampton* and *Allco Renewables*) have been dismissed by courts (with no appeal pursued). The other five remain pending. South Fork Wind, LLC has intervened or has been named as a respondent in all the cases and is defending the challenged governmental action(s) in all of the still-pending ones.

[redacted]

5.14 PROJECT OPERATING LIFE

What is the expected operating life of the proposed project? What is the depreciation period for all substantial physical aspects of the bid, including generation facilities, delivery facilities to move power to the grid, and mandatory and voluntary transmission system upgrades?

[redacted]

[redacted]

[redacted] [redacted]

[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

5.15 FINANCING COMMITMENTS

Has the bidder already obtained financing, or a commitment of financing, for the project? If financing has not been obtained, explain how obtaining a long-term agreement as proposed will help you in obtaining financing for the proposed project, in obtaining more favorable terms for the financing of the proposed project, or in supporting the future capital investment.

[redacted]

5.16 PROJECT AGREEMENTS

State whether the bidder or its affiliates have executed agreements with respect to energy, RECs and/or capacity for the proposed project (including any agreements that have been terminated) and provide information regarding the associated term and quantities, and whether bidder has been alleged to have defaulted under or breached any such agreement.

[redacted]

[redacted]

5.17 AFFILIATED ENTITIES AND JOINT VENTURES

List all of the bidder's affiliated entities and joint ventures transacting business in the energy sector.

As stated in Section 5.2, the Proposer—Bay State Wind LLC—is a wholly owned subsidiary of North East Offshore, LLC, which is a 50/50 joint venture between Eversource Investment LLC and Ørsted North America Inc. [redacted]

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

Virtually all of Ørsted and Eversource's business is transacted in the energy sector. Please see Ørsted's 2022 and Eversource's 2022 Annual Reports (Section 5.6) for [redacted]

5.18 DEBT HISTORY

Has bidder, or any affiliate of bidder, in the last five years, (a) consented to the appointment of, or been taken in possession by, a receiver, trustee, custodian or liquidator of a substantial part of its assets, (b) filed a bankruptcy petition in any bankruptcy court proceeding, (c) answered, consented or sought relief under any bankruptcy or similar law or failed to obtain a dismissal of an involuntary petition, (d) admitted in writing of its inability to pay its debts when due, (e) made a general assignment for the benefit of creditors, (f) was the subject of an involuntary proceeding seeking to adjudicate that Party bankrupt or insolvent, (g) sought reorganization, arrangement, adjustment, or composition of it or its debt under any law relating to bankruptcy, insolvency or reorganization or relief of debtors?

The Proposer, Bay State Wind LLC, and its affiliates have not taken any of the above-described actions in the last five years. [redacted]

5.19 CONFLICTS OF INTEREST

Briefly describe any known conflicts of interest between bidder or an affiliate of bidder and Rhode Island Energy, or any affiliates of the foregoing.

The Proposer and its affiliates are unaware of any conflicts of interest with Rhode Island Energy or any of its affiliates.

5.20 LITIGATIONS OR DISPUTES WITH RHODE ISLAND ENERGY

Describe any litigation, disputes, claims or complaints involving the bidder or an affiliate of bidder, against Rhode Island Energy or any affiliate of Rhode Island Energy.

[redacted]

5.21 PURCHASE OR SALE DISPUTES

Describe any litigation, disputes, claims or complaints, or events of default or other failure to satisfy contract obligations, or failure to deliver products, involving bidder or an affiliate of bidder, and relating to the purchase or sale of energy, capacity or renewable energy certificates or products.

The Proposer is not aware that it or any of its affiliates is involved in any litigation, disputes, claims or complaints, or events of default or other failure to satisfy contract obligations, or failure to deliver products, relating to the purchase or sale of energy, capacity, or RECs or other electricity products in the U.S. Additional discussion is provided in Section 5.13.

5.22 INVESTIGATIONS OR CONVICTIONS

Confirm that neither bidder nor any directors, employees or agents of bidder, nor any affiliate of bidder are currently under investigation by any governmental agency, and that none of the above have in the last four years been convicted or found liable for any act prohibited by State or Federal law in any jurisdiction involving conspiracy, collusion or other impropriety with respect to bidding on any contract, or have been the subject of any debarment action (detail any exceptions).

The Proposer is not aware that it—or any of its directors, employees, or agents (when acting in their professional capacities on behalf of the Proposer or any of its affiliates), or any of its affiliates—is currently under investigation by any governmental agency, or that any of the above have in the last four years been convicted or found liable for any act prohibited by state or federal law in any jurisdiction involving conspiracy, collusion, or other impropriety with respect to bidding on any contract, or have been the subject of any debarment action.

5.23 REGULATORY APPROVALS FOR BINDING SALE

Identify all regulatory and other approvals needed by bidder to execute a binding sale agreement.

The Proposer has received the necessary internal approvals of the draft PPA markup. To the extent any changes to the markup are made, further approvals may be required. The Proposer understands that, pursuant to R.I. Gen. Laws § 39-31-6, such power purchase agreement would also require approval by the Rhode Island Public Utilities Commission in order to become effective.

5.24 FERC REQUIREMENTS

Describe how the project will conform to FERC's applicable regulatory requirements, including, but not limited to, FERC requirements relating to allocation of transmission capacity and open access, the justness and reasonableness of rates, the potential for undue preference or discrimination, and affiliate dealings, if any. Describe how your proposed approach is consistent with FERC precedent and ratemaking principles.

[redacted]

[redacted]

[redacted]

[redacted]

5.25 AFFILIATIONS WITH RHODE ISLAND ENERGY

Describe and document any and all direct and indirect affiliations and affiliate relationships (contractual, financial, or otherwise) in the past three years between the bidder and Rhode Island Energy and its affiliates, including all relationships in which Rhode Island Energy or its affiliates has a financial or voting interest (direct or indirect) in the bidder or the bidder's proposed project. These relationships include:

- *Corporate or other joint arrangements, joint ventures, joint operations whether control exists or not*
- *Minority ownership (50% or less investee)*
- *Joint development agreements*
- *Operating segments that are consolidated as part of the financial reporting process*
- *Related parties with common ownership*
- *Credit, debenture, and financing arrangements, whether a convertible equity feature is present or not*
- *Wholly owned subsidiaries*
- *Commercial (including real property) relationships with Rhode Island Energy.*

Affiliates of the Proposer are currently or soon will be party to [redacted] with (or soon to be with) Rhode Island Energy.

[redacted]

[redacted]

[redacted]

[redacted]

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Section 6

Siting, Interconnection, and Deliverability

6.0 SITING, INTERCONNECTION, AND DELIVERABILITY

This section of the proposal addresses project location, siting, real property rights and interconnection issues. Bidders should ensure that the threshold criteria outlined in Section 2.2 of the RFP are verified in their responses.

6.1 SITE LAYOUT

Provide site layout plan(s), including map(s), that illustrate the location of all onshore and offshore equipment and facilities (including the estimated spacing and orientation of wind turbines and a discussion of how the plan conforms to federal and state permitting requirements) and clearly delineates the perimeter of the area in which offshore wind turbines will be placed, the location of the marine terminal facility, and the proposed water routes to the project site. Also include a map of the proposed interconnection that includes the path from the Eligible Facility site to the interconnection location, all onshore transmission and interconnection routes, locations, and details and, to the extent a bid includes or references Offshore Delivery Facilities, a map that shows those facilities' location(s). To the extent that alternative routes for offshore and onshore interconnection facilities have been considered in developing the bid, maps showing these locations should also be provided. Maps should be of scales required to identify significant marine or terrestrial features, e.g. shellfish management areas, parks, highways, etc.

Plan included? [redacted] *If not, please explain:*

Describe how the proposed project is sized and designed to efficiently and cost-effectively use available lease area(s), interconnection point(s), transmission cabling, and other infrastructure required for the production and delivery of the offshore wind energy generation.

[redacted]

[redacted]

[redacted]

[redacted]

REDACTED

[redacted]

[redacted] [redacted]

REDACTED

[redacted]

REDACTED

[redacted]

[redacted]

6.2 REAL PROPERTY RIGHTS

Identify any real property rights (e.g., fee-owned parcels, rights-of-way, development rights or easements or leases, or options to purchase or lease) that provide the right to use the Eligible Facility site and offshore facilities locations including for Eligible Facilities and any rights of way needed for interconnection. Note that a demonstrated federal lease must be issued on a competitive basis after January 1, 2012 for an offshore wind energy generation site that is located on the Outer Continental Shelf and for which no turbine is located within 10 miles of any inhabited area.

i. Does the project have a right to use the Eligible Facility site and/or offshore delivery facilities locations for the entire proposed term of the PPA (e.g., by virtue of ownership or land development rights obtained from the owner)?

[redacted] *If not, please explain:*

ii. If so, please detail the bidder's rights to control the Eligible Facility site and/or offshore delivery facilities and interconnection location.

iii. Describe the status of acquisition of real property rights, any options in place for the exercise of these rights and describe the plan for securing the necessary real property rights, including the proposed timeline. Include these plans and the timeline in the overall project timeline.

iv. Identify any joint use of existing or proposed real property rights and/or easements.

v. Provide a copy of each of the leases, agreements, easements, and related documents granting the right to use the Eligible Facility site and Offshore Delivery Facilities and, if available, the transmission and interconnection location (and applicable letters of intent if formal agreements have not been executed).

6.2.1 Offshore Site Control

[redacted]

[redacted].

6.2.2 Onshore Site Control

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

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- [redacted]

[redacted]

6.3 PERMITS AND APPROVALS

Provide evidence of all government-issued permits, approvals, and authorizations that have been obtained or need to be obtained for the use and operation of the Eligible Facility site, the proposed onshore interconnection and transmission locations, and associated Offshore Delivery Facilities and the location(s) of such facilities. For any proposed Eligible Facility sites, offshore delivery facilities, and interconnection locations not currently zoned or permitted properly, identify present and required zoning and/or land use designations and permits and provide a detailed plan and timeline to secure the remaining permits, approvals, and authorizations for all offshore and onshore routes.

[redacted]

6.3.1 Zoning and Permitting Issues

Detail the zoning and permitting issues:

[redacted]

6.3.2 Permitting Plan and Timeline

Permitting plan and timeline:

[redacted] [redacted]

[redacted]

6.4 LAND-BASED PROJECT AREA

Provide a description of the area surrounding any land-based project area, including the marine terminal for deployment of major project components (e.g., foundations, towers, blades, rotors, offshore substations) and all transmission and interconnection facility locations, and a copy of each of the related leases, agreements, easements, and related documents that have been obtained (and applicable letters of intent if formal agreements have not been executed).

[redacted]

[redacted]

[redacted]

[redacted] [redacted]

6.5 INTERCONNECTION FACILITIES SITE CONTROL

If the bidder does not have interconnection facilities site control, describe the status of the plan to obtain that control.

[redacted]

[redacted]

6.6 INTERCONNECTION REQUEST

Please provide documentation to show evidence of the interconnection request to ISO-NE, the applicable New England Transmission Owner, or any neighboring control areas, to interconnect at the Capacity Capability Interconnection Standard. Please describe the status of any planned interconnection to the grid.

[redacted]

6.7 ELECTRICAL SYSTEM PERFORMANCE

Please provide studies that describe the Project's electrical system performance, its impact to the reliability of the New England Transmission system, how the project would satisfy ISO-NE's I.3.9 requirements, and how the project will interconnect at an equivalent to the Capacity Capability Interconnection Standard. Projects that do not have I.3.9 approval from ISO-NE must include technical reports or a Feasibility study that approximates the ISO-NE interconnection process, including but not limited to clear documentation of study technical and cost assumptions, reasoning, and justification of such assumptions. Proposals with a Qualification Determination Notification ("QDN") from ISO-NE for their proposed capacity amount and commitment period must include all QDN documentation in their proposal. All projects that do not have a QDN for their proposed capacity amount and commitment period must provide a study performed by ISO-NE or a third party in accordance with ISO-NE Planning Procedure 10 in order to prove ability to interconnect at the CCIS. Provide a copy of an interconnection agreement, if any, executed by the bidder with respect to the proposed project. If an interconnection agreement has not been executed, please provide the steps that need to be completed before an interconnection agreement can be executed and the associated timeline. Please also provide the status and expected completion date of any additional interconnection studies already underway with ISO-NE *and/or the transmission owner. All studies must follow the current ISO-NE interconnection procedures and detail any assumptions regarding resources and corresponding network upgrades ahead of the project in the ISO-NE interconnection queue. All network upgrades and assumptions identified in these studies must be clearly documented and included in the bid price. Performance and its impact.*

Copy of completed I.3.9 approval or I.3.9-equivalent study attached: [redacted] *If none, please explain.*

Copy of completed CCIS-equivalent study attached: [redacted] *If none, please explain.*

Copy of Interconnection Agreement attached: [redacted] *If none, please explain.*

Additionally, any other studies undertaken by ISO-NE or the bidder must be provided.

6.7.1 I.3.9 Approval from ISO-NE

The Project will satisfy ISO-NE's I.3.9 requirements later in the ISO-NE interconnection process after ISO-NE's completion of the Project's System Impact Study (SIS). The SIS is an engineering study that evaluates the impact of the proposed interconnection on the safety and reliability of the Administered Transmission System and any other Affected System. The study identifies and details the system impacts that would result if the Generating Facility were interconnected without Project modifications or system modifications, focusing on Adverse System Impacts.

Once the Adverse System Impacts are known, ISO-NE, in coordination with the applicable transmission owner and the Project, will determine the required upgrades to the ISO-NE transmission system and required Project design specifications to mitigate the Adverse System Impacts identified in the study. After completion of the SIS, the Affected Transmission Owners and the Project will submit Proposed Plan Applications to ISO-NE. The Proposed Plan Applications will identify the transmission system upgrades and Project design specifications required for the Project to interconnect without a significant adverse effect upon the reliability or operating characteristics of the Transmission Owner's transmission facilities, the transmission facilities of another Transmission Owner, or the system of a Market Participant. The Proposed Plan Applications will be presented to the NEPOOL Reliability Committee. After an approval vote from the NEPOOL Reliability Committee, the Project will gain I.3.9 approval pursuant to Section I.3.9 of the ISO Tariff.

[redacted]

6.7.2 Capacity Capability Interconnection Standards

[redacted]

[redacted]

6.7.3 Interconnection Agreement

[redacted]

[redacted]

[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
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[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
		[redacted]	[redacted]

[redacted]

6.8 DELIVERABILITY CONSTRAINT ANALYSIS

Please provide documentation of the deliverability constraint analysis set forth in Appendix F to the RFP. Provide a description of the findings of the deliverability constraint analysis, including but not limited to a list of thermal overloads and voltage violations identified.

Copy of completed deliverability constraint analysis: ☐

If the deliverability constraint analysis was performed as a portion of a separate study (i.e. Facility Study), please explain and provide the study.

[redacted]

[redacted]

[redacted]

6.9 ADDITIONAL INTERCONNECTION REQUESTS

If multiple interconnection requests have been made, please specify all such active requests which have not been superseded by subsequent requests and information regarding the status of each. Provide copies of any requests made and studies completed. Describe how such studies and information support the costs assumed in preparing your bid and the associated timeline proposed.

[redacted]

6.10 NETWORK UPGRADES

Please provide cost estimates for any necessary network upgrades identified in the studies identified in Section 6.7.

[redacted]

[redacted]

[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
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	[redacted]	[redacted]

6.11 ALTERNATIVE INTERCONNECTION

To the extent that you provide an alternative interconnection scenario based on ISO-proposed interconnection process changes, you must also include studies using the proposed ISO-NE-proposed process. Any such studies must be accompanied with clear documentation of study technical and cost assumptions, reasoning, and justification of such assumptions.

[redacted]

6.12 ELECTRICAL MODELS

Provide the electrical models of all energy resources supporting the proposed project in accordance with the filing requirements of the ISO-NE Tariff Schedule 22 and 23.

[redacted] *If none, please explain:*

[redacted]

6.13 ELECTRICAL DIAGRAM

Provide a copy of an electrical one-line diagram showing the interconnection facilities, the relevant facilities of the transmission and/or distribution provider, and any required network upgrades identified in the studies required in section 6.7 of this document.

[redacted] *If none, please explain:*

[redacted]

REDACTED

[redacted]

[redacted]

REDACTED

[redacted]

6.14 INTERCONNECTION FACILITIES

Specify and describe the current or new interconnection facilities (lines, transformers, switching equipment, system protection and controls, etc.) that bidder owns or is intending to construct or have constructed in order to deliver the proposed energy.

[redacted]

REDACTED

[redacted]

[redacted] [redacted]

[redacted]

[redacted]

6.15 INCREMENTAL DATA REQUIREMENTS

IDV file(s) in PSSE v34 format modeling all upgrades to the transmission network identified in the studies required in section 6.7 of this document. [redacted] *If none, please explain:*

If the bidder does not use PSSE, provide in text format necessary modeling data as follows:

Line Data (voltage and thermal ratings)

Impedances (r, X and B)

Line Length (bus numbers and names)

Reactive compensation models as necessary

Other changes to the model that would occur due to a Project such as terminal changes for lines/transformer/generator leads/loads etc.

[redacted]

6.16 PRODUCTION/DELIVERY PROFILE

Please detail with supporting information and studies (as available) that the production/delivery profile contemplated in your proposal reflects constraints or curtailment, if any, after the upgrades that are expected to take place pursuant to interconnection at an equivalent to the CCIS. If the project is planning to make any voluntary upgrades beyond those associated with the CCIS-equivalent standard, as more fully described in the RFP, please describe the transmission network upgrades necessary, their estimated cost (for which the bidder would have cost responsibility, and the impact on the proposed generation schedule by reducing remaining constraints or curtailments.

[redacted]

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Section 7

Environmental Assessment and Environmental and Fisheries Mitigation Plan, Permit Acquisition Plan, and Environmental Attributes Certification

7.0 ENVIRONMENTAL ASSESSMENT AND ENVIRONMENTAL AND FISHERIES MITIGATION PLAN, PERMIT ACQUISITION PLAN AND ENVIRONMENTAL ATTRIBUTES CERTIFICATION

This section addresses environmental and other regulatory issues associated with project siting, development, and operations for all aspects of the project (including generation, delivery, interconnection, etc.) and in all jurisdictions (federal, all interested states, etc.).

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

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[redacted]	[redacted]
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[redacted]	[redacted]

[redacted]

7.1 PERMITS, LICENSES, ENVIRONMENTAL ASSESSMENTS AND/OR ENVIRONMENTAL IMPACT STATEMENTS REQUIRED

Provide a description of all government-issued permits, approvals, licenses, environmental assessments, and/or environmental impact statements required for the use and operation of the Offshore Wind Energy Generation site, the proposed onshore interconnection and transmission locations, and associated Offshore Delivery facilities and the location(s) of such facilities. Along with this list, identify the governmental agencies and States that are responsible to issuing approval of all the permits, licenses, and environmental assessments and/or environmental impact statements.

[redacted]

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

[redacted]

7.1.1 Federal Approvals

Provide a list and copies of all Federal, state, and local permits, approvals, authorizations, and environmental assessments and/or environmental impact statements required to construct and operate the project. Detail which permits have already been issued and which permits are in progress/remaining to be obtained.

[redacted] Refer to Section 7.1.2, below, for a list of the state authorizations and required consultations with regulatory agencies.

[redacted]

[redacted]	[redacted]	[redacted]
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[redacted]	[redacted]	[redacted]
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7.1.2 State and Local Approvals

Identify the governmental agencies and States that have issued or will issue the required permits, approvals, authorizations, licenses, and environmental assessments and/or environmental impact statements.

[redacted]

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7.2 ANTICIPATED TIMELINE FOR SEEKING AND RECEIVING REQUIRED PERMITS

Provide the anticipated timeline for seeking and receiving the required permits, licenses, and environmental assessments and/or environmental impact statements. Include a project permit and approval assessment which describes, in narrative form, each segment of the process, the required permit or approval, the status of the request or application and the basis for projection of success by the milestone date. All requirements should be included on the project schedule in Section 9.

[redacted]

[redacted]

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7.2.1 Federal Permits

[redacted]

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7.2.2 State and Local Permits

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7.3 ENVIRONMENTAL AND FISHERIES MITIGATION PLAN

Provide a preliminary environmental characterization of the site and project, including both construction and operation. In addition, identify environmental impacts associated with the proposed project and any potential impediments to development. Bidders must detail, to the extent practical, specific adverse environmental and fisheries impacts that are likely to result from the proposed Facility and detail measures that will be taken to avoid, minimize, and/or mitigate those impacts in the categories identified in Section 2.3.3.3. Where specific measures are not known for a specific category of impact at the time of proposing, the plan must describe in detail the approach that will be implemented to collaborate with the state and Federal agencies and other stakeholders to define avoidance, minimization, and mitigation measures. The plan should provide a roadmap for the environmental and fisheries work to come and provide a degree of certainty that the Bidder is committed to working collaboratively with stakeholders to develop a cost-effective and environmentally responsible Project.

Plan included? [redacted] *If not, please explain:*

[redacted]

7.4 RELIABLE CLEAN ENERGY

Explain how the proposed project advances the objectives of achieving a reliable, clean energy future that is consistent with meeting regional greenhouse gas reduction goals as established by the 2021 Act on Climate.

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7.5 ELIGIBLE RENEWABLE ENERGY RESOURCE

Provide documentation demonstrating that the project will be qualified as an eligible renewable energy resource conforming to R.I.G.L. § 39-26-5.

[redacted]

7.6 RECS AND ENVIRONMENTAL ATTRIBUTES

All bidders must include sufficient information and documentation that demonstrates that the bidder will utilize an appropriate tracking system to ensure a unit-specific accounting of the delivery of unit-specific and unit contingent of energy and RECs. The RECs and environmental attributes associated with energy generation must be delivered into Rhode Island Energy's NEPOOL GIS accounts.

[redacted]

7.7 CLAIMS OR LITIGATION

Identify any existing, preliminary, or pending claims or litigation, or matters before any federal agency or any state legislature or regulatory agency that might affect the feasibility of the project or the ability to obtain or retain the required permits for the project.

[redacted]

7.8 EMISSIONS PROFILE

Describe any investments that will be included with your facility to improve its emissions profile.

[redacted]

7.8.1 Parent Company Sustainability Initiatives

Ørsted

Ørsted's vision is a world that runs entirely on green energy. Ørsted develops, constructs, and operates offshore and onshore wind farms, solar farms, energy storage facilities, and bioenergy plants. Over the past 15 years, Ørsted has undergone a transformation from a fossil-fuel based energy company to a global leader in renewable energy, divesting its oil and gas business in 2017. Ørsted's aspiration is to become the world's leading green energy provider by 2030 by accelerating its global build-out of renewable energy, with the ambition to reach approximately 50 GW of installed capacity by 2030.

Ørsted has also joined the Science Based Target Initiative (SBTi) Corporate Engagement Program to help develop targets for the environment that are aligned with scientific demands. Across industries, Ørsted uses shared tools and guidance to understand and measure Ørsted's impact and dependencies on biodiversity, land, water, and the ocean, and for stakeholders to hold Ørsted accountable.

In October 2021, SBTi launched its Corporate Net-Zero Standard, which provides a credible and independent assessment of whether companies with net-zero targets align their near- and long-term climate action with limiting global warming to 1.5°C. Ørsted is proud to be the first energy company—and one of only seven companies worldwide—to have a firm target to reach net-zero emissions across the full value chain (Scopes 1-3) by 2040, approved by the SBTi in 2021. This is a decade earlier than the 2050 global target for net-zero emissions.

Ørsted has been consistently ranked as the world's most sustainable energy company in Corporate Knights' Global 100 index of most sustainable corporations from 2019 to 2022. Ørsted aspires to be a globally recognized sustainability leader and to accelerate its efforts to operate in an even more sustainable way.

Since 2006, Ørsted has reduced Scopes 1 and 2 emissions intensity by 87%. Ørsted is well on track to become carbon-neutral in energy generation and operations (Scopes 1-2) by 2025, and it will see its greenhouse gas emissions intensity reduced by at least 98%, compared to 2006 levels.

Ørsted's next decarbonization frontier is to become net-zero in 2040 across the full value chain, which is why it established a supply chain decarbonization program two years ago. Ørsted's efforts are centered around three strategic pillars: 1) measurement and reporting; 2) supplier engagement; and 3) cross-sector collaborations, discussed in more detail below:

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3. Cross-sector collaborations: To pool purchasing power and send important signals to create early market demand for breakthrough technologies key to its supply chain, Ørsted is taking a leading role in cross-sector collaborations. It is proud to be a member of the 1.5 Exponential Roadmap Initiative and part of the supply chain leaders working group, as well as a founding member of the Climate Group's SteelZero initiative and the World Economic Forum's First Movers Coalition. With regard to the latter groups, Ørsted has committed to procure volumes of low-carbon materials key to its supply chain: steel and concrete.

    - Ørsted has committed to 100% net zero steel by 2040 and 50% from suppliers with Responsible Steel certification, science-based targets, and/or low carbon steel (SteelZero).
    - Ørsted has committed to procure at least 10% steel with near-zero emissions by 2030 (First Movers Coalition).
    - Ørsted has committed to procure at least 10% concrete with near-zero emissions by 2030 (First Movers Coalition).

In 2021, Ørsted announced an immediate ban on the landfilling of wind turbine blades for which there is a lack of widely available recycling solutions. As part of a push towards a more circular use of resources, Ørsted has committed to reusing, recycling, or recovering all decommissioned blades.

Ørsted recognizes that construction and generation of renewable energy can affect the environment. In 2021, Ørsted announced its ambition to deliver a net-positive impact on biodiversity across all renewable energy projects commissioned from 2030, at the latest. In addition to avoiding and minimizing negative impacts on biodiversity, Ørsted wants to ensure that its renewable energy installations contribute positively to biodiversity.

Ørsted aspires to catalyze the transition towards a world that runs entirely on green energy and to be the preferred partner for customers, local communities, suppliers, and joint venture partners, enabling all stakeholders to realize the green transformation and its benefits. If awarded, the Project will promote delivery of Ørsted's decarbonization and sustainability goals.

Eversource

Eversource is focused on being a catalyst for clean energy development. Its strong commitment to sustainability is an important component of how Eversource conducts business today and plans to demonstrate leadership well into the future. As a centerpiece of that commitment to clean energy, Eversource established an industry-leading target to be carbon neutral by 2030.

Related initiatives include the following:

- Eversource allocates 7% of its annual revenues—or more than $500 million annually—to energy efficiency programs for its nearly 4 million customers. Its energy efficiency programs have consistently ranked #1 in the U.S.
- Eversource recently constructed 70 MW of solar energy and divested its remaining fossil fueled generation.
- Eversource has constructed a utility-scale battery storage facility in a coastal community.
- Eversource has spent approximately $8 billion over the past 12 years to strengthen New England's high voltage electric grid. This has improved reliability and resiliency, while enabling more efficient and cleaner power to reach the region's customers.

Through its effort to be carbon neutral by 2030 and other forward-thinking initiatives, Eversource is recognized as one of the greenest energy companies in the U.S.

The Proposer's approach to the Project is consistent with its Owner's commitment to transitioning to a clean energy future, and the Project will make a significant contribution toward Rhode Island's greenhouse gas reduction goals.

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Section 8

Engineering and Technology; Commercial Access to Equipment

8.0 ENGINEERING AND TECHNOLOGY; COMMERCIAL ACCESS TO EQUIPMENT

This section includes questions pertinent to the engineering design and project technology. This section must be completed for a project that includes new facilities or capital investments for both generation and transmission components, if applicable. Bidders should provide information about the specific technology or equipment including the track record of the technology and equipment and other information as necessary to demonstrate that the technology is viable.

8.1 PRELIMINARY ENGINEERING PLAN

Provide a reasonable but preliminary engineering plan which includes the following information:

i. Type of generation and transmission technology, if applicable

ii. Major equipment to be used

iii. Manufacturer of the equipment

iv. Status of acquisition of the equipment

v. Whether the bidder has a contract for the equipment. If not, describe the bidder's plan for securing equipment and the status of any pertinent commercial arrangements

vi. Equipment vendors selected/considered

vii. History of equipment operations

viii. If the equipment manufacturer has not yet been selected, identify in the equipment procurement strategy the factors under consideration for selecting the preferred equipment

ix. How the proposed equipment adheres to the domestic supply rules set forth in the Build America, Buy America Act.

[redacted]

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The preliminary engineering plan for the Project is comprised of the key components described in [redacted]

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Onshore Grid Connection System

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8.2 KEY EQUIPMENT SUPPLIERS

If the bidder has not yet selected the major equipment for a project, please provide a list of the key equipment suppliers under consideration.

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Domestic Supply Rules

[redacted] for the description of how the Project will comply with domestic supply rules in the Build America, Buy America Act.

8.3 MANUFACTURER INSTALLATIONS

Please identify the same or similar equipment by the same manufacturer that are presently in commercial operation including the number installed, installed capacity and estimated generation for the past three years.

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8.4 TECHNOLOGY STATUS

For less mature technologies, provide evidence (including identifying specific applications) that the technology to be employed for energy production is ready for transfer to the design and construction phases. Also, address how the status of the technology is being considered in the financial plan for the project.

Technological innovation as well as modernization of proven methods has been a driver of engineering and design elements selected for use in the Project. The Proposer has a history of closely collaborating with industry-wide suppliers across all key components, coaching them to build an understanding of the current and future requirements typically needed to work within the wider offshore wind industry. This collaboration drives innovation and enables commercial realization of emergent, next-generation technologies. During development, the Proposer anticipates utilizing a design envelope with a range of industry standard methods and newer innovations. This approach preserves optionality and allows the Proposer to explore the commercial potential of less mature technologies in a development context while not discounting successes of prior projects.

The Proposer implements a rigorous qualification process for evaluating potential new suppliers of equipment and technology. This process includes a technical assessment, a HSE and risk assessment, and a comprehensive risk analysis. Use of new technology provides a more robust array of technical solutions to common problems in offshore wind development and design. [redacted]

In addition to innovation, many critical equipment components for the Project are either the same as or are based on earlier versions of technology that has been manufactured and operated with success on various large-scale offshore wind farms by the Proposer, its organizations, and the offshore wind industry as a whole. As such, all equipment used in the Project will have a history of proven and reliable operation or is in a phase of late-stage development and poses no practical technological risk.

8.5 EQUIPMENT LIST

Please indicate if the bidder has a full and complete list of equipment needed for all physical aspects of the bid, including generation facilities, transmission lead lines, and mandatory and voluntary transmission system upgrades. If not, identify the areas of uncertainty and when the full and complete list of equipment will be identified.

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8.6 EQUIPMENT PROCUREMENT

Please indicate if the bidder has secured its equipment for all physical aspects of the bid, including generation facilities, transmission lead lines, and mandatory and voluntary transmission system upgrades. If not, identify the long-lead equipment and describe the timing for securing this equipment.

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Section 9

Project Schedule

9.0 PROJECT SCHEDULE

A bidder must demonstrate that its proposal can be developed, financed, and constructed and be technically viable within a commercially reasonable timeframe. The bidder is required to provide sufficient information and documentation that shows that the bidder's resources, process, and schedule are adequate for the acquisition of all rights, permits and approvals for all aspects of the project and for the financing of the project consistent with the proposed project milestone dates.

Bidders are required to provide a complete critical path schedule for the project from the notice of selection of the project for contract consideration to the start of commercial operations. For each project element, list the start and end date.

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9.1 SCHEDULE AND CRITICAL PATH

Identify the elements on the critical path. The schedule should include, at a minimum, the receipt of all permits necessary to construct and operate the facility, the closing of construction financing, the commencement of construction, the execution of an interconnection agreement with ISO-NE and interconnecting utility, and the commercial operation date. Include any other requirements that could influence the project schedule and the commercial operation date (e.g. adherence to Build America, Buy America Act). Bidders must demonstrate that their projects have a credible proposed operation date by providing, at a minimum, documentation showing the following:

i. commencement of permitting processes

ii. a plan for completing all permitting processes

iii. viable resource assessment

iv. environmental assessment/Environmental and Fisheries Mitigation Plan, which shall include site and environmental data transparency requirements, as further described in Section 2.3.3.3 ("EFMP")

v. viable financing plans

vi. viable installation and electrical interconnect plans

vii. material progress toward acquisition of real property rights

viii. evidence of material vendor activity

The status of critical path items is summarized in [redacted], and the critical path schedule for the Project is detailed in Figure 9.1. [redacted]

[redacted] Finally, the Proposer’s experience with the permitting process has been incorporated in the Project schedule and adequate time has been included for the preparation of a sufficient COP application and for the BOEM approval process.

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Section 10

Construction and Logistics

10.0 CONSTRUCTION AND LOGISTICS

This section of the proposal addresses necessary arrangements and processes for outfitting, assembly, storage, and deployment of major project components such as turbine nacelles, blades, towers, foundations, and delivery facilities support structures, and other major components associated with delivery facilities and, and the storage facility (as applicable). Please provide a construction plan that captures the following objectives:

[redacted]

[redacted]

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10.1 MAJOR TASKS ASSOCIATED WITH PROJECT DEPLOYMENT

List the major tasks or steps associated with deployment of the proposed Project and the necessary specialized equipment (e.g., vessels, cranes).

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10.2 SITE CONTROL FOR MARINE TERMINALS AND OTHER WATERFRONT FACILITIES

Provide documentation to demonstrate site control for all marine terminals and other waterfront facilities that will be used to stage, assemble, and deploy the project for each stage of construction.

Evidence that the bidder or the equipment/service provider have a valid lease, or option to lease, a marine terminal and/or waterfront facility for construction of the offshore wind energy project (e.g., by virtue of ownership or land development rights obtained from the owner).

If not available, describe the status of acquisition of real property rights for necessary marine terminal and/or waterfront facilities, any options in place for the exercise of these rights, including the proposed timeline. Include these plans and the timeline in the overall project schedule. Provide any agreements, options, or other materials reflecting the bidder's efforts so far to secure real property rights (and any letters of intent to extent signed agreements are not in place).

Identify any joint use of existing or proposed real property rights for marine terminal or waterfront facilities.

An overview of the Project's use of marine terminals and other waterfront facilities with respect to each stage of construction is summarized in Table 10.1 and described in greater detail below. [redacted]

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10.2.1 WTG Staging and Pre-Assembly

The specific Project scope covering the installation of the WTG components consists of the marine facilities that would support the staging, pre-assembly, and load-out of the nacelle units, the tower sections, and the blades.

[redacted]

10.2.2 Foundation Staging

The specific Project scope covering the installation of the foundation structures consists of the marine facilities that would support the staging, outfitting, and load-out of the secondary steel components for final outfitting. [redacted]

[redacted]

10.2.3 Export Cables

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10.2.4 Array Cables

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10.2.5 EPC Base

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10.3 STAGING AND DEPLOYMENT

Please describe the proposed approach for staging and deployment of major project components to the project site. Indicate the number, type and size of vessels that will be used, and their respective roles, as well as the projected timing of their use. Please include specific information on how the bidder's deployment strategy will conform to requirements of the Merchant Marine Act of 1920 (the Jones Act).

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10.4 PARTY RESPONSIBLE FOR DEPLOYMENT ACTIVITIES

List the party (e.g., the bidder or equipment/service providers under contract to the bidder) responsible for each deployment activity and describe the role of each party. Describe the status of bidder's contractual agreements with third-party equipment/service providers.

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Section 11

Operations and Maintenance

11.0 OPERATIONS AND MAINTENANCE

Projects that can demonstrate that the operation and maintenance ("O&M") plan, level of funding, and mechanism for funding will ensure reliable operations during the term of the contract or the tariff are preferred.

11.1 OPERATIONS AND MAINTENANCE PLAN

Provide an O&M plan for the project that demonstrates the long-term operational viability of the proposed project. The plan should include a discussion of the staffing levels proposed for the project, the expected role of the project sponsor or outside contractor, scheduling of major maintenance activity, and the plan for testing equipment.

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11.2 OPERATIONS AND MAINTENANCE FUNDING

Describe in detail the proposed O&M funding mechanism and funding levels to support planned and unplanned O&M requirements.

As described in Section 11.1, and elaborated on in Section 11.4, the O&M of this Project will be an integral part of Ørsted's business for decades to come. [redacted] The financing of the overall Project is described in Section 5.

11.3 WARRANTY TERMS/EQUIPMENT GUARANTEES

Describe the terms (or expected terms) of the warranties and/or guarantees on major equipment that the bidder is utilizing or proposing to utilize.

The Proposer plans to utilize warranties or guarantees for [redacted]

[redacted]

- [redacted]

- [redacted]

[redacted]

11.4 OPERATIONS AND MAINTENANCE AGREEMENTS

Describe the status of the project sponsor in securing any O&M agreements or contracts. Include a discussion of the sponsor's plan for securing a medium-term or long-term O&M contract, including the expected provider of O&M services.

As described in Section 11.1, [redacted] It is not planned that this would change within the lifetime of the Project.

11.5 OPERATIONS AND MAINTENANCE EXPERIENCE

Provide examples of the bidder's experience with O&M services for other similar projects.

Ørsted represents an offshore wind operator with an unparalleled amount of experience both technically and geographically. Ørsted was the world's first company to commission an offshore wind farm in Vindeby, Denmark, in1991. [redacted]

[redacted]

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Additional details on Ørsted's experience in development and operation of offshore wind projects are provided in Section 12 of this Proposal.

[redacted]

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Section 12

Project Management/Experience

12.0 PROJECT MANAGEMENT/EXPERIENCE

Bidders are required to demonstrate project experience and management capability to successfully develop (for a project that includes new facilities or capital investment) and operate the project proposed, Rhode Island Energy is particularly interested in project teams that have demonstrated success in projects of similar type, size and technology and, for projects that include new facilities or capital investment, can demonstrate an ability to work together effectively to bring the project to commercial operation in a timely fashion.

As the largest offshore wind developer in the U.S. with nearly 5,000 MW under contract on the East coast, the Proposer is equipped with unparalleled development experience in the U.S. market. The Proposer's organization is composed of diverse teams with experience spanning the entire lifecycle of large-scale generation and transmission projects. Ørsted has thousands of wind power employees dedicated to the development, construction, and operation of large-scale offshore wind projects across the globe, including several hundred employees located in the U.S. Eversource has more than 8,000 employees dedicated to the development, construction, and operation of utility-scale transmission and distribution projects across the Northeast.

12.1 PROJECT ORGANIZATIONAL CHART

Provide an organizational chart for the project that lists the project participants and identifies the corporate structure, including general and limited partners.

The Project management structure and development organization is provided in Figure 12.1. Details related to corporate structure can be found in Section 5.2, Business Entity Structure. Once construction of the Project commences, some roles will be exchanged with people specialized in project execution. [redacted] and similarly for other roles.

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12.2 DEVELOPING, FINANCING, OWNING, AND OPERATING EXPERIENCE

For a project that includes new facilities or capital investment, provide statements that list the specific experience of the bidder and each of the project participants (including, when applicable, the bidder, partners, EPC contractor and proposed contractors), in developing, financing, owning, and operating generating or transmission facilities (as applicable), other projects of similar type, size and technology, and any evidence that the project participants have worked jointly on other projects.

Section 5 discusses in detail the Proposer's prior experience in developing, financing, owning, and operating projects of similar scope and scale. Additionally, detailed accounts and tables describing the Proposer's project experience are listed in Section 12.5. Additional information is available upon request.

12.3 OWNING AND OPERATING EXPERIENCE

For a bid that includes existing facilities, provide statements that list the specific experience of the bidder and each of the project participants (including, when applicable, the bidder, partners, EPC contractor and proposed contractors), in owning and operating generating or transmission facilities (as applicable), other projects of similar type, size and technology, and any evidence that the project participants have worked jointly on other projects.

[redacted]

12.4 KEY PERSONNEL

Provide a management chart that lists the key personnel dedicated to this project and provide resumes of the key personnel. For Eligible Facilities that are not yet in-service, key personnel of the bidder's development team having substantial project management responsibilities must have:

i. Successfully developed and/or operated one or more projects of similar size or complexity or requiring similar skill sets; ***and***

ii. For a project that includes new facilities or capital investment, experience in financing power generation projects (or have the financial means to finance the project on the bidder's balance sheet)

Key personnel directly involved in the management of this Project are identified in Section 12.4.1 and Section 12.4.2. [redacted]

12.4.1 Ørsted Key Staff

Ørsted has an experienced team that will lead and manage the successful implementation of the Project throughout all development aspects in accordance with management models that have executed dozens of previous projects [redacted]

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12.4.2 Eversource Key Staff

In its role as co-owner of Bay State Wind LLC, Eversource has an experienced team to lead and manage the successful implementation of the facility [redacted]

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12.5 PROJECT EXPERIENCE

Provide a listing of all projects the project sponsor has successfully developed or that are currently under construction. Provide the following information as part of the response:

i. Name of the project

ii. Location of the project

iii. Project type, size, and technology

iv. Commercial operation date

v. Estimated and actual capacity factor of the project for the past three years

vi. Availability factor of the project for the past three years

vii. References, including the names and current addresses and telephone numbers of individuals to contact for each reference

12.5.1 Bay State Wind LLC

In July 2013, Ørsted, then Deepwater Wind, won the Department of the Interior's first competitive lease sale for offshore wind energy areas to acquire BOEM Leases OCS-A 0486 and OCS-A 0487, an area known as the Rhode Island-Massachusetts Wind Energy Area (WEA). In 2015, Ørsted acquired BOEM Lease OCS-A 0500, immediately adjacent to the Rhode Island-Massachusetts WEA. [redacted]

As a result of Bay State Wind LLC's efforts, the Proposer has won several contracts and will construct over 1,700 MW of offshore wind generation. Among these is Revolution Wind 1. This 704 MW installation plans to serve both Rhode Island (400 MW) and Connecticut (304 MW). Additional projects from the Proposer in various stages of development include South Fork Wind, a 132-MW offshore wind farm designed specifically to serve Long Island's constrained South Fork, and the 924-MW Sunrise Wind 1 project.

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[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]			[redacted]			[redacted]		
						[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]														
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

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12.5.2 Ørsted

The Industry Leader

Ørsted ranks #3 in Corporate Knights' 2022 index of the Global 100 most sustainable corporations in the world and is recognized on the CDP Climate Change A List as a global leader on climate action. Ørsted is a global industry leader in offshore wind and, therefore, has significant experience with the rigors and challenges of the offshore wind business. Ørsted currently has 30.7 GW total installed, under construction, and awarded renewable energy capacity (see Figure 12.2). Ørsted's existing activities span a number of markets that include the U.S., Denmark, the United Kingdom (UK), Germany, the Netherlands, and Asia-Pacific, excluding China. As a result, Ørsted is well practiced in adapting to, and thriving within, new regulatory, permitting, and political landscapes. It is the current Ørsted leadership team that, within the short span of the past three to four years, has driven dramatic cost reductions and paved the way for exponential market growth.

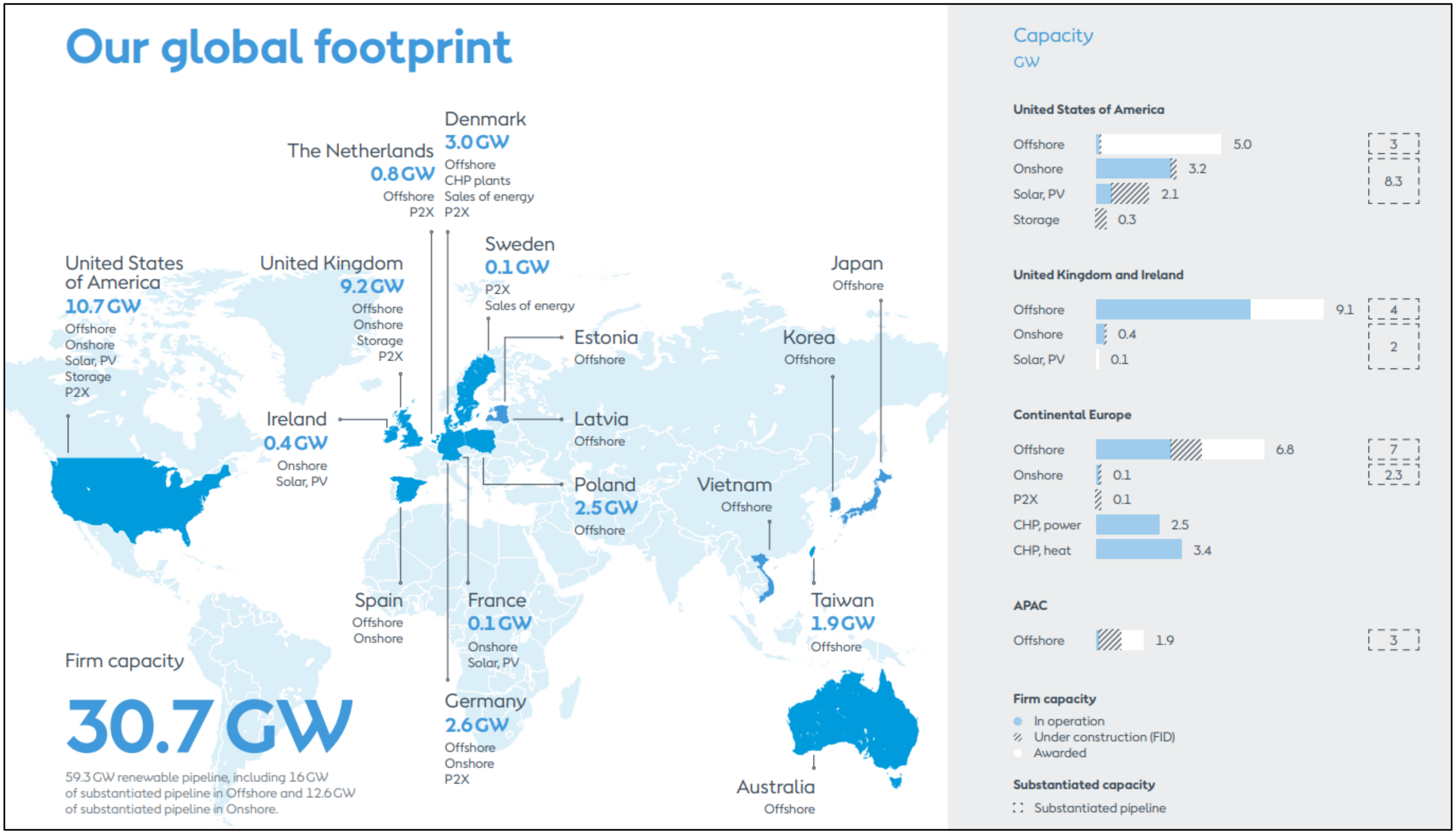

Figure 12.2 Total Installed, Under Construction, Awarded, and Contracted Capacity by Ørsted (GW)

U.S. Experience

In 2018, Ørsted acquired Deepwater Wind, the company that built the nation's first offshore wind farm off Block Island, Rhode Island. The Deepwater Wind team gained invaluable experience working with regulators, stakeholders, vendors, and U.S. construction contractors through the development and execution of the Block Island Wind Farm—experience and insights that are now a part of Ørsted. Together, this expanded team is leading a stakeholder-centric approach to development that has made it the go-to partner for states spanning the Eastern Seaboard as they seek to develop offshore wind resources.

Ørsted is developing several projects with Eversource, totaling 1,700 MW. Ørsted is also actively developing the Ocean Wind 1 and 2 projects (totaling 2,248 MW) for delivery to New Jersey, and the Skipjack Wind Farm, a 966-MW installation that will deliver power to Maryland. In 2020, Ørsted completed its work supporting the EPC for Coastal Virginia Offshore Wind, a pilot project of Dominion Energy delivering power to Virginia. Additionally, Ørsted has seen success in its onshore renewable portfolio with 11 onshore wind farms in operation across the U.S., delivering 3,000 MW of clean power to over 800,000 American homes.

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Ørsted has the knowledge and experience with every phase of offshore wind development to design and implement solutions that are appropriate and proven. To date, Ørsted has constructed 8.9 GW of offshore wind capacity, with another 13.4 GW awarded and under construction, which is approximately 26% of globally offshore wind capacity. By way of Block Island and [redacted], Ørsted has worked hand in hand with Rhode Island to solidify entry to the U.S. offshore wind market. Ørsted's existing activities span a number of markets, which include Denmark, the UK, Germany, the Netherlands, the U.S., and Taiwan. Detailed information regarding Ørsted's offshore wind portfolio is provided in Table 12.4. References are provided in [redacted]

[redacted]

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Table 12.4 Ørsted Project Experience

Project	Location	Description	Size and Project Technology	Commercial Operation Date	Status	Capacity Factor (Estimated)[1]			Capacity Factor (Actual)[2]			Availability Factor (Actual)[3]		
						2019	2020	2021	2019	2020	2021	2019	2020	2021
USA														
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Coastal Virginia Offshore Wind	Virginia Beach	Offshore Wind	12 MW; Siemens Gamesa SWT-6.0-154	2020	In Operation	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Block Island Wind Farm	Block Island, Rhode Island	Offshore Wind	30 MW; GE 6 MW SWT	2016	In Operation	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Denmark[4]														
Anholt	Kattegat (DK)	Offshore Wind	400 MW; Siemens Gamesa SWT-3.6-120	2013	In Operation	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Avedøre Holme	Øresund (DK)	Nearshore Wind	10.8 MW; Siemens Gamesa SWT-3.6-107/120	2009 / 2011	In Operation	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Horns Rev 2	North Sea (DK)	Offshore Wind	209.3 MW; Siemens Gamesa SWT-2.3-93	2010	In Operation	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Horns Rev 1	North Sea (DK)	Offshore Wind	160 MW; Vestas V80-2 MW	2003	In Operation	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Nysted	Fehmarnbelt (DK)	Offshore Wind	165.6 MW; Bonus SWT 2.3-82	2003	In Operation	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Middelgrunden	Øresund (DK)	Nearshore Wind	20 MW; Bonus B76/2000	2001	Divested (2018)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Vindeby	Smålandsfarvandet (DK)	Offshore Wind	4.95 MW; Bonus B35/450	1991	Decommissioned	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Germany[5]														
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
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Borkum Riffgrund 2[6]	North Sea (DE)	Offshore Wind	450 MW; MVOW 8.3 MW-164	2018	In Operation	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Gode Wind 1	North Sea (DE)	Offshore Wind	330 MW; Siemens SWT 6.0-154	2016	In Operation	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Gode Wind 2	North Sea (DE)	Offshore Wind	252 MW; Siemens SWT 6.0-154	2016	In Operation	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Borkum Riffgrund 1	North Sea (DE)	Offshore Wind	312 MW; Siemens SWT 4.0-120	2015	In Operation	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Netherlands														
Borssele 1 & 2	North Sea (NL)	Offshore Wind	752 MW; Siemens Gamesa 8 MW	2020	In Operation	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
United Kingdom														
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Hornsea 1	North Sea (UK)	Offshore Wind	1,200 MW; SGRE-7.0-154	2020	In Operation	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Project	Location	Description	Size and Project Technology	Commercial Operation Date	Status	Capacity Factor (Estimated)[1]			Capacity Factor (Actual)[2]			Availability Factor (Actual)[3]		
						2019	2020	2021	2019	2020	2021	2019	2020	2021
Walney Extension	Irish Sea (UK)	Offshore Wind	659 MW; MHI-Vestas V164-8.0 MW & Siemens SWT-7.0-154	2018	In Operation	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Race Bank	North Sea (UK)	Offshore Wind	573 MW; SWT-6.0-154	2018	In Operation	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Burbo Bank Extension	Irish Sea (UK)	Offshore Wind	254 MW; V164-8.0 MW (MHI Vestas Offshore Wind)	2017	In Operation	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Westermost Rough	North Sea (UK)	Offshore Wind	210 MW; SWT-6.0-154	2015	In Operation	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
West of Duddon Sands	Irish Sea (UK)	Offshore Wind	388.8 MW; SWT-3.6-120	2014	In Operation	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Gunfleet Sands Demo	Thames Estuary (UK)	Offshore Wind	12 MW; SWT-6.0-120	2013	In Operation	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Lincs	North Sea (UK)	Offshore Wind	270 MW; SWT-3.6-120	2013	In Operation	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
London Array 1	Thames Estuary (UK)	Offshore Wind	630 MW; SWT-3.6-120	2013	In Operation	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Walney 1	Irish Sea (UK)	Offshore Wind	183.6 MW; SWT-3.6-107	2011	In Operation	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Walney 2	Irish Sea (UK)	Offshore Wind	183.6 MW; SWT-3.6-120	2011	In Operation	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Gunfleet Sands 1	Thames Estuary (UK)	Offshore Wind	108 MW; SWT-3.6-107	2010	In Operation	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Gunfleet Sands 2	Thames Estuary (UK)	Offshore Wind	64.8 MW; SWT-3.6-107	2010	In Operation	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Burbo Bank	Irish Sea (UK)	Offshore Wind	90 MW; SWT-3.6-107	2007	In Operation	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Barrow	Irish Sea (UK)	Offshore Wind	90 MW; V90-3 MW Offshore (Vestas)	2006	In Operation	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Taiwan														
Formosa I – Phase II	Taiwan Strait	Offshore Wind	120 MW; 6.0 MW SWT-154	2019	In Operation	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Formosa 1 - Phase 1	Taiwan Strait	Offshore Wind	8 MW; 4.0 MW SWT-120	2017	In Operation	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
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Sources: Danish Energy Agency, Fraunhofer ISE & EEX, National Grid, and Ørsted

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12.5.3 Eversource

Eversource has successfully developed several recent large transmission projects. Descriptions of those projects having a capital cost of more than $70 million are provided in Table 12.6. As the projects listed are not generation projects, there are no capacity and availability factors.

Eversource is an industry leader in constructing and maintaining large transmission and distribution projects, including high-voltage and extra-high-voltage overhead, underground, submarine, and hybrid transmission lines, and associated terminal equipment. Throughout New England and New York, Eversource has successfully completed hundreds of capital projects over the past decade with a proven track record in:

- Successful single-state and multi-state project siting and permitting;
- Working closely with other companies to develop major projects; and
- Safely and efficiently constructing transmission and distribution projects.

Eversource, a Fortune 500 energy company, has significant financial resources and invests substantially in transmission facilities. [redacted]

Eversource has successfully completed hundreds of traditional and major capital projects over the past decade. Eversource's innovative solutions to technical and environmental challenges include:

- [redacted]
- [redacted]

[redacted]

Eversource is one of only four North American energy companies recognized as an Environmental, Social, and Governance leader. Eversource brings to bear its deep commitment to supporting the Northeast's renewable energy goals and will leverage its considerable experience in interconnecting renewable generation resources, such as wind power, into the electrical system. Eversource has a proven track record of interconnecting generation resources reliably and cost-effectively, sustaining the integrity of the transmission system while also alleviating costs for customers. Finally, Eversource is recognized as a leader in providing top-tier reliability, with the utmost focus on safety.

For the purposes of developing the Project, Eversource has replicated its successful formula by assembling a core team of seasoned professionals who have been involved in the development and construction of numerous large transmission facilities, supplemented by internal and external resources that provide the expertise to support project execution.

All the projects listed in Table 12.6 are owned by Eversource affiliates, [redacted]

[redacted]

Table 12.6 Eversource Project Experience

Project	Location	Description	Size and Project Technology	Commercial Operation Date	Status
Bethel/Norwalk	CT	Electrical Transmission Line	21-mi (34-km) 345-kV line consisting of 2.1 mi (3.4 km) of XLPE cable, 9.7 mi (15.6 km) of high-pressure fluid filled cables and 8.6 mi (13.8 km) of overhead construction	2006	In Operation
Glenbrook Cables	CT	Electrical Transmission Line	Two sets of parallel 115-kV XLPE cables installed along an 8.7-mi (14-km) route underneath roadways	2008	In Operation
Stoughton Cables	MA	Electrical Transmission Line	Two parallel 345-kV high pressure fluid filled cables installed along a 17-mi (27-km) route and a third cable installed along an 11-mi (17-km) route; and new 345-kV switching station	2007 2009	In Operation
Long Island Replacement Cable (LIRC)	NY/CT	Electrical Transmission Line	Three 138-kV XLPE marine cables	2008	In Operation
Middletown/Norwalk	CT	Electrical Transmission Line	345-kV circuits consisting of 45 mi (72 km) of overhead line and 24 mi (39 km) of underground cables; reconstruction of 57 mi (92 km) of 115-kV line; construction of new substations and expansion of existing substations	2009	In Operation
Greater Springfield Reliability (NEEWS)	MA/CT	Electrical Transmission Line	39 linear mi (63 linear km) of new 345-kV transmission lines and reconstruction of existing 115-kV lines with 13 new or rebuilt substations and switching stations (110 circuit mi [177 circuit km])	2013	In Operation
Long-Term Lower Southern Massachusetts (SEMA) Upgrades	MA	Electrical Transmission Line	New 18-mi (29-km) 345-kV line and new 345-kV substation; reconstruction of pre-existing 345-kV line on separate towers and related 115-kV modifications	2014	In Operation
Interstate Reliability (NEEWS)	CT	Electrical Transmission Line	37 mi (59 km) of new 345-kV line with associated substation improvements	2015	In Operation
Greater Hartford Central CT (GHCC)	CT	Electrical Transmission Line	27 projects (115-kV), 23 of which were placed in service as of December 31, 2018, with the balance scheduled to be completed during 2020	2021	In Operation
Greater Boston Reliability Solution	MA	Electrical Transmission Line	A series of 115- and 345-kV projects started in 2017 that will improve reliability in the greater Boston region	Rolling	Partially In-Service/Under Construction

12.6 PROJECT TEAM

With regard to the bidder's project team, identify and describe the entity responsible for the following, as applicable:

i. Construction Period Lender, if any

ii. Operating Period Lender and/or Tax Equity Provider, as applicable

iii. Financial Advisor

iv. Environmental Consultant

v. Facility Operator and Manager

vi. Owner's Engineer

vii. EPC Contractor (if selected)

viii. Transmission Consultant

ix. Legal Counsel

12.6.1 Construction Period Lender

[redacted]

12.6.2 Operating Period Lender and/or Tax Equity Provider

[redacted]

12.6.3 Financial Advisor

[redacted]

12.6.4 Environmental Consultant

[redacted]

12.6.5 Facility Operator and Manager

Offshore

[redacted]

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Onshore

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12.6.6 Owner's Engineer

[redacted]

12.6.7 EPC Contractor (if selected)

[redacted]

12.6.8 Transmission Consultant

[redacted]

12.6.9 Legal Council

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12.7 ISO-NE MARKET EXPERIENCE

Provide details of the bidder's experience in ISO-NE other Markets affected by the bid. With regard to bidder's experience with ISO-NE markets, please indicate the entity that will assume the duties of Lead Market Participant for your Project. Please provide a summary of the proposed Lead Market Participant's experience with each of the ISO-NE markets.

The Proposer and its owners as large-scale utility developers have demonstrated comprehensive experience with ISO-NE markets and requirements. Details regarding experience with ISO-NE markets with respect to utility scale transmission planning and development can be found in Section 6 and Section 12.5. [redacted]

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Section 13

Alternative Bid Proposals

13.0 ALTERNATIVE BID PROPOSALS

Per Section 2.2.2.5 of the Request for Proposals, bidders may submit alternative project proposals, based on varying aspects of the proposed project:

Contract Term Length

Additional Pricing Offer

Production/Delivery Profile

In-service Date

Project Size

Technology Type

Delivery Location

Each submitted proposal must be accompanied by a non-refundable bid fee, which will be used to offset the cost of the evaluation of proposals. Bid fee instructions will be sent upon request to bidders who contact the Official Contact listed in Section 3.5.

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13.2 PRICING MECHANISMS

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Section 14

Contribution to Employment and Economic Benefits to Rhode Island

14.0 CONTRIBUTION TO EMPLOYMENT AND ECONOMIC BENEFITS TO RHODE ISLAND

Bidders must provide annualized estimates for all economic benefits and identify the specific in-state expenditures and employment proposed during the development, construction and operation and maintenance phases of the project. Bidders are also required to fill out the Economic Development Summary Excel Workbook provided as an addendum to this Appendix.

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14.1 DIRECT AND INDIRECT ECONOMIC BENEFITS TO RHODE ISLAND

For the direct economic benefits to the State of Rhode Island, please provide an estimate of the number of jobs to be created directly during project development and construction (for a project that includes new facilities or capital investment), and during operations, and a general description of the types of jobs created, estimated annual compensation, the employer(s) for such jobs, and the location. Please treat the development, construction, and operation periods separately in your response.

Please provide the same information as provided in response to question 14.1 above but with respect to jobs that would be indirectly created, in the State of Rhode Island, as a result of the proposed project.

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14.2 PROJECT COMMITMENTS

Describe the proposed project's commitment to the following: investing in offshore wind-related environmental research, monitoring and mitigation sponsored by the DEM and/or the Rhode Island Coastal Resource Management Council; investing in workforce development and environmental research facilities to support the offshore wind industry; utilizing port facilities and office space; and investing in development activities that directly benefit economically distressed areas and/or low-income populations.

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14.3 ADDITIONAL DIRECT ECONOMIC BENEFITS TO RHODE ISLAND

Please describe any other direct economic benefits to the State of Rhode Island (either positive or negative) that could result from the proposed project, such as creating property tax revenues or purchasing capital equipment, materials, or services for Rhode Island businesses. Please provide the location(s) where these economic development benefits are expected to occur.

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14.4 ADDITIONAL BENEFITS

To the extent not already specified elsewhere in your response, please describe any additional benefits or impacts associated with the proposed project.

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14.5 ECONOMIC DEVELOPMENT SUMMARY SHEET

Economic Development Summary Sheet is a Microsoft Excel workbook provided on ricleanenergyrfp.com. Please fill out and submit the Section 14 Addendum to accompany responses in this section.

Attachments:

Copy of completed Section 14 Addendum in Excel format [redacted]

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Section 15

Diversity, Equity, and Inclusion Plan

15.0 DIVERSITY, EQUITY, AND INCLUSION PLAN

Bidders are required to demonstrate a diversity, equity and inclusion plan that describes the proposed strategy to actively promote access to employment and contracting opportunities for, and to actively recruit, diverse workers, vendors, contractors, and investors, and include how the direct, specific and measurable employment and contracting benefits created by the proposed project provides employment and procurement/contracting opportunities for minorities, women, veterans, LGBT and persons with disabilities.

Diversity, equity, inclusion, and belonging are lived values and actions in the Proposer's organization.[1,2] The Proposer's approach is rooted in a commitment to building a diverse and representative workforce, elevating different perspectives and vantage points from internal teams and external stakeholders and rightsholders, and using those strengths to build out global, sustainable solutions. The Proposer mirrors those same commitments to internal Project teams, the environment, and local communities.

[redacted]

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[1] https://orstedcdn.azureedge.net/-/media/www/docs/corp/com/sustainability/global_diversity_uk_20191114.ashx?rev=67bc30eea0f444668532ec30f0f5533d&hash=794CE70EF9134F9D9D14FF60F0DA9A7B

[2] https://www.eversource.com/content/docs/default-source/community/eversource-2021-diversity-equity-inclusion-report.pdf

[redacted]

15.1 WORKFORCE DIVERSITY PLAN

Please include descriptions of each type, duration and salary bands of the employment created and identify the recruitment efforts aimed at hiring diverse candidates for these employment opportunities.

[redacted]

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

[redacted] More detail about how individual programs are supported and how they follow this approach can be found in Section 14. Descriptions of employment created by the Project and under the workforce development strategy can also be found in Section 14. [redacted]

[redacted]

With direction from the developer or prime contractor to meet recruiting goals, suppliers will seek out candidates from prioritized demographics. [redacted] The model has proven to be effective in construction and operations scenarios around the U.S., and the Proposer plans to implement this approach in all initiatives described in this section.

15.1.2 Local Training with Supportive Services

For priority communities, skill barriers are not the only challenge to securing high-quality employment. Training and employer recruiting goals for vulnerable communities must be made accessible through a wide range of supportive services. Those services must include, but need not be limited to, support for resolving employment barriers involving childcare, housing, domestic violence, substance use, transportation, numeracy and literacy, mental health, and personal coaching. [redacted]

Particularly for maritime, construction, and turbine technician careers, workers will need to spend days or even weeks away from home, making the provision of support services for these workers even more important. Women, People of Color, working class people, tribal citizens, and environmental justice communities face these barriers at disproportionally high rates. [redacted]

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15.1.4 Environmental Justice Through Great Careers

The Proposer is uniquely qualified to deliver environmental justice through workforce development that unlocks high quality jobs. The Proposer believes that providing targeted employment and training support to Justice40 communities is a crucial pillar in achieving environmental justice. [redacted] The Proposer has differentiated itself in Rhode Island as the leader in opening high-quality, union career opportunities to priority communities.

15.2 SUPPLIER DIVERSITY PROGRAM

Please include descriptions of the subcontracting, vendor, investor, and ancillary (operational) business opportunities that will be provided by diverse businesses.

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15.3 STAKEHOLDER ENGAGEMENT PLAN SUMMARY

Provide plans to consider how the bidder will engage with project stakeholders. Identify groups of stakeholders to be included (e.g. tribal communities, economically-disadvantaged communities, environmental justice advocates, and fishing communities), project impacts on each stakeholder (and associated mitigation plans), engagement goals for each such group, engagement activities and community partnerships included in the plan, and demonstrated evidence of past and current productive relationships with project stakeholders.

Revolution Wind 2 will deliver a best-in-class stakeholder engagement plan. To do so, the Project will deliver meaningful and transparent stakeholder engagement – early and often.

From experience, the Proposer knows that the best projects are planned from the bottom-up, not dictated from the top-down. To ensure maximum engagement with a wide range of diverse and representative stakeholders, the Project will use methods that include both broad-based communication and engagement as well as tailored outreach methods to reach key stakeholders. A detailed Stakeholder Engagement Plan can be found in Attachment 15-1.

Broad-based stakeholder outreach methods may include, but will not be limited to:

[redacted]

While most Rhode Islanders will learn about Revolution Wind 2 from the broad-based outreach methods and stakeholder engagement activities, the Proposer will also conduct targeted, stakeholder-specific engagement activities. These activities are intended to garner the input and support of those most invested in and impacted by the Project, elevate the voices of those with less power, resources and privilege (including but not limited to Justice40 communities), and collaborate on the design and delivery of key project elements.

The Project will also view the Stakeholder Engagement Plan itself as a living document that will adapt and improve based on stakeholder feedback as the Project progresses. With each iteration, the Plan will modify techniques that aren't working, and scale up those that see success, while always seeking to meet groups where they are.

The Proposer appreciates from experience that stakeholder engagement is far from optional – it is an essential prerequisite for project success. Offshore wind energy projects are complex, years-long endeavors that span political administrations and economic cycles, requiring numerous government approvals and, by extension, continuous education of and support from the public.

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Section 16

List of Rhode Island Vendors and Domestic Supply Chain Opportunities

16.0 LIST OF RHODE ISLAND VENDORS AND DOMESTIC SUPPLY CHAIN OPPORTUNITIES

Bidders are required to identify Rhode Island vendors and other domestic offshore wind supply chain opportunities associated with the project.

16.1 RHODE ISLAND VENDORS

Please identify the Rhode Island vendors associated with supplying the project and provide percentage of Rhode Island-based vendors. Additionally, please provide the percentage of total vendors that are based in the United States.

16.1.1 Rhode Island Vendors

The Proposer is committed to supporting the continued growth of the supply chain for offshore wind in Rhode Island. Through its ongoing work in Rhode Island for the existing Revolution Wind 1 project, the Proposer is present in the state and plans to further expand its footprint with Revolution Wind 2.

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16.1.2 U.S. Vendors

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16.2 SUPPLY CHAIN INFRASTRUCTURE INVESTMENTS

Please identify the project's plans to invest in supply chain and infrastructure improvements to support the offshore wind industry.

[redacted]

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Section 17

Plans for Construction Labor Agreement

17.0 PLANS FOR CONSTRUCTION LABOR AGREEMENT

Bidders are required to submit a plan outlining their intentions with respect to the negotiation of project labor agreements to cover construction activities.

The Proposer appreciates the need for a diverse, skilled workforce and recognizes the value of early engagement with organized labor to support the Projects' construction and operations. In October of 2020, the Proposer was the first and only developer to enter into a national Memorandum of Understanding with NABTU for the buildout of its offshore windfarms, from Maine to Florida. [redacted]

In accordance with commitments made under the Memorandum of Understanding, [redacted]

[redacted]

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17.1 LABOR PEACE AGREEMENT

As part of the contract negotiation process, the bidder must commit to enter into a labor peace agreement with at least one bona fide labor organization either where such bona fide labor organization is actively representing employees providing necessary construction, operations and maintenance services for the project at the time of such agreement or upon notice from a bona fide labor organization that is attempting to represent employees who will provide necessary operations and maintenance services for the renewable energy system employed in the state. The maintenance of such labor peace agreement will be an ongoing material condition of any continuation of payments under the PPA. See R.I. Gen. Laws § 39-31-10(e).

Describe the Bidder's plan to enter into a labor peace agreement and/or plan for project employee representation by a labor organization.

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17.2 EMPLOYEE COMPENSATION

Bidders must commit to pay each construction, operations and maintenance employee wages and benefits that are not less than the prevailing wage and fringe benefit rates at the journeyman level that are prescribed by the Rhode Island Department of Labor and Training, and not less than the prevailing wage rates for employees for which there is no classification prescribed by the Rhode Island Department of Labor and Training. Bidders must also commit to pay benefits and wages not less than the rate applicable to apprentices for the pertinent classification prescribed by the Rhode Island Department of Labor and Training if the worker is a participant in an approved apprenticeship program and the approved apprenticeship program maintains a direct entry agreement with a certified pre-apprenticeship training program. See R.I. Gen. Laws § 39-31-10(f).

Describe the Bidder's plan to compensate project employees and apprentices not less than the prevailing wage.

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Section 18

Exceptions to Form PPAs

18.0 EXCEPTIONS TO FORM PPAS

Please attach an explanation of any exceptions to the Form PPA set forth in Appendix C. Comments to the proposed Form PPA must include any specific alternative provisions in a redline format to the Form PPA. ***Bidders are discouraged from proposing material changes to the Form PPA.***

The Proposer has provided an explanation of exceptions to the Form PPA in Attachment 18-1, and the Form PPA as marked up by the Proposer is included in Attachment 18-2.

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Section 19

Exceptions to Commitment Agreement

19.0 EXCEPTIONS TO COMMITMENT AGREEMENT

Please attach an explanation of any exceptions to the Commitment Agreement set forth in Appendix E to this Notice, including any specific alternative provisions in a redline format to the Commitment Agreement.

Bidders must include a marked version showing any proposed changes to the Commitment Agreement with their bid, and it is assumed that bidders would be willing to execute the marked-up agreement included in their bids. ***Bidders are discouraged from proposing material changes to the Commitment Agreement****.*

The Proposer has provided an explanation of exceptions to the Commitment Agreement in Attachment 19-1, and the Commitment Agreement as marked up by the Proposer is included in Attachment 19-2.

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Attachment 1-1

Demonstration of Federal Lease Ownership

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Attachment 2-1

Letters of Support

LETTERS OF SUPPORT FOR REVOLUTION WIND 2

In total, the Project has collected a total of 24 unique letter of support signatories. Overall, letters of support have been received from vital Rhode Island voices demonstrating a broad and diverse base of support for Revolution Wind 2.

Letters of Support are listed below.

Letters of Support Contributors

1. Mayor of Providence Brett P. Smiley
2. Building Futures Rhode Island
3. Climate Jobs Rhode Island
4. Waterson Terminal Services
5. Rhode Island AFL-CIO
6. Boskalis Offshore Management
7. Blount Boats
8. Environmental Council of Rhode Island
9. The Providence Foundation
10. GZA
11. Venterra Group
12. North Kingstown Chamber of Commerce
13. Bay Crane
14. VHB
15. SeaAhead
16. Quonset Development Corporation
17. Rhode Island Hispanic Chamber of Commerce
18. Rhode Island Black Business Association
19. Community College of Rhode Island
20. Partnership for Rhode Island
21. Shields Fleet 9
22. Skills for Rhode Island’s Future and the Rhode Island Small Business Hub
23. Rhode Island Building and Construction Trades Council
24. Greater Providence Chamber of Commerce

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Attachment 4-1

Wind Climate Assessment Report

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Attachment 4-2

Third Party Wind Resource Assessment

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Revolution Wind 2 | Powered by Ørsted & Eversource

Attachment 4-3

Wind Climate Data

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Attachment 5-1

North East Offshore LLC and Subsidiaries

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Revolution Wind 2 | Powered by Ørsted & Eversource

Attachment 5-2

Bay State Wind Governance Document

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Attachment 6-1

ISO-NE Interconnection Request

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Revolution Wind 2 | Powered by Ørsted & Eversource

Attachment 6-2

Electrical Models and One-Line Diagram

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Revolution Wind 2 | Powered by Ørsted & Eversource

Attachment 6-3

IDV Files

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Attachment 6-4

Burns and McDonnell Engineering and Cost Report

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Attachment 7-1

Environmental and Fisheries Mitigation Plan (EMFP)

ENVIRONMENTAL AND FISHERIES MITIGATION PLAN

Provide a preliminary environmental characterization of the site and project, including both construction and operation. In addition, identify environmental impacts associated with the proposed project and any potential impediments to development. Bidders must detail, to the extent practical, specific adverse environmental and fisheries impacts that are likely to result from the proposed Facility and detail measures that will be taken to avoid, minimize, and/or mitigate those impacts in the categories identified in Section 2.3.3.3. Where specific measures are not known for a specific category of impact at the time of proposing, the plan must describe in detail the approach that will be implemented to collaborate with the state and Federal agencies and other stakeholders to define avoidance, minimization, and mitigation measures. The plan should provide a roadmap for the environmental and fisheries work to come and provide a degree of certainty that the Bidder is committed to working collaboratively with stakeholders to develop a cost-effective and environmentally responsible Project.

Plan included? [redacted] *If not, please explain:*

1.0 ENVIRONMENTAL AND FISHERIES MITIGATION PLAN SUMMARY

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7.0 FISHERIES IMPACT AND MITIGATION

7.1 FISHERIES ENGAGEMENT APPROACH

Revolution Wind 2 is committed to maintaining a strong working relationship with all commercial and recreational fishermen who may be affected by a wind farm or wind farm activities in and around a lease area. The Proposer believes that good communication is essential to creating understanding between those who provide food for our tables and those who provide electricity for our homes. While not all conflicts can be resolved through communication alone, open and honest interaction helps to manage conflicts when they arise and identify ways to avoid or mitigate impacts that may occur.

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Attachment 12-1

Resumes of Key Personnel

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Attachment 14-1

Third Party Economic Development Report

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Revolution Wind 2 | Powered by Ørsted & Eversource

Attachment 14-2

South Quay Moffat Nichol Quote

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Attachment 14-3

Ørsted Port Development Competencies

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Attachment 15-1

Stakeholder Engagement Plan

1.0 STAKEHOLDER ENGAGEMENT PLAN

Provide plans to consider how the bidder will engage with project stakeholders. Identify groups of stakeholders to be included (e.g. tribal communities, economically-disadvantaged communities, environmental justice advocates, and fishing communities), project impacts on each stakeholder (and associated mitigation plans), engagement goals for each such group, engagement activities and community partnerships included in the plan, and demonstrated evidence of past and current productive relationships with project stakeholders.

1.1 OVERVIEW OF STAKEHOLDER ENGAGEMENT PLAN

The Stakeholder Engagement Plan describes the Proposer's commitment to robust, inclusive, and transparent public involvement. In summary, the Revolution Wind 2 team will seek to:

- Disseminate information, opportunities, and progress to the public;
- Advance the public's understanding and support for the Project, offshore wind industry, and clean energy transition through knowledge-building;
- Identify and engage with key stakeholders of the proposed Project by informing, collaborating, listening, and learning with an orientation toward inclusive decision-making;
- Encourage and collect stakeholder input, with a focus on creating space for and elevating voices of those in protected groups;
- Use stakeholder input to improve the Project and early and frequent communication to avoid, minimize, or mitigate potential conflicts before they arise;
- Obtain federal and state approvals for the construction of the Project;
- Support obtaining local real estate rights for the onshore transmission route; and
- Collaboratively design and deliver the Project on-time, with widespread support from stakeholders and in alignment with the goals of the RFP.

1.1.1 The Local Developer

Revolution Wind 2 is local; the Project team lives and works in the Rhode Island communities it serves and is here to stay. This team is already developing or operating two offshore wind farms in the state and cares deeply about the local community. Successfully developing and building the Project means building strong, open, and genuine relationships with community stakeholders.

Revolution Wind 2 will be led by a combination of existing and new team members that will include locals with deep roots in each stakeholder group and extensive backgrounds in community outreach—with support from subject matter experts and the best available communication tools.

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1.1.2 Industry-Leading Stakeholder Engagement

The Proposer is eager to build on industry-leading success with U.S. offshore wind stakeholder engagement. The Proposer is home to the only team to have successfully achieved commercial operation for an offshore wind farm in the U.S. (Block Island Wind Farm in Rhode Island), in addition to hundreds of transmission projects around the Northeast and 7.6 GW of installed offshore wind projects around the globe.

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1.1.3 Responsive to Stakeholder Feedback

A key element to our success in stakeholder engagement is that, when it comes to decisions both large and small, we listen and find ways to improve the Project—whether it is the layout of the WTGs and onshore footprint or the location and setup of community meetings.

- In planning the Revolution Wind 1 project, we reconfigured the WTG layout (subject to regulatory approval) to create consistent 1 x 1 nm spacing between turbines across the Lease Area; a major change based on input from the fisheries industry as well as the marine transportation and navigation community. Additionally, we conducted extensive consultations with community members, government staff, and elected officials at every level of government to refine the proposed onshore routing, work windows, and mitigation measures.
- For the South Fork Wind project (which serves New York), we changed the spacing of the WTGs and the proposed route of the submarine transmission cable based on feedback from the fishing community. Additionally, we based the overland route design and work constraints on input from residents and local officials.

Our team understands the impacts of our projects and values stakeholder feedback, and we will work closely with stakeholders for Revolution Wind 2 to incorporate their input wherever possible.

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1.1.5 A Comprehensive and Inclusive Approach

Over the course of Revolution Wind 2, we will "inform, listen and learn, and collaborate," similar to the approach taken for our existing projects in Rhode Island.

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[redacted]

Further, we will increasingly collaborate with our stakeholders to design and deliver an inclusive Project that utilizes local expertise intended to maximize community benefits, environmental justice, and a just transition—not just a transition. [redacted]

Throughout the Project, we will be prepared to respond to misinformation, which the team has experienced in connection with all offshore wind projects in the U.S. and Rhode Island, and to which it has developed effective response strategies. The team will combat misinformation by supplying the facts; responding to misinformation when it is released through social media, print, and radio; mobilizing allies to write letters to the editors; attending public meetings; and engaging stakeholders and decision makers proactively and consistently over the course of the Project. We will also work with the media and key stakeholders to help clarify challenging issues following the approach demonstrated in Attachments 15-2 and 15-3.

[redacted]

1.2 STAKEHOLDER IDENTIFICATION AND STAKEHOLDER LIST

The Revolution Wind 2 team knows from experience that no stakeholder group is monolithic. [redacted]

We also understand that, in our stakeholder engagement, it will be important to acknowledge that advocacy for environmental justice and a just transition in Rhode Island began before this solicitation was issued. Advocates, elected officials, government agencies, and local community leaders have been planning and advocating for years, and an equitable stakeholder engagement process is one that acknowledges the expertise and contributions by all stakeholders, including past efforts that have led us to this moment.

[redacted]

Further, as we work to implement Revolution Wind 2, the following is a comprehensive list of key Project stakeholders by type, including descriptions of why they are important to Project success, how the Project will consider them when communicating, how each step of the stakeholder engagement process may be modified and tailored to their specific needs and accessibility, and key existing Proposer staff who will act as liaisons, where necessary. [redacted]

1.2.1 Federal, State, and Local Government Agencies

[redacted]

[redacted]

[redacted]

[redacted]

1.2.2 Elected Officials

[redacted]

[redacted]

- [redacted]
- [redacted]

[redacted]

[redacted]

1.2.3 Coastal Residents/Business Owners and Local Communities (including Environmental Justice and Proximate Low-Income Communities)

[redacted]

[redacted]

[redacted]

[redacted]

1.2.4 Environmental Organizations

[redacted]

[redacted]

[redacted]

[redacted]

1.2.5 Tribal Nations and Native Organizations

[redacted]

[redacted]

[redacted]

[redacted]

1.2.6 Labor Leaders/Organizations

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

Additional details for how Revolution Wind 2 will engage these stakeholders can be found in Section 14.

1.2.7 Commercial and Recreational Fishing

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

1.2.8 Economic and Workforce Development/Training Organizations

[redacted]

[redacted]

[redacted]

[redacted]

1.2.9 Research and Development Institutions

[redacted]

[redacted]

[redacted]

[redacted]

1.2.10 Maritime Industry, Tourism Operators, and Navigational Safety Committees

[redacted]

[redacted]

[redacted]

[redacted]

1.2.11 Minority Business Enterprises (MBE), Women Business Enterprises (WBEs), Disadvantaged Business Enterprises (DBEs), and Veteran Business Enterprises (VBEs)

[redacted]

[redacted]

[redacted]

[redacted]

1.2.12 Supply Chain Businesses (including Small-Medium Enterprises)

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

1.2.13 Port Owners/Operators

[redacted]

[redacted]

[redacted]

[redacted]

[3] Ørsted Code of Conduct for Business Partners, Accessed at: orsted-code-of-conduct-for-business-partners-october-2022-english.ashx.

1.3 STAKEHOLDER ENGAGEMENT GOALS

[redacted]

[redacted]

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

[redacted]

[redacted]
[redacted]

[redacted]

[redacted]

REDACTED

[redacted]

[redacted]

[redacted]

1.3.1 Engagement Activities and Community Partnerships

The Revolution Wind 2 team is committed to effective stakeholder engagement partnerships, specific measures to promote diverse and representative participation and stakeholder accessibility, tracking success metrics from its stakeholder engagement activities, and notifying partnering state agencies, along with many others, of planned engagement activities in advance.

Many of the Project team's stakeholder-specific engagement related to diverse and representative participants, accessibility, and specific needs are described within this plan and in Sections 14 and 15, as well as in the Environmental and Fisheries Mitigation Plan (Attachment 7-1). Other activities will be incorporated across all stakeholder engagement—for example, making reasonable accommodations based on language fluency and disabilities of participants.

Revolution Wind 2 | Powered by Ørsted & Eversource

Attachment 15-2

Rhode Island Media Coverage Highlights

Rhode Island Media Coverage Highlights: February 2019 to Present

Article	Outlet	Date	Year
National Grid OKs 400-megawatt offshore wind project as costs drop	WPRI	February 7	2019
National Grid agrees to contract with proposed wind farm	AP	February 8	2019
My Turn: Jeffrey Grybowski: Pumping $250 million into R.I. economy	Providence Journal	March 16	2019
Developer of R.I. wind farm announces education, workforce initiative	Providence Journal	April 20	2019
Wind farm developers pledge $4.5 million to train workers in RI	WPRI	April 22	2019
Wind-power developer opens 2nd R.I. office	Providence Journal	March 6	2020
Powering Up: Offshore wind gains momentum despite pandemic	Providence Business News	August 7	2020
RI set to double down on offshore wind power	Providence Journal	October 27	2020
Revolution Wind team to host virtual information sessions	The NK Standard-Times	November 12	2020
Online information session on next offshore wind project	The Block Island Times	November 12	2020
New wind farm in development between Block Island and Martha's Vineyard	ABC 6	November 18	2020
RI's wind-farm plan poised to advance in '21	Providence Journal	November 18	2020
Fishing Report: Wind farm habitats get thumbs-up from anglers	Providence Journal	November 25	2020
Revolution Wind talks wind farm proposal with public	The Independent	November 27	2020
Report: Raimondo's 2030 renewables goal achievable	Providence Journal	January 13	2021
RI Gov. Dan McKee signs 'landmark' Act on Climate	Providence Journal	April 10	2021
Offshore wind developers announce ProvPort facility	Providence Journal	April 14	2021
Orsted, Eversource plan wind farm manufacturing facility at ProvPort	Providence Business News	April 14	2021
Ørsted and Eversource Tap ProvPort as Regional Offshore Wind Hub	GoLocalProv	April 15	2021
Ørsted and Eversource take steps to establish ProvPort manufacturing facility	4C Offshore	April 15	2021
Winds of Change	CBS This Morning	April 22	2021
Revolution Wind project moves forward with start to federal permitting review	Providence Business News	April 29	2021
BOEM kicks off Revolution Wind review	renews.biz	April 29	2021

REDACTED

Biden admin advances R.I. offshore wind farm	E&E News	April 29	2021
GMA takes a deeper look into what wind turbines could mean for the U.S. economy	Good Morning America	November 1	2021
'It's Not Too Late': Harnessing the power of wind energy	ABC News	November 11	2021
U.S. energy secretary set to visit ProvPort offshore wind facility	Providence Journal	December 1	2021
US energy secretary visits the 'poster child' for offshore wind development	The Boston Globe	December 2	2021
'More offshore wind means more jobs': U.S. energy secretary visits Providence	Providence Business First	December 3	2021
U.S. Energy Secretary praises Rhode Island for role in offshore wind power	Providence Journal	December 3	2021
Construction Starts on US Offshore Wind Foundation Components Factory	offshoreWIND.biz	December 3	2021
Secretary Granholm on the Politics of Green Initiatives	MSNBC	December 4	2021
Energy secretary: Offshore wind brings 'gust' of job growth	AP	December 5	2021
This Historic Community Is Pushing the Nation Toward a Wind Power Revolution	Smithsonian Magazine	March 29	2022
Block Island wind farm hasn't harmed fish populations, industry-funded study shows	The Boston Globe	April 14	2022
Energy secretary: US offshore wind jobs should be union jobs	AP	May 28	2022
Ørsted and Eversource team with Boskalis for northeast offshore wind projects	MarineLog	June 30	2022
Boskalis Lands Major Offshore Wind Deal in USA	offshoreWIND.biz	June 30	2022
Ørsted and Eversource teams with Boskalis for U.S. offshore wind projects	4C Offshore	June 30	2022
McKee announces training program for offshore wind industry jobs	WJAR	August 3	2022
CCRI to launch offshore wind training program under state, developer partnership	PBN	August 3	2022
Governor McKee Announces Programs to Train Offshore Wind Workers	Newport Buzz	August 3	2022
Rhode Island training program to support offshore wind sector	Center Square	August 3	2022
Offshore wind is an untapped power source of the future	The Weather Network	August 19	2022
BOEM asks public to weigh in on Rhode Island offshore wind project	PoliticoPro	August 29	2022
Feds issue draft environmental permit for Revolution Wind	Boston Business Journal	August 29	2022

REDACTED

BOEM Opens Environmental Analysis Comment Period for R.I. Offshore Wind Project	North American Windpower	August 29	2022
Rhode Island Offshore Wind Farm Advances Through Federal Permitting System	offshoreWIND.biz	August 30	2022
'One step closer' | Orsted-led US Revolution Wind environmental impact paperwork out	Recharge News	August 30	2022
BOEM publishes Revolution Wind draft EIS	renews.biz	August 30	2022
Inside America's offshore wind hub: Boats, cables and elation	E&E News	September 13	2022
Marking a Block Island wind farm milestone, and what it could mean: 'A lot is coming fast'	The Boston Globe	September 13	2022
5 years later, Block Island celebrated as birthplace of U.S. offshore wind	Providence Business News	September 22	2022
McKee, environmental leaders celebrate milestone anniversary for offshore winThis is a file photo of wind turbines. (WLNE)	ABC 6	September 22	2022
Rhode Island celebrates 'The Starting Five,' wind turbines	WJAR	September 22	2022
Supporters tout environmental, economic benefits of Revolution Wind at meeting	Providence Business News	October 5	2022
Look for R.I. to make gains in renewable energy, forest conservation, and clean transportation in 2023, experts say	The Boston Globe	December 29	2022
Offshore wind farms lure tourists eager to see 'biggest rotating devices on the planet'	Fortune	February 18	2023
New York's Wind Power Future Is Taking Shape. In Rhode Island	The New York Times	February 22	2023

WPRI
By: Ted Nesi
February 7, 2019

National Grid OKs 400-megawatt offshore wind project as costs drop

PROVIDENCE, R.I. (WPRI) — Rhode Island's offshore wind dreams are getting cheaper.

National Grid and Ørsted U.S. Offshore Wind said Thursday they have agreed on a 20-year contract for the utility to buy power from Ørsted's proposed 400-megawatt Revolution Wind project at a cost of 9.8 cents per kilowatt-hour.

To put that number in perspective, power from Ørsted's 30-megawatt Block Island Wind Farm — the country's only active offshore wind farm — currently costs 26.1 cents per kilowatt-hour, more than twice as much. (National Grid's standard offer rate is 10.99 cents, though company officials say the comparison isn't apples-to-apples.)

Democratic Gov. Gina Raimondo's administration picked Revolution Wind last year as part of a competitive bidding process led by Massachusetts. She hailed Thursday's announcement as another step toward her goal of increasing the amount of renewable energy in Rhode Island to 1,000 megawatts by the end of next year.

"This is a triple-win for our state because it provides affordable, clean energy for Rhode Islanders, adds jobs to our economy, and dramatically reduces carbon emissions," Raimondo said in a statement. She described the proposed cost of 9.8 cents as "far lower than we anticipated."

The Block Island project was originally developed by Deepwater Wind, which was selected back in 2008 by the Carcieri administration to handle offshore wind for Rhode Island; Ørsted acquired Deepwater last year.

"We're keeping our promise to Rhode Island to bring down the cost of offshore wind in a big way," said Ørsted Co-CEO Jeff Grybowski, who previously led Deepwater.

The proposed Grid-Ørsted contract will now go before the R.I. Public Utilities Commission, which is expected to decide whether to approve it in the next four months.

Revolution Wind will be built at least 15 miles south of Rhode Island's shoreline in Atlantic waters that Ørsted has leased from the federal government. Officials said the 400 megawatts the project will generate is enough to power about 270,000 Rhode Island homes each year. (Connecticut has since committed to buy 300 megawatts from Revolution Wind, as well.)

"It will have the kind of capacity that we would normally expect from a big traditional power plant, a big gas plant or something like that," Grybowski said during Thursday's taping of Executive Suite.

In addition to the environmental benefits of carbon-free energy, Grybowski said National Grid estimates the project will lower the average Rhode Island household's electric bill by about 50 cents a month over the 20-year life of the contract.

As another cost comparison, officials pointed to Vineyard Wind, the project that Massachusetts officials selected in the same bidding process. Vineyard Wind has filed a contract to sell its power at an inflation-adjusted cost of 6.5 cents per kilowatt-hour; Revolution Wind's cost is 7.4 cents when measured in the same way.

Grybowski cited three factors that have pushed down the cost of offshore wind in recent years: improvements in turbine technology; scale as projects get larger; and experience now that Block Island is up and running.

"We have now proven to the world, to the finance markets, to utilities, to regulators, that we can build these kinds of projects and they can be successful," he said.

Deepwater's purchase by Ørsted has not changed its commitment to Rhode Island, Grybowski said, though the company also has an office in Boston where its other CEO works. "We have large ambitions for Rhode Island, and it's going to be our home," he said.

Ørsted is currently expanding its Providence office space and expects to have more than 50 employees in the state within a few years. The company plans to spend $250 million locally on the Revolution Wind project, which is supposed to create 800 temporary construction jobs and 50 permanent jobs.

The governor's office also said Ørsted will seek no tax incentives for Revolution Wind.

AP
February 8, 2019

National Grid agrees to contract with proposed wind farm

PROVIDENCE, R.I. (AP) — Utility National Grid has agreed to a 20-year contract for power from a proposed 400-megawatt wind farm project in Rhode Island Sound.

Under the agreement announced Thursday, National Grid would pay Danish-based Orsted U.S. Offshore Wind 9.8 cents per kilowatt hour for power from its Revolution Wind Farm.

The Block Island project was originally developed by Deepwater Wind, which was acquired by Orsted last year.

The project is estimated to generate enough power for 270,000 homes.

Orsted Co-CEO Jeff Grybowski says National Grid estimates the project will lower the average household's electric bill by 50 cents a month over the life of the contract.

The state Public Utilities Commission will decide whether to approve the contract in the next four months.

PROVIDENCE Journal

The Providence Journal
By: Jeffrey Grybowski
March 16, 2019

My Turn: Jeffrey Grybowski: Pumping $250 million into R.I. economy

It's sometimes hard to believe that it's already been more than two years since our team "flipped the switch" at America's first offshore wind farm. The nation watched as Rhode Island single-handedly launched a new renewable energy industry at the Block Island Wind Farm that day.

Since then, we've been working hard to advance larger wind farm projects that will serve states all along the Eastern Seaboard. But our commitment to our home state of Rhode Island, and the promises we've made to Rhode Islanders, remain as solid as ever.

A few months ago, we joined forces with the global offshore wind leader — Ørsted — to form Ørsted US Offshore Wind. Ørsted built the world's first offshore wind farm decades ago and today operates more offshore wind turbines than any other company in the world. Our new merged company is jointly headquartered here in Providence — where Deepwater Wind was based for nearly a decade — and in Boston, where Ørsted first opened its U.S. offices. Eversource has recently invested in a 50-percent ownership stake of Revolution Wind and our Long Island project, adding even more expertise to our team. Ørsted US Offshore Wind now has nearly 100 employees in the U.S.

Growth is happening fast, and we've outgrown our Providence space, so we're expanding our downtown offices.

When we built the Block Island Wind Farm, we promised Rhode Island that the state would become a major player in the offshore wind industry. We promised Rhode Island that we'd bring hundreds more jobs to the state beyond the 300 local workers who built that first project. We promised Rhode Island that we'd bring down the cost of offshore wind as the industry matured and we built larger projects.

We are keeping all those promises to Rhode Island with our next great wind farm, Revolution Wind.

The 400 megawatts of clean energy from Revolution Wind will power 270,000 Rhode Island homes — about a quarter of the state's total electric load. That clean energy will come with a savings for Rhode Island ratepayers: Millions of dollars in total savings over 20 or so years, which translates to a savings of 50 cents a month for the typical ratepayer. The cost of that power will be lower than the current cost of energy supply for the average Rhode Islander.

The roughly 50 turbines at Revolution Wind will be located “over the horizon,” more than 15 miles south of Rhode Island in the waters halfway between Martha’s Vineyard and Montauk. We’ll need about 800 local construction workers to help us build Revolution Wind, making it one of the largest local job creators in recent history. For Revolution Wind, we expect to spend $250 million in Rhode Island, including $40 million in state ports to support the buildout.

It’s not just our company that’s grown since the Block Island Wind Farm generated its first megawatt — so too has the U.S. offshore wind industry. We set a very high bar for responsible offshore development at the Block Island Wind Farm. That includes longstanding, cooperative working relationships we’ve built with our neighbors in the maritime sector, including commercial fishermen. We believe that offshore wind can coexist with other ocean users.

The journey to building America’s first offshore wind farm in the Ocean State was a long and challenging one. But we never wavered from our greater vision for Rhode Island: A flourishing, homegrown industry that will power hundreds of thousands Rhode Island homes, put hundreds more Rhode Islanders to work, and bring costs savings to electric customers. Revolution Wind will fulfill that vision and our long-made promises to our home state.

PROVIDENCE Journal

Providence Journal
By: Brian Amaral
April 22, 2019

Developer of R.I. wind farm announces education, workforce initiative

The companies behind the offshore Revolution Wind project in the waters south of Rhode Island on Monday announced $4.5 million in funding for education and workforce development in Rhode Island.

The funding from Ørsted US Offshore Wind and the utility Eversource will buttress the future of an industry that could bring thousands of high-paying jobs to Rhode Island, which is at the forefront of offshore wind power development, Gov. Gina Raimondo said at a news conference in the Rhode Island State Library.

“We are going to receive massive economic development and job-creation benefits because of that first-mover advantage,” Raimondo said.

Of the $4.5 million in private funding announced Monday, $3 million will go toward higher education around offshore wind power. The initiative will be led by the University of Rhode Island, which will work with other universities.

URI president David M. Dooley said the funds aren’t targeted to one specific program, but rather will support everything from research to curriculum development to outright education, including internships for high schoolers.

“It’ll be an ongoing collaboration between Ørsted and URI — what are the needs and the best ways we can prepare the workforce? What expertise and new knowledge and new research can develop this new resource?” Dooley said.

Asked whether the funding from Ørsted could affect the objectivity of research in a field fraught with conflicts among the interests of offshore wind power, wildlife and the fishing industry, Dooley said URI would continue to balance those various needs as offshore wind power grows.

“I can assure you our researchers have the highest regard for doing things objectively,” Dooley said.

Another $1.5 million will be designated for the Rhode Island Commerce Corporation and the Rhode Island Department of Labor and Training, the companies said.

"We stand ready to make major investments in our home state to make sure Rhode Island students, and the state's supply chain, are ready for this new clean-jobs sector," said Ørsted US Offshore Wind co-CEO Jeffrey Grybowski.

Ørsted US Offshore Wind, part of a Danish conglomerate, and Eversource, a utility headquartered in Boston, are working together on the Revolution Wind project, in the waters more than 15 miles south of Rhode Island.

When the project is complete — complementing the already-operational Block Island wind project — about 50 turbines will spin out enough electricity to power a quarter of the homes in Rhode Island, according to Ørsted.

The project still has to go through a state Public Utilities Commission review. The PUC needs to sign off on the contract between Ørsted and National Grid to buy the power. Ørsted will also need federal and state permits, including environmental reviews.

WPRI
By: Bill Tominson
April 22, 2019

Wind farm developers pledge $4.5 million to train workers in RI

PROVIDENCE, R.I. (WPRI) — The developers of an offshore wind farm currently in the works off the Rhode Island coast are pledging $4.5 million to support education and supply chain development for the state's wind energy industry.

The partners in the "Revolution Wind" project, Ørsted U.S. Offshore Wind and Eversource, made the announcement with Gov. Gina Raimondo Monday morning at the State House.

The governor praised the companies' commitment to provide opportunities for Rhode Island college students.

"When they are ready to work, we will have plenty of jobs for them in our growing offshore wind supply chain right here in Rhode Island," she said.

The partners will invest $3 million in offshore wind higher education programs, led by the University of Rhode Island with the assistance of other higher learning institutions. Another $1.5 million will be earmarked for the Rhode Island Commerce Corporation and the Department of Labor and Training.

National Grid struck a 20-year deal with Ørsted back in February to buy power from the Revolution Wind farm project. Both that contract and the project are pending Public Utilities Commission approval.

The Revolution Wind project blossomed from the former Deepwater Wind project, which was acquired by Ørsted last year.

PROVIDENCE Journal

The Providence Journal
By: Alex Kuffner
March 6, 2020

Wind-power developer opens 2nd R.I. office

Orsted U.S. Offshore Wind, builder of the nation's first offshore wind farm off Block Island, sets up Providence hub as first stop for companies looking to do business with the Danish giant

Thomas Brostrom, CEO of Orsted's U.S. operations, with Gov. Gina Raimondo during Monday afternoon's press conference for the official opening of Orsted's second Rhode Island office. [THE PROVIDENCE JOURNAL / KRIS CRAIG]

PROVIDENCE — The construction of more offshore wind farms on the East Coast is on hold as federal regulators reconsider their impacts, but that hasn't deterred the leading developer in the global industry from opening its second office in Providence.

Orsted U.S. Offshore Wind's new innovation hub is small, with only two full-time staff members and space for seven other employees of the Danish parent company to cycle through, but Orsted executives say its presence reflects confidence in the future of the American market.

"We are still pretty optimistic," Thomas Brostrom, president of Orsted's operations in North America, said in an interview. "We are getting anxious to move on, but nothing to make our hands shake."

He spoke outside the new office in the Wexford Innovation Center on Monday before the official opening of the work space. In a demonstration of the importance of Orsted to the growth of Rhode Island's "blue economy" — commercial activities centered around the ocean — Gov. Gina Raimondo joined Brostrom and others at the event.

Offshore wind alone could generate 20,000 supply-chain jobs along the Atlantic coast, said Raimondo, citing one recent report.

"That's what's up for grabs here," she said. "Tens of thousands of high-paying jobs in a brand-new industry that's being birthed right here in the state of Rhode Island."

The office will function as the first stop for companies that want to do business with Orsted and whose technologies would help with the construction or operation of its wind farms, which include the 700-megawatt project known as the Revolution Wind Farm that would supply power to Rhode Island and Connecticut.

They could be technologies that reduce construction noise to lessen the negative impacts on marine mammals. Or they could be things that help with the installation of transmission cables.

The new hub is the only office of its kind that Orsted operates outside of its headquarters in Copenhagen. The company had an outpost in Silicon Valley with a similar focus, but closed it a couple of years ago.

It makes more sense to have this type of office on the East Coast, where Orsted operates the nation's only offshore wind farm — near Block Island — and where, in the waters between Massachusetts and Maryland, the company is planning four more projects in addition to the Revolution proposal.

Orsted considered other locations in the Northeast, but settled on Rhode Island for several reasons. For one, the company has an office in Providence already, where its engineering and development staff are based.

The presence of other blue-economy companies in the state and work at the University of Rhode Island, Brown University and other higher-education institutions were also key, said Matthew Morrissey, Orsted's head of New England markets.

"The innovation economy is very real," he said. "These linkages were made plain to us when we were looking to open this office."

And then there was the work by Raimondo, Commerce Secretary Stefan Pryor and others to make the company feel wanted.

"You feel the importance of what we're doing here," said Brostrom.

The current concerns around offshore wind were raised in connection to another developer, Vineyard Wind, and its 800-megawatt proposal in waters off Rhode Island and Massachusetts. The federal Bureau of Ocean Energy Management delayed the regulatory process for the project to look mainly at how commercial fishermen would be affected.

The decision pushed back permitting for Orsted and others, but the situation is improving, said Brostrom.

"We're getting the right signals now," he said.

PROVIDENCE BUSINESS NEWS

PBN

[Providence Business News]

By: Mary MacDonald
August 7, 2020

PROVIDENCE BUSINESS NEWS
PBN
AUGUST 7-13, 2020

SPECIAL SECTION
PBN's Healthiest Employers 2020 Awards

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Court ruling on pensions will have ripple effects | 18

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CORONAVIRUS CRISIS

Companies push for liability protection

BY MARY MACDONALD | MacDonald@PBN.com

IF AN EMPLOYEE GETS SICK with the novel coronavirus, should they be allowed to file a worker's compensation claim or a lawsuit against their employer as the source of their infection?

They can. But companies in Rhode Island, including manufacturers and professional-services companies, are seeking government-approved immunity from employee lawsuits relating to the COVID-19 pandemic.

FOCUS: LAW REVIEW

In seeking the broad protections against lawsuits and claims,

SEE LIABILITY
PAGE 20

ONE LAST THING
Beth Carter
Get in the trenches | 30

POWERING UP

Offshore wind gains momentum despite pandemic

LARGE SCALE: Matthew Morrissey, head of Northeast markets for Orsted U.S. Offshore Wind Power, stands in the company's office in Providence in March. Orsted employees have vacated the office because of the COVID-19 pandemic, but plans for offshore wind projects are still progressing.

PBN FILE PHOTO/MICHAEL SALERNO

BY NANCY LAVIN | Lavin@PBN.com

STARK white walls, blank computer screens and empty desk chairs weren't what the executives at Denmark-based wind-energy firm Orsted had in mind when they touted the opening of its U.S. innovation center in Providence earlier this year.

The ultimate goal was to create a bustling, collaborative hub of wind-energy companies getting in on the ground floor of the country's fledgling offshore wind sector.

But while Orsted's office in the **Cambridge Innovation Center** has sat unoccupied since the coronavirus pandemic arrived in March, the company's efforts to establish Rhode Island as a national leader in the industry have not stopped, according to Matthew Morrissey, head of Northeast markets for **Orsted U.S. Offshore Wind Power**.

While the pandemic has dealt a crushing blow to many industries, the offshore wind sector has gotten some long-awaited clarity, thanks to a preliminary federal review of the first utility-scale wind

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OFFSHORE WIND

CONTINUED FROM PAGE 1

farm, known as Vineyard Wind, proposed off the coast of Martha's Vineyard.

"The Vineyard Wind project is the cork in the dam," said Chris Waterson, general manager of **Waterson Terminal Services LLC**, which operates the Providence seaport on behalf of nonprofit owner **ProvPort Inc.** "Once that moves, everything kind of flows through behind it."

That includes Orsted's Revolution Wind project, a 50-turbine project planned jointly with Boston-based Eversource Energy off the coast of Rhode Island. The project's construction will create some 2,700 jobs in construction, architecture, carpentry and other related industries and add $282 million to the state's gross domestic product, according to a 2019 economic analysis. Once it begins generating power, the project will provide about 86 full-time jobs and an annual $8.1 million boost to the state's GDP, according to the report.

Orsted in March submitted project plans for Revolution Wind to the U.S. Department of Interior's Bureau of Ocean Energy Management, setting off a review and public comment period before the agency issues its final decision. The company also recently completed renovations to its 50-person Exchange Terrace offices in Providence – separate from the innovation hub – with plans to hire another 25 people to work on permitting and project development of five offshore wind farms on the drawing boards, including the Revolution Wind project, Morrissey said.

MILESTONE REACHED

The federal Bureau of Ocean Energy Management, which serves as the primary review and regulatory agency for offshore wind farms, has been the major clog in the pipeline to progress.

How much the delays are rooted in politics is unclear. President Donald Trump has publicly denounced wind energy, but the need for further reviews of the environmental impacts are valid, said Francis Pullaro, executive director for RENEW Northeast, a nonprofit association that advocates for renewable energy.

"We have no reason to question their sincerity," he said of federal administrators' calls for additional study.

As the first utility-scale project set to launch in federal waters, the 84-turbine Vineyard Wind bore the brunt of the delays, which in turn put federal investment tax credits at risk. But after a year of delays, the bureau released a preliminary analysis in early June in which it concluded the project would have mostly "negligible" and "minor" impacts on two dozen factors, such as native wildlife species, sediment, air traffic control and tourism.

That analysis marks an "incredibly significant" milestone for the project, as well as the many others lined up behind it, according to Rachel Pachter, chief development officer for New Bedford-based **Vineyard Wind LLC**. And with overwhelmingly positive responses in the public comment period, Pachter was optimistic for the green light when the Bureau of Ocean Energy Management issues its verdict this fall.

"These types of approvals are the exact signal people need to continue," Pachter said.

Morrissey agreed.

"Any opportunity where a federal agency is giving a project clarity is setting a positive precedent," he said.

That precedent not only gives hope to developers of the 16 proposed wind farms along the Eastern Seaboard with signed lease agreements through the government, it also is the kind of reassurance private investors, state leaders and the many ancillary companies that will support the sprawling wind farms need to proceed with their own plans.

A March 2020 study published by the American Wind Energy Association projected that creating 14,000 megawatts of offshore wind power projects in the next five years would generate 45,000 jobs across 74 occupations, including electricians, welders and vessel operators, and $14.2 billion in annual economic output. By 2030, those benchmarks would double, the study stated.

Hilary Fagan, vice president of business development for **R.I. Commerce Corp.**, anticipates a surge in activity in the state's offshore wind industry if the Vineyard Wind project is approved – both from existing Rhode Island companies pivoting operations, as well as new businesses entering the state.

R.I. Commerce has been credited with luring several global offshore wind companies to Providence, securing agreements with two British wind turbine maintenance companies – Boston Energy Wind Power Services Inc. and GEV Wind Power US LLC – to create a combined 177 new jobs in the state by 2023. The deals are part of $2.8 million awarded through the state's Qualified Jobs Incentive Tax Credit.

GEV recently expanded its presence in the Cambridge Innovation Center, adding room for another three people in addition to the three already there, according to Daniel Boon, GEV vice president. The bulk of the 123 jobs promised will come once the company finishes a 10,000-square-foot training facility in the Quonset Business Park, intended to teach technicians basic turbine safety and maintenance. While finalizing a lease was delayed due to travel restrictions caused by the pandemic, Boon is confident in the company's ability to finish the facility and bring on the 100-plus wind turbine technicians to train there.

Boon recalled how the small English town of Grimsby where he grew up transformed from a fishing community to a hub for the offshore wind energy sector, with dozens of major projects and new business for hotels, restaurants and other industries.

He envisions that transformation replicated in Rhode Island thanks to a growing number of industry experts setting up local offices, as well as its ties to the first – and, for now, only – offshore wind farm off Block Island.

That most of the half-dozen wind energy-related companies in the Cambridge Innovation Center have not returned since the state's stay-at-home order was lifted is not of concern to Stephen White, principal of Glosten Inc., a Seattle naval architecture and marine engineering firm that opened a Providence office there last year.

"At the end of the day, it's not going to change the result," he said of working physically in the same space. "Somebody [in the wind energy industry] is going to need the knowledge we have. We're eventually going to find each other."

PREPPING PORTS

Efforts to add to the state's growing collection of wind industry giants, as well as smaller players, have not stopped despite the tumultuous economic climate, Fagan said.

To that end, R.I. Commerce recently approved $15 million in tax credits through the Rebuild Rhode Island program to a developer planning to create a marine terminal on land along the East Providence waterfront. The South Quay Marine Terminal, part of a sprawling 45-acre site off Veterans Memorial Parkway, will be transformed into a port designed for heavy lifting – ideal for offloading components of the massive turbines and other equipment, said Michael Donegan, the attorney representing developer **RI Waterfront**

CONTINUES ON PAGE 14

CAUTION SIGNAL: Fred Mattera, executive director of the Commercial Fisheries Center of Rhode Island, warns of the potential for loss of life and loss of vessels because the 1-mile-wide transit lanes allocated for traveling around wind turbines don't provide enough room to safely maneuver vessels in high winds and storms when visibility is low.
PBN PHOTO/MICHAEL SALERNO

'The problem is, the people who are making decisions [on wind farms] **haven't gone out to sea.**'

FRED MATTERA, Commercial Fisheries Center of Rhode Island executive director

BUILDING PHASE: One of the five Block Island Wind Farm turbines under construction in 2016. Project owner Deepwater Wind LLC has since been acquired by Denmark-based Orsted, which has proposed erecting a 50-turbine farm called Revolution Wind off the Rhode Island coast.
COURTESY DEEPWATER WIND LLC

REDACTED

CONTINUED FROM PAGE 12

Enterprises LLC.

The estimated $103 million project will be completed by 2022, with construction creating 650 jobs, as well as a one-time $69 million bump in state GDP and $2.6 million in tax revenue, according to the application with R.I. Commerce. Once completed, the project will provide 21 jobs, contributing $2.5 million to annual state GDP and $95,000 in state tax revenues.

Since serving as the staging and preassembly base for the Block Island Wind Farm, the Providence port – across the river from the South Quay Marine Terminal – has forged ahead with $20 million in land and infrastructure investments aimed in part at supporting the pipeline of offshore wind projects, said Waterson.

It's unclear whether ProvPort has lined up agreements with Revolution Wind or Vineyard Wind; parties involved all declined to comment when asked, although Orsted has committed $40 million in investments to ProvPort and Port of Davisville at Quonset in North Kingstown.

But Waterson isn't worried. Even with major, multimillion-dollar investments in ports in New York, New Jersey and nearby New Bedford, there is still not enough infrastructure to support the 21,000 megawatts of Atlantic Ocean wind farms under lease in federal waters.

"I see pretty much every port available being used in some form to service these projects," he said.

In addition to Quonset, Providence and New Bedford, public and privately owned pier space in Fall River and Somerset have attracted attention from offshore wind developers, with several studies underway to consider redevelopment to accommodate wind farm projects, The Herald News has reported.

Federal project approvals will set off the next set of investments and upgrades under the Providence port's five-year capital plan. But the delays have, in some sense, been beneficial, giving the port more time to prepare for the anticipated surge in offshore wind projects, Waterson said.

Steven J. King, managing director for **Quonset Development Corp.**, which operates Quonset Business Park and the Port of Davisville, said the extra time has helped.

"There was a point where the projects were racing forward pretty quickly and we would not have had time to build out the infrastructure we need," King said.

Just last month, Gov. Gina M. Raimondo unveiled a proposal to seek $310.5 million in bond issues that would include $56.5 million for restoring industrial properties and for site preparation for offshore wind development. The Port of Davisville would also receive $31 million.

The proposed bond issues would need to be placed on the November ballot by the General Assembly.

Developing the state's offshore wind sector remains a "top priority" both economically and environmentally in tandem with the governor's goal of generating enough renewable energy to power the entire state by 2030, including 1,000 megawatts by 2020, according to Raimondo spokeswoman Audrey Lucas.

The 400 megawatts expected from Revolution Wind are crucial to hitting that 2020 target – which stood at 920 megawatts in projects finished or under contract as of the second quarter of 2020 – according to Christopher Kearns, interdepartmental project manager for the **R.I. Office of Energy Resources**. Kearns stressed the importance of striking a balance between speed and thorough state and federal review in developing the

UNCONCERNED: Stephen White, principal for Glosten Inc., a naval architecture and marine engineering firm based in Seattle with an office in the Cambridge Innovation Center in Providence, believes the half-dozen wind energy-related companies that have offices in the CIC will continue to get the job done whether employees work from home or in the office.
PBN PHOTO/MICHAEL SALERNO

offshore wind industry, noting the environmental consequences if the projects are not carefully planned and examined.

SLOW OR GO?

Unlike the wind farm developers who describe the federal permitting process as slow and laden with red tape, Fred Mattera, executive director for the **Commercial Fisheries Center of Rhode Island**, says the Bureau of Ocean Energy Management's review of Vineyard Wind lacked the time and detail needed to really understand how the project might impact fish and, in turn, the commercial fishermen who rely on them.

Mattera fears it might already be too late; the process allows developers to begin geophysical and geotechnical work before conducting research, and that work can drive away the squid and other species sensitive to noise and acoustic changes. Fewer fish could have a devastating economic impact on the state's fisheries and seafood industry, which was responsible for nearly 4,400 jobs and $420 million in direct and indirect economic impact in 2016, according to a **University of Rhode Island** study.

Safety also concerns Mattera, who says the 1-mile-wide transit lanes allocated for traveling around the turbines are not wide enough, particularly in high winds and storms when visibility is low.

"There's going to be loss of life and loss of vessels," he said. "The problem is, the people who are making decisions haven't gone out to sea."

Vineyard Wind seems poised to claim the title of "first" utility-scale offshore wind project, but Revolution Wind may not be far behind; the project remains on schedule to start delivering power by 2023, Morrissey said.

In the race to get turbines spinning in federal waters, Rhode Island also has several unique advantages, including expertise from the Block Island Wind Farm, a deep pool of talent through renowned college and university programs, and proximity to the federally designated offshore development area.

"I think the recipe is there, which you can see already from the incredible response of the global community to consider Rhode Island," Fagan said.

Whose turbines go up first may not matter, at least not in the same way it did several years ago. Aging fossil-fuel plants and increased attention on climate change ups the ante for clean alternatives, with demand for offshore wind power expected to exceed even the current pipeline of projects, Morrissey said.

And as the state scrambles for solutions to jump-start a struggling economy, the offshore wind industry could be an answer.

"This is really a tremendous opportunity for offshore wind to be a very strong foundational pillar of the post-COVID economic recovery," said Morrissey. ■

'I see pretty much **every port available being used** ... to service these projects.'

CHRIS WATERSON, Waterson Terminal Services LLC general manager

ON THE WATERFRONT: RI Waterfront Enterprises LLC has received approval for $15 million in tax credits from the R.I. Commerce Corp. to redevelop the South Quay Marine Terminal in East Providence, pictured, into a site that is capable of offloading wind turbines and other equipment used to build offshore wind developments.
COURTESY RI WATERFRONT ENTERPRISES LLC

App to help struggling fishermen

BY JAMES BESSETTE | Bessette@PBN.com

(Editor's note: A version of this story was first published on PBN.com on Aug. 4)

SOUTH KINGSTOWN – The **University of Rhode Island** Fisheries Center, along with Rhode Island Sea Grant, **Eating with the Ecosystem Inc.**, the **Commercial Fisheries Center of Rhode Island** and the Rhode Island Seafood Marketing Collaborative, announced on Aug. 4 that a new smartphone app is being adapted for local use to help fishermen reach potential customers.

The app, called FishLine and developed in California by Phondini Partners, allows fishermen to post what fish they caught on a given day, their prices, sale locations and hours for consumers in the hopes of connecting their catch with seafood customers.

URI said the app also offers recipes for meals on certain species and how those fish are caught.

While the **R.I. Department of Environmental Management** allowed fishermen to sell their fish direct to customers from their vessels as a means to support commercial fishing during the COVID-19 pandemic, fishermen were still having issues connecting with consumers, URI said. URI fisheries scientist Mitch Hatzipetro said the local seafood market "tanked" when the pandemic hit Rhode Island in the spring, causing restaurants to temporarily close as a result.

"When DEM offered the pilot project that allowed for dockside sales, some of the fishermen were leery of the idea because they weren't sure how to reach potential customers," Hatzipetro, who led the app project with Eating with the Ecosystem Program Director Kate Masury, said in a statement. "The app can help them do that."

URI said more than 12 fishermen were using FishLine to market their food, and the app was downloaded by more than 500 customers. The university also said Hatzipetro is working with local fishermen to better use the app and help spread the word about it to local consumers.

This isn't the only initiative to help the seafood industry and to those in need. In June, Eating with the Ecosystem, the Commercial Fisheries Center and the **Rhode Island Food Policy Council** created a virtual online cooking class series that raised money for families impacted financially by the pandemic. ■

AT THE DOCK: The FishLine app has been adapted for local use to help fishermen sell their catch to customers.
COURTESY PHONDINI PARTNERS

Stepping Up: Finding students a pad

BY NANCY LAVIN | Lavin@PBN.com

Editor's note: A version of this story was first published on PBN.com on July 31.)

WARWICK – Marie Cavanaugh knows firsthand the struggles of teaching through a computer screen.

The kind of electronics classes the engineer-turned-educator teaches through **STRAC Institute**, a Providence-based vocational school, are particularly difficult to replicate in distance-learning settings. The classes are typically hands-on labs showing college-aged students how to work with power generators and multimeters, and they are just not the same over videoconferencing. Cavanaugh, a longtime Warwick resident, is looking forward to returning to the classroom come the fall.

But for many of her out-of-state students to attend in-person classes, they need to find a place to live first. And this feat has become increasingly difficult as colleges and universities across the state limit occupancy of their dorms.

Fueled by her desire to teach in-person, as well as a long-standing dedication to giving back to her community, Cavanaugh has launched a social media campaign to help match college students seeking housing with homeowners with rooms for rent. Since first putting out the call to students and hosts through her community Facebook page, "2nd Chance for Warwick" in early July, Cavanaugh said she's received multiple inquiries from students and hosts.

Her matchmaking plan was temporarily derailed when she was hospitalized with pneumonia – an especially frightening experience since many of her symptoms matched that of COVID-19 – but since returning home, Cavanugh has renewed her dedication to outreach and screening of landlord-renter connections.

"I really feel for the students," she said, referencing a story about one student who was traveling back and forth from Martha's Vineyard to attend classes at **New England Institute of Technology**. "I couldn't imagine going back to college and having nowhere to live."

Students looking for housing and homeowners looking to rent rooms can get in touch with Cavanaugh through her community Facebook page at https://bit.ly/2PBKSt7. ■

PLACE FINDER: Marie Cavanaugh, a teacher at STRAC Institute in Providence, pictured in her classroom, is helping match college students looking for housing with homeowners who have rooms to rent.
COURTESY MARIE CAVANAUGH

Lenders: Slow start to Fed loan program

BY NANCY LAVIN | Lavin@PBN.com

(Editor's note: A version of this story was first published on PBN.com on Aug. 3.)

PROVIDENCE – If the outpouring of applications for the Paycheck Protection Program amounted to a flood, initial interest in the new Main Street Lending Program might be more of a trickle.

At least one local lender that has signed up to participate in the $600 billion Federal Reserve program reported little to no interest from Rhode Island businesses since they began accepting applications last month.

Westerly-based **The Washington Trust Co.** received some inquiries, but none that turned into applications, according to James M. Hagerty, executive vice president and chief lending officer.

Bank officials speculated that the program's parameters may make it less appealing for businesses. Unlike the PPP loans, which offer 100% forgiveness providing recipients meet certain criteria, the low-interest loans offered through the Main Street Lending Program must be repaid, although they do not specifically have to go to payroll expenses. It's also geared toward larger-size companies.

Other local lenders including **Citizens Bank** and **BankFive** also reported slow starts to the program, although each bank had received some inquiries and, in the case of Citizens, applications as well. Citizens and **Bank of America Corp.** both declined to share specific numbers of inquiries and applications. ■

OPINION

EDITORIALS

State must keep investing to reap offshore wind benefits

OPENING THE GATE: Deepwater Wind LLC completed the Block Island Wind Farm, pictured, in 2016. In June, the first utility-scale wind farm, an 84-turbine project called Vineyard Wind proposed off Martha's Vineyard, received a favorable preliminary analysis from the Bureau of Ocean Energy Management, paving the way for future wind farms to begin spinning.
COURTESY DEEPWATER WIND LLC

For a dozen years the economic and environmental promise of wind energy has alternately tantalized and frustrated Rhode Island leaders.

The state's early bet on what is still a nascent industry in this country has yet to fully pay off. But for once, it seems, delays that have long derailed or stalled every major project in the region may actually benefit Rhode Island.

In recent years, New Bedford's port appeared to have jumped ahead of Rhode Island as a ready staging ground for large-scale wind projects. That was largely because the Ocean State's ports lacked needed infrastructure, even though they were used for the small Block Island Wind Farm.

But ports in Providence and North Kingstown are now being upgraded and more work is planned, some of which is included in $63.5 million proposed by Gov. Gina M. Raimondo.

In this week's cover story, Steven J. King, managing director for Quonset Development Corp., which operates North Kingstown's Port of Davisville, acknowledged that the port is better-positioned today for a long anticipated surge in offshore wind projects.

There's no certainty a surge will happen but a federal agency in June offered what the industry saw as a positive review of an 84-turbine project proposed off Martha's Vineyard. If that project gets a final approval in the fall, it could finally clear the way for a 50-turbine wind farm planned off Rhode Island's southern coast.

We urge the General Assembly to put Gov. Raimondo's bond request, which includes offshore wind development, on the November ballot and for voters to approve it. ■

COVID-19 fight far from won

Rhode Island continues to do better than many other states in limiting major outbreaks of COVID-19. But such success can be fleeting, as we've seen elsewhere. Four other states, including Massachusetts, were concerned enough on Aug. 4 to add Rhode Islanders to travel advisory lists requiring them to quarantine for 14 days on arrival.

A widely followed tracking site operated by Johns Hopkins University calculates positive rates by excluding repeat results. By that measure, Rhode Island's daily positive rate has recently been exceeding the 5% figure that it and other states use to trigger quarantine restrictions on visitors.

While state health officials question the validity of how Johns Hopkins has been tracking Rhode Island's results, Gov. Gina M. Raimondo did move to order all bars to close by 11 p.m.

It matters less how well Rhode Island is doing compared with other states, than how it compares each day to its own recent testing history. The data on the latter is mixed, signaling a battle that's far from won. ■

POLL CENTRAL

EXECUTIVE POLL

The bright side

Has your company found silver linings amid the pandemic?

Yes: 86%

No: 14%

What silver linings has your company found? (Select any that apply)

We have found new ways to operate: 71%

We have morphed into a hybrid remote operation: 14%

We have not found any silver linings: 14%

We have discovered new software and technologies: 0%

We have expanded into a new market and/or industry: 0%

In what ways have silver linings benefited your company? (Select any that apply)

They have led to innovation and enterprise: 43%

They have helped us to operate more efficiently: 43%

They have opened the door to new opportunities: 43%

They have led to greater revenue stream(s): 29%

We have not seen any benefits: 14%

Is your company thriving more now than prior to the pandemic?

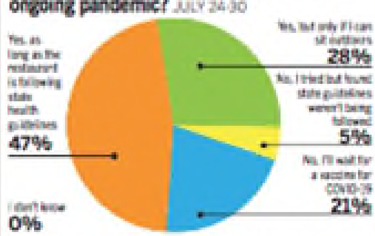
No: 71%

Yes: 29%

The Providence Business News Executive Poll is a weekly survey of 70 business leaders throughout the state, representing small and large companies in a variety of industries.

PBN.COM POLL

Are you comfortable dining out amid the ongoing pandemic? JULY 24-30



THIS WEEK'S POLL: **Should the federal government again provide an additional $600 weekly to those unemployed due to the pandemic, or something less?**

- The full $600 because too many people who did receive it still struggled to pay bills
- Less, because the recently expired payments served as a disincentive to return to work for too many
- I don't know

To vote, go to PBN.com and follow the link on the home page

Providence Journal
By: Alex Kuffner
October 27, 2020

RI set to double down on offshore wind power

PROVIDENCE — Rhode Island is set to double down on its commitment to offshore wind power.

The Ocean State became home to the first offshore wind farm in the nation with the completion of the 30-megawatt Block Island Wind Farm in 2016 and followed up last year with a contract for another 400 megawatts of capacity from the proposed Revolution Wind project to be built southwest of Martha's Vineyard.

Now, Gov. Gina Raimondo is looking to procure as much as 600 more megawatts of power generated by towering wind turbines that would rise up out of the ocean waters off southern New England.

Her administration announced on Tuesday that National Grid, the state's main energy utility, is working on a request for proposals from offshore wind developers that is on track to be released early next year.

The Rhode Island Office of Energy Resources is overseeing the drafting of the RFP, which is expected to be submitted for approval to the state Public Utilities Commission this fall. Any contracts that result from the bidding would also have to go before the commission for final approval.

The announcement follows Raimondo's executive order in January that aims to get all of Rhode Island's electricity from renewable sources by 2030 — one of the most aggressive climate goals in the country.

As of this summer, the state had developed or signed contracts for 933 megawatts of renewable energy. If no new programs were instituted, Rhode Island would get about 60% of the way to Raimondo's goal by the end of the decade, according to estimates from consultants working with the state.

The new RFP would push the state up to 82% of the goal, said Nicholas Ucci, commissioner of the state energy office. With continued investments in smaller renewable projects, primarily solar arrays, and as energy-efficiency efforts ramp up, he predicts Rhode Island will be able to meet the target.

"You can see how we can meet the bold goal the governor has set for us," said Ucci, who is heading up the planning effort to reach the goal, which would mean sweeping changes to the state's energy portfolio.

Raimondo framed the increased commitment to offshore wind within a broader context.

"In the face of global climate change, Rhode Island must drive toward a cleaner, more affordable and reliable clean energy future," she said in a statement. "It is critical that we accelerate our adoption of carbon-free resources to power our homes and businesses, while creating clean energy jobs."

For a state as small as Rhode Island, the amount of energy to be sought through the new procurement is huge. If a single wind farm were to win a contract for the maximum capacity, it would be 20 times the size of the five-turbine Block Island Wind Farm and 50% bigger than the Revolution project. A 600-megawatt wind farm would be able to power about 407,000 homes — or nearly every household in Rhode Island.

Add that hypothetical 600-megawatt project to the 400-megawatt Revolution project and the 30-megawatt Block Island array and nearly two-thirds of the annual electric demand in the state would come from offshore wind.

The announcement, however, comes at a difficult time for the offshore wind industry. After the successful construction of the pilot project about three miles southeast of Block Island, the federal government held an auction for offshore wind leases near Massachusetts and Rhode Island that shattered records for the amount that companies were willing to bid. Back then, in late 2018, it appeared that the industry's course was all but assured. Massachusetts, Rhode Island and Connecticut were all looking to buy offshore wind power to meet their clean energy goals, and the developers would supply it.

But a dispute between commercial fishermen and Vineyard Wind — one of the companies with proposals in the same general location and the first to apply for permits to the federal government — quickly expanded across the industry. Amidst concerns that developers weren't spacing wind turbines far enough apart to allow for safe navigation by fishing boats, the federal Bureau of Ocean Energy Management has held off a final decision on the Vineyard Wind application and has sat on filings by other companies.

Ørsted is one of those still waiting for an answer. The Denmark-based global company, which took over the Block Island Wind Farm after buying its developer, Deepwater Wind, is partnering with Eversource Energy on the Revolution project.

David Hardy, the newly appointed CEO of Ørsted Offshore North America, believes that the speed at which things progress will depend on the upcoming election. A win by Joseph R. Biden Jr., who is a supporter of renewable energy, would be a clear boost for offshore wind. Hardy hopes that if President Trump is reelected, it won't mean further delays. He argued that Republicans should be able to embrace an industry that will generate jobs and create energy independence.

"We're all in on offshore wind in the long run," Hardy said. "We're continuing to move forward."

Ucci said he expects a decision on Vineyard Wind from the Bureau of Ocean Energy Management in late November or early December, which should break the logjam for other applications. He is optimistic, too, about the industry's prospects and said a lot can happen between now and 2022, when a contract could be awarded through the new RFP.

Union leaders welcomed the announcement, saying it would create "hundreds of well-paying middle-class jobs" for people in the construction trades.

"This is a unique opportunity that is truly a win all around," Michael F. Sabitoni, president of the Rhode Island Building & Construction Trades Council, said in a statement.

The NK Standard-Times

The NK Standard-Times
November 12, 2020

Revolution Wind team to host virtual information sessions

NORTH KINGSTOWN – Next week, the offshore wind project Revolution Wind will be hosting virtual informational sessions for the North Kingstown community and other Rhode Islanders. The sessions will be live online on Wednesday, Nov. 18 at 1 p.m. and Thursday, Nov. 19 at 6 p.m.

During the sessions, the Revolution Wind team from Ørsted and Eversource will share project updates, including details on our planned transmission cable route in North Kingstown, and answer questions from the community.

Members of the public are all invited to attend. Those interested in attending should register at revolution-wind.com.

The Block Island Times
November 12, 2020

Online information session on next offshore wind project

The public is invited to an online discussion about the next large-scale offshore wind farm project, Revolution Wind, that will bring energy to more than 350,000 homes in Rhode Island and Connecticut.

The information sessions will take place on Wednesday, Nov. 18 at 1 p.m. and again on Thursday, Nov. 19 at 6 p.m. Both sessions will be held live. Participants can go to revolution-wind.com to access the registration link. Once registered, Eventbrite will provide details on how to join the session. According to Ørsted, which is developing the project with Eversource, a recording of the sessions and an opportunity to comment will remain available until Dec. 31.

According to Ørsted, the project's wind turbines will be located more than 15 miles south of the Rhode Island coast and 22 miles southeast of the Connecticut coast. An underground transmission cable from the wind farm will land in North Kingstown.

RHODE ISLAND NEWS

ABC 6
By: Tim Studebaker
November 18, 2020

New wind farm in development between Block Island and Martha's Vineyard

The new wind farm could contain up to 100 wind turbines, and would produce 350,000 homes' worth of power in RI and CT.

QUONSET, R.I. (WLNE) – A new wind farm 15 miles off the Rhode Island coast, between Block Island and Martha's Vineyard, could become home to up to 100 new wind turbines in the next few years.

Kellen Ingalls with the company Orsted says, "Revolution Wind will produce enough clean energy to power 350,000 homes and displace, by eliminating future emissions, more than 1,000,000 metric tons of carbon pollution."

The farm would connect to the power grid through a transmission line at Quonset Industrial Park in North Kingstown, and provide power to both Rhode Island and Connecticut. It's a partnership between the power company Eversource, and Orsted, the company that owns and operates the Block Island Wind Farm.

Ingalls says, "Both Rhode Island and Connecticut have ambitious clean energy goals that are essential to combating climate change."

The two companies began holding online public information sessions Wednesday afternoon, answering questions from the public about job creation, awarding contracts to local companies, and the fishing and boating industries. The turbines will be spaced in a one mile by one mile grid.

Ingalls says, "That spacing is consistent with requests from members of the fishing community and other maritime stakeholders."

They'll also be making $40,000,000 dollars worth of infrastructure investments in ProvPort and Quonset. Construction could begin as soon as 2023

Ingalls says, "So that'll position both states as offshore wind leaders, and it'll launch the region's next great maritime industry."

They'll hold another session Thursday evening and the videos are available for the public to watch anytime.

Visit their website for more information: revolution-wind.com/

Late Correction: The original version of this story stated that up to 50 wind turbines would be built as part of the Revolution Wind project, based on original communication from a company spokesperson. That company spokesperson has since corrected the total number of potential turbines from 50 to 100.

The Providence Journal

The Providence Journal
By: Alex Kuffner
November 18, 2020

RI's wind-farm plan poised to advance in '21

PROVIDENCE — Much was made of the Raimondo administration's selection in 2018 of a proposal for a massive offshore wind farm off the Rhode Island coast that would power as much as a quarter of the state's electric load.

The project, known as Revolution Wind, cleared a key hurdle a year later when state regulators approved a contract for the wind farm to sell power to National Grid, Rhode Island's dominant electric utility. And developers Orsted and Eversource Energy would get another boost when Connecticut also agreed to buy power from the wind farm, a move that nearly doubled the size of the project to 704 megawatts.

But since those very big and very public milestones, things have been relatively quiet for a project that could cost more than $2 billion to build.

The paucity of action is largely due to a hold-up in the federal permitting process for offshore wind projects amid concerns raised by commercial fishermen that arrays of towering turbines off the southern New England coast would interfere with fishing activities.

But a Biden presidency is expected to boost renewables overall, and a decision could come in a matter of weeks for the benchmark Vineyard Wind project, the first offshore wind farm to go before the U.S. Department of the Interior's Bureau of Ocean Energy Management. A favorable ruling on the proposal could break the logjam for Revolution Wind and other projects.

Orsted and Eversource are gearing up for a series of steps forward in 2021 that notably includes an expectation that BOEM will put their application — known as a Construction and Operations Plan — out for public comment.

The developments, detailed in a virtual open house the companies held on Wednesday, will also include filings to Rhode Island state agencies for a transmission cable that would connect the project's wind turbines — as many as 100 mounted on towers in an area between Block Island and Martha's Vineyard — to the onshore electric grid.

The plan is to run the cable north under the Rhode Island Sound seafloor, through the west passage of Narragansett Bay and on to the Quonset Business Park in North Kingstown. The cable would snake its way either through a cut in an existing seawall or in a hole drilled underneath it and then continue underground about a mile to a National Grid substation located in the state-owned business park.

The project partners expect to submit the cable documents to the state Energy Facility Siting Board, the Department of Environmental Management and the Coastal Resources Management Council this winter.

The cable route and landfall location were largely dictated by the proximity of an electrical substation that has capacity to handle the power from the wind farm, according to Ken Bowes, vice president of offshore wind siting and permitting at Eversource. Other sites under consideration included Brayton Point, where a coal-burning power plant was recently demolished.

Bowes said he expects a rigorous but fair process before the Rhode Island permitting agencies.

"They want to see this project go forward and they see the value of it," he said in a conference call after the public forum.

At the meeting, Kellen Ingalls, project development director for Orsted, said the Revolution project would power 350,000 homes and displace at least one million metric tons of carbon pollution — the equivalent of taking 150,000 cars off the road. It comes as Rhode Island, home to the only offshore wind farm in the nation, aims to increase its use not only of offshore wind energy but of all types of renewable power.

"It comes down to the kind of future we want to see for ourselves," he said. "This is a clean, renewable way to power our lives."

The Providence Journal

The Providence Journal
By: Dave Monti
November 25, 2020

Fishing Report: Wind farm habitats get thumbs-up from anglers

Ørsted, the Danish multinational power company that built the Block Island Wind Farm and five other wind farms off the East Coast, held the first of its free "Fishinar Series" last Wednesday on ground fishing for summer flounder, cod, tautog and black sea bass in the near offshore. More than 90 anglers participated in the event, which was live-streamed on Zoom through District Hall Providence.

The aim of the series is to encourage angler input into offshore wind farm plans while relating strategies and tactics on how to catch the fish through expert charter captains and private anglers. You can view the "Fishinar" in its entirety on YouTube at https://youtu.be/wlcmH2XhVXU.

A panelist, Capt. BJ Silvia of Flippin Out Charters in Portsmouth, said: “I looked at an underwater video at the Block Island Wind Farm, saw all the mussel growth and fish feeding at the base of the pylon, then I saw a tautog feeding halfway up the vertical pylon and thought, 'I have to figure out a way to catch these suspended fish.' ”

Spear fishermen and rod-and-reel anglers are catching striped bass at the wind farm. “Peter Vican, Rhode Island striped bass record holder [77 pounds, 6.4 ounces] and his fishing partner, Don Smith, were some of the first anglers to drop an ell at the wind farm for bass,” said Capt. Chris Willi of Block Island Fish Works, who lives and runs a charter and tackle business on the island. “We have a lot of natural structure around Block Island and the ground fishing is good, but the wind farm added a new dimension to our fishing. Each pylon is a 90-foot vertical artificial reef with enhanced structure, habitat and fish. We expect the same from other wind farms.”

“When fluke fishing," said panelist Rich Hittinger, first vice president of the Rhode Island Saltwater Anglers Association, "I like to fish with 20-pound test line without bait, just a jig and second stinger hook above the jig on a 3-foot leader. Anglers like the structure at the base of wind farm pylons; if fact, we made a proposal to explore a pilot that adds scour protection and structure to the base of pylons.”

The second "Fishinar," "Angling for Pelagic Fish," will be held at 7 p.m. Wednesday, Dec. 9, via Zoom. Panelists include Capt. John McMurray of New York, a charter captain, writer, president of the American Saltwater Guides Association and member of the Atlantic States Marine Fisheries Commission; Capt. Charlie Donilon of Snappa Charters, a shark fishing and shark cage diving expert; and Richard Pastore, RISAA member and near offshore fishing expert.

Species discussed will include tuna, sharks and mahi.
Visit https://districthallprovidence.org/calendar for additional information and to register for free tickets.

Dave Monti holds a captain's master license and a charter fishing license. He is an RISAA board member, a member of the R.I. Party & Charter Boat Association, the American Saltwater Guides Association and the R.I. Marine Fisheries Council. Forward fishing news and photos to Capt. Dave at dmontifish@verizon.net or visit www.noflukefishing.com and his blog at www.noflukefishing.blogspot.com.

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The Independent
By: Cameron Merrit
November 27, 2020

Revolution Wind talks wind farm proposal with public

Revolution Wind, the renewable energy venture between Eversource and Orsted, held a pair of virtual seminars last week to give members of the public a chance to view its proposal for a wind farm 15 miles south of the Rhode Island coast. Among the items available to view were a project timeline and an overview of the companies, pictured above.

Photo Courtesy of Revolution Wind

NORTH KINGSTOWN, R.I. — Revolution Wind, the renewable energy venture between Connecticut-based power company Eversource and Denmark-based power company Orsted – the world's leading developer of offshore wind projects – that aims to create a wind farm 15 miles south of the Rhode Island coast, held two virtual seminars last Wednesday and Thursday to give people a look at the project and the opportunity to ask questions about it.

The wind farm would produce 704 megawatts of energy, 400 of which will be sent to Rhode Island via two 46-mile underground transmission cables to a new substation set to be constructed in the Quonset Business Park. The substation would connect to National Grid's existing Davisville Substation before being spread out across the state grid. Work on it could begin as early as 2023, and it is projected to power over 350,000 households in Rhode Island and Connecticut. The project is currently going through a municipal, state and federal permit process through a variety of agencies and would play a large role in Gov. Gina Raimondo's Executive Order committing Rhode Island to relying 100 percent on renewable energy by 2030.

“Rhode Island has the most ambitious power goals in the country,” Kellen Ingalls, Orsted Project Development Director for Revolution Wind, said. “Revolution Wind will help them meet that goal.”

Ahead of the virtual presentation, held via Zoom, attendees entered a virtual breakout room which included handouts and interactive sheets featuring basic information on the project, its timeline, and safety measures to be put in place during and following construction of the 100-turbine wind farm.

For the presentation, Maija Benjamins, Eversource Manager of Siting for New England, read over a slideshow explaining the project, how it works, their goals and the next steps.

The wind farm itself will be built in federal waters approximately 15 miles south of Rhode Island, 12 miles southwest of Martha’s Vineyard and 34 miles southeast of Connecticut and will consist of up to 100 wind turbines arranged in a one-by-one nautical mile wind with the ability to withstand a “500-year” hurricane wind burst and wave conditions, according to the presentation.

The power generated by the wind turbines will then be sent through a system of submarine cables to an offshore substation before traveling to North Kingstown via the two 46-mile cables to connect it to the Davisville Substation. Revolution Wind is expected to deliver 704 megawatts of power, with 400 megawatts going to Rhode Island and 304 megawatts to Connecticut. Revolution Wind said they expect the power generated by the wind farm to displace at least one million metric tons of carbon pollution.

According to the presentation, Revolution Wind expects the project to create over 1,200 construction jobs between the two states, in addition to the creation of thousands of indirect and induced jobs created to support the project’s work and. Two companies have committed to investing $40 million in port infrastructure within the Ocean State.

The group said they’ve been listening to the questions and concerns of a variety of people, businesses, Native American tribes, fishers, environmental groups and government agencies to ensure the project works soundly, and are in the process of applying for permits from a variety of agencies, including the Town of North Kingstown, the Bureau of Ocean Energy Management (BOEM), the US Army Corp. of Engineers, the Environmental Protection Agency (EPA), the Federal Aviation Administration (FAA), Department of Defense, NOAA Fisheries and the US Fish and Wildlife Service, with the hope of having all permits approved by January 2023 and having the wind farm operational by the end of 2023.

Following the seminar, attendees were encouraged to ask questions during a Q&A portion and were given further time to explore the virtual breakout room, which is still available on their website, along with the slide presentation.

For more information on Revolution Wind, visit their website revolution-wind.com.

PROVIDENCE Journal

The Providence Journal
By: Alex Kuffner
January 13, 2021

Report: Raimondo's 2030 renewables goal achievable

PROVIDENCE —

If electric demand remains flat in coming years, Rhode Island would have to procure one-and-a-half times as much renewable energy as it has so far in order to meet Gov. Gina Raimondo’s goal of getting all of the state’s power supply from wind, solar and other clean energy sources by the end of the decade.

It’s an exceedingly ambitious goal — the most aggressive in the nation, according to the Raimondo administration — but it is achievable, a report released Wednesday by the state Office of Energy Resources concludes.

“Rhode Island is a national clean-energy leader with viable pathways to become the first 100% renewable state and dramatically reduce electric-sector [greenhouse gas] emissions,” state energy commissioner Nicholas S. Ucci said in a statement.

Rhode Island has already taken substantive steps toward the goal, with more than 900 megawatts of renewable energy capacity already developed or contracted for, including the 400-megawatt Revolution Wind project proposed in the ocean waters off the state's coast.

If the offshore wind farm wins federal approval and gets built, it would push the total supply of renewable energy to the state up to about 40%. And if a solicitation underway for another 600 megawatts of offshore wind capacity is fulfilled, it would push the total up to about 80%.

The remainder, according to the authors of the report from The Brattle Group, a Boston-based consulting firm, could be filled through big ground-mounted solar farms, smaller rooftop solar arrays and the purchase of renewable energy certificates — market commodities that account for the environmental benefits of clean power generation.

No matter how Rhode Island were to try to achieve the goal, it would cost electric ratepayers more than what they're paying now. In scenarios projecting 100% wholesale solar, 100% offshore wind or 100% land-based wind, the above-market costs would range from $1.9 billion to $2.1 billion. For a typical residential electric bill, the impact would be between $11 and $14 a month.

But the authors also found that positive economic impacts of the development of in-state sources of energy — offshore wind, wholesale solar and rooftop solar — would outweigh the bill impacts with a net addition of as much as $1.5 billion to the Rhode Island gross domestic product through the support of construction and operations jobs.

Some of Rhode Island's biggest corporations expressed support for the report's findings.

"Today's report provides a clear roadmap for Rhode Island to achieve our common goal: a decarbonized electricity system," said Tom Giordano, executive director of the Partnership for Rhode Island, a group representing Amica, Hasbro, IGT, Brown University and other large interests in the state. "We are excited to help support the achievement of this goal and we are confident that Rhode Island businesses will grow and prosper in the clean energy future."

Raimondo signed an executive order last year that set the 2030 target date, but the order doesn't make the goal mandatory.

The report recommends a revision of the state Renewable Energy Standard to match up with Raimondo's order and encode it in state law. The standard, which was originally adopted in 2004, requires an annual increase in renewable energy supplies to Rhode Island with a goal of 38.5 % by 2035.

The report also recommends extending the state's energy efficiency programs, which run through 2023, to 2030.

Electric demand in Rhode Island currently stands at around 7,700 gigawatt hours a year. Although that figure is expected to dip a little through energy efficiency incentives that are among the most effective in the nation, the Brattle consultants say it will grow over the long term as oil and gas heating systems are replaced with electric devices and as more people switch to electric cars.

It means that Raimondo's goal is actually a moving target. Getting there will mean adding more than 300 gigawatt hours of supply on average every year until 2030.

And to stay at 100-% renewable, the state would have to continue adding 400 to 500 gigawatt hours annually of new clean energy generation beyond 2030, according to the report. Total power demand in the state could end up doubling as electrification of the economy picks up pace.

It would be necessary if the state is to slash its carbon footprint. Electricity accounts for only 26% of greenhouse gas emissions in Rhode Island, while the numbers for transportation and heating are 36% and 35% respectively.

"Decarbonizing the electricity sector is likely to be foundational to decarbonizing the Rhode Island economy more broadly," the report states.

The Providence Journal

The Providence Journal
By: Alex Kuffner
April 14, 2021

Offshore wind developers announce ProvPort facility

PROVIDENCE — The owner of the first offshore wind farm in the nation is set to build an assembly facility at the Port of Providence to support the development of much bigger projects that would supply power to Rhode Island, Connecticut and New York.

Orsted, the global leader in offshore wind development and operator of the five-turbine Block Island Wind Farm, joined on Wednesday with its partner Eversource to announce construction of the facility that will fabricate and assemble foundation platforms for what could amount to more than 100 wind turbines.

The platforms are critical components for the proposed wind farms. They would be mounted on foundations secured to the ocean floor and wind turbines would be installed on top of them.

The plant would be used as a regional hub to supply the pieces to projects being developed by Orsted and Eversource around the Northeast. Its construction over the next year will represent the first major work associated with offshore wind in Rhode Island since the 30-megawatt demonstration project off Block Island was completed in 2016.

“We’ve been building towards this moment since the earliest days of Block Island wind,” said Matt Morrissey, head of U.S. market affairs and strategy for Orsted.

The investment in ProvPort signals a commitment by Orsted and Eversource to Rhode Island, and reflects a newfound optimism in the industry under a Biden administration that is moving previously-stalled proposals through the federal permitting process — even as commercial fishermen and other stakeholders raise concerns about impacts.

It also shows one way in which the Ocean State is using its first-mover status to benefit, through jobs and economic development, from other states’ agreements to buy offshore wind power.

“Ørsted and Eversource are keeping their commitment to making significant investments in Rhode Island to create new, good-paying union jobs and position our port facilities to become central hubs in this growing industry,” Gov. Dan McKee said in a statement.

The announcement comes as Orsted and Eversource lay the groundwork for the development of a series of utility-scale wind farms that would help meet the growing demand for renewable energy in the Northeast by supplying power to hundreds of thousands of homes.

The projects include two in the same area of waters in Rhode Island Sound: the South Fork Wind Farm, a 132-megawatt proposal that would send electricity to Long Island; and Revolution Wind, the 704-megawatt proposal that would supply 400 megawatts of capacity to Rhode Island and 304 megawatts to Connecticut.

They also include a third: the 924-megawatt Sunrise Wind, which would supply New York and be built off that state's coast.

While Orsted and Eversource say South Fork is on track to get its federal permit early next year and the public comment periods on reviews for Revolution and Sunrise could come this spring and summer respectively, the investment in ProvPort is still somewhat of a leap of faith for the developers.

But Liz Donohue, Eversource's government and regulatory affairs manager for offshore wind, said the industry has been assured by the federal government's recent actions, including last month's announcement of a plan to develop 30,000 megawatts of offshore wind by 2030.

"That was a big move and they have taken steps since then to continue moving forward," she said.

The new $24-million fabrication facility is part of $40 million in total investments that Orsted and Eversource previously announced in ProvPort and the Quonset Business Park.

The companies also reached a labor pact with the Rhode Island Building and Construction Trades Council and Dimeo Construction, the lead contractor for the project, agreeing to use only local union labor to build the 228-foot-long facility. The work will require about 40 jobs.

"These jobs represent tremendous opportunities for union workers to contribute their skills and enthusiasm to a growing industry that will help our state's economic recovery and power our future," said Michael Sabitoni, president of the trades council.

The number of jobs would grow as the facility goes into operation, said Morrissey. Orsted and Eversource have not announced any details about the turbines they would use, including their size and capacity. But if all of the projects were to go forward as proposed, they would need at least 100 turbines.

During construction of the Block Island project, the main pieces of the turbine foundations were made in Louisiana, but smaller pieces were assembled at Quonset. Parts of the turbine towers were finished at ProvPort as well.

But the planned fabrication work in Rhode Island will be more extensive, said Morrissey.

"I think the future for Rhode Island and offshore wind is very bright," he said.

Providence Business News
By: Nancy Lavin
April 14, 2021

Orsted, Eversource plan wind farm manufacturing facility at ProvPort

THE PORT OF PROVIDENCE will be home to a new wind farm component manufacturing facility serving a host of wind farms planned across the region, Orsted A/S and Eversource Energy announced on April 14. / PBN PHOTO/MICHAEL SALERNO

PROVIDENCE – The Port of Providence will soon be ground zero for assembling and building the foundations for a slew of major wind farm projects, Orsted A/S and Eversource Energy announced on Wednesday.

The two companies, which are teaming up to develop multiple wind farms across the East Coast, including the planned Revolution Wind in Rhode Island, in a news release announced plans to build a 228-foot-long manufacturing facility at ProvPort. The project, which is part of the companies' already announced $40 million investment in ports in Providence and Quonset, will serve as the base for "advanced fabrication and assembly" of foundation platforms for wind projects planned in Rhode Island, Connecticut and New York, the release stated.

Construction and related site improvements will be completed by local union labor, thanks to a project labor agreement between project partners the Rhode Island Building and Construction Trades Council and Dimeo Construction Co., of Providence. The project will create roughly 40 construction jobs.

The announcement comes after several major wind farms – including the South Fork Wind Farm jointly planned by Orsted and Eversource in New York and Ocean Wind, a project off the New Jersey coast planned by Orsted and Public Service Enterprise Group – advanced through the federal permitting process overseen by the Bureau of Ocean Energy Management. Orsted also recently signed an agreement with the National Oceanic and Atmospheric Administration to share data from the federally leased waters to improve scientific understanding about those areas.

The timeline for the Revolution Wind project, which is the only one in the pipeline that will supply power to Rhode Island, remains unclear, but state officials have insisted the other projects offer ample opportunities for the state to benefit, including through its ports.

In a statement, Gov. Daniel J. McKee described the state as home to "one of the most thriving offshore wind industries in the nation."

"Orsted and Eversource are keeping their commitment to making significant investments in Rhode Island to create new, good-paying union jobs and position our port facilities to become central hubs in this growing industry," McKee said.

The jobs the growing industry provides will also prove critical to helping the state crawl out of the pandemic-induced recession, said Joe Nolan, Eversource's executive vice president for strategy, customer and corporate relations.

David Hardy, CEO of Orsted Offshore North America, said in a statement the announcement serves to reaffirm the company's commitment to the state.

"Our partnership with local labor is critical to the success of our offshore wind farms and we're ready to put more local tradesmen and women to work in the state where we launched America's offshore wind industry," he said.

GOLOCAL Prov

GoLocalProv
By: GoLocalProv Business Team
April 15, 2021

Ørsted and Eversource Tap ProvPort as Regional Offshore Wind Hub

RI's offshore wind industry makes major announcement.

Rhode Island's leadership in the offshore wind industry took another major step forward as joint-venture partners Ørsted and Eversource announced they are taking the first steps toward transforming ProvPort into a regional offshore wind hub.

The two companies announced that they will be developing a new advanced foundation component facility to support the assembly of the developers' portfolio of Northeast offshore wind farms.

The new 228-foot long facility will be used for advanced fabrication and assembly of foundation platforms for Ørsted and Eversource's offshore wind projects serving Rhode Island, Connecticut, and New York. This facility will further develop Rhode Island's offshore wind industry and contribute to the state's growing blue economy.

"Rhode Island is proud to be home to not only the country's first offshore wind farm, but also one of the most thriving offshore wind industries in the nation," said Rhode Island Governor Daniel J. McKee. "Ørsted and Eversource are keeping their commitment to making significant investments in Rhode Island to create new, good-paying union jobs and position our port facilities to become central hubs in this growing industry. Rhode Islanders are ready to get to work building the next great U.S. offshore wind farms."

Together, Ørsted and Eversource will deliver clean, reliable energy to the Northeast through offshore wind, providing enough electricity for nearly 1 million homes. In December 2016, Ørsted and Eversource teamed up to launch a new clean energy industry right here in the U.S. Northeast. That partnership has now grown to include at least 1,700 MW of offshore wind under development, including the 704-megawatt Revolution Wind project serving Rhode Island and Connecticut; the 132-megawatt South Fork Wind serving Long Island, and the 924-megawatt Sunrise Wind project serving New York.

"We're reaffirming our commitment to Rhode Island with the advancement of a regional fabrication and assembly hub at ProvPort," said David Hardy, Chief Executive Officer of Ørsted Offshore North America. "Our partnership with local labor is critical to the success of our offshore wind farms and we're ready to put more local tradesmen and women to work in the state where we launched America's offshore wind industry."

Ørsted's RI roots are deep in this emerging industry. The company acquired Deepwater Wind in October of 2018. Deepwater constructed America's first offshore wind project.

The two companies also announced they have reached a Project Labor Agreement (PLA) with the Rhode Island Building and Construction Trades Council and Dimeo Construction, ensuring that the site upgrades and facility construction required to turn ProvPort into a regional offshore wind hub will be completed by local, union labor.

The PLA, covering the ProvPort facility construction and site work, represents the continued close cooperation between Ørsted and Eversource and the Rhode Island Building Trades. It also builds on the earlier collaboration between the Building Trades and Ørsted on the Block Island Wind Farm, America's first offshore wind farm, which has been in operations since 2016.

ProvPort s working port has historically been a longshoreman's facility.

"Offshore wind will play a key role in helping Rhode Island recover from the grips of the Covid-19 pandemic, delivering good-paying, local jobs and providing significant economic investment to position the state's infrastructure for the industries of the future," said Joe Nolan, Executive Vice President for Strategy, Customer, and Corporate Relations, and incoming Chief Executive Officer and President as of May 5 at Eversource Energy. "We are proud to partner with the Rhode Island Building Trades on this critical project that will help transform ProvPort into a regional hub for offshore wind, while ensuring that union labor plays a central role in the state's quest to reduce emissions and deliver on the promise of clean energy."

In total, Ørsted and Eversource are investing a combined $40 million at ProvPort and Quonset Point, in North Kingstown, R.I., to support the development of the Revolution Wind project serving Rhode and Connecticut, as well as the South Fork Wind project serving New York.

The site upgrades and facility construction at ProvPort will create approximately 40 union jobs.

Dimeo Construction, the project's general contractor and a leading construction company in New England, has also engaged a number of local Rhode Island construction firms to support the facility construction, all of whom will work under this PLA.

"We're grateful to be the lead contractor on this important work to upgrade ProvPort and construct a new facility that will be crucial to the development of the region's offshore wind farms," said Dimeo Construction CEO Bradford S. Dimeo. "We thank Ørsted and Eversource for giving us this opportunity to put more local union workers to work alongside us as we contribute to this exciting new industry."

The companies claim the new partnership between labor and industry will create pathways to apprenticeships and career opportunities for lower-income, minority, women and economically-disadvantaged Rhode Islanders through the Building Futures Rhode Island program. Apprentices from Building Futures were part of the labor workforce that built Ørsted's Block Island Wind Farm, Rhode Island's – and America's – first offshore wind farm.

4C Offshore
By: Tom Russell
April 15, 2021

Ørsted and Eversource take steps to establish ProvPort manufacturing facility

Joint-venture partners Ørsted and Eversource are taking the first steps toward transforming ProvPort into a regional offshore wind hub. The two companies announced a new advanced foundation component facility to support the assembly of the developers' portfolio of Northeast offshore wind farms.

The new 228-foot long facility will be used for fabrication and assembly of foundation platforms for Ørsted and Eversource's joint-venture offshore wind projects serving Rhode Island, Connecticut, and New York.

Ørsted and Eversource have also reached a Project Labor Agreement (PLA) with the Rhode Island Building and Construction Trades Council and Dimeo Construction, ensuring that the site upgrades and facility construction required to turn ProvPort into a regional offshore wind hub will be completed by local, union labor.

"Rhode Island is proud to be home to not only the country's first offshore wind farm, but also one of the most thriving offshore wind industries in the nation," said Rhode Island Governor Daniel J. McKee. *"Ørsted and Eversource are keeping their commitment to making significant investments in Rhode Island to create new, good-paying union jobs and position our port facilities to become central hubs in this growing industry. Rhode Islanders are ready to get to work building the next great U.S. offshore wind farms."*

"We're reaffirming our commitment to Rhode Island with the advancement of a regional fabrication and assembly hub at ProvPort," said David Hardy, Chief Executive Officer of Ørsted Offshore North America. *"Our partnership with local labor is critical to the success of our offshore wind farms and we're ready to put more local tradesmen and women to work in the state where we launched America's offshore wind industry."*

"Offshore wind will play a key role in helping Rhode Island recover from the grips of the Covid-19 pandemic, delivering good-paying, local jobs and providing significant economic investment to position the state's infrastructure for the industries of the future," said Joe Nolan, Executive Vice President for Strategy, Customer, and Corporate Relations, and incoming Chief Executive Officer and President as of May 5 at Eversource Energy. *"We are proud to partner with the Rhode Island Building Trades on this critical project that will help transform ProvPort into a regional hub for offshore wind, while ensuring that union labor plays a central role in the state's quest to reduce emissions and deliver on the promise of clean energy."*

"Rhode Island tradesmen and women built America's first offshore wind farm and are ready to get back to work, this time on the country's next-generation offshore wind farms," said Michael F. Sabitoni, President of the Rhode Island Building and Construction Trades Council. *"These jobs represent tremendous opportunities for union workers to contribute their skills and enthusiasm to a growing industry that will help our state's economic recovery and power our future."*

In total, Ørsted and Eversource are investing a combined $40 million at ProvPort and Quonset Point, in North Kingstown, R.I., to support the development of the Revolution Wind project serving Rhode and Connecticut, as well as the South Fork Wind project serving New York.

The site upgrades and facility construction at ProvPort will create approximately 40 union jobs.

In November 2020, Ørsted and Eversource signed a landmark agreement with North America's Building Trades Unions, an alliance of 14 national and international unions representing over three million construction workers, for the build out of their U.S. portfolio of projects with union labor. The NABTU agreement is based on the successful model developed by the Rhode Island Building Trades for the Block Island Wind Farm, under the leadership of President Michael Sabitoni.

Ørsted and Eversource teamed up back In December 2016 to launch a new clean energy industry in the U.S. Northeast. That partnership has now grown to include at least 1,700 MW of offshore wind under development, including the 704 MW Revolution Wind project to help power Rhode Island and Connecticut; the 132 MW South Fork Wind to serve Long Island, and the 924 MW Sunrise Wind project which will provide power for New York.

CBS This Morning
April 22, 2021

Providence Business News
By: Nancy Lavin
April 29, 2021

Revolution Wind project moves forward with start to federal permitting review

PROVIDENCE – Plans to bring 400 megawatts of wind power to Rhode Island are advancing, with the federal agency in charge of issuing the project permits on Thursday announcing the start to its review process.

The U.S. Department of the Interior's Bureau of Ocean Energy Management in a statement said it will begin its formal review and decision on the 100-turbine Revolution Wind project proposed for federal waters off the coast of Block Island. The process begins with a public comment period and review of the project for its impact on wildlife, fishing and boating industries and other economic and environmental factors before the agency issues a final decision.

International renewable energy developer Orsted A/S, which jointly proposed the project with the utility company Eversource Energy, previously announced its original 2023 completion date would likely be delayed due to uncertainty in the federal permitting process under the previous presidential administration.

With BOEM's announcement Thursday, the company will "soon be in a position to better refine the project's timeline," Orsted spokeswoman Meaghan Wims said in an email on Thursday.

In a statement, the company called the federal agency notice "the most significant permitting milestone to date."

"Revolution Wind is now one critical step closer to helping Rhode Island and Connecticut realize their clean energy goals, while delivering thousands of good-paying local jobs, providing significant local investment and helping to grow a new domestic supply chain," the company stated. "We look forward to BOEM's review as it moves toward issuing a final Environmental Impact Statement for this historic offshore wind project."

Rhode Island's Port of Galilee is slated to serve as an onshore operations and maintenance hub for the 100-turbine project, according to the plans submitted to BOEM. Orsted and Eversource also recently announced plans to build a wind farm manufacturing facility at the Port of Providence as part of its $40 million investment in both Providence and Quonset ports.

Revolution Wind has also submitted plans to the R.I. Public Utilities Commission's Energy Facility Siting Board which must review and approve the plans for project transmission cables. Hearings are expected to begin in the fall, with requests for advisory opinions from a slew of local and state environmental, government and health organizations due back by August, according to a preliminary order issued April 26.

At least three other wind farms slated for nearby waters have already begun or completed their own permit review process, with the Vineyard Wind project in Massachusetts slated to finish in 2023.

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Renews.biz
April 29, 2021

BOEM kicks off Revolution Wind review

Notice of intent to prepare the EIS opens a 30-day public comment period for the Orsted-Eversource project

The US Bureau of Ocean Energy Management (BOEM) has begun its environmental review of the 880MW Revolution Wind project off the coast of Rhode Island and Connecticut.

BOEM has today issued its notice of intent (NoI) to prepare the required environmental impact statement (EIS) on the project's construction and operations plan.

The publication of the NoI opens a 30-day public comment period.

During this time, BOEM will hold three virtual public scoping meetings and accept comments to inform the preparation of the EIS.

BOEM director Amanda Lefton said: "Public input plays an essential role in identifying and mitigating any potential impacts from proposed energy development activities.

"BOEM is committed to ensuring that any future offshore wind development is done safely and responsibly, and with the benefit of feedback from critical stakeholders."

Highlights from Revolution Wind's proposal include the following construction and operation of an offshore wind project with a total capacity of up to 880MW, installation of up to 100 turbines, up to two offshore substations and up to two export cables, plus monopile foundations for turbines and offshore substations.

The Port of Galilee, Rhode Island, has been identified as the location for an onshore operations and maintenance (O&M) facility.

The Revolution Wind export cable would make landfall at Quonset Point in North Kingstown, Rhode Island, and would interconnect to the electric transmission system via the existing Davisville substation, which is owned and operated by National Grid.

Orsted and Eversource, joint developers of the project, said in a statement: "Orsted and Eversource are pleased that BOEM has issued its notice of intent for Revolution Wind, representing the start of the project's formal federal environmental review and marking the project's most significant permitting milestone to-date.

"Revolution Wind is now one critical step closer to helping Rhode Island and Connecticut realize their clean energy goals, while delivering thousands of good-paying local jobs, providing significant local investment and helping to grow a new domestic supply chain.

"We look forward to BOEM's review as it moves toward issuing a final environmental impact statement for this historic offshore wind project."

BOEM's scoping process is intended to identify what should be considered in the Revolution Wind COP EIS.

Throughout the scoping process, there will be multiple opportunities to help BOEM determine the important resources and issues, impact-producing factors, reasonable alternatives and potential mitigating measures that should be analysed in the EIS.

E&E NEWS

E&E News
April 29, 2021

Biden admin advances R.I. offshore wind farm

The Interior Department today kicked off the environmental review process for Revolution Wind, the third offshore wind proposal to get a nudge from the climate-focused White House since President Biden took office.

The Bureau of Ocean Energy Management announced it would begin work on an environmental impact statement for the joint venture of Danish power firm Ørsted and New England's Eversource that could raise up to 100 turbines off the coast of Rhode Island.

The Biden administration has made offshore wind a marquee energy priority, hailing its climate benefits and the industry's ability to drive job creation along the Eastern Seaboard — both in the construction and maintenance of farms and in potential manufacturing of its blades, monopiles or nacelles.

"There is simply no reason why the blades for wind turbines can't be built in Pittsburgh instead of Beijing," Biden said in his first joint speech before Congress last night.

The Revolution wind farm would be located roughly 15 miles from Rhode Island and 32 miles from Connecticut. Revolution has power purchase guarantees in both states.

BOEM's environmental review process will interrogate the impacts of the proposed wind farm's construction and operation on other ocean users, like fishermen, and the environment. That begins with a scoping process to take public comment until June and BOEM's hosting of several virtual public meetings next month.

Ørsted said in a statement that it was pleased by the forward movement for the project.

"Revolution Wind is now one critical step closer to helping Rhode Island and Connecticut realize their clean energy goals, while delivering thousands of good-paying local jobs, providing significant local investment and helping to grow a new domestic supply chain," the company said in a statement.

The companies had anticipated Revolution's construction in 2023 but announced last year that delays by the Trump administration had likely extended timelines for Revolution, as well as Ørsted's Ocean Wind, Skipjack and Sunrise Wind offshore projects.

The company said in an email that it would "soon be in a position to better refine the project's timeline."

Biden has committed his Interior Department to approving 15 offshore wind projects by 2025, part of an accelerated blueprint to get the nascent offshore wind industry in this country to 30 gigawatts by 2030, according to the White House (***Greenwire***, March 29). The administration estimates the industry could employ up to 40,000 offshore wind workers.

Revolution is the fourth full-scale project to have reached the EIS stage, the largest permitting hurdle that offshore wind projects in federal waters have to clear. South Fork, a 15-turbine project off the coast of Long Island, received its draft environmental impact statement in January from the Trump administration. Biden's Interior began the EIS process with New Jersey's Ocean Wind in March. That same month, Vineyard Wind — a project originally scheduled to clear permitting during the Trump administration — received its final environmental impact statement.

A final decision from the Biden administration is expected any day on Vineyard, the likely first large-scale offshore wind operation in the United States.

The U.S. offshore wind industry lags behind its European counterparts, but the pipeline of U.S. projects has been driven by state climate goals, federal attention and falling development costs to raise turbines in the sea.

Rystad Energy consultants said today that $70 billion will be spent on the Americas' offshore wind sector this decade. The Vineyard Wind project alone represents a $2.8 billion investment.

REDACTED

Good Morning America
November 1, 2021

How wind energy can help save the planet

GMA takes a deeper look into what wind turbines could mean for the U.S. economy

ABC News
November 11, 2021

'It's Not Too Late': Harnessing the power of wind energy

ABC News' Ginger Zee reports on the power of wind in building a renewable energy future, traveling to Block Island, RI to visit America's oldest offshore wind farm.

The Providence Journal

The Providence Journal
By: Alex Kuffner
December 1, 2021

U.S. energy secretary set to visit ProvPort offshore wind facility

PROVIDENCE – U.S. Energy Secretary Jennifer M. Granholm is set to visit Rhode Island on Thursday as part of a two-day swing through New England to promote the Biden Administration's $1.2-trillion infrastructure package.

Granholm plans to meet up with Governor Dan McKee for an afternoon tour of an assembly and manufacturing hub under construction in the Port of Providence to support the development of offshore wind farms planned for ocean waters near the Rhode Island coast. While there, she is expected to talk about how the bipartisan infrastructure plan can benefit Rhode Island.

Granholm is coming to Rhode Island at the invitation of McKee.

“Rhode Island has been a pioneer and a national leader in clean energy and innovation and I'm proud to showcase our efforts to build a more sustainable future," the governor said in a statement.

The ProvPort hub is being built by Denmark-based Orsted, one of the leading offshore wind developers in the world, and its partner Eversource, an electric utility headquartered in Boston.

The companies are jointly developing the 132-megawatt South Fork Wind Farm, which last week became only the second commercial-scale offshore wind farm to win federal approval, as well as the 704-megawatt Revolution Wind Farm, which would supply power to Rhode Island and Connecticut. Both projects would be built in waters south of Little Compton between Block Island and Martha's Vineyard.

The projects come amid the federal government's push to develop 30 gigawatts of offshore wind energy by 2030. There are currently only two offshore wind farms in America and both are small demonstration projects: the 30-megawatt Block Island Wind Farm, completed in 2016 in Rhode Island state waters and the first of its kind in the nation, and a 12-megawatt array off Virginia.

The infrastructure package signed into law last month is expected to help spur the offshore wind industry by funding improvements to the electric transmission system and channeling money into ports used by developers for staging construction.

Granholm was in Delaware and Pennsylvania two weeks ago to highlight the law's impacts on energy efficiency programs and she visited Tennessee last week to talk about electric vehicles.

The first stop on her visit to New England will be Thursday morning at a manufacturer of EV charging stations in Enfield, Connecticut. She'll then go to New Haven to see technology aimed at reducing methane emissions that contribute to climate change.

From there, she will travel to ProvPort, where she will meet with McKee and David Hardy, CEO of Orsted Offshore North America, and Joe Nolan, CEO and president of Eversource. Members of the local ironworkers union who are building the $24-million offshore wind hub will also be on hand.

Orsted, the owner of the five-turbine Block Island Wind Farm, and Eversource plan to use the new facility as a regional hub to fabricate and assemble foundation platforms for wind turbines to be installed not only for their South Fork and Revolution projects but also for the 924-megawatt Sunrise Wind, which would supply New York and be built off that state's coast.

The platforms are critical components for the companies' proposed wind farms. They would be mounted on foundations secured to the ocean floor and wind turbines would be installed on top of them.

Granholm will finish her trip on Friday in Boston to meet with community members and elected officials about energy justice issues and weatherization efforts.

The Boston Globe

The Boston Globe
By: Brian Amaral
December 2, 2021

US energy secretary visits the 'poster child' for offshore wind development

The 12-turbine South Fork project, about 19 miles southeast of Rhode Island, will pipe its energy to Long Island.

U.S. Energy Secretary Jennifer Granholm, center, speaks with workers, and Rhode Island Gov. Dan McKee, left, while visiting a new Providence, R.I., facility where foundation components for the South Fork wind project will be assembled.Jennifer McDermott/Associated Press

PROVIDENCE — The U.S. energy secretary visited the Providence River waterfront Thursday to see the new wind foundation manufacturing site now under construction at ProvPort, showcasing Rhode Island's outsized role in offshore energy production.

"This is the poster child of how we want to do this," Secretary Jennifer Granholm told the fluorescent-garbed crowd of union leaders, energy company execs, politicians and reporters.

"This is the way it should be — the partnership between the federal government, the state, labor and the private sector."

The site is being built by Dimeo Construction for the utility Eversource and wind developer Ørsted, which are also teaming up on major offshore wind projects off the coast of New England. The 228-foot-long facility on the water here will become a site to assemble foundation components for the South Fork wind project — approved by the federal government just last week — and eventually the even larger Revolution Wind and Sunrise Wind if those get approved. From there it could serve future projects coming down the pike, too.

A weekday briefing from veteran Rhode Island reporters, focused on the things that matter most in the Ocean State.

"It's the start of something," said David Hardy, CEO of Ørsted Offshore North America. "Once you get the trained workforce, you can expand from there."

The 12-turbine South Fork project, about 19 miles southeast of Rhode Island, will pipe its energy to Long Island. Revolution Wind would provide power to Connecticut and Rhode Island. The lease area for Sunrise, about 17 miles off Block Island, would bring power to New York. South Fork was just the second major offshore wind farm approved by the U.S. government, after Vineyard Wind. The five-turbine Block Island Wind Farm was a smaller-scale project to prove that offshore wind could work, and didn't need to go through the federal approval process that South Fork has done and Revolution is doing now.

U.S. Energy Secretary Jennifer Granholm, right, speaks with Rhode Island Gov. Dan McKee on Thursday while visiting an under construction fabrication and assembly facility for offshore wind turbines at the Port of Providence in Providence, R.I. The building is scheduled to be finished this spring to support two offshore wind projects, Revolution Wind and South Fork Wind.Jennifer McDermott/Associated Press

Rhode Island has been at the forefront of wind power, and wants to stay that way; as Granholm recounted Thursday, she was telling fellow cabinet member Commerce Secretary (and former Rhode Island governor) Gina Raimondo on Wednesday that she was coming to Rhode Island.

"Block Island!" Raimondo responded, according to Granholm. "We were the first!"

According to the Department of Energy, the site at ProvPort will be one of the first of its kind in the United States; much of the supply chain, the department said, still operates out of Europe.

"It's not just the right thing to do for the environment," said Gov. Dan McKee. "But it's the right thing to do for jobs, the right thing to do for our economy."

Denmark-based Ørsted, pronounced in the native tongue something like "uhhr-sted," appears at first glance extremely Scandinavian, especially with the O that has a slash through it. But the jobs involved in this project will be extremely local, both the 40 union construction workers putting the building up now and the people eventually working in the plant itself, estimated at about 100 when it's operational. Ørsted's U.S. headquarters are split between Boston and Providence, and 250 people work here in America.

That local footprint is now growing by 228 feet laterally, as part of the $40 million Ørsted and Eversource investment between ProvPort and another site at Quonset Point in North Kingstown.

"It's manufacturing fabrication jobs in the city of Providence — there's not a lot of that happening," said Chris Waterson, general manager of ProvPort's manager, Waterson Terminal Services. "Those jobs will come from this community."

PROVIDENCE BUSINESS FIRST

Providence Business First
By: Mary Serreze
December 3, 2021

'More offshore wind means more jobs': U.S. energy secretary visits Providence

US Energy Secretary Jennifer Granholm delivers remarks after touring an offshore wind manufacturing facility that's under construction at the Port of Providence.

U.S. Energy Secretary Jennifer Granholm on Thursday praised Rhode Island while saying offshore wind development is creating jobs while advancing a clean energy future.

"I'm actually reminded of an old proverb which says 'When the winds of change blow, some build walls. Others build windmills,'" Granholm remarked while in Providence as she toured an offshore wind manufacturing facility under construction at ProvPort. "And we know which side of that Rhode Island falls on."

Granholm was joined by Gov. Dan McKee, labor leaders, and dozens of others.

ProvPort is being built by Ørsted A/S (DNNGY) and Eversource Energy (NYSE: ES). Union labor at the new facility will fabricate concrete foundations for offshore wind farms planned in Northeast waters by Ørsted and Eversource.

"More offshore wind means more jobs for iron workers, line workers, engineers, electricians, plumbers, pipe-fitters, smelters — jobs in mining and manufacturing and management and operations and sales," said Granholm.

She said jobs created by the industry are not just local, noting that Charybdis, the first U.S. jack-up vessel capable of installing offshore wind projects, is under construction at a shipyard in Brownsville, Texas. The project has created thousands of American jobs, and the massive ship will provide critical support to offshore wind construction in America, she said.

"It really does represent a gust of job growth across the country," Granholm said.

Granholm praised Rhode Island's Act on Climate, a bill signed by McKee that calls for net-zero emissions by 2050, and said offshore wind will help meet that goal.

The Providence Journal

The Providence Journal
By: Alex Kuffner
December 3, 2021

U.S. Energy Secretary praises Rhode Island for role in offshore wind power

PROVIDENCE — The new building rising up in the Port of Providence will soon become home to a fabrication hub for offshore wind farms proposed in the ocean waters stretching from Massachusetts to New York.

It's expected to be completed in the spring and by the summer should be churning out components for the South Fork Wind Farm, a project of up to a dozen turbines that was just approved by the federal government for Rhode Island Sound.

With the steel skeleton of the facility as her backdrop, U.S. Energy Secretary Jennifer Granholm spoke of the promise of offshore wind, saying that projects like South Fork will generate the clean energy that America needs as it transitions from fossil fuels.

She also said investments in renewable energy are already paying off by generating jobs in Rhode Island and elsewhere. For the construction of an offshore substation alone, 350 workers in three states are required.

"This is creating jobs all across the country even though it's being installed off the coast," she said.

Granholm was in Providence as part of a two-day swing through New England to talk about the Biden administration's plan to overhaul the country's infrastructure, from roads and bridges to telecommunications to drinking-water systems to energy networks. Her first stop was in Connecticut and she is to appear in Boston on Friday.

She came to Rhode Island at the invitation of Gov. Dan McKee, who said he wanted to showcase what the state has done to support offshore wind. The first offshore wind farm in the nation, a 30-megawatt demonstration project, was installed in state waters off Block Island five years ago. And the state has signed on for another 400 megawatts of capacity from a much larger wind farm known as Revolution Wind planned far off the coast.

The aim, he said, is for Rhode Island to serve as the "base camp" for the industry's supply chain. Already, Ørsted, the Danish company partnering with utility Eversource on the South Fork and Revolution proposals as well as another off New York, has opened offices in Providence. So too, the governor added, has GEV Wind, a turbine-maintenance company headquartered in England.

“We were the birthplace of the Industrial Revolution,” he said, pointing to Slater Mill in Pawtucket. “And now we’re going to be the birthplace of the wind revolution.”

Granholm applauded Rhode Island for what’s been done so far.

“This is the poster child for how we want to do this on the coasts,” she said. “This is the way it should be.”

The $1.2 trillion infrastructure bill signed into law by President Biden last month is expected to boost offshore wind by setting aside money for research and development and for upgrading transmission lines that deliver energy to cities and states. The Build Back Better legislation under consideration in Congress would do more by providing additional tax credits for renewable energy.

Granholm focused her comments on the economic benefits of clean energy. Referring to her recent participation in the global talks on climate change in Glasgow, she said that countries around the world have adopted goals of getting to net-zero carbon emissions by 2050.

“They need the products to be able to do that,” she said. “That’s obviously wind turbines, but it’s a bunch of other products, too. The question is, ‘Who’s going to build that stuff?’ Well, we want to build it.”

REDACTED

offshoreWIND.biz

Offshore Wind Biz
By: Adnan Durakovic
December 3, 2021

Construction Starts on US Offshore Wind Foundation Components Factory

Joint venture partners Ørsted and Eversource have started constructing a manufacturing facility for offshore wind foundation components at ProvPort in Rhode Island, United States.

Once complete, the new facility will be used to support the construction of advanced foundation components integral to foundations for Ørsted and Eversource's portfolio of offshore wind farms serving Rhode Island, Connecticut, and New York.

The construction site was toured by US Secretary of Energy Jennifer M. Granholm, Rhode Island Governor Dan McKee, and Labor leaders on Thursday, 2 December.

US Secretary of Energy Jennifer Granholm at ProvPort. Source: Ørsted

"I want to thank Secretary Granholm and Governor McKee for touring our site today along with our labor partners who will help deliver America's green transformation," said **David Hardy**, Chief Executive Officer of Ørsted Offshore North America.

"Rhode Island is home to America's First Offshore Wind Farm, which was commissioned on December 12, 2016. Five years later, it is fitting that we showcased our ProvPort facility today and its growing capabilities that will further establish Rhode Island as a regional offshore wind energy hub. Our investments into the port and community, combined with support from local, state and federal leaders, are making our clean energy vision a reality."

The site upgrades and construction underway at ProvPort are covered by a Project Labor Agreement that Ørsted and Eversource reached with the Rhode Island Building and Construction Trades Council and the project's general contractor Dimeo Construction – ensuring that all the work is being completed by local, union labor. This initial scope of work has created 40 local jobs.

In total, Ørsted and Eversource are investing a combined USD 40 million (EUR 35.44 million) at ProvPort and Quonset Point, in North Kingstown, Rhode Island.

The bipartisan Infrastructure Investment and Jobs Act recently signed into law by US President Joe Biden will help accelerate port upgrades, electrical grid infrastructure, and much more to expedite the delivery of offshore wind energy as a way to combat climate change and reduce air pollution, Ørsted.

"The Biden Administration has been a relentless champion for clean, renewable energy with offshore wind as its bedrock," said **Joe Nolan**, Chief Executive Officer and President of Eversource Energy.

"We are thrilled today to showcase some of the tremendous work already underway in Rhode Island that, together with other regional investments, is playing a critical role in combating climate change, growing the domestic supply chain, and creating well-paying, local jobs."

The new facility will support the development of the 704 MW **Revolution Wind** project serving Rhode Island and Connecticut, as well as the recently approved 132 MW **South Fork Wind** project in New York.

The joint venture partners are also developing the 924 MW **Sunrise Wind** project in New York.

MSNBC
By: Ali Velshi
December 4, 2021

After signing the bipartisan infrastructure bill into law last month, the Biden Administration is now laser-focused on pursuing its climate-related agenda items. Hundreds of millions of dollars are headed out the door as we speak to fund green projects that will help transition the nation away from fossil fuels, reduce carbon emissions, and create millions of new jobs in the process. This week, U.S. Energy Secretary Jennifer Granholm toured cities across the Northeast highlighting the White House's unprecedented investment tin fighting climate change. Ali Ve;shi got to catch up with her on one leg of the trip, at the Port of Providence in Rhode Island to discuss the country's "clean energy future."

AP
By: Jennifer McDermott
December 5, 2021

Energy secretary: Offshore wind brings 'gust' of job growth

PROVIDENCE, R.I. (AP) — U.S. Energy Secretary Jennifer Granholm said Thursday that the administration's goal for offshore wind and the projects being developed now represent a "gust of job growth throughout the country."

Granholm visited a new offshore wind manufacturing hub in Providence to talk about the Biden administration's plan to deploy 30 gigawatts of offshore wind energy by 2030 and to promote the investments in the $1 trillion infrastructure deal.

"More offshore wind means more jobs for iron workers, line workers, engineers, electricians, plumbers, pipefitters," she said. "Jobs in mining and manufacturing and management and operations and sales, not to mention of course the benefit to surrounding communities."
At the Port of Providence, Orsted, a Danish energy company, and the utility Eversource are constructing a building for the fabrication and assembly of large, advanced components for

turbine foundations. Orsted officials gave Granholm and Rhode Island Gov. Dan McKee a tour. The group met union workers who are building the facility.

McKee said he envisions Rhode Island as the “base camp” to support the offshore wind supply chain along the East Coast. Granholm said looking at the building reminded her of a proverb: “When the winds of change blow, some build walls, others build windmills.”

“And we know which side of that Rhode Island falls on,” she said.

Eversource President and CEO Joe Nolan said the Biden administration’s support of offshore wind is a “breath of fresh air” after the Trump administration. Both Nolan and Orsted Offshore North America CEO David Hardy said such support is critical while the U.S. industry is still in the fragile, early stages.

“The momentum is happening,” Nolan said. “We need it to continue.”

“It’s a young industry,” added Hardy. “We need help getting the first projects off the ground.” Their manufacturing hub at the port is scheduled to be finished this spring to support two offshore wind projects, Revolution Wind and South Fork Wind.

Revolution Wind is a planned offshore wind farm south of Martha’s Vineyard, Massachusetts, to provide power for Connecticut and Rhode Island. The federal government is currently reviewing the construction and operations plan.

The South Fork Wind project will be located off the coast of Rhode Island. Its transmission system will connect to the electric grid on Long Island, New York, making it the state’s first offshore wind farm and jumpstarting the offshore wind industry there.

Granholm announced last week that the administration approved the construction and operations for South Fork Wind, as part of a plan to deploy 30 gigawatts of offshore wind energy by 2030. It was the administration’s second approval of a commercial-scale, offshore wind energy project in the United States. The first commercial-scale project is off the coast of Massachusetts.

The first U.S. offshore wind farm began operating off Block Island, Rhode Island, in late 2016. But at five turbines, it’s not commercial-scale. Orsted acquired the developer, Rhode Island-based Deepwater Wind, and now operates that wind farm.

Granholm also visited a manufacturer of electric vehicle chargers and a clean energy technology company in Connecticut Thursday. On Friday, she’s hosting a roundtable discussion in Boston about the transition to clean energy.

Granholm has been making stops around the country to talk about how investments in infrastructure incentivize companies like these to open and expand, driving the transition away from fossil fuels, creating jobs and helping people save money on energy. She is visiting areas that are proactive in reducing emissions and areas where more work needs to be done.

President Joe Biden signed his hard-fought $1 trillion infrastructure deal into law in November, declaring that the new infusion of cash for roads, bridges, ports and more is going to make life "change for the better" for the American people. It has $100 million for wind energy research and development, $2.5 billion for transmission lines, including transmission from offshore wind farms, and $20 million to ensure offshore wind is built sustainably, Granholm said.

The companion piece of legislation, the social and environment bill under consideration in the Senate, has $600 million for port infrastructure, as well as significant tax credits to incentivize offshore wind development and turbine manufacturing, she added.

Smithsonian MAGAZINE

Smithsonian Magazine
By: Elizabeth Royte
March 29, 2022

This Historic Community Is Pushing the Nation Toward a Wind Power Revolution

Block Island, off the New England coast, overcame political strife to lead the way on energy independence

Block Island, 15 miles off the coast at its farthest point, has always been at the mercy of the four winds. Raging winter gusts have been known to rip porches off houses and knock stones off the rock walls that lattice the island's meadows and pastures. More regularly, breezes delivered to residents the drone of enormous diesel-burning generators, the Rhode Island community's sole source of power. No one liked it, "but that was just part of island life," a local real estate agent tells me. People got used to the noise, and those who lived near the power plant—less than half a mile from downtown—resigned themselves to frequently scrubbing soot from their windows and sills.

But then, at precisely 5:30 a.m. on the first of May, 2017, a great silence fell upon the land. The generators, after roaring for 89 years, shut down. And yet electrons continued to flow.

"Suddenly you could hear the leaves rustling, the waves breaking, and the birds"—Henry duPont, a local engineer who attended the diesel shutdown, breaks off, allowing the twitter and squawk of spring migrants to speak in his stead. Residents have been marveling at the quietude ever since.

Since that day, Block Island has been the only community in the United States fully powered by offshore wind: in this case, five 6-megawatt turbines pounded into the seafloor just south of the island's Mohegan Bluffs. Over the next several years the Block Island venture will be joined by many more towns and cities, as up to 2,000 new turbines begin to populate utility-scale wind farms along the Atlantic Seaboard. These projects were fast-tracked a year ago when President Biden set a national goal of generating 30 gigawatts of offshore wind energy on both coasts and in the Gulf of Mexico by 2030. That's enough juice to run ten million homes while avoiding the production of 78 million metric tons of greenhouse gas emissions.

"The loudest people against the wind farm considered the island their little paradise."

The Mohegan Bluffs community faces the open Atlantic—and the array of towering wind turbines. Neil Ever Osborne

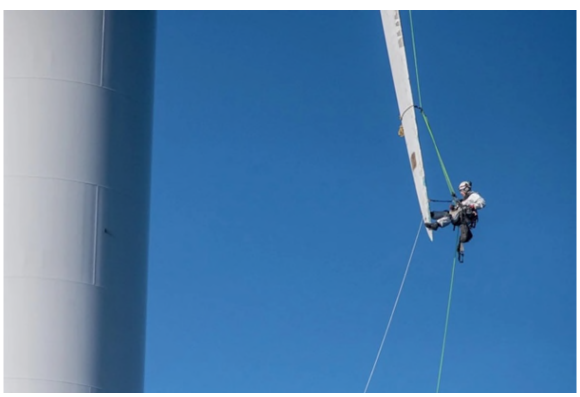
From its inception, the Block Island Wind Farm, launched by a Providence-based company called Deepwater Wind, was meant to be a demonstration project. Not of the technology—European nations nailed that decades ago and now operate more than 5,000 offshore turbines—but of the knotty permitting process that allows a commercially financed power generator to plug into an established electrical grid. And smoothing the regulatory path will be essential if the nation is going to quit fossil fuels. According to a recent Princeton University study, total installed wind power must grow more than sixfold from today's capacity for the nation to achieve net-zero greenhouse gas emissions by mid-century.

While tens of thousands of smaller wind turbines, rated at less than two megawatts, have stippled the American landscape since the 1970s, truly widespread wind power will depend on much larger devices. Wind speed tends to increase with altitude, and the taller the tower is, the larger the blades and the turbine can be, dramatically increasing energy production. For example, one of the tallest turbines in operation, General Electric's Haliade-X, a 13-megawatt behemoth installed in Rotterdam, reaches about 80 stories high, and each blade is 351 feet long. In just seven seconds it generates enough power to serve the average American home for a day.

These giants will almost certainly be planted primarily at sea, where it's easier to transport enormous blades and tower sections, there's more space for arrays, and permitting hassles with property owners are reduced. "You're not dealing with people's backyards or other kinds of challenges over hundreds of miles," says Matt Morrissey, a former vice president of Orsted, the Danish company that acquired the Block Island Wind Farm in 2018.

Hundreds of feet above the sea, Will Fancher, a rope access supervisor for the Block Island Wind Farm, performs maintenance that is far from routine. Neil Ever Osborn

Fancher working on the turbine blade's tip receptor. Neil Ever Osborne



Fancher inspects the turbine blade's tip receptor. Neil Ever Osborne

Offshore wind, especially in the Northeast, is stronger and more consistent than terrestrial wind because the ocean surface creates less drag than land, which is pocked with trees, buildings and mountains. Steady ocean temperatures also make for steadier wind. And with companies planning to site wind farms 12 or more miles from shore, reducing the ability to see them from living room windows, they've quelled some of the opposition that doomed the nation's first proposed offshore wind farm, off Cape Cod, Massachusetts.

But not all of it.

On a damp May morning, when 80 percent of Block Island homes are still shuttered for the off-season, I meet with Dick Martin, who has been with the Block Island Power Company for more than four decades. Until the wind farm came online, Martin tended BIPCo's five giant yellow diesel generators, which he shows me in metal sheds lined with din-dampening padding. Back in his office, he lets me heft a foot-long sample of the submarine cable that runs three miles from the wind farm to Block Island, and then another 20 miles to the mainland. As thick as a spiral ham, the cable section weighs 46 pounds.

Under heavy skies, we drive to Southeast Lighthouse, atop Mohegan Bluffs. From here, the first of the five wind towers, which form a nearly straight line, appears much closer than 2.9 miles. The turbine towers reach more than 330 feet above the sea surface. The white blades, each one 241 feet long, spin mesmerically, disappearing into the clouds. "I think they're beautiful," Martin says. Sculptural, others pronounce. Majestic.

Wind turbine at sunset, Block Island Wind Farm, Rhode Island. Neil Ever Osborne

I have no aesthetic problem with these symbols of high modernity. Would I feel different if I lived in one of the mansions on this bluff, my expansive ocean views interrupted by a power plant? Possibly. But altered views were not the argument that opponents most often voiced at public meetings held over several years before construction. “People said they were concerned about the birds, the fish, the whales, the noise—anything they could throw at it,” Martin recalls. Others worried that drilling would further erode the bluffs (it didn’t), or that the blades would create mind-altering flicker effects (who knows?).

“The loudest people against the wind farm were those who considered the island their summer getaway, their little paradise,” says Kim Gaffett, a naturalist whose family has lived on Block Island for generations and who served as the head of the island’s town council during the project’s development. “They flew in from Washington State, New Jersey and Massachusetts to fight it.” Most of the roughly 1,000 year-round residents—who paid some of the highest electric bills in the country—favored the turbines.

Everyone wanted data on environmental impacts. And so two years before Deepwater dropped any equipment into the water, it hired environmental consultants to study the area’s fin- and shellfish, marine mammals and birds. Data from these studies and from abroad show that offshore wind farms don’t appear to harm migratory birds (most of which travel closer to shore). The impact on bats has not been sufficiently studied. High-definition and thermal-imaging cameras and other equipment placed on a vessel monitoring the work area indicated that marine mammals navigate away from wind farms during pile driving (which lasted a few days per turbine) and had no problem avoiding the piles thereafter.

Kim Gaffett, weighing a bird in her workshop, led the town council during the debate about installing offshore turbines. Neil Ever
Osborne

One visitor to Block Island is a migratory bird called the northern parula, held by Kim Gaffett, a naturalist. Neil Ever Osborne

Fish studies that continued during construction and for three years afterward revealed that the Block Island Wind Farm did not destroy but actually created marine habitat: mussels and barnacles quickly colonized the underwater structures, attracting fish. Now the turbines are the place to be if you want to hook a black sea bass, tautog, fluke or bluefish. As for lobster, well, this never was a prime lobster congregation spot—one reason the farm was sited here—though some evidence suggests that the electromagnetic fields of underwater cables may affect lobster navigation.

Were the turbines a hazard to navigation, as some fretted? Lit, numbered and marked on charts, no. But the scads of boaters now drawn to them created another problem. As one charter captain told researchers, “When I fish, I prefer to fish alone ... And that area now, you can’t fish in that area and be alone.”

The National Audubon Society generally supports offshore wind, on the principle that climate change will do more harm to birds than wind farms will. So does the National Wildlife Federation. “We’ve got to stand up large-scale sources of green energy” to face the “urgent threat” of climate change, the NWF’s Catherine Bowes says, adding, “offshore wind energy holds incredible potential.”

To protect whales—fewer than 350 North Atlantic right whales remain—scientists and environmentalists have come up with guidelines for offshore wind developers along the Atlantic coastline. They should alter construction schedules to accommodate whale migration; slow down vessels when whales are in the vicinity; and use noise-dampening technologies, like devices that create sound-muffling curtains of air bubbles around piles, to avoid injuring whales' sensitive ears or driving them into areas of increased boat traffic. Another option is to use "gravity-based" turbine supports, which can weigh several thousand tons and sink onto, rather than being pounded into, the seafloor. Best practices also include surveying and pile driving only during daylight hours so work can stop if whales are spotted.

"Lessons from Europe don't exist for large baleen whales" like humpbacks, blue and right whales.

Lisa Nolan, executive director of the Southeast Lighthouse Foundation, which received a donation of more than $1 million from the wind farm's developer. Neil Ever Osborne

Island resident Steve Miller hooks a bluefish near a turbine tower. Turns out the parts of the structures that are underwater actually attract many forms of marine life. Neil Ever Osborne

There's a general feeling that wind farms and related port infrastructure should not be placed in habitats that are critical to whales. But what's critical? According to Howard Rosenbaum, who monitors whales for the Wildlife Conservation Society, researchers are still learning when, where and how these peripatetic and long-lived creatures occupy the New York Bight, a busy waterway that will likely see increased vessel traffic as offshore wind is developed. "Lessons from Europe don't exist for large baleen whales" like humpbacks, fin, blue and right whales, he says. Because most of the proposed energy sites on the Atlantic Coast lie within whale migration routes, he says, "the race is on to gather baseline data." Fortunately, he adds, "everyone—the states, the feds, developers, NGOs—are all very engaged on this issue."

Tooling along Block Island's hilly roads, past picturesque ponds and glades of white-flowering shadbush, I find it hard to ignore the signs of privilege: the muted elegance of the historic homes and the abundance of open space given over to neither crops nor animals. More than 47 percent of island land is conserved, which makes Block Island, via Thoreau ("a man is rich in proportion to the number of things which he can afford to let alone"), rich indeed. Passing one weathered-gray shingled estate after another, I think there is at least some justice in the placement of those steel turbines in the backyards of the island's wealthiest residents. After all, nationwide, it's low-income communities that live closest to, and suffer the worst health impacts from, dirty power plants.

I roll down a private lane on the island's southwest lobe to meet with one of the wind farm's most persistent critics, David Lewis. The Lewis family has lived continuously on Block Island since at least 1817, and today their property is set on a rise surrounded by 200 acres of stone-walled pastures, another 200 acres of publicly owned conservation land, and the Atlantic Ocean.

"This was not a NIMBY issue for me," Lewis says, gesturing toward the wind-whipped sea. It's true that you can't see all five turbines in a single visual gulp from this spot, but moving between the upstairs windows, you can glimpse each one. A Harvard-trained biologist and a recently retired manufacturing representative for General Dynamics, Lewis objected to the wind farm because of the political process that, he said, led to the power purchase agreement with National Grid, the utility company. Now all Rhode Islanders were paying too much for clean energy, he and others contend, while wind farm developers made a killing. Yet a recent analysis of Block Island power rates, which vary by season, found that the cost per kilowatt hour, if averaged over a year, is 44 percent lower than it was before the wind farm went online.

The towers are spaced about half a mile apart, weigh 440 tons apiece and are anchored to the seabed in water about 80 to 90 feet deep. Neil Ever Osborne

Lewis presses a loftier point, even now that the issue is moot. "Seascapes are sacred and immutable," he tells me, then quotes from *Moby-Dick*, when the *Pequod* sinks beneath the waves "and the great shroud of the sea rolled on as it rolled five thousand years ago." At a public hearing before Rhode Island's Coastal Resources Management Council, he testified against his white whale. "One of the irreplaceable features of many outward-looking seascapes is that...one sees an expansive view to an open horizon that has looked just the same for longer than man can contemplate....Only the arrogance of man allows him to choose a point in time to say, 'Here and now, I have the right to permanently alter the way something has always been, into something else of my choosing.'"

Yes, it's nice when pretty things stay that way, I feel like saying. But coastlines have always changed; this headland didn't always host the Lewis family compound, for example. More important, how is society supposed to manage a trade-off in which a pleasant view enjoyed by a handful of people is weighed against the benefits of a sustainable energy supply that would accrue to many thousands of people, now and into the future?

Five years on, the wind farm dust has mostly settled. Block Island fishermen are happy, charter boats run turbine tours for intrigued tourists, the fiber-optic strand Deepwater included in the submarine power cable has started to provide the island with fast internet, and property values have held.

A section of the submarine power cable linking wind farm, island and mainland. Note the thin fiber optic cable, too. Neil Ever Osborne

"Change is difficult for everyone, but new people coming in accept the wind farm," says Cindy Pappas, of Sullivan Sotheby's International Realty. Of course, she adds, "No one is saying 'I want a windmill view.'"

Most people acknowledge the power they receive now is better than it used to be. Energy from the diesel generators sputtered, often blowing out appliances, and brownouts in the summertime, when the population triples, were common. Now folks are buying air conditioners, a perfect example of what is known as the Jevons paradox, in which efficiencies (such as an endless supply of carbon-free energy at a stable price) spur greater consumption.

For better or worse, the northern Atlantic is now acknowledged to be an almost textbook place for offshore wind development. The continental shelf is wide and relatively shallow (in deeper California waters, and in Maine, developers are planning for floating turbines anchored to the seafloor with cables); the region has plenty of nearby customers, which reduces transmission costs; and the wind is, as they say in Rhode Island, wicked good. “The Gulf Stream runs up the coast unimpeded, as does the wind,” Orsted’s Morrissey says. “By the time it reaches southern New England, it’s at its apex.”

“We are an entirely green community. We did something to make our children proud.”

Equipped with lights and noted on charts, the Block Island wind turbines don’t pose an unusual danger to mariners, Henry duPont says: “You could sail through them blind.” Neil Ever Osborne

The East Coast also offers what’s called peak coincidence. “Offshore wind reaches its greatest speed in late afternoon, when the turbines are really spinning,” Morrissey says. “And that’s exactly when the large power centers in Boston and Providence and New York and Washington require the most energy.”

Lessons from Block Island now inform plans for wind farms up and down the East Coast. Developers, residents, businesses, planners, regulators and scientists have learned to work with each other. Other island communities have noted the additional benefits the community extracted from Deepwater Wind, such as the fiber optic cable to the mainland and two donations of some $1.25 million each to the local historical society and the Southeast Lighthouse Foundation.

But there is still much to sort out as the wind industry marches toward the Biden administration's goals.

The nation's energy transition will require major investments in new ports, work boats, manufacturing facilities and grid upgrades. Utilities still need sustainable and far cheaper ways to store energy for wind farms' inevitable lulls in generation. Developers need certainty that states will buy their product. The cost of offshore power must continue to go down, as it has done on land; the price of *on*shore wind power has dropped from 7 cents to 2 cents per kilowatt hour in the last decade. And commercial fishers need assurance that they will be compensated financially if they lose access to fishing grounds.

"We need to keep cumulative [wildlife] impacts in mind if we are going to be doing this from Maine to Virginia," Sue Tuxbury, a fisheries biologist with the National Oceanic and Atmospheric Administration, told an offshore wind-energy science forum hosted by the University of Rhode Island's department of oceanography. Birds, fish and whales are unlikely to suffer much harm from the Block Island wind farm, but no one knows how a thousand turbines might affect those creatures, especially floating turbines, whose cables could potentially entangle large whales. There are, to date, few floating arrays or even models to study.

The higher you go, the more wind there is. Ocean breezes in the Northeast tend to be reliable, creating a prime target for wind farm developers. Neil Ever Osborne

Engineers are tweaking wind farm designs to increase efficiency. For 20 years, Princeton University engineer Elie Bou-Zeid says, turbines have been getting bigger, but "wind farm output can increase by up to 60 percent through smarter layouts." Bou-Zeid is studying designs that cluster turbines in groups of three; others are studying arrays in which the blades of front-row turbines are tilted to produce less power so the second and third rows can produce even more.

Block Islanders, for the most part, remain righteously proud of the part they played in laying the groundwork for what promises to be a massive buildout of offshore wind on the East Coast. “Even though we are the smallest town in the smallest state in the nation, we’re taking an enormous step forward not only for ourselves, but for the country and ultimately the planet,” says Bryan Wilson, manager of the Block Island Wind Farm. “We learned so much about how to do this right, and now we are an entirely green community. We did something to make our children proud.”

And for those who rue the industrialization of the seaboard? One is tempted toward pragmatism: Things change. New Englanders no longer hunt whales to produce commercial oils. Block Islanders no longer burn peat to heat their homes, as they did after deforesting their island in the early 1700s. The peat bogs they excavated are now those lovely ponds.

Through a contentious but deliberative process, Block Islanders severed themselves from a power plant that burned a million gallons of fossil fuel a year. That’s not a vast amount in the overall scheme of things, but it’s a model that countless people are aching to follow.

The Boston Globe

The Boston Globe
By: Brian Amaral
April 14, 2022

Block Island wind farm hasn't harmed fish populations, industry-funded study shows

The study 'doesn't tell you what 100 turbines are going to be like, said Drew Carey, an author of the study and CEO of the Newport-based firm INSPIRE Environmental. '(But) it should allay the fears that there would be a catastrophic effect.'

The Block Island wind farm has five turbines turbines in Block Island Sound.Chang W. Lee/NYT

PROVIDENCE — An industry-funded study released last month found no significantly negative effect on fish populations during the construction and operation of the Block Island offshore wind farm.

The study crunched seven years of data from monthly trips out to the site in a commercial trawler, which caught ground fish and invertebrates like butterfish, little skate, scup, winter skate and longfin squid.

Scientists compared what they caught near the wind turbines to what they caught in other similar places outside the project area. The only meaningful effect they found by the wind turbines was positive: a lot more black sea bass were congregating around the Block Island wind farm, probably because they like to hang out near physical structures like wind turbine foundations. Scientists also found more Atlantic cod there, but not often enough to draw any firm conclusions.

“It’s encouraging and reassuring, with the caveat that (the Block Island wind farm) is a small project,” said Drew Carey, an author of the study and CEO of the Newport-based firm INSPIRE Environmental. “It doesn’t tell you what 100 turbines are going to be like. (But) it should allay the fears that there would be a catastrophic effect.”

A weekday briefing from veteran Rhode Island reporters, focused on the things that matter most in the Ocean State.

The 30-megawatt Block Island wind farm has five turbines, located about three miles southeast of the island.

As any recreational angler can tell you, fish populations naturally ebb and flow, making this sort of research tricky. But any modest changes to populations caused by offshore wind development, Carey said, are dwarfed by the changes in sea life we’re already seeing from the warming and acidification of the oceans caused by climate change.

“There will be winners and losers among species, but in terms of a net effect, my guess is it’s going to be a positive overall in terms of fish populations,” Carey said.

The study, published March 29 in the ICES Journal of Marine Science, was funded by Deepwater Wind, which was later acquired by Denmark-based Ørsted. Rhode Island coastal regulators mandated that the study take place as part of the approval for the Block Island wind farm. The wind farm started commercial operations in December 2016. The study looked at data from 2012 to 2019, spanning the time before the turbines were spinning to several years into their use.

The Block Island wind farm was a small demonstration project to test the feasibility of offshore wind in the United States. In the coming years, if things go according to plan, it will be joined by hundreds more turbines off the East Coast, several belonging to Ørsted. Those projects sometimes stoke concerns from the commercial fishing industry.

They shouldn’t have to conflict, said David Ortiz, head of government affairs and market strategy in the Northeast for Ørsted.

“This is a really strong data point that should be taken into account as we move forward industry-wide,” Ortiz said in an interview.

According to the study's authors, it was the first research of its kind in the United States. Every month the FV Virginia Marise would trawl the area to collect ground fish and invertebrates. The study design was developed with environmental regulators and the commercial fishing industry itself, its authors say.

Because they used an actual fishing vessel with commercial gear, it also showed it's possible to fish between wind turbines themselves. That's another concern about offshore wind: It could present physical obstacles. The Block Island wind turbines are a half a nautical mile apart; other projects coming down the pike will be a full nautical mile apart. The study showed that it was possible to trawl between turbines without snagging on a cable, said INSPIRE's Carey.

The results were largely in line with previous studies in Europe, which is ahead of the U.S. in offshore wind power development, the authors say.

The study not only looked at what fish were caught, but also what sort of condition they were in and what was in their stomachs. Some were eating more mussels, which indicated they were feeding off of mussels growing on the turbines themselves.

"That was pretty neat," said Dara Wilber, the lead author of the study who also works at INSPIRE Environmental. "It's an indirect way of seeing what the fish are feeding on."

Otherwise, though, they found no physiological differences in the fish — in stomach fullness, for example — that could be attributed to the wind farm, the authors say.

Wilber noted that the research was on a wind farm at pilot scale. Monitoring for fish populations will continue as the industry goes from pilot scale to commercial scale.

"In some ways, it's lessons learned by the industry in how to build and put out the turbines, but also by us biologists about how to monitor" for impacts on marine life, Wilber said.

AP
By: Jennifer McDermott
May 28, 2022

Energy secretary: US offshore wind jobs should be union jobs

NEW LONDON, Conn. (AP) — The growing offshore wind industry is often touted as a boon for job creation, but who will do the work?

The U.S. energy secretary and Danish wind developer Orsted say they want American union workers to build offshore wind farms to dot the U.S. coastlines — the building trades workers who could otherwise be left out of a transition to renewable resources.

A majority of onshore wind and solar farms have been built either with non-union workers or without collective bargaining agreements, except for in California where unions are more involved in the industry, according to North America's Building Trades Unions. Orsted signed a project labor agreement this month with the national union representing 3 million people in the building trades to construct the company's U.S. offshore wind farms with an American union workforce.

"Our recent experience in the last two decades with onshore wind and solar has been that the majority of those projects are not built with us," NABTU Secretary-Treasurer Brent Booker said this week. "So this is groundbreaking in setting the standard for an emerging industry here."

The Biden administration wants to deploy 30 gigawatts of offshore wind energy by 2030, generating enough electricity to power more than 10 million homes. Energy Secretary Jennifer Granholm visited the New London State Pier facility last week to see how Orsted, energy provider Eversource and the state of Connecticut are transforming it into a hub for the offshore wind industry.

At a press conference after, the Democratic governor and Democratic congressmen spoke about creating American jobs — messaging that will surely play into their reelection campaigns.

Gov. Ned Lamont said there are “hundreds of good paying jobs right here” and “we’re just getting started.”

U.S. Sen. Richard Blumenthal thanked the unions, saying “this is the future of energy in the United States of America right here.” U.S. Rep. Joe Courtney said they’re maximizing every opportunity for the state to grow in a sustainable way.

U.S. Sen. Chris Murphy, the only one not up for reelection, echoed the same message, saying offshore wind is the “holy grail of public policy” because it creates jobs, helps the local economy, makes the country more secure and helps save the planet.

Flanked by building trades members, Granholm said the administration is committed to creating “union jobs in America in this clean energy economy.” She said she wants predominantly American union workers to build U.S. offshore wind farms and would like to see project labor agreements in all aspects of the energy transition, drawing cheers from workers at the pier.

“That’s what we’d like, all union,” she told The Associated Press.

Allison Ziogas, Orsted’s U.S. labor relations manager, said one of the reasons they sought the agreement with NABTU was to assure workers, particularly in the fossil fuel industry, that they can have good-paying jobs in offshore wind.

“There is not the same level or quality of jobs with the solar industry, so it’s kind of created a false narrative that you can have good jobs or a healthy climate but not both,” she said. “And we really recognized that if we didn’t have everyone on board, we knew how things would wind up. It would wind up in gridlock.”

Orsted currently has six projects in five states. The “National Offshore Wind Agreement” covers contractors working on those projects and future ones, with no termination date on the project labor agreement. It sets the terms and conditions for union workers to build offshore wind farms, with targets to ensure a diverse workforce. It contains provisions for training to ensure they can construct the complex infrastructure.

Ziogas said nearly all of the total work hours on each project will be done with union labor, with a team from abroad with experience installing turbines supporting the offshore work. She said Orsted is committed to “creating an American industry,” and hopes the agreement sets the bar for it.

Keith Brothers, head of the building trades in Connecticut, said he briefly spoke with Granholm at the pier about the project labor agreement. Brothers said it’s about creating opportunities, not only for a longtime tradesman but also for a new apprentice looking for a career in the emerging U.S. offshore wind industry.

“That’s what’s exciting about it, it’s new. We really don’t know what it’s going to bring or how many jobs. But we know it’s a lot,” he said. “We know it’s new and there’s a lot coming.”

The first U.S. offshore wind farm began operating off Block Island, Rhode Island, in late 2016. Orsted acquired the developer and now operates that five-turbine wind farm. The first commercial-scale project is off the coast of Massachusetts.

The Biden administration has also approved the construction and operations for South Fork Wind, a joint venture between Orsted and Eversource. Its transmission system will connect to the electric grid on Long Island, New York, making it the state’s first offshore wind farm and jumpstarting the offshore wind industry there. The onshore construction started in February.

MARINELOG

MarineLog
By: Nick Blenkey
June 30, 2022

Ørsted and Eversource team with Boskalis for northeast offshore wind projects

Image: Ørsted

Ørsted and Eversource say they are working with Netherlands-based Boskalis for the foundation and offshore substations transportation and installation work for their South Fork Wind and Revolution Wind projects, as well as scour protection installation contracts for its Revolution Wind and Sunrise Wind projects.

The contract for the work was finalized in late 2021.

Ørsted and Eversource say that “as part of the joint venture’s commitment to delivering well-paying jobs to the region and to accelerating the development of domestic offshore wind maritime expertise in the U.S., the contracts will support the training and employment of American workers and will utilize a sizable fleet of U.S. vessels. This fleet includes, but is not limited to, protected species observer vessels, platform supply vessels, barges, and tugs.”

The contracts will also support the opening of a new Boskalis office located in Providence, R.I., expanding Boskalis’s U.S. footprint. The new office will play a key role in serving as Boskalis’ renewable energy U.S. business center, supporting, among other projects, the transportation and installation of the project foundations in collaboration with the Boskalis Houston office, and serve as a central connection point for multiple project teams.

Ørsted and Eversource say that they are supporting the development of a new domestic offshore wind supply chain that will create thousands of jobs for American workers across the country. As part of that commitment, the companies recently announced that work has begun on the first U.S.-built service operations vessel (SOV) and crew transfer vessel charter agreements to support the building of five new vessels in Rhode Island. The companies are also supporting the first Jones Act-qualified wind turbine installation vessel (WTIV), the *Charybdis*, through a charter agreement with Dominion.

offshoreWIND.biz

Offshorewind.biz
By: Adnan Durakovic
June 30, 2022

Boskalis Lands Major Offshore Wind Deal in USA

Ørsted and Eversource are working with Boskalis for the foundation and offshore substations transportation and installation work for the joint venture's South Fork Wind and Revolution Wind projects, as well as scour protection installation contracts for its Revolution Wind and Sunrise Wind projects.

The contract for this work was finalized in late 2021. The more than 1.7-gigawatt portfolio of projects serving Rhode Island, Connecticut, and New York is expected to produce enough renewable energy for more than a million homes in the Northeast, with all projects operational by the end of 2025, the developers said.

The contracts will support the training and employment of American workers and will utilize a sizable fleet of US vessels. This fleet includes, but is not limited to, protected species observer vessels, platform supply vessels, barges, and tugs.

The contracts will also support the opening of **a new Boskalis office located in Providence,** Rhode Island, expanding Boskalis's US footprint.

The new office will play a key role in serving as Boskalis' renewable energy US business center, supporting, among other projects, the transportation and installation of the project foundations in collaboration with the Boskalis Houston office, and serve as a central connection point for multiple project teams.

This new Rhode Island office is said to continue the trend Ørsted and Eversource have established for attracting global suppliers to set up US facilities and create U.S. jobs in order to serve their projects.

Through their joint venture projects, Ørsted and Eversource are supporting the development of a new domestic offshore wind supply chain that will create thousands of jobs for American workers across the country, the companies said.

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The companies are also supporting the first Jones Act-qualified wind turbine installation vessel (WTIV), the Charybdis, through a charter agreement with Dominion.

"Ørsted and Eversource are investing in a domestic supply chain to build the American offshore wind industry and deliver new economic opportunity to states across the country," said **David Ortiz**, Ørsted's Head of Northeast Government Affairs and Market Strategy.

"This includes attracting companies like Boskalis to expand their operations in states like Rhode Island, hiring and training local workers, and utilizing U.S. vessels to build our projects."

Under the contracts, Boskalis **will manage the transport and installation of three offshore substations and the XXL monopiles** for the South Fork Wind and Revolution Wind projects.

Boskalis **will also install scour protection** for the Revolution Wind and Sunrise Wind projects.

Many US vessel operators are expected to play a critical role in the marine transport to and from the installation site, including the transport of the first American-made offshore wind substation from where it is being fabricated in Texas.

"We are proud to partner with Boskalis to continue to deliver well-paying jobs and clean, renewable energy to the Northeast," said **Mike Ausere** Vice President of Business Development at Eversource.

"Boskalis global expertise in helping construct offshore wind farms as well as its shared commitment to a clean energy future makes them the perfect partner for this next exciting phase of our project development as we continue to grow the offshore wind industry here in the U.S."

As part of the recently signed National Offshore Wind Agreement with North America's Building Trades Unions, Ørsted and Eversource have committed to using union labor for the construction of their shared portfolio of wind farms in development in the Northeast.

For the South Fork Wind, Revolution Wind, and Sunrise Wind projects, Boskalis will work with local partners and labor unions for training and support for the construction, installation and logistics.

"Ørsted and Eversource are helping to realize the development of the US offshore wind industry, providing one of the key clean energy sources for our future," said **Jamie Lescinski**, Boskalis's Offshore Renewables U.S. Managing Director.

"We are excited to help build the South Fork, Revolution and Sunrise wind farms and look forward to contributing to the growth and strength of the U.S. offshore renewables supply chain."

4C Offshore
By: Tom Russell
June 30, 2022

Ørsted and Eversource teams with Boskalis for U.S. offshore wind projects

Ørsted and Eversource have announced that they are working with Boskalis for the foundation and offshore substations transportation and installation work for the joint venture's South Fork Wind and Revolution Wind projects, as well as scour protection installation contracts for its Revolution Wind and Sunrise Windprojects.

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10 WJAR

WJAR
By: NBC 10 News
August 3, 2022

McKee announces training program for offshore wind industry jobs

(WJAR) —

Governor Dan McKee announced on Wednesday a training program to help Rhode Islanders break into the offshore wind industry.

The Offshore Wind Training Program will be based at the Community College of Rhode Island.

It will create the state's first Global Wind Organization training certificate program at the school.

“Rhode Island has momentum, and that is evident by this major workforce development initiative – it is a true collaboration between higher education, labor, and the workforce,” McKee said in a statement.

The governor announced the new public-private partnership with leaders from Ørsted and Eversource at an event at CCRI.

Both entities have partnered to create Revolution Wind, a joint venture that aims to give 400MW to Rhode Island, according to its website.

The program is being partially supported by $1 million from Revolution Wind.

That is part of a $4.5 million commitment to education the joint venture has made, according to the governor's office.

“CCRI is the workforce training engine that will power the growing offshore energy sector in Rhode Island,” said Meghan Hughes, President of CCRI.

The course takes 44 hours to complete, and the certificate is valid for two years.

REDACTED

PBN
By: Nancy Lavin
August 3, 2022

CCRI to launch offshore wind training program under state, developer partnership

OFFSHORE WIND DEVELOPERS Orsted A/S and Eversource Energy are partnering with the state to launch an internationally accredited offshore wind training program at the Community College of Rhode Island. Pictured is the Block Island Wind Farm. /COURTESY ORSTED US OFFSHORE WIND

LINCOLN – If Rhode Island wants to leverage its role in the offshore wind industry to bring more jobs to the state, it needs to prepare those future workers.

How the state will train that emerging workforce became clearer on Wednesday as private and government partners gathered to announce plans to launch an internationally-recognized certificate program at the Community College of Rhode Island. The Global Wind Organization training certificate program, expected to open for enrollment in early 2023, marks the latest in a series of joint agreements between the state and the private offshore wind developers, Orsted A/S and Eversource Energy.

Orsted and Eversource, which are heading up a slew of major area offshore wind projects, will give $1 million from an already announced $4.5 million funding pot to support the new wind training program, according to a statement from Gov. Daniel J. McKee's office. The $4.5 million pledge, first announced in 2019, funds a variety of workforce development programs through state educational institutions and the R.I. Department of Labor and Training. The developers have separately committed $40 million to upgrades ports in Providence and Quonset.

The first-in-the-state, 44-hour CCRI program will train participants in first aid, fire awareness, working at heights and sea survival, among other skills, integrating existing facilities such as the pool with new items like 30-foot-tall structures to teach safe climbing practices and rope techniques, the release stated.

Boston Energy will serve as a consultant in the infrastructure improvements, instructor training, and accreditation necessary to prepare the new certificate program, with work anticipated to begin this fall.

Additionally, Orsted and Eversource through their Revolution Wind project slated for federal waters off Rhode Island's coast said they will give more money to the DLT to train construction workers on offshore wind projects.

"Rhode Island has momentum, and that is evident by this major workforce development initiative – it is a true collaboration between higher education, labor, and the workforce," McKee said in a statement. "Our state has a historic, once-in-a-generation opportunity before us to capitalize on its position as the leader in wind and renewable energy, creating good-paying jobs and protecting Rhode Island's future, while being well-positioned to lead the way in fighting the climate crisis."

While McKee and other state officials have long touted the economic benefits that will come from the state's involvement in offshore wind projects, the number of new jobs for Rhode Island remains unclear.

How many participants the state is hoping to graduate from its new CCRI training program was also not specified, nor is it clear that they are guaranteed jobs on Orsted and Eversource's projects. The developers are also working on two other area wind projects, South Fork and Sunrise Wind, which will use some amount of workers and port infrastructure in Rhode Island.

Partners on the new CCRI training program also include R.I. Commerce Corp., the Rhode Island Building and Construction Trades Council and Building Futures.

NEWPORT BUZZ

[Newport Buzz]
By: Christian Winthrop
August 3, 2022

Governor McKee Announces Programs to Train Offshore Wind Workers

Governor Dan McKee, along with offshore wind joint-venture partners Ørsted and Eversource, announced today a collaborative partnership with higher education, labor and workforce development organizations, to prepare Rhode Island’s offshore wind workforce.

The partnership, together with the Community College of Rhode Island, the Rhode Island Department of Labor and Training, Rhode Island Commerce, the Rhode Island Building and Construction Trades Council and Building Futures, will be supported by $1 million from Revolution Wind, Ørsted and Eversource’s offshore wind project for Rhode Island and Connecticut. The funding is a portion of a previously-announced $4.5 million commitment to support education, workforce training, and supply chain development in the state.

The training partnership will establish the State’s first Global Wind Organization (GWO) training certificate program at the Community College of Rhode Island’s Flanagan campus in Lincoln. GWO training – the international standard for offshore wind safety training – provides essential safety training for workers engaged in offshore wind farm construction and operations. Workers enrolled in the program will receive training in first aid, manual handling, fire awareness, working at heights, and sea survival.

“Rhode Island has momentum, and that is evident by this major workforce development initiative – it is a true collaboration between higher education, labor, and the workforce,” said Governor Dan McKee. “Our State has a historic, once-in-a-generation opportunity before us to capitalize on its position as the leader in wind and renewable energy, creating good-paying jobs and protecting Rhode Island's future, while being well-positioned to lead the way in fighting the climate crisis."

"We need to make sure Rhode Island is not just the birthplace of American offshore wind, but its home going forward. Investments like this are how we will make that happen," said Lt. Governor Sabina Matos. "This program will ensure that we have one of the best-trained wind energy workforces in the nation. We can protect our environment while creating good-paying union jobs and leading a growing international industry."

"Rhode Island workers helped launch America's offshore wind industry. Now, with this major initiative, we're partnering with the Rhode Island building trades and state leaders in higher ed and workforce development to ensure Rhode Islanders have the training and skills they need to help build the state's clean energy future," said David Hardy, Chief Executive Officer of Ørsted Offshore North America.

"We are working to launch a new domestic industry in Rhode Island, and across the region, that will provide well-paying jobs, deliver clean, renewable energy, and help mitigate the worst impacts of climate change," said Joe Nolan, Chief Executive Officer and President of Eversource Energy. "Today's $1 million investment is building a safe and inclusive workforce in Rhode Island that will play a critical role in advancing the state's blue economy and accelerate the transformation to a clean energy future we can all be proud of."

CCRI will engage Rhode Island-based Boston Energy, which will serve as a consultant in the facility retrofitting, equipment purchasing, instructor training, and GWO accreditation. Work will begin on the GWO Basic Safety Training program curriculum and facility build-out this fall. Using their existing facilities, this training center will include, among other things, the pool to simulate offshore conditions for sea survival training, and 30 foot tall structures where students will learn safe climbing practices and rope techniques.

"CCRI is the workforce training engine that will power the growing offshore energy sector in Rhode Island," said Meghan Hughes, President of CCRI. "We are grateful to our industry, government, and labor partners for this investment, which will allow CCRI to build a world-class GWO training program that will provide Rhode Islanders with the skills needed to enter high-quality careers in the offshore wind sector."

"Rhode Island is well-established as a first mover and national leader in the offshore wind industry, and our ability to bring leaders across various sectors together under one umbrella is a crucial part of that success," said Rhode Island Commerce Secretary Liz Tanner. "Public-private partnerships like this will help us continue to build on our momentum in the Blue Economy, create good jobs, and truly lead the new way toward a clean energy future."

"The Ocean State has been a national leader in offshore wind, and we want to ensure that Rhode Islanders from all backgrounds can get the skills and training they need for jobs in this burgeoning industry," said Department of Labor and Training Director Matthew Weldon. "We look forward to continuing our partnership with Building Futures to help ensure access to these opportunities, particularly for low-income and BIPOC individuals. Thank you to Ørsted and Eversource for this important investment in Rhode Island's workforce."

"Union workers helped launch the nation's offshore wind industry with our work on the Block Island Wind Farm, and we're ready to play a central role in building the clean energy projects of the future. We're proud to be playing a part in this partnership and helping to train and certify future offshore wind trades men and women that will power the future of our country," said Michael Sabitoni, President of the Rhode Island Building & Construction Trades Council. "Union labor means good-paying jobs, and now, a future in green energy so we can play our part in supporting the country's energy transition."

"To generate clean energy offshore, GWO certification for Rhode Island's offshore workers is essential," said Andrew Cortés, Founder and Executive Director of Building Futures. "Revolution Wind is an investment in our future; these training dollars will help ensure that diverse community residents experiencing poverty are not left out of this future. Instead, they will have a clear path to family sustaining careers through Registered Apprenticeships in the construction trades."

This program will be available to all workers seeking a GWO training certificate, which provides them with the specialized safety credentials required for working offshore. The program is expected to open for enrollment in early 2023. The course takes 44 hours to complete and certification is valid for two years. GWO training is a critical component in ensuring safe working conditions and practices in the industry. Upon completion of the course, graduates will obtain the practical skills needed to perform their job safely and be prepared for the rigors of offshore work.

In addition to the GWO training program, Revolution Wind announced today that it has provided funding to the Department of Labor and Training for offshore wind career training for Rhode Islanders involved in the construction of offshore wind projects. The Department of Labor and Training, together with Building Futures, will ensure that local workers have access to robust and equitable offshore wind career training and pathways to family-sustaining jobs.

Building Futures has extensive experience executing training programs, having worked with the DLT since 2007 to meet employer and industry need for skilled workers through the Registered Apprenticeship system while creating family-sustaining career opportunities for low-income, diverse community members.

The 704-megawatt Revolution Wind project will create thousands of estimated direct, indirect and induced jobs for Rhode Island during construction and operations.

Revolution Wind will also play a central role in helping Rhode Island reach its ambitious goal of 100 percent renewable energy by 2033 and further position the state, the birthplace of offshore wind in the U.S., as a major hub for this growing industry.
Once permits are in-hand, offshore construction work on Revolution Wind would begin in 2023, with the project in operations in 2025. Onshore and offshore survey work is already underway.

In total, Ørsted and Eversource are investing a combined $40 million at ProvPort and Quonset Point in North Kingstown to support the development of Revolution Wind, as well as the South Fork Wind project serving New York. Work to build a new regional offshore wind construction facility at ProvPort is complete.

Ørsted and Eversource's joint portfolio of Northeast offshore wind farms will be built by American union labor. The developers and North America's Building Trades Unions (NABTU) reached a Project Labor Agreement (PLA) to construct the company's U.S. offshore wind farms with an American union workforce. A first-of-its-kind in the United States, the National Offshore Wind Agreement sets the bar for working conditions and equity, injects hundreds of millions of dollars in middle-class wages into the American economy, creates apprenticeship and career opportunities for communities most impacted by environmental injustice, and ensures projects will be built with the safest and best-trained workers in America.

Together, Ørsted and Eversource will deliver clean, reliable energy to the Northeast through offshore wind, providing enough electricity for more than 1 million homes. In December 2016, Ørsted and Eversource teamed up to launch a new clean energy industry right here in the U.S. Northeast. That partnership has now grown to more than 1,700 MW of offshore wind under development, including the 704-megawatt Revolution Wind project serving Rhode Island and Connecticut; the 130-megawatt South Fork Wind serving Long Island, and the 924-megawatt Sunrise Wind project serving New York.

The Center Square | Rhode Island

The Center Square
By: Brent Addleman
August 3, 2022

Rhode Island training program to support offshore wind sector

In this Aug. 15, 2016, file photo, wind turbines from the Deepwater Wind project stand in the sea off Block Island, R.I.

AP Photo/Michael Dwyer

(The Center Square) – Rhode Island residents seeking employment in offshore wind will benefit from a new training program.

Gov. Dan McKee, along with labor and higher education officials and officials from Orsted and Eversource, announced Wednesday a new partnership that brings together higher education, workforce development, and labor organizations that is designed to provide state residents with the education and training necessary to work in the energy sector.

“Our state has a historic, once-in-a-generation opportunity before us to capitalize on its position as the leader in wind and renewable energy, creating good-paying jobs and protecting Rhode Island's future, while being well-positioned to lead the way in fighting the climate crisis,” McKee said in a release.

The Community College of Rhode Island, according to the release, is partnering with the state’s Department of Labor and Training, Rhode Island Commerce, the state’s Building and Construction Trades Council and Building Futures and will benefit from a $1 million investment from Revolution Wind. Revolution Wind is the name of Orsted and Eversource's offshore wind project encompassing Rhode Island and Connecticut.

According to the release, the $1 million in funding is a portion of the $4.5 million commitment the state has made to support education, workforce training, and supply chain development in the state that will support the energy sector.

The Global Wind Organization training partnership, according to the release, will be offered at the Flanagan campus of the Community College of Rhode Island in Lincoln. The program, which is the international standard for offshore wind safety training, will provide workers training in first aid, manual handling, fire awareness, working at heights, and sea survival.

David Hardy, who serves as chief executive officer of Orsted OffShore North American, said the program will help launch the offshore wind industry in the state.

"We are working to launch a new domestic industry in Rhode Island, and across the region, that will provide well-paying jobs, deliver clean, renewable energy, and help mitigate the worst impacts of climate change," Joe Nolan said in the release. He's chief executive officer and president of Eversource Energy.

The program will be open, according to the release, to all individuals seeking employment in offshore wind and provide them with a training certificate. The program is expected to open in early 2023 and consists of 44 hours to complete a certification that would be valid for two years.

According to the release, the 704-megawatt Revolution Wind project is estimated to create thousands of direct, indirect, and induced jobs for the construction and operational phases of the project.

The Weather Network
By: Neil Ever Osborne and M.A. Jacquemain
August 19, 2022

Offshore wind is an untapped power source of the future

The rising offshore wind sector promises an explosion in wind power generation.

The next big opportunity in renewable energy is likely to be in wind power — in the form of wind farms clustered offshore in the ocean.

With the passage of the Inflation Reduction Act, which will see the Biden administration invest $370 billion (U.S.) in climate programs and clean energy, the budding offshore wind sector is poised for huge growth.

The Biden administration has set a goal of producing 30 gigawatts (GW) of offshore wind energy by 2030. The bill, by reducing the cost of building clean energy infrastructure, makes this goal attainable.

Vessel near the Block Island Wind Farm. Block Island Wind Farm is the first commercial offshore wind farm in the U.S., located 3.8 miles (6.1 km) from Block Island, Rhode Island in the Atlantic Ocean. The five-turbine, 30 MW project was developed by Deepwater Wind. Construction began in 2015 and in late summer 2016 five Alstom Haliade 150-6-MW turbines *were erected. Operations were launched in December 2016. It is the largest project using wind power in Rhode Island, USA. (Neil Ever Osborne)*

There are several U.S. offshore wind projects in development along the Atlantic Coast and in the Gulf of Mexico, and already two major offshore wind farms in operation.

One of these is the Block Island Wind Farm, situated three kilometres off the coast of a beloved Rhode Island vacation spot. The community of Block Island is fully powered by the farm's five giant turbines, which produce six megawatts (MW) of power each.

(For comparison, the average land-based turbine produces about 2 MW.)

The Block Island project was a venture aimed at opening the door to the host of wind farms sure to follow up and down the coast. As a case study, Block Island has demonstrated the challenges to introducing major infrastructure in the sightlines of wealthy stakeholders.

The project required extensive environmental assessment to determine impacts on marine life, birds, and bats, but perhaps an even bigger obstacle was winning over locals and tourists, whose ocean views are now marred by the almost 100 metre tall structures.

Despite some initial opposition, locals have embraced the wind farm — and seen their electricity costs plummet.

Block Island Wind Farm in the distance is the first commercial offshore wind farm in the U.S., located 3.8 miles (6.1 km) southeast of Block Island in the Atlantic Ocean. (Neil Ever Osborne)

Land-based wind power is far ahead of the offshore sector. The United States generates 139 GW of wind power, only 42 of which is from offshore sources. China, the world leader in wind energy, generates about 90 per cent of its total of 342 GW from land-based wind — a chunk of it from the world's largest onshore wind farm in the Gobi Desert.

Canada, which ranks ninth in the world in wind power capacity at 14.4 GW, derives none of it from offshore wind farms.

But this is about to change. The federal government has commissioned studiesto find suitable locations for offshore wind farms and assess the environmental implications.

Analysts see the Atlantic coast as having vast untapped potential. The U.S. Department of Energy estimates the energy capacity potential to be more than 1,000 GW in U.S. Atlantic waters.

Captain Steve Miller is with a blue fish he caught near the Block Island Wind Farm. Rhode Island, U.S. Miller, a full-time resident of Block Island, joined the United States Coast Guard at age seventeen, fished commercially in his twenties, and held a 100-Ton Master Captain's License from the Coast Guard for several years. (Neil Ever Osborne)

As the industry has continued to develop more efficient turbines, the cost of producing offshore wind electricity has dropped dramatically — and the sector has seen record growth as a result.

China added almost 17 GW of offshore wind capacity in 2021. An auction of nearly 500,000 acres of prime future wind farm locations off the coast of New York drew bids of $4 billion.

The world's largest offshore wind farm, Hornsea Project Two in the English Channel, will be fully commissioned by the end of the month and produce 1.32 GW. And South Korea is planning to top this with an offshore project in development that is to have 8.82 GW of capacity.

The global research firm Wood MacKenzie has pegged offshore wind to be a "$1 trillion opportunity."

Thumbnail image: Will Fancher, a Rope Access Supervisor, conducts routine maintenance on a turbine blade at the Block Island Wind Farm off the coast of Rhode Island, U.S. (Neil Ever Osborne)

POLITICOPRO

PoliticoPro
By: Kelsey Tamborrino
August 29, 2022

BOEM asks public to weigh in on Rhode Island offshore wind project

The Bureau of Ocean Energy Management announced Monday it will open public comment on a draft environmental analysis for the proposed Revolution Wind project off the coast of Rhode Island.

Details: The department will open up a 45-day comment period to receive public input on the proposed project in preparation of a final environmental impact statement.

"We're committed to maintaining open and transparent communication with all stakeholders, and value public input," said BOEM Director Amanda Lefton in a statement. "BOEM is using the best available science as well as knowledge from ocean users and other stakeholders to avoid and minimize conflict with existing uses and marine life."

The proposed 704-megawatt offshore wind farm would be located in project developers' Ørsted and Eversource's federal lease area between Rhode Island and Massachusetts. The project is currently slated to begin local construction work as early as 2023 and could supply enough power for at least 300,000 homes.

Revolution Wind — a partnership between Ørsted and Eversource — submitted a construction and operation plan for the proposed wind facility of up to 100 wind turbines located approximately 15 nautical miles southeast of Point Judith, Rhode Island, according to BOEM.

Background: Both Rhode Island and Connecticut have set clean energy goals that would be supported by the Revolution Wind project.

Earlier this year, Rhode Island's governor signed legislation requiring 100 percent of the state's electricity be offset by renewable energy by 2033. Connecticut has also set a goal for 100 percent of the state's electricity to come from zero-carbon sources by 2040.

What's next: The notice of availability for the environmental analysis will publish in the Federal Register on Sept. 2.

BOSTON BUSINESS JOURNAL

Boston Business Journal
By: Mary Serreze
August 29, 2022

Feds issue draft environmental permit for Revolution Wind

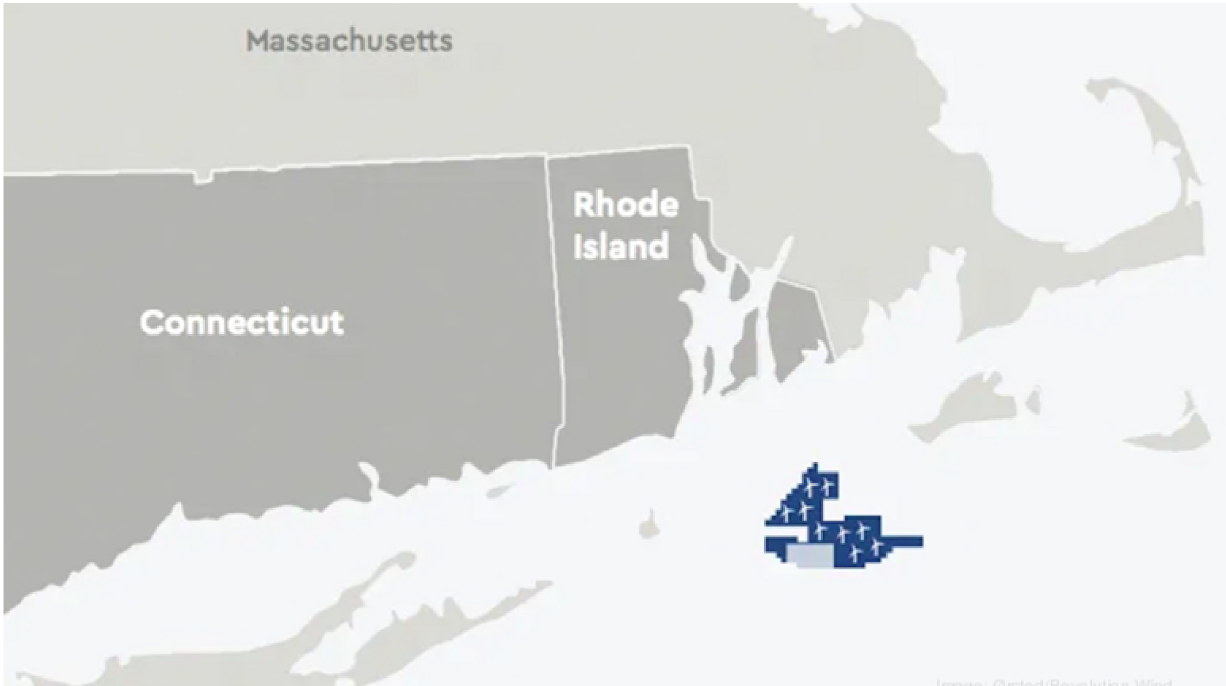
A turbine generates electricity at Block Island Wind, a five-tower project off the coast of Rhode Island.

Mary Serreze

The federal Bureau of Ocean Energy Management today issued its Draft Environmental Impact Statement for Revolution Wind, a joint venture between Ørsted — the Danish energy giant — and the Massachusetts-based Eversource Energy (NYSE:ES).

Revolution Wind in a statement hailed the draft federal permit as an “important milestone” and thanked BOEM for its "comprehensive and diligent review."

The proposed 704-megawatt offshore wind farm would be located in the Atlantic Ocean about 15 miles south of the Rhode Island coastline and 32 miles southeast of Connecticut. The project has contracts in place to provide both states with low-carbon energy.



Revolution Wind would be located off the coast of Southern New England and provide low-carbon energy to Connecticut and Rhode Island.

Ørsted/Revolution Wind

Today's announcement opens a 45-day public comment period. BOEM says it plans a set of meetings where the public can learn more about the project and gain information about the review process.

Revolution Wind said that it is reviewing the draft federal findings and "remains committed to working with our community and environmental partners to ensure that the project is built responsibly and sustainably."

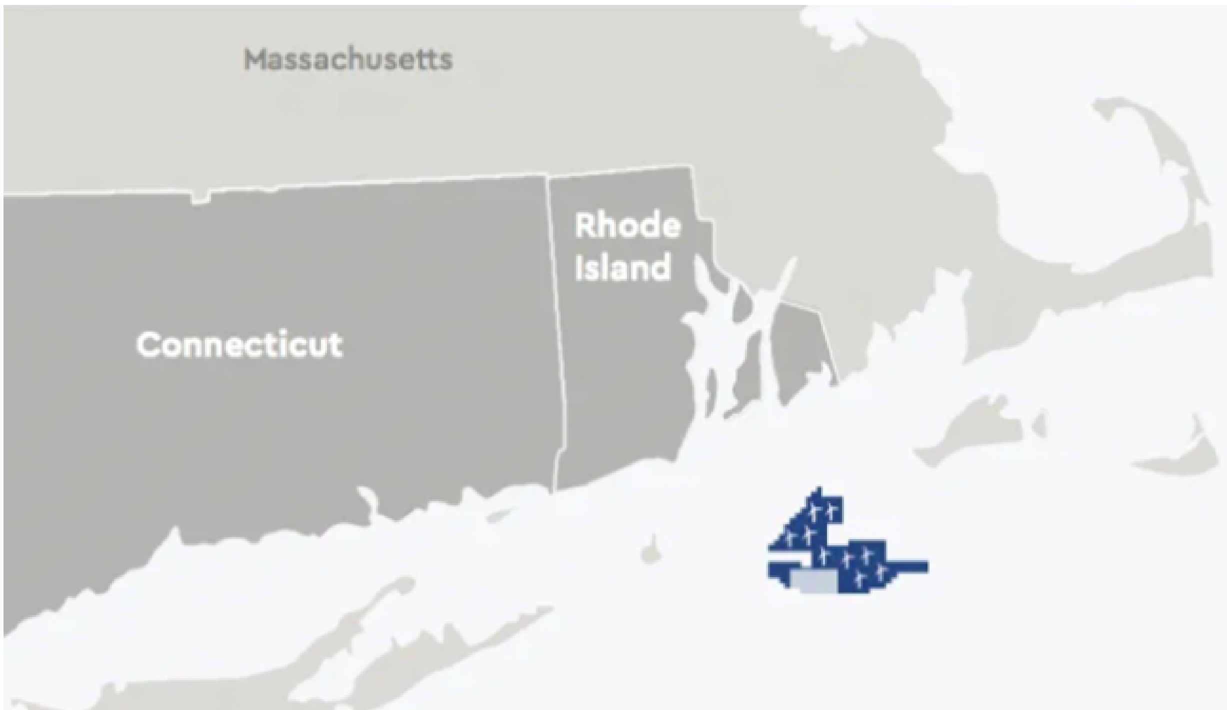
Developers plan to land the project's high-voltage undersea power cable in North Kingstown, not far from where Ørsted and Eversource are leasing flex industrial space at Quonset Point.

Revolution Wind has an expected in-service date of 2025.

The partners plan to stage their major offshore construction from State Pier in New London, Connecticut. But Boskalis, a Dutch shipping and logistics company with an office in Providence, will transport and install foundations and substations. Two Rhode Island shipbuilders — Senesco Marine and Blount Boats — are building special vessels to transport crew members to and from the offshore sites.

North American Windpower
By: Ariana Fine
August 29, 2022

BOEM Opens Environmental Analysis Comment Period for R.I. Offshore Wind Project



The Bureau of Ocean Energy and Management (BOEM) has made the Draft Environmental Impact Statement (DEIS) available for the proposed Revolution Wind energy project, located off the shore of Rhode Island.

The Notice of Availability for the Revolution Wind environmental analysis will publish in the Federal Register on Sept. 2, opening a 45-day public comment period that ends at 11:59 p.m. ET on Oct. 17. The input received via this process will inform preparation of the Final EIS.

"Collaborating with all stakeholders and ocean users throughout the leasing and development process is vital," states BOEM Director Amanda Lefton. "We're committed to maintaining open and transparent communication with all stakeholders, and value public input. BOEM is using the best available science as well as knowledge from ocean users and other stakeholders to avoid and minimize conflict with existing uses and marine life."

Revolution Wind LLC submitted a Construction and Operation Plan (COP) for its proposed wind farm of up to 100 wind turbines located approximately 15 nautical miles southeast of Point Judith, R.I. The expected MW capacity range for this project is 704 to 880 MW, enough to power at least 300,000 homes. The DEIS analyzes the potential environmental impacts of the project as described in the COP and several alternatives to the proposed action.

BOEM will use the findings of the EIS to inform its decision on whether to approve Revolution Wind's COP, and if so, what mitigation measures to require.

During the comment period, BOEM will hold three in-person and two virtual public meetings, where the public can learn more about the review process, the EIS schedule, potential impacts from the proposed project and proposals to reduce potential impacts. There will also be an opportunity for participants to provide comments on the DEIS.

Meeting times, comment submission deadlines and instructions, and more information can be found here.

offshoreWIND.biz

Offshore Wind Biz
By: Adrijana Buljan
August 30, 2022

Rhode Island Offshore Wind Farm Advances Through Federal Permitting System

The US Bureau of Ocean Energy and Management (BOEM) has issued the Draft Environmental Impact Statement (DEIS) for the Revolution Wind project offshore Rhode Island, developed by Ørsted and Eversource.

The Notice of Availability for the Revolution Wind environmental analysis will be published in the Federal Register on 2 September, opening a 45-day public comment period. The input received via this process will inform preparation of the Final Environmental Impact Statement (EIS), BOEM said.

After receiving the DEIS, Revolution Wind said this was an important milestone in the ongoing federal permitting process.

"This critical project is now one step closer to delivering enough clean, renewable energy to power hundreds of thousands of homes throughout the region and playing a key role in helping both Rhode Island and Connecticut meet their ambitious clean energy goals", Revolution Wind said in a statement.

"As we review the draft findings, we would like to thank the Bureau of Ocean Energy Management for its comprehensive and diligent review. As always, Revolution Wind remains committed to working with our community and environmental partners to ensure that the project is built responsibly and sustainably. In the weeks to come, we look forward to hearing directly from residents and stakeholders as the review process continues".

The DEIS analyses the potential environmental impacts of the project as described in its Construction and Operation Plan (COP) and several alternatives to the proposed action.

According to BOEM, which started the project's environmental review in Spring 2021, Revolution Wind proposes installing up to 100 wind turbines approximately 15 nautical miles southeast of Point Judith, Rhode Island, making up for a wind farm of a capacity between 704 MW and 880 MW.

In October last year, Ørsted and Eversource placed a firm order with Siemens Gamesa for two of their joint projects: South Fork in New York and Revolution Wind in Rhode Island.

Under the agreement, Siemens Gamesa will supply, deliver and install a total of 77 of its 11 MW wind turbines, of which 65 are planned to be installed on Revolution Wind, totalling 715 MW.

Revolution Wind has three power purchase agreements in place, signed in 2019, for a total of 704 MW of the project's capacity: two contracts with the State of Connecticut totalling 304 MW and a 400 MW contract with the State of Rhode Island.

RECHARGE
Global news and intelligence for the Energy Transition

Recharge News
By: Tim Ferry
August 30, 2022

'One step closer' | Orsted-led US Revolution Wind environmental impact paperwork out

Danish developer Orsted and joint venture (JV) partner Eversource have taken a key step forward with their Revolution offshore wind project in the US Atlantic following the publication by the federal government of the draft environmental impact statement (EIS) for the 704MW array off the states of Rhode Island and Connecticut.

The draft EIS, released by the Bureau of Ocean Energy Management (BOEM), the regulator of energy development in federal waters, kicks off a 45-day comment period that is part of the process needed to move the project towards its record of decision (ROD) next April, after which construction can begin.

“Collaborating with all stakeholders and ocean users throughout the leasing and development process is vital,” said BOEM director Amanda Lefton. “BOEM is using the best available science as well as knowledge from ocean users and other stakeholders to avoid and minimise conflict with existing uses and marine life.”

The draft EIS analyses the potential environmental impacts of Revolution’s construction and operations plan (COP), which calls for 100 wind turbines to be installed in the lease area some 15 miles (28km) southeast of Point Judith, Rhode Island, with an expected capacity range from 704MW to 880MW, enough to power at least 300,000 homes.

“We’re excited that Revolution has reached this important milestone in the ongoing federal permitting process,” a project spokesperson told *Recharge*.

“This critical project is now one step closer to delivering enough clean, renewable energy to power hundreds of thousands of homes throughout the region and playing a key role in helping both Rhode Island and Connecticut meet their ambitious clean energy goals.”

Revolution has contracted 400MW to Rhode Island and 304MW to Connecticut while holding extra capacity that could be deployed for growing demand for offshore wind power in southern New England.

Rhode Island **just mandated as much as 1GW of offshore wind by 2033**, while Massachusetts officially **raised its mandate 40%, to 5.6GW, by 2035**.

Revolution will be the second Orsted-Eversource JV project to gain its ROD following the approval of the **132MW South Fork Wind in 2021**, and will be the second of nine projects totalling some 18GW of capacity slated for approval next year, kicking off a construction boom in the nascent industry.

One third of the capacity up for approval is located in the Rhode Island-Massachusetts wind energy areas (WEAs), the US' largest and most advanced zones for offshore wind development. The Orsted-led JV's 880MW-1.3GW Sunrise project is scheduled for approval in August, followed by the Ocean Winds and Shell JV's 2GW-2.4GW Mayflower and Avangrid's 2GW-2.3GW New England Wind developments in October.

So much capacity coming available in the same year may lead to bottlenecks, however, particularly with port capacity needed for staging projects. A **study by University of Delaware researchers** Willet Kempton and Sara Parkison published this spring found that "following 2022... there is an immediate port area shortfall. From 2023 to 2035, state procurement demand far exceeds our measured marshalling port supply".

Much of the port capacity in the region is too small and underdeveloped to meet the demands of the industry. The 800MW Vineyard 1, for example, will be marshalled out of the New Bedford Marine Commerce Terminal (NBMT), the nation's first purpose-built offshore wind port, but the 29-acre site, originally intended to stage the ill-fated **Cape Wind's** 3.6MW turbines, will now need to handle 62 of GE's 13MW Haliade-X nacelles, each weighing 600 tonnes, along with their 107-metre-long blades.

As New Bedford will be unable to cope with the entire project itself, two additional ports will be drafted into service, adding layers of complexity to what is already a logistically challenging project.

All three of the Orsted-led JV's projects, South Fork, Revolution, and Sunrise, will be marshalled out of **State Pier in New London, Connecticut,** where a $250m renovation is currently underway to enable the pier to handle the massive components of the offshore wind sector, along with turbine and other assembly.

The State Pier renovation, with some $75m in funding from the Orsted-led JV, is scheduled for completion in late 2023.

Offshore wind-ready vessels are likewise in short supply, especially **Jones Act-compliant** wind turbine installation vessels (WTIV), the massive, specialty-vessels needed for turbine installation.

The US has only a single WTIV under construction, the $500m, 472-foot (144-metre) *Charybdis*, with most US projects relying on a costly and inefficient system of US-flagged barges delivering components from marshalling ports to a foreign-flagged WTIV anchored at the wind farm site. That flagship WTIV, however, being built for Virginia's Dominion Energy, is actually slated for the installation of Revolution and South Fork, enabling a smoother and more efficient project installation.

The *Charybdis* will then move on to the installation of Dominion Energy's **2.6GW Coastal Virginia Offshore Wind** project starting in 2025.

Orsted owns or is partnering with other developers on more than 4GW of projects in US waters, including the **up-to-2GW Ocean Wind 1 project off New Jersey with partner PSEG**, and is a key player helping the US meet the **Biden administration's goals of 30GW of offshore wind capacity by 2030.**

reNEWS.BIZ
renews.biz
By: Offshore Wind
August 30, 2022

BOEM publishes Revolution Wind draft EIS

Notice of Availability for the 704MW project's DEIS will publish in the Federal Register on 2 September

The Bureau of Ocean Energy Management (BOEM) is making available the Draft Environmental Impact Statement (DEIS) for the proposed 704MW Revolution Wind Farm offshore wind project, off Rhode Island.

The Notice of Availability for the Revolution Wind DEIS will publish in the Federal Register on 2 September 2022, opening a 45-day public comment period, which ends on 17 October.

Revolution Wind is being developed by a partnership between Orsted and Eversource Energy.

The input received via this process will inform preparation of the Final Environmental Impact Statement (EIS).

Other documents available for viewing in will be the Revolution Wind DEIS Notice of Availability (Docket No. BOEM-2022-0045), the Revolution Wind Draft Environmental Impact Statement (DEIS) and the Revolution Wind Construction and Operations Plan (COP), with appendices (updated July 2022)

During the comment period, BOEM will hold public meetings, where the public can learn more about the review process, EIS schedule, potential impacts from the proposed project, and proposals to reduce potential impacts.

Revolution Wind stated: "We're excited that Revolution Wind has reached this important milestone in the ongoing federal permitting process.

"This critical project is now one step closer to delivering enough clean, renewable energy to power hundreds of thousands of homes throughout the region and playing a key role in helping both Rhode Island and Connecticut meet their ambitious clean energy goals.

"As we review the draft findings, we would like to thank the Bureau of Ocean Energy Management for its comprehensive and diligent review.

“As always, Revolution Wind remains committed to working with our community and environmental partners to ensure that the project is built responsibly and sustainably.

“In the weeks to come, we look forward to hearing directly from residents and stakeholders as the review process continues.”

E&E News
By: Benjamin Storrow
September 13, 2022

Inside America's offshore wind hub: Boats, cables and elation

The Atlantic Pioneer, a crew transfer vessel, docks at a turbine at the Block Island wind farm offshore from Rhode Island. Chris Bentley/Flickr

WARREN, R.I. — Marcia Blount had just taken over her family's boat building business when she spied an opportunity. A project called Cape Wind was moving forward with plans to install 130 wind turbines in the shallow waters of Nantucket Sound south of Massachusetts.

Someone, she thought, will need to build the boats to deliver workers to all those turbines.

So, in 2011, her company acquired the license to build a so-called crew transfer vessel, or CTV, from a British shipbuilder.

Then, nothing happened.

Cape Wind floundered amid a mountain of lawsuits. She noticed fewer and fewer people at the wind industry conferences she attended.

"It did get almost to the point where you started to wonder, 'Is this ever going to happen?'" Blount recalled.

Now, more than a decade after Blount set her eyes on the saltwater horizon, the offshore wind industry is finally poised to take off. The first two large-scale projects are slated to begin offshore construction early next year, taking the number of turbines installed in American waters from seven to 81. One could begin cable installation as soon as November, while the other is slated to start in early 2023.

The projects, both planned in federal waters south of New England, are part of an offshore wind boom along the East Coast. President Joe Biden wants to see the U.S. install 30 gigawatts of offshore wind by 2030, enough to power 10 million homes. The White House estimates the build-out would cut carbon dioxide by 78 million tons, more than the annual power plant emissions of New England, New Jersey and New York combined.

Onshore, companies like Blount's are racing to get ready. Blount Boats Inc. is building two 100-foot crew transfer vessels for a company contracted to work with Vineyard Wind, a 62-turbine project planned in federal waters 12 miles south of Martha's Vineyard, and Orsted A/S, a Danish developer with six projects along the East Coast.

"We see it as the future for us," she said on a recent tour of the company's boatyard. The aluminum skeleton of a 100-foot CTV was taking shape inside a massive hanger on the east bank of Narragansett Bay. If all goes to plan, the first will be launched sometime next spring.

"We saw the potential and jumped on it back in 2011," she said amid the din of screws being tightened and hissing welding sparks.

"I mean, if they develop everything that's been leased on the East Coast — even only on the East Coast — they're going to need dozens of these vessels. So we would very much want to be part of that."

Blount is hardly the only one. On the other side of Narragansett Bay, some 23 companies serving the offshore wind industry have set up shop at a sleek co-working space in Providence. They include shipping and logistics firms planning the trans-Atlantic voyage for turbine parts that can span the length of a football field, and consultants who spend hours poring over thousands of pages of permitting documents. Even a dredging company has taken up a place at the downtown office space.

That activity coincides with some of America's first construction work on offshore wind.

In Wainscott, N.Y., a joint venture of Orsted and Eversource Energy has completed much of the onshore work needed to serve its 12-turbine South Fork Wind Farm, which will be built 35 miles east of Montauk. The company will begin drilling a tunnel for its high voltage cable under a local beach in October.

Similar work began in Barnstable, Mass., last year to connect Vineyard Wind to the New England grid before workers paused construction to accommodate the summer tourist season on Cape Cod. It is primed to begin again this fall, and this time, it will be accompanied by underwater work in the ocean.

"It's really exciting — it's actually happening," said Jeff Tingley, a consultant who is helping oversee development of onshore substations for three Orsted projects along the East Coast.

The industry is now ready to move its work into the Atlantic Ocean. The Prysmian Group, a cable-maker, has finished manufacturing two high-voltage export cables at factories in Europe for Vineyard Wind. They are being loaded on ships, which are set to embark in the coming weeks. One will make the journey mounted on a barge positioned atop a semi-submersible vessel to accelerate the trip across the ocean.

Vineyard Wind CEO Klaus Moeller has spent the past months busily planning for the cables' arrival. The cable corridor needed to be surveyed for potential obstacles, ranging from old lobster traps to unexploded bombs from World War II (one was actually found). A remote-controlled submersible was used to clear the path.

Finally, a certificate from federal regulators is needed to begin laying the cable. A decision is expected in September. The date of actual construction will depend on weather conditions.

"This year, we will focus on onshore and the start of the cables, and next year we will start foundations and the turbines and then finish it in '24," Moeller said.

'A new chapter'

That the industry made it this far was never guaranteed in America.

While offshore wind has flourished in Europe and is taking off in Asia, the idea of installing turbines in the ocean has long been contentious in the United States. After the failure of Cape Wind, the Trump administration nearly brought the whole industry to a halt with calls for more environmental study of Vineyard, the first project to undergo federal review.

Vineyard faces a legal challenge to its environmental permit from a group of landowners and fishermen. But unlike Cape Wind, it can rely on federal permitting rules that did not exist when the first Massachusetts project was proposed more than two decades ago. It also has a powerful ally in Biden, whose administration has made offshore wind a pillar of U.S. climate plans.

Federal regulators moved quickly to support the industry, approving permits for Vineyard and South Fork, while administration officials tout the job creation and emissions cutting potential of generating electricity from wind at sea.

In July, Biden visited a former coal plant in southeastern Massachusetts where Prysmian is building a factory to produce submarine cables. The plant will make cables for projects like Commonwealth Wind, a 1,200 megawatt facility that is being developed by Avangrid Inc., a Connecticut-based utility that owns a stake in Vineyard. The project is about a third of the way through an 18-month permitting process, said Hakan Ozmen, a Prysmian executive.

“This is going to be a big advantage not only for offshore wind and renewable energy, but from the workforce perspective,” Ozmen said. “This is a new chapter for technology development.”

For now, most of the components being used for Vineyard and South Fork are being manufactured abroad. Prysmian’s two cable lengths, for instance, were made at factories in Finland and Italy. Vineyard’s foundations, or monopiles, are under construction in Germany, and its transition pieces, which connect turbine towers to their foundations, are currently being built in Spain.

“To see the progress the team is making in spite of the different challenges we’ve faced is definitely gratifying and a real testament to our work,” said Moeller, the CEO of Vineyard Wind.

Wind ‘clustering’

Marcia Blount is president and chief financial officer of Blount Boats Inc. | Benjamin Storrow/E&E News/POLITICO

In Providence, the Cambridge Innovation Center co-working space hums with people who are planning to move turbine parts and cables. They spend time planning the logistics of moving components across the ocean that in some cases weigh as much as two fully loaded 747 airplanes.

That is no easy task. Demand for new offshore wind components is skyrocketing, and the number of boats and crews capable of moving that equipment is limited. Further complicating matters are permits that restrict construction around wildlife movements and tourism seasons. Project developers are also keen on streamlining construction schedules, as every day spent working on the water is expensive.

The idea of clustering all the people needed to do that work in one co-working space was pushed by Rhode Island officials, who have sought to support the growth of the industry in the Ocean State. One of those officials was Tingley, the consultant who previously held a role at the Rhode Island Commerce Corporation. He would urge offshore wind companies to set up in Rhode Island.

His pitches often included tours of CIC, as the co-working space is known. The sleek office building is equipped with a game room, communal kitchen, phone booths and conference rooms. Much of the work being done at the CIC is connected with Orsted, the Danish developer that set up an innovation center in Rhode Island.

"It's fantastic. I can now walk down the hall and talk to a friend at a company like Seaway 7, which does big offshore construction. Right next door is Crowley, a company that does logistics," said Tingley, who now works for Saybrook Associates Inc., a consulting firm. "What you're seeing is clustering. It's an industry where everyone wants it to be successful. So there is quite a lot of information sharing. There is a lot of discussion about what we see happening in the future, discussion around mutual problem solving to benefit the industry."

Not all the offshore wind work being done in the U.S. is at whiteboards. Orsted is building a foundation facility in Providence. Equinor ASA, a Norwegian oil company that has invested heavily in offshore wind, is building a tower factory at the port of Albany to serve its projects in New York. Shipyards across the Northeast are also busy.

Vineyard Wind will use three crew transport vessels to serve its project. One of them will be built at a shipyard in Somerset, Mass. The other two are being built by Blount's company in Rhode Island and will be delivered to American Offshore Services, a marine shipping company contracted to work with Vineyard and Orsted.

The vessels represent a natural extension of Blount Boat's business, said Blount. Her father, Luther, built a barge in 1949 to haul stinking clam shells away from the processing plant where his brother made clam chowder. Over the next half-century, Blount Boats built everything from ferries to work boats for the Gulf Coast oil industry.

The crew boats for offshore wind have a shallow draft, which enables them to be launched from Blount's dock on the Warren River in Warren. The bow is equipped with a pincer, which hugs the turbine when docking, stabilizing the vessel as it delivers workers in choppy seas.

Blount has already built two crew transport vessels for demonstration projects off Rhode Island and Virginia. The company is in negotiations to build two more for American Offshore Services. The company's biggest challenge today is finding enough employees as the company aims to grow its workforce from around 40 to 75, Blount said. Finding skilled workers is difficult.

But after building two of the first crew transport vessels in America, Blount is confident the business's boats will be ready to launch with the industry next year. After a decade of waiting, she's bullish that there will be plenty of work for years to come.

"It's really pretty thrilling that it's right in our backyard," Blount said. "Given the number of vessels they need and the timing on when they need them, to me, I mean, it's a wonderful opportunity. They could literally fill up the Northeast shipyards and still need more boats."

The Boston Globe

The Boston Globe
By: Brian Amaral
September 13, 2022

Marking a Block Island wind farm milestone, and what it could mean: ‘A lot is coming fast’

It’s been more than 5 years since the Block Island wind farm became operational. Industry leaders say the farm demonstrates off-shore wind is more than just feasible.

Ørsted Offshore North America CEO David Hardy and others gathered in in Providence Thursday, marking 5 years of operations of the Block Island wind farm.Courtesy of Ørsted

PROVIDENCE — Politicians, union leaders, and the developer behind Rhode Island’s next wind farm gathered in the city Thursday to celebrate the fifth anniversary of its first.

It’s been five years since the Block Island wind farm became operational. (Technically it’s been five years and nine months, but December 2021 wasn’t a great time to have a five-year anniversary party.) The starting five, as current owner and operator Ørsted calls them, were a demonstration project to determine the feasibility of wind power in U.S. waters.

The Block Island farm shows offshore wind power is more than just feasible, industry leaders say.

“It’s a celebration of what was the beginning of something that could be big,” Ørsted Offshore North America CEO David Hardy said after an event held at the CIC Providence on Dyer Street. “But it’s really about looking forward to what’s coming next. A lot is coming fast.”

Wind turbines near Block Island in May 2017. Chang W. Lee/NYT

The wind farm off Block Island provides energy to the island and, at some times, to the mainland too, Hardy said. There are five turbines in the project. With the farm, the island was able to turn off fossil fuel guzzling generators. It also provides a training ground for the workers on the next generation of wind power projects on the horizon.

A weekday briefing from veteran Rhode Island reporters, focused on the things that matter most in the Ocean State.

The event Thursday featured speeches by Governor Dan McKee and recorded remarks by U.S. Interior Secretary Deb Haaland.

Ørsted, whose parent company is based in Denmark, is also the developer behind upcoming offshore wind projects. They include South Fork, which is under on-shore construction and will bring power to Long Island, New York; and Revolution Wind, which is in the approval process and would bring power to Connecticut and Rhode Island. Both are joint ventures with Eversource.Revolution Wind would dwarf the Block Island farm in size, at 704 megawatts to Block Island's 30.

Ørsted has U.S. headquarters in Boston and Providence. The company currently has 57 employees in Providence, and expects to have more than 100 by the end of 2023.

Providence Business News
By: Nancy Lavin
September 22, 2022

5 years later, Block Island celebrated as birthplace of U.S. offshore wind

STATE LEADERS, union representatives and developers celebrated the five-year anniversary of the Block Island Wind Farm at an anniversary event on Thursday. / COURTESY ORSTED US OFFSHORE WIND

PROVIDENCE – State leaders lavished praise on the people who envisioned and built the Block Island Wind Farm while marking its five-year anniversary on Thursday.

Bold promises abounded about Rhode Island's growing role in the offshore wind industry since making a name for itself with the first-in-the-nation wind farm off Block Island. But details about the "thousands of jobs" and revolutionary environmental benefits that will result from Rhode Island's foothold in the wind industry were noticeably absent.

Instead, the lineup of lawmakers, union leaders and project developers who spoke during the celebration event at the Wexford Science & Technology building focused on past successes, including the challenges they overcame in building the Block Island Wind Farm.

Joe Walsh, business manager of the Providence chapter of the International Brotherhood of Electrical Workers, recalled the late-night town meetings in which critics claimed the project would ruin their waterfront views and kill the state's tourism and fishing industries.

Environmentalists condemned project proponents as "bird-killers," remembered Scott Duhamel, secretary-treasurer of Rhode Island Building & Construction Trades Council.

Yet these concerns never came true, and the success story of the first-in-the-nation wind farm gave Rhode Island national, and even international, recognition, Duhamel said.

"That is what this is about, a burgeoning new industry in America with good-paying jobs," Duhamel said. "We built that. We built those five."

While it will forever hold the title of first, the Block Island project will soon be eclipsed by a slew of utility-scale projects with skyscraper-sized turbines that generate more than 20 times more power. Among them: Revolution Wind, a 704-megawatt giant from Block Island Wind Farm owner Orsted A/S and its partner Eversource Energy.

While the 100 turbines aren't expected to start spinning for another three years, proponents say Rhode Island is already readying for – and receiving – the benefits of the massive wind farm.

David Hardy, CEO of Orsted Offshore North America, pointed to the company's $40 million investment in port infrastructure, including a recently completed turbine manufacturing facility at the Port of Providence. Nationwide, the Danish wind developer has spent $2 billion on infrastructure and supplies across 44 states, he said.

As Orsted looks to expand its U.S. presence further, Rhode Island remains a bright spot for the company and one where "we feel like there's a lot of opportunity," Hardy said.

Meanwhile, the state has ponied up $35 million from its fiscal 2023 budget to build a wind turbine shipping area off of East Providence's waterfront. Also during this legislative session, lawmakers committed the state's utility company, Rhode Island Energy, to procuring another 1,000 megawatts of offshore wind power.

DAVID HARDY, CEO of Orsted Offshore North America, pointed to investments in port infrastructure in Rhode Island as one example of the company's commitment to the state during an event on Thursday. / PBN PHOTO/NANCY LAVIN

And on Thursday, Orsted and co-developer Eversource Energy awarded a contract for the cables that will connect Revolution Wind to the power grid onshore. Under the new deal with Nexans, the company will supply the underwater cables that transmit the wind farm power to the electric grid in Rhode Island and Connecticut, according to a news release.

The agreement marks the second deal with Nexans for this project; the company also won the contract for cable installation work earlier this year.

Taken together, the funding, policy changes and signed contracts mean Rhode Island is poised for long-term economic success, including "thousands" of jobs, Gov. Daniel J. McKee said.

"The people of the state of R.I. are going to get the benefit of an ongoing economy that is going to grow and grow and grow," he said.

But the exact number of jobs – and when they will come – is unclear. McKee admitted he didn't know these details, though he insisted he was not worried.

"I know the growth is going to be there," he said.

Although McKee also said the state is not relying on federal leaders, the future of Revolution Wind and several other offshore wind arrays hinges on federal agency approvals, which have not been easy to secure in the past.

The 100-turbine wind farm off the coast of Block Island was originally set to be finished in 2023, but like other area offshore wind arrays, got held up during the federal permitting process due to the novelty of the industry and the prior presidential administration's attitude toward renewable energy. Projects have also faced backlash from fishermen, who worry the massive turbines will disrupt the ecosystems and species on which their livelihood depends.

A preliminary assessment of the project's environmental impacts published in August did not find it would substantially alter the fate of the fishing industry, which is expected to decline regardless due to climate change. The project could, however, improve the state economy, according to the U.S. Bureau of Ocean Energy Management report.

After the initial evaluation, BOEM has begun a public comment period, which includes several online and in-person meetings in October. The feedback will be incorporated into the agency's final review and decision, which it expects to be released next summer, according to Lissa Eng, an agency spokesperson.

Developers now expect to begin construction in 2023, with a targeted 2025 completion date.

Nancy Lavin is a PBN staff writer. You may reach her at Lavin@PBN.com.

ABC 6
By: Cori Dubois
September 22, 2022

McKee, environmental leaders celebrate milestone anniversary for offshore win

This is a file photo of wind turbines. (WLNE)

NEW SHOREHAM, R.I. (WLNE) — Gov. Dan McKee and environmental leaders celebrated a milestone anniversary for offshore wind on Thursday.

In a release, the governor's office said the five-turbine Block Island Wind Farm is America's first commercial offshore wind farm.

The celebration marked more than five years that the wind farm has been in operation.

"The work that we're doing here, investments made in the blue economy, aren't just good as we work to combat the effects of climate change, and certainly that is our priority, to make sure that we are attacking the things that we need to do to make sure we have a clean environment so that people can live in our state and enjoy it. But they are good for the economy," said McKee.

The governor was also joined by energy giant Ørsted, which headquarters its American offshore wind operations in Providence.

REDACTED

WJAR
By: R.J. Heim
September 22, 2022

Rhode Island celebrates 'The Starting Five,' wind turbines

PROVIDENCE, R.I. (WJAR) —

It's been five years now since five wind turbines have been active just offshore from Block Island, making Rhode Island the first in the country to do so.

Gov. Dan McKee and environmental groups honored the nation's first offshore wind farm, dubbed as "The Starting Five," on Thursday.

When Deepwater Wind threw the switch generating enough wind power electricity for 17,000 homes in December 2016, there was, and continues to be, some controversy over environmental impacts. But the skeptics and "naysayers" weren't at the celebration of the five-year milestone.

Joe Walsh, IBEW Local 99 Union Business Manager, recalls as far back as 2008, "at town meetings, people calling us names, how we're gonna ruin the views on Block Island and all this stuff, gonna destroy tourism, it's gonna destroy the fishing industry, it's gonna destroy everything."

Walsh said that didn't happen.

"The most beautiful landscapes in the world are peppered with wind, onshore and offshore. And I always wondered, well, they're doing it, how come we're not doing it," Walsh added.

FILE - In this Aug. 15, 2016 file photo, three of Deepwater Wind's five turbines stand in the water off Block Island, the nation's first offshore wind farm. (AP Photo/Michael Dwyer, File)

And now it's 5 years later.

"What started here in Rhode Island is now becoming an entire industry across America," Orsted North America's President and Chief Operating Officer David Hardy said to a packed meeting room in the Cambridge Innovation Center.

In 2018, Orsted bought Deepwater Wind for $510 million and set up its North American headquarters in Rhode Island.

With state government's initiative, the cooperation of all parties involved, including between labor and Orsted, is the model now as other states are playing catch-up.

"As we put people to work on these most important projects, we are also helping the economy of every community in the state of Rhode Island," McKee said.

A rainbow illuminates the sky above Deepwater Wind's five turbines in the water off Block Island. (Aleksander via Chime In)

So far, tens of thousands of jobs have been created in the Ocean State, all wind power related, with more on the way.

McKee recently announced a training program that aims to increase workers for the offshore wind industry.

The training certificate would be offered at the Community College of Rhode Island.

Ordsted's new manufacturing facility, a big gray block building at Provport, will be used to manufacture components for the wind turbine industry.

"We're building an industry from the ground up, having started right here in Rhode Island. And we get to build it the right way," added Hardy.

Orsted's next projects are already underway: South Fork Wind, that will serve Long Island with power, will be online end of 2023, followed by Revolution Wind, serving more customers in Rhode Island, by the end of 2025.

These are all based in the Ocean State, leading the country in offshore wind power generation.

Providence Business News
By: Nancy Lavin
October, 5, 2022

Supporters tout environmental, economic benefits of Revolution Wind at meeting

THE U.S. BUREAU OF OCEAN ENERGY MANAGEMENT held a public meeting Wednesday in East Greenwich to gather feedback on Revolution Wind ahead of its final decision on the project. Pictured is the Block Island Wind Farm. / COURTESY ORSTED U.S. OFFSHORE WIND

EAST GREENWICH – The offshore wind industry has not always been embraced with open arms.

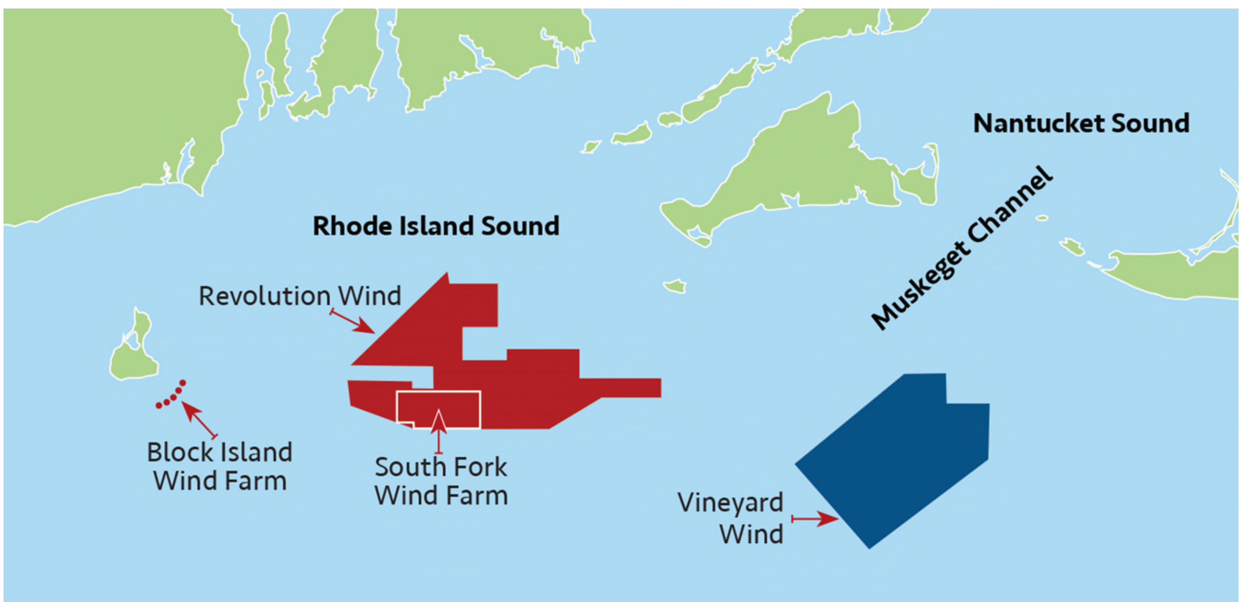
But criticism was noticeably absent from a Wednesday meeting about the Revolution Wind farm proposed off the Rhode Island coast.

The informational session and comment period hosted by the U.S. Bureau of Ocean Energy Management was one of a series of five public meetings seeking input on the project by Orsted A/S and Eversource Energy LLC.

The comments will be used to help shape the federal agency's final review and decision of how the massive, 704-megawatt wind project will affect the surrounding environment and economy.

The hearings come a little over a month after BOEM issued an initial review of the project. The 2,000-page draft published Aug. 29 looked at the wind farm's effect on a range of environmental and economic issues, including air quality, commercial and recreational fishing, boat navigation, recreation and tourism. The offshore wind industry's potential to disrupt fishing and tourism and damage critical environmental habitats has been a growing source of concern across the region and in Rhode Island, with many critics contending that there is not enough information about the nascent industry to guarantee there won't be consequences.

That was not the case Wednesday at the Swift Community Center in East Greenwich, where the message was one of resounding support.



THE REVOLUTION WIND farm is one of several massive offshore wind projects planned for federal waters off Rhode Island's south coast. / SOURCE: R.I. DEPARTMENT OF ENVIRONMENTAL MANAGEMENT / PBN GRAPHIC/ANNE EWING

About a dozen people spoke, representing environmental, fishing and business industries. Across the board, they touted the project's benefits for meeting the state's ambitious climate goals well worth a small disruption to the ecosystem and fishing industry.

"There's no perfect energy source out there," said Jed Thorpe, the Rhode Island state director for Clean Water Action. "Offshore wind is the best bang for our buck in terms of meeting our energy needs but also taking care of our environment and meeting our climate change goals as well."

BOEM's draft report on Revolution Wind did not find any significant environmental or economic problems that might be caused by the project. Certain areas, such as commercial and recreational fishing, scientific research and water views, are going to suffer with or without the wind farm because of climate change, development and other external factors, the report stated.

The project may bring long-term economic benefits such as jobs to the region, although the exact number of jobs in Rhode Island was not specified in the report.

Scott Yerman, a longtime fisherman, credited the project for offering him a new job opportunity, taking his boat out to survey the area through work with Connecticut company Sea Services North America.

“Orsted has provided guys like me a new way to earn money,” Yerman said.

He also noted how further research into the project assuaged his concerns, saying that the area around the turbines will remain open for fishing and that the one-mile separation between each structure means boats can still pass.

“If more people did the same work, I am pretty sure they would come to the same conclusions we have, that offshore wind and commercial fishing will be fine side by side,” Yerman said.

Though some supporters urged BOEM to expedite the approval process, the permitting review has already been plagued by delays that have pushed back the original construction timeline by several years.

Now developers plan to start construction in 2023, finishing the project by 2025.

Orsted and Eversource issued a joint statement after the draft review was published, calling it an “Important milestone.”

“This critical project is now one step closer to delivering enough clean, renewable energy to power hundreds of thousands of homes throughout the region and playing a key role in helping both Rhode Island and Connecticut meet their ambitious clean energy goals,” the developers stated. “As we review the draft findings, we would like to thank the Bureau of Ocean Energy Management for its comprehensive and diligent review. As always, Revolution Wind remains committed to working with our community and environmental partners to ensure that the project is built responsibly and sustainably. In the weeks to come, we look forward to hearing directly from residents and stakeholders as the review process continues.”

Another in-person public information session will be held in New Bedford on Thursday, and a virtual meeting is scheduled for Oct. 11. The agency is also accepting written comments online or by mail through Oct. 17.

For more information, visit https://www.boem.gov/renewable-energy/state-activities/revolution-wind.

The Boston Globe

The Boston Globe
By: Brian Amaral
December 29, 2022

Look for R.I. to make gains in renewable energy, forest conservation, and clean transportation in 2023, experts say

David Ortiz, head of government affairs and market strategy, Northeast, Ørsted

Rhode Island's thriving offshore wind industry, launched here with The Starting Five at the Block Island Wind Farm, will jump into hyperdrive in 2023: We'll be building turbine foundation components at ProvPort and crew transfer vessels at Rhode Island shipyards; establishing operations facilities at Quonset Point; continuing our partnerships with the R.I. building trades and our commitment to workforce training; and collaborating with the rest of the state's offshore wind cluster. It's all part of our growing presence and commitment to Rhode Island.

In the new year, the Block Island Wind Farm will enter its seventh year in operations, and our next Rhode Island offshore wind project, Revolution Wind, will enter the final stages of permitting and gear up for construction. And thanks to Governor McKee's leadership, the state's next offshore wind solicitation will mean even more Ocean State homes and businesses will be powered by clean, offshore wind energy. Put it all together and you can probably tell: We're really bullish about the year ahead for Rhode Island.

FORTUNE

Fortune
By: Olivia Rudgard and Bloomberg
February 18, 2023

Offshore wind farms lure tourists eager to see 'biggest rotating devices on the planet'

The sheer size and scale of wind turbines, which can stand over 800 feet tall and rotate at up to 200 miles per hour, is often used against them. Speaking in Britain's House of Commons last year, Neil Parish, then an MP and chair of an influential environmental committee, expressed a typical view: "Why do people come to many of our great constituencies? Because they are beautiful," he said. "Tourist[s] love to come to them, but I promise that they do not come looking for solar or wind farms."

Except there is growing evidence that, at least sometimes, they do. A number of companies now offer wind farm tours to curious tourists who are keen to understand how the turbines work and what they're like up close. In Scotland, adventurous visitors can mountain bike and hike around an onshore wind farm, and boat tours in the UK and US offer the chance to sail right underneath a turbine's blades. In Denmark, small groups can even climb an offshore turbine themselves. While there's no data to indicate the size of this nascent slice of the hospitality sector, there is ample research to suggest that travelers are not only unfazed by wind farms, but find them objects of fascination.

"They're the biggest rotating devices on the planet. They dwarf a 747. At sea, they're a little otherworldly," says Jeremy Firestone, a University of Delaware professor who took a group of students to visit a wind farm off the shore of Rhode Island in 2016. He called the experience "like Disneyland for adults."

The wind farm Firestone visited, about four miles from Block Island, has been in operation since 2016: It was the first commercial offshore wind farm in the US. Tours started the same year, and now run around five times annually. Boat captain Charlie Donilon, who piloted Firestone's tour and still runs them today, supplements the view with informative chatter about wind power and construction of the giant turbines. Many of Donilon's clients are academics looking to learn more about renewable energy, but some are pleasure-seekers throwing in a wind farm tour alongside lunch and a trip to the nearby lighthouse.

"I thought, 'This is definitely going to be a moneymaker,'" Donilon says, comparing wind farms to America's greatest infrastructure. "It's hard to believe that these giant structures were built by man. You might put them in the same category as the space shuttle, or the Hoover Dam."

Of course, some people are drawn to anything that spins, splashes or bangs. In Scotland, hydroelectric energy already has an 80-year history; dams, though far from naturally beautiful, have become an attraction and a resource for tourists and school groups. "Industrial tourism" or, less charitably, "nerd tourism," has also long pulled people to Britain's mills, mines and canals.

"You wouldn't have been able to go to the big gas power stations because they're not really open, but this is an opportunity, and people are interested in it," says Simon Cleary, economics director at Scottish consultancy Biggar Economics.

Windy sites are often already wild, beautiful places that depend on visitors for their economy, making it particularly important to understand how tourists feel about visible turbines. Last year, Biggar conducted a study meant to evaluate whether a proposed onshore development in Wales, visible from 13th century Caerphilly Castle, would hurt visitor numbers. It found that visits to Scotland's Stirling Castle had risen by 60% since the construction of a similarly visible wind farm, a trend driven not by the turbines themselves but by "the *Outlander* effect," a historical Starz TV drama that boosted interest in Scottish castles. Still: Views of modern turbines from the ramparts did not seem to prevent fans from indulging in fantasies of rolling hills populated by 18th century Highland warriors.

"People are less sensitive to the visual impact than you might think," Cleary says.

Turbines closer to shore are more likely to put off beachgoers, although whether people's behavior actually follows survey results is harder to say. "The economic effects are likely to be not that significant to communities," says Firestone, who has co-authored studies on the topic. Another study last year by academics at the UK's Oxford Brookes University found that the "overall impact on tourism appears relatively benign, and sometimes positive," though the report cited concerns that the novelty will wear off as turbines become commonplace. It helps if offshore wind companies engage with the local community and with businesses, and invest long-term in visitor centers and local staff.

"This is really not a monster"

One of the longest-running wind farm boat tours, off the coast of Denmark near Copenhagen, offers visitors the rare opportunity to actually step inside. The Middelgrunden wind farm, which consists of 20 turbines built in 2000, was at the time the world's largest offshore wind farm, and the first to be cooperatively owned — 10 turbines are owned by around 10,000 members of a cooperative, and 10 are owned by the local utility.

For a total cost of 12900 kr ($1,853) per group, visitors are ferried to a turbine, where they climb over 210 feet of internal ladders to reach the top and a view of 19 others stretching in an arc into the distance. It's a unique opportunity because wind turbines built after 2009 tend to have elevators rather than ladders. These can only hold two people at one time, one of whom must be a professional operator, making such tours impossible.

Hans Christian Soerensen, a civil engineer and one of the founders of the Middelgrunden project, first asked local skipper Alex Garavano to take people to the windmills two decades ago. Last year they ran around 30 tours for up to 18 people each time, with Soerensen present to answer questions and provide information.

One of the goals of the cooperative is to educate people about wind power. Soerensen, who also works as a consultant on wave and tidal power projects, says close interaction is key to tackling public opposition. "People are scared about what they don't know about," he says. "That's what I have seen many, many times, when we have new projects in regions which don't have wind turbines. That's what we try to demonstrate here in Copenhagen when we have people visiting. This is really not a monster." In particular, he says, getting close to the turbines dismisses worries about noise, often one of the major sources of concern.

Firestone says interest in boat tours like these, as well as viewing turbines from the shore in "curiosity trips," might simply outweigh any negative effect of their being built. Developers of onshore wind farms can also drive tourism by improving the local area, and adding signage, trails and mountain-biking facilities — factors far more important to visitor numbers than the simple visual. Cleary points out that the offshore Rampion Wind Farm, completed in 2018, is visible from Brighton Pier, one of England's most popular free tourist destinations. A proposed expansion of the farm now faces concerted local opposition, but the existing 116 turbines haven't yet dented interest in the English holiday town.

Paul Dyer, the owner and skipper of charter company Brighton Diver, has offered a boat tour since the Rampion farm opened. Many of his clients are locals who see the turbines from the south coast every day and want a closer look. "It's turning on the tourists, if anything," he says. "There were a lot of people against it before they built it, and then it's grown on everybody. It looks nice — especially at night, when they light it up."

Less well-documented is whether other land-hungry renewable energy sources, like solar farms, can exploit the same effect. Individual solar panels lack the awe-inspiring size of a wind turbine, and the visual impact of rolling fields being smothered by shiny panels inspires fierce opposition. In a letter to a local newspaper last month, the chair of a residents' association implored planners not to approve a solar project on Britain's Isle of Wight, citing the "breathtaking" views advertised to visitors. “This precious scenery is threatened,” she wrote. “Don’t kill our tourism golden goose.”

But there’s little evidence of these negative impacts, either. Solar farms are frequently added to caravan parks and holiday villages in sunny places like Cornwall and Australia. Both South Korea and Vietnam have pushed solar-energy projects as travel destinations, and some businesses are already succeeding at solar tourism. In North Carolina, Montgomery Sheep Farm offers solar farm tours alongside stargazing and working with animals. In southern England, the community-owned solar and wind project Westmill has been offering public tours since 2008. In 2015, it welcomed its 10,000th visitor.

The New York Times

New York Times
By: Patrick McGeehan
February 22, 2023

New York's Wind Power Future Is Taking Shape. In Rhode Island.

Much of the initial work required to build the first ocean turbines that will deliver power to New Yorkers is being done elsewhere.

Workers near downtown Providence are building components for the South Fork wind farm off Block Island, which is expected to be the first offshore wind farm to supply energy to New York.James Estrin/The New York Times

Workers near downtown Providence are building components for the South Fork wind farm off Block Island, which is expected to be the first offshore wind farm to supply energy to New York.James Estrin/The New York Times

PROVIDENCE, R.I. — When Gov. Kathy Hochul laid out her plan for accelerating the development of New York's offshore wind industry a year ago, she promised thousands of jobs for state residents.

Today, New York's first wind farm in the Atlantic Ocean is under construction. Crews in hard hats are assembling platforms for giant turbines and building boats that will ferry technicians onto the water to ensure the massive blades keep rotating.

But the work is not being done in New York. It is happening more than 150 miles away in Rhode Island.

States and cities all along the East Coast are vying with New York to be hubs for the fast-growing business of harnessing wind power offshore. But Rhode Island took the lead by building the first offshore wind farm in the United States several years ago. Centrally located among projects planned from New York to Massachusetts, the nation's smallest state has held on to many of the jobs and economic benefits that go with being first.

"Everybody wants to think they're at the forefront, that they're the leader," said Michael F. Sabitoni, the president of the Rhode Island Building and Construction Trades Council. "You can print this: Rhode Island's the leader."

New York has more offshore wind projects in the works than any other state, according to the state authority that oversees them. But its ambitious plans and most of the jobs they would create are at least a few years off.

The most advanced of the projects, South Fork Wind, is expected to be the first offshore site to supply electricity to New York.

Workers in Providence, R.I., building the components for the turbines for New York's first offshore wind farm.James Estrin/The New York Times

South Fork, 35 miles east of the tip of Long Island, is scheduled to start operating late this year. The 132 megawatts of electricity it is expected to produce — enough to power about 70,000 homes — will run through 60 miles of cables under the sea to a substation in East Hampton.

For the past six years, the only offshore wind farm producing electricity for American consumers has been the small Block Island Wind Farm, about 16 miles off the Rhode Island coast. Consisting of five turbines capable of producing six megawatts of power each, it is the successful model on which many larger hopes have been pinned.

Six years after the Block Island farm was plugged into New England's power grid, a mad rush is on to build several much larger wind farms along the East Coast. In 2021, President Biden set a goal of deploying 30 gigawatts of offshore wind power by 2030 — enough, he said, to power 10 million American homes.

To that end, states have set their own ambitious goals. Ms. Hochul has called for New York to produce nine gigawatts — a gigawatt is equal to 1,000 megawatts — of offshore wind power by 2035. A group of environmental advocates and union leaders have pushed her to go further, calling for 15 gigawatts by 2040 and 20 by 2050.

So far, there are plans for four more wind farms that would provide power to New York over the next five years. The main base of operations for those projects will be the South Brooklyn Marine Terminal. Last month, the New York State Energy Research and Development Authority accepted bids for another wind farm off the Long Island coast.

Kate Muller, an authority spokeswoman, said New York had more offshore projects in the works than any other state and was developing five ports to support them. The authority estimates that offshore wind will produce 10,000 jobs in New York by 2035. As is typical, there will be more jobs during the building phase than during operations.

But the first one, South Fork, has not yet been built. And its completion and operation rely on hundreds of workers toiling in factories in Rhode Island, like the crew Chris Petit oversees.

Workers at Blount Boats in Warren, R.I., building vessels that will carry workers to perform maintenance on the turbines after they are installed.James Estrin/The New York Times

Mr. Petit, the shipyard superintendent for Blount Boats in Warren, R.I., is leading a team of 45 laborers who are welding together the shiny aluminum parts of a 99-foot-long catamaran that will carry workers to the South Fork turbines.

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The South Fork project is a joint venture between Orsted, a Danish company that is one of the world's biggest developers of offshore wind power, and Eversource, a large New England utility.

Orsted has set up operations on the Providence waterfront to make components for three proposed wind farms, and on a Monday afternoon in late January, workers were ankle-deep in wet concrete, shaping a circular platform designed to fit around one of South Fork's 12 turbines. In an adjacent building, constructed for making turbine parts, other workers assembled internal platforms needed to transform wind into high-voltage electricity.

The companies have made big investments in Rhode Island and elsewhere in New England to foster an industry that can build the South Fork project and others like it, including Sunrise Wind, which is to be New York's second offshore wind farm.

They built the construction hub for components at ProvPort in Providence, where 80 members of Local 271 are making the platforms for South Fork and other wind farms. Mr. Sabitoni said he expected his union's employment there to rise to about 120 workers.

The vessels being built at Blount Boats will have bows specially designed to dock against turbine towers in rough seas. James Estrin/The New York Times

"This industry is getting ready and I do expect it to really blossom," Mr. Sabitoni said.

At another Rhode Island port, Quonset Point in North Kingstown, Senesco Marine is building more boats for transferring crews to South Fork and other offshore sites.

"There's really not enough qualified yards in New York and New Jersey" to build those boats now, said Josh Diedrich, the managing director of WindServe Marine, the offshore wind division of Staten Island-based Reinauer Transportation.

Space at deepwater ports along the East Coast is also at a premium. That is why sometime this summer, the components for the South Fork turbines, including blades that are 300 feet long, will be delivered to the State Pier in New London, Conn.

More than 150 workers in New London are racing to complete a $255 million project, paid for by Connecticut and the joint venture between Orsted and Eversource, to create a site suitable for the final assembly of the turbines before they are lifted onto barges and hauled out to sea.

New London is slated to serve as the marshaling port for Sunrise Wind, as well. The assembly work is expected to involve about 100 union laborers during the developers' 10-year lease.

New York is not the only state playing catch-up to meet its offshore wind goals. Last fall, Gov. Phil Murphy of New Jersey doubled the state's target for offshore wind power to 11 gigawatts by 2040.

Two factories that would make the steel tubes that will be driven into the seabed to support the ocean turbines are being built at a port in Paulsboro, N.J. But until domestic facilities like those are up and running, many of the largest components of the first commercial wind farms in America will come from overseas.

Some executives in the offshore wind industry said the center of gravity was likely to shift toward New York City as work begins on the bigger wind farms planned for the waters off the East Coast.

Already, much of the work has been done by union construction crews on Long Island to prepare for connection of the power to be supplied by South Fork. Workers hired in New York boarded a ship in Providence that picked up a thick cable at a new factory in South Carolina and will bury it under the sea from the Hamptons to the wind farm, said Allison Ziogas, Orsted's U.S. labor relations manager. Other New Yorker workers, hired to maintain South Fork's turbines, are in England, training at a wind farm on the North Sea, she said.

Orsted is also building a base in Port Jefferson on Long Island's North Shore to maintain and operate the South Fork farm once it is in service, said David Hardy, the chief executive of Orsted Americas, whose headquarters are split between Boston and Providence.

"Those are the long-term jobs, they're 30-, 35-year jobs," Mr. Hardy said.

General Electric said in January that if it received enough orders from developers of New York wind farms, it would build two factories south of Albany: one to make blades for offshore turbines and one to make housings for generating components. The company said the factories would produce about 1,000 construction jobs and about 870 longer-term jobs.

Jeff Tingley, managing partner with OSWind Partners, a consulting firm in Providence, said it was probably inevitable that Rhode Island's moment as a major hub for offshore wind would be relatively short-lived.

"Small states are at a disadvantage," Mr. Tingley said. "If you're a big state like New York or New Jersey, you've got 20 or 30 years of employment ahead of you. It's a generational thing."

REDACTED

Revolution Wind 2 | Powered by Ørsted & Eversource

Attachment 15-3

Branding and Outreach Campaigns

REDACTED

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REDACTED

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Attachment 18-1

Explanation of Exceptions to the Form PPA

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Attachment 18-2

Form PPA as Marked Up by Proposer

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Attachment 19-1

Explanation of Exceptions to the Commitment Agreement

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Attachment 19-2

Committment Agreement as Marked Up by Proposer

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APPENDIX A

BIDDERS RESPONSE PACKAGE

APPENDIX A

RHODE ISLAND AFFORDABLE CLEAN ENERGY SECURITY ACT FOR RENEWABLE ENERGY

REQUEST FOR PROPOSAL BIDDERS RESPONSE PACKAGE

APPLICANT INFORMATION

Applicant: Bay State Wind LLC

Contact: Christian Bjøl

Address: 56 Exchange Terrace
Providence, RI 02903

Phone: (917) 355-6030

Email: CHBJO@orsted.com

SECTION 1 OF APPENDIX A TO THE RFP
CERTIFICATION, PROJECT, AND PRICING DATA

The Certification, Project, and Pricing Data ("CPPD") document is a Microsoft Excel workbook that is provided on the website at www. ricleanenergyrfp.com.

Bidders are required to provide firm pricing for 184 days from the date of bid submission. The bidder must also sign the certification form found in Appendix A verifying that the prices, terms, and conditions of the proposal are valid for at least 184 days. An officer or duly authorized representative of the bidder is required to sign the Proposal Certification Form.

[redacted]

SECTION 2 OF APPENDIX A TO THE RFP
EXECUTIVE SUMMARY OF THE PROPOSAL (INCLUDING THE BASE PROPOSAL AND ANY ALTERNATIVE PROPOSALS)

The bidder is required to provide an executive summary of the project proposal that includes a complete description of the proposed generation bid, the delivery point located within ISO-NE, the proposed contract term and pricing schedule, the interconnection plan, the overall project schedule, the additional ACES requirements detailed in Section 2.2.3.8, and other factors the bidder deems to be important. A table summarizing the proposal(s), including details such as generation project location, interconnection location(s), capacity (MW), commercial operation date, pricing ($/MWh), etc., is encouraged.

[redacted]

SECTION 3 OF APPENDIX A TO THE RFP
OPERATIONAL PARAMETERS

[redacted]

3.1 Maintenance Outage Requirements – Specify partial and complete planned outage requirements in weeks or days for all generation facilities and associated facilities required for the delivery of energy from the generation facilities to the delivery point. Also, list the number of months required for any outage cycle(s) to repeat (e.g., list time interval of minor and major overhauls, and the duration of overhauls).

[redacted]

3.2 Operating Constraints – Specify all the expected operating constraints and operational restrictions for the project (i.e., limits on the number of hours a unit may be operated per year or unit of time), differentiating those that may be variable or situational in nature.

[redacted]

3.3 Reliability – Describe how the proposal would provide enhanced electricity reliability to Rhode Island, including its impact on transmission constraints.

[redacted]

3.4 Moderation of System Peak Load – Describe how the proposal would contribute to moderating system peak load requirements and provide the following information:

i) Estimated average output for each summer period (June- September) from 3:00 - 7:00 pm

ii) Estimated average output for each winter period (October-May) from 4:00 – 9:00 pm

[redacted]

SECTION 4 OF APPENDIX A TO THE RFP
ENERGY RESOURCE AND DELIVERY PLAN

[redacted]

For Eligible Facilities, the bidder is required to provide an energy resource and a production/delivery profile for its proposed project, including supporting documentation, as described in Section 2.2.3.4. The energy resource and profile information should be consistent with the type of technology/resource option proposed and the term proposed. Bidders should respond to all information requests which are relevant to the bid in a timely manner.

4.1 Provide a summary of all collected wind data for the proposed site. Identify when and how (e.g. meteorological mast or LiDAR – for "Light Detection and Ranging") the data was collected and by whom.

Indicate where the data was collected and its proximity to the proposed site. Include an identification of the location and height for the anemometers and/or "range gate" heights for sensing by LiDAR that were used to arrive at an assessment of the site generation capability.

Describe any additional wind collection efforts that are planned or ongoing.

Provide (a) at least one year of hourly wind resource data. Real Data collected from the site is preferred, though projected data is permissible. Methodology must also be included. And (b) a wind resource assessment report for the proposed facility from a qualified unaffiliated third-party wind resource assessment firm. Include an analysis of the available wind data which addresses the relationship between wind conditions and electrical output. Provide a projection of net hourly energy production or net annual energy production, including projections of average net hourly energy production, including projections of average net hourly energy production, including projections of average hourly energy production, based on the wind resource data (hourly 8760 data profile and a 12 x 24 energy projection) at both P50 and P90 levels.

Provide a site-adjusted power curve. Each curve should list the elevation, temperature and air density used.

Identify the assumptions for losses in the calculation of projected annual energy production, including each element in the calculation of losses.

[redacted]

4.2 Offshore Wind Energy Generation Delivery Plan

Please provide an energy delivery plan and production/delivery profile for the proposed project, including supporting documentation. The energy delivery plan and production/delivery profile must provide the expected Offshore Wind Energy Generation to be delivered into the ISO-NE market settlement system and permit the Evaluation Team to determine the reasonableness of the projections for purposes of Sections 2.2.2.3 Eligible Products, 2.2.2.4 Allowable Contract Term, 2.2.2.5 Minimum/Maximum Contract Size and Allowable Alternative Bids, and 2.2.3.4 Interconnection and Delivery Requirements. Such information should be consistent with the energy resource plan and production/delivery profile provided above and considering any and all constraints to physical delivery into ISO-NE.

[redacted]

4.3 REC/Environmental Attribute Delivery Plan

Please provide documentation and information demonstrating that the project will deliver GIS Certificates representing the associated RECs and any other Environmental Attributes, as applicable. Please describe whether transfer of all GIS Certificates is authorized under the current ISO-NE GIS rules and protocols, or if a rule or protocol change is required. To the extent such a change is required, please provide regarding the proposal and the process for implanting the change.

[redacted]

SECTION 5 OF APPENDIX A TO THE RFP FINANCIAL/LEGAL

[redacted]

Bidders are required to demonstrate the financial viability of their proposed project. Bidders should provide the following information:

5.1 Please submit information and documentation that demonstrates that a long-term contract resulting from this RFP Process would either permit the bidder to finance its proposal that would otherwise not be financeable or assist the bidder in obtaining financing of its proposal.

[redacted]

5.2 Please provide a description of the business entity structure of the bidder's organization from a financial and legal perspective, including all general and limited partners, officers, directors, managers, members and shareholders, involvement of any subsidiaries supporting the project, and the providers of equity and debt during project development. Provide an organization chart showing the relationship between the equity and debt participants and an explanation of the relationships. For jointly owned facilities, identify all owners and their respective interests, and document the bidder's right to submit a binding proposal.

[redacted]

5.3 Please provide a description of the financing plan for the project as described in Section 2.2.3.5, including construction and term financing. The financing plan should address the following:

i. Who will finance the project (or are being considered to finance the project) and the related financing mechanism or mechanisms that will be used (i.e. convertible debenture, equity or other) including repayment schedules and conversion features

ii. The project's existing initial financial structure and projected financial structure

iii. Expected sources of debt and equity financing

iv. Estimated construction costs

v. The projected capital structure

vi. Describe any agreements, both pre- and post-commercial operation date, entered into with respect to equity ownership in the proposed project and any other financing arrangement.

In addition, the financing plan should address the status of the above activities as well as the financing of development and permitting costs. All bidders are required to provide this information.

[redacted]

5.4 Provide documentation illustrating the experience of the bidder in securing financing for projects of similar size and technology as required in Section 2.2.3.6. For each project previously financed, provide the following information:

i. Project name and location

ii. Project type and size

iii. Date of construction and permanent financing

iv. Form of debt and equity financing

v. Current status of the project

[redacted]

5.5 Please provide evidence that the bidder has the financial resources and financial strength to complete and operate the project as planned.

[redacted]

5.6 Provide complete copies of the most recent audited financial statement and annual report for each bidder for each of the past three years; including affiliates of the bidder (if audited statements are not available, reviewed or compiled statements are to be provided). Also, provide the credit ratings from Standard & Poor's and Moody's (the senior unsecured long term debt rating or if not available, the corporate rating) of the bidder and any affiliates and partners.

[redacted]

5.7 Please also include a list of the board of directors, officers, and trustees for the past three years and any persons who the bidder knows will become officers, board members or trustees.

[redacted]

5.8 The bidder should demonstrate its ability (and/or the ability of its credit support provider) to provide the required security as described in Section 2.2.3.7, including its plan for doing so.

[redacted]

5.9 Provide a description of any current or recent credit issues/credit rating downgrade events regarding the bidder or affiliate entities raised by rating agencies, banks, or accounting firms.

[redacted]

5.10 Describe the role of the Federal Production Tax Credit ("PTC") or Investment Tax Credit ("ITC") as newly revised by the Inflation Reduction Act, and any other incentives, on the financing of the project. In the response, please describe (a) your plan to qualify for the ITC/PTC and the level of the ITC/PTC for which you plan to qualify, (b) the facilities, investment in which, the ITC is expected to apply, (c) your plan to utilize the tax credits and the relationship to your financing plan, and (d) how qualification for the ITC/PTC is reflected in your proposed pricing. If a bidder assumes that such credits, subsidies, grants or incentives will not be available for its Eligible Facility, it should state how it would propose to share the benefits of those credits, subsidies, grants or incentives with Rhode Island Energy's customers if they subsequently become available. Bidders may propose adjustments to the contract price based on an increase in any state or federal tax credit or other government grant or subsidy.

[redacted]

5.11 Describe the bidder's plan to adhere to the domestic supply rules set forth in the Build America, Buy America Act and the act's implications on access to federal funding, cost of materials, and supply chains.

[redacted]

5.12 Describe how the bidder would consider Rhode Island Energy customers in the event of the availability or receipt of any tax credit or other government grant or subsidy not contemplated in their proposals. Bidders must state their assumptions regarding the availability of federal or state tax credits, subsidies, or grants or other incentives.

[redacted]

5.13 Bidders must disclose any litigation or disputes in the last three years related to projects developed, owned, or managed by bidder or any of its affiliates in the United States or related to any energy product sale agreement.

[redacted]

5.14 What is the expected operating life of the proposed project? What is the depreciation period for all substantial physical aspects of the bid, including generation facilities, delivery facilities to move power to the grid, and mandatory and voluntary transmission system upgrades?

[redacted]

5.15 Has the bidder already obtained financing, or a commitment of financing, for the project? If financing has not been obtained, explain how obtaining a long-term agreement as proposed will help you in obtaining financing for the proposed project, in obtaining more favorable terms for the financing of the proposed project, or in supporting the future capital investment.

[redacted]

5.16 State whether the bidder or its affiliates have executed agreements with respect to energy, RECs and/or capacity for the proposed project (including any agreements that have been terminated) and provide information regarding the associated term and quantities, and whether bidder has been alleged to have defaulted under or breached any such agreement.

[redacted]

5.17 List all of the bidder's affiliated entities and joint ventures transacting business in the energy sector.

[redacted]

5.18 Has bidder, or any affiliate of bidder, in the last five years, (a) consented to the appointment of, or been taken in possession by, a receiver, trustee, custodian or liquidator of a substantial part of its assets, (b) filed a bankruptcy petition in any bankruptcy court proceeding, (c) answered, consented or sought relief under any bankruptcy or similar law or failed to obtain a dismissal of an involuntary petition, (d) admitted in writing of its inability to pay its debts when due, (e) made a general assignment for the benefit of creditors, (f) was the subject of an involuntary proceeding seeking to adjudicate that Party bankrupt or insolvent, (g) sought reorganization, arrangement, adjustment, or composition of it or its debt under any law relating to bankruptcy, insolvency or reorganization or relief of debtors?

[redacted]

5.19 Briefly describe any known conflicts of interest between bidder or an affiliate of bidder and Rhode Island Energy, or any affiliates of the foregoing.

[redacted]

5.20 Describe any litigation, disputes, claims or complaints involving the bidder or an affiliate of bidder, against Rhode Island Energy or any affiliate of Rhode Island Energy.

[redacted]

5.21 Describe any litigation, disputes, claims or complaints, or events of default or other failure to satisfy contract obligations, or failure to deliver products, involving bidder or an affiliate of bidder, and relating to the purchase or sale of energy, capacity or renewable energy certificates or products.

[redacted]

5.22 Confirm that neither bidder nor any directors, employees or agents of bidder, nor any affiliate of bidder are currently under investigation by any governmental agency, and that none of the above have in the last four years been convicted or found liable for any act prohibited by State or Federal law in any jurisdiction involving conspiracy, collusion or other impropriety with respect to bidding on any contract, or have been the subject of any debarment action (detail any exceptions).

[redacted]

5.23 Identify all regulatory and other approvals needed by bidder to execute a binding sale agreement.

[redacted]

5.24 Describe how the project will conform to FERC's applicable regulatory requirements, including, but not limited to, FERC requirements relating to allocation of transmission capacity and open access, the justness and reasonableness of rates, the potential for undue preference or discrimination, and affiliate dealings, if any. Describe how your proposed approach is consistent with FERC precedent and ratemaking principles.

[redacted]

5.25 Describe and document any and all direct and indirect affiliations and affiliate relationships (contractual, financial, or otherwise) in the past three years between the bidder and Rhode Island Energy and its affiliates, including all relationships in which Rhode Island Energy or its affiliates has a financial or voting interest (direct or indirect) in the bidder or the bidder's proposed project. These relationships include:

- Corporate or other joint arrangements, joint ventures, joint operations whether control exists or not
- Minority ownership (50% or less investee)
- Joint development agreements
- Operating segments that are consolidated as part of the financial reporting process
- Related parties with common ownership
- Credit, debenture, and financing arrangements, whether a convertible equity feature is present or not
- Wholly owned subsidiaries
- Commercial (including real property) relationships with Rhode Island Energy.

[redacted]

SECTION 6 OF APPENDIX A TO THE RFP
SITING, INTERCONNECTION, AND DELIVERABILITY

[redacted]

This section of the proposal addresses project location, siting, real property rights and interconnection issues. Bidders should ensure that the threshold criteria outlined in Section 2.2 of the RFP are verified in their responses.

6.1 Provide site layout plan(s), including map(s), that illustrate the location of all onshore and offshore equipment and facilities (including the estimated spacing and orientation of wind turbines and a discussion of how the plan conforms to federal and state permitting requirements) and clearly delineates the perimeter of the area in which offshore wind turbines will be placed, the location of the marine terminal facility, and the proposed water routes to the project site. Also include a map of the proposed interconnection that includes the path from the Eligible Facility site to the interconnection location, all onshore transmission and interconnection routes, locations, and details and, to the extent a bid includes or references Offshore Delivery Facilities, a map that shows those facilities' location(s). To the extent that alternative routes for offshore and onshore interconnection facilities have been considered in developing the bid, maps showing these locations should also be provided. Maps should be of scales required to identify significant marine or terrestrial features, e.g. shellfish management areas, parks, highways, etc.

Plan included? Yes☒ No☐ If not, please explain:

Describe how the proposed project is sized and designed to efficiently and cost-effectively use available lease area(s), interconnection point(s), transmission cabling, and other infrastructure required for the production and delivery of the offshore wind energy generation.

[redacted]

6.2 Identify any real property rights (e.g., fee-owned parcels, rights-of-way, development rights or easements or leases, or options to purchase or lease) that provide the right to use the Eligible Facility site and offshore facilities locations including for Eligible Facilities and any rights of way needed for interconnection. Note that a demonstrated federal lease must be issued on a competitive basis after January 1, 2012 for an offshore wind energy generation site that is located on the Outer Continental Shelf and for which no turbine is located within 10 miles of any inhabited area.

i. Does the project have a right to use the Eligible Facility site and/or offshore delivery facilities locations for the entire proposed term of the PPA (e.g., by virtue of ownership or land development rights obtained from the owner)?

Yes☐ No☒ If not, please explain:

ii. If so, please detail the bidder's rights to control the Eligible Facility site and/or offshore delivery facilities and interconnection location.

iii. Describe the status of acquisition of real property rights, any options in place for the exercise of these rights and describe the plan for securing the necessary real property rights, including the proposed timeline. Include these plans and the timeline in the overall project timeline.

iv. Identify any joint use of existing or proposed real property rights and/or easements.

v. Provide a copy of each of the leases, agreements, easements, and related documents granting the right to use the Eligible Facility site and Offshore Delivery Facilities and, if available, the transmission and interconnection location (and applicable [redacted]nt if formal agreements have not been executed).

[redacted]

6.3 Provide evidence of all government-issued permits, approvals, and authorizations that have been obtained or need to be obtained for the use and operation of the Eligible Facility site, the proposed onshore interconnection and transmission locations, and associated Offshore Delivery Facilities and the location(s) of such facilities. For any proposed Eligible Facility sites, offshore delivery facilities, and interconnection locations not currently zoned or permitted properly, identify present and required zoning and/or land use designations and permits and provide a detailed plan and timeline to secure the remaining permits, approvals, and authorizations for all offshore and onshore routes.

Detail the zoning and permitting issues:

[redacted]

Permitting plan and timeline:

[redacted]

Start Date: [redacted] End Date [redacted]

6.4 Provide a description of the area surrounding any land-based project area, including the marine terminal for deployment of major project components (e.g., foundations, towers, blades, rotors, offshore substations) and all transmission and interconnection facility locations, and a copy of each of the related leases, agreements, easements, and related documents that have been obtained (and applicable letters of intent if formal agreements have not been executed).

[redacted]

6.5 If the bidder does not have interconnection facilities site control, describe the status of the plan to obtain that control.

[redacted]

6.6 Please provide documentation to show evidence of the interconnection request to ISO-NE, the applicable New England Transmission Owner, or any neighboring control areas, to interconnect at the Capacity Capability Interconnection Standard. Please describe the status of any planned interconnection to the grid.

[redacted]

6.7 Please provide studies that describe the Project's electrical system performance, its impact to the reliability of the New England Transmission system, how the project would satisfy ISO-NE's I.3.9 requirements, and how the project will interconnect at an equivalent to the Capacity Capability Interconnection Standard. Projects that do not have I.3.9 approval from ISO-NE must include technical reports or a Feasibility study that approximates the ISO-NE interconnection process, including but not limited to clear documentation of study technical and cost assumptions, reasoning, and justification of such assumptions. Proposals with a Qualification Determination Notification ("QDN") from ISO-NE for their proposed capacity amount and commitment period must include all QDN documentation in their proposal. All projects that do not have a QDN for their proposed capacity amount and commitment period must provide a study performed by ISO-NE or a third party in accordance with ISO-NE Planning Procedure 10 in order to prove ability to interconnect at the CCIS. Provide a copy of an interconnection agreement, if any, executed by the bidder with respect to the proposed project. If an interconnection agreement has not been executed, please provide the steps that need to be completed before an interconnection agreement can be executed and the associated timeline. Please also provide the status and expected completion date of any additional interconnection studies already underway with ISO-NE and/or the transmission owner. All studies must follow the current ISO-NE interconnection procedures and detail any assumptions regarding resources and corresponding network upgrades ahead of the project in the ISO-NE interconnection queue. All network upgrades and assumptions identified in these studies must be clearly documented and included in the bid price.

[redacted]

Attachments:

Performance and its impact:

[redacted]

Copy of completed I.3.9 approval or I.3.9-equivalent study attached:☐

If none, please explain:

[redacted]

Copy of completed CCIS-equivalent study attached: ☐

If none, please explain: [redacted]

Copy of Interconnection Agreement attached: ☐ If none, please explain:

[redacted]

Additionally, any other studies undertaken by ISO-NE or the bidder must be provided.

[redacted]

6.8 Please provide documentation of the deliverability constraint analysis set forth in Appendix F to the RFP. Provide a description of the findings of the deliverability constraint analysis, including but not limited to a list of thermal overloads and voltage violations identified.

[redacted]

Attachments:

Copy of completed deliverability constraint analysis: ☐

If the deliverability constraint analysis was performed as a portion of a separate study (i.e. Facility Study), please explain and provide the study:

[redacted]

6.9 If multiple interconnection requests have been made, please specify all such active requests which have not been superseded by subsequent requests and information regarding the status of each. Provide copies of any requests made and studies completed. Describe how such studies and information support the costs assumed in preparing your bid and the associated timeline proposed.

[redacted]

6.10 Please provide cost estimates for any necessary network upgrades identified in the studies identified in Section 6.7.

[redacted]

6.11 To the extent that you provide an alternative interconnection scenario based on ISO-proposed interconnection process changes, you must also include studies using the proposed ISO-NE-proposed process. Any such studies must be accompanied with clear documentation of study technical and cost assumptions, reasoning, and justification of such assumptions.

[redacted]

6.12 Provide the electrical models of all energy resources supporting the proposed project in accordance with the filing requirements of the ISO-NE Tariff Schedule 22 and 23.

Electrical models attached: ☒ If none, please explain:

[redacted]

6.13 Provide a copy of an electrical one-line diagram showing the interconnection facilities, the relevant facilities of the transmission and/or distribution provider, and any required network upgrades identified in the studies required in section 6.7 of this document.

Electrical one-line diagram attached: ☒ If none, please explain:

[redacted]

6.14 Specify and describe the current or new interconnection facilities (lines, transformers, switching equipment, system protection and controls, etc.) that bidder owns or is intending to construct or have constructed in order to deliver the proposed energy.

[redacted]

6.15 Incremental data requirements:

1. IDV file(s) in PSSE v34 format modeling all upgrades to the transmission network identified in the studies required in section 6.7 of this document. ☒ If none, please explain:

[redacted]

2. If the bidder does not use PSSE, provide in text format necessary modeling data as follows:

[redacted]

- Line Data:

Voltage Thermal Ratings

Impedances (r, X and B)

Line Length: from to
(bus numbers and names)

Enter appropriate explanation in this space or reference applicable attachment(s)

- Transformer data (including Phase shifting transformers if applicable):
  Terminal Voltages Thermal Ratings

  Impedance

  From To
  (bus numbers and names)

Enter appropriate explanation in this space or reference applicable attachment(s)

- Reactive compensation models as necessary

Enter appropriate explanation in this space or reference applicable attachment(s)

- Other changes to the model that would occur due to a Project such as terminal changes for lines/transformer/generator leads/loads etc.

Enter appropriate explanation in this space or reference applicable attachment(s)

6.16 Please detail with supporting information and studies (as available) that the production/delivery profile contemplated in your proposal reflects constraints or curtailment, if any, after the upgrades that are expected to take place pursuant to interconnection at an equivalent to the CCIS. If the project is planning to make any voluntary upgrades beyond those associated with the CCIS-equivalent standard, as more fully described in the RFP, please describe the transmission network upgrades necessary, their estimated cost (for which the bidder would have cost responsibility, and the impact on the proposed generation schedule by reducing remaining constraints or curtailments.

[redacted]

SECTION 7 OF APPENDIX A TO THE RFP ENVIRONMENTAL ASSESSMENT AND ENVIRONMENTAL AND FISHERIES MITIGATION PLAN, PERMIT ACQUISITION PLAN AND ENVIRONMENTAL ATTRIBUTES CERTIFICATION

[redacted]

This section addresses environmental and other regulatory issues associated with project siting, development, and operations for all aspects of the project (including generation, delivery, interconnection, etc.) and in all jurisdictions (federal, all interested states, etc.).

7.1 Provide a description of all government-issued permits, approvals, licenses, environmental assessments, and/or environmental impact statements required for the use and operation of the Offshore Wind Energy Generation site, the proposed onshore interconnection and transmission locations, and associated Offshore Delivery facilities and the location(s) of such facilities. Along with this list, identify the governmental agencies and States that are responsible to issuing approval of all the permits, licenses, and environmental assessments and/or environmental impact statements.

i. Provide a list and copies of all Federal, state, and local permits, approvals, authorizations, and environmental assessments and/or environmental impact statements required to construct and operate the project. Detail which permits have already been issued and which permits are in progress/remaining to be obtained.

[redacted]

ii. Identify the governmental agencies and States that have issued or will issue the required permits, approvals, authorizations, licenses, and environmental assessments and/or environmental impact statements.

[redacted]

7.2 Provide the anticipated timeline for seeking and receiving the required permits, licenses, and environmental assessments and/or environmental impact statements. Include a project permit and approval assessment which describes, in narrative form, each segment of the process, the required permit or approval, the status of the request or application and the basis for projection of success by the milestone date. All requirements should be included on the project schedule in Section 9.

[redacted]

7.3 Environmental and Fisheries Mitigation Plan (EFMP)

Provide a preliminary environmental characterization of the site and project, including both construction and operation. In addition, identify environmental impacts associated with the proposed project and any potential impediments to development. Bidders must detail, to the extent practical, specific adverse environmental and fisheries impacts that are likely to result from the proposed Facility and detail measures that will be taken to avoid, minimize, and/or mitigate those impacts in the categories identified in Section 2.3.3.3. Where specific measures are not known for a specific category of impact at the time of proposing, the plan must describe in detail the approach that will be implemented to collaborate with the state and Federal agencies and other stakeholders to define avoidance, minimization, and mitigation measures. The plan should provide a roadmap for the environmental and fisheries work to come and provide a degree of certainty that the Bidder is committed to working collaboratively with stakeholders to develop a cost-effective and environmentally responsible Project.

Plan included? Yes☒ No☐ If not, please explain:

[redacted]

7.4 Explain how the proposed project advances the objectives of achieving a reliable, clean energy future that is consistent with meeting regional greenhouse gas reduction goals as established by the 2021 Act on Climate.

[redacted]

7.5 Provide documentation demonstrating that the project will be qualified as an eligible renewable energy resource conforming to R.I.G.L. § 39-26-5.

[redacted]

7.6 All bidders must include sufficient information and documentation that demonstrates that the bidder will utilize an appropriate tracking system to ensure a unit-specific accounting of the delivery of unit-specific and unit contingent of energy and RECs. The RECs and environmental attributes associated with energy generation must be delivered into Rhode Island Energy's NEPOOL GIS accounts.

[redacted]

7.7 Identify any existing, preliminary, or pending claims or litigation, or matters before any federal agency or any state legislature or regulatory agency that might affect the feasibility of the project or the ability to obtain or retain the required permits for the project.

[redacted]

7.8 Describe any investments that will be included with your facility to improve its emissions profile.

[redacted]

SECTION 8 OF APPENDIX A TO THE RFP
ENGINEERING AND TECHNOLOGY; COMMERCIAL ACCESS TO EQUIPMENT

[redacted]

This section includes questions pertinent to the engineering design and project technology. This section must be completed for a project that includes new facilities or capital investments for both generation and transmission components, if applicable. Bidders should provide information about the specific technology or equipment including the track record of the technology and equipment and other information as necessary to demonstrate that the technology is viable.

8.1 Provide a reasonable but preliminary engineering plan which includes the following information:

i. Type of generation and transmission technology, if applicable

ii. Major equipment to be used

iii. Manufacturer of the equipment

iv. Status of acquisition of the equipment

v. Whether the bidder has a contract for the equipment. If not, describe the bidder's plan for securing equipment and the status of any pertinent commercial arrangements

vi. Equipment vendors selected/considered

vii. History of equipment operations

viii. If the equipment manufacturer has not yet been selected, identify in the equipment procurement strategy the factors under consideration for selecting the preferred equipment

ix. How the proposed equipment adheres to the domestic supply rules set forth in the Build America, Buy America Act.

[redacted]

8.2 If the bidder has not yet selected the major equipment for a project, please provide a list of the key equipment suppliers under consideration.

[redacted]

8.3 Please identify the same or similar equipment by the same manufacturer that are presently in commercial operation including the number installed, installed capacity and estimated generation for the past three years.

[redacted]

8.4 For less mature technologies, provide evidence (including identifying specific applications) that the technology to be employed for energy production is ready for transfer to the design and construction phases. Also, address how the status of the technology is being considered in the financial plan for the project.

[redacted]

8.5 Please indicate if the bidder has a full and complete list of equipment needed for all physical aspects of the bid, including generation facilities, transmission lead lines, and mandatory and voluntary transmission system upgrades. If not, identify the areas of uncertainty and when the full and complete list of equipment will be identified.

[redacted]

8.6 Please indicate if the bidder has secured its equipment for all physical aspects of the bid, including generation facilities, transmission lead lines, and mandatory and voluntary transmission system upgrades. If not, identify the long-lead equipment and describe the timing for securing this equipment.

[redacted]

SECTION 9 OF APPENDIX A TO THE RFP
PROJECT SCHEDULE

[redacted]

A bidder must demonstrate that its proposal can be developed, financed, and constructed and be technically viable within a commercially reasonable timeframe. The bidder is required to provide sufficient information and documentation that shows that the bidder's resources, process, and schedule are adequate for the acquisition of all rights, permits and approvals for all aspects of the project and for the financing of the project consistent with the proposed project milestone dates.

Bidders are required to provide a complete critical path schedule for the project from the notice of selection of the project for contract consideration to the start of commercial operations. For each project element, list the start and end date.

9.1 Identify the elements on the critical path. The schedule should include, at a minimum, the receipt of all permits necessary to construct and operate the facility, the closing of construction financing, the commencement of construction, the execution of an interconnection agreement with ISO-NE and interconnecting utility, and the commercial operation date. Include any other requirements that could influence the project schedule and the commercial operation date (e.g. adherence to Build America, Buy America Act).

[redacted]

9.2 Bidders must demonstrate that their projects have a credible proposed operation date by providing, at a minimum, documentation showing the following:

i. commencement of permitting processes

[redacted]

ii. a plan for completing all permitting processes

[redacted]

iii. viable resource assessment

[redacted]

iv. environmental assessment/Environmental and Fisheries Mitigation Plan, which shall include site and environmental data transparency requirements, as further described in Section 2.3.3.3 ("EFMP")

[redacted]

v. viable financing plans

[redacted]

vi. viable installation and electrical interconnect plans

[redacted]

vii. material progress toward acquisition of real property rights

[redacted]

viii. evidence of material vendor activity

[redacted]

SECTION 10 OF APPENDIX A TO THE RFP
CONSTRUCTION AND LOGISTICS

[redacted]

This section of the proposal addresses necessary arrangements and processes for outfitting, assembly, storage, and deployment of major project components such as turbine nacelles, blades, towers, foundations, and delivery facilities support structures, and other major components associated with delivery facilities and, and the storage facility (as applicable). Please provide a construction plan that captures the following objectives:

10.1 Please list the major tasks or steps associated with deployment of the proposed project and the necessary specialized equipment (e.g. vessels, cranes).

[redacted]

10.2 Please provide documentation to demonstrate site control for all marine terminals and other waterfront facilities that will be used to stage, assemble, and deploy the project for each stage of construction.

i. Evidence that the bidder or the equipment/service provider have a valid lease, or option to lease, a marine terminal and/or waterfront facility for construction of the offshore wind energy project (e.g., by virtue of ownership or land development rights obtained from the owner).

[redacted]

ii. If not available, describe the status of acquisition of real property rights for necessary marine terminal and/or waterfront facilities, any options in place for the exercise of these rights and describe the plan for securing the necessary real property rights, including the proposed timeline. Include these plans and the timeline in the overall project schedule. Provide any agreements, options, or other materials reflecting the bidder's efforts so far to secure real property rights (and any letters of intent to the extent signed agreements are not in place).

[redacted]

iii. Identify any joint use of existing or proposed real property rights for marine terminal or waterfront facilities.

[redacted]

10.3 Please describe the proposed approach for staging and deployment of major project components to the project site. Indicate the number, type and size of vessels that will be used, and their respective roles, as well as the projected timing of their use. Please include specific information on how the bidder's deployment strategy will conform to requirements of the Merchant Marine Act of 1920 (the Jones Act).

[redacted]

10.4 List the party (e.g. the bidder, or equipment/service providers under contract to the bidder) responsible for each deployment activity and describe the role of each party. Describe the status of bidder's contractual agreements with third-party equipment/service providers.

[redacted]

SECTION 11 OF APPENDIX A TO THE RFP
OPERATIONS AND MAINTENANCE

[redacted]

Projects that can demonstrate that the operation and maintenance ("O&M") plan, level of funding, and mechanism for funding will ensure reliable operations during the term of the contract or the tariff are preferred.

11.1 Provide an O&M plan for the project that demonstrates the long-term operational viability of the proposed project. The plan should include a discussion of the staffing levels proposed for the project, the expected role of the project sponsor or outside contractor, scheduling of major maintenance activity, and the plan for testing equipment.

[redacted]

11.2 Describe in detail the proposed O&M funding mechanism and funding levels to support planned and unplanned O&M requirements.

[redacted]

11.3 Describe the terms (or expected terms) of the warranties and/or guarantees on major equipment that the bidder is utilizing or proposing to utilize.

[redacted]

11.4 Describe the status of the project sponsor in securing any O&M agreements or contracts. Include a discussion of the sponsor's plan for securing a medium-term or long-term O&M contract, including the expected provider of O&M services.

[redacted]

11.5 Provide examples of the bidder's experience with O&M services for other similar projects.

[redacted]

SECTION 12 OF APPENDIX A TO THE RFP
PROJECT MANAGEMENT/EXPERIENCE

[redacted]

Bidders are required to demonstrate project experience and management capability to successfully develop (for a project that includes new facilities or capital investment) and operate the project proposed, Rhode Island Energy is particularly interested in project teams that have demonstrated success in projects of similar type, size and technology and, for projects that include new facilities or capital investment, can demonstrate an ability to work together effectively to bring the project to commercial operation in a timely fashion.

12.1 Provide an organizational chart for the project that lists the project participants and identifies the corporate structure, including general and limited partners.

[redacted]

12.2 For a project that includes new facilities or capital investment, provide statements that list the specific experience of the bidder and each of the project participants (including, when applicable, the bidder, partners, EPC contractor and proposed contractors), in developing, financing, owning, and operating generating or transmission facilities (as applicable), other projects of similar type, size and technology, and any evidence that the project participants have worked jointly on other projects.

[redacted]

12.3 For a bid that includes existing facilities, provide statements that list the specific experience of the bidder and each of the project participants (including, when applicable, the bidder, partners, EPC contractor and proposed contractors), in owning and operating generating or transmission facilities (as applicable), other projects of similar type, size and technology, and any evidence that the project participants have worked jointly on other projects.

[redacted]

12.4 Provide a management chart that lists the key personnel dedicated to this project and provide resumes of the key personnel. For Eligible Facilities that are not yet in-service, key personnel of the bidder's development team having substantial project management responsibilities must have:

i. Successfully developed and/or operated one or more projects of similar size or complexity or requiring similar skill sets; **and**

ii. For a project that includes new facilities or capital investment, experience in financing power generation projects (or have the financial means to finance the project on the bidder's balance sheet)

[redacted]

12.5 Provide a listing of all projects the project sponsor has successfully developed or that are currently under construction. Provide the following information as part of the response:

i. Name of the project

ii. Location of the project

iii. Project type, size, and technology

iv. Commercial operation date

v. Estimated and actual capacity factor of the project for the past three years

vi. Availability factor of the project for the past three years

vii. References, including the names and current addresses and telephone numbers of individuals to contact for each reference

[redacted]

12.6 With regard to the bidder's project team, identify and describe the entity responsible for the following, as applicable:

i. Construction Period Lender, if any

ii. Operating Period Lender and/or Tax Equity Provider, as applicable

iii. Financial Advisor

iv. Environmental Consultant

v. Facility Operator and Manager

vi. Owner's Engineer

vii. EPC Contractor (if selected)

viii. Transmission Consultant

ix. Legal Counsel

REDACTED

[redacted]

12.7 Provide details of the bidder's experience in ISO-NE other Markets affected by the bid. With regard to bidder's experience with ISO-NE markets, please indicate the entity that will assume the duties of Lead Market Participant for your Project. Please provide a summary of the proposed Lead Market Participant's experience with each of the ISO-NE markets.

[redacted]

SECTION 13 OF APPENDIX A TO THE RFP
ALTERNATIVE BID PROPOSALS

[redacted]

13.1 Per Section 2.2.2.5 of the Request for Proposals, bidders may submit alternative project proposals, based on varying aspects of the proposed project:

- Contract Term Length
- Additional Pricing Offer
- Production/Delivery Profile
- In-service Date
- Project Size
- Technology Type
- Delivery Location

Each submitted proposal must be accompanied by a non-refundable bid fee, which will be used to offset the cost of the evaluation of proposals. Bid fee instructions will be sent upon request to bidders who contact the Official Contact listed in Section 3.5.

[redacted]

SECTION 14 OF APPENDIX A TO THE RFP CONTRIBUTION TO EMPLOYMENT AND ECONOMIC BENEFITS TO RHODE ISLAND

[redacted]

Bidders must provide annualized estimates for all economic benefits and identify the specific in-state expenditures and employment proposed during the development, construction and operation and maintenance phases of the project. Bidders are also required to fill out the Economic Development Summary Excel Workbook provided as an addendum to this Appendix.

14.1 For the direct economic benefits to the State of Rhode Island, please provide an estimate of the number of jobs to be created directly during project development and construction (for a project that includes new facilities or capital investment), and during operations, and a general description of the types of jobs created, estimated annual compensation, the employer(s) for such jobs, and the location. Please treat the development, construction, and operation periods separately in your response.

[redacted]

14.2 Please provide the same information as provided in response to question 14.1 above but with respect to jobs that would be indirectly created, in the State of Rhode Island, as a result of the proposed project.

[redacted]

14.3 Describe the proposed project's commitment to the following: investing in offshore wind-related environmental research, monitoring and mitigation sponsored by the DEM and/or the Rhode Island Coastal Resource Management Council; investing in workforce development and environmental research facilities to support the offshore wind industry; utilizing port facilities and office space; and investing in development activities that directly benefit economically distressed areas and/or low-income populations.

[redacted]

14.4 Please describe any other direct economic benefits to the State of Rhode Island (either positive or negative) that could result from the proposed project, such as creating property tax revenues or purchasing capital equipment, materials, or services for Rhode Island businesses. Please provide the location(s) where these economic development benefits are expected to occur.

[redacted]

14.5 To the extent not already specified elsewhere in your response, please describe any additional benefits or impacts associated with the proposed project.

[redacted]

14.6 The Section 14 Addendum: Economic Development Summary Sheet is a Microsoft Excel workbook provided on ricleanenergyrfp.com. Please fill out and submit the Section 14 Addendum to accompany responses in this section.

Attachments: [redacted]

Copy of completed Section 14 Addendum in Excel format (.xls or .xlsx file): ☒

SECTION 15 TO APPENDIX A TO THE RFP
DIVERSITY, EQUITY, AND INCLUSION PLAN

[redacted]

Bidders are required to demonstrate a diversity, equity and inclusion plan that describes the proposed strategy to actively promote access to employment and contracting opportunities for, and to actively recruit, diverse workers, vendors, contractors, and investors, and include how the direct, specific and measurable employment and contracting benefits created by the proposed project provides employment and procurement/contracting opportunities for minorities, women, veterans, LGBT and persons with disabilities.

15.1 Workforce Diversity Plan

Please include descriptions of each type, duration and salary bands of the employment created and identify the recruitment efforts aimed at hiring diverse candidates for these employment opportunities.

[redacted]

15.2 Supplier Diversity Program

Please include descriptions of the subcontracting, vendor, investor, and ancillary (operational) business opportunities that will be provided by diverse businesses.

[redacted]

15.3 Stakeholder Engagement Plan

Provide plans to consider how the bidder will engage with project stakeholders. Identify groups of stakeholders to be included (e.g. tribal communities, economically-disadvantaged communities, environmental justice advocates, and fishing communities), project impacts on each stakeholder (and associated mitigation plans), engagement goals for each such group, engagement activities and community partnerships included in the plan, and demonstrated evidence of past and current productive relationships with project stakeholders.

[redacted]

SECTION 16 TO APPENDIX A TO THE RFP
LIST OF RHODE ISLAND VENDORS AND DOMESTIC SUPPLY CHAIN OPPORTUNITIES

[redacted]

Bidders are required to identify Rhode Island vendors and other domestic offshore wind supply chain opportunities associated with the project.

16.1 Please identify the Rhode Island vendors associated with supplying the project and provide percentage of Rhode Island-based vendors. Additionally, please provide the percentage of total vendors that are based in the United States.

[redacted]

16.2 Please identify the project's plans to invest in supply chain and infrastructure improvements to support the offshore wind industry.

[redacted]

SECTION 17 TO APPENDIX A TO THE RFP
PLANS FOR CONSTRUCTION LABOR AGREEMENT

[redacted]

Bidders are required to submit a plan outlining their intentions with respect to the negotiation of project labor agreements to cover construction activities.

17.1 As part of the contract negotiation process, the bidder must commit to enter into a labor peace agreement with at least one bona fide labor organization either where such bona fide labor organization is actively representing employees providing necessary construction, operations and maintenance services for the project at the time of such agreement or upon notice from a bona fide labor organization that is attempting to represent employees who will provide necessary operations and maintenance services for the renewable energy system employed in the state. The maintenance of such labor peace agreement will be an ongoing material condition of any continuation of payments under the PPA. See R.I. Gen. Laws § 39-31-10(e).

Describe the Bidder's plan to enter into a labor peace agreement and/or plan for project employee representation by a labor organization.

[redacted]

17.2 Bidders must commit to pay each construction, operations and maintenance employee wages and benefits that are not less than the prevailing wage and fringe benefit rates at the journeyman level that are prescribed by the Rhode Island Department of Labor and Training, and not less than the prevailing wage rates for employees for which there is no classification prescribed by the Rhode Island Department of Labor and Training. Bidders must also commit to pay benefits and wages not less than the rate applicable to apprentices for the pertinent classification prescribed by the Rhode Island Department of Labor and Training if the worker is a participant in an approved apprenticeship program and the approved apprenticeship program maintains a direct entry agreement with a certified pre-apprenticeship training program. See R.I. Gen. Laws § 39-31-10(f).

Describe the Bidder's plan to compensate project employees and apprentices not less than the prevailing wage.

[redacted]

SECTION 18 TO APPENDIX A TO THE RFP
EXCEPTIONS TO FORM PPAS

Please attach an explanation of any exceptions to the Form PPA set forth in Appendix C. Comments to the proposed Form PPA must include any specific alternative provisions in a redline format to the Form PPA. **Bidders are discouraged from proposing material changes to the Form PPA.**

[redacted]

SECTION 19 OF APPENDIX A TO THE RFP
EXCEPTIONS TO COMMITMENT AGREEMENT

Please attach an explanation of any exceptions to the Commitment Agreement set forth in Appendix E to this Notice, including any specific alternative provisions in a redline format to the Commitment Agreement.

Bidders must include a marked version showing any proposed changes to the Commitment Agreement with their bid, and it is assumed that bidders would be willing to execute the marked-up agreement included in their bids. **Bidders are discouraged from proposing material changes to the Commitment Agreement**.

[redacted]

Bay State Wind

Excel Files

REDACTED

Attachment JMR-3 – Bidder Conference Presentation

Rhode Island Energy™
a PPL company

2022 Rhode Island – Offshore Wind Request for Proposal

Panelists:

Jim Rouland

Brian Schuster

Katherine Wilson

November 1, 2022

Conference Housekeeping

Rhode Island Energy™
a PPL company

During this Bidder Conference:

- Attendees will only be able to see the Panelists, not each other;
- All Attendees will be muted unless unmuted by the Panelists to ask a question at the end of the presentation;
- The Video function is disabled for all Attendees;
- The Chat function is disabled; however,
- Attendees are able to ask questions of the panelists using the Q&A feature.

This Conference will not be recorded - the Recording function is fully disabled.

The Presentation used during this Conference will be posted to the RIE OSW RFP website for viewing after this Conference concludes.

Thank you for your participation!

Submitting Questions

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While the RIE team will be presenting an overview of the RI OSW RFP, Bidder input is important!

To submit questions during this conference, please click the "Q&A" icon at the bottom of your screen – a chat box should appear and allow you to enter your question. Type your question into the box, send, and it will be visible to the panelists. Please note, only the panelists will be able to see the questions submitted until they are answered (via a written response) or answered live.

The RIE Team will queue all submitted questions – dispositioning them at the end of the presentation.

At the end of the presentation the RIE team will also field verbal questions. The team will provide directions at the end of this presentation about how to enter a queue to ask a question.

Please be advised that the answers provided during today's presentation may not represent an official response.

Official responses will be provided to all bidders in writing to questions submitted by **November 30, 2022** to RIEOSWRFP@pplweb.com, with a copy to CleanEnergyRFP@nationalgrid.com

Disclaimer

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Any statements herein describing or providing reference to documents and agreements are summaries only, and are qualified in their entirety by reference to such documents and agreements. Further, the Bidder Conference presentation is intended for discussion purposes only, and are not providing authoritative guidance concerning the solicitation.

The governing documents are:

- RI OSW RFP (*issued October 14, 2022*)
- Appendices to the RI OSW RFP including: Bid Package documents, ACES statute, the Model PPA, APRA Statute and Regulation, the Form of Commitment Agreement, an the Deliverability Constraint Analysis.

Further information can also be found at **Docket No. 22-22 EL**.

Visit the RFP website: https://ricleanenergyrfp.com/

AGENDA

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- Background
- RFP Timeline
- Products, Pricing, & Evaluation
- Questions

Specific to the 2022 RI OSW RFP

Today's presentation solely focuses on information specific to the 2022 RI OSW RFP issued October 14, 2022.

No prior RFPs are relevant, nor is there any association with other programs conducted by Rhode Island Energy, such as the Rhode Island Renewable Energy Growth Program.

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Background

Affordable Clean Energy Security Act ("ACES")

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- In June 2022, the Rhode Island General Assembly passed amendments to the ACES Act to expand the amount of Offshore Wind in the State, supporting Rhode Island's clean energy goals.

- Governor McKee signed the Amendments into Law on June 29, 2022.

- The ACES amendments generally sought to require RIE to conduct an RFP for Offshore Wind, and through the RFP process, to require Bidders to provide additional non-pricing information, such as reducing environmental impacts, expanding economic opportunities, and supporting diversity, equity, and inclusions measures.

ACES (cont.)

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Specifically:

- The RFP shall be issued by October 15, 2022
- The RFP shall be developed in consultation with the RI OER and RI DPUC, with a 30-day stakeholder period
- The RFP shall be for newly developed offshore wind – seeking at least 600MW, but not more than 1,000MW
- The RFP requires bids to include, and be evaluated by, a series of non-pricing elements, such as: environmental impacts (submission of EFMP), site layout plan and maps, annualized estimates of economic benefits, a DEI plan, identification of vendors and other supply chain opportunities, and plan outlining bidder intentions in relation to labor agreements.

Additionally, the ACES amendments:

- Require filed contracts be approved or disapproved by the Commission within 120 days of the filing
- Require developers to the RFP enter into a labor peace agreement with specific terms concerning the details of that agreement; and pay employees the prevailing wage and fringe benefits
- Allows for the inclusion of bid fees to cover costs of consultants and counsel hired by RI OER, DPUC, RI Commerce, and the DEM (up to $200k per agency)

OSW RFP Drafting Process

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- The RFP and its Appendices were drafted by RIE in consultation with the Office of Energy Resources (OER) and Division of Public Utilities & Carriers (DPUC).

- Further, RIE carefully considered all feedback from stakeholders which were submitted via the Rhode Island Public Utilities Commission public stakeholder process.

- RIE is working to finalize a redline of changes made to the RFP following the draft RFP public comment period. This document, and a summary of changes made as a result of the stakeholder comment period, are expected to be filed shortly to the OSW RFP docket (22-22 EL).

Proposals & Pricing Transparency

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Proposals

Per the RFP rules, Bidders are obligated to submit **both *confidential and public versions*** of their Bid Proposals.

*The proposal(s) identified as the "Public Version" will be posted at the RICleanEnergyRFP.com and will be made **available to the public**.*

Contracts

As defined in Section 2.1 of the RI OSW RFP, "…executed contracts will be filed with the PUC in its entirety with sensitive information potentially subject to redaction…" It is important to note that ***contract price*** will **not** be protected as sensitive information.

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RFP Timeline

Three Major Steps

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Step 1

- Bidder Questions due by **November 30, 2022**
- Base Case development and Evaluation Criteria Development (quantitative and non-pricing)
- Bidder Proposal Development, **due by February 1, 2023**

Step 2

- Bid Proposal Evaluations begin February 1, 2023
- **Conditional Selection** expected **May 14, 2023**
- *Note: Depending on number of proposals and their complexity, Conditional Section date of May 14 could change (forward or back)*
- **Contract Negotiations** begin around **May 14, 2023 and may run through August 4, 2023**

Step 3

- **Contract Execution** expected **by or before August 4, 2023**
- RIE to file contracts and associated supporting material **by approx. October 4, 2023**
- PUC proceeding to begin immediately after filing

RFP Schedule

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Event	Anticipated Dates
Issue RFP	October 14, 2022
Bidders Conference	November 1, 2022
Deadline for Submission of Questions	November 30, 2022
Due Date for Submission of Proposals	February 1, 2023 by 12:00 p.m. (noon) EPT
Review of Bids with Rhode Island OER and Division	February 8, 2023
Conditional selection of Bidder(s) for negotiation	May 12, 2023
Negotiate and Execute Contracts	August 4, 2023
Submit Contracts for PUC Approval	October 4, 2023

We're Looking For Feedback!

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RIE is aware that the NYSERDA OSW RFP has been delayed, with their Bid Proposal due date pushed to January 26, 2023.

Due to this change, RIE is considering a one-month delay to its Bid Proposal due date to provide Bidders with additional time. Subsequent milestones would also be delayed one month.

Would this change be helpful, or will it cause additional complications?

RIE is also considering RFP language changes to allow bidders to withdraw their proposals prior to the Conditional Selection date should their project is selected in another RFP.

We'd like your initial thoughts on this call (during Q&A), but would prefer your formally written responses submitted to RIE by close-of-business Thursday (Nov. 3)

Products, Pricing, and Evaluation Methodology

Product Terms & Conditions

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- Total Offshore Wind target: 600 – 1,000 MW
  - Minimum bid proposal size: 100 MW
  - Maximum bid proposal of approximately 1,000 MW
  - RIE is providing Bidders with the flexibility to submit proposals that are optimally sized to effectively and efficiently use lease area, maximize the use of available interconnection points, and minimize the footprint of transmission cabling along with other related infrastructure.
- Alternative Proposals are allowed
  - Bidders are encouraged to offer multiple proposals
  - Two or more Bidders may also submit a joint conforming proposal
- Products Include: Energy and Renewable Energy Credits (REC)
  - Contract targets a 15 to 20-year terms
  - RIE may seek to extend REC purchases beyond the term of the contract through notice within 3 months of the end of the contract.

Allowable Forms of Pricing

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- Bid Proposals must include a firm, all-in price schedule for all energy (generation) and Renewable Energy Credits ("REC"s) that are compliant with the terms found in Section 2.2.4.2 of the RFP. Proposals:
  - Must address the availability of Federal and State tax credits, grants, and subsidies – especially utilization of the Inflation Reduction Act (IRA)
  - Are not subject to increase based upon availability/receipt of federal or state credits/grants/subsidies

- Initial bids must be include a fixed price with separate pricing for energy ($/MWh) and RECs ($/REC)

- Per Section 2.2.4.2, Bidders may submit alternative Bid Proposals with differing price terms such as:
  - Escalating prices, so long as the change per year does not exceed 3% per year
  - Different fixed rate prices for various periods of the contract

Bid Fee

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- Each Proposals submitted must be accompanied by a non-refundable bid fee.
- **Bid Fees**:
  - Minimum Fee for First Proposal = $500,000
  - Each Additional Proposal Fee = $100,000
  - Same Project w/ Different Pricing Fee = $25,000
- Importantly, if there are changes to the physical aspects of the project (e.g. project size, production, in-service date or delivery location), it is deemed a different proposal requiring a $100k bid fee. If the project details remain the same, but a different pricing option is provided, at $25k bid fee is required.
- **To submit bid fees, the Bidder must contact RIE to receive necessary Funds Transfer and Tax information**.
- See Section 2.2.4.5 of the RFP for additional information

Evaluation Team

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Quantitative/Pricing Team

- Leads: Rhode Island Energy RFP team*, TCR, National Grid
- Consultation: Rhode Island Office of Energy Resources (OER) and Division of Public Utilities & Carriers (DPCU)

Qualitative/Non-Pricing Team

- Leads: Rhode Island Energy RFP team*, National Grid
- Consultation: OER and DPUC

**RIE RFP team will be comprised of leadership and subject matter experts from various teams, such as Transmission Planning & Interconnection, Rates and Regulatory, Environment, DEI, Legal, etc.*

Evaluation Methodology – Overview of Process

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Stage 1

Proposals will be reviewed to ensure they meet eligibility, threshold, and other related minimum requirements – *See Section 2.2 of the RFP.*

Stage 2

Proposals will be evaluated based upon the specified price (quantitative) and non-price (qualitative) criteria – *See Section 2.3 of the RFP.*

Stage 3

Further evaluation of remaining proposals to ensure the selection of proposal(s) which provide greatest value to RIE customers while maximizing the objectives of the ACES statute – *See Section 2.4 of the RFP.*

RIE reserves the right, at any stage, to disqualify and eliminate from further consideration any proposal that it reasonably believes does not meet the requirements

Evaluation – Stage 1

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- Bidders must meet **all** eligibility, threshold, and other related minimum requirements, including but not limited to:
  - Bidder, facility and product eligibility requirements
  - Pricing requirements
  - Reasonable interconnection and delivery requirements
  - Proposal completeness and timeliness
  - Technical and logistical viability
  - Commercially Reasonable
  - Site control
  - Additional requirements specific to ACES
  - *See Section 2.2 of the RFP for additional details.*

- Proposals that meet eligibility, threshold and other minimum requirements will then be subject to Stage 2 evaluation.

Evaluation – Stage 2

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Price Evaluation (75 points out of a possible total score of 100 points)

Based upon direct contract costs and benefits and indirect economic costs and benefits

- Mark-to-market comparison of the bid price to projected market prices of energy
- Comparison of REC bid price to the Renewable Energy Standard Compliance avoided cost
- Other costs and benefits to customers
- More fully described in Section 2.3.1 and 2.3.2 of RFP

Non-Price Evaluation (25 points out of a possible total score of 100 points)

Based upon the criteria that includes but is not limited to:

- Environmental and Fisheries Mitigation Plans (described in Section 2.3.3.3 of RFP)
- Economic benefits to the State of Rhode Island (described in Section 2.3.3.2 of RFP)
- Diversity, Equity and Inclusion Plan (described in Section 2.3.3.4 of RFP)
- Siting and permitting progression and plans
- Project status, including interconnection status, and operational viability
- More fully described in Section 2.3.3 of RFP

Importance of Non-Pricing Factors

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- The Amendments to ACES sought to **specifically add and expand non-pricing evaluation factors**

- This includes detailed information and plans associated with:
  - siting and permitting
  - environmental impacts
  - project development and operational viability
  - interconnection and deliverability
  - Financing
  - contract risk
  - economic benefits.

Additional Non-Pricing Factors

- **Economic Benefits** (Section 2.3.3.2)
  - Bidders should provide information on specific and measurable employment benefits of the project
  - Bidders should provide specific commitments to economic activities (e.g. investments in OSW research, investments in supply chain, and commitments to the utilization of port facilities)
  - Bidders should provide development plans to support economically distressed areas and low-income populations

- **Environmental and Fisheries Mitigation Plan (EFMP)** (Section 2.3.3.3)
  - Detail adverse environmental impacts and measures to avoid/minimize/mitigate those impacts – including impacts on historically marginalized communities and environmental justice communities
  - Provide evidence showing agreement to meet the provisions in the RFP, such as making information and data available to the public, following the guidance developed by the Bureau of Ocean Energy Management, and adherence to Noise Mitigation and Acoustic Monitoring measures

- **Diversity, Equity and Inclusion (DEI) Plan** (Section 2.3.3.4)
  - Must provide a Workforce Diversity Plan and a detailed Supplier Diversity Program

Evaluation - Stage 3

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Goal is to select the proposal(s) that provide the greatest value to RIE customers while maximizing the objectives of the ACES Statute

Remaining proposals will be subject to Stage 3 review, potentially combined into portfolios and evaluated and based upon the following factors

- Stage 2 ranking
- Portfolio effect (overall impact of any combination of proposals)
- Commercial reasonableness of bids
- Risk associated with project viability
- Customer bill impacts
- Creation of additional economic/environmental benefit to the State of Rhode Island
- More fully described in Section 2.4 of RFP

Contract Negotiation & Regulatory Approval

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- Any bidder conditionally selected is required to indicate in writing whether they intend to proceed with their proposal within 5 business days.

- Contract negotiations are expected to begin immediately upon notification
  - Bidder must **commit to enter a labor peace agreement** with at least one bona fide labor organization
  - Bidder must also provide an executed **Commitment Agreement**

- Any PPA executed by RIE will be file with the PUC for review and approval
  - When filed, PUC will *accept comments for at least 30 days*
  - During the comment period, the DEM, RI Commerce Corporation, and OER will all provide various advisory opinions
  - PUC will hold public hearings and *issue a written order within approx. 120 days of filing*.

Memorandum of Understanding (MOU)

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In addition to the Bidder obligations and commitments detailed on the prior slides, successful bidders will be required to negotiate and execute contractual commitments with various Rhode Island Regulatory Agencies – likely in the form of MOUs

The MOUs will be in association with specific commitments put forward by Bidders in the Proposal(s) associated with economic benefits, DEI benefits, and environmental justice benefits.

Further Success Bidders will enter an MOU with the DEM and/or CRMC before the final PPA is executed.

Questions

Asking A Question

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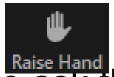
TO SUBMIT WRITTEN QUESTIONS – BIDDER CONFERENCE:

To submit written questions to panelists during the presentation, please click the "Q&A" icon on the bottom of your screen – the Q&A box will appear where you can submit questions to the Panelists. If you prefer to submit questions anonymously, please select the box in the panel before submitting. Please type your questions and submit.

ASK A QUESTION VERBALLY – BIDDER CONFERENCE:

- Instead of submitting a written question, Bidders may also ask a verbal question.
- To ask a question, please raise your hand by clicking the "Raise Hand" 

icon at the bottom of your screen.
- The Panelists will queue Bidders with raised hands, then call on them to ask their question:
    - Panel will provide permission to the Attendee to unmute whereby the Attendee will be brought forward to speak.
    - Please unmute your microphone and ask you question.
    - Upon complete – the Panel with disposition the speaker back to the Attendee pool and move to the next Attendee with a question.

Asking A Question (cont.)

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ASKING QUESTIONS AFTER THE BIDDER CONFERENCE:

Any Bidder that has questions for the RIE OSW RFP team should submit their responses **by or before November 30th, 2022**. Questions must be submitted to **BOTH** of the following mailboxes:

RIEOSWRFP@pplweb.com; **AND** CleanEnergyRFP@nationalgrid.com

All answers will be posted on the Q&A section of the OSW RFP website.

Don't wait until the last minute - Submit your questions early!

Remember – We're also looking for your feedback on the prospective timeline change due to the NYSERDA program date changes. Our decision will be based upon Bidder feedback. ***Please provide your feedback on this item by CoB Thursday, November 3rd!***

Attachment JMR-4 – FAQ Responses to Developer Questions

2022 Rhode Island Request for Proposal for Offshore Wind Energy Per ACES Statute

All Bidder Questions Submitted Through November 30, 2022

Topics:

- General Questions
- Diversity, Equity, and Inclusion Plan Questions
- Interconnection-related Questions
- Quantitative Evaluation-related Questions
- Qualitative Economic Evaluation Questions
- Environmental and Fisheries Mitigation Plan Questions
- PPA Template Questions

General Questions

1. **Bidder Question**: Can Rhode Island Energy provide additional clarity on bid proposal formatting to support efficient submission and review? Specifically, if multiple bid options are being submitted by a single bidder, how would Rhode Island Energy prefer that information to be presented? (*See RFP Section 3.6*).
    - **Rhode Island Energy Response:** Bidders are directed to organize proposals in a fashion which best suits each bidder's specific strategy, while simultaneously meeting all requirements listed in the RFP, including Section 3.6. Bidders shall ensure all components of the RFP Appendix A are answered for all bid proposals. Additional pricing proposals for the same project do not require all components of the RFP Appendix A to be answered if all other project details remain the same.
2. **Bidder Question:** Will co-locating transmission cables with existing cables be considered in non-price evaluation? (*See RFP Section 2.2.3.3*).
    - **Rhode Island Energy Response:** As defined in Section 2.3.3.2 of the RFP, Rhode Island Energy is considering a series of non-pricing criteria, including "Siting and Permitting" and "Environmental Impacts and Environmental and Fisheries Mitigation Plan." If presented as a component of a bid, the co-location of transmission facilities may be considered as an aspect of these criteria. Bidders are encouraged to provide the maximum amount of detail and information available for each project associated with the non-pricing criteria defined in the RFP.

Diversity, Equity, and Inclusion Plan Question

1. **Bidder Question:** How does Rhode Island Energy define diverse businesses? (*See RFP Section 2.3.3.4*).
    - **Rhode Island Energy Response:** The Affordable Clean Energy Security (ACES) Act, as amended, does not provide a specific definition relevant to this question. Bidders should

describe assumptions made and provide any references used regarding "business opportunities that will be provided by diverse businesses" in accordance with Section 2.3.3.4 of the RFP.

Interconnection-Related Questions

1. **Bidder Question:** Are Capacity Capability Interconnection Standard (CCIS) upgrades required to achieve Commercial Operation Date (COD) and initiate the payment of the PPA? (*See RFP Section 2.2.3.4*).
   - **Rhode Island Energy Response:** Yes. Bidders must interconnect at both the Network Capability Interconnection Standard (NCIS) and CCIS levels prior to achieving COD, per Section 3.4(b)(i) and Section 3.6(a) of Appendix C to the RFP, the PPA template.
2. **Bidder Question:** Can Rhode Island Energy confirm that a study completed by an independent engineer experienced in ISO-NE that confirms deliverability of a project based on expected grid upgrades and an ISO-NE base case meets the intent of the following RFP requirement? (*See RFP Section 2.2.3.4*).

   Reference – RFP Section 2.2.3.4: "Rhode Island Energy is seeking projects from which the expected generation delivery profile submitted in its bid can be delivered without material constraints or curtailments. Consequently, bidders must demonstrate that their proposed point of delivery into ISO-NE, along with their proposed interconnection and transmission or distribution system upgrades, is sufficient to ensure full delivery consistent with the proposal's submitted generation profile."
   - **Rhode Island Energy Response:** Projects that have not received I.3.9 approval, or a completed System Impact Study (SIS) or Cluster System Impact Study (CSIS) by ISO-NE, must submit third-party studies that approximate the ISO-NE process in Section 2 of ISO-NE Planning Procedure 5-6. Reference Appendix F of the RFP for additional deliverability constraint analyses required. Studies completed by an independent engineer that appropriately follow both the ISO-NE NCIS and CCIS methodology meet the intent of this requirement.
3. **Bidder Question:** How is the portion of the PPA related to transmission system upgrade costs (TSUC) calculated? Where should it be stated in the proposal? If the TSUC or grid upgrade costs are higher than what is estimated at the time of bid, will Rhode Island Energy allow for an increase in the PPA? (*See RFP Section 2.2.3.4*).
   - **Rhode Island Energy Response:** According to Section 2.2.3.4 of the RFP, "Proposals must include in their pricing all interconnection and transmission or distribution system upgrade costs required to ensure such delivery, including upgrades that may need to occur beyond the point of interconnection." Based upon the terms listed above and in the RFP, a bid price must be all-inclusive. Bidders should include cost estimates where requested within the RFP, including for Item 6.10 of Section 6 in Appendix A of the RFP. The selected bid price, however, must not be contingent on transmission system upgrade costs and may not be increased if those upgrade costs are higher than what is estimated at the time of the bid.
4. **Bidder Question:** Can Rhode Island Energy provide any additional clarity on how the following requirement of Section 2.2.3.4 of the RFP will be evaluated?

   Reference – RFP Section 2.2.3.4: "If a bidder's proposal and associated generation delivery profile includes and assumes additional network upgrades (which the bidder would be *committed to have built, would be instituted through an elective upgrade process with ISO-NE, and for which the bidder would also have complete cost responsibility), then, as is the case with the required NCIS and CCIS interconnection upgrades, the bidder must include all details of such additional network upgrades, including supporting studies and information, necessary to allow a proper evaluation of the proposal."*

- **Rhode Island Energy Response:** The bidder must submit adequate documentation that satisfies the requirements of the RFP, including providing details of all network upgrades assumed in the interconnection studies performed by the bidder.

5. **Bidder Question:** What is an example of an interconnection process that has not been proposed by ISO-NE? (*See RFP Section 2.2.3.4*).

    - **Rhode Island Energy Response:** ISO-NE proposed rules are those that have been introduced by ISO-NE in the established ISO-NE/NEPOOL processes or, if applicable, have been filed by ISO-NE with the Federal Energy Regulatory Commission (FERC) and are under review by the FERC. Any proposed changes to the ISO-NE interconnection process that do not meet those criteria are not changes that have been proposed by ISO-NE. Bidders should clearly state any assumptions made with respect to bids based on ISO-NE proposed changes to established interconnection processes.

6. **Bidder Question:** Per RFP Appendix A, Item 6.12 – Please clarify which specific models are required, and how Rhode Island Energy plans to use them in the evaluation?

    - **Rhode Island Energy Response:** Bidders are required to submit the steady-state power flow models, which are typically a component of the System Impact Study, as well as any other electrical models supporting the proposed project in accordance with the filing requirements of the ISO-NE Tariff Schedule 22 and 23. This includes the transient and short-circuit models.

Quantitative Evaluation-Related Questions

1. **Bidder Question:** How will Rhode Island Energy consider proposals with a high likelihood of success of obtaining tax credits, but where those tax credits are not factored into the price? (*See RFP Section 2.2.4.2.2*).

    - **Rhode Island Energy Response:** As stated in Section 2.2.4.2.2 of the RFP, proposed prices may not be subject to increase based upon the availability or receipt of any tax credits. As also stated in Section 2.2.4.2.2 of the RFP, bidders may propose a bid price that would be decreased based on the project obtaining tax credits, but the analysis of the bid would be based on the price bid without the tax credit contingency being realized. Rhode Island Energy will evaluate and consider all data and information provided by bidders related to the commitments and actions bidders will undertake concerning tax credits or other government grants or subsidies. Bidders are encouraged to provide the maximum amount of detail and information available for each project.

2. **Bidder Question:** In RFP Section 2.2.4.2.2, under the third pricing condition regarding price adjustment if the generation ceases to conform to R.I. Gen. Laws § 39-26-5, is the requirement to provide an energy-only price that is different than the energy component of the energy and REC price? Is the bidder allowed to provide a different price for energy-only that is lower or higher?

    - **Rhode Island Energy Response:** As described in Section 2.2.4.2.2 of the RFP, bidders are obligated to submit bids that include both an energy and non-zero renewable energy credit (REC) price. If, at some time in the future, the RECs associated with the project cease to conform to R.I. Gen. Laws § 39-26-5 (Renewable Energy Standard), Rhode Island Energy will only purchase the energy associated with the project, at the adjusted energy-only price provided as a component of the bid proposal.

3. **Bidder Question:** Does the following excerpt from Section 2.2.4.2.2 of the RFP regarding alternative (non-conforming) pricing apply to grid upgrade costs? If grid upgrades costs are higher than proposed, will the PPA price be adjusted higher?

    Reference – RFP Section 2.2.4.2.2: "Any pricing formula must be symmetrical. In other words, if an index is used, prices must be allowed to increase or decrease in a symmetrical manner relative to a base price"

    - **Rhode Island Energy Response:** Alternative pricing, such as non-conforming pricing, may be considered if meeting the conditions of Section 2.2.4.2.2 of the RFP. This section refers to how a pricing formula for alternative pricing must be symmetrical, but does not detail how that formula is defined. However, according to Section 2.2.3.4 of the RFP, "Proposals must include in their pricing all interconnection and transmission or distribution system upgrade costs required to ensure such delivery, including upgrades that may need to occur beyond the point of interconnection." Based upon the terms listed above and in the RFP, a bid price must be all-inclusive. Bid prices will not be adjusted if grid upgrades, when completed, differ from what the bidder estimated in their bid proposal.

4. **Bidder Question:** What mark-to-market methodology will be used in comparing the total contract cost of RECs bid to the avoided cost and/or projected market prices, as described in Section 2.3.1.1 of the RFP? Are bidders responsible for showing the comparison of total contract costs to the avoided cost based on their own forecasts, or will Rhode Island Energy provide both power price and REC forecasts upon which this comparison should be done?

- **Rhode Island Energy Response:** Section 2.3.1 of the RFP describes the evaluation methodology that Rhode Island Energy will employ to evaluate and ultimately rank bid proposals relative to price-based factors. This section does not intend for bidders to conduct any of the evaluation, nor will bidders be included in the evaluation process beyond the data and information provided by bidders as part of their bid proposals. Bidders are not responsible for showing the comparison of total contract costs to the avoided cost based on their own forecasts.

5. **Bidder Question:** What source is Rhode Island Energy using for projected market prices? (*See RFP Section 2.3.1.1).*
   - **Rhode Island Energy Response:** The mark-to-market analysis is conducted by Rhode Island Energy through utilization of a third-party consultant. This section does not intend for bidders to conduct any of the evaluation, nor will bidders be included in the evaluation process beyond the data and information provided by bidders as part of their bid proposals.
6. **Bidder Question:** What is Rhode Island Energy's current weighted average cost of capital? (*See RFP Section 2.3.1.3).*
   - **Rhode Island Energy Response:** Rhode Island Energy will utilize a Weighted Average Cost of Capital (WACC) of 6.97%.
7. **Bidder Question:** How does the Build America, Buy America Act apply to this RFP? (*See RFP Appendix A, Item 5.11).*
   - **Rhode Island Energy Response:** As defined in Section 5 of Appendix A in the RFP, bidders are instructed to describe how their project will adhere to the Build America, Buy America Act for all instances in which the Build America, Buy America Act applies. For any instances in which the bidder believes the Build America, Buy America Act does not apply to the eligible components to be used in its project, Rhode Island Energy recommends the bidder provide explanation for why it does not apply and the supporting reasoning behind that position.

Qualitative Economic Evaluation Questions

1. **Bidder Question:** Do local economic benefits relate specifically to Rhode Island, and regional economic benefits relate to benefits in New England and New York? How are local economic benefits weighted differently from regional economic benefits in evaluation, if at all? (*See RFP Section 2.3.3.2).*
    - **Rhode Island Energy Response:** Please see the definition of "Regional" in the "Economic Development Summary" Excel Workbook provided as an addendum to the RFP's Appendix A. Please see Section 2.3.3.2 "Factors to be Assessed in Non-Price Evaluation" of the RFP for a description of non-pricing criteria. Further, local benefits are preferred based upon the focus of this Rhode Island Offshore Wind RFP; however, bidders are encouraged to develop and provide the best possible suite of benefits – both local and regional – for consideration by Rhode Island Energy in the bid evaluation process.
2. **Bidder Question:** How does Rhode Island Energy plan to evaluate economic benefits generated from the export of offshore wind components or services from Rhode Island to other states? (*See RFP Section 2.3.3.2*).
    - **Rhode Island Energy Response:** Bidders are encouraged to provide the maximum amount of detail and information available for each project associated with the non-pricing criteria defined in the RFP. This information may be relevant under Section 14 of Appendix A, under Item 14.5. Please see Section 2.3.3.2 "Factors to be Assessed in Non-Price Evaluation" of the RFP for a description of non-pricing criteria.
3. **Bidder Question:** How does Rhode Island Energy define economic benefits? (*See RFP Section 2.3.2).*
    - **Rhode Island Energy Response:** The Affordable Clean Energy Security (ACES) Act, as amended, requires that bidders provide "annualized estimates for all economic benefits, including the specific in-state expenditures and employment proposed during the development, construction, and operation and maintenance phases of the project." The ACES Act does not provide a specific definition relevant to this question; however, bidders should describe the assumptions made in providing the information required by the RFP and the ACES Act, as described above.
4. **Bidder Question:** Can Rhode Island Energy clarify if there are plans to impose penalties for failure to deliver on economic benefits, and if so, what would those penalties be? (*See RFP Section 2.3.2).*
    - **Rhode Island Energy Response:** As addressed in Section 2.3.2 of the RFP, successful bidders will be required to negotiate and execute a legally binding contractual commitment with the applicable government entity or entities of the State of Rhode Island for any specific commitments to economic benefits. Any such terms, including schedules for delivery of economic benefits and provisions regarding penalties for failure to deliver on said economic benefits, will be defined in the legally binding contractual agreement between bidder and State agency. Of note, the contractual commitment will be required before a final PPA is executed.

Environmental and Fisheries Mitigation Plan Questions

1. **Bidder Question:** How does Rhode Island Energy define historically marginalized communities and environmental justice communities? Can Rhode Island Energy provide a list of the specific communities? (*See RFP Section 2.3.3.3).*

    - **Rhode Island Energy Response:** The Affordable Clean Energy Security (ACES) Act, as amended, does not provide a specific definition relevant to this question. Bidders should describe assumptions made regarding "environmental impacts of the proposed Facility on historically marginalized communities and environmental justice communities" in accordance with Section 2.3.3.3 of the RFP. Bidders may also leverage (but are not required to) Executive Order 14008 and the Justice40 Initiative as guidance in defining and identifying historically marginalized communities and environmental justice communities and may identify their methods of defining and identifying such communities. Further, the Rhode Island Department of Environmental Management also provides guidance which can be utilized when evaluating such communities within Rhode Island. This information can be found at: https://dem.ri.gov/environmental-protection-bureau/land-revitalization-and-sustainable-materials-management/environment-justice

2. **Bidder Question:** How will Rhode Island Energy apply the following requirements of Section 2.3.3.3 of the RFP to projects that have already submitted a Construction and Operations Plan?

    Reference – RFP Section 2.3.3.3: "A successful bidder must agree to provide the Company, six (6) months prior to submission of a Construction and Operation Plan, an "Underwater Acoustic Monitoring Plan" detailing how data will be collected to and made available as soon after collection as is practicable for use by third-parties."

    - **Rhode Island Energy Response:** If the bidder has already submitted an "Underwater Acoustic Monitoring Plan," or similar report evaluating the effects of the Facility's underwater noise generating activities to BOEM with its submitted Construction and Operations Plan (COP), the bidder should include the report filed with its COP. The BOEM's Draft Information Needed for Issuance of a Notice of Intent under the National Environmental Policy Act for a Construction and Operations Plan, dated October 24, 2022, which comment period expired December 12, 2022, notes that "[t]he COP should include a complete and sufficient marine acoustic modeling submission in support of BOEM's completion of an Endangered Species Act effects analysis." See also 30 CFR §§ 585.626(b)(15) and 627(a)(3)-(4). In the event that bidder did not submit such documentation to BOEM with its COP, bidder should describe how it will plan to submit to Rhode Island Energy such Underwater Acoustic Monitoring Plan.

3. **Bidder Question:** Is a current list of multi-state or regional coordination and/or collaboration efforts, as per RFP Section 2.3.3.3 under "Regional Collaboration," available for review? Is this a financial commitment to provide funding, or only a commitment to provide in-kind support through engagement?

    - **Rhode Island Energy Response:** Bidders are encouraged to contact the Rhode Island Department of Environmental Management (DEM) or the Coastal Resources Management Council (CRMC) for further information on the type of participation contemplated by the DEM and/or the CRMC.

4. **Bidder Question**: Regarding the contractual commitment with the DEM and/or CRMC under Section 2.3.3.3 of the RFP, is a current list of the Best Management Practices, industry standards, and requirements available for review?

- **Rhode Island Energy Response:** Bidders are encouraged to contact the Rhode Island Department of Environmental Management (DEM) or the Coastal Resources Management Council (CRMC) for further information on what is required for compliance with the section.

5. **Bidder Question:** Please clarify the requirement described in Item 7.8 of Appendix A to the RFP, requesting the bidder describe any investments that will be included with your facility to improve its emissions profile. Does this only apply to existing projects and not a new renewable energy generation source that does not have a historical emissions profile?
    - **Rhode Island Energy Response:** Yes, this requirement is only applicable to existing generation.

PPA Template Questions

1. **Bidder Question:** Can Rhode Island Energy confirm how the Seller will be protected from overcommitting volume on the sale of RECs if Rhode Island Energy has the right to match Alternative Offers? (*See PPA Template, Section 2.3 of Appendix C to the RFP).*
    - **Rhode Island Energy Response:** As described in Section 2.3 of Appendix C to the RFP, the PPA template, in the event that Rhode Island Energy exercises its option to enter into a REC Rights Agreement, Rhode Island Energy would have the right to match an Alternative Offer received by the Seller for RECs generated by the Facility and, if Rhode Island Energy exercises that right, it would purchase the RECs that are the subject of that Alternative Offer.
2. **Bidder Question:** Will Rhode Island Energy allow a phased approach to commercial operation in line with the project schedule submitted by bidders in their proposals, where the PPA of a phase can be initiated when 90% of its respective phase's proposed nameplate capacity has reached regular commercial operation? (*See PPA Template, Section 3.4 of Appendix C to the RFP).*
    - **Rhode Island Energy Response:** Bidders are free to propose a phased commissioning of the Facility through multiple partial commercial operation dates in the same PPA or through multiple PPAs/Facilities, so long as the terms and conditions, including pricing, are consistent across the phases.

Note: RFP refers to the "Request for Proposals for Long-Term Contracts for Offshore Wind Energy," Issuance Date October 14, 2022 (as amended), by the Narragansett Electric Company d/b/a Rhode Island Energy.

2022 Rhode Island Request for Proposal for Offshore Wind Energy Per ACES Statute

Additional Bidder Questions Submitted After March 8, 2023

Questions

1. **Bidder Question:** Concerning the non-refundable Bid Fee required in conjunction with each bid proposal – what is the fee associated with proposals that have the exact same technical parameters as another bid (interconnection, layout, turbines, capacity, etc.), but are differentiated by the amount of local economic development being provided? Does Rhode Island Energy see this as a change in the physical aspect of the project requiring a bid fee of $100,000, or as an additional pricing offer and require the $25,000 bid fee?

    - **Rhode Island Energy Response:** The aforementioned alternative bid that alters the amount of local economic development, but not adjusting the technical parameters of the proposal requires an additional bid fee of $25,000 per proposal after the first proposal (which requires a fee of $500,000). An alternative bid that maintains the exact same technical parameters as another bid, and only differing in the amount of local economic development, is not seen as a change in the physical aspect of the project.

2. **Bidder Question:** Can you provide information on the bid proposal transfer process Bidders are required to use to provide proposals to to Rhode Island Energy?

    - **Rhode Island Energy Response:** Rhode Island Energy has posted a link on its website the provide instructions on how to process proposal document transfers. Please refer to the document called "Bid Transfer Instructions" found at the following link:

      https://ricleanenergyrfp.com/2022-offshore-wind-rfp/2022-offshore-wind-rfp-documents/

3. **Bidder Question:** Can you provide information on the wire instructions Bidders should use to process the transfer of bid fees?

    - **Rhode Island Energy Response:** Please contact the Rhode Island Energy (RIE) OSW Team at RIEOSWRFP@pplweb.com. Upon request, the RIE OSW Team will provide the requested wire transfer instructions via email to support the transfer of bid fees associated with prospective bids (due by Noon on March 13, 2023).

Note: RFP refers to the "Request for Proposals for Long-Term Contracts for Offshore Wind Energy," Issuance Date October 14, 2022 (as amended), by the Narragansett Electric Company d/b/a Rhode Island Energy.

2022 Rhode Island Request for Proposal for Offshore Wind Energy Per ACES Statute

Additional Bidder Questions Submitted After November 30th, 2022

Questions

1. **Bidder Question:** Can Rhode Island Energy clarify if the labor peace agreement that the bidder must commit to enter as part of the contract negotiation process must cover construction, operations, and maintenance services? *(See RFP Section 2.5).*

    - **Rhode Island Energy Response:** That is correct. Section 39-31-10 of the Affordable Clean Energy Security Act states that the developer must enter into a labor peace agreement with at least one bona fide labor organization "actively representing employees providing necessary construction, operations and maintenance services...." Without further guidance by a relevant Rhode Island state agency, Rhode Island Energy interprets that language as requiring that the labor peace agreement cover construction, operations, ***and*** maintenance services.

2. **Bidder Question:** Can Rhode Island Energy clarify when the bidder proposal identified as the "Public Version" will be posted online and made available to the public? *(See RFP Section 3.4).*

    - **Rhode Island Energy Response:** Rhode Island Energy will post the public versions of the proposals to the ricleanenergyrfp.com website as soon as practicable after they are received from the bidders. In any event, public versions of the bids will not be posted until at least 24 hours after the deadline for submission.

3. **Bidder Question:** There is a misalignment between the CPPD Form and the RFP. The RFP states bids must be held firm and valid for 184 days, while the "Part II" tab in the CPPD Form states that prices, terms, and conditions of the bidder's proposal are valid and shall remain open for at least 260 days from the submission date. Will Rhode Island Energy issue an updated CPPD Form?

    - **Rhode Island Energy Response:** Yes, Rhode Island Energy will issue an updated CPPD Form, updating the "Part II" tab.

4. **Bidder Question:** Will you be providing information on bid proposal transfer to Rhode Island Energy, as well as wire instructions for the Bid Fees?

    - **Rhode Island Energy Response:** Rhode Island Energy will provide information on bid proposal transfer and wire instructions not later than one week prior to the bid proposal deadline. When the information is posted, Rhode Island Energy will send a notice both through the website posting and via email, so that all parties will be notified of the information.

Note: RFP refers to the "Request for Proposals for Long-Term Contracts for Offshore Wind Energy," Issuance Date October 14, 2022 (as amended), by the Narragansett Electric Company d/b/a Rhode Island Energy.

2022 Rhode Island Request for Proposal for Offshore Wind Energy

Per ACES Statute

Additional Bidder Questions Submitted After March 8, 2023

Questions

1. **Bidder Question:** Concerning the non-refundable Bid Fee required in conjunction with each bid proposal – what is the fee associated with proposals that have the exact same technical parameters as another bid (interconnection, layout, turbines, capacity, etc.), but are differentiated by the amount of local economic development being provided? Does Rhode Island Energy see this as a change in the physical aspect of the project requiring a bid fee of $100,000, or as an additional pricing offer and require the $25,000 bid fee?

    - **Rhode Island Energy Response:** The aforementioned alternative bid that alters the amount of local economic development, but not adjusting the technical parameters of the proposal requires an additional bid fee of $25,000 per proposal after the first proposal (which requires a fee of $500,000). An alternative bid that maintains the exact same technical parameters as another bid, and only differing in the amount of local economic development, is not seen as a change in the physical aspect of the project.

2. **Bidder Question:** Can you provide information on the bid proposal transfer process Bidders are required to use to provide proposals to to Rhode Island Energy?

    - **Rhode Island Energy Response:** Rhode Island Energy has posted a link on its website the provide instructions on how to process proposal document transfers. Please refer to the document called “Bid Transfer Instructions” found at the following link:

      https://ricleanenergyrfp.com/2022-offshore-wind-rfp/2022-offshore-wind-rfp-documents/

3. **Bidder Question:** Can you provide information on the wire instructions Bidders should use to process the transfer of bid fees?

    - **Rhode Island Energy Response:** Please contact the Rhode Island Energy (RIE) OSW Team at RIEOSWRFP@pplweb.com. Upon request, the RIE OSW Team will provide the requested wire transfer instructions via email to support the transfer of bid fees associated with prospective bids (due by Noon on March 13, 2023).

Note: RFP refers to the "Request for Proposals for Long-Term Contracts for Offshore Wind Energy," Issuance Date October 14, 2022 (as amended), by the Narragansett Electric Company d/b/a Rhode Island Energy.

Attachment NNK-1 – 2022 RI OSW RFP Quantitative Evaluation Report and Appendices

REDACTED

REDACTED

Final Report

2022 RI OSW RFP Quantitative Evaluation Report

Evaluation of Long-term Contracts for Offshore Wind Energy Proposals

Prepared for:

Rhode Island Energy

June 26, 2023

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DISCLAIMER

2022 RI OSW RFP Quantitative Evaluation Report has been prepared by Tabors Caramanis Rudkevich, INC (TCR) for Rhode Island Energy (RIE) for the sole purpose of providing the quantitative analyses to allow RIE to evaluate the proposals that they receive in response to the 2022 Offshore Wind RFP. The information provided herein deals with the analysis, methodology and results of the proposal quantitative evaluations. Any other use of the materials without the explicit permission of RIE is strictly prohibited.

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Section 1. Summary and Overview

1.1: Background

Rhode Island Energy ("RIE") issued a Request for Proposals on October 14th, 2022 for long term contracts from offshore wind energy projects ("2022 RI OSW RFP"). RIE solicited bids ("Proposals") for offshore wind projects providing such supplies of offshore wind energy and Renewable Energy Certificates ("RECs") pursuant to the amendments made to the Affordable Clean Energy Security Act ("ACES"); in support of the state of Rhode Island's clean energy portfolio goals. The ACES requires the electric distribution company to issue an RFP for at least 600 MW of contract capacity. In total, RIE may, but is not required to, select up to approximately 1,000 MW of offshore wind capacity, if bid projects meet the requirements of ACES and additional factors as defined in the RFP, for which the Rhode Island Public Utilities Commission ("Commission") may consider in its review of RIE's procurements under ACES § 39-31-10. The 2022 RI OSW RFP required bidders to submit proposals for at least 100 MW and up to 1,000 MW of generation capacity[1].

RIE selected Tabors Caramanis Rudkevich ("TCR") as Evaluation Team Consultant to help them evaluate certain costs and benefits[2] of the proposals received in response to the RFP. This report summarizes the analyses TCR prepared to evaluate such costs and benefits, and the results of those evaluations.

The 2022 RI OSW RFP Evaluation Team ("Evaluation Team") reviewed and evaluated the Project bids using a process described in testimony sponsored by RIE in this proceeding. As part of this process, TCR performed the Stage Two Quantitative Analysis of each Proposal by creating a scenario or "case" for each Proposal ("Proposal Case") and a common "counterfactual" case ("Base Case") which provides projections under a future in which RIE does not acquire wind energy under long-term contracts from any of the Proposals received in response to the RFP. TCR evaluated the costs and benefits of each Proposal Case using inputs from that Proposal and results from modeling the operation of the New England and New York energy markets assuming the specific Proposal being modeled is chosen, as well as results from the modeling of the Base Case.

During Stage Three of the evaluations TCR also performed sensitivity cases requested by the Evaluation Team to facilitate Stage Three of the evaluation.

Appendix A summarizes the results of TCR's Stage Two Quantitative Analyses of the Proposal Cases, the quantitative scores based on those results, the qualitative scores developed by the Qualitative Team, and the ranking of each Proposal based on the total of the quantitative and qualitative scores.

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1 If a bidder proposes to use wind turbines with a nameplate capacity that would require it to build a project that is greater than 1,000 MW (i.e,. 1,000 MW is not evenly divisible by the nameplate capacity of the turbine), the bidder's proposal must not exceed the 1,000 MW maximum capacity by greater than half of a turbine size.

2 The costs and benefits TCR analyzed were a subset of the overall costs and benefits associated with the 2022 RI OSW bids. Costs and benefits considered less amenable to quantification were analyzed in the Qualitative Analysis portions of the evaluation process. In this report, we use "costs and benefits" and similar terms to refer to the subset of costs and benefits TCR quantified using its tools and methods.

Appendix A also summarizes the results of TCR's Stage Three Quantitative Analyses which evaluates an additional sensitivity case run per the request of the Evaluation Team, the quantitative scores based on those results, the qualitative scores, and the ranking of each Proposal based on the total of the quantitative and qualitative scores. The results of the Stage Three Analysis are compared against and presented alongside Stage Two Proposals.

TCR produced two sets of Stage Two and Stage Three rankings – a "Gross Ranking" and a "Net Ranking" which compares two versions of net benefit calculations against their respective counterparts. The workbooks used in the Gross Ranking calculate quantitative benefits as outlined in the Quantitative Protocol, while the workbooks used in the Net Ranking use a modified calculation of the quantitative metric used to account from revenues from sale of energy. The modification is in accordance with RFP section 2.2.4.2.2 which describes a mechanism where the buyer (RIE) would be credited by the seller (bidder), for hours when the price at the delivery point is negative. That adjustment ensures that the net cost of purchasing and reselling energy is no greater than the PPA price of the contract. Additional details on the benefit modification can be found in **Appendix B.2** and all four sets of rankings are presented in **Appendix A**.

1.2: Analytical Approach

The TCR Quantitative Analyses used metrics for the two categories of costs and benefits specified in the RFP, *i.e.* Direct Contract Costs and Benefits ("Direct Costs and Benefits") and Other Costs and Benefits to Retail Consumers ("Indirect Costs and Benefits").

- TCR developed values for the Direct Cost and Benefit metrics of each Proposal using data from the Proposals themselves, from the outputs of TCR's Proposal Case simulation modeling and from additional intermediate calculation sheets carried out in the Quantitative Workbook of each Proposal Case.
- TCR developed values for the Indirect Cost and Benefit metrics of each Proposal by comparing outputs of its simulation modeling of each Proposal Case to the outputs of its simulation modeling of the Base Case in its Quantitative Workbook for each Proposal Case.

TCR developed values for each of these metrics in 2023 constant dollars ("2023$") for each Proposal/Portfolio by year over a forecast evaluation period of 2027 to 2052[3] ("evaluation period" or "valuation horizon"). **Section 2** of this Report describes those metrics.

1.3: Evaluation Models & Workbooks

Section 3 of this Report describes TCR's simulation of the Base Case as well as the Proposal Cases. **Appendix C** provides the Base Case results in detail. **Appendix D** provides detailed descriptions of the assumptions TCR used to model the Base Case and the Proposal Cases, as well as the ENELYTIX® platform used to do that simulation modeling. **Section 4** describes the Quantitative Workbook for each Proposal Case.

Bid scoring was based on a 100-point scale under which a Proposal Case could receive a maximum of 75 points based upon the results of its Quantitative Analysis performed by TCR and a maximum of 25 points based upon the results of a separate Qualitative Analysis performed by a separate set of

3 This evaluation period was selected prior to opening of Bids to ensure Proposals within a reasonable range of anticipated online dates are evaluated over the entirety of their respective PPA periods.

members of the Evaluation Team ("Qualitative Team"). See **Appendix B.1** for the Quantitative Protocol describing the point allocation/scaling methodology. TCR developed the Quantitative Analysis scores assigned to each Proposal Case based upon the results of the analyses described in this Report. TCR added these Quantitative Analysis scores to the Qualitative Analysis scores provided to it by the Qualitative Team to calculate the total score of each Proposal Case.

TCR then ranked each Proposal/Portfolio Case from high to low according to the total scores. **Section 5** describes this scoring and ranking.

Discussions in the subsequent sections describe TCR's process for evaluating Proposal Cases in Stage Two. Unless stated otherwise, it should be noted that identical processes were used to evaluate sensitivities during the Stage Three analysis.

Figure 1 below provides an overview of the overall evaluation process focusing on the quantitative aspects of the evaluation. The figure identifies the key process elements described in this report including market models, evaluation workbooks and reports, and provides an outline of the overall data flows and dependencies.

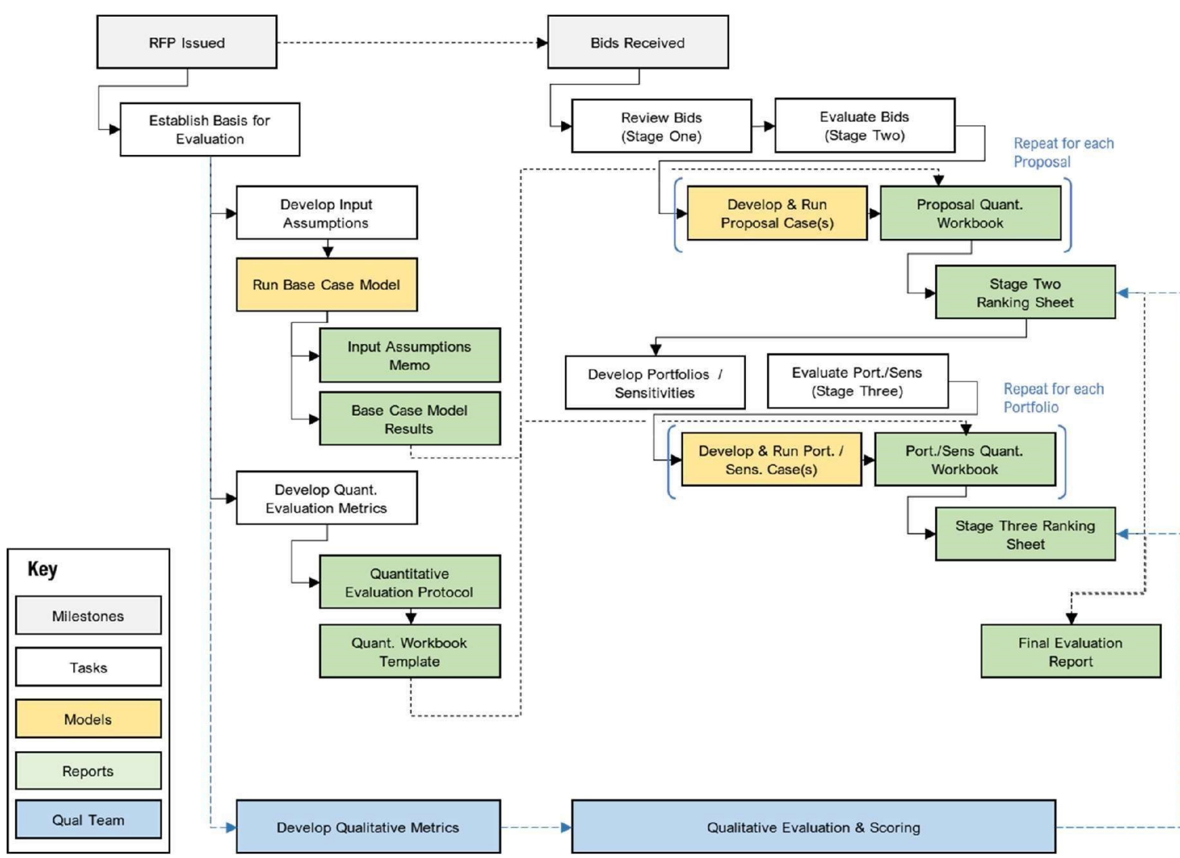

Figure 1 Offshore Wind Evaluation Process

Section 2. Evaluation Costs and Benefits

This section summarizes the analytical approach and metrics TCR used to measure each category of costs and benefits and to develop values for each of those metrics.

The 2022 RI OSW RFP process evaluated two quantitative categories of costs and benefits - Direct Contract Costs and Benefits ("Direct Costs and Benefits") and Other Costs and Benefits to Retail Consumers ("Indirect Costs and Benefits"). Prior to opening the bids, the Evaluation Team developed a Protocol for Quantitative Evaluation / Price Analysis ("Quantitative Protocol"). That protocol, provided in **Appendix B.1**, specifies the analytical approach and metrics to be used for the quantitative evaluation of the direct and indirect costs and benefits. Additional complexities were identified after opening of bids that required adjustments to the evaluation protocol. These adjustments are discussed in an addendum to the Quantitative Protocol provided in **Appendix B.2**.

2.1: Analytical Approaches to Quantitative Evaluation of Proposal Cases

The Quantitative Protocol specifies that *"The ACES requires the electric distribution company to issue an RFP for at least 600 MW of contract capacity. In total, RIE may, but is not required to, select up to approximately 1,000 MW of offshore wind capacity"* with bidders being allowed to bid a range of Proposals with capacities ranging from 100 MW to 1,000 MW.

Stage Two analysis would evaluate each independently regardless of proposal size, with the opportunity to aggregate smaller proposals into larger "Portfolios" that would fall within the procurement limits in Stage 3.

2.2: Metrics Used in Quantitative Evaluation of Proposal Cases

The Quantitative Protocol specifies the *"…core quantitative measure of comparison*" as *"…the levelized net unit benefit per MWh of the project"* which will be calculated in 2023 dollars. For each Proposal Case, TCR developed the value for each component direct and indirect metric described in this section, by year, over the evaluation period in 2023\$. It then calculated the present value for each metric using a Nominal discount rate of 6.97%. The Nominal discount rate is converted to a real discount rate based on assumed inflation rates[4] and used in the calculation of the present value. Finally, TCR calculated a levelized unit value (\$/MWh) for each metric as the present value of each metric divided by the present value of the annual energy from the Proposal Case.

4 Assumptions for projected inflation are from Wood Mackenzie's projected inflation per as published in it North America Gas Investment horizon outlook. These projections for inflation were consistent and comparable with other sources including projections from the Congressional Budget Office, World Economic Outlook and the Bureau of Economic Analysis. Inflation rates vary prior to the study period and are considered in the discounting of benefits and costs to $2023 real dollars. This rate of inflation is at 2% beyond 2027. Present value calculations are based on annual real discount rates that are calculated based on the annual values for inflation.

2.2.1: Direct Costs and Benefits

TCR measured the Direct Costs and Benefits of each Proposal Case by calculating the values of each of the following metrics:

i. **Total Direct Costs** include the Direct Cost of Energy, the Direct Cost of Renewable Portfolio Standard ("RPS") Class 1 eligible RECs.
   a. The Direct Cost of Energy was calculated from the Proposal price for energy multiplied by the annual quantity of delivered energy for each year over the proposed contract term.
   b. The Direct Cost of RPS Class 1 eligible RECs was calculated from the Proposal price for RECs multiplied by the annual quantity of RECs for each year over the proposed contract term.

   The resulting levelized unit value for Total Direct Costs of the Proposal is reported in column H of **Appendix A**.

ii. **Total Direct Benefits** include the Direct Benefit of Energy and RECs.
   a. The Direct Energy Benefit is the market value of the energy deliveries from the Project over the proposed contract term, based upon the forecast market energy prices at the delivery point under the Proposal Case.
   b. The Direct Benefit of RECs is the avoided cost of using these products from the Proposal Case to meet RPS requirements, valued at the Base Case market prices of RECs, plus the forecast market value of any RECs delivered to the RIE that are surplus to RPS requirements and assumed to be sold out of state.

   The resulting Net Direct Benefit[5] is the sum of the above Direct Costs and Direct Benefits. The levelized unit values of the Net Direct Benefit are reported in column J of **Appendix A** for the Proposals.

2.2.2: Indirect Costs and Benefits

TCR measured the Net Indirect Benefits of each Proposal Case by calculating the values of each of the metrics described below.

i. **Indirect Energy Price Benefits** are the savings over the evaluation period from changes to wholesale energy market costs paid for load in Rhode Island, i.e., from changes to Locational Marginal Prices ("LMP") in Rhode Island in the Proposal Case relative to energy market costs in Rhode Island in the Base Case. This metric first calculates the gross annual savings associated with Rhode Island retail load. It then calculates the change in aggregate market value of energy from existing long-term contracts in the Proposal Case being analyzed compared to the Base Case. Finally, the metric calculates the net impact as the gross savings on RI retail load less the change in revenues RIE derives from selling energy from previously-signed RIE long-term contracts.

ii. **Indirect REC Price Benefits** are the savings over the evaluation period from changes to the costs paid by RI utilities for Class 1 RECs based on expected market prices in the Proposal Case

5 The calculated Net Direct Benefit can be a negative number if the costs are greater than the benefits. The resulting negative value are effectively costs.

relative to the Base Case. This metric calculates the savings associated with RECs obtained by the RI utilities to meet the state RPS requirements incremental to the RECs delivered by the Proposal and through existing long-term contracts.

The resulting Total Net Indirect Benefit is the sum of the above Indirect Benefits. The levelized unit values of the Total Net Indirect Benefit for each Proposal are reported in column K of **Appendix A.**

2.2.3: Total Net Unit Benefit (Cost)

The Net Benefit (Cost) of a Proposal is the sum of its Total Net Direct Benefit (Cost) and its Total Net Indirect Benefit (Cost). The levelized unit value of this metric is the core measure for comparison under the Quantitative Protocol. **Appendix A** column L reports this value, in $/MWh.

TCR also calculated the Net Benefit (Cost) in absolute terms ($). This value equals the present value of the Total Direct Benefits and Total Indirect Benefits less the present value of the Total Direct Costs. **Appendix A** column M reports this metric.

2.2.4: Quantitative Workbooks

TCR developed the values of these metrics in a Quantitative Workbook for each Proposal and Portfolio.

- TCR developed values for the Direct Cost and Benefit metrics of each Proposal Case from the bids submitted for each Proposal, from the outputs of its simulation modeling of each Proposal Case, outputs from its simulation modeling of the Base Case, as well as from its quantitative evaluation workbook for each Proposal Case.
- TCR developed values for the Indirect Cost and Benefit metrics of each Proposal Case by comparing outputs of its simulation modeling of each Proposal Case to the outputs of its simulation modeling of the Base Case, as well as from its quantitative evaluation workbook for each Proposal Case.

Section 3. Market Simulations –Base Case and Proposal Cases

TCR developed values for most of the metrics used in the calculations of Direct Costs and Benefits as well as Indirect Costs and Benefits from the outputs of its simulation modeling of the Base Case and each Proposal Case. This section describes the basic differences between the Base Case and the Proposal Cases. It then describes the ENELYTIX® platform TCR used to model each of those Cases and the major input assumptions TCR used in that modeling.

3.1: Base Case and Proposal Cases

The Base Case provides a "but for" or "counterfactual" projection of market parameters associated with Rhode Island electricity consumption under a future in which RIE does not acquire offshore wind energy under long-term contracts from any of the Proposals received in response to the 2022 RI OSW RFP.[6] These market parameters include projections for long term changes to the overall capacity mix, the associated physical parameters such as hourly generation and emissions, as well as the projected costs of market prices including the hourly nodal price of energy across RI and the price of other environmental attributes.

Each Proposal Case provides a projection market parameters associated with Rhode Island electricity consumption under a future in which RIE acquire the offshore wind energy bid by that Proposal under a long-term contract. TCR used the results from each Proposal Case as well as certain inputs from the Base Case to measure the Direct Costs and Benefits of that Proposal described in Section 2, *i.e.*, these Cases provide the projections of carbon emissions and costs with the Proposal in service.

TCR reflected the difference between the Base Case and each Proposal Case in its modeling by using inputs corresponding to each case for generation capacity additions and for transmission system upgrades/changes where these were affected by such generation capacity additions. Subsection 3.3 summarizes each major category of input assumptions TCR used in its modeling and describes the differences in input assumptions between the Base Case and each Proposal Case. **Appendix D** provides detailed descriptions of the assumptions TCR used to model the Base Case and the Proposal Cases, as well as of the ENELYTIX® platform TCR used for its simulation modeling.

The differences in these input assumptions cause the model to produce differences in results between the Base Case and each Proposal Case. **Appendix C** provides key results from the ENELYTIX® modeling of the Base Case.

3.2: ENELYTIX® Simulation Model

TCR used the ENELYTIX® computer simulation software tool to simulate the operation of the New England and New York wholesale markets for energy and ancillary services and RECs under the Base

6 The Base Case is not a plan for the Rhode Island or New England electric sector and should not be viewed as such. TCR used the results from the Base Case as a common reference point against which to measure the Costs and Benefits of each Proposal described in Section 2, *i.e.*, the Base Case provides the projections of carbon emissions and costs without any of the Proposals in service.

Case and for each Proposal Case. ENELYTIX® develops internally consistent, detailed projections of prices in each of those markets as well as of the key physical parameters underlying those prices such as capacity additions and retirements, energy generation by source, carbon emissions and fuel burn. TCR conducted a separate ENELYTIX® run for the Base Case and for each Proposal Case being analyzed.

ENELYTIX® developed its projections through the interaction of the Capacity Expansion module and the Energy and Ancillary Services ("E&AS") module.

- The Capacity Expansion module determines an optimal electric system expansion in New England and New York over a long-term planning horizon. Its objective function is to minimize the net present value of the total cost, *i.e.*, capital, fuel and operating, of the generation fleet serving the wholesale market within the ISO-NE and New York Independent System Operator ("NYISO") electrical footprint subject to resource adequacy, operational and environmental constraints. Resource adequacy constraints are specified in terms of installed capacity requirements ("ICR") for the ISO-NE system as whole and for reliability zones within ISO-NE. Resource adequacy constraints were also imposed for NYISO and its sub-areas. Environmental constraints include requirements for state-by-state procurement of electric energy generated by renewable resources, as well as state and regional emissions limits. The module represents each state's year-by-year Class 1 RPS requirements, Massachusetts CES requirements, state-specific RPS resource eligibility, limitations on REC banking and borrowing, and alternative compliance payment ("ACP") prices. The NYISO model includes the CLCPA Act[7] among other mandated clean energy targets.
- The Energy and Ancillary Services ("E&AS") module simulates the Day-Ahead and Real-Time market operations within the footprint of the ISO-NE and NYISO power systems and markets. This module implements hourly chronological simulations of the Security Constrained Unit Commitment ("SCUC") and Economic Dispatch ("SCED") processes, as well as the structure of the ancillary services in ISO-NE and NYISO markets.

The two modules use the Power System Optimizer ("PSO") market simulator developed by Polaris Systems Optimization, Inc.[8] In addition the two modules rely on data obtained from ISO-NE and NYISO including the economic and operational characteristics of existing generating units, representation of the electric transmission system, and projection of future electricity demand.

3.3: Major Input Assumptions Used to Model Base and Proposal Cases

TCR used ten major categories of input assumptions[9] to model the Base Case and each of the Proposal Cases in ENELYTIX®.

1. Generating Unit Capacity Additions
2. Transmission Topology
3. Load Forecast

7 Climate Leadership and Community Protection Act (https://www.nyserda.ny.gov/All-Programs/CLCPA)

8 www.psopt.com.

9 TCR uses the term 'Assumptions' to refer to inputs to the modeling process that are exogenous to the model, and often calculated from data available from sources such as ISO-NE, EIA's Annual Energy Outlook or other proprietary datasets such as S&P Market Intelligence Platform.

4. Installed Capacity Requirements
5. RPS Requirements
6. Massachusetts CES and annual cap on Carbon Emissions
7. Emission Allowance Prices
8. Generating Unit Retirements
9. Generating Unit Operational Characteristics
10. Fuel Prices.

Of those, the only three categories in which there were input assumption differences between the Base Case and each Proposal Case were Generating Unit Capacity Additions, Generating Unit Retirements and Transmission Topology.

This subsection summarizes each of the major categories of input assumptions TCR used in modeling ISO-NE and describes the differences in those input assumptions between the Base Case and each Proposal Case. TCR used the input assumptions in the remaining seven categories to model both the Base Case and each of the Proposal Cases. **Appendix D** provides detailed descriptions of the assumptions for ISO-NE and for the NYISO that TCR used to model the Base Case and the Proposal Cases. The following sub-section will discuss categories of assumptions focusing on the ISO-NE model.

3.3.1: ISO-NE Modeling Input Assumption Categories with differences between the Base Case and each Proposal Case

Generating Unit Capacity Additions. This category consists of three groups of resources.

Existing & Scheduled capacity additions are the generating resources input to ENELYTIX® assumed to be in-service during the evaluation period based on external source materials and inputs from RIE. These resources are common to the Base Case and all Proposal Cases. These include:

- Existing generating units listed in the 2022 ISO New England Forecast Report of Capacity, Energy, Loads, and Transmission ("CELT Report");
- Projects that had cleared the most recent Forward Capacity Auction (FCA16);
- Distributed photovoltaic (PV) capacity at levels in the ISO-NE's Final 2022 PV Forecast through 2031 and thereafter at levels extrapolated from the ISO-NE PV Forecast[10] which includes PV installed under the Solar Massachusetts Renewable Target (SMART) Program;
- Renewable generation projects that either have existing long-term contracts with the RIE, or that have been selected to negotiate contracts with the New England utilities as of December, 2022. These include, but are not limited to offshore wind procurements that are under contract or will be procured under state targets.

Proposal capacity additions are the as-bid Proposal offshore wind units that are specific to the Proposal being evaluated and included in each of the respective Proposal Case models. The performance and costs of these units are based on the bid documents. The Base Case does not include any proposal additions.

Model selected capacity additions are renewable and fossil resources that ENELYTIX® has the option to add at least cost during the study horizon, as determined by its internal calculations, to

10 ISO New England Final 2022 PV Forecast, April 28 2022

meet resource adequacy, energy and environmental constraints existing within the simulation model over the study time period. ENELYTIX® evaluates the economics of each of these possible resources with the assumption that they would be developed and financed on a merchant basis, *i.e.* without long-term purchase power agreements. Even if these resources were assumed to have long-term power sales agreements, the expectation is that the pricing terms of such agreements would reflect similar future economic fundamentals.

To ensure consistency in evaluation of Proposals, the capacity additions and retirements for the Proposal Cases would be determined by generic capacity expansions that would hold decisions constant across similarly sized proposals. This methodology is described in detail as an attachment to the Quantitative Protocol.

Generating Unit Retirements. This category consists of two groups of assumptions.

Scheduled retirements are the specific generating capacity units input to ENELYTIX® as retiring prior to, or during, the evaluation period. These are the generating units that are scheduled to have retired prior to the beginning of the evaluation period (January 2027) plus the ISO-NE approved scheduled retirements as of December 2022 over the evaluation period.

Model Selected retirements are existing generating units that are retired by ENELYTIX® over the study period based upon their economic viability. ENELYTIX® determines, within the simulation, whether it is cost efficient to keep an existing unit online, to retire the unit, or to replace it with a more efficient unit or with a resource that is needed to meet environmental constraints.

Transmission. ENELYTIX® provides a detailed representation of the transmission topology and electric characteristics of transmission facilities within ISO-NE and the NYISO. The Evaluation Team and TCR worked together to ensure that the ENELYTIX® model correctly reflected the transmission upgrades associated with each Proposal. These included transmission topology and contingency sets for additional contingency constraints that might be affected by power injections from Proposals.

Aside from those differences, the remaining transmission input assumptions were common to the Base Case and each Proposal Case over the evaluation horizon. ENELYTIX® modeled the ISO-NE transmission system based on the 2025 summer peak power flow case obtained from ISO-NE and the NYISO system based on the 2024 summer peak power flow case obtained from NYISO. For the Base Case, and each Proposal Case, TCR worked with the Evaluation Team to identify the relevant transmission constraints to monitor. These included all major ISO-NE interfaces and frequently binding constraints assembled by the Evaluation Team, transmission changes associated with large clean energy projects procured through recent RFP processes, and contingency analyses performed by the Evaluation Team and TCR.

3.3.2: ISO-NE Modeling Input Assumption Categories <u>with no differences</u> between the Base Case and each Proposal Case

The remaining seven categories of modeling input assumptions that are common to the Base Case and each Proposal Case are Load Forecast, Installed Capacity Requirements, RPS Requirements, Massachusetts CES and cap on Carbon Emissions, Emission Allowance Prices, Generating Unit Operational Characteristics and Fuel Prices.

Load Forecasts. The load forecast inputs to ENELYTIX® are annual energy and peak load before (“Gross”) and after the impacts of reductions due to passive demand response (“PDR”), *i.e.* “Gross less PDR”. TCR drew these forecasts through 2033 from the ISO-NE 2022 CELT Report. It developed the forecasts for 2031 through 2050 through separate extrapolations of the Gross, PDR and electrification components. TCR also developed a forecast of energy requirements net of the impacts of reductions from behind the meter photovoltaic generation ("BTMPV" or "BMPV"). This forecast, which corresponds to the obligation for retail metered load, is referred to by ISO-NE as Net Energy Load ("NEL") or as "Gross less PV less PDR". TCR used this forecast to estimate annual state RPS obligations and MA CES obligations, both of which are inputs to ENELYTIX®. In order to simulate the ISO-NE market on an hourly basis, TCR developed hourly load forecasts for each ISO-NE zone. It developed these based upon its forecasts of annual energy and summer/winter peaks and on 2012 historical load shapes to be consistent with calendar 2012 NREL wind generation profiles, the most recent detailed data available from NREL for New England. To accurately capture the impact of growing electrification, TCR separated the electrification load from the overall forecast (which is based on a 2012 year annual shape) and superimposed a separately developed hourly forecast of electrification.

Installed Capacity Requirements. ICR forecast inputs to ENELYTIX® include the system-wide requirement as well as local sourcing requirements ("LSR") for import constrained zones. TCR developed its forecasts of these requirements based on its analyses of ISO-NE studies[11]. The forecast of system-wide ICR assumes that import capacity under the existing supply agreement with Hydro Quebec and imports from other external control areas including New York, New Brunswick, and Highgate will remain at the level identified in the most recent ISO-NE capacity auction.

RPS Requirements. ENELYTIX® models the Class 1 RPS requirements of each New England state except Vermont, which does not have an equivalent Class 1 RPS requirement. The RPS requirement input to ENELYTIX® for each state equals the forecast load of Load Serving Entities ("LSEs") obligated to comply with that state's RPS multiplied by that state's annual Class 1 RPS percentage target. The forecast load of LSEs is the forecast Gross less PV less PDR load for each state reduced by the load exempt from the RPS in that state. Additional RPS inputs to ENELYTIX® are state-specific resource eligibility, limitations on certificate banking and borrowing, and ACP prices.

Massachusetts CES and Cap on Carbon Emissions. ENELYTIX® models regulation 310 CMR 7.74, a cap on carbon emissions from electric generating units ("EGU") located in Massachusetts and regulation 310 CMR 7.75, the CES. The CES requirement input to ENELYTIX® equals the forecast load of LSEs obligated to comply with the CES multiplied by the Massachusetts annual CES percentage target.

Emission Allowance Prices. TCR used the CO_2 allowance price assumptions based on Regional Greenhouse Gas Initiative (RGGI) projections from WoodMac's 2022 North American gas forecasts.[12] TCR developed its NOx and SO_2 allowance price assumptions for NYISO based on emission limits under the Federal Cross State Air Pollution Rule ("CSAPR").[13] Appendix F describes the additional TCR allowance price assumptions for NYISO.

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11 ISO-NE History of historical ICR and related values (https://www.iso-ne.com/static-assets/documents/2016/12/summary_of_historical_icr_values.xlsx), ISO-NE Regional System Plan (https://www.iso-ne.com/system-planning/system-plans-studies/rsp), ISO-NE Calculation of ICR and local resource requirements (https://www.iso-ne.com/markets-operations/markets/forward-capacity-market/fcm-participation-guide/installed-capacity-requirement)

12 North America gas 10 year investment horizon outlook, published October 2022, https://www.woodmac.com/store/outlook/north-america/

13 New England states are not subject to CSAPR. Some New England states have cap and trade programs for NOx and SO2, but the market is thin, prices are low, and allowances are often granted annually rather than auctioned.

Generating Unit Operational Characteristics. TCR developed assumptions for the key physical and operating cost parameters of all the types of generating units and resources that ENELYTIX® models. These include thermal units, nuclear units, hydro, pumped storage hydro, wind and solar PV.

Fuel Prices. TCR developed forecasts of monthly spot gas prices for each gas-fired unit in New England based upon the spot prices at the market hub which serves the unit. The four relevant hubs are Algonquin, Tennessee Zone 6, Tennessee Dracut and Iroquois Zone 2. The forecasts are based upon WoodMac's 2022 North American gas projections of Henry Hub prices plus projections of the basis differential to each hub from the Henry Hub. The basis differentials are obtained from the forward prices and assumed to be held constant based on the last year of available data. The projections of distillate and residual to electric generators in New England are also drawn from WoodMac forecasts.

Due to constraints in pipeline capacity, generating units in New England face shortages in natural gas supply during the winter period. To capture its impact, TCR included a winter gas cap to approximate the economic and environmental impact resulting from dual-fuel generators switching from natural gas to fuel oil on winter days with high natural gas prices. The fuel switching mechanism is included for all ENELYTIX® *i.e.,* the Base Case and all Proposal Cases. The fuel switch constraint driving the switching was calibrated to ensure the frequency of annual fuel switching, on average, does not exceed 30 days.

Section 4.
Proposal Evaluation – Quantitative Workbook

TCR's Quantitative Analysis calculated the costs and benefits of each Proposal using a Quantitative Workbook for that Proposal. If a bid included alternative pricing options for energy and RECs for a particular Proposal, TCR prepared separate Quantitative Workbook for each pricing option included in the bid.

The Quantitative Workbook is an Excel workbook consisting of the following worksheets:

- A summary worksheet which summarizes the resulting quantitative calculations for lookup and use in further processing
- A Primary a proposal quantitative metrics calculation worksheet which categorically calculates each of the metrics using inputs from the additional inputs and intermediate calculation worksheets.
- Four additional sheets are used for intermediate calculations – a worksheet for energy and price adjustments associated with existing long-term contracts, a worksheet calculating the contribution of the Proposal RECs toward RPS, and two additional support workbooks that calculate the emission reductions in the Proposal Case relative to the Base Case for CO2 and NOx.
- Seven calculation input worksheets – these primarily aggregate the outputs from the modeling of the Base Case and Proposal Case, as well as external inputs that feed into the above calculation workbooks.
- Twenty four additional supporting worksheets that report additional data drawn from the modeling of the relevant bid, provided for added reference
- A financials worksheet used to apply a discount rate against varying inflation, and
- A contents sheet.

4.1: Proposal Metrics Worksheet

The Proposal Metrics worksheet of the Quantitative Workbook for a given Proposal develops values for each of the metrics used to calculate the Direct and Indirect Costs and Benefits of that Proposal Case. It develops annual values in 2023$ over an evaluation period of 2027 to 2052 and then calculates their respective present values.

The Proposal Metrics worksheet for each Proposal develops these annual values and present values from the following major inputs:

- Prices for energy and RECs from the bid
- Details of generation and revenues for units under existing and anticipated long term contracts
- Details of REC accounting for the relevant Proposal Case
- Results from ENELYTIX® modeling of the relevant Proposal Case
- Results from ENELYTIX® modeling of the Base Case

Section 5. Scoring and Ranking of Proposal Cases

The Evaluation Team used the results from TCR's Quantitative Analyses and from the Qualitative Analyses performed by the Qualitative Evaluation Team, to score and then rank Proposals.

The scoring system was based on a 100-point scale. A Proposal Case could receive a maximum of 75 points based upon the results of its quantitative evaluation and a maximum of 25 points based upon the results of its qualitative evaluation. TCR developed the Quantitative Analysis scores assigned to each Proposal Case based upon the results of its quantitative evaluations. The Qualitative Team developed the scores assigned to each Proposal Case based upon the results of their Qualitative Analysis evaluations.

TCR assigned Quantitative Analysis scores to each Proposal Case based upon results of their respective Quantitative Analysis results pursuant to the following approach:

- Assign 75 points to the Proposal Case with the highest levelized unit Net Benefit, 2023$/MWh, ("top bidder");
- for each other bid, subtract 3.0 points for each $1.00/MWh of levelized unit Net Benefit that the bid is below the top bidder to determine the score for each remaining proposal.

The Qualitative Team provided TCR the scores assigned to each Proposal Case based upon results of their qualitative evaluations.

TCR added the quantitative and qualitative scores to calculate the total score of each Proposal Case. TCR then ranked each Proposal Case from high to low according to its total score.

APPENDIX A:
Proposal Scores and Ranking

A.1: Stage Two Scores and Ranking Based On Gross Evaluation

RI OSW Stage 2 Results

1. Stage 2 Ranking [Gross] <- Dropdown for Ranking Selection

Results as of 6/29/2023

Row	Evaluation Identifier	Total Contract Amount [Project]	[redacted]	Project Proposed Annual Delivery [MWh]	Project Weighted Net Capacity Factor [%]	[redacted]	Sub total - Direct Cost of Project Energy + RECs [2023$/MWh]	Sub total - Direct Benefit of Project Energy + RECs [2023$/MWh]	Total Net Direct Benefit of Project (Cost) [2023$/MWh]	Total Net Indirect Benefit (Cost) [2023$/MWh]	Total Unit Net Benefit (Cost) [2023$/MWh]	Net Benefit (Cost) : Absolute * [2023$]	Quantitiative Score [Max = 75]	Qualitative Score [Max = 25]*	Total Score [Max = 100]	Rank
6	[redacted]	884 MW	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	(112.39)	13.53	(98.86)	(3,043,050,854)	75.00	10.00	85.00	1
7	[redacted]	884 MW	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	(118.07)	13.60	(104.48)	(3,217,857,410)	58.15	10.00	68.15	2
8	[redacted]	884 MW	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	(120.11)	13.50	(106.61)	(3,283,727,365)	51.74	10.00	61.74	3
9	[redacted]	884 MW	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	(121.13)	13.68	(107.45)	(3,310,642,605)	49.22	10.00	59.22	4
10	[redacted]	884 MW	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	(126.19)	13.48	(112.70)	(3,473,738,815)	33.47	10.00	43.47	5
11	[redacted]	884 MW	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	(127.02)	13.61	(113.42)	(3,496,897,674)	31.33	10.00	41.33	6
52	4	6	7	10	9	11	19	23	24	29	31	33	40	41	42	43

Notes

- Proposals marked as a 'sensitivity' case include additional adjustments to the model setup. All other cases are modeled 'as-bid'.
- Proposals marked as 'gross' calculate the metrics per the Quantiative Evaluation protocol based on the direct outputs from the Proposal Case model.
- Proposals markeed as 'net' calculate the metrics with adjustments to account for provisions in RFP Section 2.2.4.2.2 (d). Negative revenues in hours with negative LMPs at the POI are assumed to be credited or 'netted' back to the Buyer by the Bidder, and reflected as an increase in energy revenues under the Direct Metric.
- The Net Benefit (Cost): Absolute reported equals the net present value (NPV) of the sum of annual costs and benefits for each proposal, discounted to 2023 and represented in 2023 real dollars. The Total Unit Net Benefit equals the NPV absolute benefit divided by the NPV energy procured.

A.2: Stage Two Scores and Ranking Based On Net Evaluation

REDACTED

RI OSW Stage 2 Results

2. Stage 2 Ranking [Net] <- Dropdown for Ranking Selection

Results as of 6/29/2023

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
5		Evaluation Identifier	Total Contract Amount [Project]	[redacted]	Project Proposed Annual Delivery [MWh]	Project Weighted Net Capacity Factor [%]	[redacted]	Sub total - Direct Cost of Project Energy + RECs [2023$/MWh]	Sub total - Direct Benefit of Project Energy + RECs [2023$/MWh]	Total Net Direct Benefit of Project (Cost) [2023$/MWh]	Total Net Indirect Benefit (Cost) [2023$/MWh]	Total Unit Net Benefit (Cost) [2023$/MWh]	Net Benefit (Cost) : Absolute * [2023$]	Quantitiative Score [Max = 75]	Qualitative Score [Max = 25]*	Total Score [Max = 100]	Rank
6		[redacted]	884 MW	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	(77.67)	13.53	(64.13)	(1,974,130,145)	75.00	10.00	85.00	1
7		[redacted]	884 MW	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	(82.28)	13.60	(68.69)	(2,115,510,559)	61.35	10.00	71.35	2
8		[redacted]	884 MW	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	(83.88)	13.50	(70.38)	(2,167,816,550)	56.25	10.00	66.25	3
9		[redacted]	884 MW	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	(84.75)	13.68	(71.08)	(2,189,899,853)	54.17	10.00	64.17	4
10		[redacted]	884 MW	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	(88.85)	13.48	(75.37)	(2,322,934,530)	41.30	10.00	51.30	5
11		[redacted]	884 MW	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	(89.56)	13.61	(75.96)	(2,341,950,045)	39.53	10.00	49.53	6
12																	
13																	
14																	
15																	
16																	
17																	
18																	
19																	
20																	
21																	
22																	
23																	
52		4	6	7	10	9	11	19	23	24	29	31	33	40	41	42	43

Notes

- Proposals marked as a 'sensitivity' case include additional adjustments to the model setup. All other cases are modeled 'as-bid'.
- Proposals marked as 'gross' calculate the metrics per the Quantiative Evaluation protocol based on the direct outputs from the Proposal Case model.
- Proposals markeed as 'net' calculate the metrics with adjustments to account for provisions in RFP Section 2.2.4.2.2 (d). Negative revenues in hours with negative LMPs at the POI are assumed to be credited or 'netted' back to the Buyer by the Bidder, and reflected as an increase in energy revenues under the Direct Metric.
- The Net Benefit (Cost): Absolute reported equals the net present value (NPV) of the sum of annual costs and benefits for each proposal, discounted to 2023 and represented in 2023 real dollars. The Total Unit Net Benefit equals the NPV absolute benefit divided by the NPV energy procured.

A.3: Stage Three Scores and Ranking Based On Gross Evaluation

	A B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	RI OSW Stage 2 Results															
3	3. Stage 3 Ranking [Gross]		<- Dropdown for Ranking Selection													
4	Results as of	6/29/2023														
5	Evaluation Identifier	Total Contract Amount [Project]	[redacted]	Project Proposed Annual Delivery [MWh]	Project Weighted Net Capacity Factor [%]	[redacted]	Sub total - Direct Cost of Project Energy + RECs [2023$/MWh]	Sub total - Direct Benefit of Project Energy + RECs [2023$/MWh]	Total Net Direct Benefit of Project (Cost) [2023$/MWh]	Total Net Indirect Benefit (Cost) [2023$/MWh]	Total Unit Net Benefit (Cost) [2023$/MWh]	Net Benefit (Cost) : Absolute * [2023$]	Quantitiative Score [Max = 75]	Qualitative Score [Max = 25]*	Total Score [Max = 100]	Rank
6	[redacted]	884 MW	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	(94.66)	12.09	(82.57)	(2,543,539,830)	75.00	10.00	85.00	1
7	[redacted]	884 MW	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	(112.39)	13.53	(98.86)	(3,043,050,854)	26.12	10.00	36.12	2
8	[redacted]	884 MW	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	(118.07)	13.60	(104.48)	(3,217,857,410)	9.27	10.00	19.27	3
9	[redacted]	884 MW	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	(120.11)	13.50	(106.61)	(3,283,727,365)	2.86	10.00	12.86	4
10	[redacted]	884 MW	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	(121.13)	13.68	(107.45)	(3,310,642,605)	0.35	10.00	10.35	5
11	[redacted]	884 MW	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	(126.19)	13.48	(112.70)	(3,473,738,815)	-15.41	10.00	-5.41	6
12	[redacted]	884 MW	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	(127.02)	13.61	(113.42)	(3,496,897,674)	-17.55	10.00	-7.55	7
13																
14																
15																
16																
17																
18																
19																
20																
21																
22																
23																
52	4	6	7	10	9	11	19	23	24	29	31	33	40	41	42	43

53 **Notes**

- Proposals marked as a 'sensitivity' case include additional adjustments to the model setup. All other cases are modeled 'as-bid'.
- Proposals marked as 'gross' calculate the metrics per the Quantiative Evaluation protocol based on the direct outputs from the Proposal Case model.
- Proposals markeed as 'net' calculate the metrics with adjustments to account for provisions in RFP Section 2.2.4.2.2 (d). Negative revenues in hours with negative LMPs at the POI are assumed to be credited or 'netted' back to the Buyer by the Bidder, and reflected as an increase in energy revenues under the Direct Metric.
- The Net Benefit (Cost): Absolute reported equals the net present value (NPV) of the sum of annual costs and benefits for each proposal, discounted to 2023 and represented in 2023 real dollars. The Total Unit Net Benefit equals the NPV absolute benefit divided by the NPV energy procured.

54

A.4: Stage Three Scores and Ranking Based On Net Evaluation

REDACTED

	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	RI OSW Stage 2 Results															
3	4. Stage 3 Rankings [Net]	<- Dropdown for Ranking Selection														
4	Results as of	6/29/2023														
5	Evaluation Identifier	Total Contract Amount [Project]	[redacted]	Project Proposed Annual Delivery [MWh]	Project Weighted Net Capacity Factor [%]	[redacted]	Sub total - Direct Cost of Project Energy + RECs [2023$/MWh]	Sub total - Direct Benefit of Project Energy + RECs [2023$/MWh]	Total Net Direct Benefit of Project (Cost) [2023$/MWh]	Total Net Indirect Benefit (Cost) [2023$/MWh]	Total Unit Net Benefit (Cost) [2023$/MWh]	Net Benefit (Cost) : Absolute * [2023$]	Quantitiative Score [Max = 75]	Qualitative Score [Max = 25]*	Total Score [Max = 100]	Rank
6	[redacted]	884 MW	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	(69.86)	12.09	(57.76)	(1,779,481,352)	75.00	10.00	85.00	1
7	[redacted]	884 MW	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	(77.67)	13.53	(64.13)	(1,974,130,145)	55.89	10.00	65.89	2
8	[redacted]	884 MW	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	(82.28)	13.60	(68.69)	(2,115,510,559)	42.24	10.00	52.24	3
9	[redacted]	884 MW	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	(83.88)	13.50	(70.38)	(2,167,816,550)	37.15	10.00	47.15	4
10	[redacted]	884 MW	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	(84.75)	13.68	(71.08)	(2,189,899,853)	35.06	10.00	45.06	5
11	[redacted]	884 MW	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	(88.85)	13.48	(75.37)	(2,322,934,530)	22.19	10.00	32.19	6
12	[redacted]	884 MW	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	(89.56)	13.61	(75.96)	(2,341,950,045)	20.42	10.00	30.42	7
13																
14																
15																
16																
17																
18																
19																
20																
21																
22																
23																
52	4	6	7	10	9	11	19	23	24	29	31	33	40	41	42	43

Notes

- Proposals marked as a 'sensitivity' case include additional adjustments to the model setup. All other cases are modeled 'as-bid'.
- Proposals marked as 'gross' calculate the metrics per the Quantiative Evaluation protocol based on the direct outputs from the Proposal Case model.
- Proposals markeed as 'net' calculate the metrics with adjustments to account for provisions in RFP Section 2.2.4.2.2 (d). Negative revenues in hours with negative LMPs at the POI are assumed to be credited or 'netted' back to the Buyer by the Bidder, and reflected as an increase in energy revenues under the Direct Metric.
- The Net Benefit (Cost): Absolute reported equals the net present value (NPV) of the sum of annual costs and benefits for each proposal, discounted to 2023 and represented in 2023 real dollars. The Total Unit Net Benefit equals the NPV absolute benefit divided by the NPV energy procured.

APPENDIX B:
Protocol for Quantitative Metric Calculations, Stage Two

B.1: Protocol for Quantitative Metric Calculations

2022 Rhode Island Long-Term Contracts for Offshore Wind Solicitation

Protocol for Quantitative Evaluation / Price Analysis

Introduction

Rhode Island Energy ("RIE"), in consultation with the Rhode Island Office of Energy Resources ("OER") and the Rhode Island Division of Public Utilities and Carriers ("Division"), is soliciting proposals for long-term contracts of newly-developed Offshore Wind Capacity[1] ("Proposals") through its RFP for Long-Term Contracts for Offshore Wind Energy issued October 14, 2022 ("2022 RI OSW RFP"). RIE is seeking these proposals pursuant to the amendments made to the Affordable Clean Energy Security Act ("ACES"); in support of the state of Rhode Island's clean energy portfolio goals. The ACES requires an electric distribution company to issue an RFP for at least approximately 600 MW of contract capacity. In total, RIE may, but is not required to, select up to approximately 1,000 MW of offshore wind capacity, if bid projects meet the requirements of ACES and additional factors as defined in the RFP, for which the Rhode Island Public Utilities Commission ("Commission") may consider in its review of discretionary procurements. Proposals are due by noon (12:00 PM EPT) on March 13, 2023. Ultimately, contracts conditionally selected by RIE are subject to final approval by the Commission.

This document describes the quantitative metrics and multi-year net present value cost/benefit analysis the evaluation team (an internal RIE team) and RIE's consultant, Tabors Caramanis Rudkevich ("TCR"), will use in Stage II to evaluate Proposals received in response to the 2022 RI OSW RFP.

1. Quantitative Evaluation Process and Measures

To be evaluated, for ranking and selection, Proposals must meet the Stage One eligibility, threshold and other minimum requirements set out in the RFP. Proposals deemed eligible by the evaluation team are considered for detailed Stage Two analysis.

The core quantitative measure of comparison in Stage Two will be the levelized net unit benefit per MWh ("Total Net Unit Benefit"). This measure is developed by calculating the net present value ("NPV") stream of annual costs and benefits calculated in real 2023 dollars ($2023) over the study period of 2027 through 2052.[2] The Total Net Unit Benefit will be the metric used for the relative ranking based on price and quantitative scoring of eligible proposals.

1 "Newly Developed Renewable Energy Resource" as defined in R.I.G.L. § 39-26.1-2(7).

2 Assumes the COD of proposals to be between 2027 and 2032; 20 years as the longest contract.

2. Financial Parameters to be used in Quantitative Evaluation of Proposals

- Discount rate (in nominal dollars) - i.e., the After Tax Weighted Average Cost of Capital of 6.97%[3]
- Rate of inflation beyond 2027 - 2%[4]

3. Allocation of 75 points for Quantitative Evaluation Results

For purposes of ranking and scoring proposals in Stage II, RIE plans to allocate a maximum of 75 points to Proposals, based on their quantitative evaluation results. The evaluation team will prepare an allocation of the 75 points for ranking and scoring purposes, based on Total Net Unit Benefits.

1. Assign 75 points to the Proposal with the highest Total Net Unit Benefit (i.e., the "top bid").[5]
2. For the other Proposals, subtract 3 points for each $1.00 Total Net Unit Benefit per MWh less favorable than the top bid.

4. Quantitative Evaluation of Proposals

This section describes the specific metrics, information sources and calculations that the evaluation team will use to determine the Direct Costs and Benefits, and the Indirect Costs and Benefits, of Proposals and the resulting Total Net Direct Unit Benefits ($/MWh) and Total Net Unit Benefits ($/MWh). For this purpose, the evaluation team will use a quantitative spreadsheet ("Quantitative Evaluation Workbook"). The Quantitative Evaluation Workbook will calculate:

- Direct Costs and Benefits of each Proposal by year based upon the bid for that Proposal as well as on results of ENELYTIX simulation modeling of that Proposal ("Proposal Case"), as explained further below.[6]
- Indirect Costs and Benefits of each Proposal by year based upon the results of ENELYTIX simulation modeling of that Proposal Case and of a business as usual scenario void of any new offshore wind ("Base Case"), as explained further below.
- The net present value ("NPV") of those costs and benefits as well as the resulting Total Net Unit Benefits ($/MWh).

3 Source - Narragansett Electric Company d/b/a National Grid, Cost of Capital, For the Test Year Ended June 30, 2017 and the Rate Year Ending August 31, 2021. RIPUC Docket Nos. 4770/4780, August 16, 2018.

4 Assumptions for projected inflation are from Wood Mackenzie's projected inflation per as published in it North America Gas Investment horizon outlook. These projections for inflation were consistent and comparable with other sources including projections from the Congressional Budget Office, World Economic Outlook and the Bureau of Economic Analysis. Inflation rates vary prior to the study period and are considered in the discounting of benefits and costs to $2023 real dollars.

5 Under a circumstance in which the Evaluation Team believes the bid with the highest levelized Total Net Unit Benefit is an outlier, i.e., the Total Net Unit Benefit per MWh of the bid is unreasonably different compared to that of the other bids, the Evaluation Team with unanimous agreement of all members may award that bid an appropriate number of points, which will be the highest ranked bid, and award 75 points to the second highest bid. Scores of all other bids will then be relative to the second highest bid.

6 ENELYTIX is an energy market modeling and analytics environment licensed by TCR to simulate the operation of the New England and New York electricity markets.

A. ENELYTIX Modeling Approach

ENELYTIX is used to model a Base Case and various Proposal Cases. The Base Case represents a future scenario in which none of the Proposals received in response to the 2022 RI OSW RFP are selected or assumed to have been developed. Each Proposal Case represents a future scenario in which that Proposal is assumed selected through the 2022 RI OSW RFP and developed.

Modeling the Base Case

TCR runs ENELYTIX capacity expansion ("CAPEX") model to develop projections in long term capacity additions and retirements followed by Energy and Ancillary Services ("E&AS") models to simulate the hourly nodal operation of the New England and New York electricity market over the period 2027 through 2052. The outputs, or results, from ENELYTIX are projections of key physical outputs and market prices for the Base Case that will be used to evaluate each of the Proposals. These results include projections of annual quantities of energy, Renewable Energy Certificates ("RECs"), carbon dioxide ("CO2") emissions and nitrogen oxide ("NOx") emissions, as well as projections of market prices for energy and RECs.

TCR and the evaluation team jointly develop input assumptions that are used to develop Base Case models. These assumptions capture the forward-looking state of the New England and New York electricity markets as of December 15th, 2022.[7] The Base Case model is finalized prior to the opening of Bids.

Modeling Proposal Cases

TCR will run individual ENELYTIX CAPEX[8] and E&AS models for each Proposal which will result in comparable projections of key physical outputs and market prices for each Proposal Case over the study period beginning from the Proposal COD. These projections combined with Base Case projections will be used in the calculation of quantitative metrics described in this document.

All Proposal Case assumptions will be identical to the Base Case except for the inclusion of the Proposal as-bid unit(s) and bidder proposed onshore transmission upgrades.

B. Calculation of Direct Cost & Benefit Metrics

Based on Proposal bid data and the ENELYTIX modeling results of base case and proposal cases, the evaluation team will express all of the following costs and benefits in 2023 constant dollars, and any cost or benefit inputs expressed in nominal dollars will be deflated to 2023 reference year dollars, based on the rate of inflation:

1. A mark-to-market comparison of a Proposal's bid price for energy to the projected market price for energy at the delivery point with the proposal in service:
    a. Calculate the annual market value ($) of energy delivered by the Proposal at the delivery node(s) over the Proposal contract period accounting for contract delivery conditions. Annual market value ($) equals the sum over the year of the quantity of energy delivered at nodes in each hour

7 Updates or changes to external sources of input, such as newer versions of ISO-NE publications, releases of commodity price forecasts, changes to RPS regulations etc. beyond this date are not included.

8 To reduce the impact of degeneracy in CAPEX solutions for Proposal Cases, TCR will develop generic capacity expansions representing reasonable variations to the Base Case capacity buildout in response to the addition of discrete quantities of additional offshore wind. This approach is described in detail in Attachment A.

of year times hourly Locational Marginal Prices (LMPs) at the node.

b. Calculate the annual cost ($) of energy from the Proposal over the Proposal contract period accounting for contract delivery conditions (peak, off-peak, etc.) and bid prices.

c. Calculate the annual net benefit of the energy from the Proposal as the market, LMP-based value of energy from the Proposal at the point of delivery minus the annual cost ($) of energy from the Proposal (Step B.1.a results minus Step B.1.b results).

2. A mark-to-market comparison of the proposal's bid price for RECs eligible for RIE Renewable Energy Standard ("RES") compliance to the projected market prices for RECs at the delivery point:

   a. Identify the annual quantity of RECs that are projected to be required to meet the RES requirements of the distribution service retail load served by RIE.

   b. Identify the RECs that RIE is holding under long-term contracts and Renewable Energy Growth Program tariff, in each year. (These will be based on RIE existing contracts, Renewable Energy Growth Program, DG Standard Contracts, anticipated RIE contracts for RECs from proposals selected through the New England Clean Energy RFPs and anticipated RECs from Rhode Island's procurement of Revolution Wind).

   c. Calculate the net requirement for RECs that could be filled by RECs from the Proposal. The Step B.2.c quantity or "gap" = greater of (Step B.2.a minus Step B.2.b) and zero.

   d. Identify the number of annual RECs that RIE would acquire from the Proposal and the total Direct annual cost of those RECs. Direct annual cost equals annual quantity of Proposal RECs times Proposal annual unit cost per REC as bid.

   e. Identify the number of RECs to be supplied by the Proposal to fill all, or a portion, of the gap in required RECs as the smaller of Step B.2.d and Step B.2.c.

   f. Calculate the direct annual dollar benefit of Proposal RECs used to fill all, or a portion of the gap from Step B.2.c. This is the cost of avoiding the purchase of the quantity from Step B.2.e at the Base Case Market price for REC (Quantity of Proposal RECs used to fill gap times Base Case REC market price).

   g. Calculate the direct annual dollar benefit of Proposal RECs sold. This is the total quantity of Proposal RECs minus the Step B.2.e quantity RIE use to fill the gap, times the Proposal Case Market price of REC (Proposal RECs surplus to gap times Proposal case REC market Price).

   h. Calculate the annual total direct benefit by subtracting the result from Step B.2.d from the sum of Steps B.2.f and B.2.g.

3. Calculation of Total Net Direct Benefits

   a. Compute the annual Total Net Direct Benefits as the sum of the present values of direct benefits calculated in Step B.1.c and Step B.2.h.

C. Calculation of Indirect Costs & Benefit Metrics

The evaluation team will express all of the following costs and benefits in 2023 constant dollars, and any cost or benefit inputs expressed in nominal dollars will be deflated to 2023 reference year dollars based on the rate of inflation:

1. Impact of changes to the Locational Marginal Price ("LMP"). This metric will calculate price change impacts on the energy of customers in the RIE service territory.
   a. For the Proposal case, calculate the annual market value ($) of energy supplied to Rhode Island retail customers in each year starting from the contract proposal start date through the end of the study period, 2052. The annual market value of energy equals the sum over the year of the quantity of energy supplied in Rhode Island load zone in each hour of year times hourly LMPs.
   b. For the Base case, calculate the annual market value ($) of energy supplied to ratepayers in each year starting from the Proposal contract start date through the end of the study period, 2052. Annual market value of energy equals the sum over the year of the quantity of energy supplied in Rhode Island load zone in each hour of year times hourly LMPs in each load zone.
   c. Calculate the gross energy market price change impact of the Proposal on the total cost of energy to RIE distribution service customers as the Base Case cost of energy to RIE distribution customers from Step C.1.b minus the Proposal case cost of energy to RIE distribution customers from Step C.1.a.
   d. Calculate the change in the aggregate market value of energy from all RIE contracts in the Base Case, i.e., without the Project in service. The change in market value of each RIE contract equals the quantity of energy from that contract at the delivery node in each hour of year multiplied by the difference between the hourly LMP at that node in the Base case and in the Proposal Case for the respective terms of the RIE contracts.
   e. Calculate the annual net energy market price change impact of the Proposal starting from the Proposal contract start date through the end of the study period, 2052 on the total cost of energy to RIE distribution service customers by subtracting the change in the aggregate market value of energy from all RIE contracts in the Base Case from Step C.1.d from the gross energy price change impact from Step C.1.c.
2. Impact of changes to RIE RES compliance cost.
   a. Calculate the annual quantity of RECs that will need to be acquired at market prices beyond the quantity supplied by the Proposal. This equals the annual RECs RES requirements of the distribution service retail load served by RIE minus the quantity of RECs that RIE held under long-term contract minus the quantity of Proposal RECs used to meet the annual requirement.
   b. Calculate the value of the price change in $/MWh as the difference between the Proposal market price for RECs and the Base Case market price for RECs.
   c. Calculate the absolute annual indirect benefit of that price change by multiplying the quantity from Step C.2.a by the price difference from Step C.2.b.

3. Calculation of Total Net Indirect Benefits

   a. Compute the Total Net Indirect Benefits as the sum of the impact on LMP calculated in Step C.1.e and the impact on RES compliance calculated in Step C.2.c.

D. Calculation of Total Net Unit Benefit

1. The evaluation team will calculate the levelized Total Net Unit Benefit as follows:

   a. Compute the present value of the Total Net Direct Benefits calculated in Step B.3.a and the present value of the Total Net Indirect Benefits calculated in Step C.3.a.

   b. Compute the present value of the Total Net Unit Benefit as the sum of the present value of Total Net Direct Benefits and Total Net Indirect benefits calculated in in Step D.1.a.

   c. Compute the present value of the annual MWh of energy delivered for the proposal. The annual energy quantities should be discounted to a 2023 reference year using the real discount rate.

   d. Divide the result of Step D.1.b by the result of Step D.1.c to compute the levelized Total Net Unit Benefit for the proposal. This result will be expressed in 2023 constant dollars per MWh.

E. Calculation of Additional Supporting Metrics[9]

For the winning Proposal, the evaluation team will express all of the following costs and benefits in 2023 constant dollars, and any cost or benefit inputs expressed in nominal dollars will be deflated to 2023 reference year dollars, based on the rate of inflation:

1. The value of proposal contribution toward reducing regional GHG emissions.

   a. Calculate the quantity of total emissions attributable to Rhode Island and ISO-NE neighboring states for the Proposal Case and for the Base Case.

   b. Calculate the annual reduction in quantity of CO_2 emission by subtracting the quantity of emissions for the Proposal Case from the quantity for the Base Case.

   c. Calculate the annual non-embedded value of CO_2 per ton as the difference between the cost of carbon established in the 2021 Avoided Energy Supply Costs in New England – 2021 Report ("AESC 2021")[10] and the Regional Greenhouse Gas Initiative (RGGI) allowance price projections used in the ENELYTIX model.

   d. Calculate the absolute dollar value of non-embedded greenhouse gas reduction benefits by multiplying the reduction quantity from Step E.1.b by the non-embedded value from Step E.1.c.

2. The value of proposal contribution toward reducing regional NOx emissions.

   a. Calculate the quantity of total emissions attributable to Rhode Island and ISO-NE neighboring states for the Proposal Case and for the Base Case using the same methodology as for GHG

9 These calculations will be based on the Docket 4600 Benefit-Cost Framework. However, these quantitative metrics will only be used when presenting business case.

10 Available at: https://www.synapse-energy.com/sites/default/files/AESC%202021_20-068.pdf

emissions.

b. Calculate the annual reduction in quantity of NOx emission by subtracting the quantity of emissions for the Proposal Case from the quantity for the Base Case.

c. Calculate the absolute dollar value of non-embedded NOx reduction benefits by multiplying the reduction quantity from Step E.2.b by the cost of NOx established in AESC 2021.

3. Impact of a change in Proposal PPA market value in a year with extreme winter gas prices

a. Calculate the 3-month average of the daily spot Algonquin Citygate (AGC) gas prices for historical winter periods (December – February) for each year 2002 through 2021[11].

b. Identify the winter periods with the highest average AGC price and the lowest AGC price.

c. Compute the average of all historic winter AGC prices, 2002 through 2021. Calculate the highest and lowest historical winter average AGC price as a percentage over or under the historic average winter AGC price.

d. Compute the ratio of the total historic gas consumption (MMBtu) for the winter of the highest average AGC price to the total gas consumption December through February for the modeled winter 2030/2031 period assuming Proposal Case resources. Compute this same ratio for the winter of the lowest average AGC price[12].

e. Adjust the percentage over/under the average for the highest and the lowest historic winter average AGC price by the fuel consumption ratios computed in Step E.3.d. Apply the adjusted gas price over/under factors (high and low) to derive high and low winter gas prices for the three winter months in the 2030/2031 power year.

f. Calculate the value of the energy ($) delivered by the Project in the Proposal Case for the three winter months in the 2030/2031 power year assuming Proposal Case resources and Base Case fuel prices. Calculate the value of the energy delivered by the proposal using the adjusted high and adjusted low winter gas prices assuming Proposal Case resources.

g. Calculate the percentage changes in the annual Proposal contract market value in a year with the adjusted high and low winter gas prices. These percentages equal the energy cost to RI consumers in the 2030/2031 winter under the respective high and low winter gas price scenarios assuming Proposal Case resources divided by the annual energy cost to RI consumers in the 2030/2031 power year under the Proposal Case.

h. Calculate the net percentage change due to extreme winter prices as the high winter gas price percentage change minus the absolute value of the low winter gas price percentage change.

i. Divide the percentage change in the Proposal PPA market value in a year with extreme winter gas prices from E.3.h by 20 (the maximum contract period). Apply that percentage to the annual value of the PPA in each year over the Proposal contract period. (This approach reflects the

11 This is the period for which published statistics are available. Gas prices on days with no reported prices are assumed to equal the price for the most recent preceding day for which there were reported prices.

12 This ratio is a scaling factor to reduce the magnitude of the historical extreme variation to reflect the reduction in pipeline constraints in the Proposal Case relative to the historical period due lower gas use.

uncertainty regarding the specific year in which an extreme winter gas price event might occur during the study period.)

Attachment A – Capacity Expansion for Proposal Cases

This section describes a modeling framework that TCR will apply to the ENELYTIX capacity expansion (CAPEX) process for Proposal Cases to account for complexities in the modeling of proposals of varying sizes. Complexities arise in modeling Proposal Cases due to degeneracy in model solutions against relatively small incremental changes to the Base Case. The intent of the framework is provide a solution that ensures bids of comparable sizes are evaluated consistently and an equitable manner at increasing project sizes. This approach is intended to provide clear, initial guidance to evaluate bids; however, based upon the bids received, still lends itself to further sensitivity adjustments as necessary.

Complexities with running individual capacity expansions for each project.

The ENELYTIX capacity expansion model determines the optimal combination of retirements of existing capacity and additions of generic new capacity to meet resource adequacy and environmental constraints at least cost, i.e. the objective function, over the planning horizon. The model is designed to obtain the solution with a set precision. There are multiple feasible solutions to the capacity expansion problem within that precision level. As a result, small differences in input assumptions between scenarios, e.g. proposal cases, can have disproportionally large implications for the capacity expansion model's selection of generic new capacity additions; specifically their timing and composition.

In previous rounds of modeling, TCR recognized that small differences in input assumptions between two similar Proposals, could result in significant differences in the capacity expansion model's selection of generic new capacity additions.

For example, a given proposal case had capacity additions from 2035 onward consisting of one 533 MW combined cycle (CC) unit and five 338 MW combustion turbine (CT) peaking units (1 CC + 5 CT solution). In contrast, an almost identical proposal had capacity additions from 2035 onward consisting of two 533 MW combined cycle (CC) unit and three 338 MW CT units. (2 CC + 3 CT solution).

- The input assumptions for those two Proposal Cases were nearly identical yet the capacity expansion model selected two different yet equally near-optimal capacity expansion solutions for each of them.
- The two different, yet equally near-optimal, capacity expansion solutions produce very different energy price results (LMPs), when dispatched in the Energy & Ancillary Services model (E&AS). All else being equal, a 2 CCs + 3 CTs solution will result in lower LMPs than a 1 CC + 5 CTs solution. As a result, the model will yield indirect price impact benefiting OSW project B for reasons that are an artifact of the model's algorithm not necessarily reflective of the real differences sought to be estimated.

TCR expects to continue to see small differences in input assumptions causing significant differences in the capacity expansion model's selection of generic new capacity additions for the Proposal Cases which will likely lead to outcomes that may have significant differences in energy price projections not necessarily reflective of the real differences sought to be estimated.

TCR Implemented Framework Solution

The capacity expansion model achieves two key objectives: 1) determining retirements and additions of generic new capacity and 2) developing projections of REC and emission compliance prices.

TCR proposes to use separate runs of the capacity expansion models to meet each of those objectives.

1. Generic CAPEX Models for determining retirements and additions: TCR will develop a series of generic capacity expansion models reflective of increasing increments of offshore wind addition to the Base Case. The objective of these runs is to identify nameplate MW breakpoints at which we can expect incremental changes in the buildout/retirement decisions made under the Base Case.
   - The first breakpoint will represent the addition of offshore wind in a quantity that results in a change to thermal additions / retirements in the Base Case – such as displacing a CC unit that could be added to the Base Case in 2027. For purposes of illustration, let us assume that breakpoint capacity equals 300 MW. Proposals smaller than this illustrative 300 MW breakpoint will be run using capacity additions and retirements from the Base Case. Proposals larger than 300 MW but smaller than the next breakpoint will be run using the additions and retirements from this 300 MW 'generic capacity expansion' case.
   - Starting with the 300 MW 'generic capacity expansion' case, the quantity of offshore wind is further increased until the next change in thermal capacity buildout is noted. For purpose of illustration, let us assume this capacity equals 700 MW. Proposals larger than 700 MW will be run using additions and retirements from this 700 MW 'generic capacity expansion' case.
   - This process is repeated until we have generic capacity expansion models for the entire range of bids up to 1 GW.

   Due to uncertainty and variability in the timing and interconnection of bids, TCR will adopt generic and conservative estimates for capacity factor. These additions are assumed to connect across SEMA/RI and will be tested against the impact of varying the COD between 2027 and 2032. The generic capacity expansion models will be calibrated against the Base Case model to ensure the capacity decisions are incremental.

2. Proposal Specific Models Developing projections for REC and emission compliance prices: a CAPEX model will be run for each proposal case being evaluated but using frozen capacity addition and retirement decisions from their respective generic capacity expansions developed in step 1. This run will produce REC prices and emission compliance prices that are reflective of the quantity of offshore wind that is added by the proposal unit.

This approach ensures that CAPEX and EAS market models for various offshore wind proposals accurately capture their respective impacts on REC and energy markets – in terms of both direction and magnitude. Similar sized proposals will be evaluated consistently across identical capacity expansions, while proposals of increasing sizes will reflect the impact on the system which is a logical progression from the Base Case model.

B.2: Proposal Evaluation Processes

2022 Rhode Island Long-Term Contracts for Offshore Wind Solicitation

Proposal Evaluation Process

Introduction

This document serves as a companion document to the Quantitative Protocol document and provides details regarding any adjustments or additional steps that were taken in the Proposal Evaluation Processes.

1. Stage Three Sensitivity Case

The Evaluation Team received bids from a single bidder which included six pricing variations to a single buildout of offshore wind. Each of these pricing variations were treated as separate Proposal Cases – each with their own supporting Proposal Case ENELYTIX Market Model and Quantitative Evaluation Workbook as described in the Quantitative Evaluation Protocol. All six Proposal Cases are included in the final Stage Two rankings.

During Stage Three, no Portfolio cases were developed due to lack of bid options, however the Evaluation Team decided to run a Sensitivity Case for one of the 'as-bid' Proposal Cases. The bidder had identified a few overloads with its project in-service, but did not address those overloads with transmission upgrades. The Evaluation Team decided to model a few additional transmission upgrades to mitigate the identified overloads, since these transmission system upgrades would probably be made if the proposed project proceeded through the ISO-NE interconnection process and further into development.

TCR modeled the Sensitivity Case to include specific incremental transmission upgrades that were provided by the Evaluation Team incremental to the Proposal Case assumptions. Similar to all Stage Two Proposals, the Sensitivity Case includes its backing Proposal Case ENELYTIX model and Quantitative Evaluation Workbook. The results of the Sensitivity Case are added to the Stage Two Proposal Cases and collectively form final Stage Three results.

2. Gross & Net Quantitative Metrics / Workbooks

During Stage Two analysis TCR and the Evaluation team noted a significant number of hours where nodal LMPs at the point of delivery were negative resulting in 'negative' revenues (i.e. net costs) resulting from the sale of energy in those hours. This resulted in project energy revenues being below average market prices. This was attributed to transmission congestion arising from security constrained dispatch of resources proximate to the point of interconnection.

RFP Section 2.2.4.2.2 outlines a price adjustment mechanism that reduces exposure of the buyer (RIE) to negative LMPs during which re-selling energy procured through a PPA would have otherwise resulted in negative revenues. The mechanism described in the RFP states that the seller (bidder) is required to reimburse/credit the buyer by the per MWh value of the negative LMP, thereby subsidizing/offsetting the PPA payments made by the buyer to the seller in those specific hours.

The table below illustrates this transaction in five scenarios of decreasing nodal LMPs from the perspective of the Buyer.

Nodal LMP [$/MWh]	PPA Price [$/MWh]	Buyer Net Benefit (Cost) [$/MWh]	Seller Credit to Buyer [$/MWh]	Buyer Adjusted Net Benefit (Cost) [$/MWh]
(a)	(b)	(c) = (a) – (b)	(d)	(e) = (c) + (d)
$70	$50	$20	$ -	$20
$50	$50	-	$ -	-
$ -	$50	$(50)	$ -	$(50)
$(30)	$50	$(80)	$30	$(50)
$(80)	$50	$(130)	$80	$(50)

In other words, this mechanism passes on any market-side costs caused by negative LMPs back to the seller ensuring the net cost to the buyer is never greater than the PPA price.

Upon request of the Evaluation Team, TCR developed alternative versions of Proposal Quantitative Evaluation Workbooks which included adjusted metric calculations that accounted for such revenue offsets in hours with negative pricing at the point of delivery. TCR implemented this adjustment by first calculating the annual credits that would be reimbursed by the seller based on analysis of the proposal revenues in hours with negative LMPs, and then applying this credit to offset the revenues from sale of energy.[1]

This resulted in TCR producing two versions of each Quantitative Evaluation Workbook– one version labeled as “Gross” which does not include the revenue offsets, and the other labeled as “Net” which includes the revenue offsets. Results from both versions of the workbooks are presented in separate ranking sheets where they are compared against their respective Gross or Net counterparts.

[1] The credit payment from the seller to the buyer can either be viewed as a subsidy/offset on the PPA price (while still earning negative revenues) or as a nullification of the negative revenues (assuming no change to the PPA price). Both are equivalent from a cost accounting perspective and would result in the same net value if the credits were reduced from the PPA price.

APPENDIX C:
Base Case Results

RI OSW BASE CASE MODEL RESULTS (CAPEX V5.1 & EAS V2)

RI Offshore Wind Evaluation

March 13th, 2023

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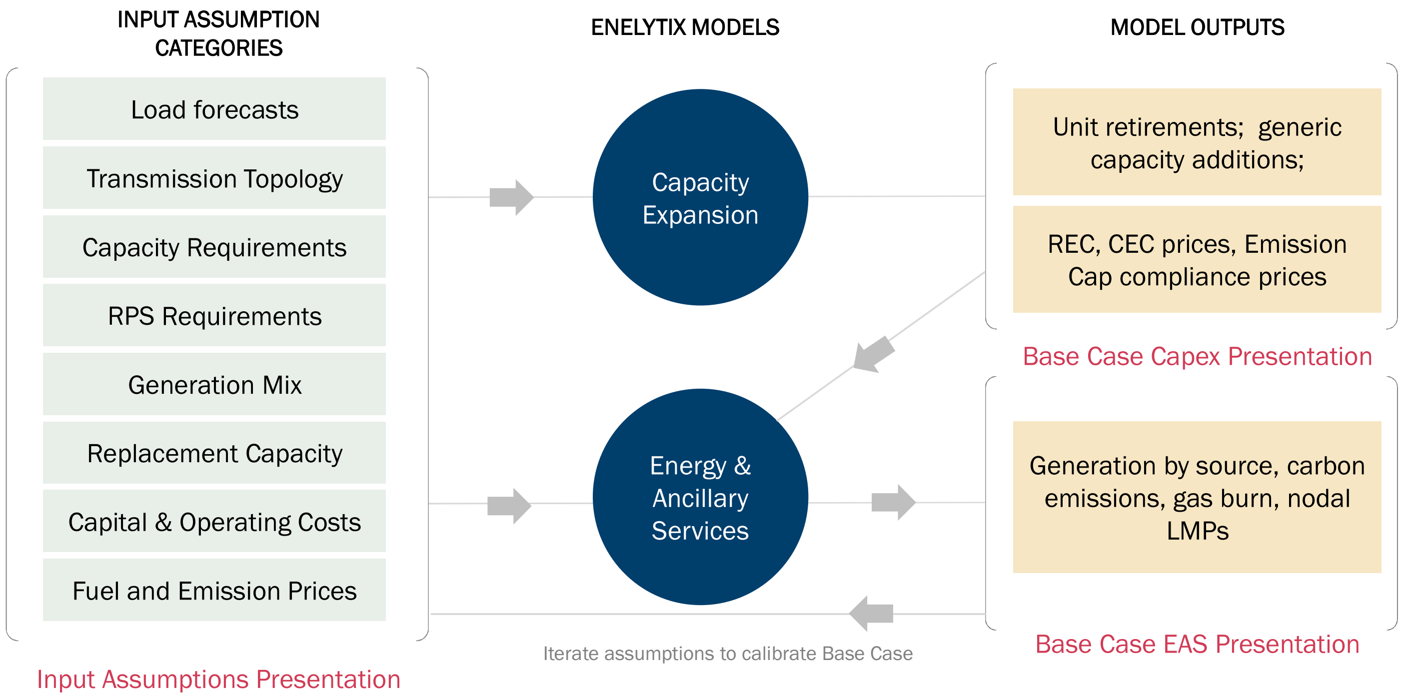
Table of Contents

Introduction

- The RI Offshore wind RFP (RI OSW RFP) Base Case is not a plan for the RI electric sector and should not be viewed as such. It is a "counterfactual" projection of carbon emissions and energy costs associated with RI electricity consumption under a scenario in which RIE <u>does not enter into long-term contracts for energy from offshore wind under this solicitation</u>.
- It provides a common reference point or benchmark against which to measure the incremental costs and benefits of each Proposal received in response to the RFP
- The scenario assumes all legislative requirements and regulations in effect as of December 15, 2022 including Class I Renewable Portfolio Standard (RPS) regulations in all New England states.
  - *Evaluation horizon for projects : 2027 – 2052* [1]
  - *All costs in real 2023$ with an assumed rates of inflation that levelize at 2% 2027 and onward*

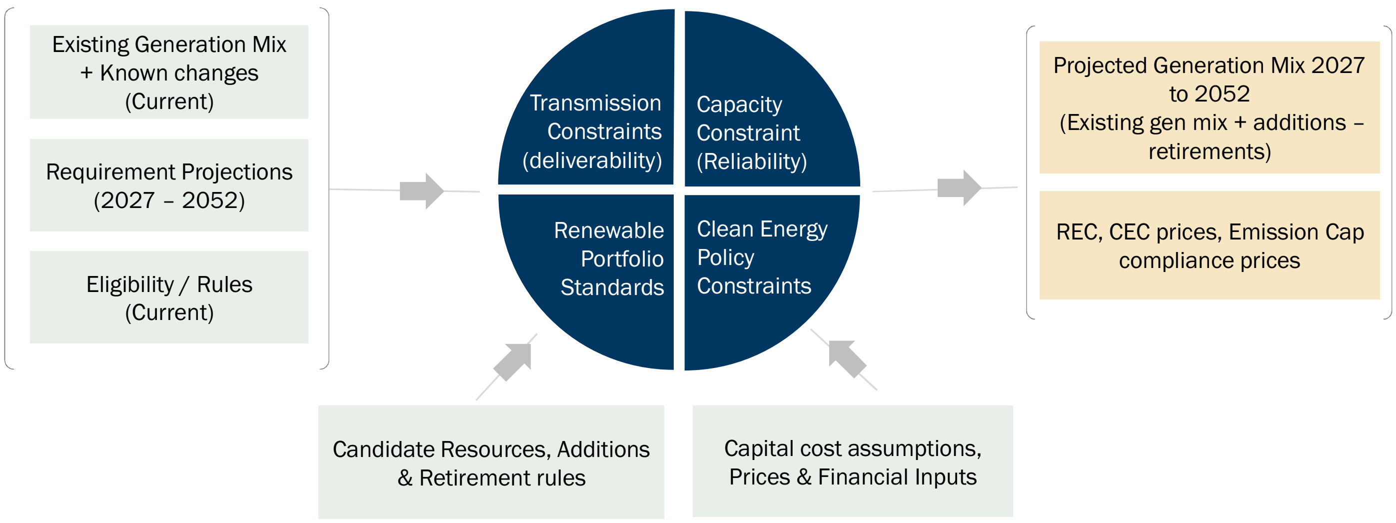
[1] the Base Case will be run for 25 years however the evaluation periods may be adjusted to exclude years prior to any bids coming online

Overview of Base Case Modeling Process



The Capacity Expansion Model

- The Capacity Expansion model determines the optimal capacity expansion plan over the study period and resulting changes to the capacity and generation mix over that period.
- Its objective function is to minimize the net present value of the total cost, i.e., capital, fuel and operating, of the generation fleet serving the forecast load in the wholesale market within the ISO-NE electrical footprint, subject to various constraints.



Capacity Supply and Demand

This section describes model compliance with zonal capacity constraints representing resource adequacy requirements in the model. Requirements are calculated as an adjusted reserve margin over peak demand.

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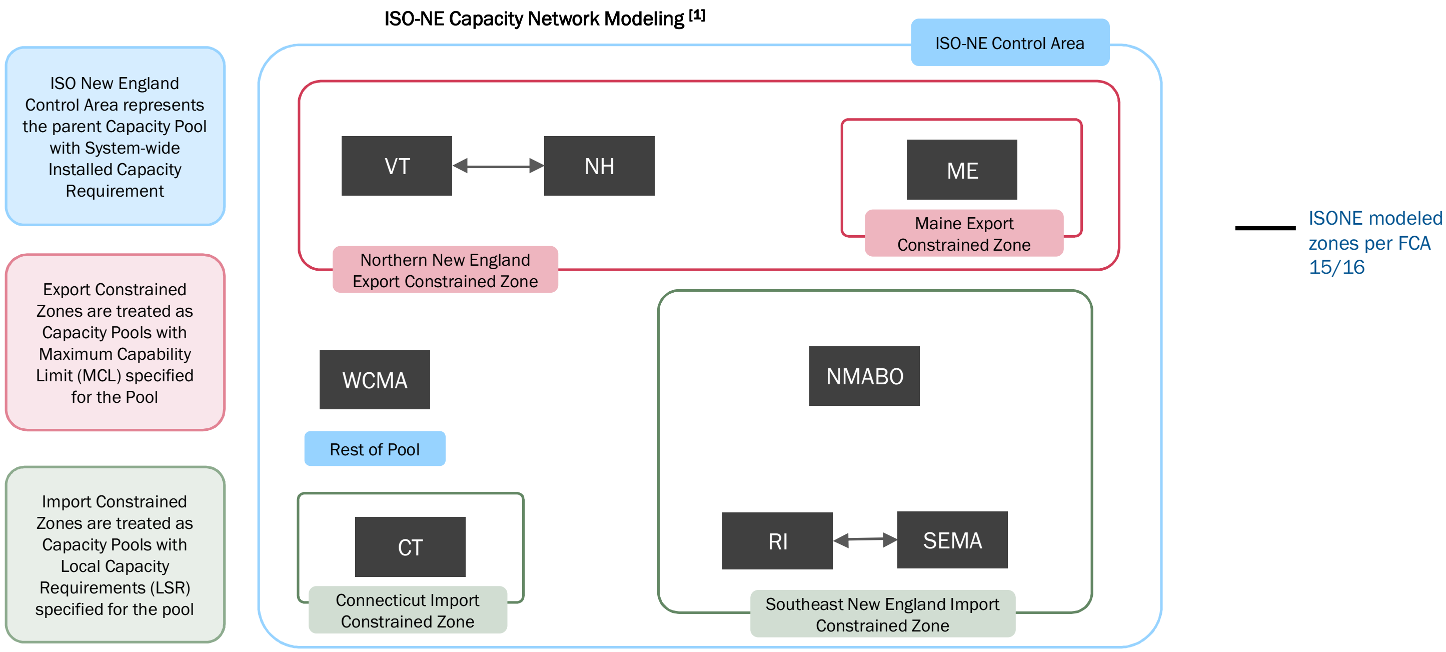
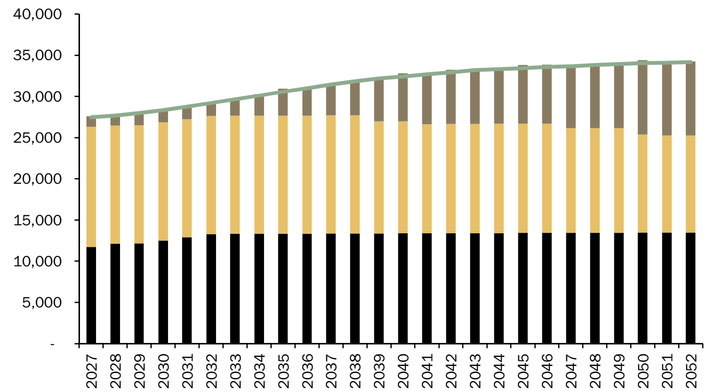
Capacity Zones for ISO-NE



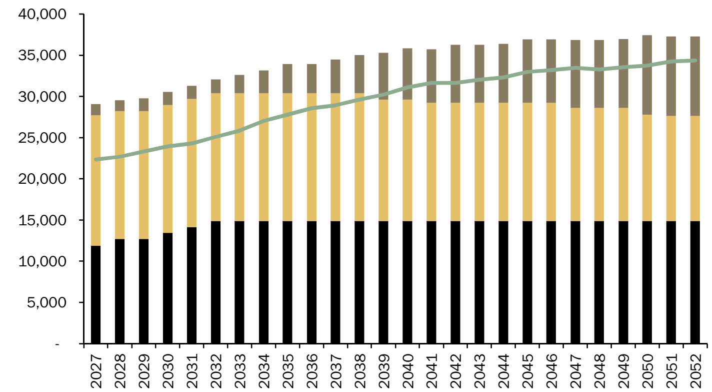
[1] https://www.iso-ne.com/static-assets/documents/2021/03/a9_fca_16_transmission_transfer_capability_and_capacity_zonal_development.pdf

ISO-NE System Wide Generating Capacity Balance

ISO-NE System Wide Summer Capacity Pool



ISO-NE System Wide Winter Capacity Pool

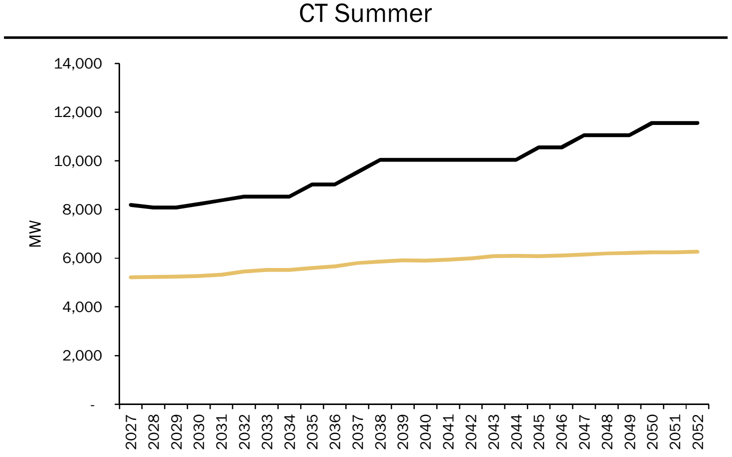


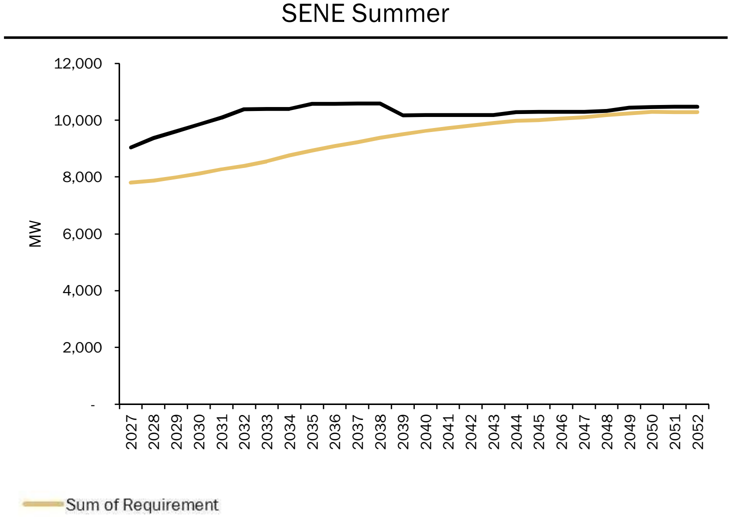
Sum of CapNew Sum of CapOld Sum of CapStatic Sum of Requirement

- ISO-NE load forecast was developed using extrapolations from the 2022 CELT forecast with separate projections for electrification forecasts. ISO-NE winter peaks grow faster than summer peaks, however the overall system remains a summer peaking system over the study period.
- ISO-NE summer pool binds throughout the study period and drives capacity additions. Winter pool has surplus capacity in all years.

CapStatic – capacity which cannot be retired by the model (nuclear, renewables) / **CapOld** – capacity that the model may retire / **CapNew**- capacity added by the model

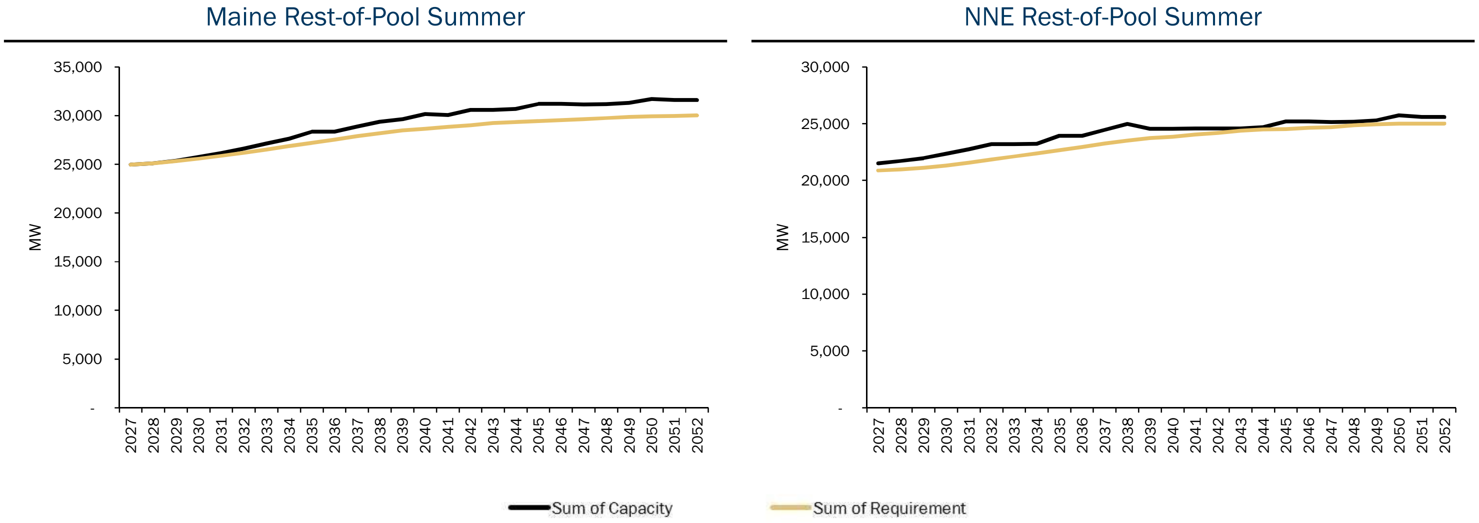
ISO-NE Capacity Balance by Zone- Import Constrained





- South East New England (SENE) import constrained zone starts binding in the late 2040's and drives additions in the SEMA / RI / NMABO zones.

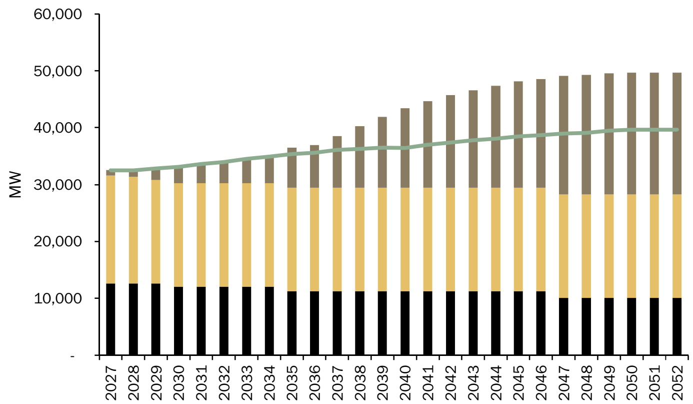
ISO-NE Capacity Balance by Zone- Export Constrained



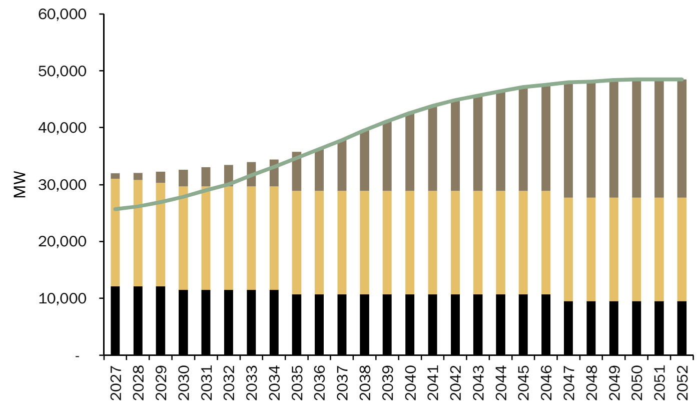
- Export-constrained zones bind initially and low margins are seen throughout the study period. Constraint drives retirements in energy areas of VT,ME and NH and drives additions in the remaining ISO-NE zones.

NYISO Capacity Balance

NYISO System Wide Summer Capacity Pool



NYISO System Wide Winter Capacity Pool



- NYISO transitions to a winter peaking system beginning in the mid 2030s with significant load growth driven by heating electrification.

CapStatic – capacity which cannot be retired by the model (nuclear, renewables) / **CapOld** – capacity that the model may retire / **CapNew**- capacity added by the model

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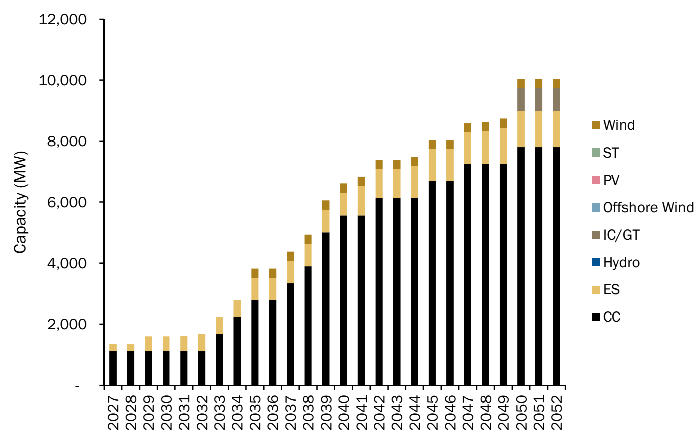
Model Selected Additions and Retirements

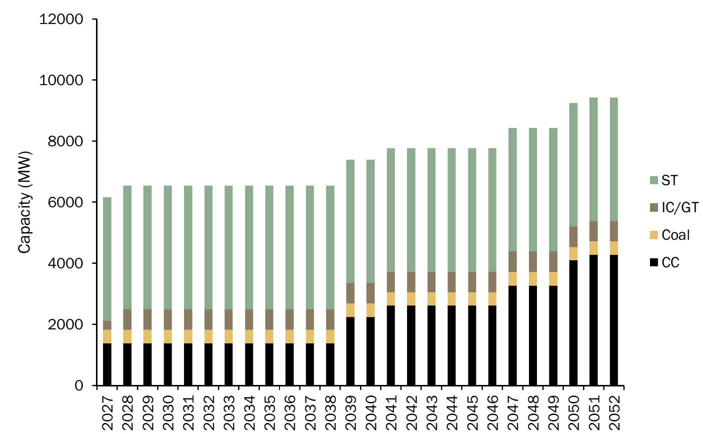
This section describes the model selected generic capacity additions and retirements in response to multiple model constraints over the study period, taking into considerations cost and performance parameters of individual units as well as the overall state of the system.

ISO-NE Model Selected Capacity Changes by Type

ISO-NE New Additions by Type (Cumulative)



ISO-NE Retirement by Type (Cumulative)



- Model adds CC units over the study period to meet growing energy and capacity requirements. Model adds small quantities of onshore wind in specific regions when costs are reduced due to PTC/ITC reductions. Energy storage is added to the system to balance renewables and to provide capacity.
- Model retires large quantities of coal and steam turbine units which are replaced by more efficient CCs. CCs are retired in the model in regions that have surplus capacity.

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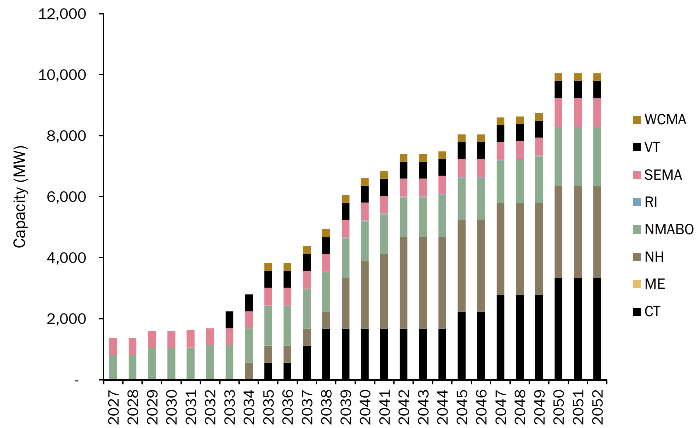
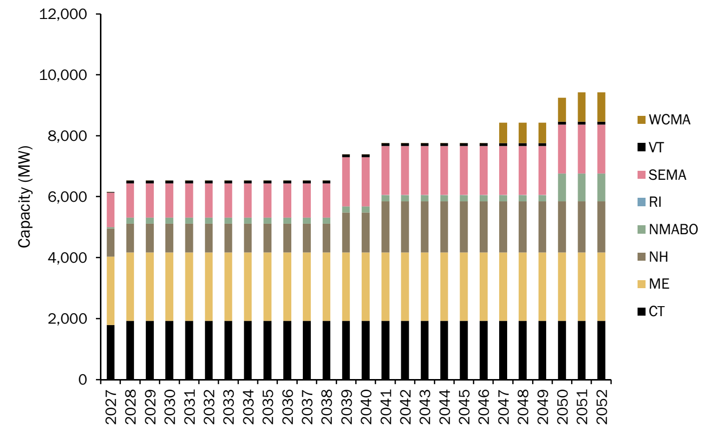
ISO-NE Model Selected Capacity Changes by Area

ISO-NE New Additions by Area (Cumulative)



ISO-NE Retirements by Area (Cumulative)



- Capacity pools drive the energy areas where new capacity is added. ME, NMABO and RI have limited to no potential for thermal additions.

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Summary of ISO-NE Model Selected Additions and Retirements

		BaseCase - Model Selected Additions				
Year	Energy Area	CC	ES	IC/GT	Wind	Total
2037	CT	1,114	-	-	-	1,114
	ME	-	-	-	-	-
	NH	557	-	-	-	557
	NMABO	557	736	-	-	1,293
	RI	-	-	-	26	26
	SEMA	557	-	-	31	588
	VT	557	-	-	-	557
	WCMA	-	-	-	247	247
	Total	3,342	736	-	304	4,382

		BaseCase - Model Selected Retirements				
Year	Energy Area	CC	Coal	IC/GT	ST	Total
2037	CT	-	-	233	1,693	1,927
	ME	1,386	-	40	813	2,239
	NH	-	439	105	400	944
	NMABO	-	-	202	-	202
	RI	-	-	-	2	2
	SEMA	-	-	1	1,124	1,125
	VT	-	-	97	-	97
	WCMA	-	-	3	4	7
	Total	1,386	439	681	4,037	6,541

		BaseCase - Model Selected Additions				
Year	Energy Area	CC	ES	IC/GT	Wind	Total
2047	CT	2,785	-	-	-	2,785
	ME	-	-	-	-	-
	NH	2,785	227	-	-	3,012
	NMABO	557	831	-	-	1,388
	RI	-	-	-	26	26
	SEMA	557	-	-	31	588
	VT	557	-	-	-	557
	WCMA	-	-	-	247	247
	Total	7,241	1,058	-	304	8,603

		BaseCase - Model Selected Retirements				
Year	Energy Area	CC	Coal	IC/GT	ST	Total
2047	CT	-	-	233	1,693	1,927
	ME	1,386	-	40	813	2,239
	NH	741	439	105	400	1,685
	NMABO	-	-	202	-	202
	RI	-	-	-	2	2
	SEMA	486	-	1	1,124	1,611
	VT	-	-	97	-	97
	WCMA	657	-	3	4	664
	Total	3,270	439	681	4,037	8,426

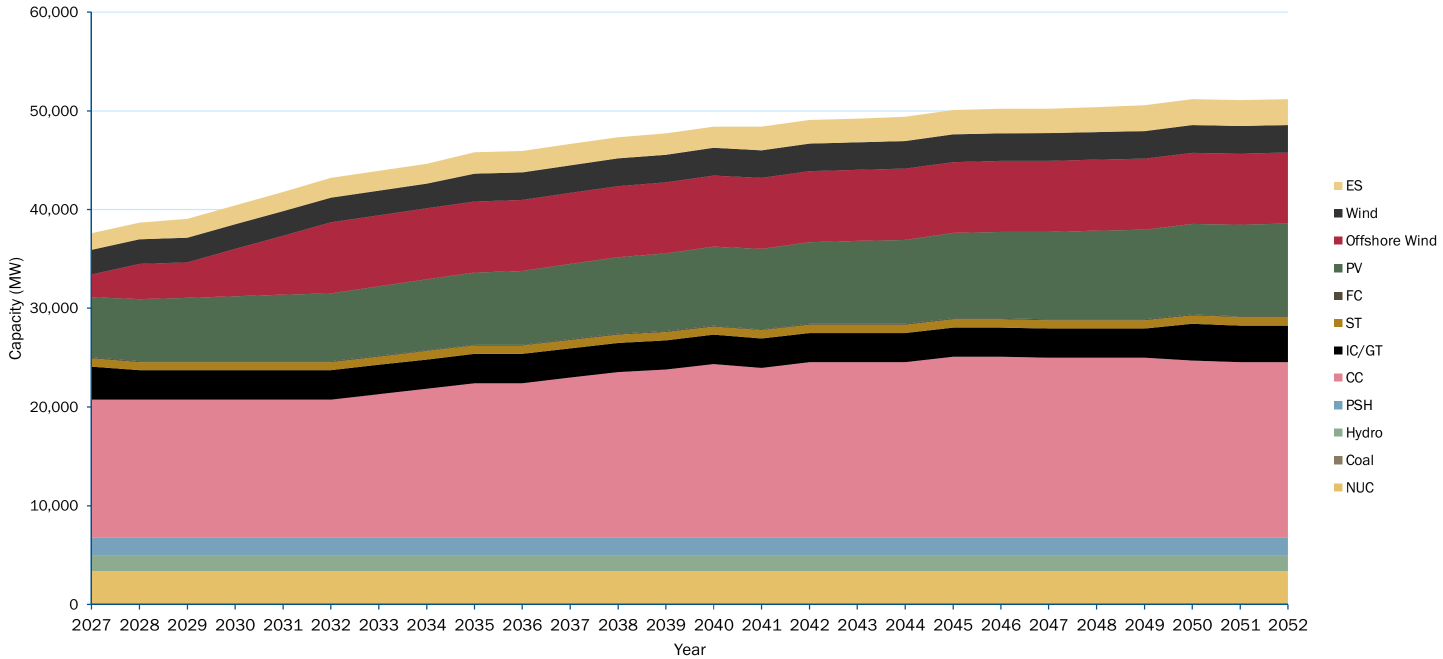
		BaseCase - Model Selected Additions				
Year	Energy Area	CC	ES	IC/GT	Wind	Total
2052	CT	3,342	-	-	-	3,342
	ME	-	-	-	-	-
	NH	2,785	227	-	-	3,012
	NMABO	557	969	376	-	1,902
	RI	-	-	-	26	26
	SEMA	557	-	376	31	964
	VT	557	-	-	-	557
	WCMA	-	-	-	247	247
	Total	7,798	1,196	752	304	10,050

		BaseCase - Model Selected Retirements				
Year	Energy Area	CC	Coal	IC/GT	ST	Total
2052	CT	-	-	233	1,693	1,927
	ME	1,386	-	40	813	2,239
	NH	741	439	105	400	1,685
	NMABO	705	-	202	-	907
	RI	-	-	-	2	2
	SEMA	486	-	1	1,124	1,611
	VT	-	-	97	-	97
	WCMA	959	-	3	4	966
	Total	4,277	439	681	4,037	9,432

Model Selected Retirements, ISO-NE

Generator name	Energy Area	Type	Fuel Type	Summer Capacity	Winter Capacity	Retire Date
CANAL 1|365	SEMA	ST	Fuel Oil	565	565	2027
CANAL 2|366	SEMA	ST	Fuel Oil	559	559	2027
MAINE INDEPENDENCE STATION 1|40338	ME	CC	NG	247	272	2027
MAINE INDEPENDENCE STATION 2|40339	ME	CC	NG	247	272	2027
MERRIMACK 1|489	NH	Coal	Coal	108	108	2027
MERRIMACK 2|490	NH	Coal	Coal	330	331	2027
MIDDLETOWN 2|480	CT	ST	Fuel Oil	117	120	2027
MIDDLETOWN 3|481	CT	ST	Fuel Oil	233	237	2027
MIDDLETOWN 4|482	CT	ST	Fuel Oil	400	402	2027
MONTVILLE 5|493	CT	ST	Fuel Oil	81	82	2027
MONTVILLE 6|494	CT	ST	Fuel Oil	400	384	2027
NEW HAVEN HARBOR|513	CT	ST	Fuel Oil	446	453	2027
NEWINGTON 1|508	NH	ST	Fuel Oil	400	400	2027
RUMFORD POWER|1255	ME	CC	NG	244	269	2027
SAPPI SOMERSET/HINCKLEY 2|66234	ME	ST	Fuel Oil	111	111	2027
WESTBROOK ENERGY CENTER G1|14177	ME	CC	NG	266	286	2027
WESTBROOK ENERGY CENTER G2|14178	ME	CC	NG	266	286	2027
YARMOUTH 3|641	ME	ST	Fuel Oil	111	113	2027
YARMOUTH 4|642	ME	ST	Fuel Oil	584	590	2027
BURLINGTON GT|363	VT	IC/GT	Fuel Oil	17	22	2028
COS COB 10|370	CT	IC/GT	Fuel Oil	19	23	2028
COS COB 11|371	CT	IC/GT	Fuel Oil	19	23	2028
COS COB 12|372	CT	IC/GT	Fuel Oil	19	23	2028
KENDALL JET 1|452	NMABO	IC/GT	Fuel Oil	18	23	2028
MMWEC Simple Cycle Gas Turbine|38692	NMABO	IC/GT	NG	135	135	2028
SCHILLER CT 1|559	NH	IC/GT	Fuel Oil	18	21	2028
SWANTON GT-1|12510	VT	IC/GT	Fuel Oil	19	24	2028
SWANTON GT-2|12511	VT	IC/GT	Fuel Oil	19	24	2028
ANP-BELLINGHAM 2|1415	SEMA	CC	NG	263	299	2039
DIGHTON POWER LLC|1005	SEMA	CC	NG	163	188	2039
GRANITE RIDGE ENERGY 1B|48121	NH	CC	NG	331	370	2039
GRANITE RIDGE ENERGY 1A|48120	NH	CC	NG	331	370	2041
MASS POWER|497	WCMA	CC	NG	248	280	2047
MILLENNIUM|1210	WCMA	CC	NG	330	378	2047
SALEM 5|48695	NMABO	CC	NG	337	353	2050
SALEM 6|48696	NMABO	CC	NG	339	352	2050
STONY BROOK GT1C|1187	WCMA	CC	Fuel Oil	104	119	2050
ALTRESCO|326	WCMA	CC	NG	154	183	2051
Other (Small unit aggregate)	-	-	-	231	296	2027
Other (Small unit aggregate)	-	-	-	54	63	2028

ISO-NE Capacity Mix* (Nameplate MW) by Type



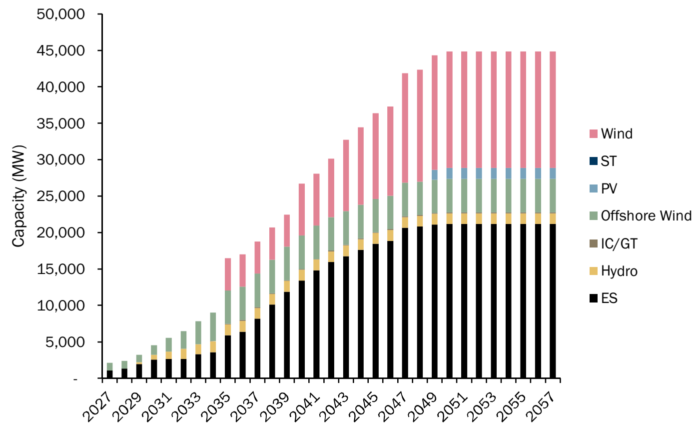
** Include both scheduled and model selected additions/retirements.*

ISO-NE Capacity Mix (Nameplate MW) by Type – Cont'd

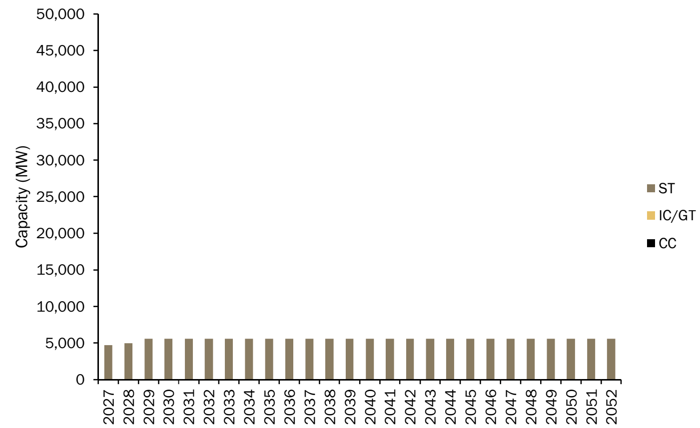
Year	NUC	Coal	Hydro	PSH	CC	IC/GT	ST	FC	PV	Offshore Wind	Wind	ES
2027	3,357	0	1,564	1,823	13,996	3,348	841	83	6,102	2,308	2,496	1,683
2028	3,357	0	1,564	1,823	13,996	2,967	841	83	6,277	3,592	2,496	1,683
2029	3,357	0	1,564	1,823	13,996	2,967	841	83	6,432	3,592	2,496	1,919
2030	3,357	0	1,564	1,823	13,996	2,967	841	83	6,585	4,792	2,496	1,919
2031	3,357	0	1,564	1,823	13,996	2,967	841	83	6,733	5,992	2,496	1,939
2032	3,357	0	1,564	1,823	13,996	2,967	841	83	6,887	7,192	2,496	2,004
2033	3,357	0	1,564	1,823	14,553	2,967	841	83	7,039	7,192	2,496	2,004
2034	3,357	0	1,564	1,823	15,110	2,967	841	83	7,188	7,192	2,496	2,004
2035	3,357	0	1,564	1,823	15,667	2,967	841	83	7,334	7,192	2,800	2,168
2036	3,357	0	1,564	1,823	15,667	2,967	841	83	7,477	7,192	2,800	2,168
2037	3,357	0	1,564	1,823	16,224	2,967	841	83	7,617	7,192	2,800	2,168
2038	3,357	0	1,564	1,823	16,781	2,967	841	83	7,755	7,192	2,800	2,168
2039	3,357	0	1,564	1,823	17,038	2,967	841	83	7,889	7,192	2,800	2,168
2040	3,357	0	1,564	1,823	17,595	2,967	841	83	8,020	7,192	2,800	2,168
2041	3,357	0	1,564	1,823	17,225	2,967	841	83	8,149	7,192	2,800	2,395
2042	3,357	0	1,564	1,823	17,782	2,967	841	83	8,275	7,192	2,800	2,395
2043	3,357	0	1,564	1,823	17,782	2,967	841	83	8,399	7,192	2,800	2,395
2044	3,357	0	1,564	1,823	17,782	2,967	841	83	8,521	7,192	2,800	2,490
2045	3,357	0	1,564	1,823	18,339	2,967	841	83	8,639	7,192	2,800	2,490
2046	3,357	0	1,564	1,823	18,339	2,967	841	83	8,756	7,192	2,800	2,490
2047	3,357	0	1,564	1,823	18,239	2,967	841	83	8,870	7,192	2,800	2,490
2048	3,357	0	1,564	1,823	18,239	2,967	841	83	8,981	7,192	2,800	2,515
2049	3,357	0	1,564	1,823	18,239	2,967	841	83	9,090	7,192	2,800	2,628
2050	3,357	0	1,564	1,823	17,972	3,719	841	83	9,196	7,192	2,800	2,628
2051	3,357	0	1,564	1,823	17,789	3,719	841	83	9,300	7,192	2,800	2,628
2052	3,357	0	1,564	1,823	17,789	3,719	841	83	9,402	7,192	2,800	2,628

NYISO Model Selected Capacity Changes by Type

NYISO New Addition by Type (Cumulative)



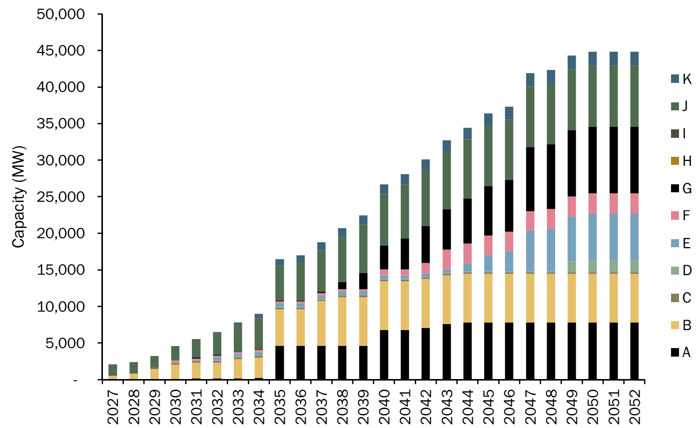
NYISO Retirements by Type (Cumulative)



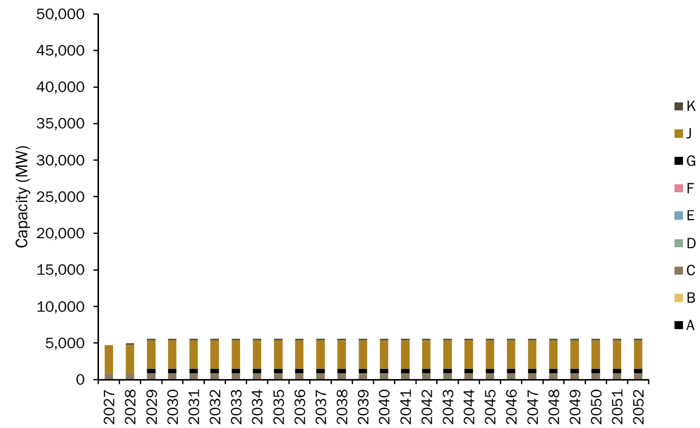
- New York's zero-carbon policy drives the addition of significant quantities of energy storage to provide capacity and a combination of onshore wind and PV for energy. Offshore wind is added to its 9GW mandated target by 2035.
- Large quantities of fossil steamers are retired from the system with CC units retained for capacity

NYISO Model Selected Capacity Changes by Zone

NYISO New Additions by Area (Cumulative)

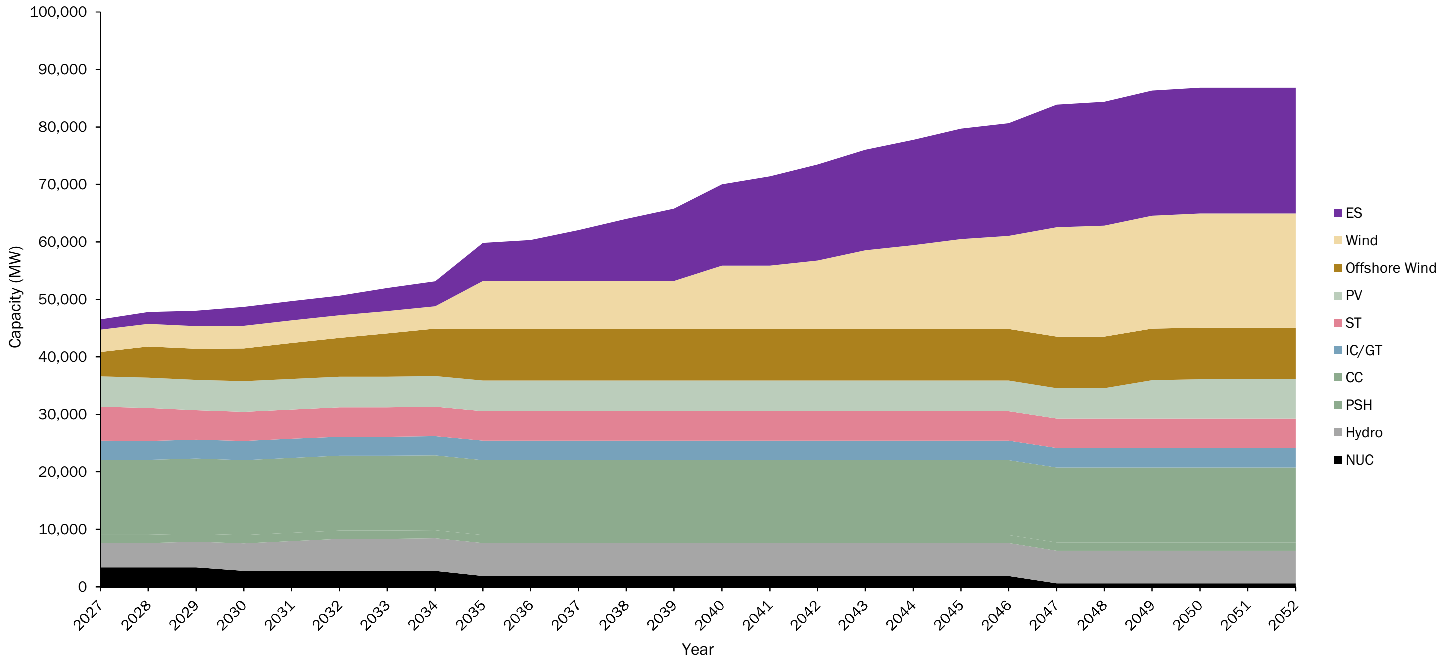


NYISO Retirements by Area (Cumulative)



- Additions are spread around the zones in NY based on meeting the local capacity constraints as well as the availability of low cost and high capacity factor renewables

NY-ISO Capacity Mix* (Nameplate MW) by Type



** Include both scheduled and model selected additions/retirements.*

NY-ISO Capacity Mix (Nameplate MW) by Type

Year	NUC	Hydro	PSH	CC	IC/GT	ST	PV	Offshore Wind	Wind	ES
2027	3,366	4,238	1,409	13,035	3,346	5,926	5,321	4,173	3,924	1,771
2028	3,366	4,238	1,409	13,035	3,300	5,727	5,321	5,403	3,924	2,064
2029	3,366	4,460	1,409	13,035	3,300	5,115	5,321	5,403	3,924	2,687
2030	2,731	4,840	1,409	13,035	3,300	5,115	5,321	5,728	3,924	3,309
2031	2,731	5,243	1,409	13,035	3,300	5,115	5,321	6,246	3,924	3,371
2032	2,731	5,611	1,409	13,035	3,300	5,115	5,321	6,804	3,924	3,393
2033	2,731	5,611	1,409	13,035	3,300	5,115	5,321	7,520	3,924	4,019
2034	2,731	5,707	1,409	13,035	3,351	5,115	5,321	8,238	3,924	4,312
2035	1,882	5,707	1,409	13,035	3,407	5,115	5,321	8,954	8,346	6,620
2036	1,882	5,707	1,409	13,035	3,407	5,115	5,321	8,954	8,346	7,121
2037	1,882	5,707	1,409	13,035	3,407	5,115	5,321	8,954	8,346	8,903
2038	1,882	5,707	1,409	13,035	3,407	5,115	5,321	8,954	8,346	10,808
2039	1,882	5,707	1,409	13,035	3,407	5,115	5,321	8,954	8,346	12,594
2040	1,882	5,707	1,409	13,035	3,407	5,115	5,321	8,954	11,042	14,139
2041	1,882	5,707	1,409	13,035	3,407	5,115	5,321	8,954	11,042	15,523
2042	1,882	5,707	1,409	13,035	3,407	5,115	5,321	8,954	11,935	16,666
2043	1,882	5,707	1,409	13,035	3,407	5,115	5,321	8,954	13,727	17,475
2044	1,882	5,707	1,409	13,035	3,407	5,115	5,321	8,954	14,574	18,342
2045	1,882	5,707	1,409	13,035	3,407	5,115	5,321	8,954	15,696	19,176
2046	1,882	5,707	1,409	13,035	3,407	5,115	5,321	8,954	16,201	19,592
2047	581	5,707	1,409	13,035	3,407	5,115	5,321	8,954	18,997	21,369
2048	581	5,707	1,409	13,035	3,407	5,115	5,321	8,954	19,278	21,537
2049	581	5,707	1,409	13,035	3,407	5,115	6,674	8,954	19,644	21,811
2050	581	5,707	1,409	13,035	3,407	5,115	6,831	8,954	19,914	21,899
2051	581	5,707	1,409	13,035	3,407	5,115	6,831	8,954	19,914	21,899
2052	581	5,707	1,409	13,035	3,407	5,115	6,831	8,954	19,914	21,900

REDACTED

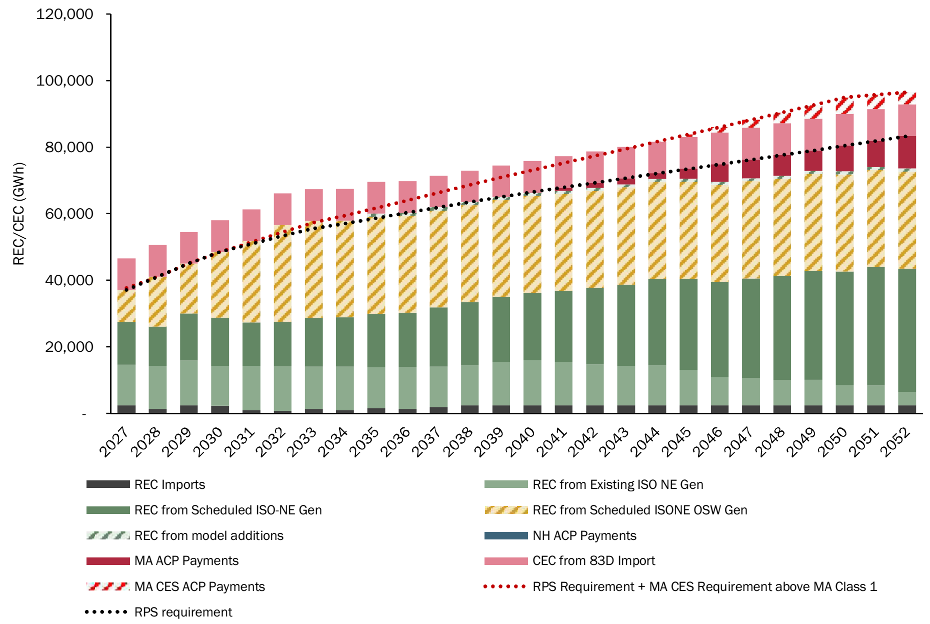
Clean Energy Policy Compliance:

RPS & MA CES

This section provides a summary of the model compliance against mandated renewable portfolio standard constraints that are enforced on the system. RPS requirements are calculated as a percentage of the non-exempt net energy for load

ISO-NE Class 1 RPS & CES Supply by Source

ISO-NE Class 1 RPS and MA CES Requirements, Compliance



- MA CES remains in oversupply through 2043. CES ACPs are used for compliance starting 2044
- Scheduled additions lead to REC oversupply over in the near term with model-built additions in 2035 keeping the REC supply above demand.

REDACTED

ISO-NE Class 1 RPS & CES Summary

[redacted]

REDACTED

ISO-NE Class 1 RPS & CES Prices

[redacted]

REDACTED

NYISO RPS Requirements

[redacted]

Clean Energy Policy Compliance:

Emission Reduction Targets

This section provides a summary of the model compliance against mandated carbon reduction constraints that are enforced on the system.

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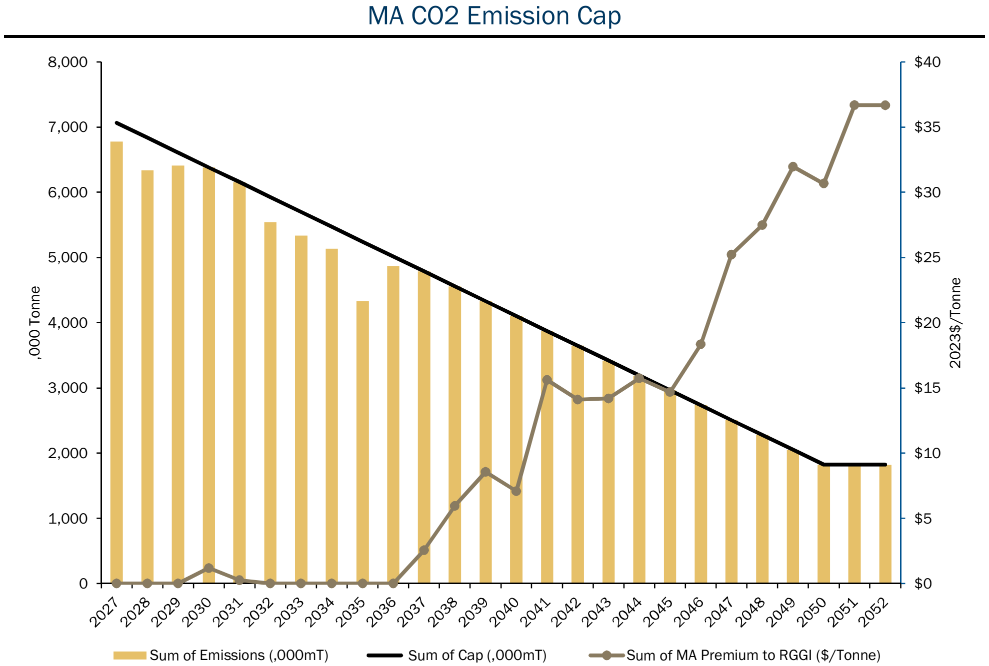
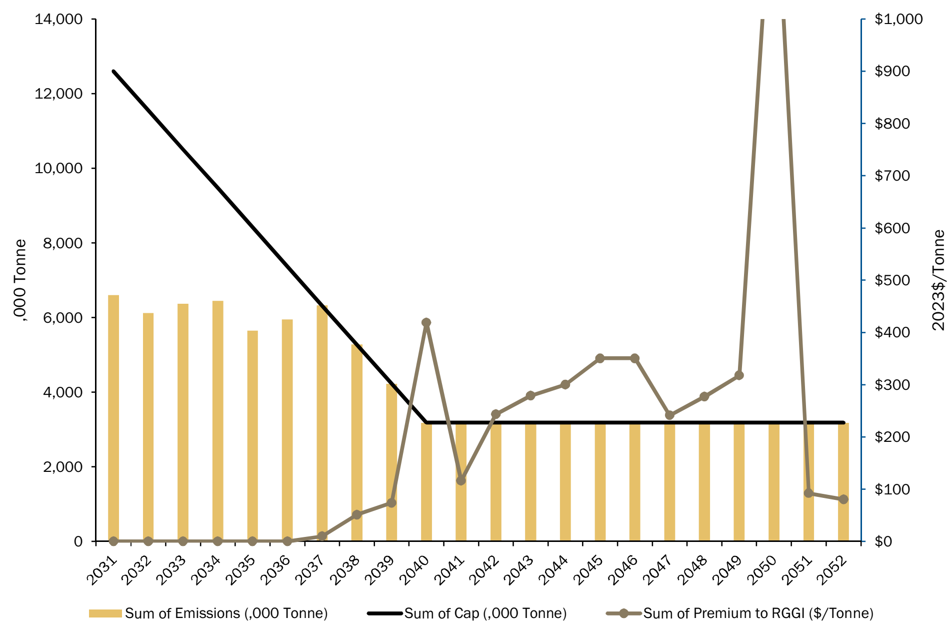
Massachusetts Carbon Cap



- MA carbon emission cap starts binding almost immediately and remain constrained over the study period.
- Carbon price adder is applied to generators in MA to ensure operating emissions remain below target.

NYISO Carbon Cap

NYISO CO2 Emission Target (95X2040)



- NYISO target is set at 95% reduction in emissions from 1990 levels (down from 100%).
- Constraint starts binding in 2037 with shadow prices reflecting the premium on emissions.
- Spikes in price-adders (eg. In 2050) are averaged in the EAS model for model stability.

E&AS Model: ISO-NE LMPs

This section provides a summary of the regional Locational Marginal Prices (LMPs) from the hourly simulation of the energy market model based on the results of the Capacity expansion process.

REDACTED

ISONE LMPs – Monthly for Sample Years

[redacted]

REDACTED

ISONE LMPs – Annual Average LMPs over Study Period

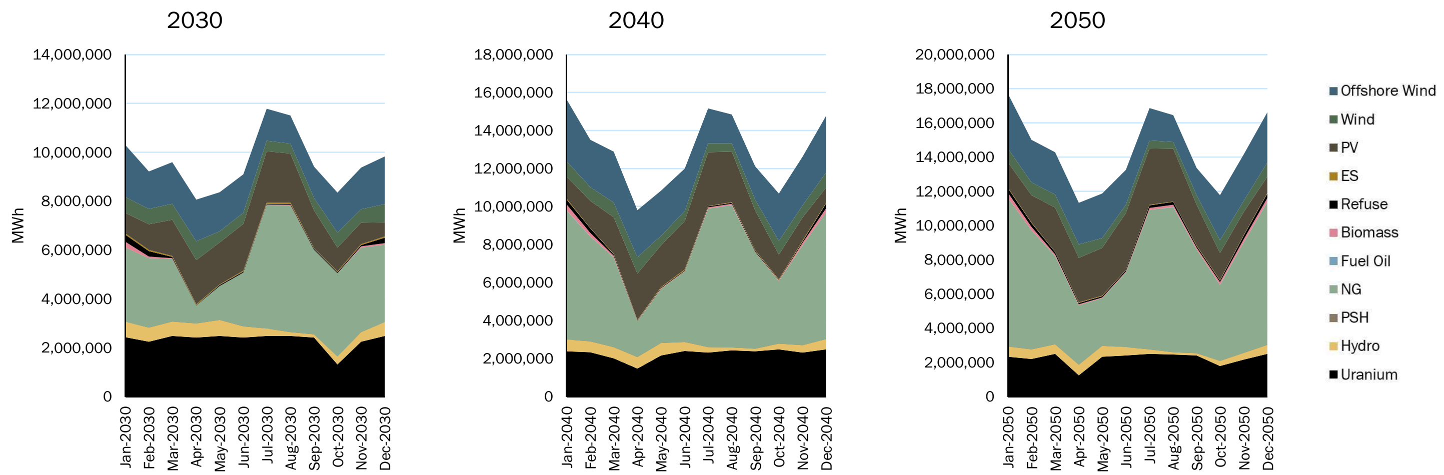
[redacted]

E&AS Model: ISO-NE Generation Mix

This section provides a summary of the generation and interchange flow in ISO-NE from the hourly simulation of the energy market model based on the results of the Capacity expansion process.

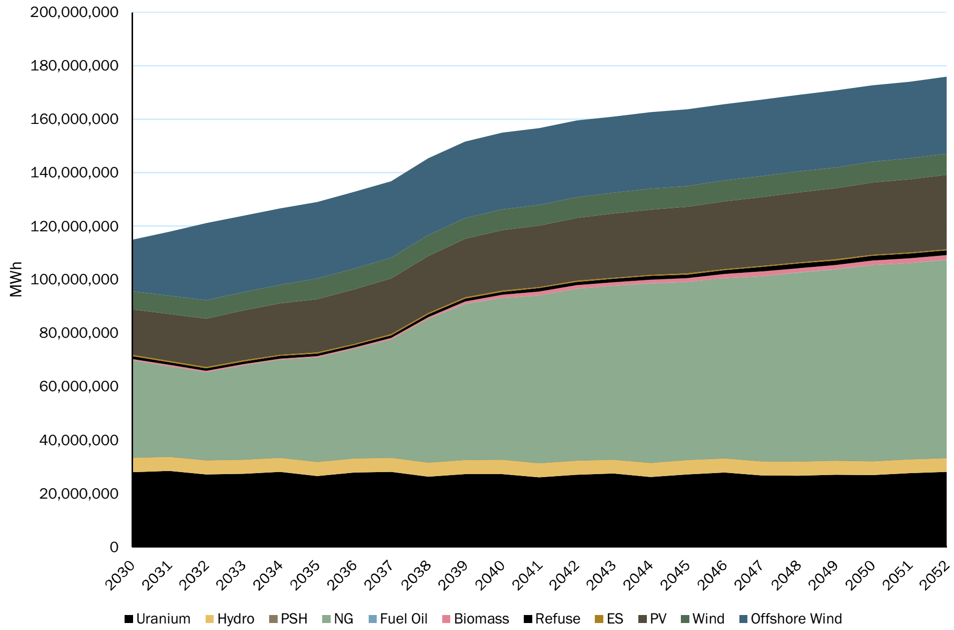
REDACTED

ISONE Generation Mix - Monthly for Sample Years



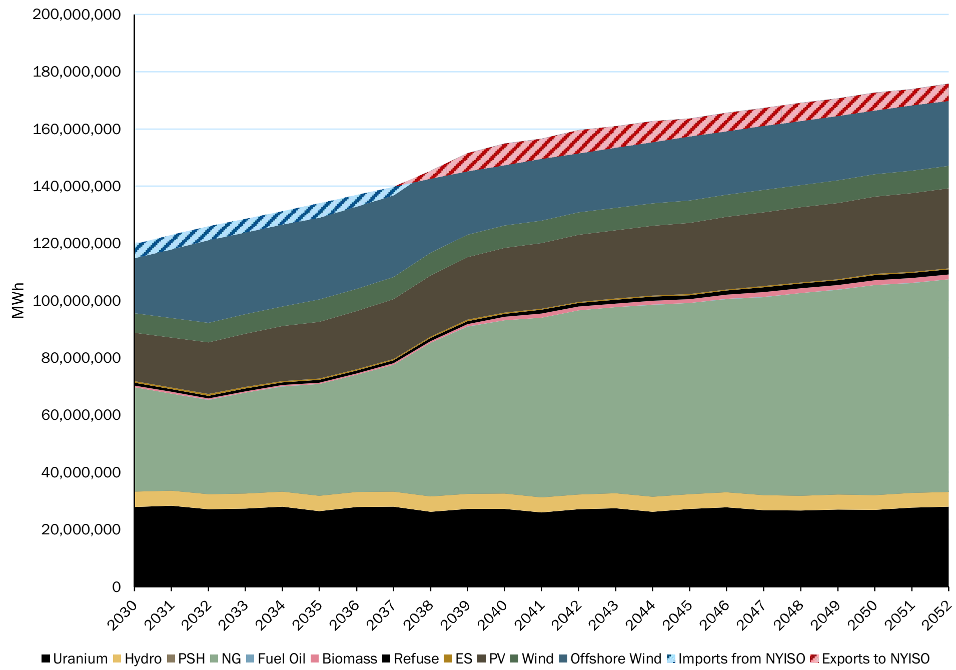
- System remains predominantly natural gas based as it transitions to a dual peaking system

ISONE Generation Mix - Annual



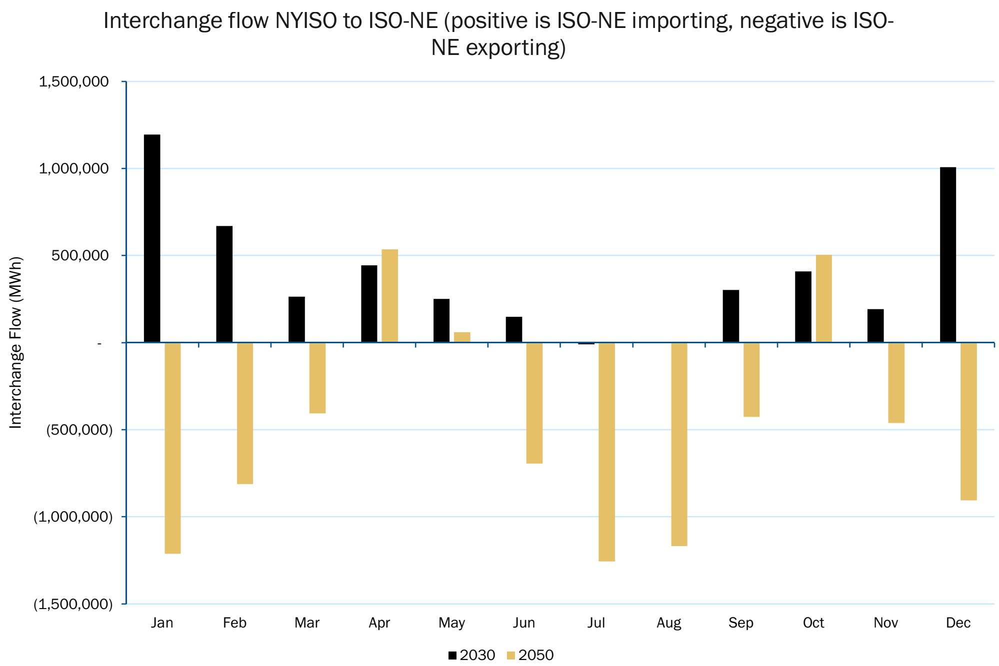
- System sees steady growth in PV based on ISO-NE projected growth.
- Gas fired generation grows in time as other sources of generation remain static.

ISONE Generation Mix – Annual - contd



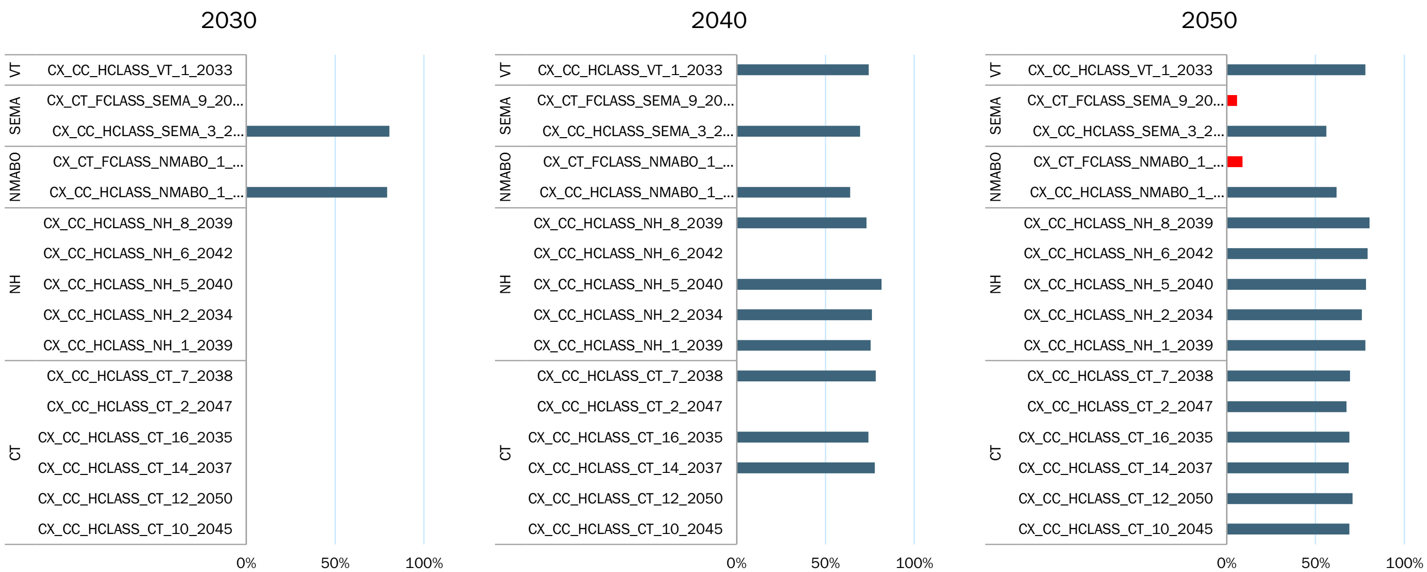
- ISO-NE is a net importer of energy through 2038 with ISO-NE prices being higher than the neighboring NYISO system
- Annual interchange flow flips after 2040 with the enforcement of the carbon policy in New York driving higher prices.

ISONE Interchange with NYISO



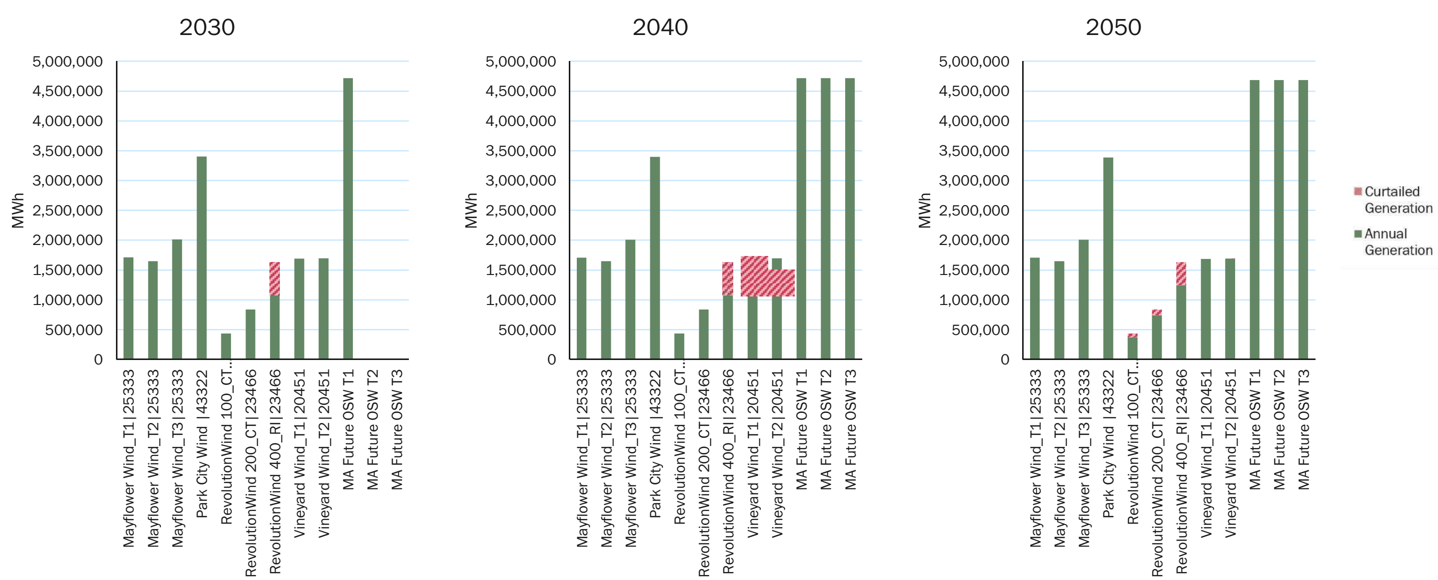
- In 2030, ISO-NE imports energy from NYISO, specifically in the winter period where prices in NE are high
- In 2050, ISO-NE exports energy to the emission constrained NYISO system when prices are high in summer and in winter.

Capacity factor of Generic Thermal additions



- All generic CC units operate between 60% and 80% capacity factors. Peaker units added in NMABO and SEMA have expected low CFs and are added predominantly for capacity.

Curtailment in Offshore Wind Generation

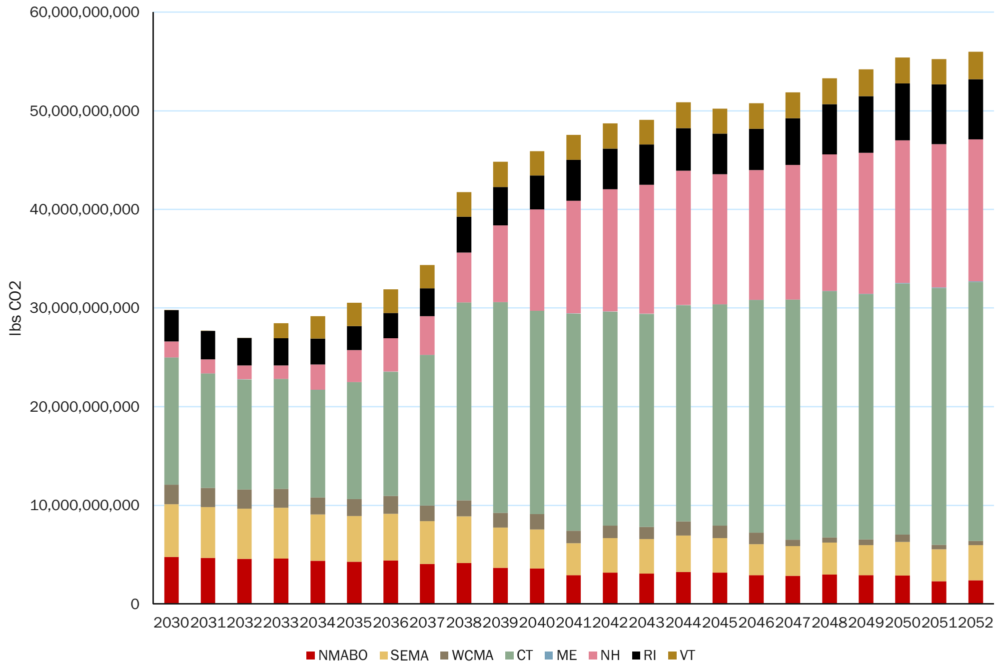


- Revolution wind generation sees curtailment due to binding contingency constraints

E&AS Model: ISO-NE Emissions and Fuel

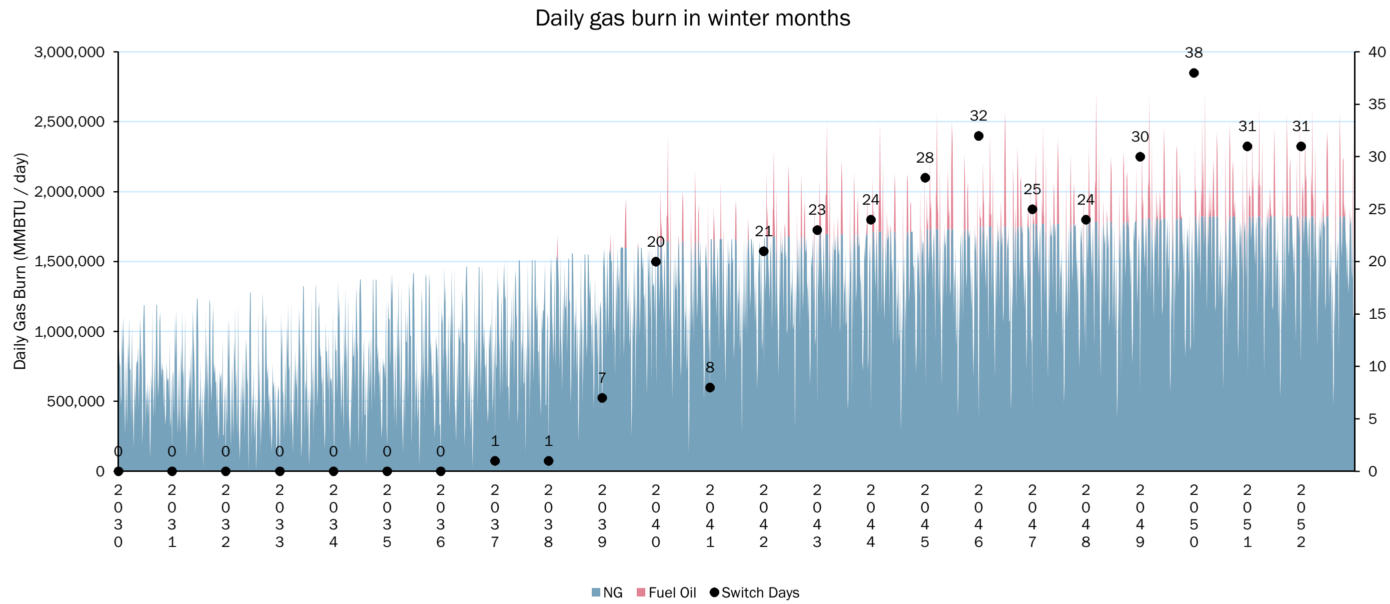
This section provides a summary of the carbon emissions and fuel burn from the hourly simulation of the energy market model based on the results of the Capacity expansion process.

ISONE Carbon Emissions



- Carbon emissions increase in line with CC generation
- MA Emissions reduce driven by the mandated carbon cap.

Fuel Switching in ISO-NE



- Recalibrated gas burn results in fuel switching at roughly 30 days in the outer years. Fuel switch frequency in the initial years is limited due to high renewable generation.

E&AS Model: NYISO LMPs & Generation Mix

This section provides a summary of the generation and LMPs in NYISO from the hourly simulation of the energy market model based on the results of the Capacity expansion process.

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NYISO LMPs – Monthly for Sample Years

[redacted]

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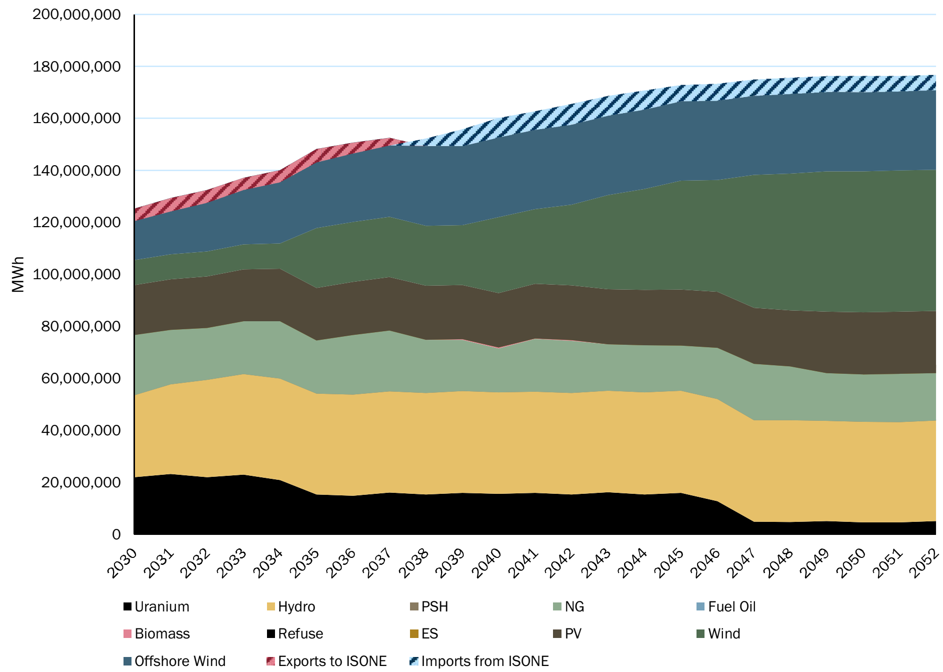
NYISO Generation Mix – Annual



- NYISO generation mix sees a more drastic transition in generation mix with significant growth in renewables
- Nuclear capacity retires over the study period.
- Natural gas fired generation is retained in the system but contributes a small fraction of the annual generation

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APPENDIX D:
Base Case Assumptions and Description of ENELYTIX simulation model

D.1: New England Document

REDACTED

Draft Report

Base Case for Evaluation of 2022 RI Offshore Wind Proposals

Input and Modeling Assumptions

New England

Prepared for: **Rhode Island Energy (RIE)**

Tabors Caramanis Rudkevich

March 6, 2023

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DISCLAIMER

Tabors Caramanis Rudkevich, INC (TCR) has been contracted by Rhode Island Energy (RIE) to provide the quantitative analyses that will allow RIE to evaluate the proposals that they receive in response to the 2022 RI OSW RFP. The information provided herein is solely for the purpose of development of a Base Case against which the proposed projects may be compared. Any other use of the materials without the explicit permission of TCR is strictly prohibited.

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CHAPTER 1: Base Case for Evaluation of RI OSW RFP Proposals – New England Assumptions

This document describes the modeling and input assumptions that the TCR team proposes for the New England power system model against which RIE will measure the incremental costs and benefits of each Proposal received in response to the 2022 RI Offshore Wind Request for Proposals "RI OSW RFP". In this document, TCR refers to that model as the "RI OSW RFP Base Case" or "Base Case".

The complementary document "Base Case for Evaluation of 2022 RI Offshore Wind Proposals– Input and Modeling Assumptions New York" describes all Base Case modeling and input assumptions that are specific to New York. The description of the overall modeling environment described in Chapter 2 of this report applies to both markets.

1.1: RI OSW RFP Base Case Design

The RI OSW RFP Base Case is not a plan for the Rhode Island electric sector, and it should not be viewed as such. Instead, the RI OSW RFP Base Case is a projection of the carbon emission and energy cost implications of a scenario that assumes the additional resources available to meet the state-mandated clean energy policy requirements are limited to those that have been procured through existing policy-driven additions as well as market-driven RPS Class 1 eligible resources.

This RI OSW RFP Base Case provides the Evaluation Team a "but for" or "counterfactual" projection of carbon emissions and costs associated with RI electricity consumption under a future in which the EDCs do not acquire the 600 – 1,000 MW MW of offshore wind under long-term contracts with proposals received and selected in response to the RI OSW RFP. The RI OSW RFP Base Case serves as a common reference point or benchmark against which the EDCs measure the incremental costs and benefits of each Proposal received in response to the 2022 RI OSW RFP.

The RI OSW Base Case reflects all legislative requirements and regulations in effect as of December 15, 2022, including Renewable Portfolio Standard (RPS) regulations in RI and other New England states. The RI OSW RFP Base Case covers the period 2027 through 2052 and expresses cost data in constant 2023 dollars (2023$) unless otherwise noted.

CHAPTER 2: Modeling Environment

2.1: Model Footprint

TCRs model includes a representation and joint operation of the ISO-NE and NYISO power markets with representation of flows to neighboring regions represented as fixed flow interchanges.

The ISO-NE market covers the six states of Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont, each of which represents a distinct Energy Area, with the exception of Massachusetts. Massachusetts is broken into Northeast Massachusetts (NEMA), Southeast Massachusetts (SEMA), and Western Central Massachusetts (WCMA).

In addition to NYISO, ISO-NE has external interfaces with HQ and NB, as well as NYISO.

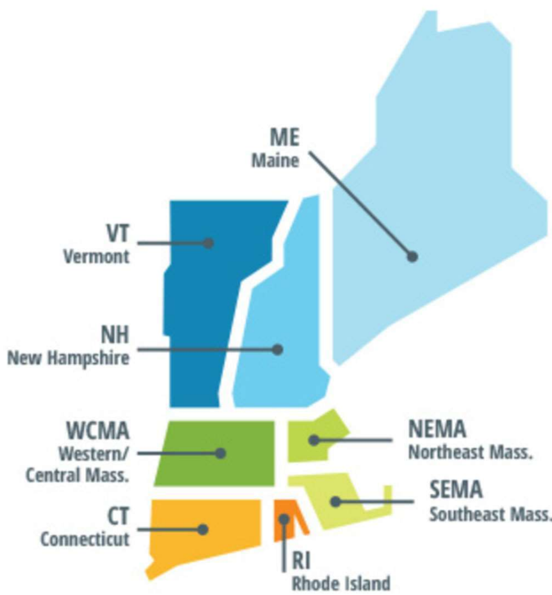


Figure 1: ISONE Energy Areas[1]

1 https://www.iso-ne.com/about/key-stats/maps-and-diagrams/

The NYISO footprint exclusively covers the entirety of the state of New York and is divided into 11 energy areas, Zones A through K.

NYISO has external interfaces with PJM, HQ and IESO, as well as with ISONE.

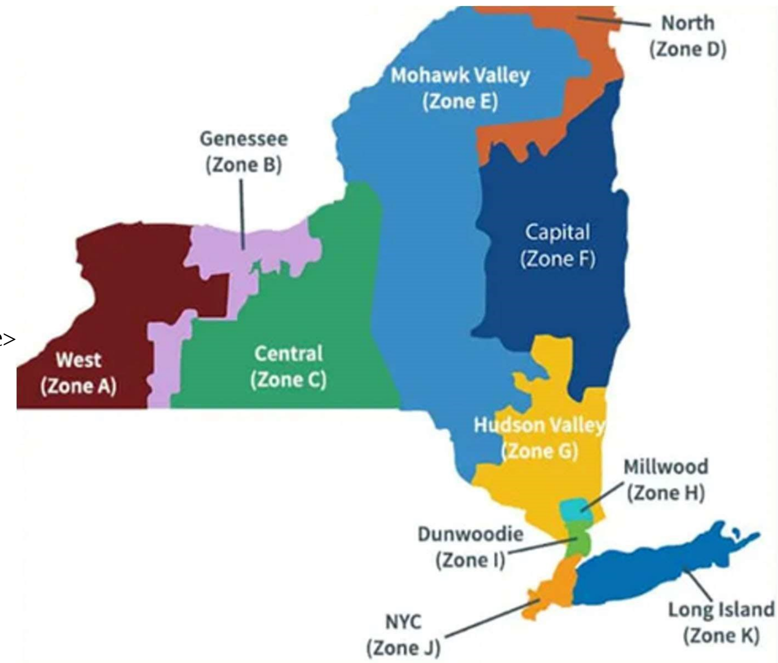
<image> 

Figure 2: NYISO Energy Areas

2.2: Simulation Model

TCR uses ENELYTIX to model the Base Case and Proposal Cases. Appendix 1 describes the ENELYTIX platform in detail.

TCR uses ENELYTIX to develop an internally consistent and accurate set of Base Case prices in New England wholesale markets for energy and ancillary services, RECs, and Clean Energy Certifications (clean generation attributes, or "CECs") through the interaction of its two key modules: the Capacity Expansion module and the Energy and Ancillary Services (E&AS) module. Figure 3 illustrates this interaction.

- The Capacity Expansion module determines the long-term optimal electric system expansion in New England subject to relevant resource adequacy and environmental constraints. These include system-wide and zonal installed capacity requirements (ICR), RPS requirements, and carbon emission limits on Massachusetts Eligible Generating Units (EGUs). This module models the power system footprint at the zonal level consistent with the design of the capacity markets in ISO-NE.
- The Energy and Ancillary Services (E&AS) module simulates Day-Ahead and Real-Time market operations within the footprint of the ISO-NE and New York Independent System

Operator (NYISO) power systems. This model implements chronological simulations of the Security Constrained Unit Commitment (SCUC) and Economic Dispatch (SCED) processes, as well as the structure of the ancillary services in ISO-NE and NYISO markets. The E&AS model is fully nodal, performs true Mixed Integer Programming (MIP) optimization, uses no heuristics, rigorously optimizes storage facilities, phase shifters, and High Voltage Direct Current (HVDC) operation, and accounts for marginal transmission losses.

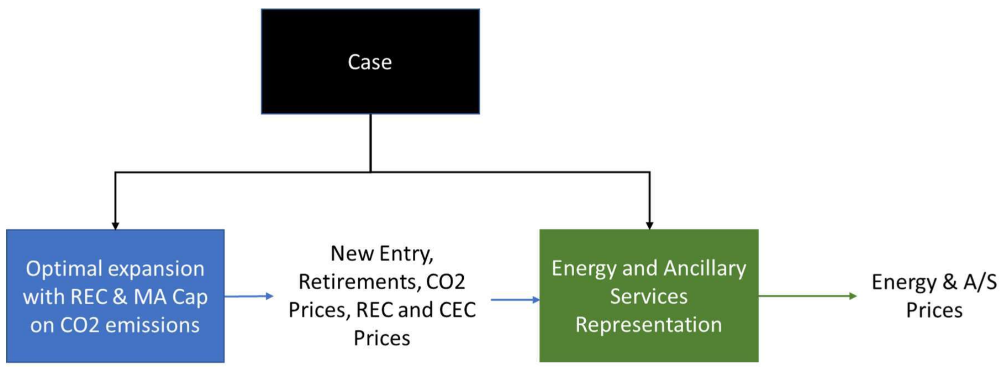


Figure 3. Interactive Use of ENELYTIX Modules

The sequence of deploying these modules, as illustrated in Figure 3, is as follows:

- Development of the Base Case begins with application of the Capacity Expansion module, which determines the optimal capacity expansion plan and resulting changes to the generation mix over time, Class 1 REC prices, prices for the MA Clean Energy Credits (CEC), and the shadow price of CO_2 in Massachusetts implied by compliance with the hard cap on emissions from EGUs located in Massachusetts.
- Outputs from the Capacity Expansion module are inputs to the Energy and Ancillary Services module. These outputs include new entry and retirement decisions and shadow prices of CO_2 emissions along with the CO_2 shadow prices associated with the Regional Greenhouse Gas Initiative (RGGI) program. The E&AS module provides chronological unit commitment and dispatch modeling. This module among other things calculates locational marginal prices for load and generators and net revenues that each generating unit would receive from the Energy and AS markets.

Both modules use the Power System Optimizer (PSO) solver developed by Polaris Systems Optimization, Inc.[2] which serves as a key component of the ENELYTIX modeling environment. Within ENELYTIX, both modules rely on the same dataset for ISO New England and share the economic and operational characteristics of ISO-NE's existing generating units, representation of the electric transmission system, and projection of future electricity demand.

All modules use the input assumptions in Chapter 3 through 13 where applicable as summarized by module in Table 1 below.

Table 1. Applicability of Input and Assumption Categories by ENELYTIX Module

Chapter	Capacity Expansion Module	E&AS Module
3. Transmission	Interfaces only	All transmission constraints
4. Interchange	fixed schedule	economically scheduled between ISONE & NYISO; fixed schedule for external interchange
5. Load Forecast	Seasonal Load Duration Curves	Hourly chronological
6. Ancillary Services	N/A	Modeled in detail
7. Installed Capacity Requirements	By Zone	N/A
8. RPS Requirements	Yes	REC Prices from Capacity Expansion

2 www.psopt.com

Chapter	Capacity Expansion Module	E&AS Module
9. Clean Energy Standards and Carbon Emissions Regulations	Yes	CO_2 shadow prices from Capacity Expansion
10. Generation Mix	Yes	Yes, with additional input from Capacity Expansion
11. Generating Unit Operational Characteristics	Yes	Yes
12. Fuel Prices	Yes	Yes
13. Emission Rates and Allowance Prices	Yes	Yes

2.3: Capacity Expansion Module

The discussion that follows summarizes the methodology used by the Capacity Expansion Model to simulate EGU investment and retirement decisions and calculate market prices for energy, RECs,CECs, and shadow prices for Massachusetts CO_2 emissions. The specific values of the input assumptions the Capacity Expansion Model uses to model the Base Case are provided in the remaining chapters of this document unless indicated otherwise.

The Capacity Expansion Module solves a dynamic multi-year optimization problem using a MIP optimization solver. The problem is solved over a 35-year optimization horizon (2025 – 2060) which consists of a 25-year evaluation period and a 10-year lookahead. The objective function is to minimize the net present value of the total cost, i.e., capital, fuel and operating, of the generation fleet serving the wholesale market within the ISO-NE electrical footprint.

These costs are minimized subject to the resource adequacy, operational and environmental constraints. By respecting these constraints, the optimization algorithm explicitly evaluates the needs for:

- energy delivered to each load zone to meet consumers' demand in that zone,
- installed capacity in each reliability zone to assure resource adequacy (reliability) of the system,
- curbing CO_2 emissions by generating plants in Massachusetts to comply with the final 310 CMR 7.74 rules,
- energy produced by new renewable resources procured to comply with state-specific Class 1 RPS and Massachusetts CES requirements, and
- retaining the power flow within the capacity of the transmission network.

While processing these requirements, the algorithm evaluates trade-offs between the capital and operating costs of existing and new resources vis-à-vis their ability to meet these requirements and standard operating constraints. Through finding the global minimum for the net present value of total costs, the algorithms identify the optimal resource mix, locational and technology specific new build decisions and retirement decisions. It also computes shadow prices for environmental constraints.

The resource adequacy constraints are specified in terms of installed capacity requirements for the ISO-NE system as a whole and for reliability zones within ISO-NE as depicted in Figure 4. These requirements are met by maintaining sufficient generating capacity within each of these reliability zones.

ISO New England performs an annual resource adequacy assessment to develop locational requirements which are then used as inputs to develop parameters for the Forward Capacity Market. This assessment, however, is prepared only for the year for which it conducts the Forward Capacity Auction (FCA). The most recent FCA16 covered the 2025/26 capacity year. Using statistical data for past resource adequacy analyses performed by ISO-NE, forward projections of electricity demand, and future limits on transmission interfaces defining reliability zones, TCR develops forward-looking estimates of installed capacity requirements for all recently binding zones. Chapter 7 presents these estimates.

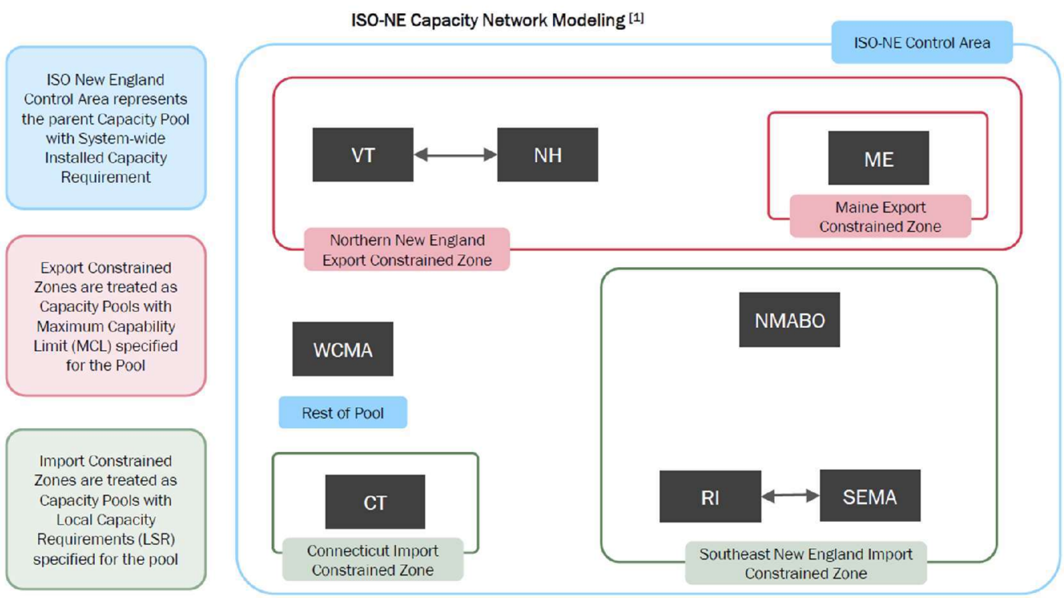


Figure 4. Representation of the Resource Adequacy Constraints in ISO-NE

The capacity expansion module provides a simplified representation of electric system operation compared to that of the E&AS module. Simplifications are necessary to reduce the size of the optimization problem and achieve computational tractability. The module uses three major simplifications.

1) It relies on load duration curves instead of chronological hourly modeling of electricity demand

2) It uses non-chronological dispatch of generation and does not model the unit commitment process
3) It includes representation of transmission interfaces but does not model any other constraints or contingencies.

The model uses representative load duration curves for three seasons – Summer (June – September), Winter (December – March) and Shoulder (April, May, October and November). Load in each season is represented by blocks of various duration and magnitude that are assumed to remain constant within each block.

This load representation uniquely determines the season and block for each hour of the year. Using that relationship, the module develops average availability of variable resources such as wind and solar by block and season. Capacities of thermal and nuclear units are de-rated in the Shoulder season to account for planned maintenance. Additional derating accounting for forced outages is applied in all seasons.

To reflect the impact of operational constraints on the new build and retirement decisions, the module effectively simulates economic dispatch subject to transmission constraints represented by interfaces monitored by ISO-NE. In computing the impact of generation and loads on interface flows, the full representation of the transmission network which reflects both Kirchhoff's laws (the current law and the voltage law) is used.

The environmental constraints include state requirements for procurement of electric energy generated by renewable resources, as well as emissions requirements. The module includes each state's year-by-year Class 1 RPS requirements, Massachusetts CES requirements, state-specific resource eligibility, limitations on certificate banking and borrowing, and alternative compliance payment (ACP) prices that change over time. The module represents as a constraint the proposed CO_2 emission cap rules applicable to generators located in Massachusetts. The module uses projected RGGI CO_2 emission allowance prices as an input. Chapters 8, 9 and 13 discuss the detailed input assumptions and data sources.

The module determines Class 1 REC prices as the shadow price of the constraint associated with both meeting all states' RPS requirements through the addition of Class 1 eligible resources and meeting the Massachusetts incremental CES requirement through the addition of either Class 1 eligible resources or CES-eligible hydro resources. The module determines Massachusetts CEC prices as the Class 1 REC price minus the shadow price of the constraint associated with meeting all states' RPS requirements. The resulting REC and CEC prices in each year reflect the premiums that the marginal RPS and CES resources need above the energy and capacity market revenues they receive to fully recover their costs.

The capacity of a given renewable resource type that can be built in a given year is subject to several constraints in the model:

- the estimated remaining technical potential for that resource type in each location
- the estimated maximum single-build capacity that of the resource type

Chapter 11 describes the characteristics of potential renewable resource capacity additions available to the capacity expansion module.

Our projections constrain Class 1 REC and Massachusetts CEC prices to be not less than $2/MWh (except in the presence of a higher administratively set floor price).

2.4: Energy and Ancillary Services Module

The ENELYTIX E&AS module is a detailed chronological production costing simulation model which implements SCUC and SCED-based simulation of the electricity markets in ISO-NE and NYISO. This module embodies the most detailed operational representation of these electric markets and underlying power systems. In this document we provide the detailed inputs and assumptions underlying the models and algorithms as shown in Figure 5 below.

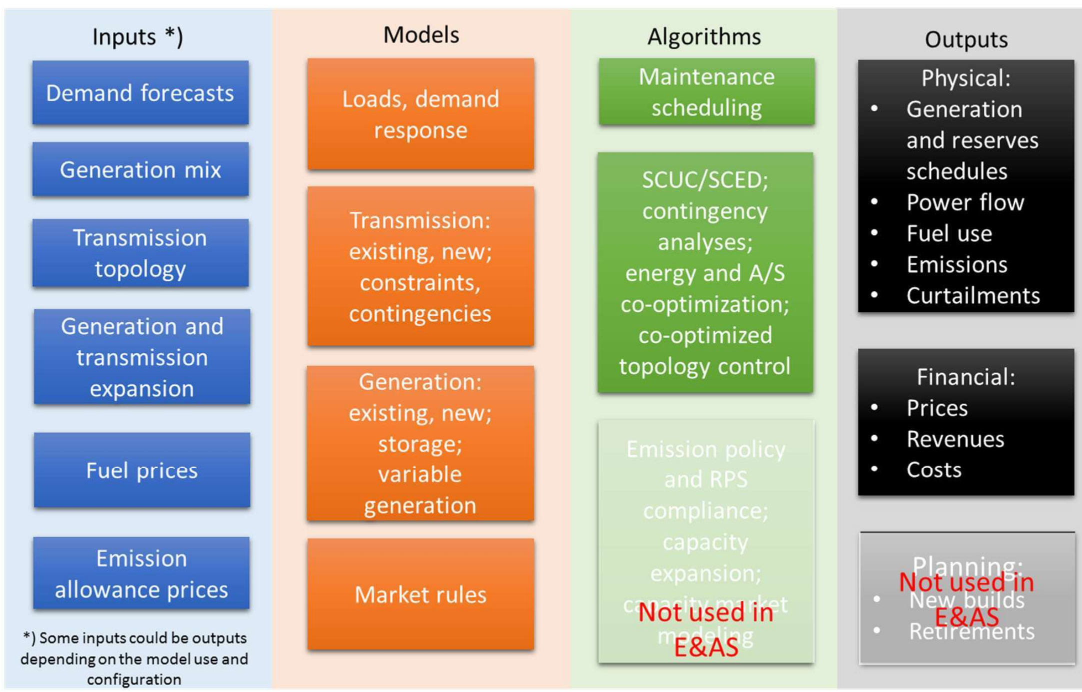


Figure 5. Schematic of the E&AS Module

CHAPTER 3: Transmission

The geographic footprint modeled by in the Base Case encompasses the six New England states (Maine, Massachusetts, New Hampshire, Vermont, Rhode Island, and Connecticut) whose electricity movement and wholesale markets are coordinated by ISO-NE. In addition, the Base Case also incorporates a detailed representation of NYISO.

The ENELYTIX model organizes the physical location of all network resources and loads using bus bars and node mapping. Generators are mapped to bus bars/electrical nodes (eNodes). Bus bars are mapped to ISO-NE/NYISO zones and to specific areas outside the ISO-NE/NYISO system. The mapping of load nodes to ISO-NE/NYISO zones and areas outside ISO-NE/NYISO is used by ENELYTIX to allocate area load forecast to individual buses in proportion to bus specific loads in the power flow case.

The transmission topology and electric characteristics of transmission facilities for ISO-NE are modeled on the 2025 Summer Peak case obtained from ISO-NE which is combined with the representation of the NYISO system obtained from the 2021 FERC 715 powerflow filings for summer peak 2024. TCR mapped New England generators and load areas to bus bars and electrical nodes (eNodes) associated with bus bars according to specifications provided by ISO-NE. Mapping of NYISO and generators and loads was provided by Newton Energy Group, ENELYTIX vendor. Contingencies and interface limit definitions, including those associated with more recent market updates, were provided by RIE. Table 2 shows the major interfaces modeled in ISO-NE

Table 2. ISO-NE Modeled Interface Limits

Interface	Modeled Limit (MW)	Modeled Limit (inverse flow) (MW)
CSC	346	-
CT IMPORT	3,400	3,745
EAST-WEST	3,500	3,000
KEENE RD EXP	165	-
ME-NH	1,900	2,200
NB-NE	1,000	550
NE-BOSTON	5,250	-
NE-NWST	1,400	-
NE-NY	1,200	1,400
NE-SEMA/RI	1,800	3,400
NE-SWCT	2,800	-
NNC	200	200
NNE-SCOB+394	3,450	-
NORTH-SOUTH	2,725	-
ORR_SOUTH	1,325	-

Interface	Modeled Limit (MW)	Modeled Limit (inverse flow) (MW)
SBRK_SOUTH	1,700	-
SEMA-NE	2,800	-
SNDYPD_IMP	2,000	2,000
SNDYPD-SOUTH	4,300	-
SURW_SOUTH	2,200	-
W CT IMPORT	3,810	-

CHAPTER 4: Interchange

ENELYTIX models ISO-NE interchanges with neighboring regions as follows:

- NYISO interchanges: modeled as hourly economic dispatch
  - Cross Sound Cable HVDC interconnection with NYISO
  - Roseton AC interface with NYSIO
- Quebec interchanges: these are modeled as fixed hourly schedules, using interchange data from 2021.
  - Phases I and II Interface with Hydro Quebec via HVDC
  - Highgate interface with Hydro Quebec via HVDC
- New Brunswick interface at Keswig external node, hourly schedule from 2021. New Brunswick interchange is significantly different than it was in 2012, so data from 2021 was used.

In all instances TCR calendar shifts the interchange flow data for each forecast year to assure that the flow levels remain synchronized with the load pattern in ISO-NE.

Table 3 summarizes the fixed interchange flow schedules between ISONE and neighboring non-NYISO regions.

Table 3. Scheduled Net Interchange Summary

Interchange	Interface	Max Import (MW)	Max Export (MW)	Avg Import (MW)	Avg Export (MW)	Total Import (GWh)	Total Export (GWh)
NB	Keswig	988	398	318	21	2,784	186
HQ	HighGate[3]	227	142	221	0.03	1,933	0.3
	P1&P2	1,986	0	1,343	0	11,767	0

3 HQ Highgate export data based on 2012 Interface data.

CHAPTER 5: Load Forecast

This chapter describes the methodology TCR used to develop the load forecast used in this ISO-NE model. The load forecast consists of a single year hourly load shape and a monthly energy and peak forecast spanning the study period. ENELYTIX uses the monthly energy and peak forecast along with the single year hourly load shape to create an hourly demand schedule for the entire study period. The single year annual load shape is the historical 2012 annual load shape.[4]

Figure 6 below illustrates of the interaction of various load components involved in developing the load forecast for ISO-NE as well as defining load-specific terminology that will be used in this report.

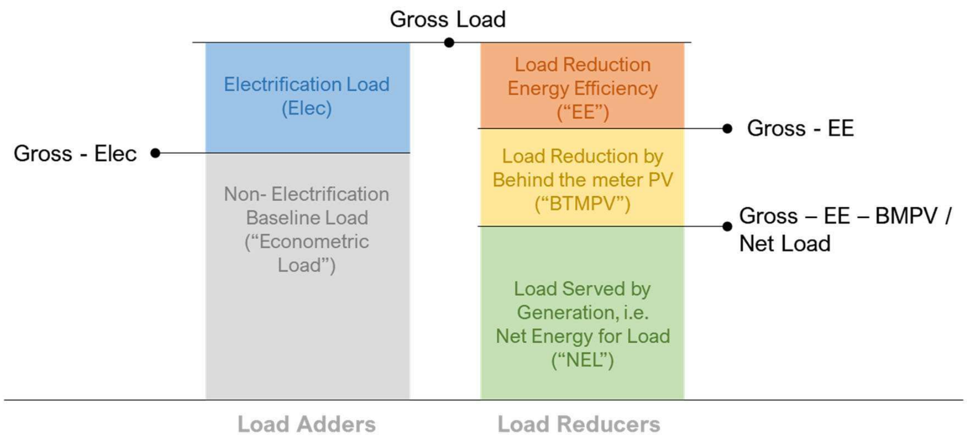


Figure 6. Load Components (Illustrative)

At any given hour, the total load on the system is the "Gross Load" and is comprised of the baseline 'Econometric Load' and the electrification load ("Elec") which represents incremental load due to building electrification as well as the impact of electric vehicles on the grid. To obtain the actual load required to be served, the Gross Load is adjusted downward by savings attributable to energy efficiency ("EE") measures, thus obtaining the "Gross less EE" or "Gross – EE" load. This level of load sees further reductions due to energy supplied by behind-the-meter

4 A 2012 hourly load shape reflects the ISO-NE regional demand profile with negligible impacts of BTMPV load reduction and electrification. This common weather year is used to develop hourly profiles for other weather driven model inputs such as wind and PV generation.

photovoltaic resources (BTMPV) to obtain a "Gross – EE – BTMPV", which is also known as the Net Energy for Load ("NEL") or simply "Net load". NEL is served through a combination of energy from in-state generation and imports from neighboring regions.

The TCR model uses the 'Gross – EE' load as opposed to the Net load, and instead represents the BTMPV load reduction as front-of-the-meter non-dispatchable PV resources. This better captures the impacts of peak shifting due to increasing penetration of behind the meter resources against a relatively static 2012 load shape resulting in a more accurate representation of the evolving load profiles over the study period.

Similarly, increased levels of electrification are anticipated in the system over the study period that would result in variations to the hourly load profile relative to the 2012 load shape. This is especially important for the ISO-NE system which is expected to transition from a summer-peaking system to a dual-peaking system driven by increases in heating electrification loads in the winter periods. To account for this, TCR adopts a three-step process to isolate and re-incorporate electrification load in its forecast as follows:

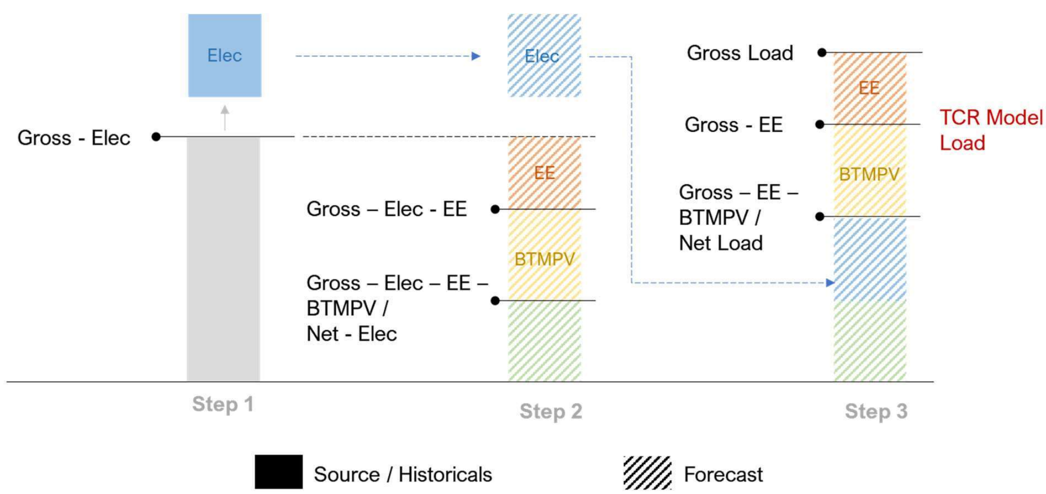


Figure 7. Approach to incorporating Electrification Forecasts

- **Step 1:** Separate the impact of Electrification from the source materials to obtain a pre-electrification load forecast.
- **Step 2:** Develop projections of hourly load forecasts without electrification load (Gross – Elec – EE) using pre-electrification monthly load forecast projections and a single year hourly shape.

  Separately develop comparable hourly projections for electrification.
- **Step 3:** Combine the hourly forecasts developed in 2 above to arrive at the final forecast values for all load components.

The TCR model uses the Gross – EE forecast as input load.

5.1: Pre-Electrification Load Forecasts

TCR developed the monthly energy and peak forecasts through 2031 using forecasts from the 2022 ISO New England Forecast Report of Capacity, Energy, Loads, and Transmission (2022 CELT Report).[5] Forecasts for electrification are reported separately and are backed out of the final forecast values to obtain pre-electrification forecasts.

Forecasts for 2032 and beyond are extrapolated by TCR based on long term forecasts obtained from the 2022 EIA Annual Energy Outlook (AEO 2022) and additional assumptions detailed below.

5.1.1: Monthly Load Forecasts 2027 – 2031

The 2022 CELT Report provides annual forecast for energy, summer peak and winter peak by ISO-NE Energy area in a forecast Data File. TCR uses the forecasts from tabs 2A, 2B, and 2C of the Data File. The annual energy and summer/winter peak forecasts were allocated into monthly forecasts using allocation factors based on historical hourly load data. Electrification forecasts available from tabs 16 were backed out of the forecasts to arrive at pre-electrification forecasts for 2027 – 2031, consistent with the forecast methodology described earlier.

The summer and winter peak load forecasts are coincidental "50/50" forecasts. Coincidental forecast reflects the zonal peak at the time ISO-NE system reaches peak demand instead of the true zonal peak. The 50/50 forecasts represent the median value of the distribution of demand based on different weather scenarios. The 2022 CELT Report also provides 90/10 summer and winter peak forecasts, which represent the 90th percentile forecast of load.

The 50/50 peak forecasts were used for the load forecast and for system-wide ICR requirements, while the 90/10 peak forecasts were used to calculate summer and winter LSR and MCL capacity requirements (see Chapter 7).

5.1.2: Monthly Load Forecasts 2032 – 2052

TCR develops projections beyond 2032 using a combination of annual growth rates derived from AEO 2022 and extrapolation of CELT forecasts to obtain the monthly energy, summer peak and winter peak forecasts for the remainder of the study period.

TCR produced annual energy forecasts by developing separate projections for various load components. Pre-electrification gross load is assumed to grow linearly at the 10-year compounded annual growth rate (CAGR) of the CELT projected values over the remainder of the study period. Projections for load reduction associated with BTMPV beyond the CELT years are

5 ISO-NE CELT 2022 https://www.iso-ne.com/static-assets/documents/2022/04/2022_celt_report.xlsx

projected using a methodology consistent with the 2022 ISO-NE PV forecast[6] which is the study that supplies the BTMPV projection to the CELT report. Net load is projected using year-on-year growth rates derived from the AEO 2022 Reference Case forecast for New England. That forecast provides a long-term trajectory for load and aligns with the growth rates seen in the CELT forecasts between 2022 and 2031. Forecasts for EE reductions are obtained based on the difference between the pre-electrification Gross – BTMPV and the NEL projections.

Figure 8. ISO-NE wide Energy Forecast components (GWh)Figure 8 illustrates the ISO-NE wide load projections used in the model.

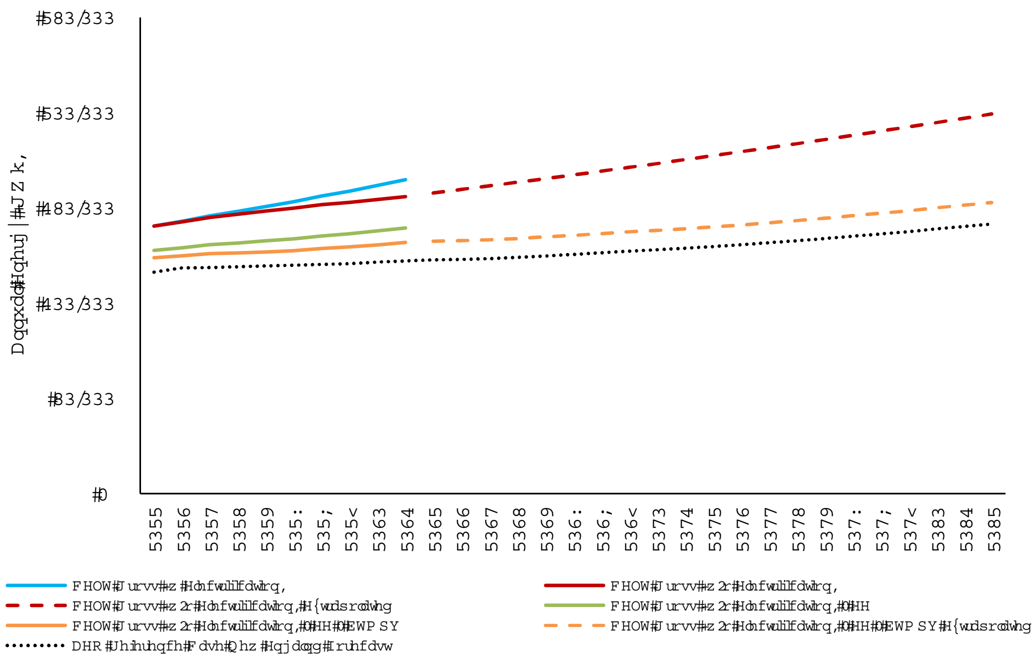


Figure 8. ISO-NE wide Energy Forecast components (GWh)

TCR produced annual projections for summer and winter peaks using a similar component-wise approach to extrapolate based on CELT forecasts. Pre-electrification gross peaks are extrapolated using curve-fit methods over the CELT projection period to capture the respective trends in summer and winter peak growth. Peak reductions associated with energy efficiency are calculated by multiplying the forecasted EE energy reductions by the percent contribution of that energy to peak based on the trend in CELT forecasted EE peak reductions. Peak

6 ISO-NE Final 2022 PV Forecast, April 28th, 2022, https://www.iso-ne.com/static-assets/documents/2022/04/final_2022_pv_forecast.pdf

reduction contributions due to BTMPV are not required as those resources are modeled as front-of-the-meter generation.

Annual values of ISO-NE energy and peaks are translated into monthly regional forecasts using distributions derived from the CELT forecasted distributions for the year 2031. TCR assumes these distributions remain constant over the study period.

5.1.3: Hourly Load Shape

In order to simulate the ISO New England market on an hourly basis, TCR requires an hourly load shape for each simulated time frame and area modeled. Figure 9 plots the load shapes used in this model, which is hourly load from 2012. ENELYTIX uses 2012 load profiles in order to align with the 2012 calendar year wind generation profiles used in this model, which represent the most recent detailed data available from NREL for New England.

To develop hourly load forecasts for the entire study period, ENELYTIX calendar-shifts the 2012 load profile to align days of the week and NERC holidays from 2012 to the forecast year. The ENELYTIX algorithm then modifies the calendar shifted template profiles in such a manner that the resulting load shape exhibits the hourly pattern close to that of the template profile while matching monthly total energy and peak load to the monthly energy and peak forecasts.

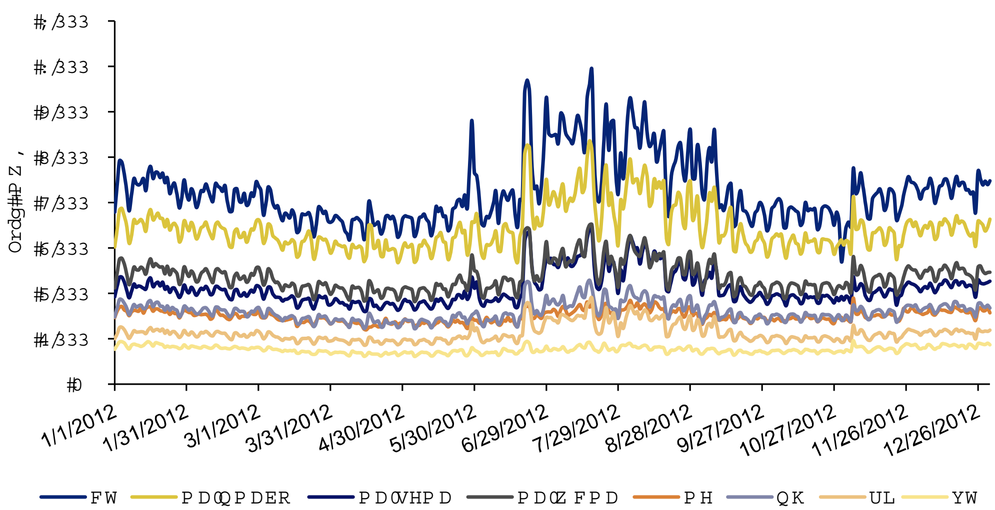


Figure 9. ISO Historical Load Shape, 2012

5.2: Electrification Forecast

TCR developed the annual energy forecasts for electrification through 2031 using forecasts from the 2022 CELT Report. Forecasts beyond 2031 are extrapolated by TCR.

5.2.1: Annual Electrification Forecast 2027 - 2052

Electrification forecasts are available in the 2022 CELT Data file on tab 16 which are broken down into electrification associated with electric vehicles (EV) and building heating (HVAC) .

TCR projects the growth in electrification load based on the difference between the 10-year CAGR-based linear extrapolation of CELT forecasted gross load with and without electrification. The resulting electrification load in 2052 is used as an end point to develop an S-curve that aligns with CELT forecasted electrification and ends at the target 2052 energy value calculated above.

Summer and winter electrification peaks are not required as the hourly electrification load is added to the hourly pre-electrification load forecasts to obtain new system peaks.

The distribution of electrification load between EVs and HVAC as well as the distribution across the energy areas is held at the 2031 CELT distributions which are assumed to persist over the study period. At ISO-NE level, 2/3 of electrification load from transportation and 1/3 from heating is assumed after 2031. Figure 10 illustrates the ISO-NE wide annual electrification forecast modeled.

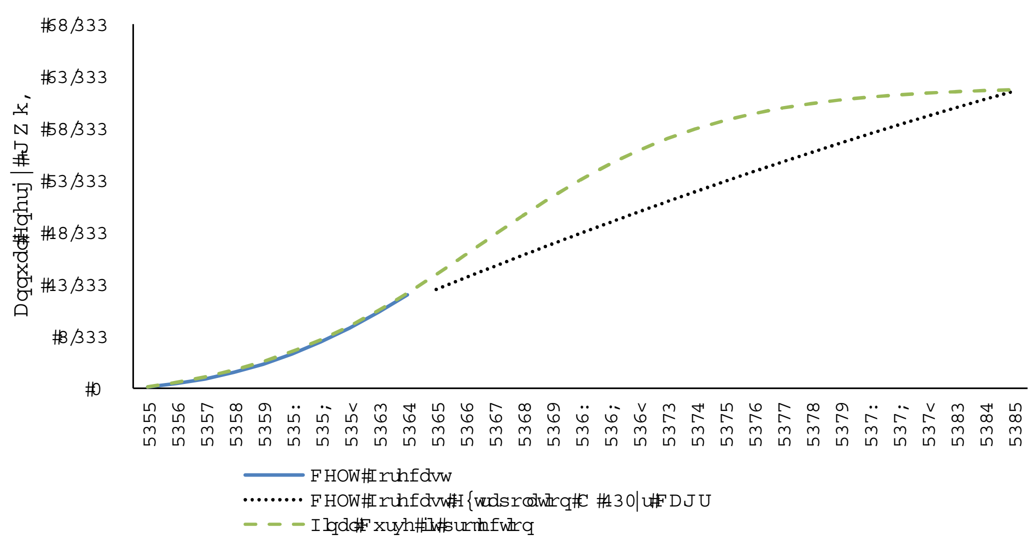


Figure 10. Annual Electrification Load (GWh)

5.2.2: Electrification Hourly Shape

TCR used hourly electrification shapes obtained from the MA Decarbonization Roadmap Study[7]. The study included a bottom-up load development process that quantified various load components on an hourly basis across various scenarios, producing snapshots in time through 2050. These hourly profiles were based on a 2012 calendar year, consistent with base load profile used.

Electric vehicle load shapes reflected charging patterns for combined heavy duty, medium duty and light duty trucks, and light duty autos. TCR reviewed the shapes and developed a single representative charging shape that was applied across all study years and all regions. The shape was normalized against the forecast and adjusted against energy forecasts and further calendar shifted to align with hourly pre-electrification forecasts developed earlier. Figure 11 and Figure 12 below illustrates the normalized electrification shape.

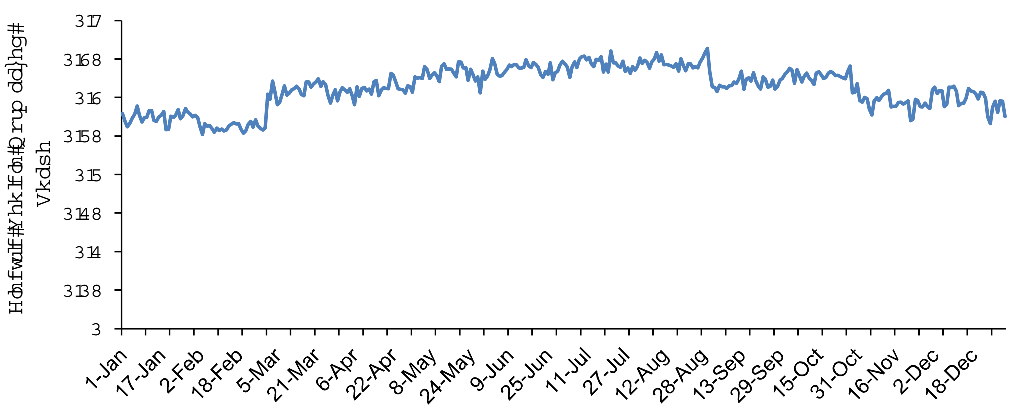


Figure 11. ISO-NE Electric Vehicle Normalized Load Shape

7 Hourly electrification shapes are obtained from the [Energy Pathways to Deep Decarbonization report](), a technical report of the Massachusetts 2050 Decarbonization Roadmap Study published in 2020.

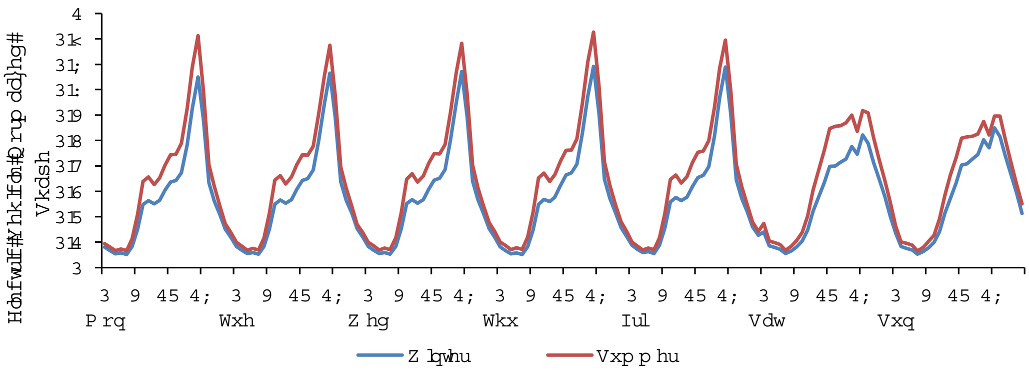


Figure 12. 7 Days ISO-NE Electric Vehicle Normalized Shape

HVAC consisted primarily of heating electrification loads that were broken down into various components of residential and commercial heating. TCR reviewed the load profiles and implemented separate shapes for residential and commercial heating, which further differed by state. Figure 13 and Figure 14 below illustrate the normalized shapes used for heating electrification by state.

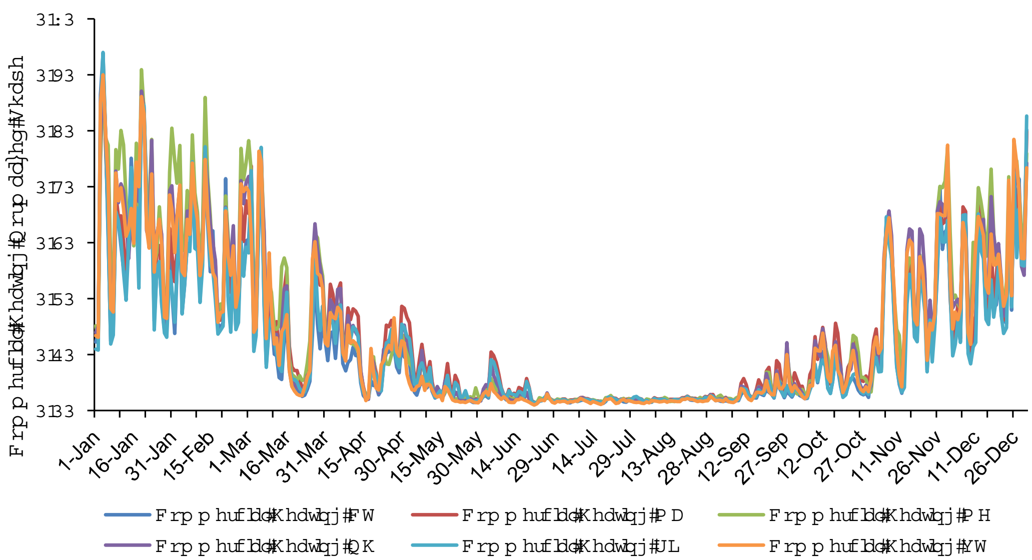


Figure 13. ISO-NE Commercial Normalized Load Shape by State

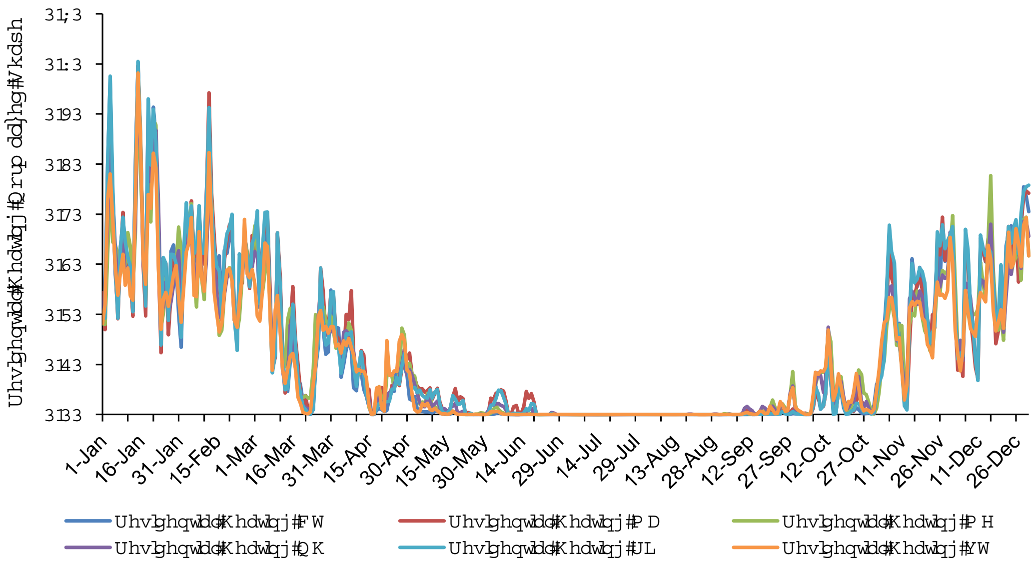


Figure 14. ISO-NE Residential Normalized Load Shape by State

TCR used distributions from the study to split the projected heating load into residential and commercial components and applied the respective load profiles to arrive at hourly heating electrification values. These values are also calendar shifted to arrive at hourly forecasts over the study period.

5.3: Combined Forecasts

TCR combines the pre-electrification Gross-EE forecasts with the electrification loads to obtain the final hourly Gross-EE load. Table 4, Table 5 and Table 6 summarize the annual energy, summer coincident peak and winter coincident peak by energy area and year.

Table 4. ISO-NE Annual Energy by Energy Area (Gross – EE, GWh)

	2027	2028	2029	2030	2031	2032	2033	2034	2035
CT	30,988	31,370	31,665	32,082	32,566	33,124	33,572	34,074	34,616
RI	8,463	8,629	8,780	8,976	9,197	9,368	9,507	9,662	9,828
WCMA	17,709	18,092	18,421	18,821	19,258	19,614	19,904	20,226	20,571
SEMA	17,231	17,567	17,852	18,202	18,587	18,924	19,198	19,502	19,830
NMABO	29,507	30,175	30,755	31,450	32,205	32,790	33,266	33,796	34,364
VT	6,210	6,377	6,537	6,731	6,934	7,210	7,459	7,722	7,990
NH	13,470	13,706	13,888	14,113	14,355	14,538	14,673	14,831	15,008
ME	13,369	13,837	14,304	14,845	15,434	15,937	16,384	16,858	17,347
ISO-NE	**136,947**	**139,753**	**142,202**	**145,220**	**148,536**	**151,506**	**153,964**	**156,671**	**159,554**
	2036	**2037**	**2038**	**2039**	**2040**	**2041**	**2042**	**2043**	**2044**
CT	35,180	35,717	36,262	36,752	37,191	37,615	38,024	38,425	38,845

RI	10,000	10,163	10,328	10,474	10,606	10,732	10,853	10,970	11,092
WCMA	20,928	21,268	21,609	21,916	22,189	22,453	22,704	22,950	23,205
SEMA	20,169	20,491	20,815	21,107	21,368	21,619	21,860	22,095	22,338
NMABO	34,953	35,512	36,077	36,583	37,036	37,471	37,888	38,295	38,719
VT	8,254	8,501	8,736	8,945	9,129	9,293	9,441	9,575	9,701
NH	15,200	15,382	15,574	15,748	15,905	16,062	16,218	16,376	16,545
ME	17,833	18,290	18,730	19,120	19,464	19,779	20,064	20,328	20,584
ISO-NE	**162,516**	**165,323**	**168,132**	**170,646**	**172,888**	**175,025**	**177,052**	**179,013**	**181,029**
	2045	**2046**	**2047**	**2048**	**2049**	**2050**	**2051**	**2052**	
CT	39,239	39,623	40,035	40,414	40,792	41,220	41,599	41,977	
RI	11,206	11,316	11,434	11,542	11,648	11,770	11,876	11,983	
WCMA	23,442	23,672	23,918	24,144	24,369	24,622	24,846	25,069	
SEMA	22,566	22,789	23,025	23,243	23,458	23,704	23,920	24,135	
NMABO	39,114	39,499	39,909	40,286	40,661	41,085	41,460	41,833	
VT	9,813	9,917	10,019	10,109	10,195	10,289	10,369	10,447	
NH	16,707	16,868	17,044	17,207	17,371	17,560	17,727	17,894	
ME	20,814	21,027	21,245	21,439	21,628	21,833	22,013	22,188	
ISO-NE	**182,899**	**184,710**	**186,628**	**188,384**	**190,122**	**192,082**	**193,811**	**195,526**	

Table 5. ISO-NE Summer Coincident Peak by Energy Area (Gross – EE, MW)

	2027	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**
CT	6,712	6,739	6,732	6,782	6,846	6,949	7,007	6,967	7,035
RI	1,854	1,868	1,885	1,909	1,938	1,961	1,980	1,967	1,989
WCMA	3,196	3,210	3,279	3,308	3,344	3,347	3,388	3,474	3,520
SEMA	3,205	3,224	3,237	3,259	3,286	3,329	3,366	3,417	3,460
NMABO	5,417	5,419	5,506	5,559	5,624	5,657	5,722	5,839	5,913
VT	1,043	1,065	1,125	1,158	1,194	1,212	1,257	1,354	1,402
NH	2,394	2,379	2,464	2,486	2,510	2,461	2,475	2,544	2,560
ME	2,108	2,198	2,377	2,462	2,554	2,538	2,618	2,834	2,918
ISO-NE	**25,928**	**26,102**	**26,605**	**26,922**	**27,296**	**27,454**	**27,814**	**28,397**	**28,797**
	2036	**2037**	**2038**	**2039**	**2040**	**2041**	**2042**	**2043**	**2044**
CT	7,105	7,147	7,213	7,268	7,321	7,364	7,402	7,428	7,458
RI	2,011	2,057	2,080	2,097	2,081	2,095	2,107	2,145	2,156
WCMA	3,563	3,575	3,617	3,653	3,704	3,731	3,754	3,759	3,777
SEMA	3,500	3,543	3,590	3,623	3,631	3,657	3,678	3,712	3,734
NMABO	5,983	6,015	6,083	6,142	6,212	6,257	6,294	6,314	6,345
VT	1,449	1,478	1,521	1,559	1,595	1,622	1,644	1,662	1,678
NH	2,576	2,521	2,539	2,553	2,627	2,638	2,648	2,599	2,610
ME	2,996	3,021	3,097	3,163	3,251	3,298	3,336	3,344	3,375
ISO-NE	**29,182**	**29,358**	**29,739**	**30,058**	**30,421**	**30,661**	**30,862**	**30,964**	**31,134**

	2045	2046	2047	2048	2049	2050	2051	2052	
CT	7,486	7,511	7,533	7,557	7,583	7,607	7,619	7,639	
RI	2,134	2,141	2,148	2,182	2,192	2,198	2,175	2,180	
WCMA	3,806	3,819	3,832	3,837	3,852	3,864	3,876	3,885	
SEMA	3,727	3,740	3,752	3,782	3,800	3,811	3,795	3,803	
NMABO	6,379	6,402	6,422	6,442	6,466	6,488	6,496	6,511	
VT	1,691	1,702	1,711	1,723	1,733	1,740	1,736	1,739	
NH	2,670	2,677	2,684	2,645	2,656	2,665	2,711	2,717	
ME	3,417	3,436	3,452	3,460	3,480	3,496	3,502	3,508	
ISO-NE	**31,310**	**31,429**	**31,535**	**31,627**	**31,761**	**31,869**	**31,910**	**31,981**	

Table 6. ISO-NE Winter Coincident Peak by Energy Area (Gross – EE, MW)

	2027	2028	2029	2030	2031	2032	2033	2034	2035
CT	5,018	5,043	5,092	5,183	5,213	5,257	5,371	5,583	5,692
RI	1,247	1,262	1,300	1,332	1,343	1,391	1,428	1,491	1,527
WCMA	2,596	2,618	2,682	2,735	2,749	2,825	2,899	3,016	3,087
SEMA	2,448	2,466	2,522	2,568	2,576	2,653	2,721	2,825	2,893
NMABO	4,307	4,351	4,466	4,557	4,586	4,734	4,850	5,021	5,138
VT	1,019	1,057	1,133	1,182	1,194	1,277	1,351	1,460	1,535
NH	1,964	1,977	1,995	2,019	2,036	2,062	2,085	2,124	2,147
ME	2,169	2,258	2,392	2,519	2,591	2,745	2,874	3,052	3,178
ISO-NE	**20,769**	**21,031**	**21,582**	**22,096**	**22,287**	**22,943**	**23,578**	**24,572**	**25,198**
	2036	**2037**	**2038**	**2039**	**2040**	**2041**	**2042**	**2043**	**2044**
CT	5,821	5,836	5,936	6,025	6,174	6,274	6,244	6,306	6,347
RI	1,564	1,577	1,609	1,637	1,684	1,712	1,705	1,724	1,737
WCMA	3,159	3,197	3,261	3,317	3,396	3,449	3,457	3,494	3,520
SEMA	2,959	2,995	3,054	3,106	3,181	3,231	3,233	3,268	3,291
NMABO	5,254	5,318	5,418	5,508	5,639	5,727	5,724	5,782	5,821
VT	1,610	1,645	1,709	1,765	1,853	1,904	1,895	1,926	1,947
NH	2,173	2,183	2,206	2,226	2,258	2,277	2,278	2,293	2,305
ME	3,299	3,378	3,490	3,587	3,703	3,786	3,813	3,868	3,908
ISO-NE	**25,839**	**26,130**	**26,683**	**27,172**	**27,888**	**28,360**	**28,348**	**28,661**	**28,875**
	2045	**2046**	**2047**	**2048**	**2049**	**2050**	**2051**	**2052**	
CT	6,470	6,503	6,565	6,514	6,562	6,596	6,697	6,722	
RI	1,777	1,786	1,802	1,785	1,799	1,808	1,842	1,848	
WCMA	3,576	3,595	3,625	3,624	3,651	3,672	3,701	3,715	
SEMA	3,350	3,367	3,395	3,384	3,409	3,428	3,467	3,480	
NMABO	5,934	5,965	6,014	5,976	6,019	6,049	6,141	6,164	
VT	2,020	2,036	2,060	2,020	2,041	2,053	2,110	2,115	

NH	2,332	2,342	2,357	2,355	2,369	2,382	2,405	2,416	
ME	3,985	4,014	4,051	4,042	4,083	4,106	4,148	4,160	
ISO-NE	**29,443**	**29,609**	**29,868**	**29,702**	**29,933**	**30,094**	**30,511**	**30,620**	

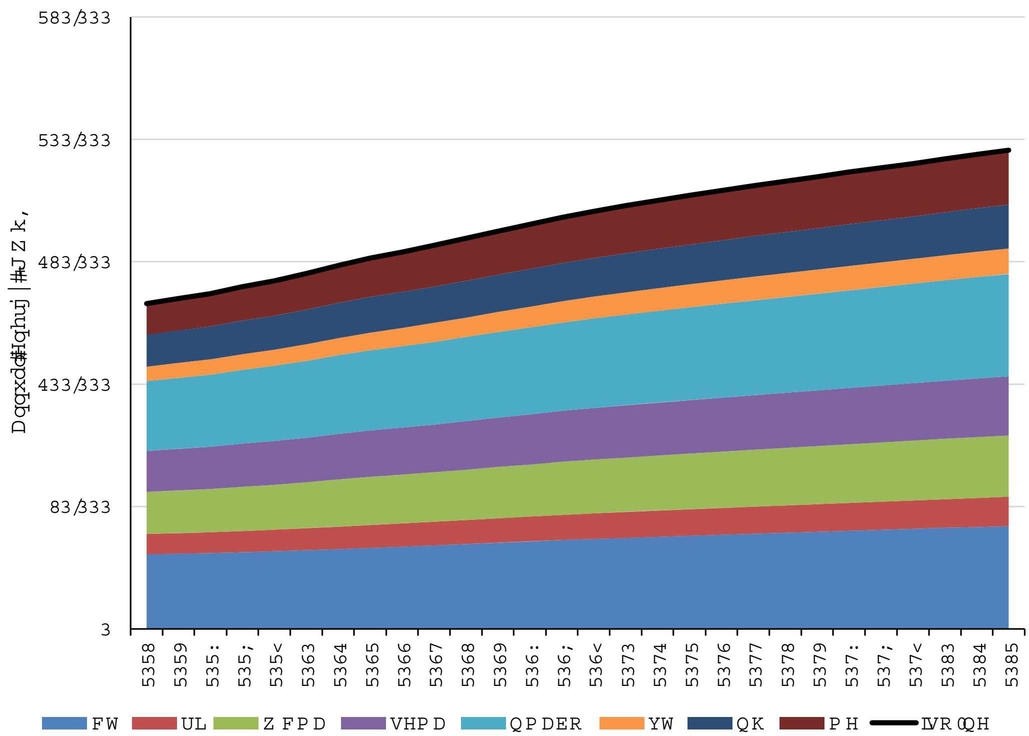


Figure 15. ISO-NE Modeled Load (GWh)

CHAPTER 6:
Ancillary Services

ENELYTIX models four types of Ancillary Services in New England: Regulation, Ten-Minute Spinning Reserve, Ten-Minute Non-Spinning Reserve, and Thirty-Minute Operating Reserve. Reserves are cascading – excess Regulation counts toward spinning reserves, and excess spinning reserves count toward non-spinning reserves. Non-Spinning reserves can be provided by offline peaking capacity and can handle upward ramping only.

- Regulation must be provided by online resources at the level of ramp rate (in MW/min) limited by a 5-minute activation time.
- Ten-Minute Spinning Reserve must be provided by online resources at the level of ramp rate (MW/min) limited by a 10-minute activation time.
- Ten-Minute Non-Spinning Reserve is provided by offline resources capable of supplying energy within 10 minutes of notice. TMNSR can only be provided by quick-start-capable CTs and Internal Combustion (IC) units.
- Thirty-Minute Operating Reserve can be provided by either on-line or off-line resources with less than 30 minutes of activation time.

Hydro units can provide Regulation, Ten-Minute Spinning Reserve, and Thirty-Minute Operating Reserve for up to 5%, 10%, and 30% of its dispatch range, respectively. PV, wind, nuclear, and storage cannot provide ancillary services.

Table 7 summarizes reserve requirements in ISO-NE.

Table 7. ISO-NE Regulation and Reserve Requirements

Reserve Type	Requirement (MW)
Regulation	Hourly schedule per ISO-NE requirements
Ten-Minute Spinning Reserve	820
Ten-Minute Non-Spinning Reserve	820
Thirty-Minute Operating Reserve	750

CHAPTER 7: Installed Capacity Requirement (ICR)

7.1: Overview

In the Base Case, TCR includes three different ISO-NE capacity requirements:

- System-wide Generating Capacity Requirement (ICR)
- Local Sourcing Requirement (LSR) or import-constrained zones
- Maximum Capacity Limit (MCL) for export-constrained zones

Each of these three requirements are enforced for both the summer and winter. Although ISO-NE is currently a summer peaking system, increasing electrification load is expected to transition the system into a dual peaking system. This section reports both the summer and winter peaking requirements.

7.2: System-wide Generating Capacity Requirement (GCR)

The GCR is based on the system-wide Installed Capacity Requirement (ICR), and is calculated using the following formula:

$$GCR = ICR - Tie\ benefits - OP4 + MinRsv - EE - BTMPV - Others$$

Where:

- **ICR** is the Installed Capacity Requirement, calculated as:
  $$ICR = peak\ load\ forecast * (1 + reserve\ margin)$$
- **Tie benefits** represents all capacity tie benefits, including the HQICC
- **OP4** is a voltage reduction relief calculated by ISO-NE for each FCA
- **MinRsv** is the minimum reserve published by ISO-NE for each FCA
- **EE** is past, present, and future energy efficiency measures at the time of peak demand
- **BTMPV** is projected behind-the-meter photovoltaic generation at the time of peak demand
- **Others** includes additional generating capacity that cleared the FCA, including active demand response.

The reserve margin for the ICR calculation is an average of reserve margins calculated from previous Forward Capacity Auctions (FCAs) using the following formula:

$$Reserve\ Margin = \frac{ICR + total\ tie\ benefits}{Gross\ Peak\ Load}$$

Table 8 summarizes TCR's ISO-NE system-wide GCR requirement in the Base Case:

Table 8. ISO-NE Capacity Requirement (Summer)

FCA		FCA12	FCA13	FCA14	FCA15	FCA16	TCR Projection					
FCA Period		**21/22**	**22/23**	**23/24**	**24/25**	**25/26**	**27/28**	**29/30**	**34/35**	**39/40**	**44/45**	**49/50**
FCA Results												
Gross Peak Load	MW	29,436	29,093	28,838	29,303	28,025						
Net ICR	MW	33,725	33,750	32,490	33,270	31,645						
Gross ICR	MW	35,745	35,750	34,430	35,005	33,475						
(Reserve Margin + 1)	%	121%	123%	119%	119%	119%	121%	121%	121%	121%	121%	121%
Peak Load Forecast- ISONE	MW						29,039	29,697	31,914	34,059	35,289	35,952
Tie Benefit												
HQICCs	MW	958	969	941	883	923	923	923	923	923	923	923
Total Tie Benefits	MW	2,020	2,000	1,940	1,735	1,830	1,830	1,830	1,830	1,830	1,830	1,830
Adjustments												
ADR and other Import Reductions	MW	1,841	1,873	1,550	2,056	2,163	1,897	1,897	1,897	1,897	1,897	1,897
BTMPV Summer Peak	MW						1,418	1,517	1,711	1,857	1,968	2,051
EE	MW						2,832	3,009	3,363	3,727	3,958	4,055
OP4	MW						263	263	263	263	263	263
MinRsv	MW						700	700	700	700	700	700
ICR	*MW*						*34,999*	*35,791*	*38,464*	*41,049*	*42,532*	*43,330*
Generating Capacity Requirement	*MW*						*27,460*	*27,976*	*30,101*	*32,175*	*33,316*	*33,934*

Table 9: ISO-NE Capacity Requirement (Winter)

FCA		FCA12	FCA13	FCA14	FCA15	FCA16	TCR Projection					
FCA Period		**21/22**	**22/23**	**23/24**	**24/25**	**25/26**	**27/28**	**29/30**	**34/35**	**39/40**	**44/45**	**49/50**
FCA Results												
Gross Peak Load	MW	29,436	29,093	28,838	29,303	28,025						
Net ICR	MW	33,725	33,750	32,490	33,270	31,645						
Gross ICR	MW	35,745	35,750	34,430	35,005	33,475						
(Reserve Margin + 1)	%	121%	123%	119%	119%	119%	121%	121%	121%	121%	121%	121%
Peak Load Forecast- ISONE	MW						23,503	24,490	27,865	30,729	32,521	33,491
Tie Benefit												
HQICCs	MW						923	923	923	923	923	923
Total Tie Benefits	MW						1,830	1,830	1,830	1,830	1,830	1,830
Adjustments												
ADR and other Import Reductions	MW						-1,897	-1,897	-1,897	-1,897	-1,897	-1,897
BTMPV Winter Peak	MW						0	0	0	0	0	0
EE	MW						2,694	2,902	3,270	3,534	3,623	3,538
OP4	MW						263	263	263	263	263	263
MinRsv	MW						700	700	700	700	700	700
ICR	*MW*						*28,326*	*29,516*	*33,583*	*37,035*	*39,195*	*40,364*
Generating Capacity Requirement	*MW*						*22,342*	*23,324*	*27,023*	*30,212*	*32,282*	*33,536*

7.3: Local Sourcing Requirement (LSR) for Import-Constrained Zones

Local Sourcing Requirements are minimum levels of installed capacity that must be procured within an import-constrained zone. The following capacity pools are modeled as import-constrained zones in the Base Case: NEMA/Boston, RI/SEMA, SENE, and CT.

For each of these import-constrained zones, TCR calculates reserve margins from the results of previous FCAs. The reserve margin is calculated as follows:

$$Reserve\ Margin = \frac{Local\ Sourcing\ Requirement\ (LSR) + N1\ Import\ Limit}{Gross\ \frac{90}{10}\ Demand} - 1$$

For each zone, the reserve margin is a simple average of reserve margins calculated using data from previous FCAs and is held constant throughout the study period.

Using this reserve margin, the LSR is calculated as follows:

$$LSR\ = (RM + 1) * Gross\ \frac{90}{10}\ Peak\ Load - N1\ Import\ Limit - BTMPV - EE$$

Where:

- **RM** is the reserve margin
- **Gross 90/10 Peak Load** is the 90th percentile of the peak load forecast distribution, drawn from the 2021 CELT Report and extrapolated throughout the study period as described in Chapter 5
- **N1 Import Limit** is the N-1 import limit
- **BTMPV** is projected behind-the-meter photovoltaic energy at the time of peak demand
- **EE** is the energy impact of past, present, and future energy efficiency measures at the time of peak demand

Table 10 summarizes TCR's projection of Local Sourcing Requirements for the import-constrained zones.

Table 10. Local Sourcing Requirements for Import-Constrained Zones

Pool	2025/26	2026/27	2027/28	2028/29	2029/30	2034/35	2039/40	2044/45	2049/50
SENE	8,246	8,214	8,217	8,241	8,285	8,530	8,839	9,244	9,804
CT	4,769	4,719	4,676	4,647	4,635	4,716	4,886	5,121	5,454

7.3.1: Maximum Capacity Limit and Export-Constrained Zones

In addition to import-constrained zones, ISO-NE identifies export-constrained zones and reports a Maximum Capacity Limit (MCL) for each. In the Base Case, TCR models ME and NNE as export-constrained zones. This means that the Base Case model includes Rest-of-Pool (ROP)

LSRs for the parts of ISO-NE that exists outside these export-constrained zones, referred to as “All but ME” and “All but NNE”.

For “All but ME” and “All but NNE”, TCR calculates reserve margins from the results of previous FCAs. The reserve margin is calculated as follows:

$$Reserve\ Margin = \frac{ROP\ LSR + Export\ Limit}{Rest\ of\ Pool\ Gross\ \frac{90}{10}\ Peak\ Load} - 1$$

Where:

- **ROP LSR** = ISO-NE Net LSR – Maximum Capacity Limit
- **Export Limit** is the maximum export from the export constrained zone. This is drawn from FCA data
- **Rest of Pool Gross 90/10 Peak Load** is the peak demand for the part of ISO-NE which exists outside the export-constrained zone

For each zone, the reserve margin is a simple average of reserve margins calculated using data from previous FCAs, and is held constant throughout the study period.

Using this reserve margin, the ROP LSR is calculated as follows:

$$ROP\ LSR\ = (RM + 1) * Gross\ \frac{90}{10}\ ROP\ Peak\ Load - Export\ Limit - BTMPV - EE - Tie\ Benefit$$

Where:

- **RM** is the reserve margin
- **EE** is past, present, and future energy efficiency measures at the time of peak demand
- **BTMPV** is projected behind-the-meter photovoltaic generation at the time of peak demand
- **Tie Benefits** represents all capacity tie benefits for this zone. This is drawn from FCA data.

Table 11 shows the Rest of Pool LSRs for the two export-constrained zones throughout the study period.

Table 11. ROP LSRs for Export-Constrained Zones

Zone	2025/26	2026/27	2027/28	2028/29	2029/30	2034/35	2039/40	2044/45	2049/50
All but ME	28,242	28,173	28,163	28,196	28,277	28,870	29,645	30,630	31,951
All but NNE	22,827	22,751	22,727	22,744	22,801	23,282	23,933	24,768	25,895

7.4: Contribution of Resources toward ICR

For resources listed in ISO-NE CELT 2022 Generator List as well as scheduled new additions, TCR used the Summer Cleared Capacity based on the results of FCA 16. Units reporting dynamic de-list capacity were assumed to contribute the sum of their cleared capacity and their delist capacity. Units with static de-lists were considered as retired or with reduced capacity contribution depending on the de-list MW relative to the nameplate MW.

For scheduled clean energy procurement additions that did not participate in FCA 12 through 16, as well as generic resources built by the capacity expansion model, TCR assumed their contribution to ICR based on its analysis of summer cleared capacities in FCA 16. TCR calculated the weighted average ICR contribution (ratio of summer/winter cleared capacity to SCC capacity from CELT) by technology and used this to estimate the capacity contribution for those future additions. Using SCC capacity, instead of nameplate capacity, as provided by CELT is how some capacity contributions can exceed 100%.

Table 12 below summarizes TCR assumptions of summer and winter capacity contributions.

Table 12. Assumed Summer and Winter Capacity Contributions

Technology	Contribution to Capacity - Summer	Contribution to Capacity - Winter
Combined Cycle Gas Turbine	91%	98%
Simple Cycle Frame Gas Turbines	92%	101%
Simple Cycle Aeroderivative	93%	116%
PV	21%	0%
PV (Behind the meter)	0%	0%
Onshore Wind	9%	18%
Offshore Wind	31%	61%
Conventional Hydro	100%	115%
Energy Storage (battery)	100%	100%
Biomass (Solid)	87%	88%
Biomass (Gas)	47%	44%

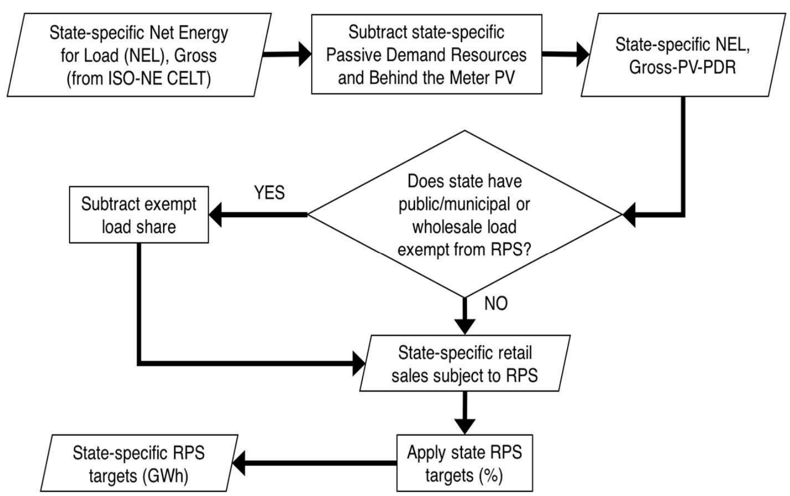
CHAPTER 8: Renewable Portfolio Standard (RPS) Requirements

This Chapter describes the forecast requirement for Class 1 RPS resources over the study period.

As described in Chapter 2, TCR configures the ENELYTIX Capacity Expansion Module to model Class 1 RPS requirements and resources for all New England states except Vermont, which does not have a Class 1 RPS requirement equivalent to those of the other five states. Over the study time horizon, TCR expects negligible interaction between secondary tiers and the Class 1 REC markets; only Class 1 requirements are modeled, therefore, in order to project new Class 1 eligible renewable additions and Massachusetts Class 1 REC prices.[8]

With the exception of Vermont, the eligibility criteria for Class 1 RPS programs in each of the New England states have a great deal of overlap, and the resulting high level of "fungibility" of new resources' environmental attributes creates a linkage among the Class 1 REC markets of the other five states. This means that they must all be modeled to project REC prices in each zone.

Figure 16 illustrates the process TCR used to determine state-specific Class 1 RPS energy targets by year for each of the five states.



8 The New Hampshire Class II (solar) requirement (0.3 percent of RPS-obligated load) has been added to our Class 1 requirement, given that the distributed solar resources likely to count toward it are included in the distributed PV forecast represented in the model.

Figure 16. Process Used to Project State-specific RPS Energy Targets

TCR projects RPS requirements using the following data:

- Projections of NEL from Chapter 5.
- Load share for load serving entities (LSEs) and certain wholesale load exempt from state RPS requirements.
- Annual RPS targets for each state[9], expressed as a percentage of sales to end-use customers for obligated (non-exempt) load-serving entities.

For a given state, the forecast requirement for Class 1 RPS energy is equal to the forecast load of LSEs obligated to comply with the RPS multiplied by the annual Class 1 RPS percentage target. The forecast load of LSEs obligated to comply with each RPS is equal to the Gross-PV-EE forecast of NEL by state, reduced by exempt load (Table 13).

Table 13. Exemptions from RPS Obligations

State	Percentage of Load Exempt from RPS Requirements
CT	6.9%
MA	13.7%
ME	7.6% 2027-2031, 6.7% post-2031%
NH	4.0%
RI	2.9%

TCR derives the shares of NEL exempt from RPS obligations used in its calculation from state RPS compliance reports, ISO-NE historical NEL data, and EIA data. Table 14 provides a full listing of projected New England RPS requirements.[10]

9 TCR models state RPS targets per regulations as of June 15, 2019. This does not include changes to the Maine RPS target "An Act to Reform Maine's Renewable Portfolio Standard," LD1494, passed on June 26, 2019 (http://legislature.maine.gov/legis/bills/display_ps.asp?PID=1456&snum=129&paper=&paperld=l&ld=1494) . Based on a review of the bill and its implications on the modeling assumptions, the Evaluation Team decided to exclude changes to the Maine RPS target due to uncertainties on implementation details.

10 Sources: (a) Load forecast sourced from the 2022 CELT Report; BTMPV netted from load forecast is extrapolated from ISO-NE Final 2022 PV Forecast, https://www.iso-ne.com/system-planning/system-plans-studies/celt. (b) Values based on RPS compliance reports, ISO-NE historical NEL data, EIA data, and data provided by MA DOER staff. ME values excludes exemption for PTDZ load after 2031, when that provision sunsets. (d) MA: MGL Ch. 25A, Section 11F, as amended by Chapter 8 of the Acts of 2021, Section 32. https://malegislature.gov/laws/generallaws/parti/titleii/chapter25a/section11f, https://malegislature.gov/Laws/SessionLaws/Acts/2021/Chapter8. CT: Connecticut Renewable Portfolio Standard, Connecticut Public Utilities Regulatory Authority. https://www.ct.gov/pura/cwp/view.asp?a=3354&q=415186 RI: RES Obligation Targets, by Compliance Year, for Both New and Existing Resources, Rhode Island Public Utilities Commission, http://www.ripuc.ri.gov/utilityinfo/RES-Annual-Targets.pdf. NH: SB 129, enacted July 2017. http://gencourt.state.nh.us/bill_status/billText.aspx?sy=2017&id=957&txtFormat=pdf&v=current. ME: Maine Renewable Portfolio Standard, Maine Public Utilities Commission. https://www.maine.gov/mpuc/electricity/RPSMain.htm.

Table 14. Projected RPS Requirements

(a) Net Energy for Load (NEL) Gross-PV-EE Forecast (GWh)													
	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
CT	29,687	29,938	30,110	30,413	30,792	31,354	31,815	32,331	32,886	33,460	34,001	34,544	35,024
MA	61,276	62,464	63,482	64,752	66,158	67,367	68,357	69,464	70,658	71,891	73,054	74,220	75,252
ME	12,922	13,382	13,843	14,376	14,958	15,231	15,455	15,705	15,975	16,254	16,517	16,781	17,014
NH	13,121	13,326	13,478	13,673	13,884	14,138	14,345	14,578	14,828	15,087	15,331	15,576	15,792
RI	8,266	8,413	8,547	8,726	8,933	9,096	9,230	9,379	9,541	9,707	9,864	10,022	10,161
(b) RPS-exempt load as a proportion of NEL													
	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
CT	6.9%	6.9%	6.9%	6.9%	6.9%	6.9%	6.9%	6.9%	6.9%	6.9%	6.9%	6.9%	6.9%
MA	13.7%	13.7%	13.7%	13.7%	13.7%	13.7%	13.7%	13.7%	13.7%	13.7%	13.7%	13.7%	13.7%
ME	7.6%	7.6%	7.6%	7.6%	7.6%	6.7%	6.7%	6.7%	6.7%	6.7%	6.7%	6.7%	6.7%
NH	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
RI	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%
(c) NEL Subject to RPS Obligations (GWh) = (a) x (1 - b)													
	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
CT	27,637	27,871	28,031	28,313	28,666	29,190	29,619	30,098	30,616	31,150	31,654	32,159	32,606
MA	52,869	53,894	54,772	55,868	57,081	58,123	58,978	59,933	60,963	62,027	63,030	64,036	64,927
ME	11,935	12,360	12,785	13,278	13,815	14,218	14,427	14,661	14,913	15,173	15,419	15,665	15,883
NH	12,598	12,795	12,941	13,128	13,331	13,574	13,774	13,997	14,238	14,486	14,720	14,955	15,163
RI	8,023	8,166	8,296	8,469	8,670	8,829	8,959	9,104	9,260	9,422	9,574	9,727	9,862
(d) Class 1 RPS Requirements (%) *													
	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
CT	34.0%	36.0%	38.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%
MA	33.0%	36.0%	39.0%	40.0%	41.0%	42.0%	43.0%	44.0%	45.0%	46.0%	47.0%	48.0%	49.0%
ME I	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
ME IA	27.0%	31.0%	35.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%
NH	15.7%	15.7%	15.7%	15.7%	15.7%	15.7%	15.7%	15.7%	15.7%	15.7%	15.7%	15.7%	15.7%
RI	48.0%	55.5%	63.5%	72.0%	81.0%	90.5%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
(e) Class 1 RPS Requirements (GWh) = (c) x (d)													
	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
CT	9,397	10,034	10,652	11,325	11,466	11,676	11,847	12,039	12,246	12,460	12,662	12,864	13,042
MA	17,447	19,402	21,361	22,347	23,403	24,412	25,360	26,370	27,433	28,532	29,624	30,737	31,814
ME I	1,193	1,236	1,279	1,328	1,382	1,422	1,443	1,466	1,491	1,517	1,542	1,566	6,353
ME IA	3,222	3,832	4,475	5,311	5,526	5,687	5,771	5,864	5,965	6,069	6,167	6,266	6,353
NH	1,978	2,009	2,032	2,061	2,093	2,131	2,162	2,198	2,235	2,274	2,311	2,348	2,381
RI	3,851	4,532	5,268	6,098	7,023	7,990	8,959	9,104	9,260	9,422	9,574	9,727	9,862

* NH Requirement includes Class II solar (0.7%)

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Table 14. Projected RPS Requirements (cont.)

(a) Net Energy for Load (NEL) Gross-PV-EE Forecast (GWh)													
	2040	**2041**	**2042**	**2043**	**2044**	**2045**	**2046**	**2047**	**2048**	**2049**	**2050**	**2051**	**2052**
CT	35,446	35,846	36,223	36,587	36,964	37,311	37,647	38,006	38,333	38,656	39,029	39,353	39,676
MA	76,157	77,016	77,827	78,609	79,420	80,165	80,886	81,658	82,359	83,054	83,855	84,552	85,245
ME	17,219	17,413	17,596	17,773	17,956	18,125	18,288	18,463	18,621	18,778	18,959	19,117	19,274
NH	15,982	16,163	16,333	16,497	16,667	16,824	16,975	17,137	17,284	17,430	17,598	17,744	17,890
RI	10,283	10,399	10,509	10,614	10,724	10,824	10,922	11,026	11,121	11,214	11,322	11,417	11,510
(b) RPS-exempt load as a proportion of NEL													
	2040	**2041**	**2042**	**2043**	**2044**	**2045**	**2046**	**2047**	**2048**	**2049**	**2050**	**2051**	**2052**
CT	6.9%	6.9%	6.9%	6.9%	6.9%	6.9%	6.9%	6.9%	6.9%	6.9%	6.9%	6.9%	6.9%
MA	13.7%	13.7%	13.7%	13.7%	13.7%	13.7%	13.7%	13.7%	13.7%	13.7%	13.7%	13.7%	13.7%
ME	6.7%	6.7%	6.7%	6.7%	6.7%	6.7%	6.7%	6.7%	6.7%	6.7%	6.7%	6.7%	6.7%
NH	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
RI	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%
(c) NEL Subject to RPS Obligations (GWh) = (a) x (1 - b)													
	2040	**2041**	**2042**	**2043**	**2044**	**2045**	**2046**	**2047**	**2048**	**2049**	**2050**	**2051**	**2052**
CT	32,998	33,371	33,722	34,061	34,412	34,735	35,048	35,382	35,686	35,987	36,334	36,636	36,936
MA	65,708	66,449	67,149	67,824	68,523	69,166	69,788	70,454	71,059	71,658	72,349	72,951	73,549
ME	16,074	16,255	16,426	16,591	16,762	16,920	17,072	17,235	17,383	17,529	17,698	17,846	17,992
NH	15,346	15,519	15,682	15,840	16,003	16,153	16,299	16,454	16,595	16,735	16,897	17,037	17,177
RI	9,981	10,093	10,200	10,302	10,408	10,506	10,601	10,702	10,794	10,885	10,990	11,081	11,172
(d) Class 1 RPS Requirements (%) *													
	2040	**2041**	**2042**	**2043**	**2044**	**2045**	**2046**	**2047**	**2048**	**2049**	**2050**	**2051**	**2052**
CT	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%
MA	50.0%	51.0%	52.0%	53.0%	54.0%	55.0%	56.0%	57.0%	58.0%	59.0%	60.0%	61.0%	62.0%
ME I	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
ME IA	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%
NH	15.7%	15.7%	15.7%	15.7%	15.7%	15.7%	15.7%	15.7%	15.7%	15.7%	15.7%	15.7%	15.7%
RI	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
(e) Class 1 RPS Requirements (GWh) = (c) x (d)													
	2040	**2041**	**2042**	**2043**	**2044**	**2045**	**2046**	**2047**	**2048**	**2049**	**2050**	**2051**	**2052**
CT	13,199	13,348	13,489	13,624	13,765	13,894	14,019	14,153	14,274	14,395	14,534	14,654	14,775
MA	32,854	33,889	34,917	35,947	37,002	38,041	39,081	40,159	41,214	42,278	43,409	44,500	45,600
ME I	1,607	1,625	1,643	1,659	1,676	1,692	1,707	1,723	1,738	1,753	1,770	1,785	1,799
ME IA	6,429	6,502	6,570	6,636	6,705	6,768	6,829	6,894	6,953	7,012	7,079	7,138	7,197
NH	2,409	2,436	2,462	2,487	2,512	2,536	2,559	2,583	2,605	2,627	2,653	2,675	2,697
RI	9,981	10,093	10,200	10,302	10,408	10,506	10,601	10,702	10,794	10,885	10,990	11,081	11,172

* NH Requirement includes Class II solar (0.7%)

8.1: Compliance

Retail electricity sellers are allowed to comply with the RPS with qualified clean energy generation or by paying an ACP.

TCR models the state-specific eligibility of resources based on generation type, size, vintage, and commercial operation date, as well as any special eligibility requirements such as those applicable to the eligibility of biomass units in certain pools. The ENELYTIX capacity expansion model ensures state RPS requirements are met through the most cost-effective combination existing eligible resources, new model build generic renewables, and through the payment of quantity capped ACPs.

By statute, Class 1 RPS ACPs for Rhode Island are indexed to inflation, so in our model they are held constant in real terms at their 2023 levels of $78.05. The Massachusetts value for 2023 is $40 per MWh and then held constant in nominal terms over the study period, which we deflate in real terms over the study period. Similarly, the ACPs in Connecticut and Maine ACP are fixed in nominal terms at $40 and $50 per MWh respectively in 2023, which we deflate in real terms over the study period. New Hampshire's ACP, currently $60.17 per MWh, increases at half the rate of inflation, so for modeling purposes we deflate it in real terms at half the assumed rate of inflation.

Resources located outside ISO-NE provide RECs used to comply with Class 1 RPS obligations in each of the states. TCR assumes that RECs imported into ISO-NE to comply with Class 1 RPS requirements remain constant throughout the study time horizon. TCR estimates the imports, based upon the most recent public data available from state RPS compliance reports and the NEPOOL GIS, to be 2,400 GWh.

CHAPTER 9: Massachusetts Carbon Emission Regulations and Clean Energy Standard

The RI OSW RFP Base Case uses two regulations affecting the electric sector promulgated on August 11, 2017. These are regulation 310 CMR 7.74, a cap on carbon emissions from EGUs located in MA which was re-promulgated without change in December 2020, and regulation 310 CMR 7.75, the CES.

9.1: Cap on Carbon Emissions, Regulation 310 CMR 7.74

The regulation imposes an annual physical cap on CO_2 emissions from EGUs located in the Commonwealth of Massachusetts. EGUs are classed as either *New Facilities* or *Existing Facilities*, with separate specific caps on aggregate emissions applicable to EGUs in each category, plus an aggregate cap on emissions from all EGUs (i.e., aggregate cap). Individual EGUs are allowed to use "over-compliance credits" in order to comply with their unit specific limits. Table 15 presents the limits for new and existing EGUs for select years. The sum of these is the aggregate limit.[11]

Table 15. Aggregate Limits in Select Years, 2025-2040

Year	Aggregate GHG Emissions Limit	Existing Facility Aggregate GHG Emissions Limit	New Facility Aggregate GHG Emissions Limit
2025	7,523,279	6,023,279	1,500,000
2026	7,295,301	6,095,301	1,200,000
2027	7,067,323	5,904,823	1,162,500
2028	6,839,345	5,714,345	1,125,000
2029	6,611,366	5,523,866	1,087,500
2030	6,383,388	5,333,388	1,050,000
. . .	(- 2.5% of 2018 /yr)		
2035	5,243,497	4,380,997	862,500
2040	4,103,607	3,428,607	675,000
2045	2,963,716	2,476,216	487,500

11 Massachusetts Department of Environmental Protection, "BACKGROUND DOCUMENT ON PROPOSED NEW AND AMENDED REGULATIONS: 310 CMR 7.00 and 310 CMR 60.00 Air Pollution Control for Stationary and Mobile Sources," December 16, 2016. Table 15 is reproduced from Table 3 in this report.

Year	Aggregate GHG Emissions Limit	Existing Facility Aggregate GHG Emissions Limit	New Facility Aggregate GHG Emissions Limit
2050	1,823,825	1,523,825	300,000
2051	1,823,825	1,523,825	300,000
2052	1,823,825	1,523,825	300,000

The rule defines *New Facilities* as EGUs located in Massachusetts that have less than 10 years operational history as well as those that are scheduled for commissioning during the 2018 – 2025 time period.

Table 16 lists the *Existing Facilities* that are subject to the Existing Facility cap according to Table 4 in the DEP December document.[12]

Table 16. Facility Limits as % of Total Cap

Facility Name	2013-2015 Average Generation (MWh)	% of Total Generation
ANP Bellingham Energy Company, LLC	2,238,927	12%
ANP Blackstone Energy Company, LLC	2,049,400	11%
Bellingham	507,609	3%
Berkshire Power	1,137,483	6%
Canal Station	265,266	1%
Cleary Flood	131,311	1%
Dartmouth Power	125,833	1%
Deer Island Treatment	2,584	0%
Dighton	859,904	4%
Fore River Energy Center	3,236,599	17%
Kendall Square	1,219,559	6%
MASSPOWER	791,485	4%
Medway Station	4,172	0%
Milford Power, LLC	387,564	2%
Millennium Power Partners	1,723,289	9%
Mystic	3,945,784	21%
Pittsfield Generating	208,106	1%
Potter (Braintree Electric)	63,569	0%
Stony Brook	179,176	1%

12 Ibid, p. 39.

Facility Name	2013-2015 Average Generation (MWh)	% of Total Generation
Tanner Street Generation	95,400	0%
Waters River	4,131	0%
West Springfield	39,933	0%

9.2: Clean Energy Standard, Regulation 310 CMR 7.75

The regulation requires retail electricity sellers, excluding Municipal Light Plants (MLPs), to procure CECs or pay the Clean Energy Standard (CES) ACP. The affected retail electricity sellers are investor-owned distribution companies providing standard offer service and competitive energy suppliers. CECs are denominated in megawatt hours (MWh). The quantity of CECs that sellers are required to use to satisfy their obligations each year is a specified percentage of their electricity sales, expressed in MWh. Table 17 presents our forecast of CES requirements over the study period. This forecast is based on the NEL (Gross-PV-EE) from Chapter 5, and an assumption regarding CES-exempt load.

9.2.1: Compliance

Retail electricity sellers are allowed to comply with the CES using RPS Class 1 RECs, using CECs from DEP-qualified new clean energy generation, or by paying an ACP. By statute, the CES ACP is set at $40 per MWh 2023 and is assumed to deflate in real terms through 2052. The rule contains provisions specifying resource eligibility and banking of CECs. Under the CES, eligible imports from new clean energy generation from Canada must be imported through a dedicated transmission line with a commercial operation date after 2017.

Table 17. CES Requirements, 2027 to 2052[13]

	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
(a) Net Energy for Load (NEL) Forecast for MA (GWh)	61,276	62,464	63,482	64,752	66,158	67,367	68,357	69,464	70,658	71,891	73,054	74,220	75,252
(b) CES- and RPS-exempt load as a proportion of NEL (%)	13.7%	13.70%	13.7%	13.7%	13.7%	13.7%	13.7%	13.7%	13.7%	13.7%	13.7%	13.7%	13.7%
(c) NEL Subject to CES and RPS Obligations (GWh) = (a) x (1 - b)	52,869	53,894	54,772	55,868	57,081	58,123	58,978	59,933	60,963	62,027	63,030	64,036	64,927
(d) CES Requirements (%)	34.0%	36.0%	38.0%	40.0%	42.0%	44.0%	46.0%	48.0%	50.0%	52.0%	54.0%	56.0%	58.0%
(e) CES Requirements (GWh) = (c) x (d)	17,975	19,402	20,813	22,347	23,974	25,574	27,130	28,768	30,482	32,254	34,036	35,860	37,657
(f) MA Class 1 RPS Requirements (%)	33.0%	36.0%	39.0%	40.0%	41.0%	42.0%	43.0%	44.0%	45.0%	46.0%	47.0%	48.0%	49.0%
(g) MA Class 1 RPS Requirements (GWh) = (c) x (f)	17,447	19,402	21,361	22,347	23,403	24,412	25,360	26,370	27,433	28,532	29,624	30,737	31,814
(h) CES Incremental to RPS (%) = max[(d)-(f), 0]	1.0%	0.0%	0.0%	0.0%	1.0%	2.0%	3.0%	4.0%	5.0%	6.0%	7.0%	8.0%	9.0%
(i) CES Incremental to RPS (GWh) = max[(e)-(g), 0]	529	0	-	0	571	1,162	1,769	2,397	3,048	3,722	4,412	5,123	5,843
	2040	**2041**	**2042**	**2043**	**2044**	**2045**	**2046**	**2047**	**2048**	**2049**	**2050**	**2051**	**2052**
(a) Net Energy for Load (NEL) Forecast for MA (GWh)	76,157	77,016	77,827	78,609	79,420	80,165	80,886	81,658	82,359	83,054	83,855	84,552	85,245
(b) CES- and RPS-exempt load as a proportion of NEL (%)	13.7%	13.7%	13.7%	13.7%	13.7%	13.7%	13.7%	13.7%	13.7%	13.7%	13.7%	13.7%	13.7%
(c) NEL Subject to CES and RPS Obligations (GWh) = (a) x (1 - b)	65,708	66,449	67,149	67,824	68,523	69,166	69,788	70,454	71,059	71,658	72,349	72,951	73,549
(d) CES Requirements (%)	60.0%	62.0%	64.0%	66.0%	68.0%	70.0%	72.0%	74.0%	76.0%	78.0%	80.0%	80.0%	80.0%
(e) CES Requirements (GWh) = (c) x (d)	39,425	41,198	42,975	44,764	46,595	48,416	50,247	52,136	54,005	55,894	57,879	58,361	58,839
(f) MA Class 1 RPS Requirements (%)	50.0%	51.0%	52.0%	53.0%	54.0%	55.0%	56.0%	57.0%	58.0%	59.0%	60.0%	61.0%	62.0%
(g) MA Class 1 RPS Requirements (GWh) = (c) x (f)	32,854	33,889	34,917	35,947	37,002	38,041	39,081	40,159	41,214	42,278	43,409	44,500	45,600
(h) CES Incremental to RPS (%) = max[(d)-(f), 0]	10.0%	11.0%	12.0%	13.0%	14.0%	15.0%	16.0%	17.0%	18.0%	19.0%	20.0%	19.0%	18.0%
(i) CES Incremental to RPS (GWh) = max[(e)-(g), 0]	6,571	7,309	8,058	8,817	9,593	10,375	11,166	11,977	12,791	13,615	14,470	13,861	13,239

13 Sources: (a) Load forecast sourced from "Energy Pathways to Deep Decarbonization, A Technical Report of the Massachusetts 2050 Decarbonization Roadmap Study," (December 2020), as cited in "Massachusetts Decarbonization Roadmap," December 2020; represents load growth of the Pipeline Gas scenario. https://www.mass.gov/doc/energy-pathways-for-deep-decarbonization-report/download. BTMPV netted from load forecast is extrapolated from ISO-NE Final 2021 PV Forecast, https://www.iso-ne.com/static-assets/documents/2021/03/final_2021_pv_forecast.pdf; (b) Based on ISO-NE historical NEL data, EIA data, and data provided by MA DOER staff for 2019. Includes exempt municipal load (14.2% of retail sales, 13.4% of NEL) and exempt wholesale load (large exempt end users). (d) 310 CMR 7.75 Clean Energy Standard. https://www.mass.gov/doc/310-cmr-775-clean-energy-standard-amendments-july-2020/download (f) MGL Ch. 25A, Section 11F, as amended by Chapter 8 of the Acts of 2021, Section 32. https://malegislature.gov/laws/generallaws/parti/titleii/chapter25a/section11f, https://malegislature.gov/Laws/SessionLaws/Acts/2021/Chapter8.

CHAPTER 10: Generation Mix

10.1: Existing Generation Capacity

TCR uses the existing generating units listed in the ISO-NE 2021 CELT Report, tab 2.1, Generator list.[14]

10.2: Scheduled Retirements

Table 18 summarizes the ISO-NE approved scheduled retirements. TCR obtains this list of retirements from the ISO-NE Retirement Tracker and cross-references these retirements against S&P Global's data services.[15] The Salem Harbor plant is also assumed to retire in 2050 based on the settlement agreement between the plant owners and the Conservation Law Foundation.[16]

Table 18. ISO-NE Approved Capacity Retirements

CELT Asset ID	Name	Energy Area	Generation/ Fuel Type	Summer Capacity (MW)	Retire Date
Retirements Per ISO-NE retirement Tracker					
538	PINETREE POWER	WCMA	ST	15	6/1/2023
572/573/574/575	SO. MEADOW 11 - 14	CT	IC/GT	146	6/1/2023
1478/1616	MYSTIC 8, 9	NMABO	CC	1413	6/1/2024
556	SCHILLER 4	NH	Coal	48	6/1/2024
395	DOREEN	WCMA	IC/GT	17	6/1/2025
515	NORWICH JET	CT	IC/GT	15	6/1/2025
540	POTTER 2 CC	SEMA	CC	72	6/1/2025
557/558	SCHILLER 5, 6	NH	Coal	48	6/1/2025
580/581	SO. MEADOW 5, 6	CT	ST	30	6/1/2025
630	WEST SPRINGFIELD 10	WCMA	IC/GT	17	6/1/2025
1693	WEST SPRINGFIELD GT-1	WCMA	IC/GT	39	6/1/2025
1694	WEST SPRINGFIELD GT-2	WCMA	IC/GT	41	6/1/2025
628	WOODLAND ROAD	WCMA	IC/GT	20	6/1/2025
Long Term Nuclear Retirements [17]					
484	MILLSTONE POINT 2	CT	NUC	864	7/1/2035
485	MILLSTONE POINT 3	CT	NUC	1206	11/1/2045

14 https://www.iso-ne.com/static-assets/documents/2021/04/2021_celt_report.xlsx

15 https://www.iso-ne.com/static-assets/documents/2016/08/retirement_tracker_external.xlsx

16 https://www.clf.org/wp-content/uploads/2014/02/Final-Settlement-Agreement-2_18_20142.pdf. The retirement of the unit is also accompanied by an emissions cap starting at 2,279,530 tons/year in 2025 declining to 528,874 tons/year in 2049.

17 Nuclear unit licenses for both Millstone Point and Seabrook in ISONE were extended indefinitely.

CELT Asset ID	Name	Energy Area	Generation/ Fuel Type	Summer Capacity (MW)	Retire Date
555	SEABROOK	NH	NUC	1248	3/1/2050
Assumption-Based Retirements					
48695/48696	SALEM 5,6	NMABO	CC	675	1/1/2050

10.3: Scheduled Additions

TCR included near term generator additions based on recently signed or awarded Clean Energy Procurements, using information provided by the EDCs. In addition, TCR included units having cleared the Forward Capacity Auctions 13-16, covering additions from 2022 through 2025.

10.3.1: Near Term Class 1 Renewable Resource Additions

TCR assumes addition of renewable generation projects selected under recent clean energy RFPs that are contracted to commence operation after 2022. Table 19 summarizes the procurements whose contracted additions are included in the model.[18]

Table 19. Additions from New England Clean Energy RFP

Program Detail	Technology	Approximate Nameplate Capacity (MW)
Additions with signed contracts		
CT Small Scale RFP (2017)	PV, Wind	240
Tri-state RFP (2017)	PV, Wind	330
MA 83D (2017/18)149	Hydro	1090
MA 83C I (2018/19)	Offshore Wind	800
CT Clean Energy RFP (2018)	Fuel Cell, Offshore Wind	252
RI ACES (RW400) (2019)	Offshore Wind	400
CT Zero Carbon RFP (2018/19)	PV, Offshore Wind	248
MA 83C II (2019/20)	Offshore Wind	804
RI LTCS (Procurements from 2013 - 2019)	Biomass, Hydro, Wind, Offshore Wind	149[19]
CT OSW Procurement I (2020/21)	Offshore Wind	804
ME RPS 1A RFP I (2020)	PV, Wind, Hydro, Biomass	546
ME RPS 1A RFP II (2021)	PV, Wind, Hydro, Biomass	422
MA 83C III (2021/22)	Offshore Wind	400[20]

18 Details of individual contracts were provided to TCR by RIE and are not reported due to confidentiality.

19 RI LTCS contracted for 50WM of Gravel Pit Solar in 2018, but that contract was later voided. Gravel Pit Solar is not included here.

20 Due to uncertainties in the development of the 1.2 GW commonwealth wind project, the Evaluation team decided to not include that project as part of the 83C III procurement.

Program Detail	Technology	Approximate Nameplate Capacity (MW)
Northern ME REDP (2022)	Wind	1000
Future Procurement Targets Included		
MA 83C Future procurement [21]	Offshore Wind	3,600

10.3.2: Capacity Additions Based on the Forward Capacity Auction (FCA)

Table 20 summarizes projected near-term new generation additions which are greater than 10 MW and have cleared the latest Forward Capacity Auction (FCA) completed as of June 2021.[22,23]

Table 20. Scheduled Individual Generation Capacity Additions (>10 MW)

Resource ID	FCA Name	Energy Area	Type	Summer ICAP (MW)	In Effect / COD
38692	MMWEC Simple Cycle Gas Turbine	NMABO	IC/GT	135	6/1/2021
40732	Three Corners Solar	ME	PV	110	6/1/2022
40912	South Portland BESS	ME	ES	10	6/1/2023
40883	KCE CT 1	CT	ES	200	6/1/2024
41573	Milford Grid, LLC	CT	ES	200	6/1/2024
41566	Great Lakes Millinocket	ME	ES	20	6/1/2024
40919	Resource Cross Town	ME	ES	175	6/1/2024
40666	Cranberry Point Battery Energy Storage	SEMA	ES	150	6/1/2024
40915	Medway Grid, LLC	SEMA	ES	250	6/1/2024
44404	Oxford Energy Center, LLC	CT	ES	20	6/1/2025
44330	Berlin Renewable BES	NH	ES	14	6/1/2025
44284	Fore River Battery Storage	SEMA	ES	40	6/1/2025
44442	Wendell Energy Storage	WCMA	ES	100	6/1/2025
44374	Westover Energy Storage	WCMA	ES	100	6/1/2025
44206	Black Hill Solar	CT	PV	18	6/1/2025
41563	Gravel Pit Solar 1	CT	PV	120	6/1/2025
44207	Montville Solar	CT	PV	20	6/1/2025
44286	Glenvale - Emery	ME	PV	25	6/1/2025
44205	Keay Brook Solar	ME	PV	20	6/1/2025
44208	Chariot Solar LLC	NH	PV	50	6/1/2025
44204	Tilton Heights Solar	NH	PV	20	6/1/2025
44213	Kearsarge Smithfield	RI	PV	12	6/1/2025
41025	Douglas PV	SEMA	PV	13	6/1/2025
41001	Spring Street Renewables	SEMA	PV	13	6/1/2025

21 The Future MA offshore wind procurement reflects the incremental offshore wind that is required to be procured to meet the states 2030 offshore wind procurement target of 5.6 GW. This includes 1.2 GW of offshore wind that was excluded from the 83C III procurement. The model assumes three 1,200 MW tranches of generic offshore wind that distribute load across the NMABO, SEMA, RI and CT load centers and are assumed to come online in 2030, 2031 and 2032 respectively.

22 https://irtt.iso-ne.com/reports/external

23 https://www.iso-ne.com/isoexpress/web/reports/auctions/-/tree/fcm-auction-results

Resource ID	FCA Name	Energy Area	Type	Summer ICAP (MW)	In Effect / COD
44317	Ameresco - Hampden Landfill	WCMA	PV	10	6/1/2025
44128	Conway Solar2	WCMA	PV	12	6/1/2025
41406	Rear Somers PV	WCMA	PV	10	6/1/2025

**Units < 10 MW are not shown in the table (In total, 278 MW Energy Storage and 165 MW Solar PV)*

10.3.3: Distributed PV Resources

Because distributed PV development is largely driven by policies other than the Class 1 RPS requirements—such as the Solar Massachusetts Renewable Target ("SMART") and the Small Scale Renewable Energy Growth and Renewable Energy Fund programs in Rhode Island—TCR uses the 2022 CELT Report to project distributed PV additions, rather than add them using the Capacity Expansion model in response to the market.[24] All distributed PV generation additions through 2031 in the ISO-NE PV Forecast are assumed in the Base Case to come to fruition. TCR forecasted distributed PV for the remainder of the study horizon by extrapolating the ISO-NE PV Forecast using a curve fit.

The forecast breaks PV into two types—behind the meter (BTMPV) and non-BTM distributed PV. Non-BTM PV are allowed to provide energy and capacity, whereas BTMPV can only provide energy. Non-BTM PV resources are assumed to provide a contribution to ICR at a level equal to the contribution factor assumed for PV resources. In representing the Massachusetts RPS rules in the Capacity Expansion module, TCR assumes that all distributed PV energy can count against or reduce the Class 1 RPS requirement.[25] TCR assumes distributed PV in Vermont counts toward the Vermont Distributed Generation (Tier 1) requirement (not represented in our model), and do not allow it to count toward Class 1 requirements elsewhere.

10.4: Capacity Expansion Generation Additions

The capacity expansion module chooses from a predefined list of potential future generation resources to satisfy resource adequacy and environmental constraints. There are two categories of generation resources that can be added by the capacity expansion module. The first category includes the fossil-fuel based conventional sources of generation that are built in discrete increments based on the size and attributes of the reference unit. The second category includes variable renewable resources such as wind and photovoltaic that the model can build in varying size increments up to their resource potential. Additionally, the capacity expansion module can add battery storage.

10.4.1: Cost assumptions for Capacity Expansion Model Generic Additions

10.4.1.1: Capital Cost Assumptions

24 ISO New England Final 2022 PV Forecast, April 28th, 2022 ("ISO-NE PV Forecast"). The PV forecast includes detailed estimates of installations in each state, developed in conjunction with those states. The projected new entry is primarily policy-driven, but includes a post-policy component; both components embody explicit realization rates that vary over the period.

25 Reducing the requirement (as in the Solar Carve-outs) or being counted toward it (as in the SMART program) are effectively the same thing from a modeling perspective.

Table 21 below summarizes the potential resource types that TCR has available in its capacity expansion model. The capacities indicated for variable resources are for reference only, and additional performance characteristics of thermal units are described in Table 26 of this report.

- Generic fossil fuel resource additions include dual-fuel capable combined cycle and simple cycle gas turbine generating units. For these technologies, TCR relies on unit characteristics and cost assumptions as specified in the Concentric Energy Advisors' (CEA) report prepared for ISO-NE; filed with FERC in support of its application for the FCA16 parameters.[26] Table 21 presents capital and operating cost assumptions for generic market-driven fossil resource additions.
- Nuclear additions are not allowed to be built by the capacity expansion model.
- Generic renewable resources include behind-the-meter and utility-scale PV, onshore and offshore wind, run-of-the-river hydropower, and biopower resources. The costs for some of these technologies were included in the ISO-NE study which were benchmarked against costs available from the EIA Annual Energy Outlook 2021 cost assumptions[27] and NRELs ATB 2020[28]. Costs not available from the ISO-NE study were sourced from EIA, and if those were not available, from NREL.
- Generic 4-hour battery storage is allowed to be built by the capacity expansion model without a cap on the available potential.

26 https://www.iso-ne.com/static-assets/documents/2021/02/a02_mc_2021_02_24_cea_adendum.docx

27 https://www.eia.gov/outlooks/aeo/assumptions/pdf/table_8.2.pdf

28 https://atb.nrel.gov/electricity/2020/data.php

Table 21. Potential Resource Additions

Resource Category	Technology Details	Source of Cost	Capacity (MW)	Heat Rate (BTU/kWh)	Overnight Capital Cost (2023$/kW)	Fixed O&M (2023$/kW-year)	Variable O&M (2023$/MWh)
Combined Cycle Gas Turbine	GE 7HA.02 Single shaft with Duct Firing	ISONE CONE and ORTP	557	5,796	$1,115	$64	$4
Simple Cycle Frame Gas Turbines	GE 7HA.02	ISONE CONE and ORTP	376	8,168	$884	$41	$5
Simple Cycle Aeroderivative	GE LM6000PF+	ISONE CONE and ORTP	98	8,679	$2,288	$87	$5
Biomass (solid)	50-MW Biomass Plant Bubbling Fluidized Bed	EIA Cost Assumptions	44	13,500	$5,917	$172	$5
Biomass (Gas)	Landfill Gas 4 x 5.6 MW	EIA Cost Assumptions	18	8,513	$1,971	$23	$6
Hydro	Conventional Hydropower	NREL	211	-	$8,184	$51	$0
PV	20 MW Fixed Mount in New England	ISONE CONE and ORTP	20	-	$1,245	$15	$0
PV	Distributed Residential Fixed tilt roof mounted	NREL	0.005	-	$1,842	$29	$0
Wind	82.5 MW Vestas V150-5.6MW Turbines; Central New Hampshire	ISONE CONE and ORTP	82.5	-	$2,446	$35	$0
Offshore Wind	800 MW; MA Offshore Wind Lease Area	ISONE CONE and ORTP	800	-	$6,249	$129	$0
Energy Storage	85% round trip efficiency	NREL	50	-	$1,445	$36	$0

10.4.1.2: Impact of PTC / ITC on costs

The impact of both the Production Tax Credit (PTC) and Investment Tax Credit (ITC) are captured in the input assumptions and reflected in the ENELYTIX model. These provisions have been updated to capture the changes implemented in the 2022 Inflation Reduction Act (IRA)[29].

The IRA broadens the coverage of PTCs and ITCs to include additional technologies, such as PTC coverage to solar, and extends them through 2024[30], beyond which they are effectively replaced by Clean Energy Production Tax Credits (CEPTC) and Clean Energy Investment Tax Credits (CEITC) respectively. The replacement credits extend the provisions to other zero-emission carbon technologies as well and introduce different tiers of credits based on the entity meeting specific criteria. CEPTC and CEITC are assumed to phase out starting 2033, reducing to 75% of the credit for that year, 50% in the following year and 0% thereafter.

Resources may opt for either PTC/CEPTC or ITC/CEITC, but not both. TCR assumes that the credits will be at base levels of 30% credit for ITC/CEITC and 2.7 ¢/kWh (in real 2023$) for PTC/CEPTC. The value of PTC credit is based on inflating the 1.5 ¢/kWh in 1992 dollars based on the guidelines published by the IRS.[31]

Based on an analysis of the reductions in Levelized Cost of Energy (LCOE), TCR assumes that PV, offshore wind, storage and hydro resources opt for ITC while biofuel resources and onshore wind opt for PTC. The capacity expansion model includes the impact of the ITC as a direct reduction in the capital cost. The cost reduction of the PTC is capitalized in the capacity expansion model and included as a direct credit in the E&AS model.

Table 22 provides a summary of the applicable PTC/ITC assumptions used in the model. TCR assumes a lead time between the construction start date and COD of each technology based on review of lead times assumed by NREL and EIA.

Table 22. Summary of modeled PTC/CEPTC and ITC /CEITC provisions

Construction Year	PV Utility and rooftop			Wind (onshore)			Wind (offshore)		
	ITC	PTC	COD Assumed	ITC	PTC	COD Assumed	ITC	PTC	COD Assumed
2022	30.0%	2.7	2024	30.0%	2.7	2025	30.0%	2.7	2026
2023	30.0%	2.7	2025	30.0%	2.7	2026	30.0%	2.7	2027
2024	30.0%	2.7	2026	30.0%	2.7	2027	30.0%	2.7	2028
2025	30.0%	2.7	2027	30.0%	2.7	2028	30.0%	2.7	2029
2026	30.0%	2.7	2028	30.0%	2.7	2029	30.0%	2.7	2030
2027	30.0%	2.7	2029	30.0%	2.7	2030	30.0%	2.7	2031
2028	30.0%	2.7	2030	30.0%	2.7	2031	30.0%	2.7	2032
2029	30.0%	2.7	2031	30.0%	2.7	2032	30.0%	2.7	2033

29 https://www.whitehouse.gov/cleanenergy/inflation-reduction-act-guidebook/

30 Year reflects construction start date.

31 Federal Register :: Credit for Renewable Electricity Production and Publication of Inflation Adjustment Factor and Reference Price for Calendar Year 2022; Correction

2030	30.0%	2.7	2032	30.0%	2.7	2033	30.0%	2.7	2034
2031	30.0%	2.7	2033	30.0%	2.7	2034	30.0%	2.7	2035
2032	30.0%	2.7	2034	30.0%	2.7	2035	30.0%	2.7	2036
2033	22.5%	2.0	2035	22.5%	2.0	2036	22.5%	2.0	2037
2034	15.0%	1.3	2036	15.0%	1.3	2037	15.0%	1.3	2038
2035 & Later	0.0%	0.0	2037 onward	0.0%	0.0	2038 onward	0.0%	0.0	2039 onward
Construction time (years)	2			3			4		

Construction Year	**Biofuel**			**Hydro**			**Energy Storage**		
	ITC	**PTC**	**COD Assumed**	**ITC**	**PTC**	**COD Assumed**	**ITC**	**PTC**	**COD Assumed**
2022	N/A	N/A	2025	N/A	N/A	2026	N/A	N/A	2024
2023	N/A	N/A	2026	N/A	N/A	2027	N/A	N/A	2025
2024	N/A	N/A	2027	N/A	N/A	2028	N/A	N/A	2026
2025	30.0%	2.7	2028	30.0%	2.7	2029	30.0%	N/A	2027
2026	30.0%	2.7	2029	30.0%	2.7	2030	30.0%	N/A	2028
2027	30.0%	2.7	2030	30.0%	2.7	2031	30.0%	N/A	2029
2028	30.0%	2.7	2031	30.0%	2.7	2032	30.0%	N/A	2030
2029	30.0%	2.7	2032	30.0%	2.7	2033	30.0%	N/A	2031
2030	30.0%	2.7	2033	30.0%	2.7	2034	30.0%	N/A	2032
2031	30.0%	2.7	2034	30.0%	2.7	2035	30.0%	N/A	2033
2032	30.0%	2.7	2035	30.0%	2.7	2036	30.0%	N/A	2034
2033	22.5%	2.0	2036	22.5%	2.0	2037	22.5%	N/A	2035
2034	15.0%	1.3	2037	15.0%	1.3	2038	15.0%	N/A	2036
2035 & Later	0.0%	0.0	2038 onward	0.0%	0.0	2039 onward	0.0%	N/A	2037 onward
Construction time (years)	3			4			2		

10.4.1.3: Financial Assumptions for Generic Resource Additions

The Base Case uses common financing assumptions for all market-driven unit additions, both fossil fuel and renewable. These assumptions include a 20-year financing period, and a real after-tax weighted average cost of capital (WACC) of 6.0%. The WACC is based on the results of an analysis by Concentric Energy Advisors prepared for ISO New England, which assumes uncontracted merchant development, and is based on costs of equity and debt that are commensurate with a merchant project's perceived risks of cost recovery in the market, which are higher than those of a project whose revenues are contracted under a PPA.[32] The use of a WACC based on merchant rather than contracted development reflects the Base Case assumption that only merchant development will be possible

32 ISO-NE CONE and ORTP Analysis. Concentric Energy Advisors. Prepared for ISO New England, January 13, 2017, p. 48.

because the market will not bring about the development of resources with long-term PPAs in the absence of mandated procurements such as 83C.

10.4.2: Maximum Resource Potentials

10.4.2.1: Fossil-Fuel Generator Additions

For thermal generation additions, TCR assumes that new buildable capacity in each area is approximately two times the current installed thermal capacity in that area. TCR assumes that each zone has access to at least one thermal unit of each fossil fuel technology type listed in Table 21 and models multiple units of each in order to meet the zone's target requirement.

Table 23: Technical Potential for Installed Thermal Capacity by Resource Type and State (MW)

Zone	Combined Cycle Gas Turbine	Simple Cycle Frame Gas Turbines	Simple Cycle Aeroderivative	Biomass (solid)	Biomass (Gas)
CT	10,026	6,768	1,764	44	18
ME	3,342	2,256	588	130	9
NH	4,456	3,008	784	54	10
NMABO	557	376	98	43	22
RI	0	0	0	13	6
SEMA	5,013	3,384	882	17	7
VT	557	376	98	28	4
WCMA	2,228	1,504	392	25	12
ISONE Total	*26,179*	*17,672*	*4,606*	*354*	*88*

10.4.2.2: Renewable Generator Additions

TCR relies on NREL assessments of renewable resource potentials and uses data available on NREL's geospatial toolkits and associated publications to establish upper limits on various model-built variable resources for each energy area within the ISO-NE footprint.

Using NREL's Wind[33] and PV Supply Curves[34] data, TCR was able to obtain granular county level data to aggregate potentials by energy areas. The methodologies for calculating potentials are described below:

- **Onshore wind and photovoltaic**: potentials for onshore wind and PV are obtained from NREL's respective Supply Curves datasets. This data included three distinctions for each potential, ranging from 'Limited Access', representing the most restrictive siting constraints for wind or PV, to 'Open Access', representing the least restrictive siting constraints. The datasets were

33 NREL Wind Supply Curves data. https://www.nrel.gov/gis/wind-supply-curves.html

34 NREL PV Supply Curves data. https://www.nrel.gov/gis/solar-supply-curves.html

comprised of locational data along with site capacities (MW) and capacity factors. Using the data from the 'Limited Access' case, the potential capacities by site were aggregated to obtain potentials by energy area.

- **Rooftop PV:** potentials are obtained from NRELs Solar For All Toolkit[35] which provides an estimate of annual energy that may be obtained through rooftop PV installations by county. Annual energy is converted to nameplate capacity using energy area-specific capacity factors to obtain nameplate potential for rooftop PV. Finally, the rooftop PV potential is reduced by the quantity of rooftop PV already existing in the ISO-NE model.
- **Offshore wind and Hydropower**: potentials for offshore wind and hydropower by state are obtained from NREL's GIS-based technical potential study[36].

  For offshore wind, TCR assumed distributions of state potentials to each of the energy areas proportionate to the length of the coastlines. The offshore wind potentials are reduced by the quantity of existing offshore wind in the ISO-NE model.

  For Hydropower, TCR assumed similar distributions of state potentials to each of the energy areas proportionate to their approximate footprints. Since the assessment of Hydropower potential is on a site-specific basis it is assumed to already account for hydropower that has already been built.
- **Biopower**: potentials for biogas and biomass are obtained from NREL's biopower geospatial toolkit[37] which provides annual estimates of tons per year of biomass and biogas resources by county. Conversion factors to annual energy and nameplate capacity are available within the toolkit to obtain the nameplate potential for biomass and biogas resources.

Table 24 provides the final modeled resource potentials for variable resources by ISO-NE energy area.

Table 24. Technical Potential for Installed Renewable Capacity by Resource Type and State (MW)

Zone	Rooftop PV	Hydro	Biogas	Offshore Wind	Utility PV	Biomass	Onshore Wind
CT	3,890	211	8,550	14,342	40,542	44	2,887
ME	1,588	894	2,853	294,836	839,220	130	53,311
NH	1,500	397	3,802	6,912	65,718	54	10,439
NMABO	4,985	62	3,340	129,006	20,145	43	150
RI	1,082	14	1,902	41,930	22,440	13	217
SEMA	1,621	61	4,273	239,146	49,741	17	671
VT	797	835	478	-	51,990	28	17,967
WCMA	1,849	150	1,908	-	31,257	25	3,995
ISONE Total	*17,312*	*2,624*	*27,106*	*726,172*	*1,121,053*	*354*	*89,637*

35 Solar for All Data Explorer. https://maps.nrel.gov/solar-for-all/?aL=0&bL=clight&cE=0&lR=0&mC=38.870832155646326%2C-98.34521484375001&zL=5

36 U.S. Renewable Energy Technical Potentials: A GIS Study. https://www.nrel.gov/docs/fy12osti/51946.pdf

37 Biopower Atlas. https://maps.nrel.gov/biopower/?aL=wyQpUn%255Bv%255D%3Dt&bL=clight&cE=0&lR=0&mC=40.21244%2C-91.625976&zL=4

10.5: Capacity Expansion Unit Retirement

Over the study period, ENELYTIX analyzes the economics of existing thermal units to determine whether their projected revenues compared to their projected variable operating costs justifies retiring any of those units. The ENELYTIX capacity expansion optimization algorithm evaluates the trade-off between the need to keep the generating unit online to meet resource adequacy requirements against making an investment into another generating unit to satisfy environmental constraints and/or producing energy at lower operating cost.

CHAPTER 11: Generating Unit Operating Characteristics

11.1: Generator Aggregation

To optimize model computation time, TCR aggregates all units below 20 MWs by type, fuel, and load zone into a smaller set of units. Full load heat rates for the aggregates are calculated as the capacity-weighted average of the individual units and all other parameters are inherited from the unit type.

11.2: Thermal Unit Characteristics

Thermal generation characteristics are generally determined by a generator's technology and fuel type. These characteristics include heat rate curve shape, non-fuel operation and maintenance costs, startup costs, forced and planned outage rates, minimum up and down times, and quick start, regulation and spinning reserve capabilities.

TCR developed generator outage and heat rate data from information by similar unit type as obtained from both the North American Electric Reliability Corporation (NERC) Generating Availability Report and power industry data provided by S&P Global.

Each thermal unit type has a distinct normalized incremental heat rate curve. The normalized heat rate curve is scaled by the full load heat rate (FLHR) to produce unit specific heat curve. Table 25 summarizes the shape of normalized heat rate curves used in ENELYTIX.

Table 25. Normalized Incremental Heat Rate Curve

Unit Type	Blocks (Total)	Block	Capacity Range (% of Max)	Heat Rate (% of FLHR)
CT	1	1	100%	100%
CC	4	1	50%	113%
		2	51% ~ 67%	75%
		3	68% ~ 83%	86%
		4	84% ~ 100%	100%
ST (Coal)	4	1	0% ~ 50%	106%
		2	51% ~ 65%	90%
		3	66% ~ 95%	95%
		4	96% ~ 100%	100%
ST (Other)	4	1	25%	118%
		2	26% ~ 50%	90%
		3	51% ~ 80%	95%
		4	81% ~ 100%	100%

As an example, for a 500 MW CC with a 7,000 Btu/KWh FLHR, the minimum load block would be its minimum generation of 250 MW at a heat rate of 7,910 Btu/KWh, the 2nd incremental block would be 251 MW ~ 335 MW at a heat rate of 5,250 Btu/KWh, the 3rd increment would be 336 MW ~ 415 MW at a heat rate of 6,020 Btu/KWh, and the final block would be 416 MW ~ 500 MW at a heat rate of 7,000 Btu/KWh.

Table 26 summarizes other operating parameter assumptions by unit type for thermal generators. The abbreviations in the unit type column are structured as follows: First 2-3 characters identify the technology type, the next 1-2 characters identify the fuel used (**g**as, **o**il, **c**oal, **b**iomass, **r**efuse) and the numbers identify the size of generating units mapped to that type.

Table 26. Other Thermal Unit Operating Parameters by Unit Type

Unit Type	Min On Time (Hr)	Min Off Time (Hr)	EFORd (%)	VOM ($/MWh)	Startup Cost Cold ($/MW-start)
CCg100 (0-100MW)	6	8	4.29	2.5	35
CCg100+ (100-9999MW)	6	8	4.29	2.5	35
CCgo100 (0-100MW)	6	8	4.29	2.5	35
CCgo100+ (100-9999MW)	6	8	4.29	2.5	35
Cco+ (0-9999MW)	6	8	8.58	2.5	35
CCr+ (0-500MW)	1	1	4.29	2.5	35
GTb20 (0-20MW)	1	1	11.28	10	--
GTg20 (0-20MW)	1	1	18.6	10	--
GTg50 (20-50MW)	1	1	12.97	10	--
GTgo20 (0-20MW)	1	1	18.6	10	--
GTgo50 (20-50MW)	1	1	12.97	10	--
GTgo50+ (50-9999MW)	1	1	9.29	10	--
GTo20 (0-20MW)	1	1	18.6	10	--
GTo50 (20-50MW)	1	1	12.97	10	--
GTo50+ (50-9999MW)	1	1	9.29	10	--
GTo20 (0-20MW)	1	1	18.6	10	--
GTo50 (20-50MW)	1	1	12.97	10	--
GTr20 (0-20MW)	1	1	11.28	10	--
ICb+ (0-500MW)	1	1	11.63	10	--
ICg20 (0-20MW)	1	1	21.16	10	--
ICg50+ (50-500MW)	1	1	11.54	10	--
ICgo20 (0-20MW)	1	1	21.16	10	--
ICgo50 (20-50MW)	1	1	11.54	10	--
ICgo50 + (50-500MW)	1	1	11.54	10	--
ICo20 (0-20MW)	1	1	21.16	10	--
ICo50+ (50-500MW)	1	1	11.54	10	--
ICog20 (20-50MW)	1	1	11.54	10	--
ICo50 (0-50MW)	1	1	11.54	10	--
ICr+ (0-500MW)	1	1	11.63	2	--
NUC-BWR1000MW+	164	164	2.19	0	90
NUC-BWR(800-1000MW)	164	164	1.66	0	90

Unit Type	Min On Time (Hr)	Min Off Time (Hr)	EFORd (%)	VOM ($/MWh)	Startup Cost Cold ($/MW-start)
NUC-BWR(400-799MW)	164	164	3.27	0	90
NUC-PWR1000MW+	164	164	4.02	0	90
NUC-PWR(400-799MW)	164	164	3.02	0	90
STb+ (0-500MW)	10	8	10.26	0	35
STc100 (0-100MW)	24	12	8.32	5	45
STc250 (100-250MW)	24	12	6.47	4	45
STc600 (250-600MW)	24	12	7.83	3	45
STg100 (0-100MW)	10	8	10.34	6	40
STg200 (100-200MW)	10	8	8.42	5	40
STg600 (200-600MW)	10	8	8.35	4	40
STgo100 (0-100MW)	10	8	10.34	6	40
STgo200 (100-200MW)	10	8	8.42	5	40
STgo600 (200-600MW)	10	8	8.35	4	40
STo100 (0-100MW)	10	8	10.34	6	40
STo200 (100-200MW)	10	8	8.42	5	40
STo600 (200-600MW)	10	8	8.35	4	40
STo600+ (600-9999MW)	10	8	14.55	3	40
STr+ (0-500MW)	10	8	10.26	2	40

11.2.1: Nuclear Unit Operating Characteristics

Nuclear plants are modeled as special thermal units in ENELYTIX. In general, nuclear facilities are treated as must run units and assumed to run except for periods during generator maintenance and forced outage. Current refueling schedules are obtained from roadtech.com[38]. Future schedules are estimated per specified periodicity.

11.3: Hydro Electric Generator Characteristics

TCR models hydro electric generators as energy constrained generators that output energy in relation to daily pattern of water flow, i.e. the minimum and maximum generating capability and the total energy for each plant. TCR obtains historic hydro generation MWh from the EIA and the S&P Global database. Based on this historic information, TCR develops daily maximum energy output for each hydro power plant in ISO-NE. Subject to this maximum energy output constraint, TCR allows ENELYTIX® to optimize hourly energy output of each hydro electric generator to minimize system-wide production costs in each hour of the day.

11.4: Pumped Hydro Storage Facilities

38 https://www.roadtechs.com/shutdown/shutdown.php?region=n

TCR models pumped storage with the following specifications obtained from the National Hydroelectric Power Resource Study prepared for the U.S. Army Engineer Institute of Water Resources.

- Max Storage: Unit Capacity * Number of Storage hours
- Min Storage: 10% of Max Storage
- Min MW: Pumping Capacity
- Efficiency: Annual Output/Annual Pumping Energy

11.5: Wind Facilities

Wind generation is represented as hourly generation profile in ENELYTIX®. TCR assembles wind generation profiles from the National Renewable Energy Laboratory (NREL)'s Wind Integration National Dataset (WIND) Toolkit dataset based on 2012 weather data.[39] TCR maps each wind power plant to the nearest NREL site based on the plant's location. For wind plants with known historic capacity factor, TCR further screens for NREL wind sites that have capacity factor within delta of 2% from historical average capacity factor inside a 50-mile radius range from the plant's location. The resulting normalized NREL site schedule is scaled to the installed capacity of the corresponding wind site and then calendar-shifted for each forecast year making it synchronized with load profiles and interchange schedules.

11.6: Solar Photovoltaics Facilities

Like wind facilities, photovoltaic (PV) generators are also represented as hourly generation profiles in ENELYTIX®. TCR obtains solar irradiation data from the weather station closest to a PV generator's location and uses NREL's PVWatts® Calculator to estimate the site's energy production. TCR assumes all utility scale PV facilities are fixed array installations with characteristics summarized in Table 27.

Table 27. Photovoltaic Parameter Assumptions

PV Parameter	Assumption
Elevation (m)	5
Module Type	Standard
Array Type	Fixed (Open Rack)
Array Tilt (deg)	20
Array Azimuth (deg)	180
System Losses (%)	14
Invert Efficiency (%)	96

39 https://www.nrel.gov/grid/wind-toolkit.html

CHAPTER 12: Fuel Prices

12.1: Natural Gas Prices

12.1.1: Spot Gas Prices in New England

TCR obtained a monthly spot gas price forecast for natural gas market hubs from Wood Mackenzie.[40] However, a proper modeling of price diversity among gas-fired generators serving ISO-NE requires forecasts for more hubs than are provided in the Wood Mackenzie outlook. To extend the Wood Mackenzie forecast to the required hubs, TCR obtained historic spot price data for each relevant hub for the past 5 years. Using historic spot price data, for each relevant hub in the ISO-NE region TCR identified the highest price-correlated hub which had a Wood Mackenzie forecast and calculated a percentage difference in the historic spot price between the two hubs.

The projections of natural gas spot prices at each market hub equals the Wood Mackenzie projection of Henry Hub price plus the Wood Mackenzie projection of monthly basis differential to each market hub from the Henry Hub. For hubs with no Wood Mackenzie forecast, the spot price equals the projection at the highest-correlated hub with a Wood Mackenzie forecast, multiplied by the percentage difference in price between the hubs from the historic spot price data. Forecasted ISO-NE market hub and Henry Hub prices are shown in Figure 17.

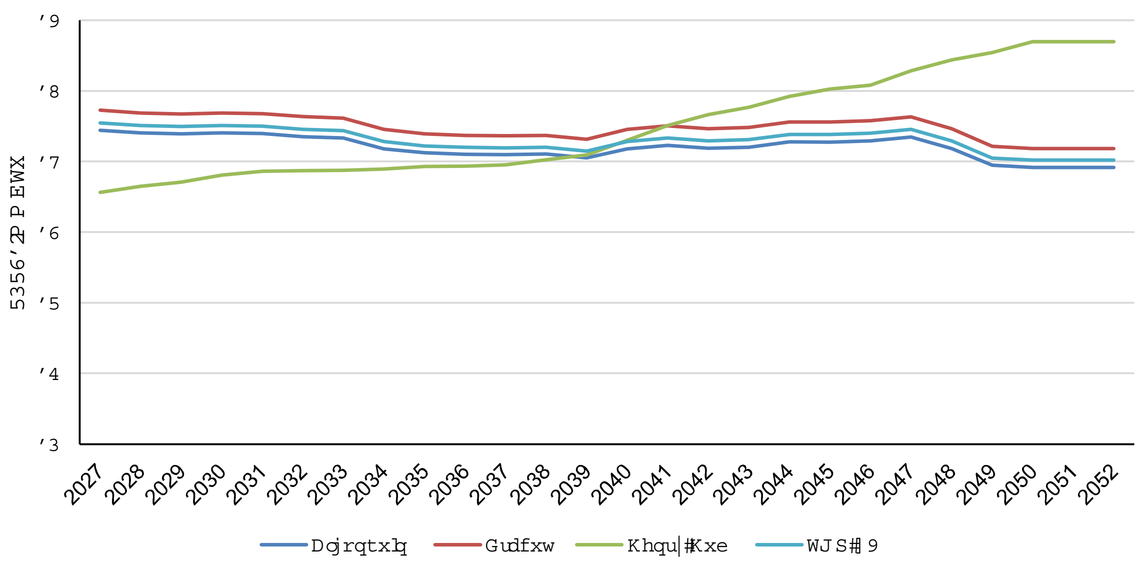

Figure 17. TCR Forecasted Yearly Spot Natural Gas Prices in ISO-NE ($2023/MMBTU)

40 North America gas 2021 outlook to 2050. Wood Mackenzie

Figure 18 shows the TCR forecast of monthly spot prices at natural hubs serving ISO-NE. This figure indicates that the forecast of gas prices to electric generating units shows significant variation between winter months and summer months.

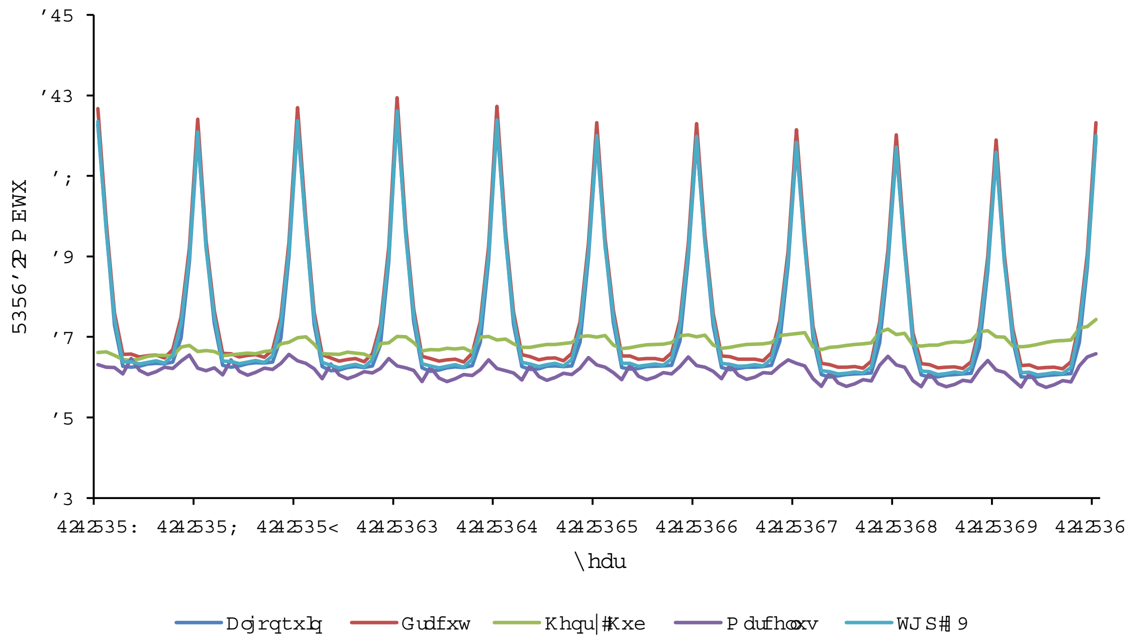

Figure 18. TCR Forecasted Monthly Spot Natural Gas Prices in ISO-NE ($2023/MMBTU)

12.1.2: Natural Gas Price Adders

TCR adds plant level fuel prices adders for all natural gas fired power plants based on each power plants' supplier type (pipeline connected vs. LDC served) and unit type (baseload units vs peaking units). These adders are shown in Table 28.

Table 28. Natural Gas Power Plant Fuel Adders ($/MMBtu)

Unit Type	Directly Connected to Pipeline	Served by LDC
Baseload Units	0.05	0.2
Peaking Units	0.15	0.4

12.2: Prices of Distillate and Residual Fuel Oil for Electric Generation in New England.

TCR obtained annual crude oil projections from Wood Mackenzie's North America gas 2021 outlook to 2050.[41] In order to extend these projections to distillate (No. 2) and residual (No. 6) fuel oil, TCR used historic fuel prices obtained from the EIA. TCR calculated price ratios between the fuel oils and crude oil using a five-year historical monthly average for the daily spot prices for crude oil (Cushing, OK WTI) and No. 2 heating oil (NY Harbor spot price), and the monthly U.S. Residual Fuel Oil wholesale price.

The projections for No. 2 fuel oil (FO2) and No. 6 fuel oil (FO6) equal the Wood Mackenzie forecast for crude oil multiplied by the historic price ratios. The projection of fuel oil prices is shown in Figure 19.

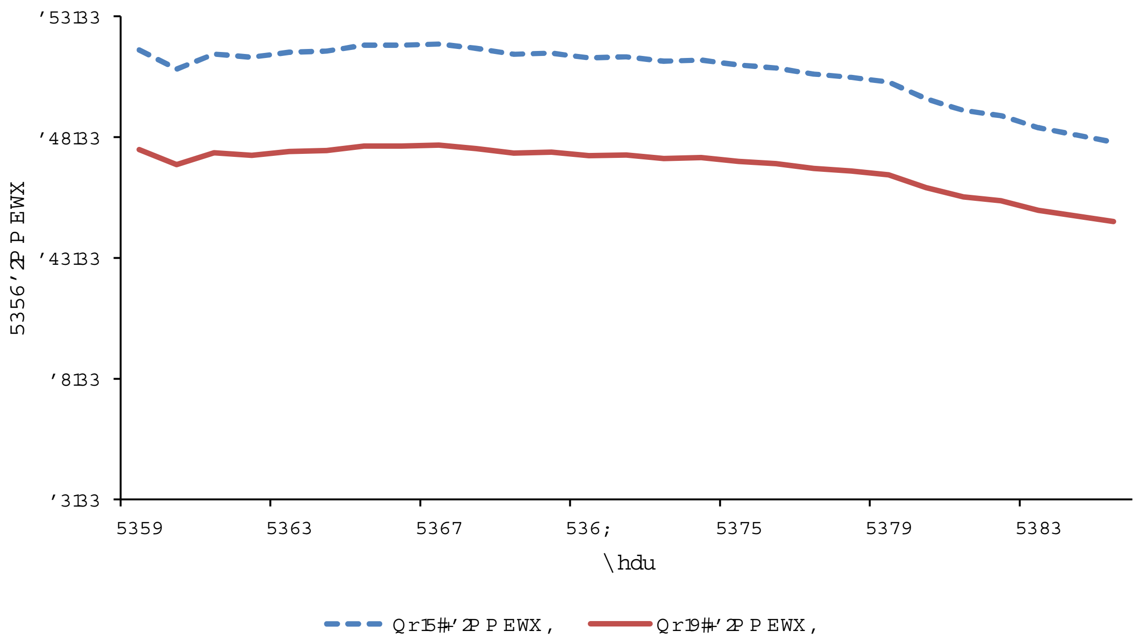

Figure 19. TCR Projection of Fuel Oil Price ($2023/MMBTU)

12.3: Winter Fuel Switching for Dual Fuel Generators

Due to limited pipeline capacity, New England sees spikes in the spot price of natural gas during extreme winter days resulting in dual-fuel generators switch from natural gas to fuel oil with resulting implications on prices and emissions during those periods.

TCR models dual-fuel generators in the system and imposes an incremental constraint daily gas burn limit that is designed to replicate the effect of fuel switching occurring in the winter months of December through February. This gas burn limit was calibrated specifically for the model, taking into account various factors, including an analysis of historical winter fuel prices, historical limits on fuel

41 North America gas gas 2021 outlook to 2050. Wood Mackenzie

supply in the winter months, and a target 30-day limit on number of days in each year that generators can operate on fuel oil.

Based on review of the above, and results of the ENELYTIX model, the Evaluation Team decided to impose a dynamic limit of gas burn that would result in a fuel switch frequency of approximately 30 days over the study period. The figure below illustrates the gas burn limits that are imposed in the model

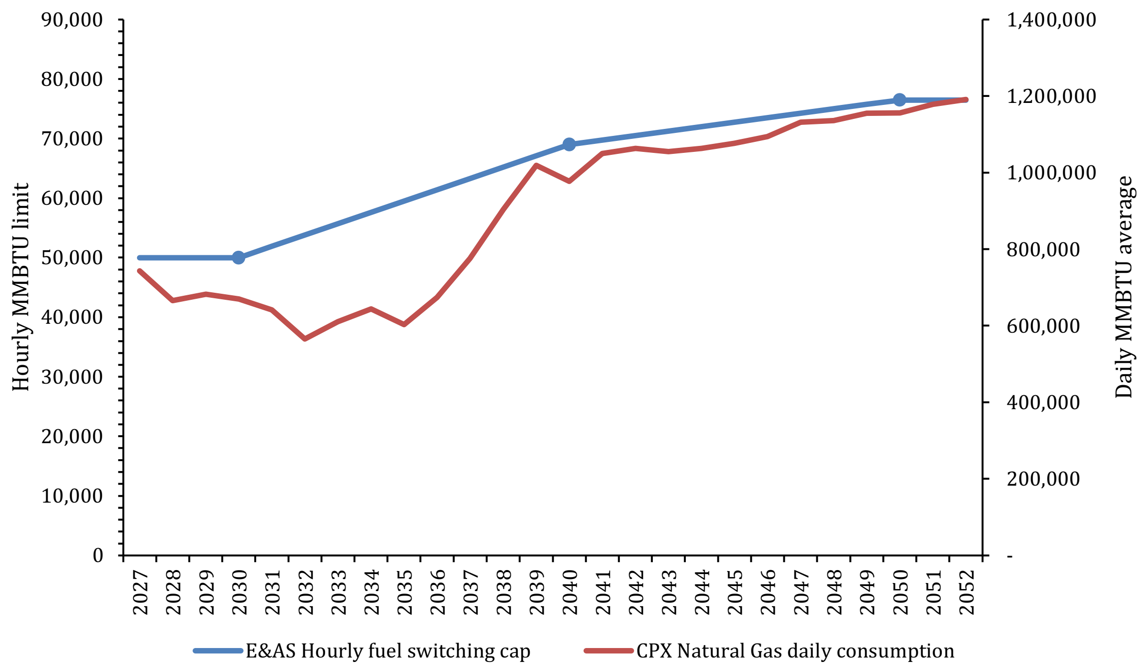

Figure 20: Natural Gas and Fuel Oil fuel switching limit

12.4: Uranium Prices

TCR develops uranium prices using the pricing calculator created by the Bulletin of the Atomic Scientist[42]. The calculator estimates the cost of electricity assuming the nuclear fuel cycle is "Once-Through". TCR omits all capital related cost associated with the cost of electricity from the calculator. The resulting uranium price is 0.99 Nominal $/MMBtu, which TCR assumed to be fixed.

12.5: Coal Prices

TCR develops plant level coal price from S&P Global's power plant operations data base. TCR derives coal cost in $/MMBtu by dividing S&P Global reported annual cost of coal delivered ($/ton) by annual

42 http://thebulletin.org/nuclear-fuel-cycle-cost-calculator/model

average heat content of coal burned (Btu/lbs.). Based on this method, TCR calculates the exact coal cost for plants where data is available. For plants without sufficient data, TCR assumes the average cost from other coal plants in the same area and/or state.

TCR developed coal cost for this project using coal price data by plant from S&P Global Services and converted said prices to real 2021$/MMBtu. TCR assumes the prices reported in will remain at those levels over the study period. Table 29 shows the prices used for the three coal units present in the ISO-NE Base Case during the 2027-2050 study period.

Table 29. Base Case Coal Prices in ISO-NE

Unit	Price (2023$/MMBTU)
MERRIMACK 1	$4.51
MERRIMACK 2	$4.51
ND PAPER	$2.30

CHAPTER 13: Emission Rates

13.1: Emission Rates

TCR obtains generator unit level emission rates from three sources: S&P Global's historic unit emissions data base, S&P Global's simulated Generator Supply Curve (GSC) data base and EIA's generic future unit characteristics. For existing thermal units, TCR uses S&P Global's historic emission rates. For existing units without historic data, TCR uses GSC emissions data. Finally, for existing units without historic and GSC data, and future units not yet operating, TCR uses EIA's generic rates.

13.2: Regional Greenhouse Gas Initiative (RGGI)

All states in ISO-NE participate in the Regional Greenhouse Gas Initiative (RGGI). TCR developed its RGGI CO_2 allowance price assumptions based on the Wood Mackenzie 2022 gas outlook to 2050, which includes a RGGI price forecast.[43] Figure 21 plots the Base Case RGGI price assumption.

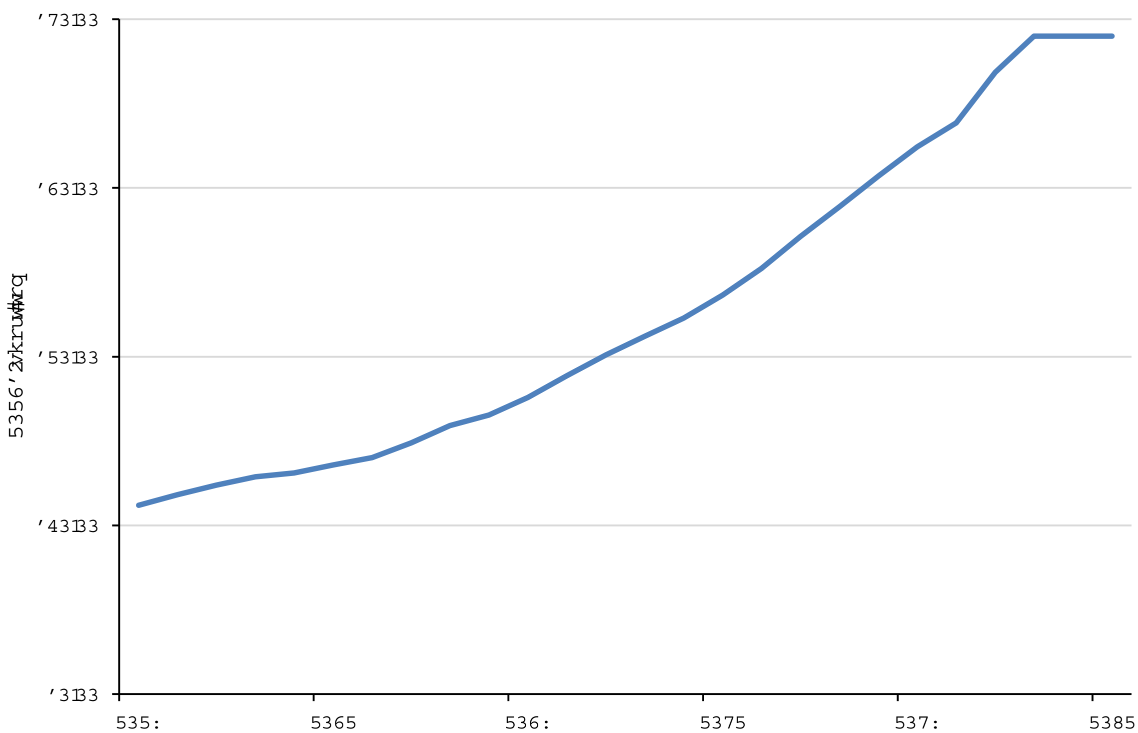

Figure 21. RGGI Price Projection, 2027-2052 (2023$/short ton)

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43 North America gas gas 2021 outlook to 2050. Wood Mackenzie

13.3: NOx and SO_2

TCR assumed allowance prices of zero for NOx and SO_2 emissions. The Federal Cross State Air Pollution Rule (CSAPR) establishes NO_x and SO_2 emission limits, and no New England state has emission limits under CSAPR. Therefore, CSAPR allowance prices are not applicable to New England generators.

SO_2. With the retirement of Brayton Point, SO_2 emissions in New England have dropped to levels near zero and correspondingly we assume zero value for SO_2 allowances for the applicable state acid rain programs.

NOx. In accordance with Governor Baker's Executive Order 562 and to meet federal Clean Air Act requirements, MA DEP in August 2016 proposed to replace the Massachusetts Clean Air Interstate Rule (310 CMR 7.32) with a new Ozone Season Nitrogen Oxides Control (310 CMR 7.34). The rule was intended to meet a 2017 (and beyond) budget for NO_x emissions from large fossil-fuel-fired electric power and steam generating units during the ozone season (May 1st through September 30th). The proposed Massachusetts Ozone Season NO_x budget is 1,799 tons. NOx ozone season emissions from all sources have been decreasing, and over the past five years have ranged between 975 and 1,620 tons. As a result, we ascribe zero value to NO_x allowances in Massachusetts.

On September 9, 2016, US EPA approved a State Implementation Plan revision submitted by Connecticut. This revision continues to allow facilities to create and/or use emission credits using NO_x Emission Trading and Agreement Orders (TAOs) to comply with the NO_x emission limits required by RCSA section 22a-174-22 (Control of Nitrogen Oxides), which imposes emissions rate limits on generators. It is possible that under this rule NO_x DERCs, or allowances, will have value to certain individual generators. Lacking evidence of a liquid market or visible pricing for such allowances in Connecticut, we are assuming their value to be zero.

GLOSSARY

TERM	Definition
ACP	Alternative Compliance Payments
ADR	Active Demand Response
AEO	Annual Energy Outlook
AESC	Avoided Energy Supply Cost
ALG	Algonquin
ATB (NREL)	Annual Technology Baseline
BIO	Biomass
BMPV/ BTMPV	Behind-the-meter Photovoltaic
Btu	British Thermal Unit
CC	Combined Cycle
CEA	Concentric Energy Advisors
CEC	Clean Energy Credits
CECP	Clean Energy and Climate Plan
CEII	Critical Energy Infrastructure Information
CELT	Capacity, Energy, Loads, and Transmission
CES	Clean Energy Standard
CMR	Code of Massachusetts Regulations
COD	Commercial Operation/Online Date
CSAPR	Cross-State Air Pollutions Rule
CT	Combustion Turbine
CT PURA	Connecticut Public Utilities Regulatory Authority
DA	Day-ahead
DER	Distributed Energy Resources
DERC	Discrete Emission Reduction Credits
DFO/NO. 2	Distillate Fuel Oil
DOER	Massachusetts Department of Energy Resources
DPU	Department of Public Utilities
E&AS	Energy and Ancillary Services
EDC	Electric Distribution Company
EE	Energy Efficiency
EEA	Energy and Environmental Affairs
EFORd	Effective Forced Outage Rates
EGU	Electric Generating Units
EIA	Energy Information Administration
eNodes	Electrical Nodes
EPA	Environmental Protection Agency
FCA	Forward Capacity Auction
FCM	Forward Capacity Market
FERC	Federal Energy Regulatory Commission
FLHR	Full Load Heat Rate
FO2	Fuel Oil #2

TERM	Definition
FO6	Fuel Oil #6
GCR	Generating Capacity Requirement
GHG	Greenhouse Gas
GIS	Geographic Information System
GSC	Generator Supply Curve
GT	Gas Turbine
GWSA	Global Warming Solutions Act
HD	Hydro Power
HVDC	High Voltage Direct Current
IC	Internal Combustion (reciprocating) Engine
ICAP	Installed Capacity
ICR	Installed Capacity Requirements
ISONE	Independent System Operator of New England
ITC	Investment Tax Credit
Kirchhoff's laws	The current law and the voltage law
LDC	Load Distribution Company
LMP	Locational Marginal Price
LSE	Load Serving Entity
LSR	Local Sourcing Requirement
MA DEP	Massachusetts Department of Environmental Protection
MCL	Maximum Capacity Limit
MinRsv	Minimum Reserve
MIP	Mixed Integer Programming
MLP	Municipal Light Plant
MMBtu	Metric Million British Thermal Unit
MMD	Market Model Database
MWh	Megawatt-hour
NECEC	New England Clean Energy Connect
NEL	Net Energy Load
NEPOOL GIS	New England Power Pool Generation Information System
NERC	North American Electric Reliability Corporation
NG	Natural Gas
NOx DERCs	Nitrogen Oxide Discrete Emission Reduction Credit
NREL	National Renewable Energy Laboratory
NYISO	New York Independent System Operator
OP4	Voltage Reduction Relief, calculated by ISONE for each FCA
PDR	Passive Demand Response
PME	Power Market Explorer
PPA	Power Purchase Agreement
PSH	Pumped Storage Hydro Unit
PSO	Power System Optimizer
PTC	Production Tax Credit
PV	Photovoltaic

TERM	Definition
PVWatts®	NREL's PV Calculator
RCSA	Regulations of Connecticut State Agencies
REC	Renewable Energy Certificate, Renewable Energy Credit
REV	Renewable Energy Potential (reV) Model
RFO/NO. 6	Residual Fuel Oil; see FO6
RFP	Requests for Proposal
RGGI	Regional Greenhouse Gas Initiative
RM	Reserve Margin
RMR	Reliability Must Run
ROP	Rest of Pool
RoR Hydro	Run-of-the-River Hydropower
RPS	Renewable Portfolio Standard
RT	Real-time
SCED	Security Constrained Economic Dispatch
SCUC	Security Constrained Unit Commitment
SENE	Southeast New England
SMART	Solar Massachusetts Renewable Target
ST	Steam Turbine
SUN	Solar Powered
TAO	Trading and Agreement Orders
TARA tool	Transmission Adequacy & Reliability Assessment tool
TMNSR	Ten-Minute Non-Spinning Reserve
TMOR	Thirty-Minute Operating Reserve
TMSR	Ten-Minute Spinning Reserve
US EPA	United States Environmental Protection Agency
VOM	Variable Operation & Maintenance
WACC	Weighted average cost of capital
WAT	Water
WIND (NREL)	Wind Integration National Dataset
WT	Wind Turbine

APPENDIX A: ENELYTIX

This Appendix describes the computer model and analytical capability TCR uses to support the evaluation of 83C II Proposed Clean Energy Projects.

A.1: ENELYTIX® and Power System Optimizer (PSO)

ENELYTIX®[44] is a cloud based energy market simulation environment implemented on Amazon EC2 commercial cloud.

A central element of ENELYTIX is the Power System Optimizer ("PSO"), an advanced simulator of power markets. PSO provides ENELYTIX the capability to accurately model the decision processes used in a wide range of power planning and market structures including long-term system expansion, capacity markets, Day-ahead energy markets and Real-time energy markets. ENELYTIX has this capability because it can configure PSO to determine the optimum solution to each market structure. Figure A-1 illustrates the four key components of the PSO analytical structure: Inputs, Models, Algorithms and Outputs.

As a system expansion optimization model, PSO integrates resource adequacy requirements with the specific design of the capacity market and with the environmental compliance policies, such as state-level and regional Renewable Portfolio Standards (RPS) and emission constraints.

As a production cost model, PSO is built on a Mixed Integer Programming (MIP) based unit commitment and economic dispatch structure that simulates the operation of the electric power system. PSO determines the security-constrained commitment and dispatch of each modeled generating unit, the loading of each element of the transmission system, and the locational marginal price (LMP) for each generator and load area. PSO supports both hourly and sub hourly timescales. In this project, the PSO is set up to model unit commitment (DA market) and an economic dispatch (RT market). In the commitment process, generating units in a region are turned on or kept on in order for the system to have enough generating capacity available to meet the expected peak load and required operating reserves in the region for the next day. PSO then uses the set of committed units to dispatch the system on an hourly real-time basis, whereby committed units throughout the modeled footprint are operated between their minimum and maximum operating points to minimize total production costs. The unit commitment in PSO is formulated as a mixed integer linear programming optimization problem which is solved to the true optima using the commercial CPLEX solver.

As an FCM Capacity Market Model, PSO is configured to simulate the outcome of the ISO-NE's Forward Capacity Auction subject to market specific rules and parameters develop projections of capacity prices.

44 ENELYTIX® is a registered trademark of Newton Energy Group, LLC.f

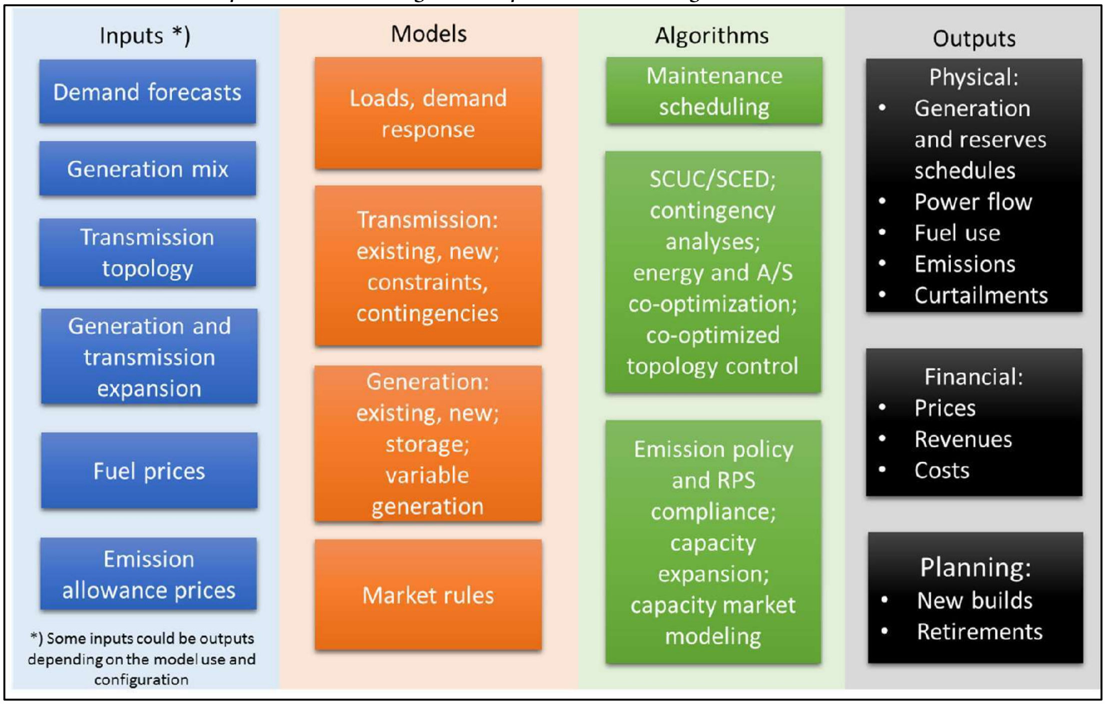

Figure A-1. Analytical Structure of PSO

The ENELYTIX/PSO modeling environment provides a realistic, objective and highly defendable analyses of the physical and financial performance of power systems, in particular power systems integrating variable renewable resources. The critical advantage of PSO over traditional production costing modeling tools is its ability to model the concurrent dynamics of:

- uncertainty of future conditions of the power system;
- the scope, physical capabilities and economics of options available to the system operator to respond to these uncertain conditions;
- the timing and optionality or irreversibility of operator's decisions to exercise these options.

By capturing these concurrent dynamics, ENELYTIX/PSO avoids the generally recognized inability of traditional simulation tools to reflect the effect of operational decisions on the physics of the power system, price formation and financial performance of physical and financial assets.

A.1.1: Modeling the Impact of Uncertainty

System operators deal with a number of uncertainties in the data they use for their day-ahead decisions that ultimately impact operations and prices in the real-time market. These uncertainties typically include differences between forecast and actual load; forecast and actual output of variable generation; and forecast versus actual generation and transmission outages.

ENELYTIX/PSO offers the most realistic representation of the impact of those uncertainties between day-ahead decisions and real-time dispatch. ENELYTIX/PSO provides information, data structures and algorithms necessary for the realistic representation of these uncertainties including different load shapes and wind patterns for modeling the Day-ahead and Real-time markets. It also has embedded methods for incorporating forecast errors if explicit forecasts are not available, and model representation of time points at which the system becomes aware of generator outages.

System operators' options for responding to these uncertainties include (1) generation commitment decisions based on day-ahead and intra-day reliability assessments, (2) forward-looking procurement of ancillary services and (3) deployment of reserves when uncertainty is realized. ENELYTIX/PSO provides unique capabilities to model the process by which system operators rely on these options. The model allows the user to specify the decision timing and (at each decision point) to determine classes of decisions that are still provisional and can be revisited at a later stage, and classes of decisions that are final and therefore irreversible. These capabilities are critical for an accurate representation of forward commitments, actual dispatch decisions, curtailments, emergence of scarcity events and corresponding price formation. The ENELYTIX/PSO represents these concurrent dynamics through the use of the decision cycle logic and rolling horizon optimization.

A.1.2: ENELYTIX modeling architecture

ENELYTIX provides the advanced modeling features of PSO and the scalability of cloud computing. With the ENELYTIX cloud-based architecture, TCR can generate, simulate and post process a large number of Cases in a matter of hours. What we can turn around in an hour competing models require 10 days.

Figure A-2 illustrates the ENELYTIX architecture. This figure highlights the system services that support parallel processing of simulation projects. As shown in that figure, a Project consists of Tasks. Each Task is a collection of Cases, and each Case is partitioned into Segments which could be processed in parallel. In ENELYTIX, implementation of a Task *is a single-click* experience. Once the Task is launched, it invokes a process in which all user requested Cases are generated at once out of the Market Model Database (MMD) pre-populated with model data. Cases are formed by specifying alternative versions of inputs (e.g. alternative supply options or portfolios of such options, load forecast, new entry and retirement assumptions or fuel price sensitivities, types and requirements for ancillary services and myriads of other alternatives the user may need to explore and compare against each other within the same task).

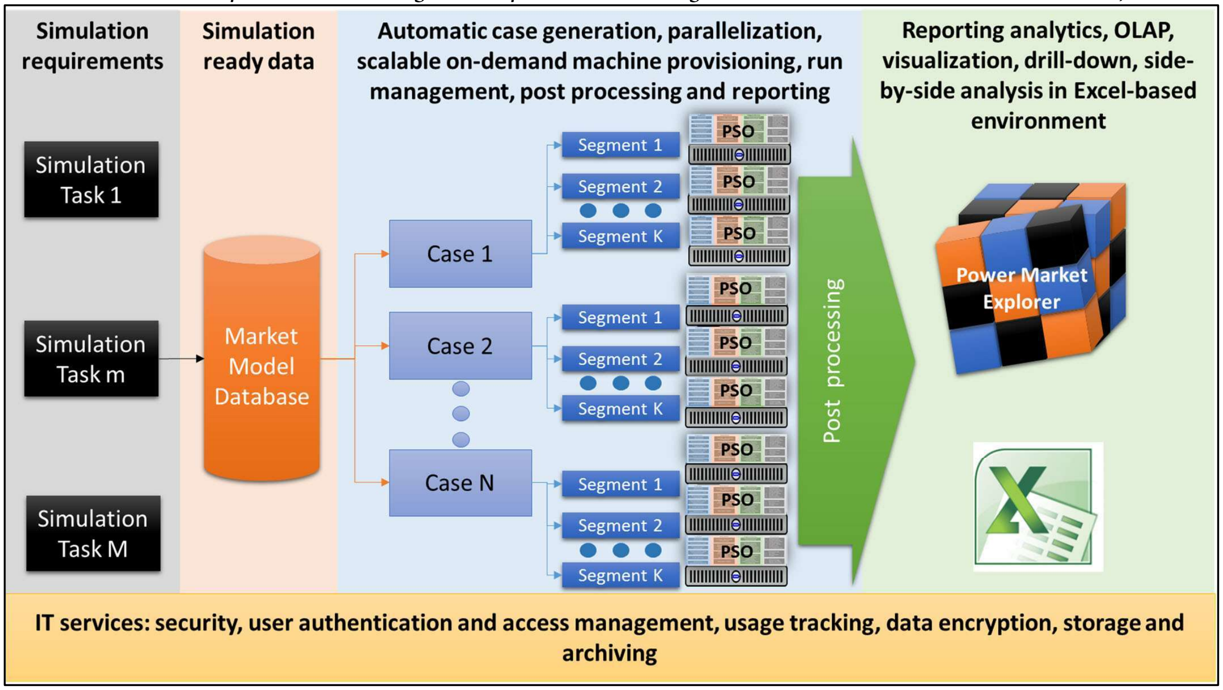

Figure A-2. Schematic of ENELYTIX Architecture

ENELYTIX automatically partitions each Case into Segments for parallel execution. Segments are queued and sent to servers dynamically procured on the cloud to be processed with PSO.

ENELYTIX collects output results, merges Segment related outputs corresponding to the same Case and sends both outputs and inputs to the Power Market Explorer (PME) Cube. PME is a multi-dimensional cube structure directly accessible from an Excel workbook on the user's desktop or laptop which provides self-service analytics for detailed exploration of output results in their entirety, side-by-side comparisons across cases, decision cycles, over time and numerous other dimensions. With PME, the user obtains instantaneous report generation via PivotTables and graphics via PivotCharts extracted directly from the PME cube. Although configurable, PME already comes with conveniently pre-calculated metrics including wholesale consumer payments, system-wide and regional adjusted production costs, emissions, curtailments, fuel use and detailed reports on assets' physical and financial performance.

ENELYTIX complies with high standards of data security properly protecting confidential and Critical Energy Infrastructure Information (CEII).

For additional information about ENELYTIX, visit www.enelytix.com.

D.2: New York Document

Draft Report

Base Case for Evaluation of 2022 RI Offshore Wind Proposals

Input and Modeling Assumptions

New York

Prepared for: **Rhode Island Energy (RIE)**

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DISCLAIMER

Tabors Caramanis Rudkevich, INC (TCR) has been contracted by Rhode Island Energy (RIE) to provide the quantitative analyses that will allow RIE to evaluate the proposals that they receive in response to the 2022 RI OSW RFP. The information provided herein is solely for the purpose of development of a Base Case against which the proposed projects may be compared. Any other use of the materials without the explicit permission of TCR is strictly prohibited.

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CHAPTER 1:
Model Overview and Footprint

This document describes the modeling and input assumptions that the TCR team proposes for the New York power system (NYISO) model against which RIE will measure the incremental costs and benefits of each Proposal received in response to the 2022 RI Offshore Wind Request for Proposals "RI OSW RFP". In this document, TCR refers to that model as the "RI OSW RFP Base Case" or "Base Case".

The complementary document "Base Case Evaluation of Rhode Island Offshore Wind Proposals – Input and Modeling Assumptions New England" describes all RIOSW Base Case modeling and input assumptions that are common to both New York and New England, as well as those that are specific to New England Base Case Design.

For NYISO, TCR will first model capacity expansion to determine a schedule of optimal unit retirements and additions to meet future capacity requirements and minimize power system cost. Then, TCR will model the Energy and Ancillary Services (E&AS) market to simulate day-ahead and real-time economic transactions between ISO-NE and NYISO. To that end, TCR will use ENELYTIX's production costing capability to simulate the operation of the two neighboring markets – ISO-NE and NYISO. The New England assumptions document describes the ENELYTIX modeling environment for both capacity expansion and E&AS market simulation.

CHAPTER 2: Transmission Topology

ENELYTIX® model organizes physical location of all network resources and loads using bus bar and node mapping. The NYISO transmission topology was modeled based on 2019 FERC 715 power flow fillings for summer peak 2024, updated against recent FERC 2022 filings. Updates include Segments A & B, Empire state line, Smart Path, Smart Path Connect, as well as representation of Tier 4 procurements Clean Path New York (CPNY) and Champlain Hudson Power Express (CHPE). Generators are mapped to bus bars/electrical nodes (eNodes). Bus bars are mapped to NYISO areas and to specific areas outside NYISO system. The mapping of load nodes to NYISO areas and external zones outside NYISO is used by ENELYTIX® to allocate area load forecasts to individual buses in proportion to bus specific loads in the power flow case.

In determining a representative list of transmission constraints to monitor, TCR included all major NYISO interfaces and critical contingencies. However, to make the Energy and Ancillary Services model run faster, all contingencies exclusively in the NYISO footprint were omitted. TCR developed limits for interfaces based on information provided in NYISO planning studies.[1] Table 1 shows the Interface limits applied.

Table 1. Interface Limits

Constraint Name	Summer Max (MW)	Summer Min (MW)	Winter Max (MW)	Winter Min (MW)
A-C	550	0	550	0
CENTRAL-EAST	3,255	-3,255	3,490	-3,490
DYSINGER-EAST	2,700	-	2,700	-
IESO-NYStL	300	-300	300	-300
Moses-South	4,050	-1,500	4,050	-1,500
NE-NY	1,200	-1,400	1,200	-1,400
NNC	200	-200	200	-200
NYC-LI	0	-350	0	-350
NYISO-IESO	1,600	-2,075	1,900	-3,150
PJM-NYISO	2,175	-1,175	2,450	-1,625
UPNY-CONED	6,525	-	6,525	-
VFT Interface	330	-300	330	-300
WEST-CENTRAL	1,475	-	1,475	-

1 NYISO System & Resource Outlook Update Slide 1 (nyiso.com)

CHAPTER 3: Interchange

In the Base Case, TCR models interchanges between NYISO and its neighboring systems (except for ISO-NE) as fixed flow schedules. Interchange with ISO-NE is economically dispatched as part of the E&AS model. For the fixed flow schedules, TCR uses 2021 historical hourly net interchange flow data obtained from NYISO for all interchanges flow schedules.

Table 2. Interchange Fixed Flow Schedule Summary

Interchange	Interfaces	Max Import (MW)	Max Export (MW)	Avg Import (MW)	Avg Export (MW)	Total Import (GWh)	Total Export (GWh)
HQ[2]	Chateauguay	1,500	993*	1,131	1*	9,906	7*
	Cedars	279	95*	97	0.05*	851	0.5*
PJM	Hudson TP	660	0	321	0	2,808	0
	Neptune	375	0	312	0	2,730	0
	VFT	315	301	257	1	2,253	5
	Keystone	2,243	785	641	14	5,613	124
IESO		1,750	702	652	3	5,712	30

2 HQ Cedars and HQ Chateauguay export schedules both from 2019 historical flow data.

CHAPTER 4: Load Forecast

4.1: Annual Gross Energy and Peak Forecast

TCR uses the Baseline load forecast from the NYISO 2022 Goldbook Report ("2022 Goldbook").[3] The Goldbook forecast contains annual energy, summer peak and winter peak forecasts for the NYISO system through 2050, broken out by various load components including impacts of electrification and storage as load adders, and behind the meter resources (BTMPV) and energy efficiency measures (EE) as load reducers.

TCR adopts the hourly load shapes for various load components from the NYISO Climate Change Impact study Phase 1 report[4] and uses those load profiles to translate annual energy forecasts from the 2022 Goldbook to hourly profiles over the study period. Refinements are applied to the load shapes to ensure that summer and winter peaks align with Goldbook forecasted values.

The 2022 Goldbook Baseline forecast captures most of the assumptions used in the Climate change impact study, such as the impact of a 7 degree Fahrenheit temperature increase in each decade, as well as various policy targets such as the inclusion of 10 GW of BTMPV installed by 2030, 500 MW non-solar behind the meter Distributed Generation (DG), and significant electrification in the form of electric vehicles and residential electric heating.

Similar to ISO-NE TCR models the total load less the impact of EE into the model and represents BTMPV resources as front-of-the-meter generation. Table 3 through Table 5 show the net energy and peak forecast.

3 NYISO ISO Goldbook 2022 https://www.nyiso.com/documents/20142/30338270/2022-Gold-Book-Baseline-Forecast-Tables.xlsx/58cf502f-046d-935e-16a7-b53fa23cf7a7

4 New York ISO Climate Change Impact Study Phase 1: Long-Term Load Impact, Itron, December 2019

Table 3. Projected Net Energy by Zone (GWh)

Year	A	B	C	D	E	F	G	H	I	J	K	*NYCA*
2027	15,889	11,356	16,292	5,958	7,889	12,118	9,664	2,906	5,805	47,866	20,306	*156,049*
2028	15,930	11,427	16,214	5,947	7,882	12,138	9,741	2,911	5,820	47,961	20,607	*156,578*
2029	16,020	11,485	16,190	5,939	7,913	12,219	9,877	2,923	5,878	48,410	21,057	*157,911*
2030	16,141	11,554	16,205	5,933	7,963	12,339	10,047	2,941	5,962	49,089	21,598	*159,772*
2031	16,360	11,701	16,335	5,940	8,073	12,536	10,298	2,982	6,074	50,025	22,228	*162,552*
2032	16,634	11,880	16,535	5,950	8,221	12,764	10,575	3,028	6,185	51,030	22,846	*165,648*
2033	16,968	12,087	16,807	5,970	8,405	13,030	10,888	3,084	6,304	52,172	23,463	*169,178*
2034	17,318	12,299	17,086	5,989	8,601	13,308	11,216	3,139	6,421	53,374	24,041	*172,792*
2035	17,726	12,544	17,419	6,014	8,826	13,634	11,579	3,199	6,557	54,721	24,673	*176,892*
2036	18,136	12,790	17,756	6,039	9,051	13,963	11,941	3,262	6,691	56,037	25,269	*180,935*
2037	18,545	13,037	18,091	6,063	9,279	14,294	12,299	3,326	6,833	57,348	25,822	*184,937*
2038	18,917	13,266	18,405	6,085	9,489	14,603	12,634	3,387	6,973	58,589	26,316	*188,664*
2039	19,298	13,502	18,725	6,108	9,700	14,928	12,973	3,452	7,127	59,884	26,807	*192,504*
2040	19,627	13,710	19,006	6,126	9,886	15,210	13,277	3,510	7,272	61,048	27,248	*195,920*
2041	19,915	13,889	19,239	6,142	10,049	15,462	13,548	3,560	7,401	62,067	27,630	*198,902*
2042	20,143	14,033	19,419	6,155	10,181	15,663	13,767	3,601	7,511	62,883	27,962	*201,318*
2043	20,369	14,173	19,606	6,167	10,308	15,860	13,976	3,644	7,619	63,653	28,305	*203,680*
2044	20,550	14,286	19,753	6,176	10,413	16,026	14,149	3,678	7,708	64,237	28,585	*205,561*
2045	20,701	14,380	19,875	6,183	10,497	16,165	14,293	3,705	7,788	64,691	28,822	*207,100*
2046	20,805	14,445	19,951	6,186	10,557	16,265	14,402	3,728	7,845	64,947	29,004	*208,135*
2047	20,906	14,509	20,027	6,191	10,612	16,363	14,504	3,748	7,905	65,233	29,202	*209,200*
2048	20,955	14,540	20,054	6,190	10,643	16,417	14,566	3,759	7,945	65,362	29,343	*209,774*
2049	20,979	14,556	20,066	6,187	10,654	16,452	14,606	3,767	7,982	65,465	29,465	*210,179*
2050	20,974	14,554	20,039	6,183	10,650	16,461	14,617	3,771	8,002	65,484	29,551	*210,286*
2051	20,974	14,554	20,039	6,183	10,650	16,461	14,617	3,771	8,002	65,484	29,551	*210,286*
2052	21,039	14,598	20,101	6,200	10,683	16,512	14,661	3,782	8,025	65,685	29,634	*210,920*

Table 4. Projected Net Summer Peak by Zone (MW)

Year	A	B	C	D	E	F	G	H	I	J	K
2027	2,970	2,406	3,063	849	1,478	2,260	2,326	591	1,285	10,559	5,470
2028	2,970	2,412	3,042	847	1,472	2,257	2,333	590	1,281	10,498	5,513
2029	2,992	2,425	3,045	851	1,480	2,276	2,365	594	1,293	10,550	5,611
2030	3,008	2,431	3,043	855	1,485	2,293	2,399	596	1,306	10,602	5,718
2031	3,035	2,449	3,060	862	1,498	2,319	2,448	602	1,324	10,669	5,830
2032	3,068	2,468	3,084	853	1,516	2,348	2,493	606	1,336	10,689	5,920
2033	3,121	2,502	3,131	859	1,545	2,390	2,555	615	1,354	10,751	6,037
2034	3,164	2,525	3,167	863	1,569	2,422	2,608	621	1,364	10,762	6,131
2035	3,212	2,551	3,207	868	1,594	2,459	2,664	627	1,376	10,772	6,231
2036	3,245	2,567	3,235	878	1,613	2,484	2,707	631	1,382	10,720	6,300
2037	3,293	2,598	3,278	876	1,638	2,521	2,761	638	1,395	10,715	6,394
2038	3,316	2,613	3,301	879	1,652	2,540	2,796	642	1,400	10,636	6,452
2039	3,335	2,627	3,320	883	1,663	2,557	2,828	645	1,407	10,559	6,502
2040	3,331	2,624	3,319	883	1,662	2,555	2,840	645	1,407	10,426	6,528
2041	3,371	2,652	3,355	893	1,684	2,591	2,888	652	1,426	10,539	6,622
2042	3,393	2,667	3,373	901	1,698	2,611	2,917	656	1,439	10,609	6,682
2043	3,422	2,690	3,400	897	1,714	2,636	2,951	662	1,455	10,719	6,753
2044	3,432	2,695	3,408	898	1,722	2,647	2,967	665	1,463	10,766	6,789
2045	3,460	2,715	3,433	904	1,738	2,671	2,997	670	1,477	10,874	6,852
2046	3,473	2,724	3,444	906	1,746	2,682	3,014	673	1,485	10,933	6,893
2047	3,489	2,734	3,457	912	1,755	2,696	3,032	676	1,495	11,020	6,935
2048	3,490	2,734	3,455	918	1,756	2,697	3,036	676	1,498	11,056	6,955
2049	3,512	2,754	3,476	916	1,767	2,715	3,060	681	1,514	11,175	7,016
2050	3,518	2,759	3,478	918	1,771	2,721	3,067	683	1,520	11,235	7,048
2051	3,518	2,759	3,478	918	1,771	2,721	3,067	683	1,520	11,235	7,048
2052	3,518	2,759	3,478	918	1,771	2,721	3,067	683	1,520	11,235	7,048

Table 5. Projected Net Winter Peak by Zone (MW)

Year	A	B	C	D	E	F	G	H	I	J	K
2026-2027	2,716	1,858	2,821	843	1,363	2,058	1,645	487	894	7,525	3,380
2027-2028	2,748	1,885	2,828	842	1,376	2,082	1,678	492	906	7,676	3,490
2028-2029	2,799	1,914	2,856	846	1,401	2,125	1,728	500	928	7,918	3,645
2029-2030	2,864	1,954	2,897	850	1,433	2,181	1,788	511	959	8,249	3,821
2030-2031	2,952	2,011	2,963	856	1,479	2,255	1,867	526	996	8,645	4,024
2031-2032	3,022	2,058	3,011	855	1,518	2,315	1,938	538	1,030	9,042	4,197
2032-2033	3,148	2,138	3,118	867	1,587	2,416	2,043	560	1,076	9,581	4,405
2033-2034	3,270	2,211	3,219	875	1,655	2,514	2,150	579	1,119	10,112	4,595
2034-2035	3,397	2,286	3,324	883	1,727	2,621	2,261	598	1,163	10,651	4,789
2035-2036	3,538	2,370	3,439	890	1,805	2,735	2,375	620	1,210	11,199	4,977
2036-2037	3,667	2,449	3,538	898	1,877	2,842	2,487	640	1,263	11,780	5,162
2037-2038	3,815	2,541	3,666	908	1,959	2,965	2,609	665	1,320	12,366	5,343
2038-2039	3,954	2,625	3,783	917	2,036	3,083	2,726	689	1,374	12,915	5,515
2039-2040	4,078	2,701	3,888	923	2,105	3,188	2,831	710	1,424	13,393	5,662
2040-2041	4,190	2,770	3,982	932	2,168	3,284	2,926	729	1,469	13,789	5,796
2041-2042	4,284	2,830	4,060	939	2,221	3,366	3,005	745	1,508	14,101	5,916
2042-2043	4,344	2,871	4,104	940	2,255	3,421	3,064	757	1,541	14,334	6,022
2043-2044	4,419	2,921	4,168	944	2,297	3,488	3,129	770	1,573	14,536	6,124
2044-2045	4,493	2,966	4,231	952	2,337	3,553	3,193	783	1,603	14,717	6,233

REDACTED

Year	A	B	C	D	E	F	G	H	I	J	K
2045-2046	4,534	2,990	4,263	954	2,360	3,593	3,231	791	1,621	14,777	6,291
2046-2047	4,581	3,020	4,302	958	2,385	3,636	3,270	799	1,642	14,846	6,366
2047-2048	4,601	3,034	4,317	959	2,397	3,657	3,290	803	1,652	14,834	6,402
2048-2049	4,617	3,051	4,327	961	2,405	3,677	3,311	808	1,669	14,886	6,464
2049-2050	4,626	3,057	4,330	962	2,409	3,688	3,323	810	1,676	14,871	6,498
2050-2051	4,626	3,057	4,330	962	2,409	3,688	3,323	810	1,676	14,871	6,498
2051-2052	4,626	3,057	4,330	962	2,409	3,688	3,323	810	1,676	14,871	6,498

CHAPTER 5: Ancillary Service Requirements

Following NYISO's structure of ancillary services, TCR models four types of reserves: Regulation, 10 minute spinning (10MSR), 10 minute non-spinning (10MNSR) and 30 minute reserves (30MR). Reserves are cascading, meaning that excess higher quality reserves counted toward meeting lower quality reserve requirements. For example, excess 10MSR count toward 10MNSR requirements and both excess 10MSR and 10MNSR reserves count toward 30MR. Spinning reserves are based upon NERC requirements. In addition, NYISO has locational requirements for the reserves on Long Island and near Central East. Non-spinning reserves can be provided by GTs and Internal Combustion (IC) units.

Hydro units can provide Regulation, Ten-Minute Spinning Reserve, and Thirty-Minute Operating Reserve for up to 5%, 10%, and 30% of its dispatch range, respectively. PV, wind, nuclear, and storage cannot provide ancillary services.

Table 6 summarizes reserve requirements in NYISO. Regulation reserves vary on an hourly basis and are not presented here.

Table 6. New York ISO Reserve Requirements

Reserve Type	Area	Requirement (MW)
10MSR	NYISO	665
10MNSR	NYISO	665
30MR	NYISO	665
10MSR	ENY (Zones F-K)	330
10MNSR	ENY	870
10MNSR	K	120
30MR	K	270 Off-peak /420 On-peak

CHAPTER 6: NYISO Capacity Requirement

6.1: Capacity Requirement and Reserve Margin

Four capacity pools were modeled for NYISO in the Base Case: NYCA (all NYISO), Zone J, Zone K, and Zones G-J. For each of these capacity pools a UCAP requirement was calculated. For the NYCA pool, the UCAP requirement is based on the New York State Reliability Council (NYSRC) 2021-22 Installed Reserve Margin (IRM)[5], and Summer 2021 derating factors[6]. For the other pools, the URM is based on the Locational Minimum Installed Capacity Requirements (LCRs) for the 2021-22 Capability Year, as well as 5-year derating factors.

$$NYCA\ UCAP\ Requirement = (1 + IRM) * (1 - derating\ factor)$$

$$Locational\ (Zone\ Pools)\ UCAP\ Requirement = LCR * (1 - derating\ factor)$$

Table 8 shows the UCAP requirement inputs and results for each of the capacity pools.

Table 7: UCAP Requirement Inputs and Result

	NYCA	J	K	G-J
IRM	20.7%			
Average Derating Factors (Summer 2021)	8.77%			
LCR		80.3%	102.9%	87.6%
5-Year Derating Factor		9.17%	9.24%	10.07%
UCAP Requirement	*1.101*	*0.781*	*0.979*	*0.844*

For each pool, the capacity requirement was calculated as:

$$Capacity\ Requirement = Peak\ Load * URM - Import\ Credits$$

Capacity requirements were calculated both summer and winter, using the season's respective peak load. Import credits were sourced from the NYISO Installed Capacity Manual.[7] The import credit values are summarized in – an "x" underneath the pool name indicates that the import credit was applied to that pool.

5 Locational Minimum Installed Capacity Requirements Study. NYISO. 1/14/2021. https://www.nyiso.com/documents/20142/17462310/LCR2021-Report.pdf/9e390b73-99a7-0ee5-6466-bbd3f7e71af4
6 https://www.nyiso.com/documents/20142/3036383/4_Amt%20of%20Capacity%20Qualified%20to%20Offer.pdf/57f56a99-3293-d795-8584-21a70c495a5a
7 NYISO Manual 4: Installed Capacity Manual, 88-89. May 2021. https://www.nyiso.com/documents/20142/2923301/icap_mnl.pdf/234db95c-9a91-66fe-7306-2900ef905338

Table 8: Import Credit Summary

Import Source	Import Credit (MW)	NYCA	J	K	G-J
Grandfathered (MW) and CY External CRIS (MW)					
Quebec via Chateauguay	1110	x			
PJM	38	x			
Unforced Capacity Deliverability Rights					
Cross Sound Cable	330	x		x	
Neptune Cable	660	x		x	
Linden VFT	315	x	x		x
Hudson	660	x	x		x

6.2: Contribution of Resources toward Capacity Requirement

TCR models thermal generation resources' available UCAP value as a percentage of their capacity ("capacity contribution factor") based on a fleet-wide Effective Forced Outage Rate (EFORd). TCR used capacity contribution factors from the New York State Reliability Council (NYSRC) white paper "The Impacts of High Intermittent Renewable Resources."[8] Table 9 shows capacity contribution factors for different unit types.

Table 9: Capacity Contribution Factors by Unit Type

Unit Type	Capacity Contribution (Summer)	Capacity Contribution (Winter)
Energy Storage (battery)	90%	90%
Biomass (Gas)	91%	91%
Biomass (Solid)	92%	92%
Conventional Hydro	96%	96%
Onshore Wind	Variable	Variable
Offshore Wind	Variable	Variable
Solar PV	Variable	Variable

For solar and wind, TCR created summer and winter capacity contribution factors based on the marginal capacity value of each by season, as reported by a NYISO study from the Analysis Group[9]. To model the marginal contribution factors, TCR created a series of descending tranches based on the installed capacity. Figure 1 through Figure 8 show these by resource type and season.

8 https://www.nysrc.org/PDF/Reports/HR%20White%20Paper%20-%20Final%204-9-20.pdf
9 Modifications to the BSM Construct in the NYISO Capacity Market: https://www.nyiso.com/documents/20142/25957407/AG%20BSM%20Report%20Draft%20and%20Appendix%20A%202021.11.11%20v2.pdf/0f5a0717-06c2-ffb5-c125-4384fa5f9bcd, Figure 5.

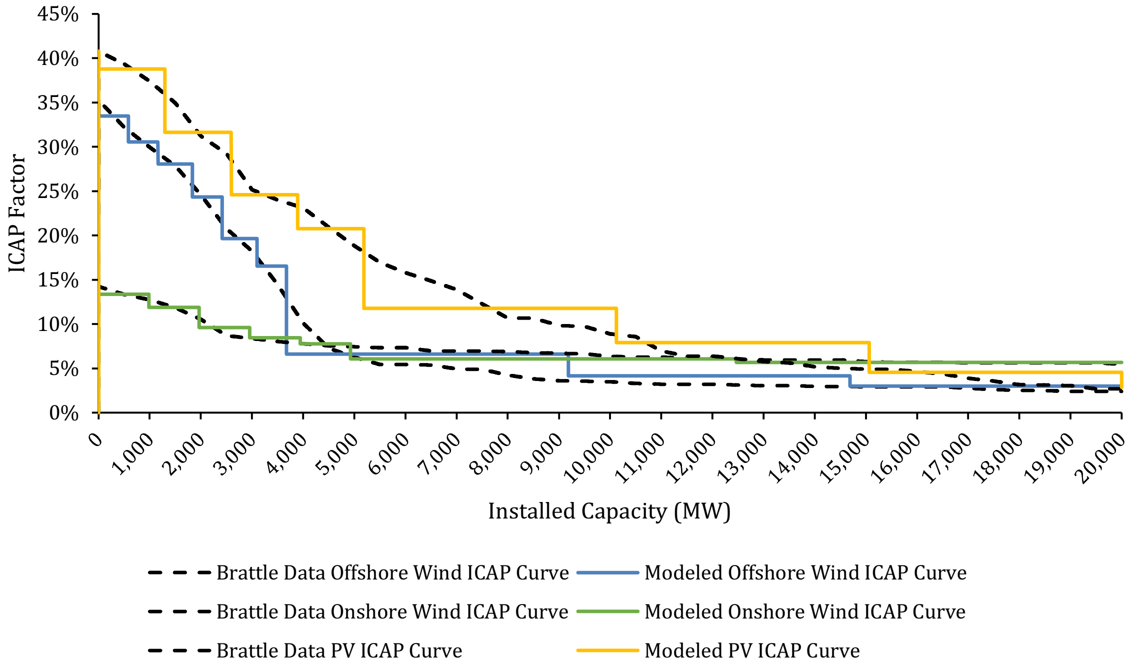

Figure 1: Summer Marginal Capacity Contribution Curve by Type

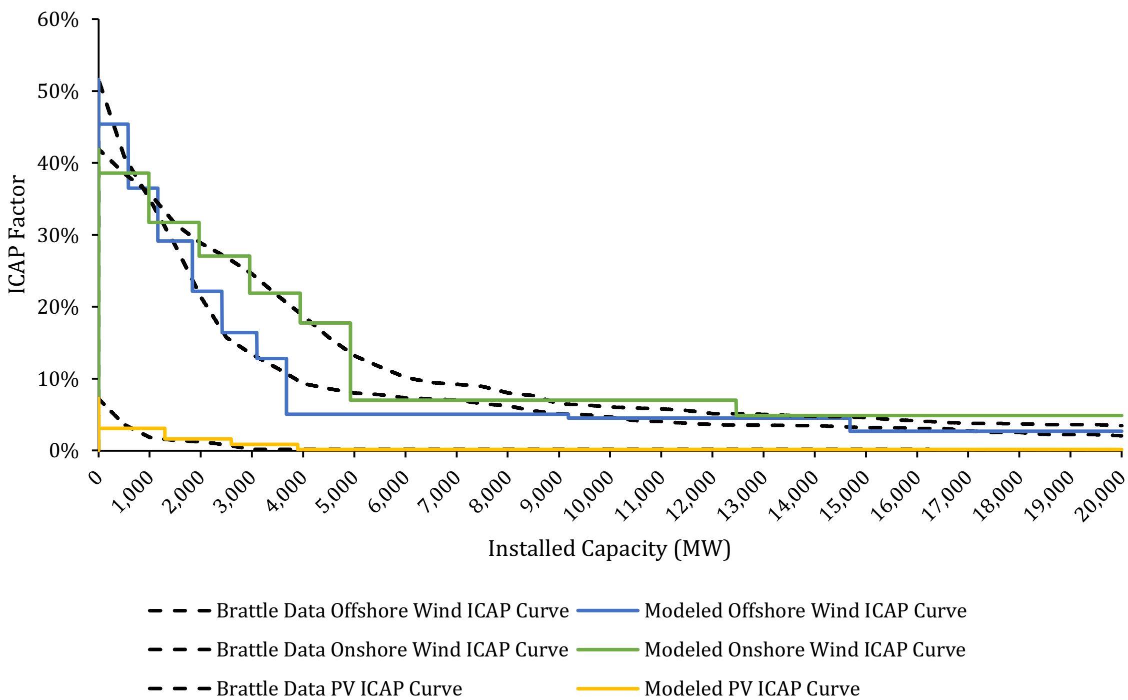

Figure 2: Winter Marginal Capacity Contribution Curve by Type

CHAPTER 7: RES Requirements and CLCPA Compliance

This chapter describes the modeling assumptions representing renewable energy portfolio requirements and electricity sector GHG reduction targets.

7.1: The CES Order

The NYPSC's 2016 CES Order[10] provides for a Renewable Energy Standard (RES) and Clean Energy Standard (CES), which include both short-term and long-term requirements for the amount of electricity consumed in the state that is to be generated by renewable resources. In the short term, the CES Order required LSEs, with no exemptions, to retire renewable energy certificates (RECs) produced by "Tier 1" resources in quantities corresponding to specified percentages of their load for each year through 2021.[11] The order includes eligibility requirements for Tier 1 resources that include location,[12] technology, and fuel and require that the resources have commenced commercial operation no earlier than January 1, 2015.

The CES Order also requires that at least 50% of electricity consumed in the state in 2030 be produced by renewable resources ("50x30"), including Tier 1 resources and so-called baseline resources. Baseline resources are those renewable resources that came online prior to 2015, including those associated with imports.

7.2: The CLCPA

The CLCPA, issued in June 2019, considerably increased the renewable energy goals that had been the basis of the CES Order. It increased the 2030 requirement to 70% renewable ("70x30") and called for the electricity sector to reduce its GHG emissions by 100% by 2040. Additionally, it called for increased energy efficiency by 2030, which would have the effect of reducing the absolute amount of renewable energy needed to meet the 70x30 requirement.

In addition, the CLCPA sets the following procurement targets:

- 6,000 MW of distributed solar by 2025
- 9,000 MW of offshore wind by 2035
- 3,000 MW of energy storage by 2030

The above technology specific targets are included in the model as additional constraints.

7.3: Total and Tier 1 Renewable Energy Requirements

10 NYPSC, Order Adopting a Clean Energy Standard, Case No. 15-E-0302, August 1, 2016.

11 The annual percentages for years through 2021 have since been updated, most recently in the Clean Energy Standard Final Phase 3 Implementation Plan, filed by NYSERDA staff and NYPSC staff in Case No. 15-E-0302, January 11, 2019.

12 Resources must be located in the NYCA or an adjacent control area; for resources in adjacent control areas, there must either be documentation of a contract path between the generator and the in-state purchaser that includes transmission rights, or transmission of an amount of spot market energy, corresponding to the plant's generation, from the source control area to the NYCA in each hour.

To determine a total renewable energy (TRE) requirement for years leading up to 2030, we interpolate linearly between a 2021 requirement and the 70x30 target. The assumed 2021 TRE requirement of 30.85% is calculated by adding the 2018-2021 incremental Tier 1 requirement, 4.05%, to the 2018 reported actual renewable energy percentage of load (26.8%). After 2030, the total renewable energy requirement is assumed to remain at 70%, with the 2040 GHG target driving future renewables growth. The annual TRE requirement is presented in Table 11.

Because all the increase in the TRE requirement must be made up by new Tier 1 resources, the total renewable energy requirement can be translated into a Tier 1 requirement for each year as a percentage of load:

Tier 1 Requirement = TRE Requirement – (baseline renewable energy / load)

where the baseline renewable energy is the sum of energy generated by in-state baseline resources (which will vary by year) and a fixed estimate of baseline renewable energy imports, taken as the reported value for 2018, approximately 12,862 GWh, minus estimated exports from the NYPA Moses Niagara and St. Lawrence fleets, a net of 10,597 GWh. The load to which the requirement is applied is net load plus Behind-the-Meter load, as discussed in the following subsection.

Table 10. Total Renewable Energy Requirement

Year	Requirement (% of load)
2021	30.90%
2022	35.20%
2023	39.50%
2024	43.90%
2025	48.30%
2026	52.60%
2027	57.00%
2028	61.30%
2029	65.70%
2030	70.00%
…	…
2052	70.00%

7.4: Compliance Treatment of Behind-the-Meter Generation

The questions of whether and how the environmental attributes associated with Behind-the-Meter (BTM) generation should count toward compliance requirements or targets, and whether BTM load should be included in RES- and/or CES-obligated load are discussed in the CES Order and the Staff White Paper on the CES.[13] Generally, the CES states that BTM resources whose RECs are not retired to meet an LSE's obligation (i.e., in the LSE's NYGATS account) are considered to be retained for voluntary additionality purposes and cannot count toward compliance with the RES (e.g., Tier 1).

13 NY Dept. of Public Service, Staff White Paper on Clean Energy Standard, Case 15-E-0302, January 25, 2016.

The Value of Distributed Energy Resources (VDER) Order[14] subsequently clarified that while RECs retained for voluntary additionality purposes will not be counted towards LSE Tier 1 obligations, they "will be counted towards the State's 50% by 2030 renewable energy goal, because that aggressive target is based on the contributions of all actors."[15]

Given the modeling complexity of treating attributes differently depending on whether they are retired for voluntary or compliance purposes—as well as the lack of substantial basis to project the fractions of BTM resources whose RECs are used for each purpose, we will make the simplifying assumptions that RECs of all BTM resources will count toward the total renewable energy requirement, and that the RECs of all Tier 1 eligible BTM resources (i.e., which became operational after 2014) will count toward the Tier 1 requirement.

7.5: GHG Cap

We represent partial compliance with the 2040 CLCPA electricity sector target, of complete GHG reduction, by assuming that emissions for in-state and imported electricity decline linearly from their 2020 level to a 100% reduction from 1990 emission levels by 2040.[16] We only enforce that constraint, however, beginning in 2031. The assumed annual requirements are listed in Table 12 below. Because imports will not be expected to be completely GHG-free by 2040 and some in-state thermal generation may still be needed for operating reserves, for modeling purposes we interpret a complete reduction of electricity-sector GHG emissions to mean that the energy needed to supply 100% of the load is either renewable (in-state or imported) or nuclear.

NYISO recognizes that achieving its zero carbon target by 2040 will require the development and deployment of dispatchable emission free resources (DEFR)[17] that are future technology not considered in our model. To ensure model stability, TCR models a relaxed carbon constraint on NYISO with a target emission reduction of up to 95% below 1990 levels by 2040 which is held over the rest of the study period and against growing load. The table below summarizes the carbon limits that TCR models.

Table 11. Assumed GHG Limits

Year	100% Emissions Reduction		95% Emissions Reduction	
	Assumed Cap, MMTCO2 e	Reduction (% from 1990)	Assumed Cap, MMTCO2 e	Reduction (% from 1990)
2031	11.8	81.41%	12.6	80.18%
2032	10.5	83.47%	11.6	81.83%
2033	9.2	85.54%	10.5	83.48%
2034	7.9	87.60%	9.5	85.12%
2035	6.6	89.67%	8.4	86.77%
2036	5.3	91.74%	7.4	88.42%
2037	3.9	93.80%	6.3	90.06%

14 Order on Net Energy Metering Transition, Phase One of Value of Distributed Energy Resources, and Related Matters, Case No. 15-E-0751, March 9, 2017.

15 NYSERDA, Value of Distributed Energy Resources (VDER): Frequently Asked Questions, Updated 6/23/2017.

16 The 2020 electricity sector GHG emissions level, 24.13 MMTCO2e, can be found in Table 3 of NYSERDA's New York State Greenhouse Gas Emissions Report, Sectoral Report #1, 2022.

17 New NYISO Report Identifies Paths to Achieve a Greener & Reliable Future Grid - NYISO

2038	2.6	95.87%	5.3	91.71%
2039	1.3	97.93%	4.2	93.35%
2040	0.0	100.00%	3.2	95.00%
…	…	…	…	…
2050	0.0	100.00%	3.2	95.00%

7.6: NYSERDA Tier 4 Resource

The New York Public Service Commissions October 15, 2020 Order[18] established a new Tier 4 within the New York CES. This tier increases the penetration of renewable energy into New York City (NYISO Zone J) to meet the statewide clean energy policy targets. Subsequently, NYSERDA issued a Tier 4 solicitation in January 2021 resulting in the procurement of two Tier 4 resources – the Champlain Husdon Power Express (CHPE) and Clean Path New York (CPNY).[19] Both projects are assumed to be online over the evaluation period with the CHPE line delivering 1.3 GW of dispatchable clean energy from HQ to Zone J through the HVDC line terminating at the Astoria Substation. CPNY connects to the Rainey substation and enables renewables from upstate NY to deliver clean energy to Zone J. Both of these projects provide both capacity as well as energy to the system.

18 https://www.nyserda.ny.gov/-/media/Files/Programs/Clean-Energy-Standard/2020/October-15-Order-Adopting-Modifications-to-the-Clean-Energy-Standard.pdf
19 Tier 4 – New York City Renewable Energy - NYSERDA

CHAPTER 8: Generating Capacity

TCR obtains operating generation assets list from NYISO's 2022 Load & Capacity Data Report (Gold Book). Based on this list of operating assets, TCR includes scheduled generation additions and retirements from the Gold Book as well as information on clean energy procurements under contract from NYSERDA to capture the changes in NYISO's generation mix during the 2027-2052 simulation period for this project.

After introducing scheduled capacity additions and retirements, future additions and retirements will be determined by ENELYTIX's capacity expansion model based on capacity requirement, TRE requirements, and emission regulations.

8.1: Scheduled generator additions

TCR obtained scheduled capacity additions using the NYISO interconnection queue and S&P Global' s generation asset database. TCR obtains a listing of projects that are currently under construction from both sources and then cross references them to obtain a complete collection of scheduled generation additions and upgrades. Table 13 summarizes TCR's scheduled generator additions from the Gold Book in the model.

Table 12. Scheduled Generation Additions and Updates

Unit Name	Energy Area	Unit Type	Summer Capacity (MW)	Online Date
Baron Winds	C	Wind	238	7/1/2023
Homer Solar Energy Center	C	PV	90	9/1/2023
Danskammer Energy Center	G	CC	596	10/1/2023
North Side Solar	D	PV	180	11/1/2023
Columbia County 1	F	PV	60	12/1/2023
Alfred Oaks Solar & Battery ES	C	PV	100	12/1/2024
Buffalo Solar Project	A	PV	25	6/1/2025
Dryden Community Solar Farm	C	PV	11	6/1/2025
NYC 2025 energy storage goal	J	ES	500	1/1/2025

In addition to those generators the Base Case also includes clean energy additions that are procured under contract by NYSERDA, which are listed in Table 14.

Table 13. NYSERDA Generation Additions and Updates

Unit Name	Energy Area	Unit Type	Summer Capacity (MW)	Online Date
Empire Wind	J	Offshore Wind	816	1/1/2024
Sunrise Wind	K	Offshore Wind	924	1/1/2024
Martin Rd Solar	A	PV	20	1/1/2024
Alabama Solar Park	B	PV	130	1/1/2024
Clear View Solar	C	PV	20	1/1/2024
Hatchery Solar	C	PV	20	1/1/2024
Highbanks Solar	C	PV	20	1/1/2024

Unit Name	Energy Area	Unit Type	Summer Capacity (MW)	Online Date
Mill Point Solar	E	PV	250	1/1/2024
Milliken Solar	C	PV	200	1/1/2024
Orleans Solar	B	PV	200	1/1/2024
Cider Solar Farm	A	PV	500	1/1/2025
Rutland Center Solar 1	E	PV	110	1/1/2025
Empire Wind 2	K	Offshore Wind	1,260	1/1/2026
Beacon Wind	J	Offshore Wind	1,230	1/1/2028

8.2: Scheduled retirements

TCR obtained approved NYISO generation retirements from 2021 Gold Book. Table 15 summarizes approved retirement.

Table 14. NYISO Approved Retirements

Unit Name	Energy Area	Unit Type	Summer Capacity (MW)	Retire Date
Shoreham 1	K	IC/GT	42.7	5/1/2025
60 St. GT 1	J	IC/GT	15.6	5/1/2025
Arthur Kill GT 1	J	IC/GT	12.2	5/1/2025
Glenwood GT 03	K	IC/GT	53.1	5/1/2025
Gowanus 2-1 through 3-8	J	IC/GT	280.6	5/1/2025
Shoreham 2	K	IC/GT	15.7	5/1/2025
Narrows 1-1 through 2-8	J	IC/GT	291.5	5/1/2025
Nine Mile Point 1	C	NUC	630.6	8/1/2029
James A. FitzPatrick	C	NUC	842.9	10/1/2034
Nine Mile Point 2	C	NUC	1288.9	10/1/2046

8.3: Future Generation Mix

The ENELYTIX capacity expansion module determines the long-term optimal electric system expansion through economic additions and retirement of resources in order to satisfy the resource adequacy and environmental constraints described in this report.

8.3.1: Capacity Expansion Model Generic Additions

The capacity expansion module chooses from a predefined list of potential future generation resources to satisfy resource adequacy and environmental constraints. There are two categories of generation resources that can be added by the capacity expansion module. The first category includes the fossil-fuel based conventional sources of generation that are built in discrete increments based on the size and attributes of the reference unit. The second category includes variable renewable resources such as wind and photovoltaic that the model can build in varying size increments up to their resource potential. Additionally, the capacity expansion module can add battery storage.

TCR relies on unit operational characteristics and cost assumptions for fossil fuel resources from the Analysis Group's ICAP demand curve development report prepared for NYISO.[20] TCR obtained operational characteristics and cost assumptions for PV and Wind resources from the Assumptions Matrix for 2021-2040 System & Resource Outlook[21], as well as from the underlying capital cost assumptions documentation[22] used by the US Energy Information Administration (EIA) for its 2020 Annual Energy Outlook (AEO 2020). TCR inflates all costs to 2023$ and accounts for any variations in those costs by NYISO zone.

Table 16 below summarizes the potential resource types that TCR has available in its capacity expansion model. Additional performance characteristics of units are described in CHAPTER 9: of this report.

20 NYISO ICAP Study: https://www.nyiso.com/documents/20142/1391705/NYISO%20Staff%20Final%20DCR%20Recommendations%20-September%2015%202016.pdf/c69e3d8a-56f9-d348-3602-e891d8278ebf, https://www.nyiso.com/documents/20142/14526320/Analysis-Group-2019-2020-DCR-Final-Report.pdf/0dc75930-e651-2120-80de-234d98cd548b, Tables 27 & 28 (Performance) Tables 24 & 27 (Costs)

21 NYISO System and Resource Outlook Assumptions Matrix: https://www.nyiso.com/documents/20142/28952672/02%20Outlook_Capacity_Expansion_Assumptions_Matrix.pdf/, Page 5 (Costs)

22 EIA Cost Assumptions: https://www.eia.gov/outlooks/aeo/assumptions/pdf/table_8.2.pdfhttps://www.eia.gov/analysis/studies/powerplants/capitalcost/pdf/capital_cost_AEO2020.pdf, https://www.eia.gov/analysis/studies/powerplants/capitalcost/pdf/capital_cost_addendum.pdf

Table 15. Potential Resource Additions

Resource Category	Technology Details	Source of Cost	Energy Area	Capacity (MW)[23]	Heat Rate	Overnight Capital Cost	Fixed O&M	Variable O&M
Simple Cycle Peaking Plant	3x0 Siemens SGT-A65	NYISO ICAP Study	A-C	65	9,000	$2,157	$25.6	$10.2
			D-F	65	9,000	$2,176	$26.4	$10.2
			G	65	9,000	$2,383	$29.3	$10.2
			J	65	9,000	$3,000	$53.9	$10.2
			K	65	9,000	$2,475	$32.1	$10.2
	1x0 GE 7F.02 (Gas Only, without SCR)	NYISO ICAP Study	A-C	243	9,513	$1,200	$17.3	$1.0
			D-F	243	9,513	$1,211	$17.9	$1.0
	1X0 GE 7F.05 (with Dual Fuel and SCR)	NYISO ICAP Study	A-C	243	9,513	$1,472	$18.5	$1.6
			D-F	243	9,513	$1,482	$19.1	$1.6
			G	243	9,513	$1,536	$20.9	$1.6
			J	243	9,513	$2,034	$39.6	$1.6
			K	243	9,513	$1,665	$23.2	$1.6
	1X0 GE 7HA.02 (Gas Only, without SCR)	NYISO ICAP Study	A-C	384	8,890	$930	$13.1	$1.0
			D-F	384	8,890	$937	$13.5	$1.0
	1X0 GE 7HA.02 (with Dual Fuel and SCR)	NYISO ICAP Study	A-C	384	8,890	$1,175	$13.8	$1.4
			D-F	384	8,890	$1,180	$14.1	$1.4
			G	384	8,890	$1,211	$15.2	$1.4
			J	384	8,890	$1,513	$26.6	$1.4
			K	384	8,890	$1,310	$16.7	$1.4
Combined Cycle Gas Turbines	1X1 GE 7HA.02 (with SCR)	NYISO ICAP Study	A-C	573	5,970	$1,565	$19.7	$3.6
			D-F	573	5,970	$1,587	$20.5	$3.6
			G	573	5,970	$1,785	$23.4	$3.6
			J	573	5,970	$2,190	$42.4	$3.6
			K	573	5,970	$2,046	$26.3	$3.6
Biomass (Gas)	Landfill gas 4 x 9.1 MW	EIA Cost Assumptions	NYCW	13	9,876	$2,397	$31.0	$6.4
			NYUP	3	9,876	$1,850	$30.5	$6.4

23 The capacity for variable resources listed in this table represents the size of the reference plant for which the costs are available. The capacity expansion model can build renewables at any size for a given year limited by overall maximum potentials.

Resource Category	Technology Details	Source of Cost	Energy Area	Capacity (MW)[23]	Heat Rate	Overnight Capital Cost	Fixed O&M	Variable O&M
Biomass (Solid)	50-MW Biomass Plant Bubbling Fluidized Bed	EIA Cost Assumptions	NYCW	45	9,876	$7,383	$228.8	$5.0
			NYUP	5	9,876	$5,457	$169.1	$5.0
Energy Storage	Battery Energy Storage System 50MW|100MWh	EIA Cost Assumptions	NYCW	50	-	$1,344	$28.8	$0.0
			NYUP	50	-	$1,313	$28.1	$0.0
Hydro	Conventional Hydropower	EIA Cost Assumptions	NYUP	196	-	$4,181	$63.4	$0.0
PV	Utility Scale, Single Axis Tracking	EIA Cost Assumptions	A	150	-	$1,472	$17.4	$0.0
			B	150	-	$1,458	$17.4	$0.0
			C	150	-	$1,458	$17.4	$0.0
			D	150	-	$1,416	$17.4	$0.0
			E	150	-	$1,416	$17.4	$0.0
			F	150	-	$1,458	$17.4	$0.0
			G	150	-	$1,683	$17.4	$0.0
			H	150	-	$1,686	$17.4	$0.0
			I	150	-	$1,686	$17.4	$0.0
			K	150	-	$1,686	$20.7	$0.0
	Distributed Residential Fixed tilt roof mounted	NREL ATB	NYCW	0.005	-	$2,474	$25.4	$0.0
			NYUP	0.005	-	$2,474	$25.4	$0.0
Wind	Large Plant Footprint: Great Plains Region 200 MW|2.82 MW WTG	NYISO S&RO Study	A	200	-	$2,115	$33.0	$0.0
			B	200	-	$2,074	$33.0	$0.0
			C	200	-	$2,198	$33.0	$0.0
			D	200	-	$2,302	$33.0	$0.0
			E	200	-	$2,219	$33.0	$0.0
			F	200	-	$2,219	$33.0	$0.0
			G	200	-	$2,302	$33.0	$0.0
Offshore Wind	Fixed-bottom Monopile Foundations 400 MW|10MW WTG	NYISO S&RO Study	J	400	-	$4,950	$125.0	$0.0
			K	400	-	$4,950	$125.0	$0.0

8.3.2: Maximum Resource Potentials

8.3.2.1: Renewable Generator Additions

TCR relies on NREL assessments of renewable resource potentials and uses data available on NREL's geospatial toolkits and associated publications to establish upper limits on various model-built variable resources for each energy area within the NYISO footprint.

Although NREL's resource potentials are typically available by state[24], TCR obtained more granular county level data to re-aggregate state potentials into potentials by energy areas. The methodologies for calculating potentials are described below:

- **Onshore wind and photovoltaic**: potentials for onshore wind and PV are obtained from NRELs REV study[25]. Granular county level data for annual energy and nameplate capacity for onshore wind, PV, and concentrated solar power were obtained directly from NREL. The potentials were aggregated to obtain potentials by energy zone and reduced by the quantity of PV and onshore wind already existing in the NYISO model.
- **Rooftop PV:** potentials are obtained from NRELs Solar For All Toolkit[26] which provides an estimate of annual energy that may be obtained through rooftop PV installations by county. Annual energy is converted to nameplate capacity using energy area specific capacity factors to obtain nameplate potential for rooftop PV. Finally, the potential of rooftop PV is reduced by the quantity of rooftop PV already existing in the MISO model.
- **Offshore wind and Hydropower**: potentials for offshore wind and hydropower by state are obtained from NREL's GIS-based technical potential study[27].

  For offshore wind, TCR assumed distributions of state potentials to each of the energy areas proportionate to the length of the coastlines. The offshore wind potentials are reduced by the quantity of existing offshore wind in the NYISO model.

  For Hydropower, TCR assumed similar distributions of state potentials to each of the energy areas proportionate to their approximate footprints. Since the assessment of Hydropower potential is on a site-specific basis it is assumed to already account for hydropower that has already been built.
- **Biopower**: potentials for biogas and biomass are obtained from NRELs biopower geospatial toolkit[28] which provides annual estimates of tons per year of biomass and biogas resources by county. Conversion factors to annual energy and nameplate capacity are available within the toolkit to obtain the nameplate potential for biomass and biogas resources.

Table 17 below provides the final modeled resource potentials for variable resources by NYISO energy area.

24 Renewable Energy Technical Potential. https://www.nrel.gov/gis/re-potential.html
25 Renewable Energy Potential (reV) Model. https://www.nrel.gov/docs/fy19osti/73067.pdf
26 Solar for All Data Explorer. https://maps.nrel.gov/solar-for-all/?aL=0&bL=clight&cE=0&lR=0&mC=38.870832155646326%2C-98.34521484375001&zL=5
27 U.S. Renewable Energy Technical Potentials: A GIS Study. https://www.nrel.gov/docs/fy12osti/51946.pdf
28 Biopower Atlas. https://maps.nrel.gov/biopower/?aL=wyQpUn%255Bv%255D%3Dt&bL=clight&cE=0&lR=0&mC=40.21244%2C-91.625976&zL=4

Table 16. Technical Potential for Installed Renewable Capacity by Resource Type and State (MW)

Row Labels	Energy Storage	Hydro	Biogas	Offshore Wind	Utility PV	Biomass	Onshore Wind
A	No upper limit	196	13	6,689	213,868	45	17,472
B		95	6	1,920	86,793	26	7,665
C		241	12	1,920	156,834	45	20,844
D		91	1	0	28,630	6	5,108
E		469	7	690	299,180	38	31,209
F		254	7	0	77,666	38	15,536
G		123	5	0	38,564	18	4,580
H		0	3	0	497	5	0
I		0	3	0	497	5	0
J		0	46	64,738	0	78	0
K		0	10	65,798	15,865	31	0
NYISO Total:		*1,469*	*113*	*141,755*	*918,393*	*335*	*102,413*

8.3.2.2: Fossil Fuel Generator Additions

For thermal generation additions, TCR assumes that new buildable capacity in each area is approximately four time the current installed capacity of all current thermal capacity in that area. TCR assumes that each zone has access to at least one thermal unit of each fossil fuel technology type listed in Table 16 and models multiple units of each in order to meet the zones target requirement.

8.3.2.3: Financial Assumptions for Generic Resource Additions

The base case uses common financing assumptions for all market-driven unit additions, both fossil fuel and renewable. These assumptions include a 20-year financing period, and a real after tax weighted average cost of capital (WACC) of 6.0%. The WACC is based on the results of an analysis by Concentric Energy Advisors prepared for ISO New England, which assumes uncontracted merchant development, and is based on costs of equity and debt that are commensurate with a merchant project's perceived risks of cost recovery in the market, which are higher than those of a project whose revenues are contracted under a PPA.[29] The use of a WACC based on merchant rather than contracted development reflects the Base Case assumption that only merchant development will be possible because the market will not bring about the development of resources with long-term PPAs in the absence of mandated procurements such as 83C.

8.3.2.4: Impact of PTC and ITC

TCR includes the impacts of Production Tax Credits (PTC) and Investment Tax Credits (ITC) on the capital and operating costs of existing and new resources based on the provisions of the 2022 inflation Reduction Act (2022 IRA).[30] In addition to extending the PTC and ITC to other technologies, it also

29 ISO-NE CONE and ORTP Analysis. Concentric Energy Advisors. Prepared for ISO New England, January 13, 2017, p. 48.
30 https://www.whitehouse.gov/cleanenergy/inflation-reduction-act-guidebook/

includes the transition to the Clean Energy Production Tax Credits (CEPTC) and Clean Energy Investment Tax Credits (CEITC) which phase out in the early 2030s.

Additional details on the implementation and supporting assumptions can be found in the ISO-NE Assumption document, which uses the same approach as that used in the NYISO model.

8.3.3: Capacity Expansion Unit Retirement

Over the study period ENELYTIX analyzes the economics of existing thermal units to determine whether their projected revenues compared to their projected variable operating costs justifies retiring any of those units. The ENELYTIX capacity expansion optimization algorithm evaluates the trade-off between the need to keep the generating unit online to meet resource adequacy requirements against making an investment into another generating unit to satisfy environmental constraints and/or producing energy at lower operating cost.

CHAPTER 9: Generating Unit Operating Characteristics

9.1: Generator Aggregation

To optimize model computation time, TCR aggregates all units below 20 MWs by type, fuel and energy area into a smaller set of units. Full load heat rates for the aggregates are calculated as the capacity weighted average of the individual units and all other parameters are inherited from the unit type.

9.2: Thermal Unit Characteristics

Thermal generation characteristics are generally determined by a generator's technology and fuel type. These characteristics include heat rate curve shape, non-fuel operation and maintenance costs, startup costs, forced and planned outage rates, minimum up and down times, and quick start, regulation and spinning reserve capabilities.

TCR developed generator outage and heat rate data from information by similar unit type as obtained from both the North American Electric Reliability Corporation (NERC) Generating Availability Report and power industry data provided by S&P Global.

Each thermal unit type has a distinct normalized incremental heat rate curve. The normalized heat rate curve is scaled by the full load heat rate (FLHR) to produce unit specific heat curve. Table 18 summarizes the shape of normalized heat rate curve used in ENELYTIX.

Table 17. Normalized Incremental Heat Rate Curve

Unit Type	Blocks (Total)	Block	Capacity Range (% of Max)	Heat Rate (% of FLHR)
CT	1	1	100%	100%
CC	4	1	50%	113%
		2	51% ~ 67%	75%
		3	68% ~ 83%	86%
		4	84% ~ 100%	100%
ST (Coal)	4	1	0% ~ 50%	106%
		2	51% ~ 65%	90%
		3	66% ~ 95%	95%
		4	96% ~ 100%	100%
ST (Other)	4	1	25%	118%
		2	26% ~ 50%	90%
		3	51% ~ 80%	95%
		4	81% ~ 100%	100%

As an example, for a 500 MW CC with a 7,000 Btu/KWh FLHR, the minimum load block would be its minimum generation of 250 MW at a heat rate of 7,910 Btu/KWh, the 2nd incremental block would be 251 MW ~ 335 MW at a heat rate of 5,250 Btu/KWh, the 3rd increment would be 336 MW ~ 415 MW at a heat rate of 6,020 Btu/KWh, and the final block would be 416 MW ~ 500 MW at a heat rate of 7,000 Btu/KWh.

Table 19 summarizes other operating character assumptions by unit type for thermal generators. The abbreviations in the unit type column are structured as follows: First 2-3 characters identify the technology type, the next 1-2 characters identify the fuel used (**g**as, **o**il, **c**oal, **b**iomass, **r**efuse) and the numbers identify the size of generating units mapped to that type.

Table 18. Other Thermal Unit Operating Parameters by Unit Type

Unit Type	Min On Time (Hr)	Min Off Time (Hr)	EFORd (%)	VOM ($/MWh)	Startup Cost Cold ($/MW-start)
CCg100 (0-100MW)	6	8	4.29	2.5	35
CCg100+ (100-9999MW)	6	8	4.29	2.5	35
CCgo100 (0-100MW)	6	8	4.29	2.5	35
CCgo100+ (100-9999MW)	6	8	4.29	2.5	35
Cco+ (0-9999MW)	6	8	8.58	2.5	35
CCr+ (0-500MW)	1	1	4.29	2.5	35
GTb20 (0-20MW)	1	1	11.28	10	--
GTg20 (0-20MW)	1	1	18.6	10	--
GTg50 (20-50MW)	1	1	12.97	10	--
GTgo20 (0-20MW)	1	1	18.6	10	--
GTgo50 (20-50MW)	1	1	12.97	10	--
GTgo50+ (50-9999MW)	1	1	9.29	10	--
GTo20 (0-20MW)	1	1	18.6	10	--
GTo50 (20-50MW)	1	1	12.97	10	--
GTo50+ (50-9999MW)	1	1	9.29	10	--
GTo20 (0-20MW)	1	1	18.6	10	--
GTo50 (20-50MW)	1	1	12.97	10	--
GTr20 (0-20MW)	1	1	11.28	10	--
ICb+ (0-500MW)	1	1	11.63	10	--
ICg20 (0-20MW)	1	1	21.16	10	--
ICg50+ (50-500MW)	1	1	11.54	10	--
ICgo20 (0-20MW)	1	1	21.16	10	--
ICgo50 (20-50MW)	1	1	11.54	10	--
ICgo50 + (50-500MW)	1	1	11.54	10	--
ICo20 (0-20MW)	1	1	21.16	10	--
ICo50+ (50-500MW)	1	1	11.54	10	--
ICog20 (20-50MW)	1	1	11.54	10	--
ICo50 (0-50MW)	1	1	11.54	10	--
ICr+ (0-500MW)	1	1	11.63	2	--
NUC-BWR1000MW+	164	164	2.19	0	90
NUC-BWR(800-1000MW)	164	164	1.66	0	90
NUC-BWR(400-799MW)	164	164	3.27	0	90
NUC-PWR1000MW+	164	164	4.02	0	90
NUC-PWR(400-799MW)	164	164	3.02	0	90
STb+ (0-500MW)	10	8	10.26	0	35

Unit Type	Min On Time (Hr)	Min Off Time (Hr)	EFORd (%)	VOM ($/MWh)	Startup Cost Cold ($/MW-start)
STc100 (0-100MW)	24	12	8.32	5	45
STc250 (100-250MW)	24	12	6.47	4	45
STc600 (250-600MW)	24	12	7.83	3	45
STg100 (0-100MW)	10	8	10.34	6	40
STg200 (100-200MW)	10	8	8.42	5	40
STg600 (200-600MW)	10	8	8.35	4	40
STgo100 (0-100MW)	10	8	10.34	6	40
STgo200 (100-200MW)	10	8	8.42	5	40
STgo600 (200-600MW)	10	8	8.35	4	40
STo100 (0-100MW)	10	8	10.34	6	40
STo200 (100-200MW)	10	8	8.42	5	40
STo600 (200-600MW)	10	8	8.35	4	40
STo600+ (600-9999MW)	10	8	14.55	3	40
STr+ (0-500MW)	10	8	10.26	2	40

9.2.1: Nuclear Unit Operating Characteristics

Nuclear plants are modeled as special thermal units in ENELYTIX. In general, nuclear facilities are treated as must run units and assumed to run except for periods during generator maintenance and forced outage. Current refueling schedules are obtained from roadtech.com[31]. Future schedules are estimated per specified periodicity.

9.3: Hydro Electric Generator Characteristics

TCR models hydro electric generators as energy constrained generators that output energy in relation to daily pattern of water flow, i.e. the minimum and maximum generating capability and the total energy for each plant. TCR obtains historic hydro generation MWh from EIA and S&P Global database. Based on this historic information, TCR develops daily maximum energy output for each hydro power plant in NYISO Subject to this maximum energy output constraint, TCR allows ENELYTIX® to optimize hourly energy output of each hydro electric generator to minimize system-wide production costs in each hour of the day.

9.4: Pumped Hydro Storage Facilities

TCR models pumped storage with the following specifications obtained from the National Hydroelectric Power Resource Study prepared for the U.S. Army Engineer Institute of Water Resources.

- Max Storage: Unit Capacity * Number of Storage hours
- Min Storage: 10% of Max Storage
- Min MW: Pumping Capacity

31 https://www.roadtechs.com/shutdown/shutdown.php?region=n

- Efficiency: Annual Output/Annual Pumping Energy

9.5: Wind Facilities

Wind generation is represented as hourly generation profile in ENELYTIX®. TCR assembles wind generation profiles from the National Renewable Energy Laboratory (NREL)'s Wind Integration National Dataset (WIND) Toolkit dataset based on 2012 weather data.[32] TCR maps each wind power plant to the nearest NREL site based on the plant's location. For wind plants with known historic capacity factor, TCR further screens for NREL wind sites that have capacity factor within delta of 2% from historical average capacity factor inside a 50-mile radius range from the plant's location. The resulting normalized NREL site schedule is scaled to the installed capacity of the corresponding wind site and then calendar-shifted for each forecast year making it synchronized with load profiles and interchange schedules.

9.6: Solar Photovoltaics Facilities

Like wind facilities, photovoltaic (PV) generators are also represented as hourly generation profiles in ENELYTIX®. TCR obtains solar irradiation data from weather station closest to a PV generator's location and uses NREL's PVWatts® Calculator to estimate the site's energy production. TCR assumes all utility scale PV facilities are fixed array installations with characteristics summarized in Table 20.

Table 19. Photovoltaic Parameter Assumptions

PV Parameter	Assumption
Elevation (m)	5
Module Type	Standard
Array Type	Fixed (Open Rack)
Array Tilt (deg)	20
Array Azimuth (deg)	180
System Losses (%)	14
Invert Efficiency (%)	96

32 https://www.nrel.gov/grid/wind-toolkit.html

CHAPTER 10: Fuel Cost

10.1: Natural Gas Prices

10.1.1: Spot Gas Prices in New York

TCR obtained a monthly spot gas price forecast for natural gas market hubs from Wood Mackenzie.[33] However, a proper modeling of price diversity among gas-fired generators serving NYISO requires forecasts for more hubs than are provided in the Wood Mackenzie outlook. To extend the Wood Mackenzie forecast to the required hubs, TCR obtained historic spot price data for each relevant hub for the past 5 years. Using historic spot price data, for each relevant hub in the NYISO region TCR identified the highest price-correlated hub which had a Wood Mackenzie forecast and calculated a percentage difference in the historic spot price between the two hubs.

The projections of natural gas spot prices at each market hub equals the Wood Mackenzie projection of Henry Hub price plus the Wood Mackenzie projection of monthly basis differential to each market hub from the Henry Hub. For hubs with no Wood Mackenzie forecast, the spot price equals the projection at the highest-correlated hub with a Wood Mackenzie forecast, multiplied by the percentage difference in price between the hubs from the historic spot price data. Forecasted NYISO market hub and Henry Hub prices are shown in Figure 2.

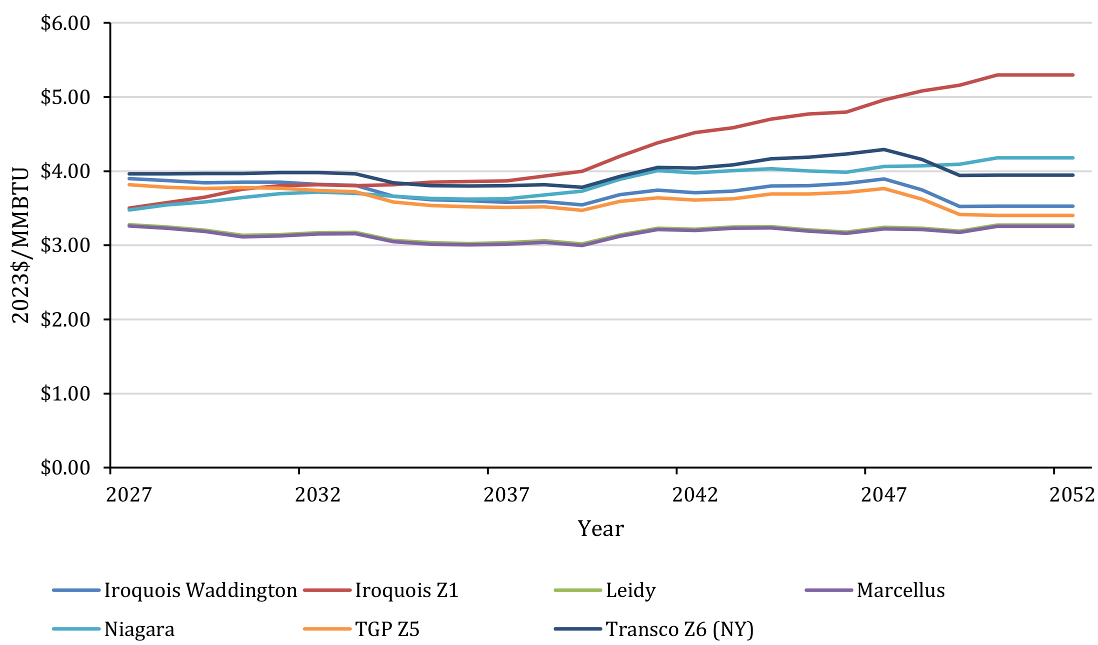

Figure 3. TCR Forecasted Yearly Spot Natural Gas Prices by Hub (2023$/MMBtu)

33 North America gas 2022 outlook to 2050. Wood Mackenzie

Figure 3 shows the TCR forecast of monthly spot prices at natural hubs serving NYISO. This figure indicates that the TCR forecast of gas prices to electric generating units shows significant variation between winter months and summer months.

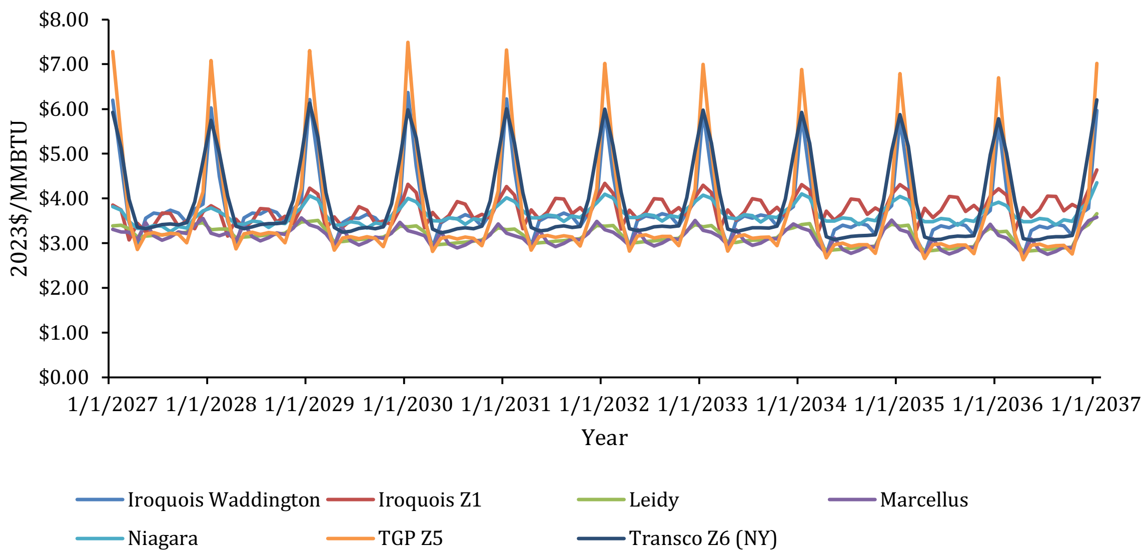

Figure 4. TCR Forecasted Monthly Spot Natural Gas Prices by Hub (2023$/MMBtu)

10.1.2: Natural Gas Price Adders

TCR adds plant level fuel prices adders for all natural gas fired power plants based on each power plants' supplier type (pipeline connected vs. LDC served) and unit type (baseload units vs peaking units). These adders are shown in Table 21.

Table 20. Natural Gas Power Plant Fuel Adders ($/MMBtu)

Unit Type	Directly Connected to Pipeline	Served by LDC
Baseload Units	0.05	0.2
Peaking Units	0.15	0.4

10.2: Fuel Oil Prices

TCR obtained annual crude oil projections from Wood Mackenzie's North America gas October 2022 outlook to 2050.[34] In order to extend these projections to distillate (No. 2) and residual (No. 6) fuel oil, TCR used historic fuel prices obtained from the EIA. TCR calculated price ratios between the fuel oils and crude oil using a five-year historical monthly average for the daily spot prices for crude oil (Cushing, OK WTI) and No. 2 heating oil (NY Harbor spot price), and the monthly U.S. Residual Fuel Oil wholesale price.

34 North America gas gas 2021 outlook to 2050. Wood Mackenzie

The projections for No. 2 fuel oil (FO2) and No. 6 fuel oil (FO6) equal the Wood Mackenzie forecast for crude oil multiplied by the historic price ratios. The projection of fuel oil prices is shown in Figure 4.

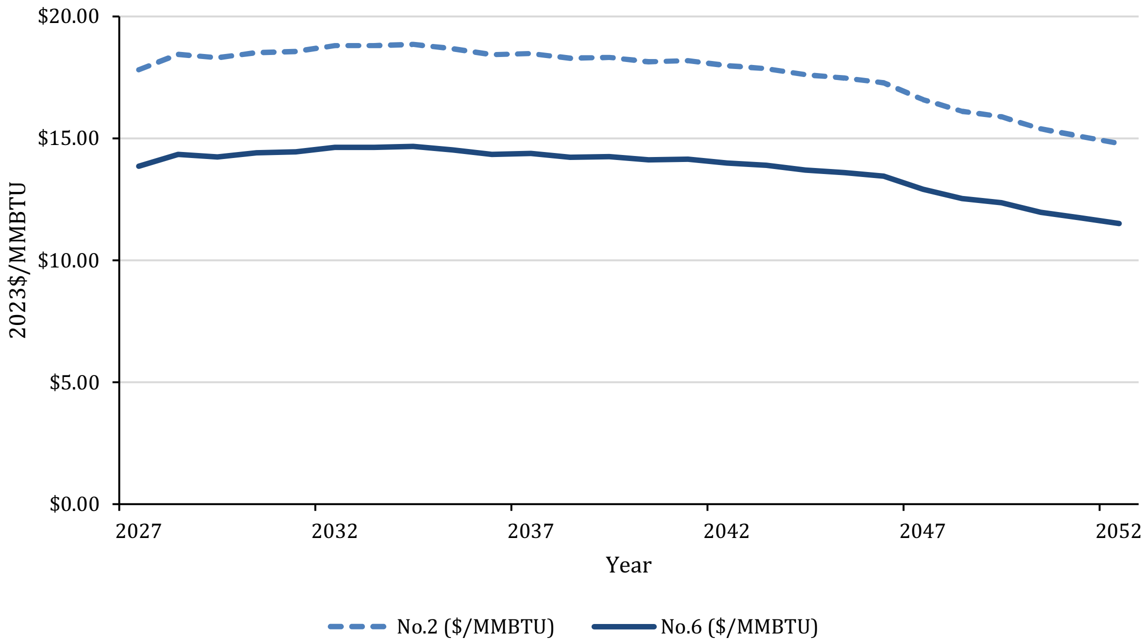

Figure 5. Projection of Fuel Oil Price (2023$/MMBtu)

10.3: Uranium Prices

TCR develops uranium prices using the pricing calculator created by the Bulletin of the Atomic Scientist[35]. The calculator estimates the cost of electricity assuming the nuclear fuel cycle is "Once-Through". TCR omits all capital related cost associated with the cost of electricity from the calculator. The resulting uranium price is 0.99 Nominal $/MMBtu, which TCR assumed to be fixed.

10.4: Coal Prices

There are no coal units operational in NYISO during the 2027-2052 study period.

35 http://thebulletin.org/nuclear-fuel-cycle-cost-calculator/model

CHAPTER 11: Emission Rates and Allowances

The two active emission control programs in the NYISO footprint are the Regional Greenhouse Gas Initiative (RGGI) programs for Carbon dioxide and the Cross-State Air Pollutions Rule (CSAPR) for sulfur dioxide and nitrogen oxides emissions. TCR models both programs in this model.

11.1: Emission Programs

11.1.1: Regional Greenhouse Gas Initiative

New York participates in the Regional Greenhouse Gas Initiative (RGGI). TCR developed its RGGI CO_2 allowance price assumptions based on the Wood Mackenzie 2021 gas outlook to 2050, which includes a RGGI price forecast.[36] Figure 5 plots the Base Case RGGI price assumption.

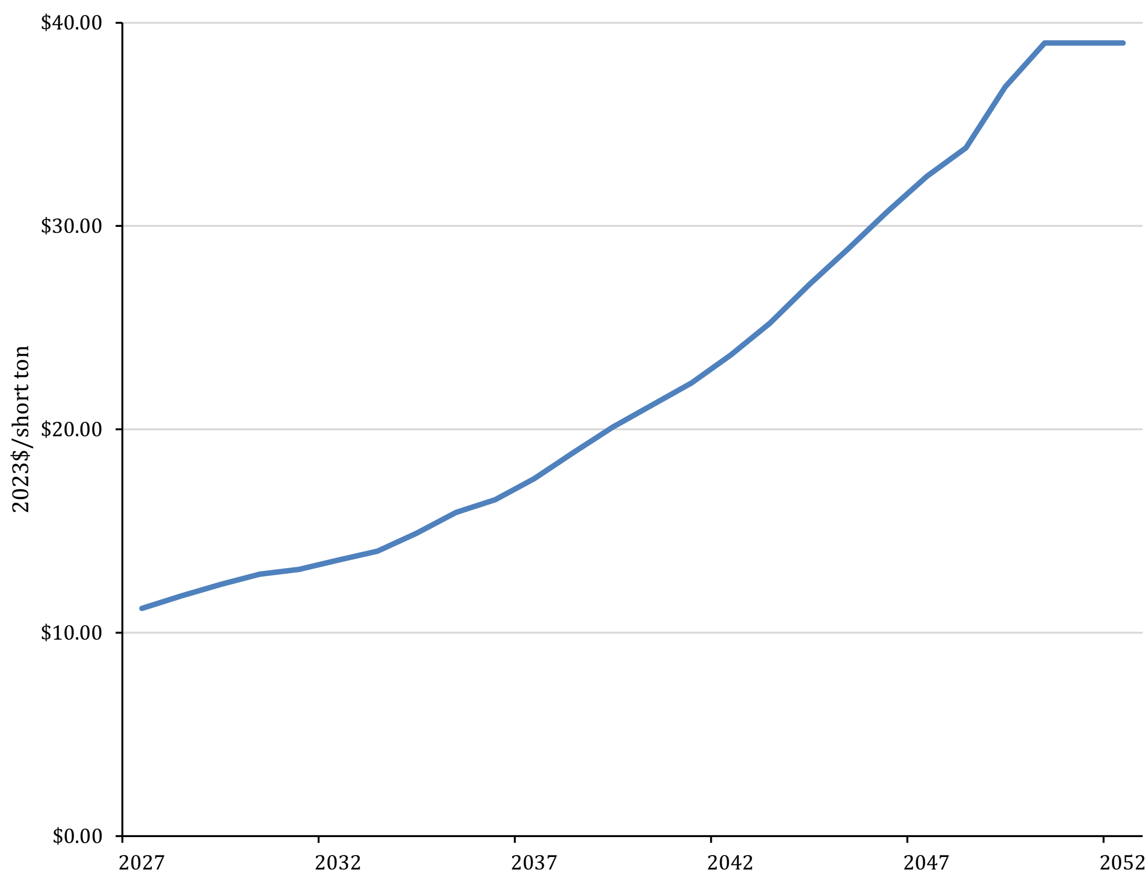

Figure 6. RGGI Price Projection, 2027-2052 (2023$/short ton)

36 North America gas 2021 outlook to 2050. Wood Mackenzie

11.1.2: Cross State Air Pollution Rule

The state of New York is covered by Cross State Air Pollution Rule (CSAPR) for both fine particles (SO_2 and annual NO_x) and ozone (seasonal NO_x). Figure 6 shows a map of CSAPR program coverage. In CSAPR terminology, "Seasonal NO_x" emission is the summer season from May 1 to September 30 while "Annual NO_x" emission refers to the rest of the year.

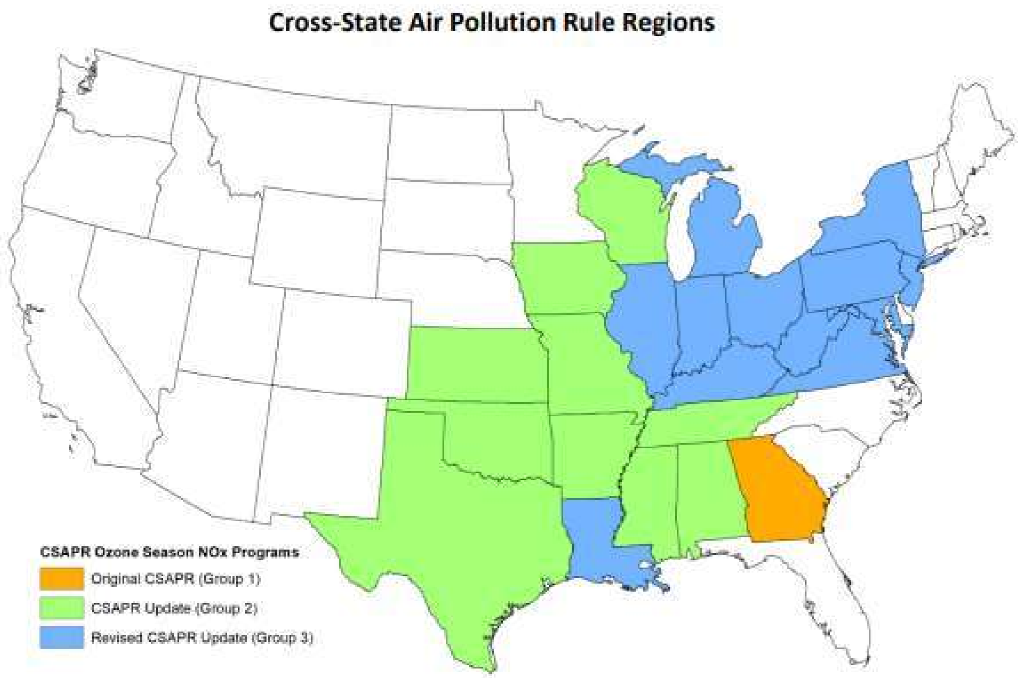

Figure 7. Map of States Covered by CSAPR Programs

Source: EPA

NYISO is a member of the Group 3 NO_x seasonal pools and the total NO_x annual pool. NO_x allowances in this pool increased by 10-fold in 2022 over the previous years. While this increase was partially tied to changes in operational behavior and regulation, the primary cause was the increased price of natural gas making coal generation more competitive.

To project future CSAPR prices, TCR obtained historical CSAPR programs' emission allowance prices from S&P Global's assessment of CSAPR program and correlated that against Henry Hub price data, also from S&P Global. Using a linear regression analysis and the WoodMac forecast for Henry Hub prices, a forecasted CSAPR emission allowance price was computed with a price floor of $2,735.

Table 22 summarizes CSAPR prices used in the model, which are assumed to be constant over the forecast, while Figure 7 shows forecasted CSAPR NO_x seasonal prices by year.

Table 21. CSAPR Emission Allowance Prices

Emission Type	2023$ per Allowance	Allowance	2023$/Pound
CSAPR NO_x Seasonal	$2,735 to $12,246	per short ton (2000lbs)	$1.37 to $6.12
CSAPR NO_x Annual	$5.42	per short ton (2000lbs)	$0.0027
CSAPR SO_2 Group 1	$5.42	per short ton (2000lbs)	$0.0027
CSAPR SO_2 Group 2	$2.81	per short ton (2000lbs)	$0.0014

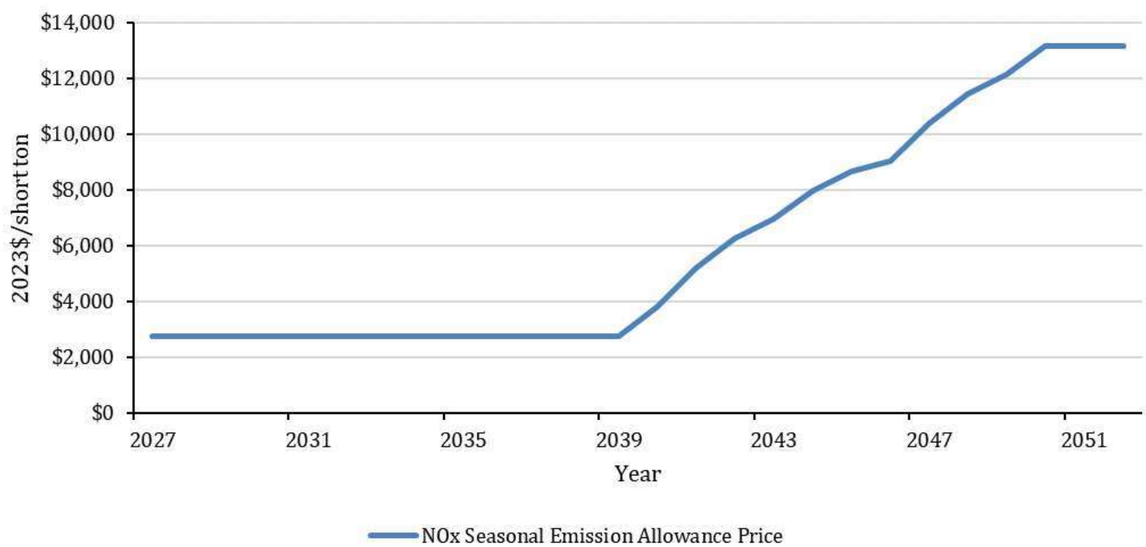

Figure 8: NOx Seasonal Emission Allowance Price Projection, 2027-2052 (2023$/short ton)

11.2: Emission Rates

TCR obtains generator unit level emission rates from three sources: S&P Global's historic unit emissions data base, S&P Global's simulated Generator Supply Curve (GSC) data base and EIA's generic future unit characteristics. For existing thermal units, TCR uses S&P Global's historic emission rates. For existing units without historic data, TCR uses GSC emissions data. Finally, for existing units without historic and GSC data, and future units not yet operating, TCR uses EIA's generic rates.

GLOSSARY

Term	Definition
10MNSR	10 Minute Non-Spinning Reserve
10MSR	10 Minute Spinning Reserve
30MR	30 Minute Reserves
ACP	Alternative Compliance Payments
ADR	Active Demand Response
AEO	Annual Energy Outlook
AESC	Avoided Energy Supply Cost
ALG	Algonquin
ATB	Annual Technology Baseline
ATB (NREL)	Annual Technology Baseline
BIO	Biomass
BMPV/ BTMPV	Behind-the-meter Photovoltaic
Btu	British Thermal Unit
CC	Combined Cycle
CEA	Concentric Energy Advisors
CEC	Clean Energy Credits
CECP	Clean Energy and Climate Plan
CEII	Critical Energy Infrastructure Information
CELT	Capacity, Energy, Loads, and Transmission
CES	Clean Energy Standard
CLCPA	Climate Leadership and Community Protection Act
CMR	Code of Massachusetts Regulations
COD	Commercial Operation/Online Date
CSAPR	Cross-State Air Pollutions Rule
CT	Combustion Turbine
CT PURA	Connecticut Public Utilities Regulatory Authority
DA	Day-ahead
DER	Distributed Energy Resources
DERC	Discrete Emission Reduction Credits
DFO/NO. 2	Distillate Fuel Oil
DOER	Massachusetts Department of Energy Resources
DPU	Department of Public Utilities
E&AS	Energy and Ancillary Services
EDC	Electric Distribution Company
EE	Energy Efficiency
EEA	Energy and Environmental Affairs
EFORd	Effective Forced Outage Rates
EGU	Electric Generating Units
EIA	Energy Information Administration
eNode	Electric Node
eNodes	Electrical Nodes
EPA	Environmental Protection Agency
FCA	Forward Capacity Auction

Term	Definition
FCM	Forward Capacity Market
FERC	Federal Energy Regulatory Commission
FLHR	Full Load Heat Rate
FO2	Fuel Oil #2
FO6	Fuel Oil #6
GCR	Generating Capacity Requirement
GHG	Greenhouse Gas
GIS	Geographic Information System
Gold Book	NYISO's Load & Capacity Data Report
GSC	Generator Supply Curve
GT	Gas Turbine
GWh	Gigawatt-hour
GWSA	Global Warming Solutions Act
HD	Hydro Power
HVDC	High Voltage Direct Current
IC	Internal Combustion (reciprocating) Engine
ICAP	Installed Capacity
ICR	Installed Capacity Requirements
IOU	Investor Own Utilities
IRM	Installed Reserve Margin
ISONE	Independent System Operator of New England
ITC	Investment Tax Credit
Kirchhoff's laws	The current law and the voltage law
LCR	Locational Minimum Installed Capacity Requirement
LDC	Load Distribution Company
LMP	Locational Marginal Price
LSE	Load Serving Entity
LSR	Local Sourcing Requirement
MA DEP	Massachusetts Department of Environmental Protection
MCL	Maximum Capacity Limit
MinRsv	Minimum Reserve
MIP	Mixed Integer Programming
MLP	Municipal Light Plant
MMBtu	Metric Million British Thermal Unit
MMD	Market Model Database
MW	Megawatt
MWh	Megawatt-hour
NECEC	New England Clean Energy Connect
NEL	Net Energy Load
NEPOOL GIS	New England Power Pool Generation Information System
NERC	North American Electric Reliability Corporation
NG	Natural Gas
NOx DERCs	Nitrogen Oxide Discrete Emission Reduction Credit
NREL	National Renewable Energy Laboratory

Term	Definition
NYCA	The full NYISO Capacity Pool
NYGATS	New York Generation Attribute Tracking System
NYISO	New York Independent System Operator
NYPSC	New York State Public Service Commission
NYSERDA	New York State Energy Research and Development Authority
NYSRC	New York State Reliability Council
OP4	Voltage Reduction Relief, calculated by ISONE for each FCA
PDR	Passive Demand Response
PME	Power Market Explorer
PPA	Power Purchase Agreement
PS	Pumped Storage Unit
PSH	Pumped Storage Hydro Unit
PSO	Power System Optimizer
PTC	Production Tax Credit
PV	Photovoltaic
PVWatts®	NREL's PV Calculator
RCSA	Regulations of Connecticut State Agencies
REC	Renewable Energy Certificate, Renewable Energy Credit
RES	Renewable Energy Standard
REV	Renewable Energy Potential (reV) Model
RFO/NO. 6	Residual Fuel Oil; see FO6
RFP	Requests for Proposal
RGGI	Regional Greenhouse Gas Initiative
RM	Reserve Margin
RMR	Reliability Must Run
ROP	Rest of Pool
RoR Hydro	Run-of-the-River Hydropower
RPS	Renewable Portfolio Standard
RT	Real-time
SCED	Security Constrained Economic Dispatch
SCUC	Security Constrained Unit Commitment
SENE	Southeast New England
SMART	Solar Massachusetts Renewable Target
ST	Steam Turbine
SUN	Solar Powered
TAO	Trading and Agreement Orders
TARA tool	Transmission Adequacy & Reliability Assessment tool
TGP	Tennessee Gas Pipeline
TMNSR	Ten-Minute Non-Spinning Reserve
TMOR	Thirty-Minute Operating Reserve
TMSR	Ten-Minute Spinning Reserve
TRE	Total Renewable Energy
TWh	Terawatt-hour
UCAP	Unforced Capacity

Term	Definition
URM	Unforced Capacity Reserve Margin
US EPA	United States Environmental Protection Agency
VDER	Value of Distributed Energy Resources
VOM	Variable Operation & Maintenance
WACC	Weighted average cost of capital
WAT	Water
WIND (NREL)	Wind Integration National Dataset
WT	Wind Turbine