REVOLUTION WIND

Deepwater Wind, LLC

with **GridAmerica Holdings Inc.** and **FirstLight Power Resources Management, LLC**

Proposal for the sale of Energy and RECs from the:

Revolution Wind Project

in response to:

The Request for Proposals for Long-Term Contracts for Offshore Wind Energy Projects issued by Electric Distribution Companies in Massachusetts and Massachusetts Department of Energy Resources.

RFP Issuance Date: June 29, 2017 Submission Date: December 20, 2017

submitted to:

The **Massachusetts Department of Energy Resources** and **Distribution Companies**, which include: Fitchburg Gas & Electric Light Company d/b/a Unitil Massachusetts Electric Company d/b/a National Grid Nantucket Electric Company d/b/a National Grid NSTAR Electric Company d/b/a Eversource Western Massachusetts Electric Company d/b/a Eversource

Certain data contained in this document or electronic file, as well as the appendices listed below, which hereby forms a part of the Proposal have been submitted in confidence and contain trade secrets or proprietary information, and Deepwater Wind and GridAmerica request confidential treatment of such parts of the Proposal as provided in Section 1.7.4 of the Request for Proposals. Deepwater Wind and GridAmerica request that the data marked with a double blue underline not be disclosed as such information is confidential and proprietary and exempt from disclosure under the Freedom of Information Act.

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Appendices

No.	Name	Confidential?
Appendix 1-1	Signed Certification and Authorization Form - Appendix D	N
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[redacted]	[redacted]	[redacted]
Appendix 1-4	[RESERVED]	N/A
Appendix 1-5	[RESERVED]	N/A
[redacted]	[redacted]	[redacted]
Appendix 2-1	Eligibility and Threshold Requirements	N
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[redacted]	[redacted]	[redacted]
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[redacted]	[redacted]	[redacted]
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[redacted]	[redacted]	[redacted]

[redacted]

Appendix 6-6	[RESERVED]	N/A

[redacted]

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[redacted]

Appendix 8-2	Offshore Transmission Model Details	N

[redacted]

Appendix 12-1	Financial Organizational Chart	N
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[redacted]

SECTION 1: CERTIFICATION, PROJECT AND PRICING DATA

Deepwater Wind, LLC, on behalf of a to-be-formed affiliate, (collectively, the "Company" or "Deepwater Wind") submits this proposal (together with its appendices, this "83C Proposal") for the Revolution Wind Project (the "Project") in response to the request for proposals issued on June 29, 2017 (the "83C RFP") under Section 83C of the Massachusetts Energy Diversity Act of 2016 (the "Enabling Legislation").

The Revolution Wind Project is a new offshore wind farm to be located in BOEM Lease OCS-A 0486 off the coast of Massachusetts, as further described in **Section 2.3** below.

Deepwater Wind offers two conforming Project configurations (collectively, the "Conforming Offers"), having alternative wind farm sizes and commercial operations dates, in accordance with Sections 2.2.1.2 and 2.2.1.3 of the 83C RFP, [redacted] We invite the acceptance of any one of the configurations described below:

Conforming Offers:

- [redacted] MW Conforming Offer: A stand-alone [redacted] MW offshore wind farm, constructed in one phase, having a 2023 commercial operations date (a "COD"), as required by Section 2.2.1.2 of the 83C RFP.
- [redacted] MW Conforming Offer: A stand-alone [redacted] MW offshore wind farm, constructed in one phase, having a COD in 2023.

[redacted]

For each of the Conforming Offers, Deepwater Wind offers alternative configurations of the Delivery Facility (defined in **Section 2.4**), either as a Project-Specific Generator Lead Line (a "Project-Specific Delivery Facility") or an Expandable Transmission Proposal (an "Expandable Delivery Facility") under a Federal Energy Regulatory Commission ("FERC") Tariff, in accordance with Section 2.2.1.3 of the RFP. Deepwater Wind and GridAmerica Holdings Inc.,

[redacted]

("GridAmerica") have entered into an option agreement (the "Option Agreement") pursuant to which GridAmerica has the right to acquire the Delivery Facility at COD, subject to certain terms and conditions and will provide transmission service to the Wind Farm and recover its purchase price under a "Transmission Services Agreement" or "TSA". The cost of the Delivery Facility for each of the Conforming Offers is reflected in pricing set forth the CPPDs listed below.

In addition to the configurations described above, Deepwater Wind and FirstLight Power Resources (our "Storage Partner" or "FirstLight") have agreed to the use of FirstLight's Northfield Mountain Pumped Hydro Storage facility (the "Storage Facility") to store energy generated by the wind farm during ISO New England's ("ISO-NE") off-peak hours and deliver energy to the Distribution Companies during the ISO-NE on-peak hours (such service referred to herein as the "Storage Feature"). The Distribution Companies may select the Storage Feature with any of Deepwater Wind's Conforming or Expandable Offers. Deepwater Wind and FirstLight have prepared a working spreadsheet including Part V of the CPPD form, as listed below, to demonstrate how the Storage Feature would modify the energy delivery profile of a [redacted] MW offshore wind farm.

In accordance with the requirements of the 83C RFP, we submit the following attachments in connection with the proposed Revolution Wind Project:

Appendix 1-1: Certification and Authorization Form
Appendix 1-2: Section 83C Bidder Response Form
[redacted]
Appendix 1-4: [RESERVED]
Appendix 1-5: [RESERVED]
[redacted]

To simplify review of this Proposal, we prepared [redacted] Electronic MS Excel versions of the CPPD forms are included on the enclosed CD ROM.

SECTION 2: EXECUTIVE SUMMARY

2.1: 83C Proposal Introduction

Deepwater Wind is putting ratepayers first by offering an entirely new vision for the development of offshore wind serving Massachusetts. We are proposing to pair offshore wind, sized in increments of [redacted] MW, with grid-scale storage and an expandable transmission system. In the near term, this will result in energy market savings of $75 million annually for Massachusetts ratepayers, without counting the benefits of economic development or emissions reductions, as detailed in **Table 2-1** below. Over the long term, this approach will result in ratepayer savings of $300 million to $600 million when compared with buying offshore wind in larger quantities (e.g. 600 MW or 800 MW), as detailed in **Appendix 14-3**.

Table 2-1: Net Benefits of this 83C Proposal

	Pricing / Cost Basis	Ratepayer (Cost) / Benefit in Year 1	83C Proposal Reference
[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]	

There are four principle components to our approach:

2.1.1: Saving Money for Ratepayers with Low Pricing

Deepwater Wind is offering pricing that is very compelling for ratepayers:

[redacted]

For each Offer, we also offer an alternative pricing structure with an annual escalator. For our [redacted] MW Conforming Offer, we offer a first-year price [redacted] annual escalator. [redacted] None or our offers are

contingent on the selection of the storage facility or the expandable transmission system described below.

2.1.2: Smaller Projects to Promote Long Term Cost-Effectiveness

The cost of offshore wind across global markets is falling thanks to improvements in technology and the development of local supply chains. But the US market is still in its infancy. Markets in the US will benefit from these falling costs only by investing in offshore wind in a disciplined approach, building up local supply chains and infrastructure over time. There is no reason for Massachusetts to over-invest in offshore wind projects immediately, when the US market is still immature compared to European markets.

In a 2016 Study[2], Lawrence Berkeley National Laboratory and NREL estimated that the levelized cost of offshore wind would fall 30% by 2030 based on technology evolution, supply chain growth, and improvements in the deployment of equipment resulting from the labor force's learning curves. An incremental approach allows the US to "catch up" to European low pricing without locking in many hundreds of megawatts of capacity into long-term contracts that are relatively higher than those in Europe today. In response, we offer an incremental approach that will minimize the long-term cost of the 1,600 MW offshore wind target by buying more, but smaller, offshore wind projects over time.

Independent analysis, prepared by the Brattle Group and attached as **Appendix 14-3**, shows that the Distribution Companies can lower the cost of achieving the Commonwealth's 1,600 MW offshore wind target by as $300 million to $600 million by choosing to buy offshore wind in increments of [redacted] per year, rather than 600 MW to 800 MW.

This scale and schedule of procurements is large enough to spur the development of local supply chains and labor forces, and allows sufficient time to benefit from the maturation of those factors, as well as technology improvements. In addition to capturing the benefits of declining costs, this approach provides the following benefits:

- Minimizes ratepayer impact in the near term, by buying smaller quantities when prices are relatively higher;
- Allows the local supply chain and labor force to develop and mature, which creates sustained local job growth, as opposed to a boom/bust cycle.
- Allows the Commonwealth to benefit from the supply chains that other States in the region are building, which will result in lower offshore wind costs in the near future.
- Minimizes the risk of adverse balance sheet impacts for the Distribution Companies by keeping the contracts as small as possible.

2.1.3: Pairing Wind and Storage to Replace Retiring Capacity

Deepwater Wind offers, as an optional feature, the pairing of the output of the Revolution Wind Project with the storage capacity of the Northfield Mountain Pumped Hydro Storage Facility, detailed in **Section 2.5** below. This will improve the dependability of the Project's energy

[2] Nature Energy (2016). "*Expert elicitation survey on future wind energy costs*". Online. Available: www.nature.com/articles/nenergy2016135

profile, aligning its output with the Commonwealth's load shape, and allowing it to be a part of the replacement of retiring fossil-fired generating capacity across New England. We believe this to be the largest pairing of offshore wind and storage anywhere in the world. Indeed, this pairing of a high-capacity utility-scale renewable energy project with a large storage facility will synthetically replicate the reliability characteristics of traditional fossil fuel-fired plants in the region, becoming a national model for next generation regional energy systems.

This pairing is especially important now because retirements pose a significant challenge for the New England region. ISO New England ("ISO-NE") estimates that up to 8,300 MW of non-gas-fired generation is "at risk" for retirement by 2020 (28 older oil and coal units) [3]. Of the 8,300 MW at risk, over 3,000 MW of non-gas resources have announced their intention to retire in the next five years[4]. If all retire, ISO-NE estimates that 6,300 MW of new or repowered capacity will be needed in the region[3].

Offshore wind has a unique ability to help replace this retiring capacity by delivering large quantities of clean energy when and where it is needed. A recent study by AWS Truepower found that offshore wind will operate at a high level of output during the coldest winter days and that, as a result, will significantly mitigate price spikes during cold winter periods[5], especially if paired with storage.

If our Storage Feature is selected, FirstLight will [redacted] This will allow the Distribution Companies to rely on the output of the Project being available when it is most needed, and will result in significant savings for Massachusetts ratepayers, as detailed in the independent study attached as **Appendix 2-6** and summarized in **Table 2-1** above.

2.1.4: Planning for Incremental, Expandable Transmission

Deepwater Wind has partnered with GridAmerica to offer an incremental expandable transmission solution. From a technical and an environmental perspective, our solution accounts for the electrical and physical constraints on the South Coast and in Narragansett Bay to allow for the full deliverability of up to 1,600 MW. From a commercial and regulatory perspective, our solution allows for cost recovery of an expandable transmission system through the purchased power agreements ("PPAs") of the wind farms that use it, rather than through a complex proceeding before ISO-NE and FERC.

[3] ISO New England, 09/14. "Managing the Reliability of the Electric Grid While the Power Industry Undergoes Rapid Transformation." Prepared by ISO-NE President Gordon van Welie for Massachusetts Restructuring Roundtable. September 19, 2014. Online. Available: http://www.iso-ne.com/static-assets/documents/2014/09/ma_roundtable_9_19_14_gvw_final.pdf

[4] ISO New England, 06/14. "Infrastructure Needs: Electricity-Natural Gas Interdependencies." Prepared by ISO-NE President Gordon van Welie for the Regional Energy Forum. June 30, 2014. Online. Available: http://newenglandcouncil.com/assets/ISONE_June30_NewEnglandCouncil_FINAL.pdf

[5] Wilson, Whitney. "Offshore Wind: Mitigation of Natural Gas Based Market Price Spikes during Extreme Cold Weather Conditions." AWS Truepower. Online. Available: https://www.awstruepower.com/assets/Offshore-Wind-Mitigation-of-Natural-Gas-Based-Market-Price-Spikes-During-Extreme-Cold-Weather-Conditions_Wilson_Oct2014.pdf

This approach is consistent with the Commonwealth's stated preference for shared offshore transmission facilities. In its 2014 Offshore Wind Transmission Study[6], the Massachusetts Clean Energy Center ("CEC") identified certain "benefits of advanced planning for the siting of a single or multiple transmission corridor(s) from the offshore wind projects in federal waters across state waters to landside grid interconnection location(s)." To achieve these benefits, the CEC identified the following "desired features" of a shared offshore transmission project:

- Expansion capability as development advances in the WEAs;
- Transmission rights (or access to the routes) available to multiple wind developers;
- Consolidated transmission routes, or corridors, from the WEAs to one or more mainland interconnection points; and
- Coordinated and expedited state permitting and licensing for the transmission routes in state waters and coordinated federal access and permitting process.

Deepwater Wind and GridAmerica plan to engineer, permit, finance, construct and operate the Delivery Facility so that it may be cost-effectively expanded from a stand-alone export line to a shared offshore transmission facility that offers the Commonwealth's desired features to other developers at a fixed price. We will do so by:

- designing the Delivery Facility to cost-effectively deliver the output of multiple offshore wind projects in the range of 200 MW to 800 MW;
- making future transmission rights available to other developers under a FERC-accepted rate, which shelters ratepayers by transferring any risks associated with transmission construction cost overages to the owner of the Delivery Facility;
- engineering and permitting the Delivery Facility to accommodate multiple parallel submarine cables; and
- pursuing all the real estate and development rights necessary for the Delivery Facility to be expanded up to a total capacity of 1,600 MW.

This structure accomplishes the Commonwealth's transmission planning goals without exposing ratepayers to the financial exposure of building out a single 1,600 MW offshore transmission system at the outset. Taking a careful and incremental approach, Deepwater Wind will design and permit a system that can accommodate 1,600 MW of capacity when fully built, and will initially construct enough transmission capacity to accommodate any of its offshore wind projects selected in the initial Massachusetts solicitations. Future offshore wind project sponsors will be able to take advantage of the design, site control, permitting, and regulatory work already performed for this system, while those sponsors contract with the transmission system owner for the installation of the incremental physical components needed to upgrade the transmission system to accommodate new offshore wind projects.

[6] ESS (2014). *"Offshore Wind Transmission Study Final Report"*. Prepared by ESS Group, Inc. for the Massachusetts Clean Energy Center. September, 2014. Online Available. http://files.masscec.com/research/MassCECOSWTransmissionStudy.pdf

2.2: Bidder Introduction

This 83C Proposal is submitted by Deepwater Wind. GridAmerica and FirstLight are supporting this 83C Proposal as described below.

2.2.1: Deepwater Wind

Deepwater Wind is America's leading offshore wind developer. Deepwater Wind, a Delaware limited liability company, is the only company to have successfully navigated the permitting, legal, financial, installation and operational challenges of offshore wind in America.

As the developer of the successful 30 MW Block Island Wind Farm ("BIWF"), Deepwater Wind is the first and the only company to develop, finance, build and operate an offshore wind farm in America. As further detailed in **Section 12**, this path breaking project required Deepwater Wind to secure over 20 federal, state and local approvals. Deepwater Wind developed and constructed the Block Island Wind Farm with 100% commercial financing provided by industry-leading equity and lending partners. This $300 million financing has since been awarded Renewable Energy Deal of the Year in 2015 by both Project Finance International and IJ Global. The construction of the Block Island Wind Farm was completed in the summer of 2016 on-budget, on-schedule and with excellent environmental and safety records.

In connection with the BIWF project, Deepwater Wind also fully developed the Block Island Transmission System ("BITS", now known as "Sea2Shore") – a $100 million, 30-mile onshore and offshore transmission system connecting Block Island to the mainland of Rhode Island for the first time. This was the first offshore renewable energy transmission system developed in the United States. Deepwater Wind sold this transmission system to The Narragansett Electric Company ("Narragansett"), an affiliate of GridAmerica at the commencement of construction. Deepwater Wind worked closely with Narragansett to achieve a successful joint engineering-procurement-construction effort to bring the system on-line concurrently with the BIWF project.

The BIWF project is a first step to developing larger, utility-scale offshore wind farms in the United States. Deepwater Wind is developing a portfolio of larger-scale projects to serve New England, New York and the Mid-Atlantic States. In July 2013, after more than four years of collaboration with federal, state and local agencies, as well as a broad range of stakeholders, Deepwater Wind won the first competitive lease auction for offshore wind energy areas held by the U.S. Department of the Interior and acquired two leases – OCS-A 0486 and OCS-A 0487.

In July 2016, the Long Island Power Authority ("LIPA") announced its plan to select the first phase of development in these lease areas – the 90 MW South Fork Wind Farm – as the winner of a competitive solicitation to project new sources of energy and capacity to Long Island's constrained south fork. This project is the first phase of development in the RI-MA WEA – the same site as the Revolution Wind Project. At the time of this Proposal, Deepwater Wind is conducting surveys of the RI-MA WEA in connection with the South Fork Wind Farm that can be leveraged to support the development of the Revolution Wind Project.

Deepwater Wind is also developing the first offshore wind farm to serve the Mid-Atlantic region. In May of 2017 the Maryland Public Service Commission designated Deepwater Wind's

Skipjack Wind Farm as a Qualified Offshore Wind Farm eligible to sell 120 MW of Offshore Wind Renewable Energy Certificates ("ORECs").

2.2.2: GridAmerica

GridAmerica is a wholly-owned unregulated subsidiary of National Grid USA ("NGUSA"), a Delaware corporation, which is a direct wholly-owned subsidiary if National Grid North America Inc. which is in turn an indirect wholly-owned subsidiary of National Grid plc, ("National Grid") and an affiliate of Massachusetts Electric Company, Nantucket Electric Company, Narragansett and New England Power Company ("NEP"). GridAmerica operates under the Utility Standards of Conduct Governing Activity Related to Solicitations for Clean Energy Resources under Sections 83C and 83D of the Massachusetts Green Communities Act, dated January 30, 2016. GridAmerica does business in the competitive markets as National Grid Ventures, a non-regulated business unit of National Grid, plc.

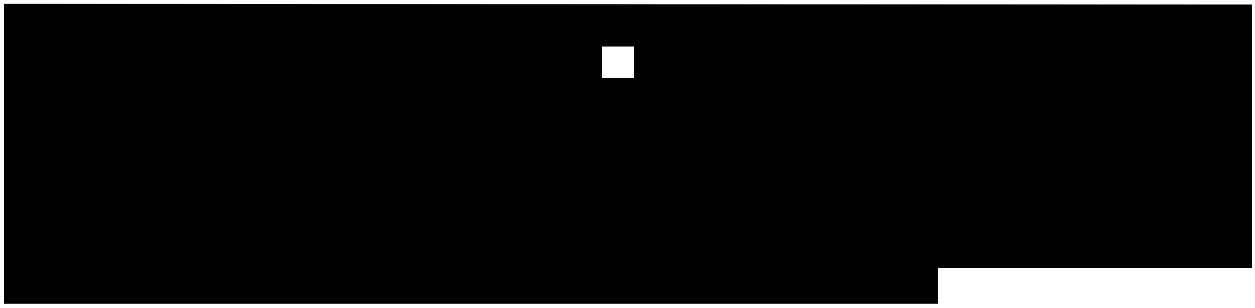
National Grid and its affiliates are world leaders in transmission development, construction and operation with numerous projects in operation or under development in the United States and in Europe. National Grid has a long record of successfully building, owning and operating large-scale electrical transmission infrastructure in New England and in the United Kingdom.

2.2.3: FirstLight

FirstLight Power Resources is a hydropower, energy storage, and solar generation company with assets based in Massachusetts and Connecticut, and headquartered out of Burlington, Massachusetts. FirstLight's hydropower and pumped storage facilities in New England produce over 1,000,000 MWh of electric generation each year, and contribute to reducing the region's carbon footprint by more than 780,000 tons annually. In addition to its conventional and run-of-river hydro facilities, FirstLight also owns and operates Northfield Mountain Pumped Hydro Storage facility ("Northfield Mountain" or the "Storage Facility") and Rocky River pumped hydro storage station, which are respectively the largest and third largest energy storage facilities in New England. [redacted]

2.3: Wind Farm Project Definition

The **Revolution Wind Project** has been designed to (i) provide a reliable and cost-effective source of energy, (ii) promote a sustainable offshore wind industry in Massachusetts and (iii) to further the Commonwealth's ability to meet its Global Warming Solution Act ("GWSA") goals. Deepwater Wind is offering multiple alternative project configurations described in **Section 1** and detailed in the Lookup Table attached as **Appendix 1-7**.



Wind Farm Design Basis. The Wind Farm will consist of (a) purpose-built offshore wind turbine generators ("WTG"), which will be installed atop (b) foundations designed for the site-specific subsurface conditions and connected by (c) submarine inter-turbine array cables to an offshore substation. Deepwater Wind has designed the Project using the Deepwater Wind is also in discussions with other world-class manufacturers, such as General Electric and MHI Vestas, who each produce offshore WTGs (some having ratings up to 9.5 MW) that would also be suitable for the Project. The final WTG selection will be made following a thorough selection process.

Wind Farm Siting. The Project will be located in federal waters on the Outer Continental Shelf (OCS) in the Bureau of Ocean Energy Management ("BOEM") Lease OCS-A 0486, within the RI-MA WEA. The Project has been sited to avoid obstructions and minimize potential conflicts with existing marine and terrestrial uses.

Interconnection and Delivery Point. The output of the Wind Farm will be delivered using the Delivery Facility described in **Section 2.4** below. Deepwater Wind has submitted interconnection requests for designating the Project's primary point of interconnection and delivery at The interconnection request also identifies the Grid America has submitted GridAmerica has fully executed the System Impact Study Agreement (**Appendix 6-5**) and expects the result

Construction Ports. The Project plans to use the New Bedford Marine Commerce Terminal during construction, making it the first offshore wind farm to use that facility. As detailed in **Section 14**, depending on the Offer selected, the Project is expected to create between

[redacted] regional jobs over its development and construction period, and to contribute to the development of a robust and enduring regional supply chain.

Operations and Maintenance. The Project will be operated and maintained from a new Shore Operations Center (SOC) planned to be located in New Bedford, MA. As detailed in **Section 14**, depending on the Offer selected, the Project is expected to create between [redacted] regional jobs per year during its operation and maintenance period.

Milestone Schedule. If the Project receives an executed PPA by [redacted] and all regulatory approvals for such PPA by [redacted], then permitting can be completed by [redacted] and the Project can be placed In-Service by [redacted]

Lessons Learned from our BIWF Project. Deepwater Wind's experience in the successful development of the Block Island Wind Farm is an important part of our plans for engineering, described in **Section 8**, construction described in **Section 10**, and operations and maintenance, described in **Section 11**. Our plans for engineering, constructing and operating the Revolution Wind Farm are substantially similar to the methods we used for our Block Island Wind Farm, as detailed in **Table 2-2** below.

Table 2-2: Learnings and Efficiencies from Block Island Wind Farm

FACTOR	LESSON LEARNED / EFFICIENCIES	SEE SEC.
Energy Resource Assessment Plan	Data collected in connection with the development of the Block Island Wind Farm is directly applicable to the Energy Campaign planned for this Project.	4
Project Financing / Debt Raise	Deepwater Wind raised approximately $300 Million from a club of six project lenders. These lenders have expressed interest in lending to future Deepwater Wind projects, including the Revolution Wind Project.	5
Tax Equity Financing	Deepwater Wind has completed the only tax equity financing for an offshore wind farm in the world. We have successfully demonstrated a methodology for establishing qualification that we plan to use for this Project.	5
Siting	Deepwater Wind worked closely with a broad range of stakeholders to identify, build consensus around, and obtain site control for, the most suitable locations for the BIWF project's infrastructure. In both cases, the project's required real estate was almost entirely owned by public entities with existing processes for establishing site control. Many of those stakeholders and agencies have comparable roles in this Project. Deepwater Wind is actively engaging with them to build the same level of consensus and support.	6
Interconnection	Deepwater Wind successfully negotiated an interconnection agreement with National Grid for the BIWF project, who will also be the connecting transmission owner for this Project. Deepwater Wind and National Grid worked closely with ISO-NE to obtain all the required interconnection rights for the BIWF project the sea2shore project. We anticipate this to be a similar process for the Revolution Wind project.	6
Environmental Assessment	The BIWF project and the Revolution Wind project have similar environmental characteristics, which also affect our construction methodology and operations and maintenance plans. Both involve many of the same permitting authorities, as detailed in **Section 7**. Site surveys are already underway on the offshore site, leveraging the learnings from the BIWF project.	7
Permit Acquisition	The BIWF project not only required substantially the same permits as the Revolution Wind project, but involved many of the same agencies.	7

	Deepwater Wind is now actively engaging with those agencies in preparation for the permitting of the Revolution Wind project.	
Engineering and Technology	Site surveys have shown that the Project site sits atop a sea-bottom composed of glacial till. This is substantially the same as the BIWF project site, which allows us to use a similar approach to foundation selection, cable burial and construction methodology.	8
Project Schedule	Deepwater Wind employed a conservative, sequential schedule for the BIWF project, in which we (a) prepared through permit applications to ensure agencies had all the materials required for their review, (b) provided a generous period of time for the agencies to complete their review, (c) executed supply contracts, but delayed notice-to-proceed until the completion of a financial close, (d) allowed ample time for long lead-time equipment, and (e) mitigated construction weather risk by planning for a two-season construction period. We plan to employ a similar approach for this Project.	9
Construction and Logistics	For the BIWF project, Deepwater Wind successfully employed a construction program that used a series of feeder barges to maximize the efficiency of the large crane vessel. We plan to employ a similar approach for this Project.	10
Operations and Maintenance	Deepwater Wind's existing operations of the BIWF project provides or efficiencies that have been passed along in our offered prices.	11

Shared Supply Chain. Deepwater Wind plans to sequentially develop multiple offshore wind farms in the RI-MA WEA. This approach is in the best interest of ratepayers because it allows us to make cost-effective investments in the regional supply chain that can be leveraged across multiple projects, over several years.

Our 90 MW South Fork Wind Farm will be the next offshore wind farm to be constructed in America, and the first in the RI-MA WEA. We plan to make significant investments in the regional supply chain to support the fabrication and installation of the South Fork Project's foundations in 2021 and the marshalling and installation of its wind turbines in 2022. As detailed below, we have planned the construction of the Revolution Wind Project to dovetail with that of South Fork, with foundation work in 2022 and wind turbine work in 2023. By aligning schedules and using a shared supply chain, Deepwater Wind can deliver the Revolution Wind Project for the low prices offered in this Proposal.

By accepting this Proposal, the Commonwealth will not only benefit from Deepwater Wind's strategy of creating a shared supply chain, but it will also contribute to the virtuous cycle of making that shared supply chain stronger, contributing to lower prices for future projects.

2.4: Delivery Facility Project Definition

Transmission Strategy. Deepwater Wind plans to develop the Project site, in incremental phases based on market demands in New England and New York. For New England, Deepwater Wind and GridAmerica plan to develop a single Delivery Facility that can be expanded to accommodate future offshore wind developments. If a Conforming Offer is selected, and the Revolution Wind Project is awarded a Purchase Power Agreement(s) ("PPA"), Deepwater Wind plans to design its Delivery Facility so that it can be cost-effectively expanded to accommodate up to 1,600 MW of offshore wind, the capacity of which will be made available on a nondiscriminatory, open-access basis.

Delivery Facility Project Components. The "Delivery Facility" will consist of (a) an offshore substation connected to the Wind Farm's Collection Facilities (as defined in **Section 8**), (b) one or more submarine HVAC cables from the offshore substations to a new landfall location, (c) one or more sets of buried terrestrial HVAC connecting the cable landfall to the new onshore substation and (d) a new onshore substation, including all the equipment required to interconnect with the electric grid.

Siting, Routing and Real Estate. [redacted]

Roles and Responsibilities. Deepwater Wind will be responsible for the development and construction of the Delivery Facility, including obtaining all rights and approvals necessary for its operations, in consultation with GridAmerica. GridAmerica has the right to acquire the company that owns Delivery Facility at COD ("NewCo") pursuant to certain terms and conditions. If GridAmerica acquires NewCo, GridAmerica will provide transmission service to the Revolution Wind Project under the terms of a Transmission Services Agreement ("TSA"). The TSA, included in **Appendix 17-1,** will be used as the basis of the TSA to be developed between NewCo and Deepwater Wind.

Design for Incremental Expansion. Deepwater Wind and GridAmerica will design the Delivery Facility to be cost-effectively expanded to accommodate interconnections of future offshore wind facilities. The Revolution Wind Project will fund the acquisition and development of the onshore real estate and one or more offshore platforms that can accommodate sufficient electrical equipment for the full 1,600 MW of offshore wind. Future offshore wind developers will have the ability to interconnect with the Expandable Delivery Facility on a nondiscriminatory, open-access basis under the terms of a TSA. Each such interconnection will be commercially and electrically discrete from the others. For each such interconnection, a new offshore substation on the offshore platform and new onshore substation equipment will be constructed and maintained and a new set of submarine and terrestrial cables connecting the new

onshore and offshore substations will be installed. Each such interconnection will share the same real estate, but will be electrically and commercially distinct from the base system and other expansions. To achieve the full 1,600 MW capacity, both the Preferred Route and the Alternative Route will be used and the Delivery Facility will provide interconnection and delivery service to Brayton Point (up to 1,000 MW) and to Davisville (up to 600 MW).

2.5: Storage Facility Project Definition

Northfield Mountain is an existing pumped hydro storage facility on the Connecticut River in the towns of Gill and Montague, MA, shown in **Figure 2-1**. The Storage Facility consists of a lower reservoir dam, an upper reservoir dam, an intake channel, a powerhouse, and a tailrace tunnel. Water is typically pumped from the Turner Falls Impoundment to the upper reservoir at night, while generation occurs during the day. When generating, water is passed via an underground pressure shaft to an underground powerhouse. The operation of the Storage Facility is independent of natural flow in the Connecticut River.

Figure 2-1: Storage Facility Location and General Arrangement

Lower Reservoir Dam. Northfield Mountain uses the Turners Falls Impoundment as its lower reservoir. The Turners Falls Dam is located at approximately river mile 122 (above Long Island Sound) and creates an impoundment extending upstream approximately 20 miles to the base of the Vernon Hydroelectric Project Dam in VT/NH. The greater portion of the Turner Falls Project and Northfield Mountain, including developed facilities and most of the lands in the FERC-defined Project Boundary are located in Franklin County, MA; specifically, in the towns of Erving, Gill, Greenfield, Montague and Northfield. The impoundment created by the Turners Falls Dam extends northerly into the town of Hinsdale, in Cheshire County, NH, and the town of Vernon, in Windham County, VT.

Upper Reservoir Dam. The crest of the upper reservoir's Main Dam is at elevation 1010 feet mean sea level (msl). There are three dikes known as the North, Northwest, and West Dikes, and are constructed in a similar manner and to the same crest elevation as the Main Dam. Per the current FERC license for Northfield Mountain, the upper reservoir may operate between 1000.5 feet msl and 938 feet msl, which equates to a useable storage capacity of approximately 12,318 acre-feet. The upper reservoir was constructed to accommodate an elevation of 1004.5 feet msl as approved by FERC in 1976. In addition, the reservoir retains useable storage capacity down to elevation 920 feet msl. Located southwest of the upper reservoir is the intake channel that conveys water to the powerhouse.

Powerhouse. The underground powerhouse contains four reversible pump/turbines operating at gross heads ranging from 753 to 824.5 feet. The electrical capacities of the units, and their in-service dates, are shown in **Table 2-3**.

Table 2-3: Storage Facility Overview

Unit	Nameplate	COD
Northfield Unit 1	292 MW	February 28, 1973
Northfield Unit 2	292 MW	October 8, 1973
Northfield Unit 3	292 MW	July 25, 1973
Northfield Unit 4	292 MW	November 30, 1972

The powerhouse has a total nameplate capacity of 1168.0 MW. Historically, the total station capacity was 1,080 MW (270 MW/unit); however, Units 1, 2, 3 and 4 recently underwent efficiency improvements with the replacement of the turbine runners, and rewind of the motor-generators. When operating in a pumping mode, the approximate hydraulic capacity is 15,200 cfs (3,800 cfs/pump). Alternatively, when operating in a generation mode, the approximate hydraulic capacity is 20,000 cfs (5,000 cfs/turbine).

Tailrace Tunnel. The underground tailrace tunnel delivers water from the Northfield Mountain Upper Reservoir to the Turners Falls Impoundment via the powerhouse. This tailrace is located approximately 5.2 miles upstream of Turners Falls Dam, on the east side of the impoundment.

2.6: Overview of Offers

2.6.1: Wind Farm

Deepwater Wind offers three (3) alternative Project configurations and pricing options for the Revolution Wind Project, described in **Section 1-1** above, in the Lookup Table attached hereto as **Appendix 1-7**, and summarized in **Table 2-4** below. All of our Conforming and [redacted] are effective for the requested 195 days from the submission date.

Table 2-4: Pricing Summary

	Levelized Price	1st Yr Price w/ 2.5% Esc.
[redacted]		
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]		
[redacted]	[redacted]	[redacted]

[redacted] **MW Conforming Offer.** In accordance with Sections 2.2.1.2 of the 83C RFP, Deepwater Wind offers a [redacted] offshore wind farm with either a Project-Specific Delivery Facility, or an Expandable Delivery Facility, with either interconnecting at [redacted] described in **Section 2.4**.

[redacted] **MW Conforming Offer.** Our analysis, described in **Section 2.1.1** above and detailed in the Brattle Report attached as **Appendix 14-3**, shows that the interests of the Commonwealth's ratepayers are best served by buying offshore wind in increments of [redacted] MW or less. The most significant benefit of buying in smaller quantities is that it allows the Distribution Companies and the Commonwealth's ratepayers to take advantage of the declining cost of offshore wind over time. Accordingly, Deepwater Wind also offers a [redacted] MW Conforming Offer, also with either a Project-Specific Delivery Facility, or an Expandable Delivery Facility.

[redacted]

[redacted]

[redacted]

2.6.2: Storage Feature

Deepwater Wind offers an optional feature that utilizes the existing FirstLight Storage Facility to store renewable energy deliveries in the off-peak hours and deliver them during the on-peak hours. The Distribution Companies may elect to pair this Storage Feature with any of the Wind Farm offers in the 83C Proposal, including [redacted].

Currently, FirstLight operates the Northfield Mountain as a merchant facility to maximize its operations in the short term energy markets; however, as addressed in the attached Energyzt Report (**Appendix 2-6**) dated October, 2017, a pumped storage unit of Northfield Mountain dedicated to enhance the delivery of offshore wind generation to highest demand hours offers multiple value propositions, including 1) improved winter reliability; 2) lower system-wide energy prices; and 3) improved utilization of zero-emission resources. [redacted] Fifty percent of the amount of environmental and energy price reductions in the Energyzt Report (which is the impact of one unit compared to two units in the Energyzt Report in Figure ES-2) results in incremental environmental and energy price reductions and totals approximately [redacted]

As detailed in the term sheet summarizing the Storage Feature, attached as **Appendix 2-7**, FirstLight offers this Storage Feature to Deepwater Wind [redacted] Deepwater Wind offers this to the Distribution Companies at the same price and terms as FirstLight has offered it to Deepwater Wind. If the Distribution Companies select this offer, the monthly invoices submitted under Deepwater Wind's PPA would [redacted]

[redacted] The proposal to pair FirstLight's energy storage with Deepwater Wind's energy production will increase the utilization of the Deepwater Wind offshore wind proposal and other renewable energy utilization during the highest electric load demand hours.

Deepwater Wind is flexible regarding the structure of the contractual arrangement(s) under which the Distribution Companies will procure the Storage Feature. To comply with the requirements of the Enabling Legislation, [redacted] Deepwater Wind and FirstLight are willing and able to be flexible to accommodate the needs of the Distribution Companies.

2.7: Satisfaction of Evaluation and Selection Criteria

The Distribution Companies should select one of our Offers in this 83C Proposal because:

- it satisfies all the "Stage One" eligibility, threshold and other minimum requirements set forth in Section 2.2 of the RFP;
- our Proposal will deliver the least cost for ratepayers, with the most sustainable jobs, and has the greatest chance of being delivered on-time, addressing all the considerations of the "Stage Two" analysis described in Section 2.3 of the RFP; and
- our strategy of developing multiple smaller projects over time best addresses the portfolio considerations set forth in Section 2.4 of the RFP.

2.7.1: Stage One: Eligibility and Threshold Requirements

Deepwater Wind developed this Proposal with careful consideration of all the requirements set forth in Section 2.2 of the RFP. **Appendix 2-1** provides a table demonstrating how each requirement has been satisfied, including a reference to the section of our Proposal in which the required information can be found.

2.7.2: Stage Two: Quantitative and Qualitative Analysis

Our [redacted] results in the best quantitative and qualitative outcomes for the Commonwealth and its ratepayer.

From the perspective of Ratepayer Impact, a series of [redacted] also mitigates potential adverse effects on the balance sheets of the Distribution Companies that could result from single larger contracts.

From the perspective of Risk, the Revolution Wind Project's site benefits from the on-going development of our South Fork Wind Farm in the same lease area. Additionally, our approach to transmission, in partnership with GridAmerica, provides a high level of confidence in our ability to deliver the project on schedule.

From the perspective of reliability, Deepwater Wind's partnership with FirstLight provides a unique opportunity to pair offshore wind with energy storage, significantly enhancing its reliability.

From the perspective of Economic Development, the Revolution Wind Project can be constructed using existing Commonwealth port facilities. This will result in a more sustainable local offshore wind industry by allowing more local companies to be involved in the development of the Project and avoiding a boom-bust cycle.

Further details of how the Revolution Wind Project measures up against the quantitative and qualitative evaluation criteria are provided in **Appendix 2-2**.

2.7.3: Stage Three: Portfolio Considerations

Developing a [redacted] is in the best interest of the ratepayers of the Commonwealth. Deepwater Wind engaged the Brattle Group to prepare an analysis of the benefits to ratepayers of procuring offshore wind in smaller increments, attached in **Appendix 14-3**. For ease of review, we have compared this analysis with the Stage Three evaluation criteria in the table attached as **Appendix 2-3**.

SECTION 3: OPERATIONAL PARAMETERS

The Revolution Wind Project is designed to provide a reliable, consistent energy production profile that the Distribution Companies can rely upon for replacing retiring fossil-fired generating capacity.

Deepwater Wind will install the Project in an area with a superb wind energy resource that will result in the peak-coincident energy production profile detailed in **Section 4**.

Deepwater Wind will install proven offshore wind turbines, detailed in **Section 8**, and implement a proven operations and maintenance program, detailed in **Section 11**.

Additionally, Deepwater Wind offers the Distribution Companies the unique opportunity to pair the Project with a large, existing pumped hydro Storage Facility, described in **Section 2.7**. If our Storage Feature is selected, the Distribution Companies may use the Storage Facility to store the off-peak energy generated by the Project for delivery during the on-peak hours.

Once operational, the Project will deliver energy and RECs into ISO-NE's SEMA zone, which benefits ratepayers by moderating system peak load, lowering wholesale electric market costs and reducing emissions from local fossil power plants.

3.1: Maintenance Outage Requirements

3.1.1: Wind Farm

Deepwater Wind is the only company with experience operating and maintaining an offshore wind farm in America. Our experience operating the Block Island Wind Farm is described in **Section 12.4.2**. The Company plans to implement an operations and maintenance program for the Project that builds upon lessons learned from this experience and that is intended to maximize project availability, as further detailed in **Section 11**.

Deepwater Wind plans to enter into a Service and Maintenance Agreement (SMA) under which the Company and the turbine vendor will develop and implement a program for annual planned maintenance and responsive unplanned maintenance to minimize maintenance outage requirements.

Deepwater Wind estimates approximately one week of planned maintenance per turbine and approximately one week of unplanned maintenance per year, which is consistent with industry standards for wind turbines of this type.

Planned maintenance is scheduled during low-wind periods of the year, generally expected to be during the summer. For most maintenance activities, only a subset of turbines is offline during the maintenance period, allowing the project to continue to deliver power during maintenance activities.

Unplanned maintenance is in response to turbine issues that cannot be resolved remotely.

To minimize the duration of unplanned maintenance outage requirements, Deepwater Wind and our turbine vendor will monitor individual turbine performance 24 hours per day and 365 days per year at a Remote Operations Center ("ROC"). In response to a turbine fault, the ROC will remotely execute an approved custom fault handling procedure to restore the faulted turbine to normal operations. If the ROC is unable to restore the turbine to normal operations, Deepwater Wind and our turbine vendor will deploy on-call technicians to the specific turbine via the project crew transfer vessel for local intervention.

Planned and unplanned maintenance represents a reduction in the turbine's annual availability of only 3.0%, which has been accounted for in the annual availability figure and net capacity factor calculation. Unplanned maintenance is assumed to be slightly greater than normal in the first year of commercial operations, which translates to a slightly lower net capacity factor in year 1.

3.1.2: Delivery Facility

Land Cable: A two-day outage will be required to inspect the manholes within six months from in-service date. If the manholes are found to be in acceptable condition, a second two-day cable outage will be required within 24 months from first inspection. If the manholes were in acceptable condition after second inspection, a two-day cable outage would be required approximately every 36 months thereafter to inspect the condition of the equipment within the manholes. These manhole inspections will be coordinated with planned maintenance outages of the wind turbines when possible.

Submarine Cable: No outages will be required for maintenance of the submarine cable.

Substations: No outages will be required for maintenance of substation equipment

3.1.3: Storage Facility

The Storage Facility requires a limited number of maintenance outages each year. FirstLight has developed a proposed long term major maintenance schedule, which is attached as **Appendix 3-1**. While the total number of days of maintenance cannot be changed, we are open to working with the Distribution Companies to coordinate its schedule to accommodate their needs.

3.2: Operating Constraints

3.2.1: Wind Farm

The Project's operating constraints are limited to wind resources and maintenance / grid outages. The expected seven days of planned maintenance for each wind turbine will be scheduled during periods of low winds during the summer months. This allows most planned maintenance tasks can be accomplished with minimal impact on the Project's annual energy production profile.

3.2.2: Delivery Facility

Subject to the completion of the interconnection process, and with the network upgrades that are being identified through that process, there will be no transmission system operating constraints for the Gen-Tie or expandable configurations of the Delivery Facility.

3.3: Reliability

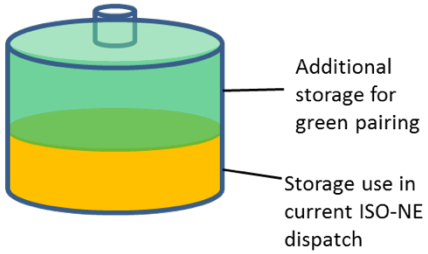
The Project will add to the reliability of the New England Transmission system by physically delivering power in ISO-NE's SEMA zone. Deepwater Wind's analysis, described in **Section 6**, suggests that the Project will also ease transmission constraints because of its interconnection location in southern New England.

Deepwater Wind commissioned Siemens PTI to prepare an interconnection Feasibility Study and Overlapping Impact Study for the Wind Farm. This analysis, described in **Section 6.7**, shows [redacted]

Separately, National Grid has completed the ISO-NE Feasibility Study for the Delivery Facility interconnection [redacted] This analysis shows that with the identified upgrades, the expandable configuration of the Delivery Facility is capable of delivering up to 1,600 MW with minimal upgrades to the New England Transmission system. This Feasibility Study contains CEII information and will be made available upon request to who demonstrate CEII clearance.

Once operational, the output of the Project will be scheduled by Deepwater Wind's ROC through the use of short-term wind forecasting, which will coordinate with the interconnecting transmission owner and ISO-NE.

If our offered Storage Feature is selected, the planned dispatch of the Storage Facility is also expected to enhance the reliability of the New England Transmission system by charging during off-peak hours and delivering during on-peak hours. Northfield Mountain is the largest electric storage system in New England. The Storage Facility can ramp from zero MW to 1,168 MW in 10 minutes. Northfield Mountain stores eight hours of full load storage. It currently provides reliability support in existing operation under ISO-NE dispatch. Unlike dispatch in the merchant energy market, a paired storage with offshore wind contract would enhance this operation by providing a certain schedule for storage and discharge that would move the off-peak large-scale wind energy produced by the Deepwater Wind offshore project into storage at Northfield Mountain for discharge [redacted] This increased utilization of Northfield Mountain would provide greater contribution to meeting peak loads than current spot market merchant dispatch operation as detailed in the attached Energyzt Report (**Appendix 2-6**).



- Largest electric storage system in New England, effectively the largest battery in New England
  - Zero to 1168 MW in 10 minutes
  - Holds 8,725 MWh's of generation
  - Generation between 130 MWs to 1,168 MWs to flexibly match demand
- The only proven large scale storage solution that stores large amounts of energy as water in upper reservoir by pumping water during low LMP hours
  - Durable and extremely cycle-proof
- Releases energy by passing water through a turbine during higher LMP hours
  - High efficiency and very low storage energy costs
- Given actual arbitrage opportunity combined with estimation uncertainty, one-third of daily storage throughput is used on average
- Two-thirds of daily storage throughput on average remains unused
  - Fast response abilities can be used to firm up intermittent wind and/or solar power

Ensuring that Northfield Mountain is cycling each day will deliver greater grid security by having a highly flexible resource online and available to provide regulation, operating reserves, and other critical system services. This project will also reduce negative off-peak pricing that is beginning to threaten the economic viability of other zero carbon resources.

3.4: Moderation of System Peak Load

3.4.1: Wind Farm

The Wind Farm will help to moderate southern New England system peak load by physically delivering large quantities energy directly into the southern New England grid, especially during the Winter Peak Period when energy and capacity are most needed.

The Wind Farm will moderate system peak load requirements based on it high level of output during on-peak hours, primarily during the winter peak period when the Project's monthly production will reach a maximum. With regard to peak load requirements, winter peak loads are typically driven by extended cold weather conditions, which are also relatively windy in nature. Therefore, system production will tend to be greater on winter peak load days as compared to production on an average day; this attribute will ease peak load requirements and the associated transmission constraints.

The Wind Farm is expected to generate nearly equal amounts of energy during ISO-NE peak and non-peak hours during both the summer and winter periods, and will have a meaningful impact on system peak load. The estimated average output for each offered configuration of the Wind Farm for each summer period (June-September, from 1:00 pm-6:00 pm), and for each winter period (October-May from 5:00 pm-7:00 pm) is summarized in the Lookup Table described in **Section 1** and attached as **Appendix 1-7**. In each configuration, the Project will contribute a meaningful quantity of both energy and capacity to the ISO-NE system during on-peak hours.

3.4.2: Storage Facility

If our offered Storage Feature is selected, the planned dispatch of the Storage Facility, detailed in **Section 3.3**, is also expected to moderate system peak load by charging during off-peak hours and delivering during on-peak hours. Please also see the attached Term Sheet (**Appendix 2-7**) and the Energyzt Report in **Appendix 2-6**)

3.5: Development Stage of Facility

3.5.1: Wind Farm

The Revolution Wind Project is the most advanced offshore wind project capable of serving the Commonwealth. Massachusetts, Rhode Island, the Federal Government and Deepwater Wind have each invested significant resources in advancing this Project site since 2010.

The Revolution Wind Project benefits from the development of our South Fork Wind Farm, described in **Section 12.4.3**, in the same BOEM Lease OCS-A 0486, which is scheduled to commence commercial operations in 2022. Subject to the receipt of a fully-approved, un-appealable PPA by or before [redacted] the Wind Farm will commence commercial operations one year later [redacted] as detailed in **Section 10**.

Deepwater Wind recently completed the first year of surveys on the Project site, located in BOEM Lease OCS-A 0486, in connection with our surveys for the South Fork Wind Farm. We are also in active dialog with all the relevant Federal and State permitting authorities in connection with our South Fork Wind Farm.

Deepwater Wind has submitted two interconnection requests for the Wind Farm; one in support of our [redacted], and other in support of this 83C Proposal in the amount of [redacted] As described in **Section 6.6**, both designate [redacted] as the primary Point of Interconnection [redacted]

We are currently engaged in advanced commercial discussions with major equipment suppliers to support our South Fork Wind Farm and our Skipjack Wind Farm off the coast of Maryland. The Project will benefit from these discussions, thereby making equipment selection following an award under this solicitation efficient.

3.5.2: Delivery Facility

Deepwater Wind and GridAmerica have been collaborating in the development of this Delivery Facility for over a year. This development work will allow the Project to achieve commercial operations in [redacted] as detailed in **Section 10**.

Deepwater Wind and GridAmerica have designed the Delivery Facility using lessons learned from their joint development of the successful Block Island Transmission System (now known as sea2shore), and using information gathered from consultations with policy-makers in both Massachusetts and Rhode Island, as detailed in **Section 8.1.4**.

GridAmerica has completed an extensive set of surveys and studies for the physical routes of the Delivery System. These surveys, summarized in **Appendix 15-1**, provide empirical data and

definitive plans for delivering all 1,600 MW, while achieving the policy and planning objectives of Massachusetts and Rhode Island.

GridAmerica has submitted an interconnection request for [redacted] as descried in **Section 6.6**.

3.5.3: Storage Facility

The Storage Facility is an operating pumped hydro storage facility that requires no additional permits, consents or approvals to offer the Storage Feature.

SECTION 4: ENERGY RESOURCE AND DELIVERY PLAN

A high-quality energy resource and delivery plan is important for engineering, project financing, interconnection and operations. Deepwater Wind has prepared a thorough energy resource and development plan based on our experience as the only company in America to have engineered, financed, interconnected and operated an offshore wind farm.

4.1: Energy Resource Plan

Data is critical to an effective energy resource plan. Deepwater Wind has gathered, or is in the process of gathering, more data than any other developer through our long-term development of the Project site, our experience developing and operating the Block Island Wind Farm, and our on-going development of the South Fork Wind Farm.

Deepwater Wind engaged AWS Truepower to prepare long-term wind resource and energy production estimates for our planned developments in BOEM Lease OCS-A 0486. The first deliverable from this engagement is the Wind Resource Assessment Plan for the South Fork Wind Farm, which is attached as **Appendix 4-1**. The Project's energy resource will use many of the same data sources as the South Fork Wind Farm, including:

- Deepwater Wind's existing proprietary data collected in connection with the Block Island Wind Farm and the South Fork Wind Farm;
- Existing publicly-available data collected from multiple regional sources, such as the recently-deployed MassCEC / WHOI LiDAR station south of Martha's Vineyard;
- Deepwater Wind's planned deployment of a LiDAR buoy in BOEM Lease OCS-A 0486, beginning in the summer of 2018;
- Mesoscale models prepared by AWS Truepower, based on data from the other sources.

Figure 4-1 below shows the existing and planned sources of data used in the Project's energy delivery plan, relative to BOEM Lease OCS-A 0486, and including AWS Truepower's current mesoscale model of the regional wind energy resource. Details of the existing data are summarized in the reports from AWS Truepower attached as **Appendix 4-2**.

The specific sources of data for the Project's energy resource plan, as depicted in Figure 4-1, are described in Table 4-1 below.

Table 4-1: Wind Resource Data Collected for the Project

Monitoring Device	Site	Description	Period of Record
MassCEC / WHOI LiDAR Platform	Southeast of Martha's Vineyard	MassCEC, WHOI, and AWS Truepower installed a LIDAR on a WHOI-owned platform located one mile south of Martha's Vineyard in order to collect wind data near federal offshore wind energy areas.	October 2016 - Present
BUZM3	Buzzard's Bay CMAN Station	The Coast Guard maintains a weather observing station on this aide to navigation which is only 14 miles from the project site.	April 1997 – Present
Chatham Rawinsonde	Chatham, MA	Chatham releases a rawinsonde (weather balloon) collecting data at 288 meters (m) above ground level (AGL). This has provided over 17,000 observations and yields a truer depiction of the overlying synoptic	1971 – Present

		weather pattern compared to surface measurements.	
WeatherFlow Block Island	Block Island Jetty	The weather station data set provides historical information to serve as a long-term correlation to Deepwater Wind's monitoring devices on Block Island.	December 2005 - Present
ZephIR 151 *DWW Proprietary*	Stony Brook University, School of Marine & Atmospheric Sciences, Southampton, NY	Deepwater Wind deployed a vertical LiDAR unit on Long Island in connection with the development of the South Fork Wind Farm.	August 2014 – Present
Mast 3813 *DWW Proprietary*	BI Coast Guard Station	Deepwater Wind's 60 m Met Tower on Block Island – the nearest land upwind of the site.	July 2009 – July 2012
ZephIR 151 *DWW Proprietary*	BI Coast Guard Station	Deepwater Wind deployed two vertical LiDAR units on Block Island in 2009. Following a validation campaign, these monitoring devices were moved to various locations on Block Island. They collected nearly three years of wind resource data at the Project's hub height.	October 2009 – April 2010
	BI Southeast Light		April 2010 – July 2012
ZephIR 156 *DWW Proprietary*	BI Coast Guard Station		July 2009 – October 2009
	BI North Light		October 2009 – July 2012
Airport Weather Observing Stations (AWOS)	Montauk, NY	Data was collected from AWOS stations around the project area. These data were used as inputs to the mesoscale model and provide a long-term reference for the energy production estimate.	Varies by location
	Groton, CT		
	Westerly, RI		
	Newport, RI		
	Block Island, RI		
	Vineyard		
	Nantucket		
University of Rhode Island (URI) Buoys	Southeast of Block Island and in BOEM Lease OCS-A 0486	URI deployed two for the purpose of ecological and meteorological monitoring. One of these buoys was in the project area. Deepwater Wind has received data from these buoys and has incorporated it into our wind resource assessment report.	November 2009 – November 2010

Based on these data, AWS Truepower estimates that the Revolution Wind Farm site has an average annual wind speed of [redacted] at a 106-m hub height. **Figure 4-2** below shows

selected data from opposite sides of the Project site. The consistency of these results demonstrates the uniformity of wind speed across BOEM Lease OCS-A 0486 area.

Using the data described above, AWS Truepower developed an indicative site layout for the Project that maximizes turbine performance by minimizing wake losses. Each of the offers described in **Section 1** consist of a subset of the most cost-effective turbine locations identified by AWS. The final turbine layout will be based on geotechnical, engineering, permitting and stakeholder input.

The data described in **Table 4-1** above are the basis for the mesoscale modeling used to estimate wind speed in the project area. This modeling is summarized in the Lookup Table provided as **Appendix 1-7**. AWS Truepower's reports are provided in the following appendices:

4.2: Offshore Wind Energy Generation Delivery Plan

4.2.1: Wind Farm

The Project will deliver energy on an as-available basis in accordance with the terms of the PPA and consistent with ISO-NE Rules and Procedures. Deepwater Wind's ROC will schedule the output of the Wind Farm to be transferred to the Distribution Companies in the Day Ahead Energy Market or Real Time Energy Market, per the terms of the PPA. All settlements will use the ISO-NE Settlement Market System.

The energy output of the Project depends upon which offered Project configuration is selected. Details are summarized in the Lookup Table provided as [redacted]

Deepwater Wind plans to enroll the Project to participate in the ISO-NE Forward Capacity Market. The quantity of ISO-NE qualifying capacity provided by each offered Project configuration is summarized in the Lookup Table provided as [redacted] and detailed in the analysis provided by AWS Truepower, attached as [redacted]

We note that the Project's energy output is highly consistent, especially during the Winter Peak Period, and is enhanced by the addition of the Storage Feature, which will be operated in a firming mode – charging during off-peak hours with energy from the wind farm and discharging during the on-peak hours, based on the day-ahead and hour-ahead forecasts.

Additionally, the analyses prepared by [redacted], given its point of interconnection in southern New England. We note that [redacted]

4.2.2: Storage Facility

If our offered Storage Feature is accepted, storage capacity will be made available to the Distribution Companies to operate the Storage Facility on the daily dispatch described below and detailed in the energy profiles in spreadsheet attached as **Appendix 1-6**. Under our offered arrangement, [redacted]

The Storage Facility is currently interconnected to the 312, 354 and 381 345kV lines through the Northfield Mountain substation. It currently provides reliability support in existing operation under ISO-NE dispatch. The paired storage contract would enhance this operation by providing a certain schedule for storage and discharge that would move the off-peak large scale renewable energy into storage at Northfield Mountain for discharge in the six on-peak hours with greatest forecasted load. This increased utilization of Northfield Mountain would provide greater contribution to meeting peak loads than current spot dispatch operation. Further, moving the energy from off-peak offshore Massachusetts generation at the delivery bus to on-peak energy delivery at the Northfield Mountain bus will increase the overall reliable support of

Massachusetts' peak energy needs (without necessarily requiring the construction of further transmission).

4.3: REC / Environmental Attribute Delivery Plan

4.3.1: Wind Farm

As required by the 83C RFP, Deepwater Wind will utilize the New England Power Pool Generation Information System ("NEPOOL GIS") for tracking generation attributes in accordance with applicable rules and requirements[8]. Since the Project is located inside New England, delivering the attributes to the NEPOOL GIS is a relatively straightforward process. Deepwater Wind will deliver all environmental attributes to the Distribution Companies' GIS Account(s) upon delivery of the associated energy to the Point of Interconnection.

4.3.2: Storage Facility

Please see the Energyzt Report [redacted] for a description of environmental attributes.

[8] http://www.nepoolgis.com/wp-content/uploads/sites/3/2017/06/GIS-Operating-Rules-Effective-6_12_17.doc?x41232

SECTION 5: FINANCIAL / LEGAL

5.1: Approach to Financing

Deepwater Wind's ability to efficiently finance offshore wind projects in the United States is a core competitive advantage. No other developer in the world has ever raised tax equity financing for an offshore wind farm. Deepwater Wind and its sponsors at the D.E. Shaw group completed a first-of-its-kind financing for the Block Island Wind Farm, and in so doing, pioneered new financial technology.

During development and construction, the Project will be funded by equity commitments from affiliates of the D.E. Shaw group and possibly other investors. During construction and operations, it will be funded by debt, equity subscriptions from current equity investors and possibly new investors, and potentially from tax equity, mezzanine or other investments. The ability to finance and the cost of financing is very much a function of risk. RFPs and resulting contracts that give a high level of certainty to revenue, such as provided for here, greatly enhance our ability to finance the Project and ultimately reduces the cost for the Clean Energy deliveries to Ratepayers.

5.2: Bidder's Organization

The bidder is Deepwater Wind, LLC, on behalf of a company to be formed. Deepwater Wind, LLC is a wholly-owned subsidiary of Deepwater Wind Holdings and the Deepwater entity that will own and operate the Revolution Wind Farm will be a wholly-owned indirect subsidiary of Deepwater Wind Holdings. Deepwater Wind Holdings is primarily owned by affiliates of the D. E. Shaw group. D.E. Shaw is well capitalized and deeply experienced in the development and ownership of renewable energy projects, as detailed in the Letter of Support attached as **Appendix 5-2**.

Deepwater Wind Holdings' Board of Managers and owners are responsible for Project-related decision-making, as described in **Section 12**. See the organizational chart provided in **Section 11.1** below.

5.3: Financing Plan

The financing of the Block Island Wind Farm proved that capital exists for well-developed and appropriately-sized U.S. offshore wind projects. The Revolution Wind Farm will benefit from the precedents of the Block Island Wind Farm, the South Fork Wind Farm and the Skipjack Wind Farm. Deepwater Wind expects that the financing structure for the Revolution Wind Farm will be similar to that of the BIWF project.

Currently, Deepwater Wind funds its development with equity subscriptions from its current investors (and potentially new investors). Deepwater Wind's financial plan is premised on structuring long-term revenue and expense streams contractually, to facilitate a limited recourse project financing that will provide attractive risk-adjusted returns to investors while maintaining conservative debt coverage ratios to assure receipt by debt providers of principle and interest

payments. The process to successfully size, structure and place the debt will be premised on the following:

- Ensuring that the equity return profile of the Project is adequate to satisfy the investment criteria of the current equity sponsors and to potentially attract additional equity participants. In part, this will be premised on structuring the Project to ensure that construction and operating risks are managed appropriately.
- Ensuring that the capital structure and the revenue stream provide appropriate minimum debt coverage ratios (DCR) throughout the tenor of the debt.
- Structuring the equipment supply and construction contracts to minimize the risks of cost and schedule overruns. This will be accomplished through a combination of fixed price= contracts, EPC participant guarantees, and a fully-integrated risk management/insurance program.
- Structuring the operational phase contracts to ensure that the contracts that result in revenue streams are appropriately matched with the operational plan for the Project. Prior to financial closing for the Project, the Project's development costs will be fully funded through equity contributions made by Deepwater Wind (supported by existing investors and, potentially, new investors).

During construction, the Project's costs will be funded with a combination of equity and debt. Deepwater anticipates a financial structure for the Project similar to that of the BIWF Project which is the only offshore wind farm to be successfully financed in the United States. Deepwater Wind currently intends to invest the equity portion of the total project cost through equity subscriptions from the current sponsors and/or other investors. The debt portion of the capital structure will include bank and institutional financing which will be raised from the proceeds of a non-recourse financing. If sufficient tax benefits are available, Deepwater Wind may enter into a transaction with a "tax equity" investor whose principal role would be, in effect, to monetize the depreciation deductions and other tax benefits associated with the Project. The financing strategy is based on current market conditions. In the event that the market conditions change prior to financing, alternate financing strategies include an institutional private placement or public style financing, or a combination of these strategies. As development of the Project progresses, Deepwater Wind will develop a base case pro forma for the Project that will set forth Deepwater Wind's assumptions for the sources and uses of funds.

Deepwater Wind expects that equity commitments will be provided by new and/or existing investors. Deepwater Wind's managers have successfully raised equity from multiple creditworthy counterparties for investment in a variety of projects. Deepwater Wind has engaged in a number of preliminary discussions with financial institutions, although the optimum time for the beginning of the financing process will not be until power from the Project has been contracted and Deepwater Wind has firm construction and equipment supply quotes.

See the letter of support [redacted]

5.4: Financing Experience

5.4.1: Deepwater Wind
Deepwater Wind is the only developer to successfully complete a financing for an offshore wind farm in America and the only developer in the world to complete a tax equity transaction for an offshore wind farm. In February 2015, Deepwater Wind closed on approximately $300 million in senior secured project financing for the BIWF project, funded by a consortium of world-class lenders led by [redacted] This financing was awarded Renewable Energy Deal of the Year in 2015 by Project Finance International and IJ Global. The financing of Block Island includes six leading lenders and two world-class tax equity investors – Citi and GE.

Deepwater Wind's principal owners are entities of the D. E. Shaw group, a global investment and technology development firm with more than 1,000 employees, approximately $43 billion in investment and committed capital as of July 1, 2017, and offices in North America, Europe, and Asia. Since its organization in 1988, the firm has earned an international reputation for financial innovation and technological leadership. The D.E. Shaw group has helped to raise over $10 Billion in capital for renewable energy projects in the US in recent years, making it one of the largest sponsors of renewable energy in the nation.

5.4.2: GridAmerica
National Grid has extensive experience in financing electric infrastructure projects of a similar size and technology to the Revolution Wind Project. A list of National Grid representative financing experience on similar projects is provided as [redacted]

5.4.3: FirstLight
FirstLight will not be financing any of the Project.

5.5: Financial Resources

5.5.1: Deepwater Wind
The capital costs for the Project, including the equity and debt portions of the capital structure, are provided in the Lookup Table attached as [redacted] As discussed in **Section 5.3**, Deepwater Wind currently intends to invest the equity portion of the total project cost through equity subscriptions from the current sponsors and/or other investors. The debt portion of the capital structure will include bank and institutional financing which will be raised from the proceeds of a non-recourse financing. If sufficient tax benefits are available, Deepwater Wind may enter into a transaction with a "tax equity" investor whose principal role would be, in effect, to monetize the depreciation deductions and other tax benefits associated with the Project.

5.5.2: GridAmerica
Although GridAmerica does not have external debt and is not rated by the credit agencies, its parent corporation, NGUSA, which will provide lending support and financial backing for GridAmerica's investment in the Revolution Wind Project, has an investment-grade corporate credit rating and a stable long-term outlook. [redacted]

5.5.3: FirstLight
FirstLight Power Resources Management, LLC is ultimately 100% owned by the Public Sector Pension Investment Board ("PSP") (rated AAA), a Canadian federal Crown corporation with

$135.6B (Cdn.) in assets as of March 31, 2017. PSP owns 100% of PSP H2O FL USA LLC. This entity in turn holds 100% of FirstLight Power Resources Holdings, Inc. and 100% of FirstLightPower Resources, Inc. There are four entities owned by Firstlight Power Resources Inc.: a.) NFM Solar Power, LLC, which owns a 2 MW solar farm; b.) FirstLight Hydro Generating Company, which owns the generation assets; c.) FirstLight Power Resources Services, LLC, which employs all of the employees (including for NFM Solar); d.) FirstLight Power Resources Management, LLC, which is the contracting entity, and manages the electricity sales.

5.6: Audited Financial Statements

5.6.1: Deepwater Wind

Copies of the three most recent years of audited financial statements of Deepwater Wind's parent entity, Deepwater Wind Holdings, LLC, is provided in [redacted] As a private company, Deepwater Wind does not have credit or debt ratings.

5.6.2: GridAmerica

GridAmerica is a direct wholly-owned subsidiary of NGUSA. NGUSA audited financial statements for the period ending March 31, for years 2015 - 2017, are provided as **Appendix 5-7**- NGUSA March 2017, **Appendix 5-8** - NGUSA March 2016, and **Appendix 5-9** - NGUSA March 2015. As stated in 5.5 above, NGUSA has an investment-grade corporate credit rating and a stable long-term outlook. Specifically, NGUSA senior unsecured credit is rated by S&P (BBB+/Stable) and Moody's (Baa1/Stable). [redacted]

5.6.3: FirstLight

We have attached three years of audited financial statements for FirstLight Power Resources Management, LLC, for the fiscal years 2014-2016 [redacted]

5.7: Company's Board of Directors

5.7.1: Deepwater Wind

Deepwater Wind has assembled a highly qualified Board of Managers consisting of both representatives of the Investors and independent industry experts. The Board consists of the following individuals and is responsible for governing Deepwater Wind and advising management as they develop projects:

Name	Title	Biography
Bryan Martin	Board Chair	Managing Director of D. E. Shaw & Co., L.P. and co-head of the D.E. Shaw group's U.S. growth and buyout private equity unit.
Curt Futch	Board Member	Managing Partner of Jupiter Peak Capital; former Managing Director and Senior Portfolio Manager of Crestline Investors; Former Vice President with BNP Paribas Merchant Banking Group.
Edward Stern	Board Member	President and Chief Executive Officer of Neptune Regional Transmission System, LLC, which developed, constructed and now operates a 660 MW undersea electric transmission system that interconnects Sayreville, New Jersey with Long Island, New York. Mr. Stern was the former Chief Executive Officer of Enel North America, Inc., which owned or operated

		nearly one hundred power plants in seven countries.
Jeff Grybowski	Chief Executive Officer	Lead developer of the Block Island Wind Farm; former Chief of Staff to the Governor of Rhode Island and an internationally-recognized expert in renewable energy policy and project development.
David Hang	Chief Financial Officer	Senior Vice President of D. E. Shaw & Co., L.P. and a member of the D. E. Shaw group's U.S. growth and buyout private equity unit. Raised all required debt and tax equity for the Block Island Wind Farm.
Steve Key	Board Member	Former CFO of Textron Inc.; formerly served on the board of directors of First Wind, Rhode Island School of Design, Greenhill & Co., J.D. Watkins.
Brian Redmond	Board Member	Founder of Paragon Energy Holdings LLC, Formerly President of ALTIVIA Petrochemicals, LLC, President of Houston Pipe Line Company and Louisiana Resource Company, and Executive Director of UBS Warburg Energy.

5.7.2: GridAmerica

A list of the current board of directors and officers for GridAmerica is provided in **Table 5-3** below. GridAmerica Board Positions and Officers provide information regarding changes over the past three years. The officer/board member who will be responsible for this project will be William Hazelip, Vice President, GridAmerica. Future officers, board members and trustees have not been determined at this time.

Table 5-3 - Officers of GridAmerica Holdings, Inc

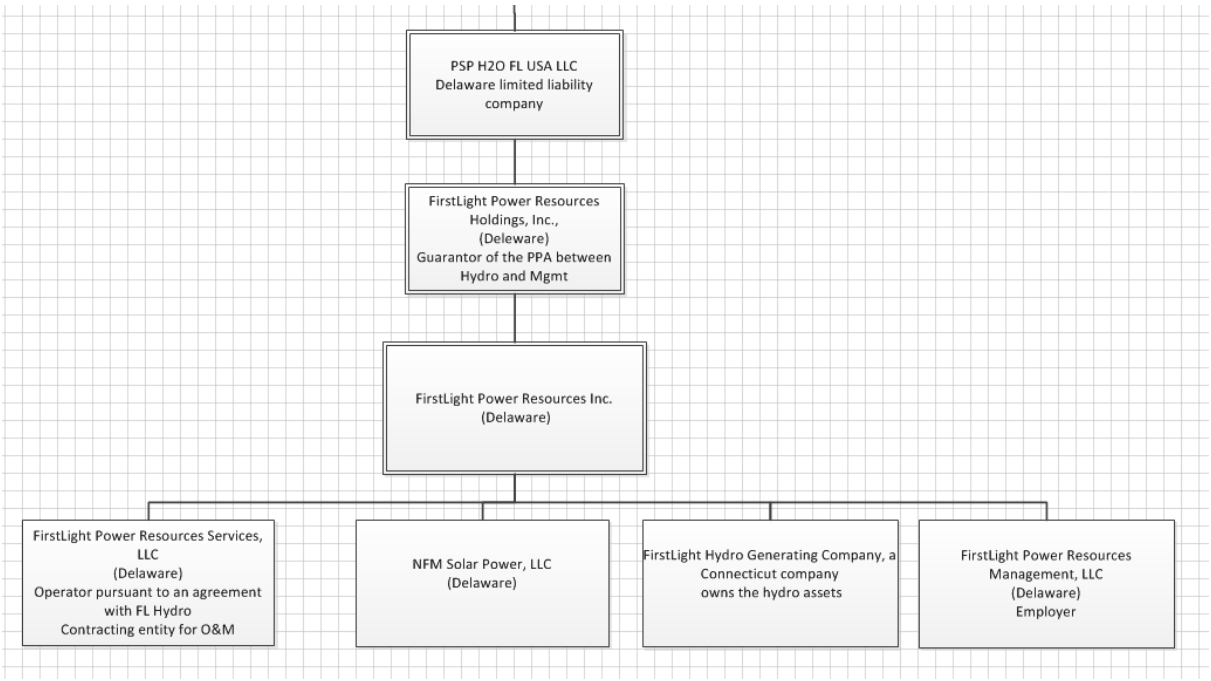
Name	Title
John Flynn	President
Mathew R. Sachs	Vice President
Charles V. DeRosa	Vice President and Treasurer
William Hazelip	Vice President
Macdara Nash	Vice President
Sharon Partridge	Vice President and Controller
Adael Acosta	Assistant Treasurer
Susan Greene	Assistant Treasurer
Arthur Kiperberg	Assistant Treasurer
Timothy E. McAllister	Secretary
James Chicoski	Assistant Secretary
Reshmi Das	Assistant Secretary

5.7.3: FirstLight

FirstLight Board of Directors: Jim Gartshore, Yves Rheault, Patrick Samson, Stephan Rupert, Jim Ginnetti

Officers: Jim Gartshore, President; Ron McLeod, Vice President, Finance & Administration; John R. Shue, Senior Vice President, Operations; Marc A. Silver, Vice President & General Counsel and Peter Rider, Vice President, Commercial.

Below is the Organization Chart and Corporate entity chart:



5.8: Credit Support

5.8.1: Deepwater Wind

The Company will post cash or letters of credit to provide the required security.

The Company agrees to provide [redacted]

5.8.2: GridAmerica

If GridAmerica acquires the Delivery Facility, it will provide security for its obligations under the TSA that it enters into with Deepwater Wind.

5.8.3: FirstLight

Credit support for the Storage Feature will be negotiated in connection with the PPA.

5.9: Credit Issues

5.9.1: Deepwater Wind

There have been no current or recent credit issues/credit rating downgrade events regarding Deepwater Wind or its affiliate entities raised by rating agencies, banks, or accounting firms.

5.9.2: GridAmerica
There have been no current or recent credit issues/credit rating downgrade events regarding NGUSA, GridAmerica's parent, or its affiliate entities raised by rating agencies, banks, or accounting firms.

5.9.3: FirstLight
There have been no current or recent credit issues/credit rating downgrade events regarding FirstLight or its affiliate entities raised by rating agencies, banks, or accounting firms.

5.10: Role of the ITC

Subject to the receipt of a PPA on the schedule described in **Section 9,** the Revolution Wind Farm is expected to qualify for the federal Investment Tax Credit ("ITC"), described below. The market-accepted approach for monetizing the ITC is through a tax equity partnership like the approach Deepwater Wind used for the Block Island Wind Farm.

The ITC is available for wind facilities that commence construction by or before December 31, 2019, however the value of the ITC declines each year after 2016.

Deepwater's Base Proposal Pricing assumes that the Revolution Project will qualify for an [redacted] ITC, subject to the receipt of an executed PPA by or before [redacted] and the receipt of all required regulatory approvals for such PPA by or before [redacted]

5.11: Pending Litigation

5.11.1: Deepwater Wind
There has been no pending litigation or disputes in the last 3 years related to the Project. In connection with various project development, Deepwater Wind is involved in on-going permitting efforts in the normal course of business.

5.11.2: GridAmerica
There is no pending (currently or in the past three years) law suits or known disputes related to competitive transmission projects developed, owned or managed by GridAmerica or any of its affiliates in the United States. This response does not include information that may be in the possession of Distribution Companies affiliated with GridAmerica.

5.11.3 FirstLight
There is no pending (currently or in the past three years) material law suits or known disputes related to FirstLight or any of its affiliates in the United States.

5.12: Life of the Proposed Project

5.12.1: Wind Farm
Deepwater Wind anticipates a minimum [redacted] operating life for the Revolution Wind Project. The Project will be depreciated in accordance IRS guidelines.

5.12.2: Delivery Facility
The Delivery Facility has several components, each with a different operating life.

All equipment is depreciated over [redacted] concurrent with the useful life of the offshore wind equipment.

5.12.3: Storage Facility
Northfield Mountain pumped storage is an existing facility. FirstLight undertakes overhauls of the turbines and regular refurbishments/replacements of the other mechanical/civil/electrical components so that the Storage Facility effectively has a perpetual life.

5.13: Project Financing Status/Role of Long-Term Contracts

Deepwater Wind is the only company to have financed an offshore wind farm in America and the only company in the world to have completed a tax equity transaction involving an offshore wind farm – both for our Block Island Wind Farm. Our financing of the Block Island Wind Farm was oversubscribed because multiple lenders expressed strong interest in both the Block Island project and Deepwater Wind's pipeline of further projects. We have not yet entered into agreements for the financing of the Project.

The Company is confident in its ability to raise the equity capital required to fund the development of the Project from existing and potential new investors if the following requirements are met: (i) revenue certainty in the form of a firm offtake agreement such as a PPA, (ii) executable/executed engineering, procurement and construction ("EPC") contract(s), (iii) site control in the form of an exclusive option or to purchase and (iv) permits. Multiple potential suppliers have expressed interest in entering into EPC contracts. The Company is the holder of a lease issued by the U.S. Bureau of Ocean Energy Management for the Project site. The Company is highly confident in our ability to permit the Project, as detailed in **Section 7**. The universe of lenders and the resultant cost of financing are in large part a function of the certainty of revenues. Therefore, the PPA is the most critical element of securing financing for the Project.

Our lenders in the Block Island project are well aware of our plans for this Project, as evidenced by the letter of support attached as [redacted]

5.14: Prior Sales – Energy / RECs / Capacity

The Company has not executed agreements with respect to Energy, RECs, and/or capacity for the Project.

[redacted]

5.15: Company's Affiliated Entities and Joint Ventures

5.15.1: Deepwater Wind

Following is a list of Deepwater Wind's affiliated entities and joint ventures actively engaged in the generation and transmission of electricity in the US:

- Block Island Wind Farm, LLC
- Deepwater Wind South Fork, LLC
- Skipjack Offshore Energy, LLC
- DWW Solar II, LLC

5.15.2: GridAmerica

Following is a list of GridAmerica's affiliated entities and joint ventures actively engaged in the generation of electricity, and the transmission, distribution and sale of electricity and natural gas in the US and UK:

United States:

- Algonquin gas transmission, llc
- Boston gas company
- Colonial gas company
- Clean line energy partners llc
- Dominion midstream partners, lp
- Keyspan gas east corporation
- Massachusetts electric company
- Millennium pipeline company, llc
- Nantucket electric company
- National grid generation llc
- National grid glenwood energy center, llc
- National grid lng llc
- National grid port jefferson energy center, llc
- New england electric transmission corporation
- New england hydro-transmission corporation
- New england hydro-transmission electric company, inc.
- New england power company
- New york transco llc
- Niagara mohawk power corporation
- The brooklyn union gas company
- the narragansett electric company

- Transgas, inc.
- Vermont green line devco, llc

United Kingdom:

- National grid gas plc
- National grid grain lng limited
- National grid electricity transmission plc
- National grid interconnector company limited
- Cadent gas limited (previously national grid gas distribution limited)
- Britned limited

5.15.3: FirstLight
The only Affiliated Entity of FirstLight is H2O Power.

5.16: Bankruptcy

5.16.1: Deepwater Wind
Deepwater Wind has not (a) consented to the appointment of, or was 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.

5.16.2: GridAmerica
Neither GridAmerica nor any affiliate of GridAmerica has engaged in the aforementioned actions related to bankruptcy in the last five years. This response does not include information that may be in the possession of Distribution Companies affiliated with GridAmerica.

5.16.3: FirstLight
Neither FirstLight nor any affiliate of FirstLight has engaged in the aforementioned actions related to bankruptcy in the last five years.

5.17: Conflicts of Interest with Distribution Companies

5.17.1: Deepwater Wind
Deepwater Wind and its affiliates do not have any known conflicts of interest with any Distribution Company or their affiliates.

5.17.2 GridAmerica
GridAmerica and its affiliates do not have any known conflicts of interest with any Distribution Company and their affiliates that are not appropriately addressed through the Standards of

Conduct for Distribution Companies and their affiliates applicable to this solicitation and other state and federal standards of conduct that apply to GridAmerica and its affiliates.

5.17.3 FirstLight
FirstLight has no known conflicts of interest with the Distribution Companies.

5.18: Disputes with Distribution Companies

5.18.1: Deepwater Wind
There is no litigation, dispute, claim or complaint involving the Company or an affiliate of the Company, against any Distribution Company or any affiliate of any Distribution Company.

5.18.2: GridAmerica
There are currently no pending significant litigations, disputes, claims or complaints involving GridAmerica or an affiliate of GridAmerica against any Distribution Company or any affiliate of any Distribution Company. From time to time NGUSA's operating company subsidiaries and other subsidiaries may be involved in routine business, commercial, contractual and tort litigation, disputes, claims or complaints in which a Distribution Company may be involved.

This response does not include information that may be in the possession of Distribution Companies affiliated with GridAmerica.

5.18.3: FirstLight
First Light has no known disputes with the Distribution Companies.

5.19: Contractual Disputes

5.19.1: Deepwater Wind
There is no litigation, dispute, claim or complaint, or event of default or other failure to satisfy contract obligations, or failure to deliver products, involving the Company or an affiliate of the Company, and relating to the purchase or sale of energy, capacity or renewable energy certificates or products.

5.19.2: GridAmerica
In the U.S., there are no current pending litigations, known disputes, claims or complaints involving GridAmerica relating to the purchase or sale of energy, capacity or renewable energy certificates or products. From time to time, NGUSA's operating company subsidiaries and other subsidiaries may be involved in routine collections, business, commercial and tort litigation which may involve the purchase and sale of energy. NGUSA's subsidiary Massachusetts Electric Company is involved in litigation entitled *Allco Renewable Energy LTD v. Massachusetts Electric Company, Angela M. O'Connor, Juliette A. Westbrook, Robert Hayden and Judith Judson* which matter broadly involves the purchase and sale of energy.

In the ordinary course of GridAmerica's UK affiliates' operations, they are parties to various litigations, claims and investigations, or events of defaults or other failures to satisfy contract obligations, or failures to deliver products, involving such affiliates and relating to the purchase or sale of energy, capacity or renewable energy certificates or products. Recently a counterparty

to an energy supply contract with one of GridAmerica's UK affiliates terminated a contract giving rise to a potential termination or liquidated damages payment by such affiliate under the terms of the contract, the ultimate resolution of which is not expected to have a material adverse effect on such affiliate's operations, cash flows or financial position.

This response does not include information that may be in the possession of Distribution Companies affiliated with GridAmerica, other than as described above.

5.19.3: FirstLight
None.

5.20: Investigations and Convictions

5.20.1 Deepwater Wind
None of the Company, and the directors, employees and agents of the Company and any affiliate of the Company are currently under investigation by any governmental agency and have not 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.

5.20.2 GridAmerica
Neither GridAmerica nor any of its director, employee and agent or affiliates is currently under investigation by any governmental agency and has not 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, nor has it been subject to any debarment action with respect to bidding on any contract. This response does not include information that may be in the possession of Distribution Companies affiliated with GridAmerica.

5.20.3: FirstLight
None

5.21: Regulatory and Other Approvals

Approval of a binding agreement to sell Energy and RECs will require approval of the Company's Board of Managers and filings referenced in Section 5.22.

5.22: Conformance with FERC

5.22.1 Wind Farm
Prior to the date on which Deepwater Wind first delivers or sells any electric energy (including test energy), capacity or ancillary services from the Project, the Company will be an "exempt wholesale generator," as defined in PUHCA and will obtain a final order issued by FERC (a) granting, pursuant to Section 205 of the FPA, 16 U.S.C. Section 824d, and FERC's regulations thereunder, the Company's application to sell energy, capacity and ancillary services at wholesale at market-based rates; (b) accepting the Company's market-based rate tariff for filing;

and (c) granting the Company all waivers of regulations and blanket authorizations customarily granted by FERC to an entity that will sell wholesale power and ancillary services at market based rates.

5.22.2: Delivery Facility

If the Deepwater Wind proposal for offshore wind energy generation is selected in the RFP, the Delivery Facility will be constructed by a special-purpose, wholly-owned subsidiary of Deepwater Wind referred to as "NewCo."

As the owner of generator tie line interconnection facilities allowing the delivery of the Project output, NewCo will be eligible for the blanket waiver of FERC's open access transmission tariff ("OATT"), Open Access Same-Time Information System ("OASIS"), and Standard of Conduct requirements in 18 C.F.R. § 35.28(d) upon filing "a statement with the Commission that it commits to comply with and be bound by the obligations and procedures applicable to electric utilities under section 210 of the Federal Power Act." Open Access and Priority Rights on Interconnection Customer's Interconnection Facilities, 150 FERC ¶ 61,211 at PP 73-74 ("Tie Line Policy") (2015).

To prepare for the potential purchase of NewCo by GridAmerica under the Option, NewCo will file a transmission rate and Transmission Service Agreement ("TSA") with FERC under Section 205 of the Federal Power Act and Part 35 of FERC's regulations. That transmission rate will be charged by NewCo to the Deepwater Wind subsidiary that owns the Project in the event that GridAmerica acquires NewCo.

To ensure that NewCo provides open access to the Delivery Facility, if NewCo receives a request for transmission service over the line from a third party, FERC permits NewCo and the third party to enter into a mutually agreeable and voluntary arrangement that provides access to transmission service over the generator lead line. Id. at PP 38-40. In addition, under Sections 210 and 211 of the FPA, the Commission may direct service to be provided under a transmission service agreement without directing NewCo to file an OATT if a mutually agreeable and voluntary arrangement cannot be reached. Id. at P 103; see Aero Energy, LLC, 118 FERC ¶ 61,204) (2007). FERC may also revoke the blanket waiver and require NewCo to file an OATT to ensure open access if necessary. Tie Line Policy at P 101. If the waiver is revoked, NewCo would be subject to standard open access requirements and would need to file an OATT with FERC. It would also need to comply with the OASIS and Standards of Conduct requirements.

The Delivery Facility will be interconnected to the ISO-NE Administered Transmission System under the terms of the ISO-NE Interconnection Agreement for the Delivery Facility and the Project, which will include the technical specifications for design and operation of the line. If required by ISO-NE, appropriate Transmission Operating Agreements will be executed so that the transmission facilities will be operated by ISO-NE as part of the unified transmission grid.

5.22.3: Storage Feature

Northfield Mountain is an existing pumped storage hydroelectric facility that has been conforming to FERC's applicable regulatory requirements.

5.23: Affiliations with Distribution Companies

5.23.1: Deepwater Wind
None

5.23.2 GridAmerica
GridAmerica, Massachusetts Electric Company and the Nantucket Electric Company and their affiliates are indirect wholly-owned subsidiaries of National Grid plc.

GridAmerica is a Delaware holding corporation set up to hold National Grid's electric transmission investments in the United States. It is a direct wholly-owned unregulated subsidiary of NGUSA. NGUSA is a public utility holding company with regulated subsidiaries engaged in the generation of electricity and the transmission, distribution and sale of both natural gas and electricity. NGUSA is a direct wholly-owned subsidiary of National Grid North America Inc. and an indirect wholly-owned subsidiary of National Grid plc, a public limited company incorporated under the laws of England and Wales.

NGUSA has two major lines of business, "gas distribution" and "electric services," and operates various services and investment companies. NGUSA's wholly-owned New England subsidiaries include, Massachusetts Electric Company and the Nantucket Electric Company. The other wholly-owned New England subsidiaries of NGUSA include New England Power Company, the Narragansett Electric Company, the Boston Gas Company, and the Colonial Gas Company. NGUSA wholly-owned New York subsidiaries include Niagara Mohawk Power Corporation, National Grid Generation, LLC, the Brooklyn Union Gas Company, and the KeySpan Gas East Corporation. Under its holding company structure, NGUSA has no independent operations or source of income of its own and conducts all of its operations through its subsidiaries.

In the ordinary course of operations, GridAmerica's affiliates engage in commercial transactions and arrangements for services with Distribution Companies and their affiliates. GridAmerica or its affiliates have also entered into joint arrangements with Distribution Companies and their affiliates in the past three years.

5.23.3: FirstLight
None.

SECTION 6: SITING, INTERCONNECTION AND DELIVERABILITY

6.1: Site Plan

The Wind Farm will be located in BOEM Lease OCS-A 0486, which is within the Rhode Island – Massachusetts Wind Energy Area (RI-MA WEA), as detailed in **Section 2.4**. The Project's site plan is attached as [redacted]

6.2: Real Property Rights

Deepwater Wind either holds or is on schedule to acquire all appurtenant real property rights to support the Conforming Offers. These rights include:

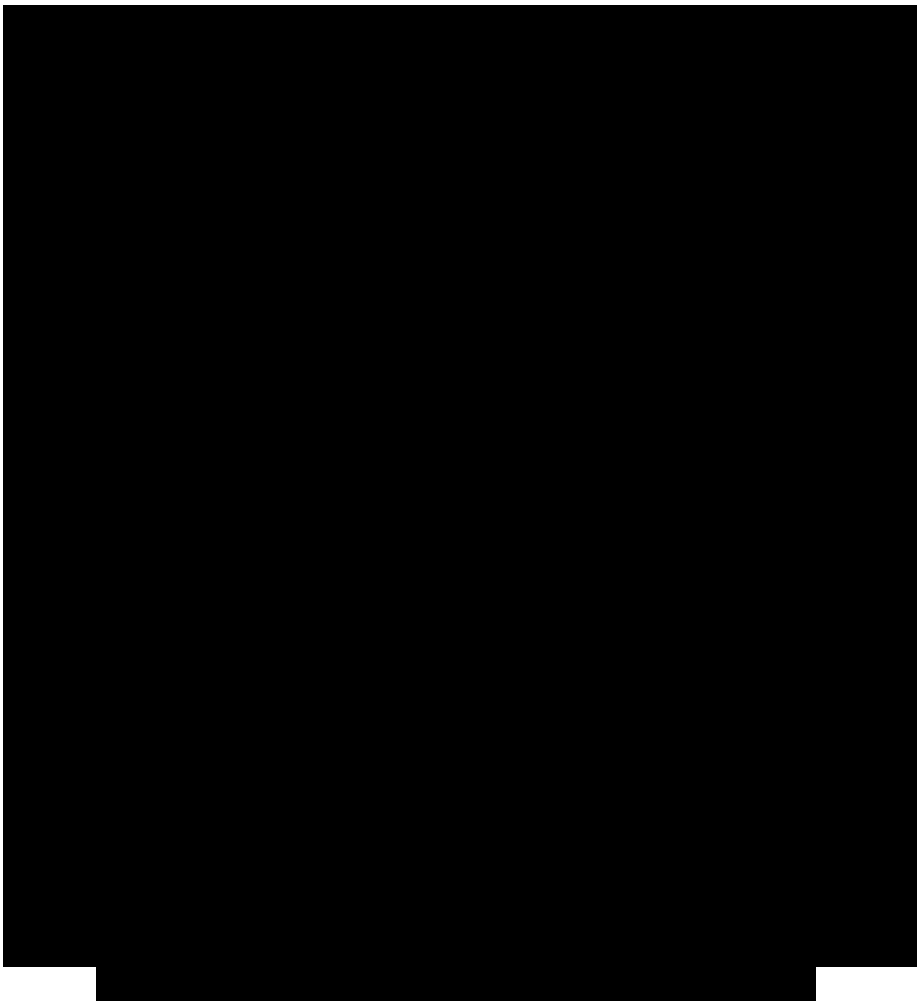
- For the Wind Farm, Deepwater Wind has the right to construct and operate turbines within the wind farm for the entire proposed term of the PPA. On July 31, 2013, Deepwater Wind secured a lease for the exclusive right to develop an offshore wind farm in the RI-MA WEA during the first ever competitive auction held by BOEM for offshore renewable energy on the OCS. This lease (BOEM Lease #OCS-A 0486) consists of 97,498 acres, however only a portion of the lease site will be used for the Project. Please see **Appendix 2-5** for a copy of the BOEM Lease #OCS-A 0486. In addition, Deepwater Wind has [redacted]
- For the portion of the Delivery Facility that is in federal waters on the OCS, the Lease #OCS-A 0486 automatically provides Deepwater Wind with the necessary rights-of-way to deliver Energy (and Capacity and RECs) without the need for any further action on the part of the Company. If another developer wishes to use the Delivery Facility, it would require that party to obtain site control from BOEM.
- If the Preferred Route for the Delivery Facility is selected, Deepwater Wind will obtain:
  - [redacted]

- The Project has secured real property rights for construction staging area at the New Bedford Marine Commerce Terminal and will secure property for a SOC for O&M in New Bedford, MA.

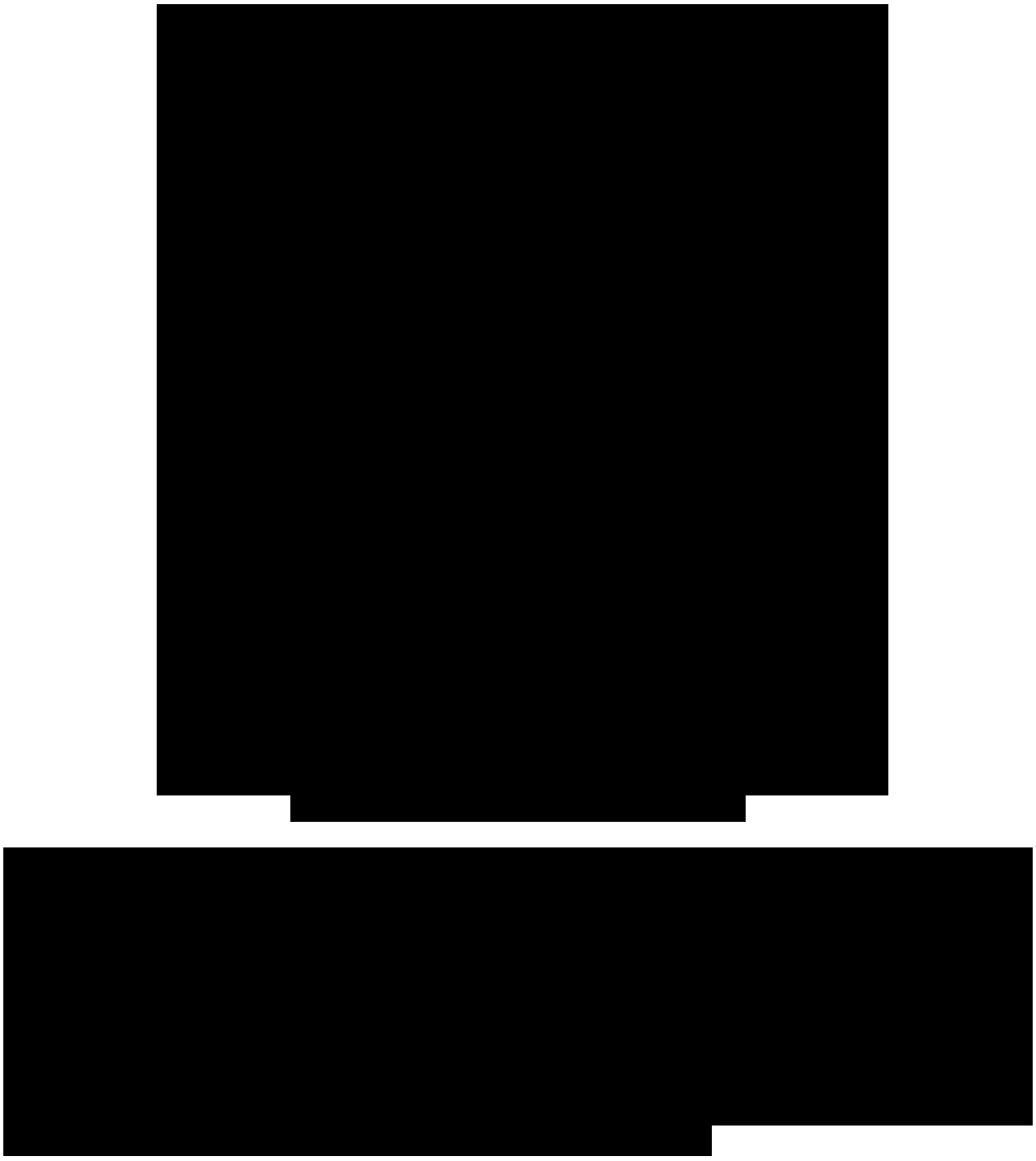
6.3: Project Site Zoning

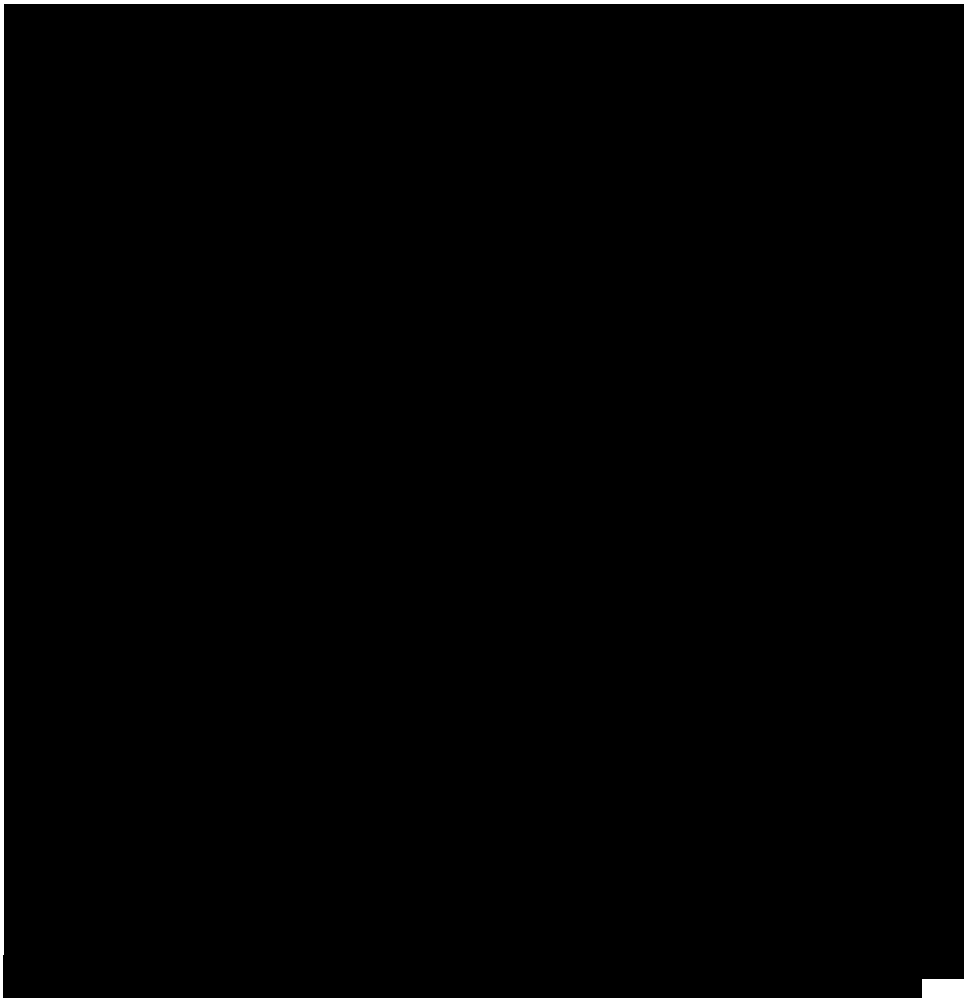
All Revolution Wind project facilities are located in areas that are properly zoned or identified for the proposed uses. While there are no official zoning designations in the marine environment where the Wind Farm and the majority of the Delivery Facility will be located, the RI-MA WEA was created as the result of a comprehensive, multi-year marine spatial planning process involving a variety of offshore stakeholders, and BOEM specifically established the RI-MA WEA as an area appropriate for offshore wind development (see [redacted] for applicable zoning maps).

For the Delivery Facility, the Preferred Route (defined in **Section 15.1**) includes a terrestrial portion located at [redacted] on parcels within the Industrial District zone which allows industrial uses (**Figure 6-2**). Uses allowed as of right in this district include essential municipal services, waterworks, pumping stations, telecommunications, marine-related fabrication and docking facilities, transformer station, electric substation, electric generating plant, and research and development laboratories and facilities. [redacted]



The general arrangement of the





6.4: Surrounding Areas

Deepwater Wind has selected a site far from shore in order to minimize impacts on coastal communities. The Wind Farm will be located offshore in federal waters in the RI-MA WEA, which is no less than 15 miles from the mainland coast of Massachusetts and no less than 15 miles from Martha's Vineyard. Location of turbines within the lease area will be determined based on final geotechnical and environmental surveys as well as consultations with stakeholders and governmental agencies. Because of these distances, visibility of the Project will be very limited from shore, on even the clearest of days. No known conflicting structures or facilities exist in or near the area where turbines are proposed.

The boundaries of the RI-MA WEA were developed through a multi-year stakeholder process that included the participation of state and federal agencies as well as a broad group of stakeholders such as commercial fishermen, tribes, and environmental advocacy organizations. The RI-MA WEA was expressly designed to avoid proximity to coastal areas of MA and RI. Additionally, RI-MA WEA was designed to avoid shipping lanes and high-value fishing grounds. This area was first identified in 2010 by a Memorandum of Understanding (MOU)

between Governors of RI and MA to resolve conflicts between the states and provide input to BOEM identification of lease areas.

Following this MOU, the Ocean Special Area Management Plan (OSAMP) was completed. The OSAMP was a two-year planning process conducted by the Rhode Island Coastal Resources Management Council (CRMC) to, in part, identify suitable areas for offshore wind energy. The OSAMP provides valuable insights for shared ocean resources, including fisheries, transportation, and siting of offshore renewable energy. In addition to the planning efforts and science completed during the OSAMP, there has been multiple years of scientific assessment within the RI-MA WEA by BOEM, the Commonwealth of MA, and Deepwater Wind. This site-specific information provides an invaluable resource which Deepwater Wind will use during the siting and permitting of the Project to minimize impacts to sensitive habitats and potential conflicts with stakeholders. Studies completed include fisheries (trawl and lobster), marine mammal and sea turtle, avian and benthic assessments.

Deepwater Wind also benefits tremendously from the science that has been completed at the BIWF. Deepwater Wind has studied the effects of the construction and operation of the BIWF on fish, lobsters, avian species, and bats. We have documented the quick recovery of the seafloor after the disturbance associated with installation and documented the swift growth of sea grasses and other species on the legs of the jacket foundation which have resulted in an enhanced environment where marine species are flourishing. BOEM has also completed an independent assessment of potential impacts during construction and operations and found that offshore wind can co-exist in harmony with marine species and other marine stakeholders who are active in the area.

The majority of the Delivery Facility is also located offshore. Portions are located in federal waters on the OCS, as well [redacted]

[redacted]

[redacted] would coordinate closely with the municipalities, RIDOT and RITBA to minimize disruption.

6.5: Interconnection Route Map

See the description of the Delivery Facility route [redacted]

6.6: Interconnection Status

6.6.1 Deepwater Wind

Deepwater Wind has submitted two Capacity Network Resources interconnection requests in connection with the Project in the amounts o [redacted]

6.6.2 GridAmerica

GridAmerica maintains ISO-New England Queue Position [redacted]

6.6.3 FirstLight

FirstLight maintains a Large Generator Interconnection Agreement for the Storage Facility on file with FERC.

6.7: Electrical System Performance

6.7.1 Deepwater Wind

In our Base Proposal, the Project's wind turbines will generate and inject [redacted] into the ISO-NE network at [redacted]

The wind power generation will provide a bulk source of renewable power generation on the ISO-NE system.

6.7.2 GridAmerica

GridAmerica has completed a Feasibility Review of [redacted]

6.7.3 FirstLight

Northfield Mountain is an existing pumped storage hydroelectric Capacity facility that has been in operation since 1972. Northfield Mountain is currently interconnected to the backbone of the ISO-NE transmission system via 312, 354 and 381 345kV lines through the Northfield Mountain electrical substation.

6.8 Multiple Interconnections

Deepwater Wind and GridAmerica hold multiple ISO-NE Interconnection Queue Positions for various configurations of the Project.

- [redacted]

If the Distribution Companies elect one of the Expandable Transmission Facility options offered in this 83C Proposal, [redacted]

6.9: Interconnection Analysis

6.9.1 Deepwater Wind

Deepwater Wind initially commissioned [redacted] to prepare a pre-feasibility study. This study found that [redacted]

[redacted]

[redacted] delivered to the Brayton Point Substation would qualify for capacity without system upgrades.

These studies consisted of an Initial Interconnection Analysis to assess the ability of the Project to interconnect subject to the Network Capability Interconnection Standard (NCIS). These studies assessed the steady state thermal, short circuit impact and an Overlapping Impacts Analysis where the Project's thermal impact was assessed for overlapping conditions accounting for existing system layout.

[redacted]

6.9.2 GridAmerica

[redacted]

6.9.3 FirstLight

N/A

6.10: Alternative Interconnection Scenario

The Project is not providing an alternate interconnection scenario based on ISO-NE proposed interconnection process changes because there are no known proposed process changes that warrant an alternative scenario.

6.11: Electrical Models

[redacted]

6.12: Electrical One-Line Diagram

6.12.1: Project-Specific Generator Lead Line

[redacted]

6.12.2: Expandable Transmission Facility

[redacted]

6.13: Required Interconnection Facilities

Deepwater Wind will design the Wind Farm and Delivery Facility, both in the Generator Lead and Expandable configurations, to conform with the requirements of ISO-NE and the interconnecting transmission owner. Accordingly, the specific interconnection facilities required to interconnect the Delivery Facility with the existing ISO-NE bulk transmission system will not be known definitively until after the completion of all required interconnection studies.

As a minimum, the interconnect facilities will include a 34.5/230 kV offshore substation which collects generation and steps-up voltage to 230 kV for exporting power to the Point of Interconnect where power will be conditioned for the Point of Interconnect sy[redacted]

6.14: Incremental Data Files (Projects that include Transmission)

[redacted]

6.15: Deliverability

6.15.1: Wind Farm

Given the retirement of Brayton Station, the point(s) of interconnection, [redacted]

6.15.2: Delivery Facility

We are confident that the Delivery Facility can be expanded beyond the [redacted]

6.15.3: Storage Facility

The Storage Facility has operated successfully since 1972.

6.16: Full Dispatch Capability

Given the retirement of Brayton Station, the point(s) of interconnection and t

SECTION 7: ENVIRONMENT, PERMITS AND RPS CERTIFICATION

7.0: Approach to Entitlements

Through the development of the Block Island Wind Farm, Deepwater Wind has gained an unmatched level of understanding of the environmental conditions in, and permitting requirements for, the waters of southern New England. Building upon over three years of intensive environmental study in the waters of southern New England, as well as on-going engagement with the Federal resource agencies, Deepwater Wind has developed a comprehensive permit acquisition plan.

In addition to our experience with the Block Island Wind Farm, the Project will benefit from Deepwater Wind's current permitting activities for the South Fork Wind Farm, which is located in the same BOEM lease area. Deepwater Wind is currently engaged in comprehensive environmental and technical surveys, as well as extensive governmental and stakeholder consultations, in connection with SFWF. Expanding these efforts to include the Project will be an efficient and straightforward process.

As part of the development of the BIWF project, Deepwater Wind conducted extensive pre-survey coordination with BOEM, USACE, NOAA NMFS, the USFWS, and the RI CRMC. In addition to the regulatory authorities, Deepwater Wind engaged key stakeholders early in the process and established constructive relationships with the Wampanoag Tribe of Gay Head (Aquinnah), the Narragansett Indian Tribe of Rhode Island, the commercial and recreational fishing community, and both regional and national environmental non-governmental agencies who advocate for marine mammal and ocean conservation.

Deepwater Wind worked with all of these regulatory agencies and stakeholders to develop survey plans and conduct field surveys that met the needs of Block Island Wind Farm and addressed specific questions or concerns that were identified by those agencies and stakeholders. Deepwater Wind expects that the experience gained, and relationships established, during the development of the Block Island Wind Farm will expedite the permitting process for this Project.

7.1: Required Permits

Deepwater Wind has a proven record of responsibly engaging and working with the appropriate authorities to receive required permits.

The permits, licenses, and environmental assessments and/or environmental impacts statements required to construct and operate the Project, described in [redacted] substantially similar to those received for the construction and operations of Deepwater Wind's BIWF and BITS projects and in-process for Deepwater Wind's SFWF project.

Based on our experiences with BIWF and SFWF and our constructive working relationship with the Federal resource agencies, we do not anticipate any major permitting issues at this time.

7.2: Permitting Timeline and Assessment

Deepwater Wind is on schedule to secure all necessary permits in time to support a 2023 COD. **Table 7-1** below provides a summary of the current permitting timeline for the Project.

[redacted] provides a detailed assessment of the process and anticipated timeline for the permitting requirements. The permitting requirements are also included on the project schedule in **Section 10**.

Table 7-1: Project's Expected Permitting Timeline

Activity	Dates
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

7.3 Environmental Assessment Experience

Through the development of the Block Island Wind Farm and South Fork Wind Farm, Deepwater Wind has gained an unmatched level of understanding of the environmental conditions and permitting requirements for an offshore wind facility and associated export cable system. Deepwater Wind's permitting plan for the Project is based on several years of intensive environmental study in the waters of southern New England, as well as ongoing engagement with federal and state resource agencies.

The Project benefits from a wide variety of studies and assessments that have already been completed as well as intensive marine spatial planning completed by the State of Rhode Island. BOEM, the State of Rhode Island, and the Commonwealth of Massachusetts have all invested significant funding for studies within the RI-MA WEA. Examples of these studies include a multi-year study of the presence of marine mammals and sea turtles and a multi-year study of the abundance and distribution of seabirds, funded jointly by BOEM and the Massachusetts Clean Energy Center. The Massachusetts Clean Energy Center also funded an assessment of existing conditions of Brayton Point which described the feasibility of locating ports and infrastructure for offshore wind at that location. In addition, the State of Rhode Island completed an extensive marine special planning effort during the development of the Ocean Special Area Management Plan (OSAMP). The OSAMP was developed with input from federal and state agencies, coastal

communities, as well as a variety of stakeholders. The OSAMP studied a large area of Block Island Sound and the RI-MA WEA where the Project will be located, and significant spatial data is now available, which provides critical resource details that will inform the siting process for Wind Farm and Export System.

In addition, on June 4, 2013, BOEM released an environmental assessment for the RI-MA WEA and issued a "Finding of No Significant Impact", which concluded that reasonably foreseeable environmental effects associated with the commercial wind lease issuance and related activities would not significantly impact the environment.

Based on this wealth of information, Deepwater Wind has been able to accelerate the development process and has already begun site assessment within the RI-MA WEA. Detailed geophysical surveys started in summer 2017 and additional site assessment and scientific surveys will continue prior to permit application submission. In addition, select surveys will continue through construction and into operations, based on collaborative discussions with resource agencies and other stakeholder organizations. These site assessment surveys provide key details to be incorporated into the permitting applications for the Project.

7.4: Preliminary Environmental Assessment

Deepwater Wind has prepared a preliminary environmental assessment of the Project for both construction and operation, based on the significant amount of information currently available for environmental resources in the Project area. This preliminary environmental assessment will be supported with more extensive reviews including intensive field studies as the Project's development progresses.

Based on this preliminary environmental assessment, Deepwater Wind has not identified significant projects risks that may negatively affect project permitting, construction, or operations. In addition, based on Deepwater Wind's experience with the operation of the Block Island Wind Farm and development of the South Fork Wind Farm, the Project will incorporate a variety of ongoing mitigation measures that will minimize potential impacts to environmental resources and/or support additional scientific understanding about the impacts of offshore turbines on environmental resources in a marine environment.

i. Impacts during site development

Potential environmental impacts during the development of the Wind Farm are primarily limited to the construction phase. Prior to any construction, the Wind Farm will be subject to review by over 20 different federal and state agencies as well as the general public during multiple public comment opportunities. The sections below focus on impacts that would occur during the construction phase of the development. Where impacts could occur during pre-construction survey or operations phases of the Project, they are noted below.

ii. Transportation infrastructure

The Project will primarily be located offshore with limited onshore facilities for the Delivery Facility Development will require the use of [redacted] Staging and laydown of equipment will

occur at existing port facilities. Deepwater Wind will work with the port facilities to determine what upgrades may be required to support the Project.

iii. Air quality impacts

Wind power results in zero emissions, assuring renewable energy compliance as well as ensuring clean air. It is expected that the Project will have minimal emissions of regulated air pollutants and greenhouse gases, all of which are associated with the marine vessels and other equipment needed for construction and operation.

Because offshore wind will displace higher cost fossil generation, the Project will reduce air emissions in southern New England. By delivering power to ISO-NE during the summer peak hours, the Project is projected to displace generation from existing power sources, which will result in an improvement in air quality for residents in southern New England. Based on results of Block Island Wind Farm, the highest level of output is expected between the hours of 12 noon and 8 PM, which is especially valuable in areas where load is driven largely by residential demand and remains relatively high into the early evening hours.

Construction activities may cause temporary effects on air quality in the form of exhaust from construction vessels and vehicles. However, these effects will be temporary and minimal due to limited duration of construction in any one place. Under Section 328(a)(1) of the Clean Air Act, the Project will require an OCS air permit for the marine vessels or other equipment used during construction and operations. Deepwater Wind has experience with this permitting process from development of the Block Island Wind Farm and South Fork Wind Farm.

iv. Access to water resources/water quality impacts

Once operational, the Project will not require any fresh water nor is it expected to have any impacts on water resources or water quality.

The need for fresh water during construction of the Project is limited to vessel needs and water required for dust suppression during work on terrestrial portions of the Export Cable. Construction activities in the offshore Project area may cause minor and temporary impacts to marine water quality from sediment disturbance from pile-driving, cable-laying, and the positioning of jack-up barges and vessel anchors.

Deepwater Wind will minimize impacts on water resources and water quality by using construction techniques, such as a jet plow for submarine cable installation, to minimize disturbance of sediment that could affect water quality, and by implementing best management practices and erosion control measures for terrestrial portions of the project.

v. Ecological and natural resources impacts

The Project may potentially affect ecological and natural resources primarily in the offshore Project area where turbines and portions of the export cable will be located. These resources include marine mammals and sea turtles, avian and bat species, sensitive benthic habitats, and finfish. The potential impacts will likely be similar to those identified for the Block Island Wind

Farm where Deepwater Wind has studied, permitted, and mitigated these risks at the only operational offshore wind facility in the US.

Marine Mammals and Sea Turtles

Marine mammals and sea turtles may be affected by noise, increased vessel activity, or potential water quality degradation from accidental fuel spill or releases of marine trash/debris. These potential effects will primarily occur during construction and, based on experience with the Block Island Wind Farm, Deepwater Wind has successfully developed an approach that minimizes these potential effects and plans to incorporate this same approach for construction of this Project.

Deepwater Wind is a leader in the protection of marine mammals and sea turtles. In May 2014, Deepwater Wind, the Natural Resources Defense Council, the National Wildlife Federation and the Conservation Law Foundation announced an agreement for "Proposed Mitigation Measures to Protect North Atlantic Right Whales…"[9]. Through this path breaking agreement, the Company and the environmental advocates established a set of restrictions on site assessment and construction activities designed to protect marine mammals and sea turtles. This agreement remains in effect.

As it relates to the Project area, significant information has already been collected about the presence and movement patterns of a variety of species of marine mammals and five species of sea turtles.[10] Deepwater Wind is incorporating this information into specific evaluations conducted during the permitting process.

Because marine mammals use sound for communication, foraging, and navigation, noise emitted by construction vessels may affect the behavior of these species. The potential impacts from acoustic sources are measured by levels of sound that have been determined to cause behavioral harassment or physical damage or injury. The National Marine Fisheries Service has established harassment thresholds for these levels. Based on an underwater acoustic modeling assessment conducted for the Block Island Wind Farm, Deepwater Wind has developed a strong understanding of the likely decibel levels associated with various construction activities. Some Project activities could result in temporary harassment (Level B, as defined by NOAA) and Deepwater Wind will obtain all necessary permits from NOAA to address these impacts and to establish appropriate mitigation measures.

Deepwater Wind must comply with several conditions in the BOEM lease when project development activities occur in the vicinity of marine mammals. In addition to requirements of the lease, Deepwater Wind developed several mitigation measures during construction of BIWF, such as seasonal restrictions for certain types of construction activities, and spill response and plans. Deepwater will continue discussions with environmental advocacy organizations about

[9] NRDC (2014). "Right Whale Agreement Announced Today." Jasny, Michael. Natural Resources Defense Counsel. May 7. 2014. Online. Availble: https://www nrdc.org/experts/michael-jasny/right-whale-agreement-announced-today

[10] Marine Mammals and Sea Turtles of Narragansett Bay, Block Island Sound, Rhode Island Sound, and Nearby Waters: An Analysis of Existing Data for the Rhode Island Ocean Special Area Management Plan, 2010.

potential impacts and benefits to marine mammals, as well as practices to avoid, minimize and measure impacts.

Avian and Bat Resources

During construction, avian species may be affected as a result of direct habitat loss or through temporary displacement or disturbance from construction activities such as increased vessel traffic, noises and temporary work lighting. These impacts will be short in duration and limited in scale. During operation, mortality of bird and bat species may result due to collisions with turbine blades or other infrastructure. Although little information is available on fatality rates at operational offshore wind facilities, Deepwater Wind is actively studying the issue at the Block Island Wind Farm and results of this assessment will inform operations at this Project.

A variety of avian and bat species may occur within the Project area, and several studies have been recently conducted about the presence and distribution within the RI-MA WEA.[11] Three species of federally listed bird species may occur in or near the Project area, including the federally-endangered roseate tern, federally-threatened piping plover, and the red knot, a candidate for federal listing. Based on biological assessments conducted by BOEM and subsequent consultations with USFWS, the likelihood of roseate terns occurring in the Project area has been determined to be "extremely low"; piping plovers are documented to primarily forage close to shore and therefore are not expected to occur in the Project area; less information is available about movement patterns of the red knot.[12]

Deepwater Wind recognizes the potential risk to avian and bat species and is conducting a variety of assessments at Block Island Wind Farm to better understand the potential impacts of offshore wind to avian and bat species. Deepwater will continue coordination with U.S. Fish and Wildlife Service and with environmental advocacy organizations to address potential concerns related to avian and bat species.

Sensitive Benthic Habitats

Although construction of turbines and export cables can disturb seafloor habitats, these impacts are expected to be minimized by use of specific construction techniques.

As part of the project development, Deepwater Wind will conduct detailed geophysical and benthic surveys to map and assess the value of potential sensitive habitats in the area of the Wind Farm and REC. Several sensitive benthic habitats identified by BOEM may occur within the offshore Project area, including rocky outcrops, glacial moraine, shellfish habitats, and/or submerged aquatic vegetation. These habitats support fish species during various life stages and can also be important commercial resources.

Nearshore areas adjacent to [redacted] are identified by the MA Division of Marine Fisheries as Conditionally Approved Shellfish Growing Areas. Areas of submerged aquatic vegetation are mapped along [redacted]

[11] Coastal Resources Management Council, October 19, 2010. Ocean Special Area Management Plan.

[12] USFWS, November 1 2012

Deepwater Wind will minimize impacts to benthic resources by using jet-plow techniques for cable installation. Where possible, Deepwater Wind will also avoid siting turbines and the export cable on substrate classified or glacial moraine or sand/gravel (type 4) habitat.

Finfish

During construction, minor short-term impacts on finfish may occur resulting from disturbance or alteration of habitat, increased suspension of sediments, and increased noise. During operation, impacts on finfish are not expected.

Significant information has already been collected about the presence and movement patterns of finfish in the Project area.[13] A wide variety of marine and estuarine fish species are known to occur in the Project area, including one federally listed endangered species, the Atlantic sturgeon, which is known to occur, or have historic range, in the waters of Rhode Island and the Taunton River. These species can be categorized into two groups based on the portion of the water column that they occupy: demersal (bottom dweller) and pelagic (surface or water column dweller) fish species.

This data provides a baseline on which Deepwater Wind will build additional site-specific information. In particular, during project development, Deepwater Wind will collect information about important habitats such as eelgrass and hard bottom substrates known to support fish species throughout various life stages.

The likely construction techniques and equipment, for the export cable such as jet-plow and horizontal direction drill (HDD), will substantially minimize disturbance and alteration of substrate, therefore limiting impacts on fish species. In addition, Deepwater Wind will endeavor to site turbines to avoid sensitive habitats that support fish.

vi. Land use impacts and Coastal Impacts

Because the majority of the Project is located offshore, land use impacts are not applicable for these portions of the Project.

For the terrestrial portions of the Export System, the transmission line portions of both the Preferred Route [redacted] will be installed along public rights-of-way and on state-owned properties. In addition, the proposed improvements [redacted] Substation are consistent with the existing uses of those properties.

The Project may affect various marine uses, including commercial vessel navigation, commercial and recreational fishing and other recreational activities, each of which is described below. Land use impacts from the onshore portions export cable route are expected to be minimal because it will be buried below existing ROW and other onshore facilities will occur in an existing industrial area.

[13] Fisheries Ecology in Rhode Island and Block Island Sounds for the Rhode Island Ocean Special Area Management Plan, 2010

Commercial Vessel Navigation

The area has been reviewed by BOEM and the CRMC through the OSAMP process and the potential for collision risk evaluated. The Lease Area was identified as outside major shipping channels. During the siting of the Project, Deepwater Wind considered patterns of commercial vessel navigation due to potential navigational safety. Although there is some traffic in the general vicinity of the Project, the heaviest traveled routes into and out of Rhode Island Sound are to the west[14]. Vessels that may traverse the Project include large vessels, such as tankers; tug-barge combinations; large cargo vessels; and large passenger vessels. The risk posed by large vessels transiting through an offshore wind facility is that there is little opportunity to stop or turn a large vessel if a navigational error or mechanical issue places a vessel off its intended track. Should one of these vessels collide with a wind turbine, substantial damage or collapse of the turbine structure could occur along with substantial vessel damage. For all vessels, and particularly for tankers carrying oil, there is added risk of pollution in the event of collision.

During development, Deepwater Wind will conduct outreach to tanker and tug-barge shipping stakeholders to discuss plans to support both siting and spacing of turbines as well as potential mitigation measures that will support navigational safety.

Commercial and Recreational Fishing

Siting turbines in proximity to commercial fishing grounds may affect the use and type of commercial fishing activities that have historically taken place at locations within the Project area. Fixed and mobile fishing gear are used throughout coastal and offshore waters of Rhode Island, Massachusetts, and New York including the Project area and the export cable route. From 2000 to 2010, the top commercial fish species by pounds landed has varied by state and by year, alternating between quahogs and squid in New York, squid and Atlantic herring in Rhode Island, and Atlantic herring and mackerel in Massachusetts.

Deepwater Wind has established relationships with the fishing community from the development of the Block Island Wind Farm and South Fork Wind Farm and has fisheries liaisons who are actively coordinating communications with the potentially affected communities. Additionally Deepwater Wind has completed multi-year fish and lobster surveys at the Block Island Wind Farm and is in the process of planning for surveys in the RI-MA WEA to support the project. As a result of this outreach and science, Deepwater Wind is uniquely positioned to site the Revolution Wind facilities to minimize impacts on commercial and recreational fishing.

Other Recreational Activities

[14] Rhode Island Sound Vessel Traffic Study conducted by United States Coast Guard in 2012

Two types of recreational activities may occur within the Project Area, recreational sailing races and wildlife viewing. While the majority of recreational boating in the region takes place in state waters (outside the area where the Project will be located), routes for distance sailing races cross the Project area. These races, which include Newport to Bermuda and trans-Atlantic routes, typically occur from June to September. The specific routes do not typically occur in a straight line but change course significantly depending on winds, currents, and other factors.

Offshore wildlife viewing activities consist of whale, bird, and shark viewing, all of which are highly localized, due in part to site-specific benthic habitat or other environmental factors. Whale watching and shark diving activities occur mainly during the summer season while bird watching occurs year-round. Shark diving is also known to occur through the month of October. Wildlife viewing activities rely on the presence and visibility of marine and avian species including fish, whales, sharks, and birds.

During project development, Deepwater Wind will conduct outreach and consultation with both stakeholder groups to minimize impacts to these activities.

Military Operations

The Project area is not within any area restricted by the military. During project development, Deepwater Wind will coordinate with the Department of Defense U.S. Fleet Forces Command regarding potential concerns, requirements, and any site-specific mitigations related to project construction and operations.

vii. Cultural resources

Deepwater Wind is committed to careful project siting and has begun consultation regarding potential cultural resources. The Project is located within an area that may have been dry land over 12,500 years Before Present and that human settlement was possible.[15] Any disturbance of the seabottom could potentially affect cultural resources present, including early settlement sites. During project development, Deepwater Wind will conduct a marine archeological survey to identify potential archeological sites and consult with Tribal Historic Preservation Offices of Native American groups with potential interest, which include the Narragansett Indian Tribe, the Mashpee Wampanoag Tribe, and the Wampanoag Tribe of Gay Head (Aquinnah), the Poospatuck and the Shinnecock Indian Nations on Long Island, as well as the State Historic Preservation Offices (SHPOs).

Deepwater must comply with several conditions of the BOEM lease including requirements for archaeological surveys, tribal pre-survey meetings, geotechnical sampling, and monitoring and avoidance. In addition, Deepwater will maintain an Unanticipated Discovery Plan that will include stop work and notification procedures that will be followed in the event that a cultural resource is encountered during construction.

Portions of the Export System to be located in [redacted]

[15] Rhode Island Ocean SAMP 2010

[redacted]

viii. Previous site use (e.g., greenfield, brownfield, industrial, etc.)

The majority of the offshore portion of this Project is located within an area that has not been previously developed. The terrestrial portion of the Export System (both preferred and alternative) is located within an industrial complex with a variety of uses, including an existing substation, and along public rights-of-way.

The terrestrial portions of the export cable pass by several oil and/or hazardous material sites identified by the Rhode Island Department of Environmental Management (RIDEM) and the Massachusetts Department of Environmental Protection (MADEP). [redacted] onstruction work in and around these areas will be coordinated with the respective state agencies.

ix. Noise level impacts

Although the Wind Farm will generate sound during construction and operation, turbines will be located approximately 15 miles from the closest point on the Massachusetts mainland, and at these distances, impacts from noise levels are not expected. The export cable will be buried and will not generate noise. The new substation will be located adjacent to an existing substation in an existing industrial area and any impacts from additional noise are expected to be minimal.

x. Aesthetic/visual impacts

Revolution Wind is expected to have limited visibility from onshore viewpoints due to distance from shore, curvature of the earth, wave height, and atmospheric conditions. Turbines will be located approximately 15 miles from the closest point on the Massachusetts mainland and 12 miles from Martha's Vineyard. Deepwater Wind will conduct a visual impact assessment and conduct community outreach to potentially affected stakeholders based on that assessment.

xi. Transmission infrastructure impacts

The interconnection point for the Export System will be located adjacent to an existing substation, and therefore no significant additional Project infrastructure is needed.

xii. Fuel supply access, where applicable

Not applicable.

7.5: Public Support

The development of the Commonwealth's offshore wind resource south of Martha's Vineyard and Nantucket Islands was the subject of vigorous discussion and debate during the 2015-2016 Legislative Session. This process resulted in wide bipartisan support among elected officials at each level of government in addition to the support of grassroots, economic and workforce

development, environmental and business associations across the Commonwealth.

At the approval of the 2016 "*Act to Promote Energy Diversity*", the Baker Administration's press release captures the breadth of support for offshore wind developed in competitively auctioned federal lease areas as part of the Commonwealth's energy portfolio:

- "The hydroelectric and offshore wind power generation authorized in this legislation will play a crucial role in securing clean and cost-effective energy for the Commonwealth's ratepayers," **said Lieutenant Governor Karyn Polito.** "By utilizing renewable sources of power generation, Massachusetts will continue to lead the nation in embracing economic and environmentally friendly methods to generate electricity to meet the needs of our communities."

- "The ability to procure clean hydroelectric power and off-shore wind is another important milestone in the Commonwealth's transition to a diversified energy portfolio," **said Energy and Environmental Affairs Secretary Matthew Beaton.** "By embracing renewable energy generation technologies, the Baker-Polito Administration continues to make progress in achieving the emissions reductions targets set forth by the Global Warming Solutions Act."

- "Massachusetts is taking yet another important step towards a clean energy economy," **said Joint Committee on Telecommunications, Utilities, and Energy Chairman, State Senator Ben Downing (D-Pittsfield).** "We are jump starting two industries - offshore wind & energy storage - that will shape our future, while recommitting ourselves to meeting our Global Warming Solutions Act requirements. More will need to be done, but this effort shows we are up to doing it."

- The 2800 MW of combined wind and hydro energy approved in the conference report will ensure that Massachusetts remains a national leader on clean energy and will help to secure a more reliable and sustainable future." **-House Committee on Ways and Means Chairman Brian S. Dempsey (D-Haverhill).**

- "I thank my colleagues for crafting this smart strategy that will bring stability to costs while expanding opportunities for offshore wind and hydro. I'd also like to thank the Baker Administration for its foresight in prioritizing energy legislation." **—House Speaker Robert A. DeLeo (D-Winthrop).**

- "Today marks an historic occasion for the Commonwealth in creating a new industry via off-shore wind," **said House Speaker Pro Tempore Patricia A. Haddad (D-Somerset).** "This legislation also provides us with a solid foundation from which we can further increase our renewable energy sources and reduce our dependence on fossil fuels. Governor Baker and Secretary Beaton have been good partners throughout the crafting of this bill and it has been a pleasure to work with them."

- "The implementation of the omnibus energy bill will help Massachusetts meet its goals for reducing greenhouse gas emissions by promoting the expansion of clean and

renewable energy resources, including hydropower and off-shore wind energy," **said House Minority Leader Bradley H. Jones, Jr. (R-North Reading).** "As a member of the conference committee that produced the final bill, I'm pleased we were able to reach a consensus that will move the Commonwealth forward in achieving a more diversified and environmentally-friendly energy portfolio."

- "I supported the passage of this energy bill because it advances offshore wind and hydropower in Massachusetts," **said Senate President Pro Tempore Marc R. Pacheco (D-Taunton).** "These initiatives will begin a new phase of clean energy procurement for the Commonwealth. Although this legislation is a good beginning, we have quite a long way to go to meet the requirements of the Global Warming Solutions Act and ensure a clean energy future for our state."

- "Massachusetts is – and has been – a pioneer of harnessing offshore wind energy, and collaboration at all levels has invested in the infrastructure, policies, and workforce programs to ensure that this sector succeeds. Offshore wind energy development is not a trend, and neither are the many benefits that energy consumers of all demographics will reap. Nationally and state-wide, we are committed to growing wind energy capacity, thus reducing the costs of offshore wind to consumers as well as levels of carbon pollution." **---Congressman William Keating**

- "This was extremely difficult to put together, and keep together," he said. "There are a lot of folks that want more, there are folks that want less, but I think what we did was, we formed a great foundation for the growth of an industry, as well as a clean energy future for the commonwealth." **- House Energy Chairman Tom Golden (D-Lowell)**

- "With immense wind resources just off our coastline and waterfront facilities ready to support offshore operations, New Bedford is in a prime position to help make the state a leader in renewable energy," **- Assistant Senate Majority leader Mark C. Montigny**

  http://www.mass.gov/governor/press-office/press-releases/fy2017/governor-baker-signs-comprehensive-energy-diversity-law.html

Business trade associations, organized labor and **environmental organizations** have also voiced strong support for the development of offshore wind:

Associated Industries of Massachusetts - "Because this is the first time a competitive RFP has ever been done in Massachusetts for OSW, the first tranche is likely to be significantly higher priced than later ones. As a result, committing too many MW to the first tranche could lock the commonwealth into less favorable contract terms. Further, it is likely the cost reductions between the first and second solicitations will be greater than those between later ones. Therefore, higher prices in the first tranche could overwhelm lower prices for subsequent tranches, hurting the ratepayer unnecessarily. In addition, a too large first solicitation could give an unfair competitive advantage to the entity that wins the first bid, chilling further competition, as it is likely the winning first bid will not only have an unfair cost advantage but also may have locked up a significant portion of

the supply chain. As it is there are only three bidders – if one were to drop out after the first tranche, the level of competition would not be robust enough for a vibrant competitive environment." Robert A. Rio, Esq., Senior Vice President and Counsel Government Affairs https://macleanenergy.files.wordpress.com/2017/02/aim-83c-comments.pdf

The Sierra Club - "Offshore wind is a key part of transitioning our nation off dirty energy sources like coal, and toward our clean energy future. According to the National Renewable Energy Laboratory (NREL) the Atlantic Ocean has 1,283.5 gigawatts (GW) of potential offshore wind. That's enough to power most of the homes along the Atlantic coast. What's more, offshore wind produces no pollution. Every offshore wind turbine we install will bring us closer to transitioning off of dirty fossil fuels, meaning cleaner air and water for families across the U.S."
http://content.sierraclub.org/coal/wind/offshore-wind

- **Massachusetts Audubon Society; Environmental League of Massachusetts; National Wildlife Federation; Natural Resources Defense Council -** "We supported and celebrated the passage of An Act to Promote Energy Diversity as confirmation that Massachusetts intends to lead the nation in launching an offshore wind power industry and seizing the massive, local, job-creating, clean energy potential off our shores. We wish to underscore that the Commonwealth's leadership role carries the responsibility of thoughtful, inclusive, and effective execution as other states consider how to follow in our path." -
https://macleanenergy.files.wordpress.com/2017/02/83c-osw-coalition-comments.pdf

Deepwater Wind recognizes the importance of community engagement. We are committed to continued stakeholder engagement during the development, construction, and operations for all of our projects. We work with local government, community groups, non-governmental organizations, and other stakeholders to ensure that our projects are built and operated to maximize benefits and avoid negative impacts.

- "We're thankful to Deepwater for having trust not only in IBEW but the building trades in general," said **Michael Monahan, a regional vice-president of International Brotherhood of Electrical Workers**.
http://www.capecodtimes.com/news/20170613/labor-environmentalists-tout-first-us-offshore-wind-farm

- "The Block Island Wind Farm serves as a shining model of what is possible, why it is worth reaching for, and how to ensure all voices are heard in the pursuit of this game-changing clean energy solution. Most importantly to the National Wildlife Federation, the Block Island Wind Farm has proven that offshore wind power can be a very wildlife-friendly energy source when sited and constructed with strong environmental protections in place."
http://blog.nwf.org/2016/12/3-reasons-2016-was-americas-best-year-ever-for-offshore-wind-power/

Deepwater Wind is committed to ongoing stakeholder communications during all phases of the Revolution Wind Project, including:

- Meeting with local associations, citizen groups, environmental advocacy organizations, commercial and recreational fishing interests, and other community organizations to inform them about the Project and address any issues that may be raised;
- Meeting with key federal, state, and local agencies and elected officials and other interested stakeholders to identify issues;
- Hold public open houses to provide information about the Project; and
- Maintain a Project specific website with information on the status of the Project. Details that will be available on the website will include:
  - A description of the Project, including project maps and other relevant information;
  - Project updates and news briefs; and
  - Contact information for those seeking additional information.

Deepwater Wind has previously attracted significant amounts of positive public support for our projects, as demonstrated by the media highlights submitted as **Appendix 7-2**. We have also provided Public Support Letters for 83C (**Appendix 7-3**) and Public Support Letters under 83D (**Appendix 7-4**)

7.6: RPS Eligibility

Since the Project meets the definition of a New Renewable Generation Unit (as it begins commercial operations after 1997), it is located within the ISO-NE Control Area, and it generates electricity using wind energy as its fuel source, it meets the definition of an eligible Class 1 resource[16], once it achieves COD. As such this Project also meets the definition of "Clean Energy Generation" in this RFP.

7.7: Attribute Tracking

As further detailed in Section 4.3, Company will utilize the NEPOOL GIS tracking system for attribute tracking, which will allow MA DEP to accurately measure progress toward meeting the Commonwealth's goals. Company agrees to deliver the environmental attributes into the Distribution Companies' NEPOOL GIS accounts.

7.8: Litigation and Other Matters Affecting Permitting

None.

[16] Per RPS Class 1 Regulations (225 CMR 14.00) - http://www.mass.gov/courts/docs/lawlib/220-229cmr/225cmr14.pdf

SECTION 8: ENGINEERING, TECHNOLOGY AND ACCESS TO EQUIPMENT

The Revolution Wind Project has been designed to minimize the long-term cost of offshore wind for the ratepayers of Massachusetts using the following principles:

- **Intelligently-Sized Project(s):** Deepwater Wind offers multiple alternative Project configurations, as described in **Section 1**, each in the range of [redacted]. This strategy has two significant benefits: (1) it reduces the total cost of the contract that the Distribution Companies must pass along to ratepayers; and (2) it allows the Commonwealth to take advantage of declining costs and learnings from an increasing number of projects. Analysis prepared by the Brattle Group and submitted as **Appendix 14-3** confirms that [redacted] is the optimum size for procuring offshore wind in the US today. Details of each offered Project configuration are set forth in the Lookup Table provided in **Appendix 1-7**.
- **Use of Existing Infrastructure:** Deepwater Wind has committed to using the New Bedford Marine Commerce Terminal for significant portions of our construction work, as detailed in **Section 10**. If we need more space is needed for construction, we will use other existing facilities, preferably in Massachusetts. However, we will not burden the Commonwealth's ratepayers with the cost of constructing additional port facilities.
- **ITC Qualification:** Subject to the conditions of set forth in our proposal, Deepwater Wind will qualify the Project for the [redacted] using the same methodology we used successfully for the BIWF project. From an engineering perspective, this requires using existing technology that allows for components to begin being manufactured by the end [redacted]
  Lessons Learned from BIWF: The Project's site is substantially similar to that of our BIWF Project. We have designed this Project, including the equipment selection described in this **Section 8** and the construction methodology described in **Section 10**, based on what worked best at BIWF.

8.1: Preliminary Engineering Plan

As further detailed in **Section 10.4** below, Deepwater Wind will manage the engineering, procurement, and construction of the Project with package managers responsible for discrete scopes of work associated with technical components of the Project. **Table 8-1** below describes the major technical components of the Project and the work packages.

Table 8-1: Technology at a Glance[17]

	WIND TURBINE GENERATORS	OFFSHORE FOUNDATIONS	COLLECTION FACILITIES	DELIVERY FACILITY
Technology Type	Wind turbine generators, specifically designed for the	Purpose-built offshore foundations, suitable for the	Medium-voltage electrical collection system connecting the generators to a	High-voltage electrical transmission system connecting the Wind Farm to the

[17] The equipment and vendors described here have been selected as the design basis for the Project. Deepwater is currently engaged in discussions with other suppliers of comparable equipment. Deepwater may elect to modify the Project's design to incorporate such equipment, however such modification will not change Deepwater's offering herein.

	offshore environment.	Project site.	common generation substation.	Point of Delivery onshore.
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

For this 83C Proposal, the Wind Turbine Generators, the Offshore Foundations and the Collection Facilities are considered part of the "**Wind Farm**" while the Offshore Switching Station, the transmission cable, the onshore substation and the 230-kV interconnection / developer attachment facilities are part of the "**Delivery Facility**".

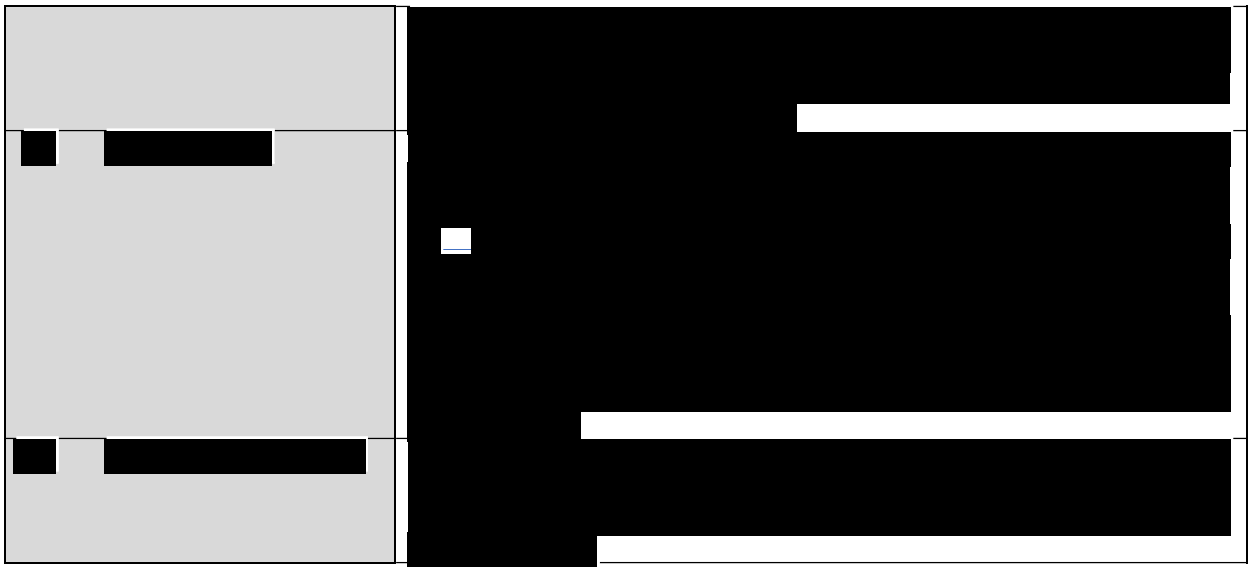
8.1.1: Wind Turbine Generators

Deepwater Wind has designed the Wind Farm using the Siemens 8.0 - 167[18] offshore wind turbine, summarized in **Table 8-1** below as the Project's design basis.

Table 8-1: Wind Turbine Generator Engineering Plan

WIND TURBINE GENERATORS	
[redacted]	[redacted]

[redacted]



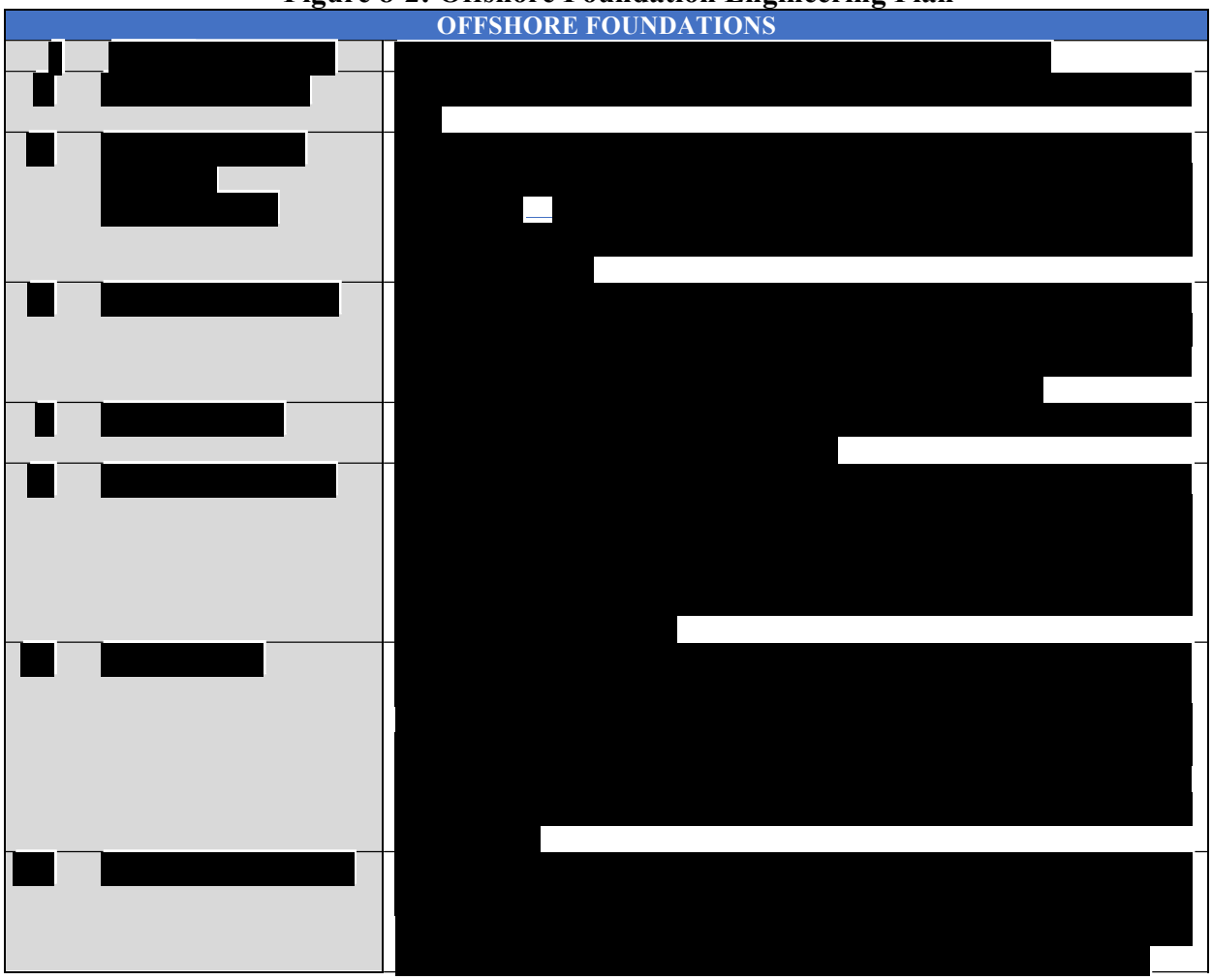
Details of the

8.1.2: Offshore Foundations

The Wind Turbines will be installed atop purpose-built offshore wind foundations designed specifically for the Project site. Deepwater Wind has selected Steel Jacket Foundations as the

design basis for the Project[19], detailed in **Table 8-2**, below. Deepwater Wind successfully deployed a comparable jacket foundation for the BIWF project. The design of the BIWF jacket foundation are shown in **Figure 8-2** below. Deepwater Wind selected jacket foundations because the Project site has similar water depths and sea bottom conditions to that of the BIWF project site.

Figure 8-2: Offshore Foundation Engineering Plan



[19] While Jacket foundations are the design basis for the Project, the Company is also evaluating the feasibility of other foundation types, such as monopiles and gravity bases. Deepwater Wind may elect to modify the Wind Farm's design to incorporate a different foundation design.

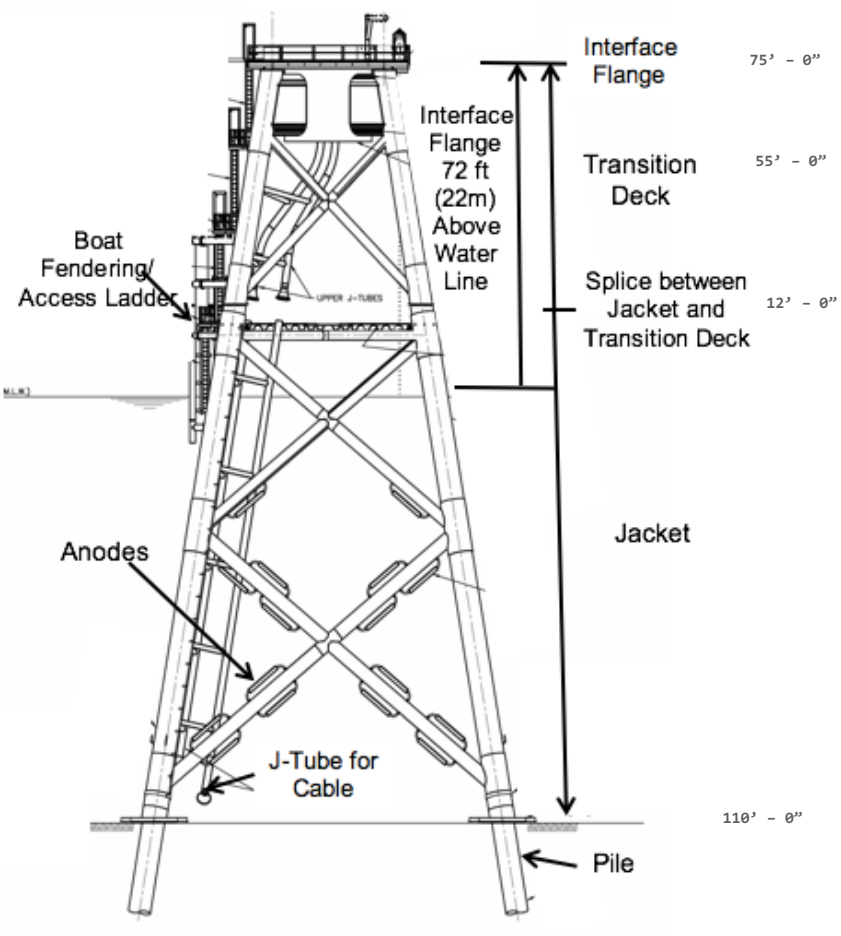


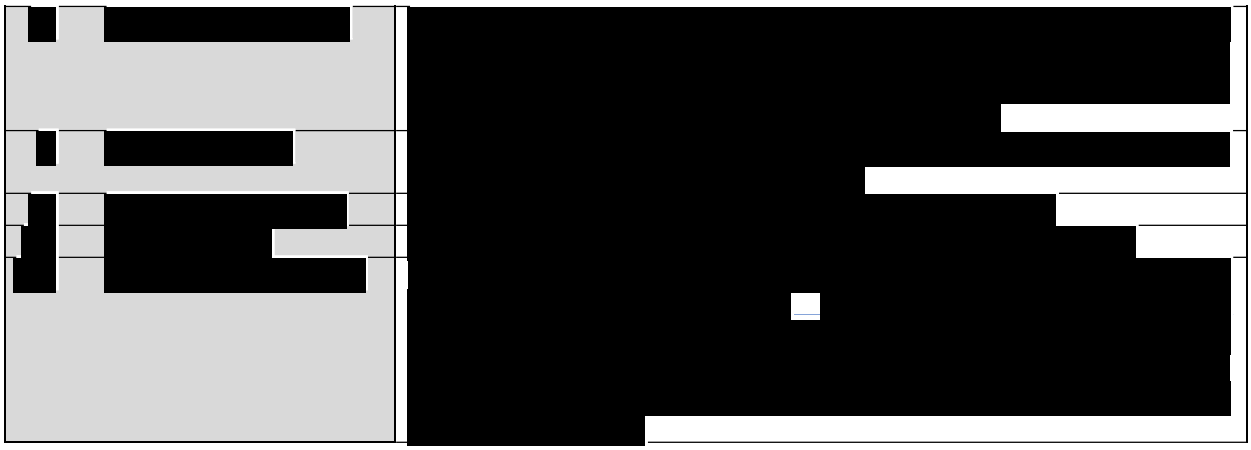
Figure 8-2: Representative Steel Jacket Foundation Design

8.1.3: Collection Facilities

Power from the Wind Farm will be collected at an Offshore Transmission Module ("OTM"), to be installed on one of the Wind Turbine Foundations, via a set of 34.5 kV inter-array cables, connecting the turbines. The Collection Facilities consist of equipment that has been deployed successfully in the offshore oil and gas industry for over 50 years and in the offshore wind industry for over 20 years, as summarized in **Table 8-3** below.

Table 8-3: Collection Facilities Engineering Plan

COLLECTION FACILITIES	
[redacted]	[redacted]

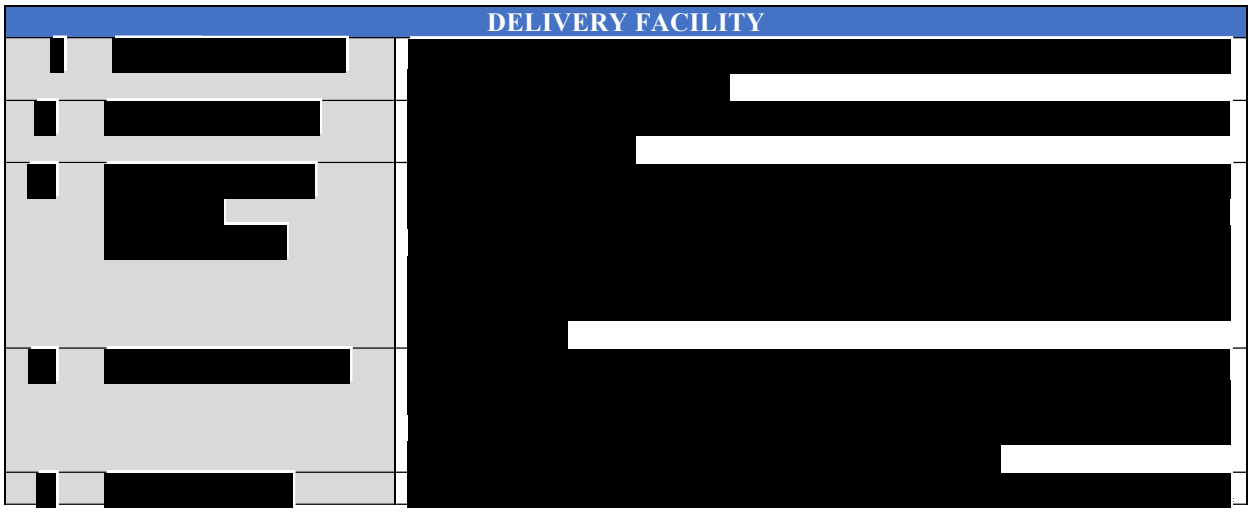


Deepwater Wind will design and construct the Collection Facilities using the OTM described in [redacted] submitted herewith. The OTM is designed to be integrated with the foundation of an offshore turbine, so that single offshore foundation will support both a wind turbine generator and the offshore substation equipment, as [redacted] also submitted herewith.

8.1.4: Delivery Facility

Power from the Wind Farm will be delivered to the Point of Interconnection via a purpose-built Delivery Facility consisting of: (a) a new offshore substation connected to the Wind Farm's OTM, (b) a submarine cable connecting that offshore substation to a new shore landing, (c) a terrestrial cable from the shore landing to a new onshore substation, and (d) the new onshore substation, including interconnection facilities connecting to the [redacted]

The Delivery Facility has been designed with careful consideration of the Commonwealth's policy objective to ensure that its full 1,600 MW offshore wind target can be delivered cost-effectively and with the least number of cables possible. Similar consideration has been given to the planning objectives of the State of Rhode Island, whose Coastal Resources Management Council is currently preparing a Special Area Management Plan for the Narragansett Bay (which all cables must transit to reach Brayton Point).



Further details regarding the Delivery Facility are provided in **Section 15**.

8.2: Key Equipment Suppliers under Consideration

See Section 8.1.

8.3: Equipment Performance History

See Section 8.1.

8.4 Technology Readiness

8.4.1: Wind Farm

Offshore wind farms have been operating successfully in Europe for over 25 years. As of January 2017, Europe has over 12.6 GW[20] of operational offshore wind capacity from over 3,500 grid-connected offshore wind turbines. The European market expects to double to 24.6 GW by 2020[21]. In 2016 alone, the European offshore wind industry added four major new projects totaling 1,558 MW grid-connected capacity[22]. Also in 2016, 11 projects, worth €18.2bn, reached FID, a 39% increase over 2015. In total 4,948 MW of new capacity reached FID during 2016[23].

8.4.2: Delivery Facility

HVAC submarine cable systems utilizing extruded cables with cross-linked polyethylene (XLPE) insulation will be utilized. These cables have been successfully deployed at voltages up to 170 kV since the 1970s and at voltages greater than 230 kV since 2006. The operating history is even longer for land-based underground cables. Some notable projects using extruded submarine cables include Santa Catarina, Brazil (2006, 245 kV, 4.5 km), NJ-Brooklyn, New York (2011, 362 kV, 11 km) and Malta-Sicily, Italy (2013, 245 kV, 100 km). The design and manufacturing of HVAC extruded submarine cables has advanced during this time and its reliability has been demonstrated by its increasing use in high voltage applications.

[20] European Wind Energy Association. Online. Available: http://www.ewea.org/policy-issues/offshore/ July 2017

[21] *Ibid*

[22] *Ibid*

[23] *Ibid*

8.5: Full and Complete List of Equipment

A full and complete list of all equipment will be prepared following the completion of all surveys required to support engineering and permitting, and upon the completion of the ISO-NE interconnection process.

8.6: Long-Lead Equipment

Deepwater Wind plans to execute long-lead equipment supply agreements for the packages described in **Section 8.1** and **10.4** promptly following the receipt of a fully-approved, un-appealable PPA. These supply agreements will be fully-negotiated, but conditioned upon the Project achieving a financial closing.

Major equipment has been identified in **Section 8.1**, and the lead times are known to be in the range of 12 to 18 months. The Project schedule in **Section 9** was developed with consideration of the manufacturing and delivery times associated with this equipment to ensure [redacted]

SECTION 9: PROJECT SCHEDULE

9.1: Critical Path Schedule

Deepwater Wind is currently conducting surveys of the site in connection with the South Fork Wind Farm. If the Revolution Wind Project receives an executed PPA [redacted] nd all required regulatory approvals for such PPA by [redacted] its permitting can be completed [redacted] as detailed in **Figure 9-1** below. A larger version is attached as **Appendix 9-1**.

[redacted]

9.2: Maritime Vessels / Laydown

While a particular vessel has not been secured, Deepwater Wind has held in depth conversations with multiple installation contractors and offshore cable installers. All potential installation partners either own the type of vessels needed for a project of this size, or have strategic partnerships with sizable vessel owner/operators.

9.3: Status of Critical Path Items

Assuming that Deepwater Wind and the Distribution Companies reach agreement on and execute a PPA by [redacted] and that such PPA fully is approved by the MA DPU by [redacted] the critical path schedule for the completion of the Project is as follows:

1. ***Commence Interconnection Process.*** Deepwater Wind has submitted an interconnection for the Project as described more fully in **Section 6.6** above.

2. ***Complete Site Assessment Activities.*** Deepwater Wind has already begun reconnaissance-level site surveys. Upon approval of the PPA, Deepwater Wind will complete this work by launching a comprehensive wind resource assessment campaign and submitting the Site Assessment Plan (SAP) to BOEM. Deepwater Wind anticipates completing geological and environmental surveys [redacted]. The required meteorological surveys will continue for an additional 12 to 24 months to satisfy the Project's investors and lenders.

3. ***Establish ITC Safe Harbor.*** Upon approval of the PPA, Deepwater Wind will implement a strategy to establish a "Safe Harbor" for the Project as required by the federal IRS to secure an [redacted] Tax Credit, as detailed in **Section 5.10** above.

4. ***Complete Studies and Submit Permit Applications.*** Upon the completion of the geological and environmental surveys, Deepwater Wind will submit all the required federal, state and local permit applications including the BOEM Construction and Operations Plan (COP) and a consolidated Environmental Report (ER). As further described in **Section 7** above, Deepwater Wind anticipates submitting permit applications [redacted]

5. ***Receipt of All Required Approvals.*** Deepwater Wind anticipates receiving the required interconnection approvals by [redacted]

6. ***Launch Foundation Detailed Engineering.*** Detailed design and engineering for the wind turbines, foundations and electrical systems is expected to take place from [redacted] that engineering is completed within the same time frame that the permits are finalized.

7. ***Procure Long Lead Items.*** Upon the completion of the detailed engineering, Deepwater Wind will procure and issue Notice-to-Proceed for the long lead time items (turbines, foundations and electrical systems). This is expected to commence in [redacted]

8. ***Financing.*** Negotiations of a financing agreement are expected to commence late in the permitting process, following the completion of engineering and concurrently with the procurement of long lead time items. Closing is anticipated [redacted], following the receipt of permits and the execution of EPC agreements with the selected long lead time equipment vendors.

9. ***Fabrication.*** Deepwater Wind will commence the fabrication of the foundations following the closing of financing. Deepwater Wind estimates that a complete foundation can be assembled at a rate of one per week. The foundation fabrication yard is expected to operate continuously for a period of approximately one year, from [redacted]

10. ***Construction.*** Upland construction work, including the Upland Substation and the Buried Terrestrial Cable, will be conducted from [redacted]. While completing the fabrication in [redacted] Deepwater Wind will begin deploying the Project's foundations in [redacted] Deepwater Wind will install the inner-array cabling the foundations and offshore substation in [redacted] Installation of the offshore wind turbines is expected to be completed in [redacted] with the commissioning of the Project completed in [redacted]

11. ***Commissioning / Testing.*** The commissioning and testing of each wind turbine generator will commence immediately after the installation and will have a duration of approximately 2 months. The Delivery Facility will be commissioned and tested, including the Soak Test, in [redacted]

12. ***Transfer of Delivery Facility Ownership.*** Upon the satisfactory completion of the Delivery Facility's Soak Test, GridAmerica will have the option to acquire the Delivery Facility from Deepwater Wind. Upon GridAmerica's notice of its intent to acquire the Delivery Facility, the Parties shall promptly proceed to a closing and transfer.

SECTION 10: CONSTRUCTION AND LOGISTICS

This **Section 10** details the construction of the proposed Project. The construction will be managed by an experienced in-house project management team representing all disciplines to ensure a safe, successful and timely project completion within the budget. Disciplines will include: project management, construction management, financial controls, safety and quality management, risk management, legal, civil engineering, mechanical engineering, electrical engineering, purchasing and logistics. Robust and proven Project procedures and audits are in place and will be used to ensure that the Project is executed in accordance with the requirements. This overall project management organization and system was successfully used to build the Block Island Wind Farm which was delivered safe, on time and within budget.

10.1: Major Tasks

10.1.1: Mobilization

Following a financial closing, Deepwater Wind will issue Notice to Proceed ("NTP") to the vendors selected for each of the packages of work described in **Section 8** above and detailed in **Section 10.4** below. Following issuance of NTP, each Deepwater Wind package manager will coordinate with the vendors under his/her package to ensure they commence mobilizing necessary service vessels and fitting out the Project's port facilities.

10.1.2: Wind Farm Construction

Concurrently with closing construction phase financing, the Proposer will purchase the necessary steel and commission the fabrication of the foundations, including piles, jackets and transition decks. Jackets, transition decks and piles for the proposed Project will be fabricated at one of the Project's port facilities and stored at the port facility until the construction season. Alternatively, Gravity Base Foundations or Monopiles will be fabricated and staged at these port facilities.

Because of the potential for rougher seas during the winter months, heavy lift installation offshore is preferred from May through October. Installation of one jacket foundation will take around 3 to 4 days. Monopiles can be installed in 2 to 3 days. Gravity Base Foundations don't need a heavy lift vessel so they can be installed anytime while the installation with take around 7 days.

Throughout the execution phase of the Project, a Certified Verification Agency (CVA) will ensure that the applicable standards and codes are used, verify engineering and quality control, inspect fabrication and installation in accordance with the witness and installation plan, and co-sign on stage completion certificates as a proof that each part of the execution is in accordance with all specifications, requirements and good workmanship. The CVA will report to BOEM to ensure a fully independent verification in accordance with the BOEM regulations.

For all transportation and installation activities, manuals will be developed with detailed instructions on how to execute the scope of work. Manuals will be approved by the CVA and will be used to approve the start of each activity.

The installation of the foundations will be executed by a derrick barge with a minimum lift capacity of approximately 1500 tons, moored to the seabed by an 8-point mooring system with approximately 10-ton anchors. Alternatively, the position of the vessel can be controlled by Dynamic Positioning (DP).

Each foundation will be installed as follows:

- execute a bottom sweep video of the installation area to define the situation at the start of the operation,
- lift the jacket from the material barge onto its location on the seabed,
- lift the lead sections of the piles into the jacket legs,
- lift the first add-on of the piles and stab into the lead sections,
- weld-out connection of add-on to lead section by means of a full penetration weld,
- lower pile through the jacket leg into the seabed till self-weight penetration,
- drive the pile into the seabed till until the pile tip is 3 feet above the jacket legs,
- lift second add-on of the piles and stab into the pile tip,
- weld-out connection of second add-on to the pile,
- drive the pile to final penetration as calculated by the foundation design contractor,
- weld the top of the piles to the jacket leg by means of shear plates,
- execute a cut-off of each of the piles such that the transition deck will be horizontal,
- install and weld-out the boat-landing,
- install and weld-out the transition deck,
- execute a bottom sweep video of the installation area to ensure compliance with all permits and
- remove debris (if any).

Alternatively, piles will be pre-installed where after the jacket will be lifted on top of the piles. During the lifting the jacket stabbing points will be stabbed into the piles. The stabbing points will then be grouted to the piles.

For the piling, an IHC hydraulic hammer will be used. Pile driving noise will be analyzed and if necessary noise mitigation will be used during pile driving while Protected Species Observers in the installation area will ensure that there will be no impact to wildlife during pile driving.

Deepwater Wind plans to operate a fenced marshaling facility with a 24-hour presence of marshaling coordinators, dispatchers and technicians at the New Bedford Marine Commerce Terminal. The marshaling area will be prepared for receiving the turbine components, especially for suitable surface strength to store the approximately 400-ton nacelles. The turbine components will be off-loaded by cranes and high capacity multi-wheel trailers. At the port facility, the WTG vendor's technicians will execute the last preparation for the offshore installation. Once fully ready, the nacelles, tower sections and blades will be loaded out onto transportation barges. The barges will be towed by 60-tons bollard pull ocean going tugs to the Wind Plant.

At the Wind Farm site, a jack-up lift vessel with a crane capacity of approximately 800 tons will set-up at the first completed foundation location. The jack-up legs will be lowered into the

seabed. A penetration of 3 to 6 feet is foreseen and will be verified during final installation engineering once the exact installation vessel has been contracted.

The transportation barge will set-up adjacent to the jack-up lift vessel. Then each turbine will be installed as follows (all connections are bolted):

- lift lower bottom tower section onto the transition deck and connect,
- lift second tower section onto the bottom tower section and connect,
- lift second top section onto the second tower section and connect,
- lift nacelle onto the tower and connect,
- lift blade 1 onto the hub and connect,
- lift blade 2 onto the hub and connect,
- lift blade 3 onto the hub and connect,
- execute completion activities,
- execute a bottom sweep video to ensure compliance with all permits and
- remove debris (if any).

For each turbine, the commissioning will be initiated by WTG vendor technicians upon completion of the installation. Since the wind energy converter has been pre-commissioned onshore, the offshore commissioning will be limited and is expected to take a few days per turbine. Transportation of technicians will be executed by a dedicated crew boat.

10.1.3: Delivery Facility Construction

Deepwater Wind will be responsible for all aspects of the construction of the Delivery Facility. The land-based HVAC Substation will be constructed [redacted] major equipment for the Substations will be fabricated and pre-assembled offsite by the equipment vendor and installed on-site by qualified local civil, mechanical, structural and electrical contractors. Construction of the Substation will require approximately 6 months

At the beach landing point, a cable landfall will be constructed to connect the submarine and terrestrial cables. Each cable landfall will consist of (1) an upland vault, at which the submarine cable is spliced to join with the terrestrial cable, and (2) a high-density polyethylene (HDPE) conduit buried beneath the beach, as shown below in Figure 2. The cable landfall will be constructed by excavating a temporary drilling pit on the upland side of the landfall and also excavating a temporary cofferdam on the marine side of the landfall. Upon their completion, a horizontal directional drill (HDD) will be used to install the HDPE conduit connecting the upland drilling pit with the cofferdam. A buried vault will be installed in the upland drilling pit.

Concurrently with the installation of the Substation, the offshore substation will be fabricated and installed offshore. The offshore substation consists of 2 modular units which will be placed on WTG foundations.

10.2: Site Control for Marine Terminal(s)

Deepwater Wind plans to construct the Project using existing Marine Terminals, including the New Bedford Marine Commerce Terminal. Deepwater Wind and the other developers have executed an option agreement so that, whichever developer(s) receive a PPA also receives the right to use the terminal.

10.3: Staging Deployment Approach

Deepwater Wind will use a similar approach to construct the Block Island Wind Farm, described in **Section 12** below.

Construction of the BIWF project progressed rapidly following financial close. Significant fabrication and assembly work was completed in Rhode Island beginning in early 2015. The first foundation of the BIWF project was installed in July 2015. Installation of the five steel jacket foundations for the project was successfully completed in fall of 2015. In the spring of 2016 Deepwater Wind installed approximately 11.5 miles of submarine cable connecting the wind farm to a new substation built on Block Island. Finally, all five wind turbines of the BIWF project were installed over 18 days in August 2016, and the last turbine component was installed within the same month.

Deepwater Wind executed the development and construction of the BIWF project with an excellent safety and environmental record, on budget, on schedule and with high levels of community support, as demonstrated by the media highlights provided in **Appendix 7-2.**

Figure 10-1: BIWF Turbine Assembly at the Port of Providence (RI)

Figure 10-2: First BIWF Foundation

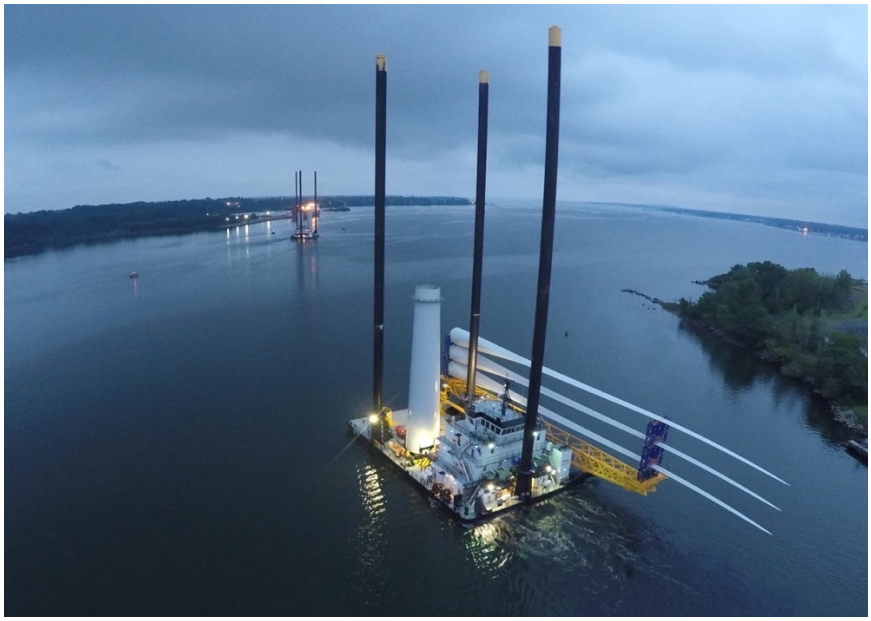


Figure 10-3: WTG transportation barges

Figure 10-4: Installation of First BIWF WTG

Figure 10-5: Installation of the Final Blade at BIWF

10.4: Deployment Responsibility and Contractual Arrangements

Deepwater Wind will be responsible for the full development and construction of the Wind Farm and Delivery Facility. Deepwater Wind will design and build the Wind Farm and the Delivery Facility using a multiple primes approach. Under a multiple primes approach, implementation of the Project is divided into a limited number of discrete contracts that can each be executed with contractors that are experts in their respective fields.

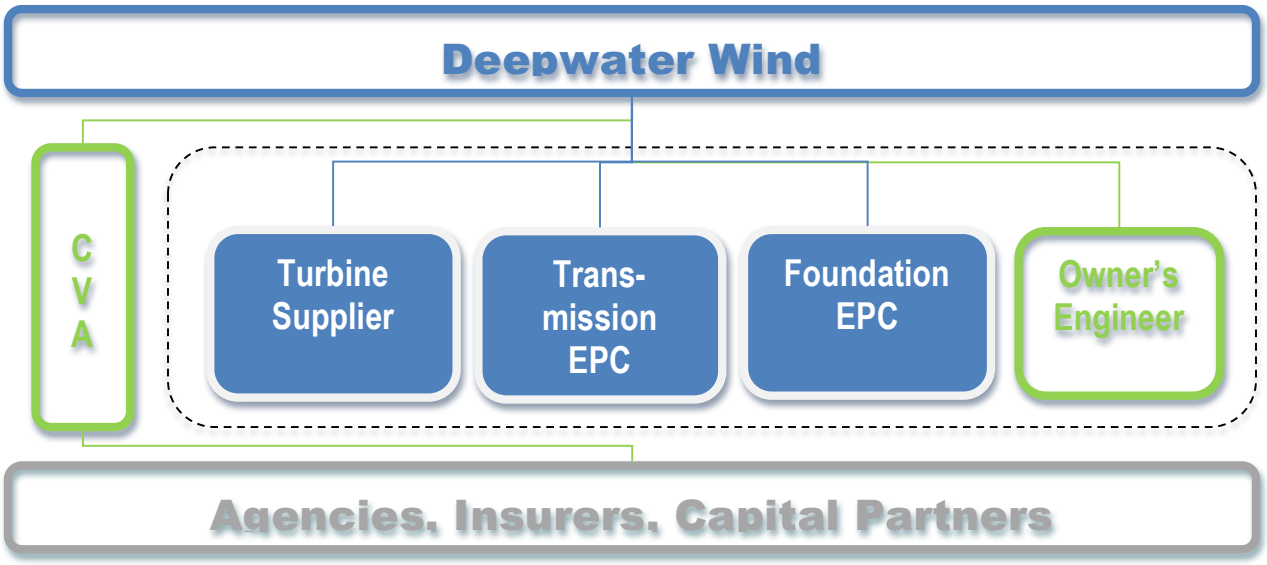


Figure 10-6: Multiple Primes Approach

Figure 10-6 above shows a representation of a multiple primes structure. Under this arrangement, Deepwater Wind will use an in-house project management team, led by Chris van Beek, Deepwater Wind's President, to ensure that the scopes of work for all contractors are integrated into a cohesive project engineering and construction plan. **Section 8** above describes the packages of work in more detail.

SECTION 11: OPERATION AND MAINTENANCE

11.0: Approach to Operations and Maintenance

When this Project achieves commercial operations in 2023, the Block Island Wind Farm, shown in **Figure 11-1**, will have been operating for seven years. Deepwater Wind's turbine vendor, GE, operates the Block Island Wind Farm from its Schenectady control room while GE's service organization is performing the maintenance of the turbines. After the usual initial ramp-up the availability and power production of the GE WTG's is fully in accordance with the specifications.

Figure 11-1: GE Wind Turbines Operating at Block Island

Deepwater Wind will build upon our experience operating and maintaining the Block Island Wind Farm to implement a similarly successful program for this Project. Deepwater Wind Operations and Maintenance Plan is attached as **Appendix 11-1**.

11.1: Operation and Maintenance Plan

11.1.1: Wind Farm

Deepwater Wind intends to enter into a Service and Maintenance Agreement with the turbine supplier for at least the first 15 years of the Wind Farm's life. Under that agreement, the turbine supplier will be responsible for planned and unplanned maintenance. That agreement will also require the turbine supplier to meet certain performance guarantees and be subject to financial penalties for underperformance by the equipment. At the end of the 15-year period, Deepwater Wind may elect to extend the service agreement or self-manage the turbine maintenance program.

In cooperation with the turbine supplier, Deepwater Wind will implement a preventative maintenance program based upon the performance guarantees established in the turbine agreements. This preventative maintenance program will be designed to achieve the guaranteed availability and maintain the levels of output assumed in Deepwater Wind's financial model. The specific schedule of preventative maintenance activities will depend upon the selection of vendors. A separate inspection and a preventative maintenance program for the foundation will also be implemented and has been budgeted for in the financial model.

Deepwater Wind will manage operations and maintenance from a Shore Operations Center to be located at the New Bedford Marine Commerce Terminal. The Shore Operations Center will house the Project's administrative support offices, the warehouse facility and maintenance shop for all offshore generating units, as well as a marine terminal for the Project's offshore support and logistics vessels. The Shore Operations Center will also house the dispatch and operational control center for each facility, which will use a SCADA system for control and data acquisition from each of the wind turbine generators.

Deepwater Wind will prepare a daily dispatch plan to maximize power production based on a wind resource forecast and equipment availability. Deepwater Wind staff will monitor actual performance of the offshore generators and compare those with predictive models; condition monitoring systems will continuously be assessing the mechanical and electrical health of the generators.

Deepwater Wind will develop a life cycle plan to execute planned maintenance and major maintenance overhauls.

The typical offshore maintenance work order will be executed by project technicians and, if necessary, by an outside specialty contractor. Deepwater Wind technicians will be competent in Deepwater Wind's operations and maintenance procedures (e.g. Health and Safety and Emergency Response) in order to conduct required work in a safe and effective manner.

The Project will include support vessels to transport maintenance personnel, contractors, tools and equipment from the shore base to the offshore tower work sites. Marine crane services will be contracted to support offshore major maintenance and heavy lifts, as necessary. Specialized contractors and vessels will be leased when needed to effect scheduled submarine inspection and repair work.

11.1.2: Delivery Facility

GridAmerica plans to engage a contractor with substantial experience and expertise in the maintenance and repair of submarine and terrestrial cables. As described in **Section 3.1**, manholes for underground cables will be inspected and tested within six months from in-service date followed by a second inspection and test within 24 months after that. Subsequently manholes would be inspected and tested every 36 months. Submarine cable terminals will be inspected as part of scheduled substation equipment inspections. The Shore Operations Center will house spare materials and provide a marine terminal for vessels. Key spare materials will be kept on hand in a local maintenance facility.

GridAmerica has well-established substation maintenance plan with certain standards and procedures for substations. These standards and procedures and the expertise of its employees will be utilized where value is added.

Each piece of equipment has its own maintenance procedure and will follow these standards and procedures which define the inspections required for substation equipment contain detailed descriptions of the safety-related requirements. These procedures and standards will fully align with NERC PRC-005 and NPCC Directory 8 for protection system maintenance requirement for Bulk Electric System (BES).

The software program Cascade is available for use as the substation asset maintenance management system. This off-the-shelf application was developed and is maintained by Digital Inspections, a KEMA company. It has the capability to track all substation equipment and their inspection and maintenance.

11.1.3: Storage Facility

A long term major maintenance schedule has been developed and is attached as [redacted] There are also support staff and management in Burlington, Massachusetts. The Maximo enterprise asset management system is used to schedule and track maintenance.

11.2: Site Control for Marine Terminal(s)

Deepwater Wind has committed to use the New Bedford Marine Commerce Terminal for its shore operations center.

Deepwater Wind does not currently have joint use of any Marine Terminals. If the Distribution Companies selected multiple awards in 83C, or awarded our Proposal in 83D and one of our competitor's proposals in 83C, given our commitment to base the O&M for Revolution Wind in New Bedford, MA, we would consider the joint use of a facility with another offshore wind developer.

11.3: O&M Funding Mechanism

11.3.1: Deepwater Wind

Deepwater Wind plans to enter into a long-term service and maintenance agreement with the turbine supplier to cover all planned and unplanned maintenance. For the Wind Turbines, Deepwater Wind assumes that the first fifteen years of operations and maintenance ("O&M") services will be provided by the turbine vendor on a $/MWH basis. Deepwater Wind is in discussions with prospective offshore wind turbine suppliers, regarding all the terms and conditions typical for a Turbine Supply Agreement, including the expected cost of their O&M service contract. All planned costs associated with operations and maintenance of the Project are

included in the Project's financial model and are reflected in the pricing set forth herein. Such pricing is not subject to further adjustment based on operations and maintenance costs.

11.3.2: GridAmerica
Upon exercise of the Option, NewCo, as the owner of the Delivery Facility will enter into a TSA with Deepwater Wind at a FERC-accepted rate. Such TSA will contain a transmission tariff that explicitly supports all operating and maintenance expenditures, both planned and unplanned, to be made by NewCo under the TSA.

11.3.3: FirstLight
O&M Funding for the project is provided by PSP through FirstLight Power Resources Management, LLC. FirstLight Power Resources Management, LLC is ultimately 100% owned by PSP (rated AAA), a Canadian federal Crown corporation.

11.4: Equipment Warranty Terms

Deepwater Wind will negotiate as part of the equipment supply agreement warranty terms typical for the supply of offshore wind turbines. These terms will include but not be limited to: guaranteed availability; liquidated damages; warranty term; and provision of O&M services during the warranty period.

Warranties would be required for transformers, shunt reactors and STATCOM devices against issues related to manufacturing defects for a period of one to five years. Warranties would be required for cables against issues related to manufacturing or installation defects for a period of five years.

11.5: Status of O&M Agreements

11.5.1: Deepwater Wind
Deepwater Wind is in discussions with prospective turbine vendors regarding all the terms and conditions typical for a Turbine Supply Agreement, including the expected cost of their O&M service contract. Deepwater Wind anticipates executing a service agreement upon the approval of a PPA and receipt of permits.

11.5.2 GridAmerica
If GridAmerica exercises its Option it will take assignment of any O&M agreements or contracts regarding the Delivery Facility that Deepwater Wind has entered into.

[redacted]

FirstLight supplies the on-site maintenance and operating personnel. Mechanical and electrical maintenance staff are represented by IBEW Local 455. Specialty O&M contractors are retained on an as- required basis.

11.6: O&M Experience

11.6.1: Deepwater Wind

Deepwater Wind is currently managing the operations and maintenance of the first offshore wind farm in America, the Block Island Wind Farm. In addition, Deepwater Wind's management and investors have extensive experience with onshore wind operations and maintenance, which they will supplement with the operations and maintenance expertise of the turbine supplier. Deepwater Wind will engage the turbine vendor to provide operations and maintenance for a period of fifteen years.

Deepwater Wind just completed its first year of operations at the Block Island wind farm without an injury incident. That includes over 45,000 work hours of higher risk activities such as crew transfers, turbine operations, and our annual maintenance program. This success demonstrates Deepwater Wind's ability to incorporate safety into our design, select quality contractors that take safety seriously, and to conduct our day-to-day operations in a safe manner.

11.6.2: GridAmerica

As a subsidiary of NGUSA, GridAmerica is able to draw on the full capabilities of its parent. National Grid plc is one of the world's largest investor-owned utilities focused on transmission and distribution activities through its subsidiaries in electricity and gas in both the UK and the U.S. NGUSA, through its subsidiaries, play a vital role in connecting millions of people to the energy they use, safely, reliably and efficiently. NGUSA, through its subsidiaries, engineers, designs, permits, constructs, owns and operates transmission facilities across upstate New York, Massachusetts, New Hampshire, Rhode Island and Vermont and owns and operates electricity distribution networks in upstate New York, Massachusetts and Rhode Island. Its network includes more than 8000 miles of transmission lines and nearly 1200 transmission and distribution substations.

National Grid's on-site U.S. staff has extensive expertise in the management, engineering, design, construction, operation and maintenance of high voltage underground transmission lines. Further, it has a network of line engineering and design firms, terrestrial and marine construction contractors, material suppliers and other external specialists with national reputations to assist it.

Some examples of existing underground and subsea transmission infrastructure near the proposed project site, for which the on-site U.S. staff currently provides O&M services are summarized below:

- **Bloomdale to Vernon Hill Transmission Line** –115kV underground cable system utilizing extruded cables installed in a concrete encased duct bank and manhole system in Worcester, Massachusetts.
- **Salem Cable** – Double circuit high capacity 115 kV underground cable installed in a concrete encased duct and manhole system, in the City of Salem, Massachusetts.
- **Block Island Submarine Cable** - Undersea transmission cable, approximately 20 miles in length, connecting the first off-shore wind farm in the US to Block Island, Rhode

Island, and connecting into the National Grid's transmission network in Narragansett, Rhode Island.

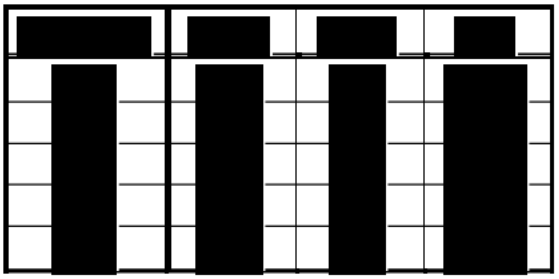
- **Nantucket Island Submarine Cables** – Two three-core undersea transmission cables supplying the island of Nantucket, Massachusetts from the transmission network in Cape Cod, Massachusetts. The length of each submarine cable is approximately 27 miles.

GridAmerica's parent company, NGUSA, through its subsidiaries, has years of experience with maintaining more than 800 substations across New England territory. Regional O&M team is currently maintaining more than 100 substation including distribution and transmission or bulk electric system substations.

11.6.3: FirstLight

FirstLight employees have been successfully operating and maintaining the Storage Facility for over a decade.

Historically, Northfield Mountain has been a very reliable facility. [redacted]



[redacted]

SECTION 12: PROJECT MANAGEMENT / EXPERIENCE

12.0: Overview of Experience

Deepwater Wind has unmatched experience in US offshore wind development through our Block Island Wind Farm project, which began commercial operations in December 2016. Deepwater has gained invaluable experience from working with regulators, stakeholders, vendors, and U.S. construction contractors through the BIWF project.

Deepwater Wind has also become the go-to partner for states up and down the eastern seaboard as they seek to develop their offshore wind resources. In addition to successfully constructing the first offshore wind farm for Rhode Island, Deepwater Wind has also been awarded contracts to develop what will be the first offshore wind farms serving New York and Maryland.

12.1: Organizational Chart

The Company is a wholly-owned direct subsidiary of Deepwater Wind Holdings, LLC, a Delaware limited liability company formed in 2007 ("DWW Holdings"). DWW Holdings, through subsidiaries, is the owner of the Block Island Wind Farm, the South Fork Wind Farm, the Skipjack Wind Farm and BOEM Leases OCS-A 486 and OCS-A 487. Additionally, the Company is a 50% owner of Garden State Offshore Energy, which owns BOEM Lease OCS-A 0482 off the coast of Delaware. As is consistent with industry practice, a wholly-owned indirect subsidiary of DWW Holdings (and an affiliate of the Company) will be the Project company, and a party to the permits and PPA.

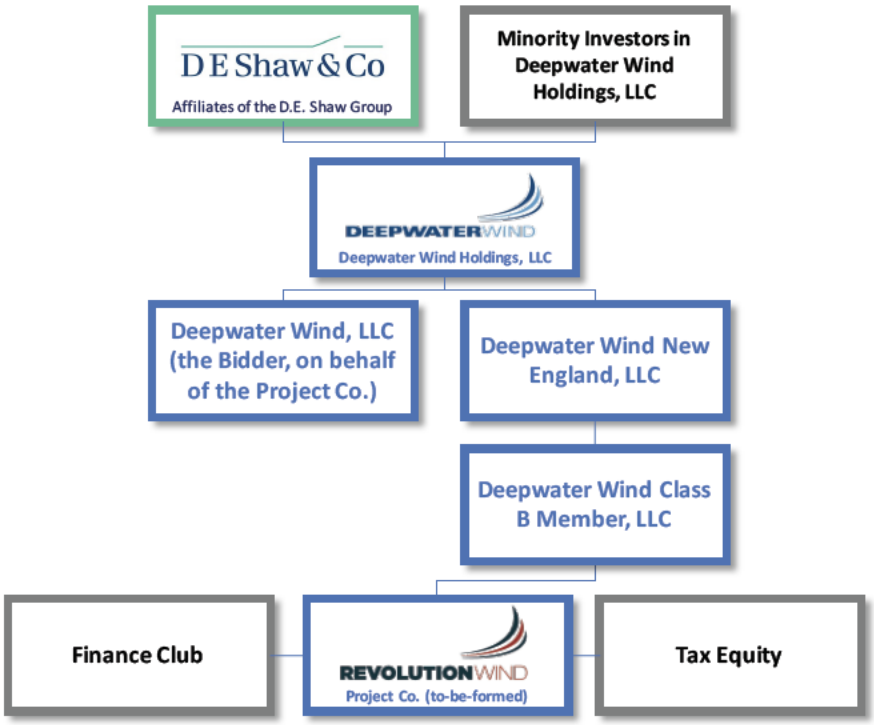


Figure 12-1: Organization Chart

An indicative organizational chart, showing Company ownership and project debt and tax equity is shown depicted below as **Figure 12-1** and attached as **Appendix 12-1**.

12.2: Experience of Project Participants

In addition to Deepwater Wind's professional staff, over the course of the development, construction and now operation of the Block Island Wind Farm, Deepwater Wind has built a highly qualified team of consultants, engineers, suppliers and contractors. Deepwater Wind intends to use many of the same contractors for the development, permitting, engineering and construction of this Project. Please see the balance of this **Section 15** below for a more detailed description of Deepwater Wind's experience.

National Grid and its affiliates have extensive experience owning and operating transmission assets in the UK and the US, specifically in New England. Please see **Section 11.6.2** for specific submarine cable operating experience in New England.

Deepwater Wind's management team is leading the design and development of the Project and has engaged leading consultants to support specific aspects of the Project's design and development, including:

- **Site Selection and Permitting.** Deepwater Wind engaged Stantec to prepare a Critical Issues Analysis to support the siting and development of this Project.
- **Array Design.** Deepwater Wind engaged AWS Truepower to optimize the WTG array for the Wind Farm and produce an energy production estimate. The energy production estimate is based on a comprehensive wind resource assessment, including over one year of data that approximates in-situ measurements.
- **Foundation Design.** Deepwater Wind engaged Keystone engineering (New Orleans, LA) to develop a preliminary steel jacket foundation design to effectively support the Wind Turbine in the environmental load conditions expected at the Project site.

Transmission Design. Deepwater Wind engaged Mott MacDonald to provide a preliminary front end engineering design of the transmission system.

Northfield Mountain is an existing pumped storage hydroelectric facility that has been in operation since 1972, so this is not applicable.

12.3: Management Chart

Deepwater Wind's execution team has an average of more than 20 years of relevant experience including significant experience in the development, engineering, meteorology, permitting, construction, finance, operations, maintenance and management of energy projects. Company is led by a veteran management team with extensive experience in developing renewable projects around the globe. Deepwater Wind's management team's resumes are attached as **Appendix 5-1**. A project management organizational chart for the execution of the Project is shown in **Figure 12-3** below and attached as **Appendix 12-2.** GridAmerica's key functional roles

supporting the Project are also shown in **Figure 12-3**, below. Resumes for GridAmerica's Project personnel are provided as **Appendix 12-3**.

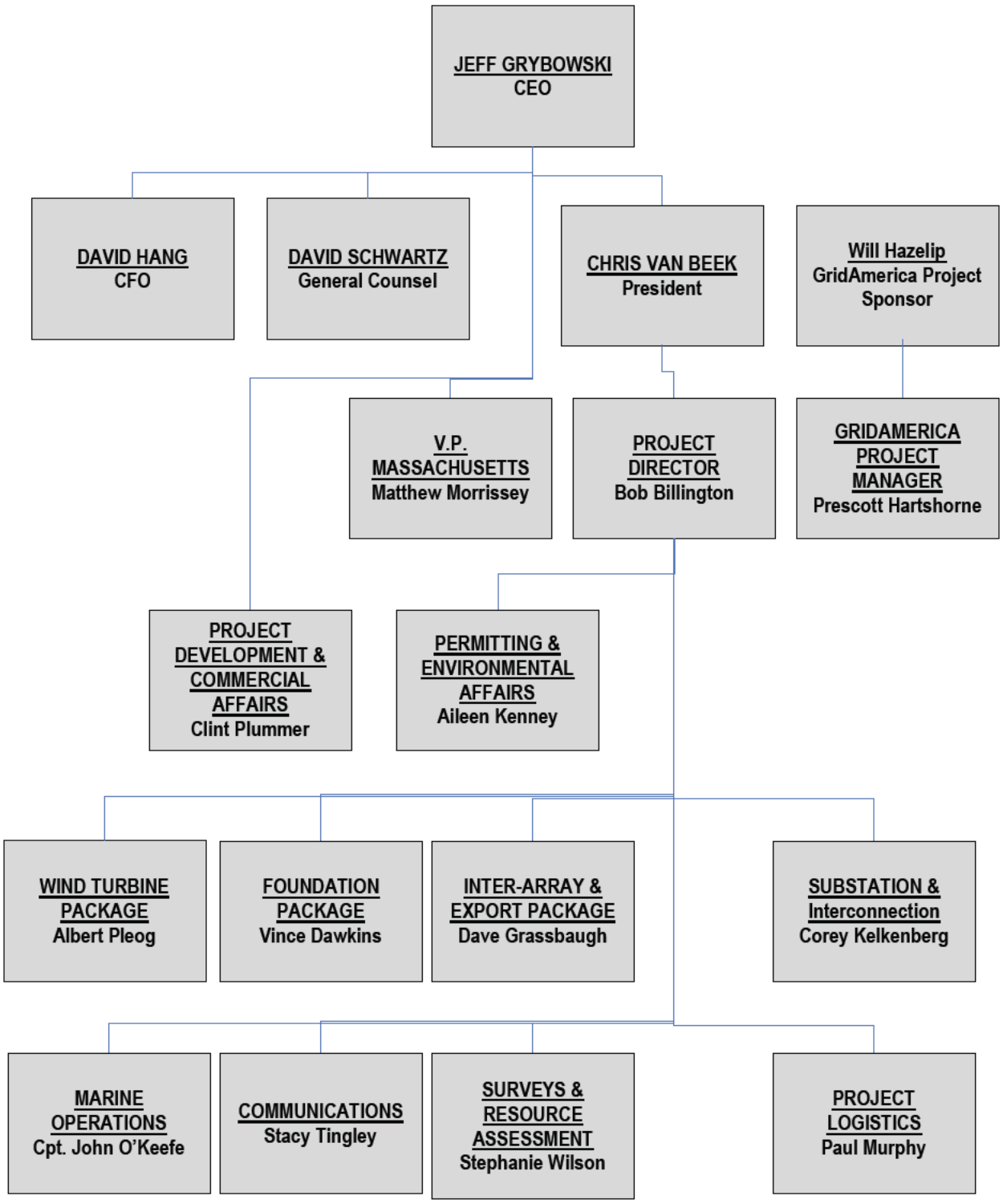


Figure 12-3 Project Management Organizational Chart

12.4: Prior Project Experience

The Company's management and Board have also developed and constructed a number of large and complex energy and infrastructure projects including those summarized in **Table 5-1** and in **Appendix 5-1**. The Company will draw on this experience, as well as Deepwater Wind's experience from the development of the BIWF project and its portfolio of solar projects to develop the Project.

12.4.1: Company Experience: Offshore Wind

Deepwater Wind has been investing significantly in the development of offshore wind projects in the northeast and mid-Atlantic since 2005. The Company has gained unmatched experience in the development of offshore wind through our 30 MW BIWF project, which is the first offshore wind farm constructed in America. The BIWF project has been in commercial operations since December 2016. Deepwater Wind managed all aspects of the development, permitting, engineering, procurement, financing of, and contracting for, the BIWF project, a process that began in 2008. Financing for BIWF was successfully closed in February 2015, making it the first offshore wind farm to be successfully financed in the United States. The $300 million financing was supported by leading global equity and debt investors.

In July 2013, Deepwater Wind won the Department of the Interior's first competitive lease sale for offshore wind energy areas to acquire BOEM Leases OCS-A 486 and OCS-A 487. Deepwater Wind has been actively developing this site and is on schedule to commence major offshore surveys in the summer of 2017 to support engineering permit applications. While these leases can accommodate the development of approximately 2,000 MW of offshore wind, Deepwater Wind plans to subdivide the leases to support the development of multiple projects in the range of 100 MW to 400 MW. The first of these projects will be the South Fork Wind Farm, a 90MW offshore wind farm designed specifically to serve Long Island's constrained South Fork. In July 2014, LIPA publicly announced its intent to select the South Fork Wind Farm as the winner of a competitive solicitation.

12.4.2: Block Island Wind Farm

In July 2015, Deepwater Wind installed the first foundation for the first offshore wind farm in America. In August 2016, Deepwater Wind installed the first offshore wind turbine in the United States. This 30 MW project began commercial operations this December and will generate enough power for 17,000 homes.

In connection with the BIWF project, Deepwater also developed a transmission system – the Block Island Transmission System – connecting Block Island to the mainland electric grid for the first time. BITS is the first offshore renewable energy transmission system in the United States, a 22-mile submarine cable system linking two new onshore substations, allowing the export of offshore wind energy to the mainland electric grid. The BIWF project and the BITS project are shown in **Figure 12-5**. Together, these two projects will provide the equivalent of firm power to the Block Island Power Company, enabling it to retire its existing diesel-fired generating station when the BIWF project commences commercial operations.

Deepwater Wind began developing the BIWF and BITS projects in 2008 and has managed all aspects of their development. Deepwater Wind conducted extensive pre-survey coordination with Bureau of Ocean Energy Management (BOEM), U.S. Army Corps of Engineers (USACE), National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS), the U.S. Fish and Wildlife Service (USFWS), and the RI Coastal Resource Management Council (CRMC). The BIWF project required permits or consultation with over 20 federal, state, and local authorities.

Deepwater Wind engaged key stakeholders early in the process and established constructive relationships with the Wampanoag Tribe of Gay Head (Aquinnah), the Narragansett Indian Tribe of Rhode Island, the commercial and recreational fishing community, and both regional and national environmental non-governmental advocates for marine mammal protection and ocean conservation.

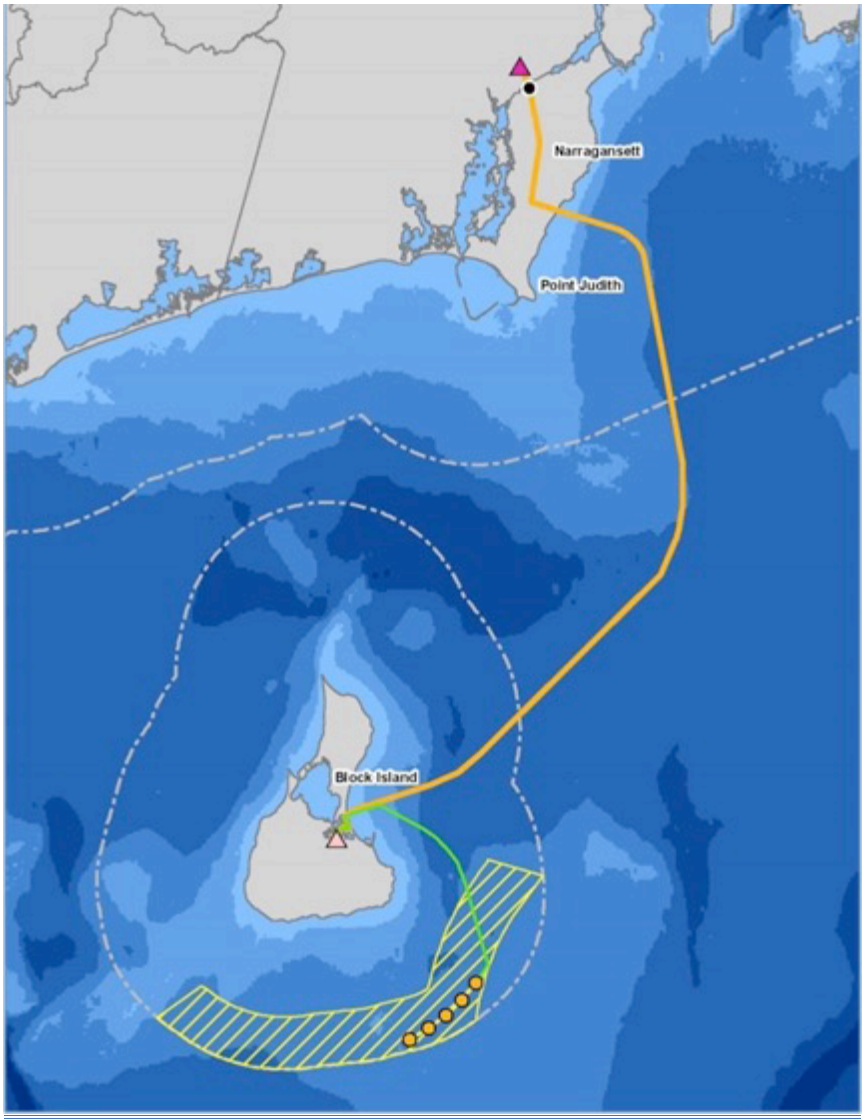


Figure 12-5: the BIWF project (Green) and BITS (Orange)

Through the development of the BIWF project, Deepwater has gained a unique set of skills, relationships and data that have informed the design, development schedule, technology choices, construction methodologies, financing strategy, operational procedures and cost estimates for the Project, including:

- a hands-on approach to stakeholder engagement that begins early in the project development process. Deepwater generated widespread support and positive media attention through a concerted community outreach plan.

- expertise in gathering and evaluating information related to wind and wave conditions; sea bottom type; alternative uses such as commercial fishing; environmental considerations such as avian, bat, marine mammal and sea turtle transit and foraging patterns; relationships with local vendors, including vessel captains, diving contractors, environmental scientists, engineers, consultants and many others who have supported the development of the BIWF project

- detailed understanding of the latest market developments, trends and costs in the development, site assessment, permitting, construction, operations & maintenance of major offshore wind farms.

- relationships with key technology and equipment providers, such as General Electric, Siemens, Vestas, ABB, Fred.Olsen, Gulf Island Fabrication, EEW, LS Cable, Keystone Engineering, Mott MacDonald and many others

- strong relationships with global financial institutions involved in the renewable energy industry, including those in the offshore wind sector. The Block Island Wind Farm has been very strongly received in the financial markets, and Deepwater Wind is highly confident in our ability to finance the Revolution Project

12.4.3: South Fork Wind Farm

Deepwater Wind is currently actively developing the South Fork Wind Farm – a 90 MW offshore wind farm to be the first phase of development in the BOEM Leases OCS-A 486 and OCS-A 487 the Company acquired in 2013. The project is designed to interconnect with and deliver energy to a constrained part of the Long Island Power Authority's grid in the South Fork – an area commonly known as "The Hamptons".

Deepwater Wind proposed the South Fork Wind Farm in response to a solicitation seeking new sources of energy and capacity that was specific to the South Fork. This was not a renewables solicitation. In July 2016 LIPA publicly announced its intention to select the South Fork Wind Farm project as the winner of this solicitation based on the project's cost-effectiveness and lack of controversy relative other options. As with BIWF, Deepwater Wind has implemented a comprehensive stakeholder and community engagement program for the South Fork Wind Farm project that has yielded in high levels of community support.

12.4.4: Skipjack Wind Farm

Deepwater is also developing the Skipjack Wind Farm – a new 120 MW offshore wind farm to be located more than 19 miles off the coast of Maryland and interconnecting with the existing Delmarva Power 138 kV transmission system in Ocean City, Maryland.

The Skipjack Wind Farm will be located in the offshore wind energy area designated by the Department of Interior as OCS-A 0482. Based on the many years of development work already completed at this site, the Skipjack Project can be implemented as soon as, if not sooner than, any other utility-scale offshore wind farm in the region, and without controversy due to its location over the horizon. Following receipt of a fully-approved, un-appealable order from the Maryland Public Service Commission ("MD PSC") in May, 2017, the Skipjack Wind Farm will be in-service by the end of 2022.

12.5: Project Team

In addition to the significant experience of the Deepwater Wind team, as the development of the Project progresses, Deepwater Wind will engage third party consultants to provide additional expertise. In the past Deepwater Wind has worked with, or is considering, such firms as:

Construction Period Lender: Societe Generale, HSBC, SMBC, La Caixa, KeyBank, CoBank, Citigroup[24]

Operating Period Lender: Societe Generale, HSBC, SMBC, La Caixa, KeyBank, CoBank[25]

Tax Equity Provider: Citigroup, GE Energy Financial Services[26]

Financial Advisor: None

Insurers: Swiss Reinsurance Company Ltd., AXIS Insurance[27]

Environmental Consultant(s): VHB GZA GeoEnvironmental, Inc.;, Stantec,

Owner's Engineer: Keystone Engineering

EPC Contractors: DEME, Boskalis or Gulf Island Fabrication for foundations. LS Cable, VBMS, Prysmian or DEME for transmission. Fred Olsen Windcarrier for turbine installation vessel.

Transmission Consultants: Siemens PTI; Mott MacDonald.

Legal Counsel: Van Ness Feldman; and others.

[24] Indicative list based on the Block Island Wind Farm financing.

[25] Indicative list based on the Block Island Wind Farm financing.

[26] Indicative list based on the Block Island Wind Tax Equity.

[27] Indicative list based on the Block Island Wind Farm insurance syndicate.

CVA: To be determined in accordance with BOEM regulations.

Remote Operations: Duke Energy

See the vendor letters of support attached as **Appendix 12-4**.

12.6: ISO-NE Experience

12.6.1: Deepwater Wind

If Deepwater Wind does not self-designate and act as the Lead Market Participant, it will designate a highly experienced Lead Market Participant during the asset registration process consistent with the tariff.

12.6.2: GridAmerica

NGUSA, collectively with its subsidiaries, is a very experienced utility and transmission owner in the Northeast. GridAmerica is a New England Power Pool (NEPOOL) participant in the transmission sector. Please see **Section 11.6.2** for detail regarding recent experience of GridAmerica with ISO-NE transmission projects.

12.6.3: FirstLight

FirstLight has been participating in the ISO-NE since ISO-NE's inception in 1997. FirstLight Power Resources Management, LLC is the existing lead market participant with the ISO-NE and will continue to be under this proposal.

SECTION 13: EMISSIONS

13.1: Emissions Estimates

As a wind energy facility, the Project will have no emissions associated with power production.

Table 13-1: Projected Anticipated Emissions from Power Production

Source of Information	Date of test (If Applicable)	Greenhouse Gases (all except methane) Expressed as Carbon Dioxide	Nitrogen Oxides (NOx)	Sulfur Oxides (SOx)	Carbon Monoxide (CO)	Particulate Matter ($PM_{2.6}$)	Methane (CH_4)
Wind energy production is emission free.	NA	0	0	0	0	0	0

For FirstLight emission details, please see the Energyzt Report attached as **Appendix 2-6.**

13.2: Emission Reduction Investments

Not applicable.

13.3: Contribution to Massachusetts Climate Goals

[redacted]

SECTION 14: EMPLOYMENT, ECONOMIC DEVELOPMENT AND OTHER BENEFITS

14.0: Approach to Economic Development

Deepwater Wind plans to sequentially develop multiple offshore wind farms in the RI-MA WEA. This approach will cultivate the most robust and enduring economic development regime because it allows us to invest in the regional supply chain to grow companies and resources that can be used repeatedly across multiple projects, over several years.

[redacted]

Deepwater Wind is committed to supporting and growing the regional offshore wind supply chain in the northeast, including particularly in Massachusetts. For with the Revolution Wind Project, we plan to make the following investments in the Commonwealth:

- *New Bedford Development Office* – Deepwater Wind was the first offshore wind developer to open and staff an office in New Bedford and we plan to use it as the regional headquarters for developing the Revolution Wind Project and our future projects serving Massachusetts. [redacted]
- *New Bedford Marine Commerce Terminal* – The Revolution Wind Farm will commit to be first offshore wind project to use the New Bedford Marine Commerce Terminal (NBMCT).
- *Shore Operations Center* – Deepwater Wind will commit to locating our operations and maintenance center for the Revolution Wind Farm in New Bedford, which is expected to create between [redacted]

In addition, Deepwater Wind has development critical partnerships with Higher Educational Institutions to improve Ocean research and workforce development. These include:

- *University of Massachusetts, Marine Fisheries Institute, the Blue Economy Initiative-* Deepwater Wind has committed to [redacted] in seed funding to create a new intuitive at UMass to create an ongoing research portfolio aimed at studying issues that affect the existing commercial fishing industry and the emerging offshore wind in [redacted]

    - Coordinating the development of offshore wind resources with other commercial offshore uses, particularly the fishing industry.
    - Developing cooperative research opportunities where existing industries may help with data collection and supporting services for the offshore wind industry
    - Engineering, siting, construction, and logistics for offshore wind power generation

- Technological innovations to reduce costs and improve efficiencies of offshore wind
- Wind resource assessment and energy production forecasting
- Integrating intermittent renewable energy sources with utility grids
- Addressing ocean monitoring and environmental compliance requirements
- Developing cooperative research opportunities where existing industries may help with data collection and supporting services for the offshore wind industry
- Identifying and funding research opportunities that benefit the commercial fishing and the offshore wind industry

Public praise for creating the UMass Blue Economy Initiative:

"This is an important example of industry-academic collaboration that advances a mutual interest in understanding the intersection of ocean-based industries and advanced technologies," said **UMass President Marty Meehan**. "It also further strengthens the university's position, and that of the UMass Dartmouth's School of Marine Science in particular, as a national center of excellence in research of ocean industries."

"Our world-class UMass Dartmouth scientists, in collaboration with their colleagues across the UMass system, will contribute unparalleled expertise and credibility as the Commonwealth becomes the hub of offshore wind while protecting our priceless fisheries," said **UMass Dartmouth Chancellor Robert E. Johnson**. "This agreement with Deepwater Wind is an example of how the university and industry can partner to strengthen our blue economy while protecting our environment."

"This agreement recognizes the unique expertise of the School for Marine Science and Technology (SMAST) faculty in the areas of marine habitats, fisheries, ocean observation and modelling, as well as other fields that are critical to every stage of offshore wind development," said **SMAST Dean Steven Lohrenz**. "Meanwhile, our sister campuses stand ready to contribute their expertise in turbine design, blade materials, and other technology innovation areas. Deepwater Wind is to be commended for shaping and funding this initiative in a way that brings the best science, as well as diverse stakeholder perspectives, to the table."

"We appreciate Deepwater Wind's willingness to invest in science, and its confidence in our ability to develop a research framework that will help commercial fishing, offshore wind, and other coastal industries co-exist to form a vibrant blue economy," said **Dr. Kevin Stokesbury**, a professor at the UMass Dartmouth School for Marine Science and Technology and Research Director for the Massachusetts Fisheries Institute.

"As New Bedford continues to position itself as a center for the offshore wind industry, it will be critical to strengthen our capacity to perform basic and applied research needed by the industry," said **New Bedford Mayor Jon Mitchell**. "Deepwater Wind's investment in SMAST reflects the company's incisive recognition of this need and its commitment to the city."

"The relationship between the emerging offshore wind industry and commercial fishing in New Bedford is vital towards ensuring significant local job creation and economic development for years to come," said **Senator Mark Montigny** (D-New Bedford), who authored key offshore

wind amendments to the 2016 omnibus renewable energy legislation. "Dynamic public-private partnerships between key stakeholders like SMAST and Deepwater Wind are critical to advancing these initiatives, and the excellent caliber of researchers at UMass Dartmouth will serve this endeavor well."

"UMass Dartmouth and SMAST have led the way, fostering critical relationships with industry leaders in the fields most important to our region," said **Representative Antonio F. D. Cabral** (D-New Bedford). "Deepwater Wind's investment taps into SMAST's substantial research capacity and unites the commercial fishing and offshore wind industries in a novel way. New Bedford is bound for success."

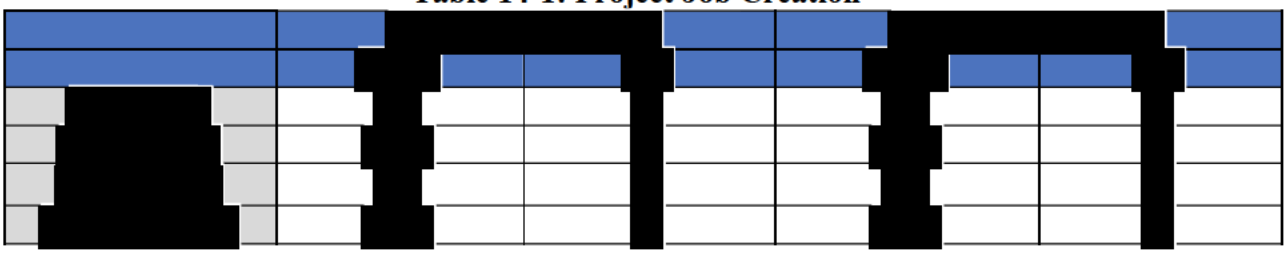
Beyond these significant commitments to Massachusetts, Deepwater Wind has not yet made other economic development commitments for the Project. We expect other jobs to be created in the region, and many could also be performed in Massachusetts.

By accepting this Proposal, the Commonwealth will not only benefit from Deepwater Wind's strategy of creating a robust and enduring regional supply chain, but it will also contribute to the virtuous cycle of making that shared supply chain stronger, contributing to growing job creation and economic development over time.

14.1: Direct Job Creation

Depending upon the offer selected, Revolution Wind Farm is expected to create a significant number of direct regional jobs during construction and operations according to a report by the Brattle Group's analysis, summarized in [redacted]

Table 14-1: Project Job Creation



Many of these jobs will be in the Commonwealth. For example, the marshaling and assembly of the wind turbines at the NBMCT will create logistics and port operations jobs, onshore and offshore construction and installation jobs and operations and maintenance jobs. Steelworkers, pipefitters, carpenters, welders, laborers, electricians and many other skilled trades will all work on the Project.

Although Northfield Mountain is an existing facility, it is providing Massachusetts jobs. Jobs during the operating period include the site staff consisting of 15 maintenance department personnel, 15 operations department personnel and eight support personnel on-site. There are also support staff and management in Burlington, Massachusetts.

14.2: Indirect Jobs Created

Depending upon the Offer selected, the Brattle Group estimates that the Revolution Wind Project will create a significant number of indirect and induced regional jobs during construction and operations, as summarized in [redacted] This report includes a detailed description of the top sectors of the economy that are expected to be affected by the development and construction of the Project, which include:

- Construction
- Environmental and other technical consulting services
- Fabricated structural metal manufacturing
- Architectural, engineering and related services

14.3: Other Economic Development Benefits

Deepwater Wind previously executed binding agreements to use local labor for the construction of the Block Island Wind Farm and worked collaboratively with regional construction and building trades. For the portions of this Project that will be constructed in Massachusetts, Deepwater Wind plans to negotiate similar agreements with organized labor to support construction of the Project.

In connection with our lease of the NBMCT, Deepwater Wind will also commit to entering into a temporary Host Community Agreement with the City of New Bedford to provide the funds for the New Bedford Wind Energy Center.

Additionally, Deepwater Wind will be a significant local taxpayer in the municipality in which the Project's Delivery Facility comes ashore and interconnects with the ISO-NE transmission system. Our design basis is for this to be in Somerset, MA, provided that interconnection rights, real estate rights and permits can be obtained for the same.

14.4 Measurement and Reporting

14.4.1: Measurement Methodology

Prime Contractors will be required to document dollar expenditures and job creation within the Commonwealth, and to make good faith efforts to meet Deepwater Wind's economic development goals based on both investments and jobs created.

Deepwater Wind will ensure that its Prime Contractors maintain detailed records, subject to audit by Deepwater Wind and the DOER, and provide periodic reports on the same.

Deepwater Wind's Project Director will regularly confer with officials at the MA DOER.

14.4.2: Reporting Responsibilities

During the development and construction phases, Deepwater Wind and each of its Prime Contractors will prepare semi-annual reports covering each aspect of their respective goals.

Following the commencement of Commercial Operations, Deepwater Wind and its Prime Contractors will provide annual compliance reporting to the DOER.

In addition to its planned reporting, Deepwater Wind will participate in any annual public conference held by the DOER to review its Prime Contractor's annual report, and will require that its Prime Contractor do the same. Deepwater Wind will take action in response to any recommendations proposed by the DOER's resulting reports.

14.5 Project Viability and Commercially Reasonable Timeline

Deepwater Wind's proposed Critical Path Schedule provided in **Section 9.1** is commercially reasonable because

- [redacted]
- We've taken a conservative, sequential approach to project development
  - Site de-conflicted based on years of vetting
  - Thorough permit applications allowing time for year of survey and data collection before permit submission
  - Generous allocation of time for agency review
  - Execute contracts conditioned upon financial close

it follows the same process and schedule of our Block Island Wind Farm, which is similar to the Project in the following ways:

14.6: Benefits to Low-Income Ratepayers

Deepwater Wind's entire proposal is predicated on an approach to development that minimizes costs to all ratepayers over the full 1,600 MW commitment established in the Enabling Legislation. [redacted] will minimize the cost to all ratepayers. This will be especially impactful to the least fortunate among us.

In addition to reducing costs to ratepayers through our proposed approach to development, the Revolution Wind Project will yield considerable benefits to Massachusetts electric and gas systems, both technically and economically, which will further benefit all ratepayers.

- *Electric Market Price Suppression*: The Project will inject a significant quantity of near-zero
  marginal cost generation into the southern New England transmission system, effectively displacing higher-marginal cost generation and lowering the electricity market clearing price. The Brattle Group details their analysis in [redacted]
- *Gas Displacement*: The Proposal will alleviate constraints in the southern New England natural gas system by reducing gas consumption for power generation, especially during

the winter months when the gas system is most constrained and when the Wind Plant is at its highest level of output.

Massachusetts Maritime Academy:

Deepwater Wind and the Massachusetts Maritime Academy have partnered on a new maritime scholars' program to help Massachusetts high school students prepare for careers in the growing offshore wind industry. Please see [redacted]

The Deepwater Wind Maritime Scholars Program will give up to 20 high school students per year– particularly those who may be economically disadvantaged – an opportunity to explore experiential learning at Massachusetts Maritime Academy during their junior and senior years.

The two-year program will include dual-enrollment during the students' junior years; two summer Sea, Science and Leadership training programs; and potential sailing aboard the *Ernestina*, the Commonwealth's only sailing schooner, among other campus activities.

Students who successfully complete the two-year program and achieve a 2.5 GPA or greater along with at least an 1100 SAT score will receive automatic admission to Mass Maritime and have the entirety of their remaining financial need covered.

The program is supported by funding from Deepwater Wind of $1 million over four years.

The Scholars Program will begin with students from the New Bedford Regional Technical High School and New Bedford High School, and is expected to expand to other Massachusetts gateway cities, such as Lowell and Fall River.

"While offshore wind is poised to provide our region with a clean, renewable source of energy, it is imperative that this emerging industry invest locally in New Bedford to create jobs and economic opportunity for young people who may struggle with the extraordinarily high costs of education," said **Assistant Senate Majority Leader Mark Montigny (D-New Bedford).** "The Maritime Scholars Program proposed by Deepwater Wind and Mass Maritime presents an innovative and exciting opportunity for New Bedford kids to earn a pathway into this exciting career track."

SECTION 15: TRANSMISSION PROJECT

15.1: Project Information

15.1.1: Project Description

[redacted]

Project-Specific Delivery Facility. The route for the Gen-Tie configuration is depicted in [redacted] which shows the extent of the total [redacted] One-lines are provided as [redacted] This configuration interconnects at the generation side of the breaker on the low side of the transformer at one or more offshore substation(s). This substation will be installed on a Deepwater Wind owned collector substation within the Deepwater Wind lease area. This substation will step up voltage from 34.5 kV to 230 kV, and will also provide reactive compensation.

The Gen-Tie will use a [redacted] The Project has conducted a Reconnaissance Geophysical Survey, attached at [redacted] which describes the feasibility of jet plow burial along the majority of [redacted] The Project has established offshore cable burial routes that balance the highest degree of installation feasibility, operating safety and lowest cost.

The Reconnaissance Geophysical Survey identified that installation through the northern reaches of the [redacted]

[redacted]

[redacted]

The route described above, from the Deepwater lease, [redacted]

Expandable Delivery Facility. Routes for the Expandable configurations are also depicted in [redacted] and one-lines are provided as [redacted] These configurations are designed such that an initial build-out of the Conforming Offers can be expanded up to 1600 MW to provide nondiscriminatory open access transmission service in accordance with Section 2.2.1.3.2 of the RFP. As described more specifically in Section 15.1.5, below, each of the Conforming Offer configurations will provide the following facilities to accommodate future expansion at reduced cost. Th [redacted] epending on the configuration selected, the cables will be connected to one or two 800 MW offshore switching stations that can accommodate additional capacity from other generators either initially or in the future. These switching stations are nominally located in the Deepwater Wind lease area for purposes of this proposal. This configuration assumes that cable voltage will be transformed [redacted]

15.1.2: Operating Voltage

[redacted]

[redacted]

[redacted]

15.1.3: Structures

In the offshore environment, the Delivery Facility cable will be buried beneath the sea floor. In the onshore environment, it will be buried in a concrete-encased duct bank. Termination structures will be installed at the new substations.

J-tubes will be installed on the collector platform to facilitate pulling the submarine cables. Cable racking structures will also be installed on the collector platform.

15.1.4: Line Length and Land Ownership

[redacted]

In the offshore environment, submerged lands away from shore are owned by the Federal Government of the United States Nearer to shore they are owned by the State of Rhode Island or the Commonwealth of Massachusetts. Existing public processes allow an applicant to apply for a Right of Way grant in each of these jurisdictions. In connection with the BIWF project, Deepwater Wind has previously obtained similar rights in waters of the Federal Government and the State of Rhode Island.

In the onshore environment, the land on which the proposed [redacted]

The cable route will be composed of the following sections:

- [redacted]
- [redacted]

- [redacted]

15.1.5: Substations and Other Facilities

The Delivery Facility will connect the Wind Farm to ISO-NE bulk transmission systems and consists of the following five component facilities:

- An *Offshore Substation (or switching station(s), in Expandable configurations)*, with 34.5 kV cables to an AC transformer connecting the Wind Farm's collection facilities to the submarine transmission cable. This substation (or switching station(s)) will be located on a separate offshore foundation(s) proximate to both the RI-MA WEA and the MA WEA;
- *Submarine AC Transmission Cable(s)*, buried beneath the sea floor as possible, running from the offshore substation to the terrestrial AC cables and from the terrestrial AC cables to the final landfall location;
- *Buried Terrestrial AC Cable(s)*, which are buried beneath roads and connect the two submarine cables sections; and
- An *Upland Project Substation*, [redacted]
- Certain *Interconnection / Developer Attachment Facilities*, connecting the Delivery [redacted] The final configuration of these interconnection facilities will be developed as part of the ISO-NE interconnection process and will include all the equipment necessary to safely connect the Project with the ISO-NE bulk transmission system.

[redacted]

[redacted]

[redacted]

[redacted]

Shared Facilities:

Deepwater Wind's unique approach to the Expandable Transmission is focused on creating a cost-effective model by procuring the necessary real estate and development rights, engineering the Delivery Facility route to accommodate multiple transmission lines, and otherwise minimizing future work associated with the Expandable Transmission. The shared facilities associated with this approach will be available on a non-discriminatory basis.

We believe the future flexibility this approach provides both Deepwater Wind and other developers outweighs the costs and therefor have included any incremental cost in both our Generator Lead Line Proposals and our Expandable Transmission Proposals.

[redacted]

15.1.6: Estimated Costs and Recovery Methodology

GridAmerica supported Deepwater Wind on the transmission portion of the proposal to allow Deepwater Wind to develop a cost estimate.

For the onshore and offshore substation scope, GridAmerica developed the engineering to enable key vendors to submit price estimates. Several vendors considered specific topographical and geographical constraints in preparing their pricing.

For the cable, GridAmerica's transmission engineers supported Deepwater Wind in developing an engineering plan, and cost estimate. GridAmerica consulted in-house estimating specialists and checked against multiple bids from offshore cable vendors as part of its support efforts.

For the collector station equipment, GridAmerica's transmission engineers developed an initial engineering plan in support of this proposal. Costs were estimated by a combination of in-house specialists and an external vendor.

In addition to the core elements of the scope for the Delivery Facility, other capex costs have been included to cover other project costs, including project management, site acquisition and permitting.

GridAmerica has completed its own interconnection Feasibility Review

15.1.7: Development Schedule
The Delivery Facility will be developed in phases, based on subscriptions of transmission capacity. The proposed Revolution Wind Farm will be the first subscriber and the first phase of the Delivery Facility will be developed together with the Revolution Wind Farm, in accordance with the schedule provided [redacted]

15.1.8: Abandonment Costs
To eliminate ratepayer exposure to abandonment cost risk, Deepwater Wind will not seek abandonment cost recovery. The bundled price proposed by Deepwater Wind includes all transmission costs for use of the Delivery Facility. In addition, because the Distribution Companies will not be transmission customers, there is no mechanism by which Deepwater Wind or GridAmerica could seek abandoned cost recovery. This aspect of the Project is a clear advantage and benefit compared to cost of service transmission project proposals that may include recovery of abandonment costs, even when such recovery is subject to cost caps.

15.2: Proposed Payment

The bundled price proposed by Deepwater Wind includes all transmission costs, including costs for the Delivery Facility as well as all interconnection and transmission upgrade costs required to interconnect at the Capacity Capability Interconnection Standard and to ensure full delivery of the proposed Offshore Wind Energy Generation profile, including transmission upgrades that may need to occur beyond the point of interconnection. Other than this price, the Buyers will pay nothing for transmission service over the Delivery Facility. Therefore, RFP requirements concerning Distribution Company responsibility for transmission payments are not applicable to this bid.

Specifically:

- Significant cost containment is provided by including all transmission costs within the bundled rate proposed by Deepwater Wind.
- There are no situations that may change the proposed transmission payments by consumers during the contract term because the Distribution Companies do not make transmission payments under this proposal.
- The offshore wind farms taking transmission service over the Delivery Facility will need to pay the FERC-accepted rate for service over the line. Therefore, post-contract term rates are subject to FERC review. Section 17 provides detail on the proposed transmission tariff.
- Given that each of the Conforming Offers is provided at a fixed price, transmission payments will not change during the contract term from the Distribution Companies' perspective.

Transmission losses will be mitigated through installation of Shunt reactors both at the offshore collector substation on the 230kV side of the Generator step up transformer and at the 230kV side of the 230/345KV transformer at the new 230/345kV AIS [redacted] The Load Tap Changing facility for changing the shunt reactor positions will help to coordinate to minimize the losses and maximize the active power transfer across the submarine

cable.

15.3: Payment Schedule

NewCo, as the owner of the Delivery Facility, will receive monthly payments in accordance with the FERC-accepted rate for the 25-year term of the TSA.

15.4: Design Life of Transmission Project

Cable:

The typical design life of an HVAC extruded land and submarine cable system is 40 years.

Substation:

The substation equipment to be used for this project has a design life of at least 40 years. Transformers and shunt reactors have a typical life of 40-50 years. History has demonstrated the long maintenance free life for GIS.

15.5: Reliability Benefits

The Project would improve system reliability by adding significant and diverse energy and capacity to the southern New England system, while also reducing southern New England's dependence on a constrained natural gas pipeline supply. The Project does not exacerbate or alleviate any known transmission constraints. Also, please see the response to Section 6.7. In addition, [redacted]

SECTION 16: EXCEPTIONS TO FORM PPA

16.1: Wind Farm Power Purchase Agreement

Deepwater Wind has negotiated and executed two PPA's with the Distribution Companies. In 2010, Deepwater Wind negotiated the PPA with National Grid for our Block Island Wind Farm, located off the coast of Rhode Island.

In 2016, Deepwater Wind negotiated the PPA's for our Tobacco Valley Solar Farm, located in Simsbury Connecticut, which is contracted with all the Distribution Companies. Based on these experiences, we are highly confident that, if selected, Deepwater Wind and the Distribution Companies can successfully negotiate the PPA for the Revolution Wind Project.

We have revised the terms and conditions of the draft PPA provided with the RFP to be consistent with the terms reflected in this Proposal. In the event of a conflict between the PPA and this Proposal, the Proposal shall govern.

Please see [redacted] Deepwater Wind's red-line of the National Grid/Unitil form PPA and [redacted] our red-line of the Eversource form PPA. We note that this does not include provisions related to the Storage Feature.

16.2: Agreement for Storage Feature

If the Distribution Companies elect to include the Storage Feature, Deepwater Wind and the Distribution Companies would endeavor to reach an agreement based on the principles established in the Storage Term Sheet attached as [redacted].

Such agreement could be structured as a part of the Wind Farm PPA or as a separate agreement. If a separate agreement, we propose to use a Master Contract that was facilitated by the Edison Electric Institute in collaboration with the National Energy Marketers Association and others to develop a model bilateral master agreement, containing the essential terms governing forward purchases and sales of wholesale electricity. The EEI Master Contract provides credit provisions, standardizes product definitions, and focuses on the transaction's basic negotiable elements, such as price, quantity, location, and duration.

SECTION 17: TRANSMISSION TARIFF / CONTRACT REQUIREMENTS

Section 2.2.1.3.1 of the RFP describes the bidder's choice to present either all-in bids or bids providing a separate transmission portion. Deepwater Wind has elected to provide all-in pricing in each of its bids. The EDCs will not pay a separate transmission charge.

NewCo, as the owner of the Delivery Facility, will file a transmission rate and TSA with FERC under Section 205 of the Federal Power Act and Part 35 of FERC's regulations. The Company has included as [redacted] to this response a copy of the form of TSA and as [redacted] o this response a narrative explanation of the TSA and an explanation of how it conforms to "83C Appendix C-3 – Key Offshore Delivery Facilities Agreement Requirements."

Regardless of whether the lead line or expandable option is selected, as the owner of generator tie line interconnection facilities allowing the delivery of the Deepwater Wind generation assets, NewCo will be eligible for the blanket waiver in 18 C.F.R. § 35.28(d). Under that section, NewCo will need to file "a statement with the Commission that it commits to comply with and be bound by the obligations and procedures applicable to electric utilities under section 210 of the Federal Power Act," and when it does so will receive waiver of FERC's OATT, OASIS, and Standard of Conduct requirements. *Tie Line Policy* at PP 73-74. This status allows NewCo to enter into a mutually agreeable and voluntary arrangement that provides access to transmission service over the generator lead line in the event any third-parties seek service over the line, such as if the Expandable Transmission option is selected.

The TSA included in [redacted] will be used as the basis of the TSA to be developed between NewCo and Deepwater Wind, as well as the basis of any transmission services agreement that Deepwater Wind would enter into with any entity that were to seek transmission service on any incremental portion of one or more of the Company's proposed Expandable solutions beyond the Company's initial proposed [redacted] build-outs under those proposed solutions. As with any FERC-filed rate, the final rate, terms, and conditions of service will be subject to any changes required by FERC. In particular, if NewCo and a third-party seeking interconnection with the Delivery Facilities or transmission service over those facilities are unable to reach a mutually agreeable and voluntary arrangement for service, the third-party has the right to file at FERC for a separate cost-based rate under sections 201 and 211 of the FPA. If that occurs, the rates, terms, and conditions for interconnection with or service over the Delivery Facilities by the third-party may differ from those provided in the form of TSA**.**