



Ocean Wind Application for Offshore Wind Renewable Energy Certificates

Submitted to the New Jersey Board of Public Utilities by Ocean Wind, LLC on December 28, 2018



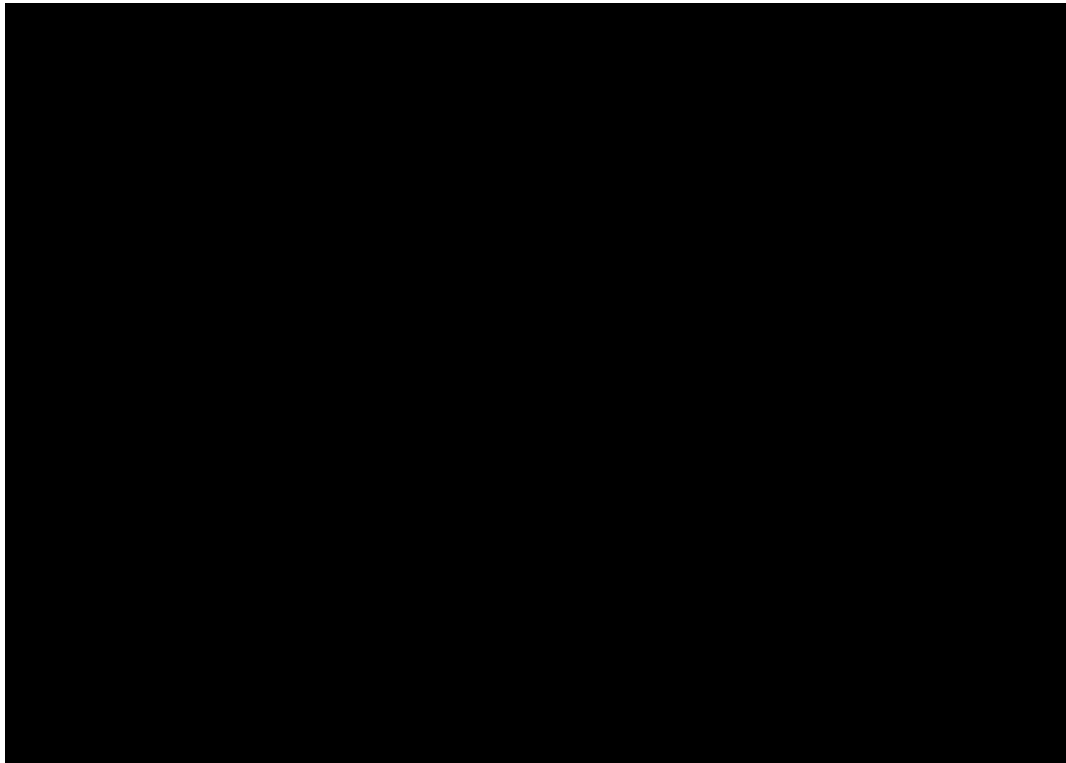
Executive Summary

"Our focus on offshore wind is born out of our efforts to help lead the way in the fight against global climate change. But, in doing so, we can also become a global leader in the emerging offshore wind economy."

– Governor Murphy, Oct. 1, 2018

Ocean Wind LLC ("Ocean Wind") is proud to offer New Jersey's first utility-scale offshore wind farm, the Ocean Wind Project (the "Project") (see Figure 1). In partnership with the State of New Jersey (the "State"), Ocean Wind will help realize Governor Phil Murphy's vision of making New Jersey a world-class leader in the offshore wind industry by providing low-cost clean energy, union jobs, new manufacturing, and crucial infrastructure investments. Ocean Wind will not just serve as the State's first offshore wind partner, upholding its commitments and successfully delivering New Jersey's flagship Project on time and on budget, but will also nurture a long-term, sustainable, clean growth industry that will contribute to the State's future success. Together, these efforts will maximize the value of offshore wind for New Jersey ratepayers now and for decades to come.

Figure 1. Ocean Wind Project



Ørsted is the world leader in offshore wind development, construction, and operation. With the recent acquisition of Deepwater Wind, Ørsted has added a local and regional track record of success in offshore wind on the US East coast that is unmatched. [REDACTED]

Ocean Wind would add regional on-shore energy expertise to the Project.

The Ocean Wind Project will deliver a highly-focused, strong and unique economic development package to the State. Ocean Wind will provide long-term investments in workforce training, sustainable development of the local supply chain, high-value investment in local infrastructure, and will catalyze an offshore wind industry ecosystem that represents New Jersey's position as a leader in clean energy and in the innovation economy.

Ocean Wind will deliver the following benefits to New Jersey:

Protecting New Jersey Ratepayers

- **Provide Low-Cost Clean Energy:** The Project will deliver large-scale renewable energy at competitive prices directly into New Jersey, leveraging Ørsted's global supply chain, track record of cost minimization, and efficient use of federal tax credits, to reduce costs for New Jersey ratepayers.
- **Deliver On-time and On-budget:** Leveraging Ørsted's regional and global record of success, deep technical expertise, and strong local insight and relationships, Ocean Wind will ensure New Jersey's flagship Project is delivered successfully.
- **Minimize Risks for Ratepayers:** Access to Ørsted's strong knowledge of technical development, permitting, stakeholder engagement, interconnection process, procurements, survey work, design of components, and cable route development, will reduce risk to ratepayers.
- **Deliver firm economic value:** Committing to firm guarantees on local spending and job creation ensures that Ocean Wind will deliver on its promises.

Creating an offshore wind economy in New Jersey

- **Develop a New Manufacturing Sector:** [REDACTED] Ocean Wind will create a wind turbine foundation manufacturing facility [REDACTED] to supply foundations for the Project and other offshore wind projects thereby creating jobs in New Jersey for years to come.
- **Advance Infrastructure Resiliency:** Ocean Wind will establish the "Ocean Wind Pro-NJ" Grantor Trust (Pro-NJ Trust) upon award, which will support Minority Business Enterprises and Women's Business Enterprises (MBE/WBE) or small and emerging businesses entering the offshore wind industry and the development of offshore wind infrastructure for these businesses.
- **Establish New Jersey as an Offshore Wind Hub:** Generate up to 69 permanent New Jersey jobs by developing an operations and maintenance hub in South Jersey.
- **Create Union Jobs:** Employ high-quality labor in partnership with the South Jersey Building and Construction Trades.

- **Strengthen Workforce Development in Atlantic City:** Implement a competitive workforce development program that prepares New Jersey residents for high-paying, middle-class jobs in a new manufacturing sector.

Responsible offshore wind energy development

- **Distance from shore:** To reduce the visual impact Ocean Wind is committing to a 15-mile minimum distance to shore for any wind turbines for this Project.
- **Protect the Environment:** Develop Ocean Wind to the highest standards of environmental stewardship and protection of marine mammals and sensitive habitat.
- **Enhance Higher Education Research at New Jersey Institutions:** Ørsted will partner with New Jersey’s world-class institutes of higher education to create mutually supportive programs that will increase the knowledge of marine life and the effects of offshore wind farms.

As shown through the initiatives above, Ørsted will bring its credibility, experience, and expertise to transform New Jersey into a global offshore wind industry hub. Ocean Wind has fully embraced the direction of the New Jersey Board of Public Utilities’(Board or BPU) Guidance Document, Governor Murphy’s Executive Order and the Offshore Wind Economic Development Act (OWEDA) to put forth an application that will propel New Jersey into a national leadership position in offshore wind power generation.

ES.1 Project Summary

The Board’s solicitation of 1,100 megawatts (MW) of offshore wind, the largest in the nation, demonstrates New Jersey’s firm commitment to generating clean, affordable energy and delivering jobs and economic benefits to the citizens of the State. By procuring offshore wind at scale, New Jersey ensures it will capture the significant energy, environmental and economic rewards that development of a locally-based offshore wind generation hub can deliver.

The Ocean Wind Project will provide [REDACTED] clean, reliable offshore wind energy to the State of New Jersey, maximizing long-term economic and environmental benefits. [REDACTED]

[REDACTED]

The key parameters of these Project configurations are described in Table 1.

ES.1.1 Generation

Ocean Wind will be situated within the boundaries of Ocean Wind’s federal Lease Area, located off of Atlantic City, New Jersey. [REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

Table 1. Key Project Parameters

Lease Area	
Distance from shore	
O&M and Construction Base	
Generation	
WTG Design Basis	
Foundations	
Number of turbines	
Product	
Price (ORECs)	
Term	
Commercial Operation	

[REDACTED]

[REDACTED] The WTCs will use conventional monopile (MP) technology to fix to the seabed. Ørsted has used this foundation technology in a safe, economical, and environmentally sound way in over 1,000 prior applications and monopiles are entirely suitable for the conditions of the site.

ES.1.2 Transmission

[REDACTED]

ES.1.3 Construction and Operations and Maintenance Ports

Ocean Wind will establish an Operations and Maintenance (O&M) facility in South Jersey to support the servicing of the project over its useful life. [REDACTED]

[REDACTED]

[REDACTED] A rendering of Ørsted's O&M hub in the United Kingdom is provided in Figure 2 and Figure 3.

Figure 2. Renderings of Ørsted's UK O&M hub.



Figure 3. Renderings of Ørsted's UK O&M hub.



[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

ES.2 Why Ocean Wind

Ørsted's "develop, build, own, and operate model" means the company is vested in the long-term success of its wind farms. Ørsted's track record demonstrates that it is careful not to overpromise and upholds its commitments. Ørsted remains responsible for delivering on its obligations over the life of the asset. Unlike other developers, whose interests may be more short-term, Ørsted's financial success is inextricably linked to the performance of generation assets over the useful life of the projects. This means that Ørsted's interests are well-aligned with those of the ratepayers Ørsted serves.

New Jersey is perfectly positioned to assume a leadership role in the offshore wind industry. A strong wind resource, excellent port infrastructure and central location along the coast, supportive academic institutions, a skilled workforce, and progressive energy policies are among New Jersey's most compelling competitive advantages. Recognizing those advantages, the State has assured its success by establishing a clear plan with the largest offshore wind solicitations in the U.S.

To take advantage of this position and establish the State as a leader for years to come, New Jersey must deliver a flagship offshore wind project in a manner that sets a very high bar for future development in this emerging industry. Ørsted has the local presence, commitment to New Jersey unions, record of innovation, technical expertise, global supply chain, and strong stakeholder relationships to serve as New Jersey's key partner.

Ocean Wind recognizes that the selection of this project will be considered relative to the goals expressed in the Governor's Executive Order No. 8. These goals are:

1. Contributing to a stronger New Jersey economy by anchoring an offshore wind supply chain in the State,

2. Combating global climate change to protect New Jersey and to protect New Jersey's natural resources,
3. Providing added reliability for the transmission network and transmission rate relief for ratepayers, and
4. Achieving all of this at the lowest reasonable cost and risk to New Jersey ratepayers.

Ocean Wind brings a winning combination of attributes to the development of New Jersey's first utility-scale offshore wind farm that meets and exceeds the State's objectives through following core competencies:

- Unrivaled experience
- Technical acumen (engineering, procurement, and project management)
- Financial capacity and independence
- Strength of supply chain relationships
- Demonstrated commitment to developing a New Jersey offshore wind industrial community
- Environmental stewardship

These competencies provide competitive advantages and are demonstrated here:

ES.2.1 Experience

Ørsted's leadership in global offshore wind development is unparalleled with nearly three times the installed capacity of its closest competitors. Over the past 25 years, Ørsted has constructed 5.1 gigawatts (GW) of offshore wind capacity, with another 3.8 GW under construction, taking its operation base to 9 GW of capacity (Figure 4 and Figure 5). The lessons learned over this 25+ year evolution culminate in this Project, reflecting the very best in offshore wind design, engineering, finance and construction, and adapting these best practices to the U.S. East Coast market.

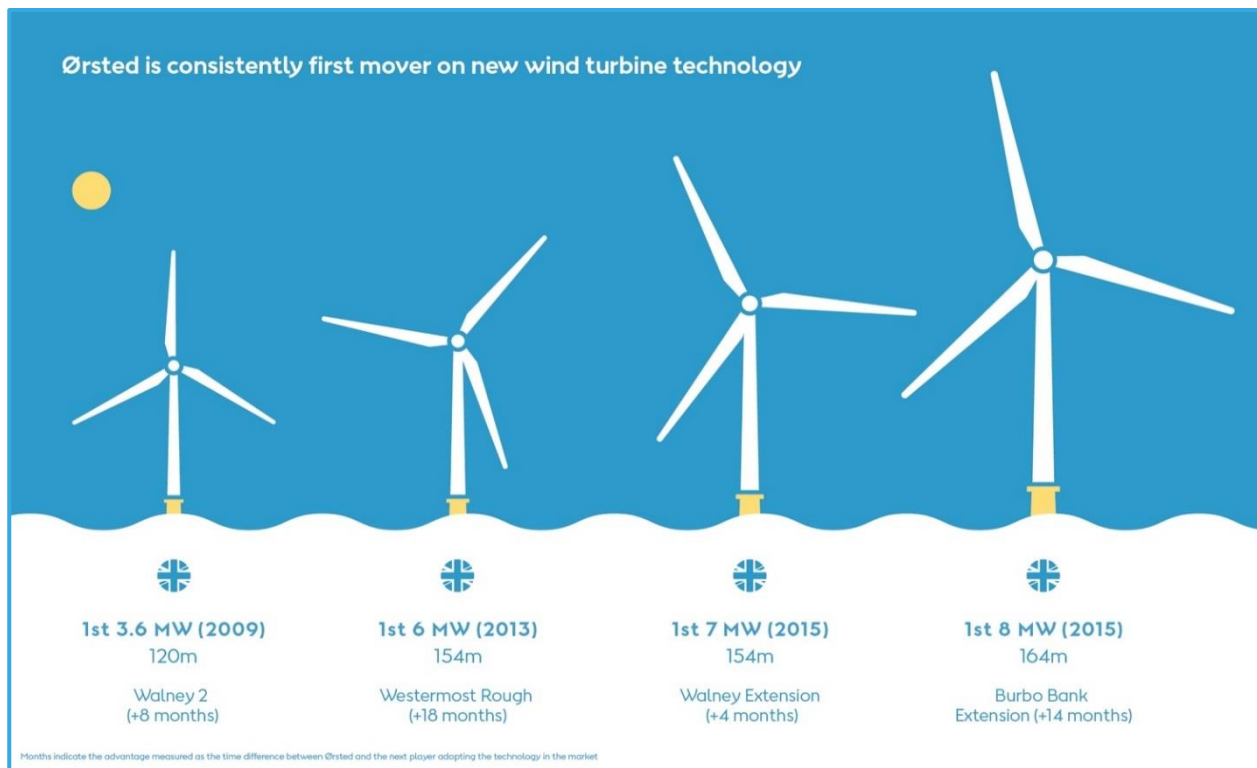
All of Ørsted's experience in offshore wind in development, construction, operation, and decommissioning is relevant to the Project. Specific examples of Ørsted's expertise in development and operations of offshore wind energy projects include:

Ørsted is an industry leader, with 3x the installed offshore wind-energy capacity of its nearest competitor.

- Designed and constructed the largest wind farm in operation today (London Array, 2013)
- Competitively awarded a power purchase agreement (PPA) for what will be the largest wind farms in the world once constructed (Hornsea I and II's combined 2,600 MW)
- Permitted complex projects with input and consent required from numerous stakeholders including regulatory agencies, non-governmental organizations, and the fishing industry;
- Designed and planned high-voltage transmission solutions capable of delivering power from offshore wind projects to the identified onshore grid connection point, from as far away as 50 miles (80 km) (Walney Extension, Race Bank and Hornsea 1)

- Constructed offshore wind farms in challenging marine environments, including far from shore projects, high wave heights, high wind speeds and rough sea conditions
- Planned and executed O&M strategy for offshore wind farms

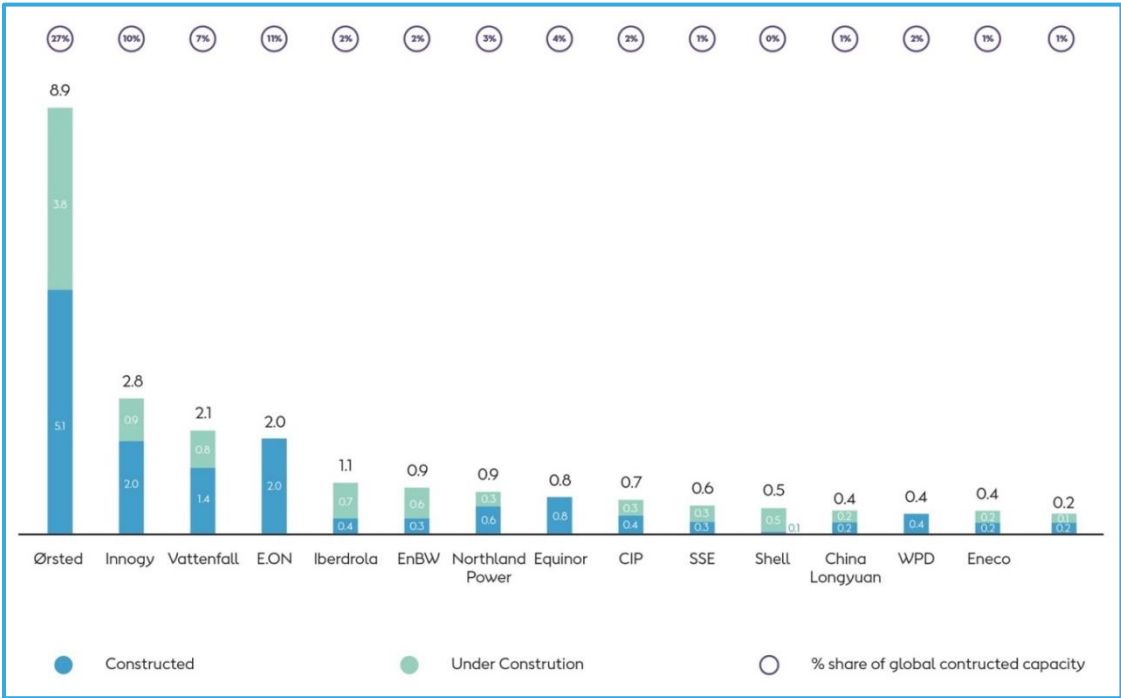
Figure 4. First Mover Advantage on WTG Technology.



Ørsted, a proven innovator, brings to the table many **firsts** in the offshore wind industry, including:

- **First** to develop an offshore wind farm (Vindeby, 1991)
- **First** to successfully develop a first commercial-scale offshore wind farm in the world (Horns Rev I, 2003)
- **First** to successfully develop an offshore wind project in the United States (Block Island Wind Farm, 2016)
- **First** to win with a zero-subsidy bid (Germany 2017), achieving a significant cost milestone in the industry
- **First** to integrate battery storage as part of an offshore wind farm (Burbo Bank Extension)
- [REDACTED]

Figure 5. Global offshore wind capacity (GW).



Ørsted’s experience gained from the development, construction and operation of multiple offshore projects in North America and Europe enables the design and implementation of technical solutions that are appropriate and proven. To demonstrate Ørsted’s breadth and depth of industry knowledge, a list of previous projects is provided in Section 1, Table 1-2. Key personnel are discussed in Section 1.2. Furthermore, Ørsted’s unparalleled experience in securing financing, operating and maintaining offshore wind projects is demonstrated in Section 1.4.

Ørsted’s deep understanding of life-cycle cost and risk gained from almost three decades of offshore wind experience allows the company to capture first-mover advantage on key technology, as demonstrated in Figure 4.

ES.2.2 Technical Acumen

In the early years of the offshore wind industry, many claimed that building massive energy infrastructure projects in the harsh conditions of the open ocean was prohibitively complex. Ørsted has proven this notion false. Today, Ørsted’s workforce of 2,300 dedicated wind energy employees—more than three times the number of Ørsted’s nearest competitor—continues to drive innovation.

Ørsted works with suppliers on the design and development of components that must integrate seamlessly in the challenging offshore environment. Individual projects leverage the learnings of prior developments and fit strategically within a larger portfolio. Ørsted’s long-standing relationships with suppliers puts the company in a unique position to drive innovation, standardization and cost reduction, benefitting for the Project and future offshore wind

development in New Jersey. This is a significant differentiator and means that the Project, and New Jersey, will benefit from Ørsted's U.S. and European experience to the fullest extent possible.

ES.2.3 Financial Capacity and Independence

Ørsted's financial strength translates into one of Ocean Wind's greatest strengths. Ørsted's strong corporate balance sheet, Investment Grade credit rating of BBB+/Baa1, and history of profitable growth demonstrate the financial capability necessary to undertake and successfully deliver Ocean Wind to the State of New Jersey. Ørsted's credit ratings and financial data demonstrate Ørsted's financial strength and ability to complete and operate the Ocean Wind Project.

[Redacted text block]

- [Redacted bullet point]
- [Redacted bullet point]
- [Redacted bullet point]

By virtue of Ørsted's financial strength and proven track record, the Project is uniquely positioned to qualify for substantial federal tax benefits afforded by the Investment Tax Credit (ITC) or the Renewable Electricity Production Tax Credit (PTC), and the New Markets Credit. Due to significant planned capital investment and the creation of new jobs in the State of New Jersey, Ørsted qualifies for the Grow New Jersey Tax Credit or the New Jersey Wind Energy Facility Credit. The combination of these federal and New Jersey tax incentives will maximize value, passing resulting cost reductions on to New Jersey ratepayers.

ES.2.4 Strength of Supply Chain Relationships

Ocean Wind's highest priority is delivering the best value to New Jersey ratepayers. Heavy investment in the local supply chain is a key factor in delivering on this goal. Ørsted has a long history of supporting local economic growth and encouraging broad supply chain development in the areas where it operates. The size and scope of Ørsted's portfolio allows it to secure the best value from vendors across the offshore wind supply chain. Ørsted has an unmatched ability to leverage its global and regional position and U.S. project pipeline to give suppliers certainty when making long-term decisions to invest in New Jersey, resulting in a major boost to the local economy. As the developer with the largest portfolio (operating, in construction, and under development) and the only developer active in the United States, Europe, and the Asia-Pacific region) Ørsted's suppliers have willingly followed Ørsted across the globe.

Ocean Wind has the strength, expertise, and commitment to make New Jersey a center of the new U.S.-based offshore wind industry.

[Redacted text block]

[REDACTED]

Figure 6. [REDACTED]

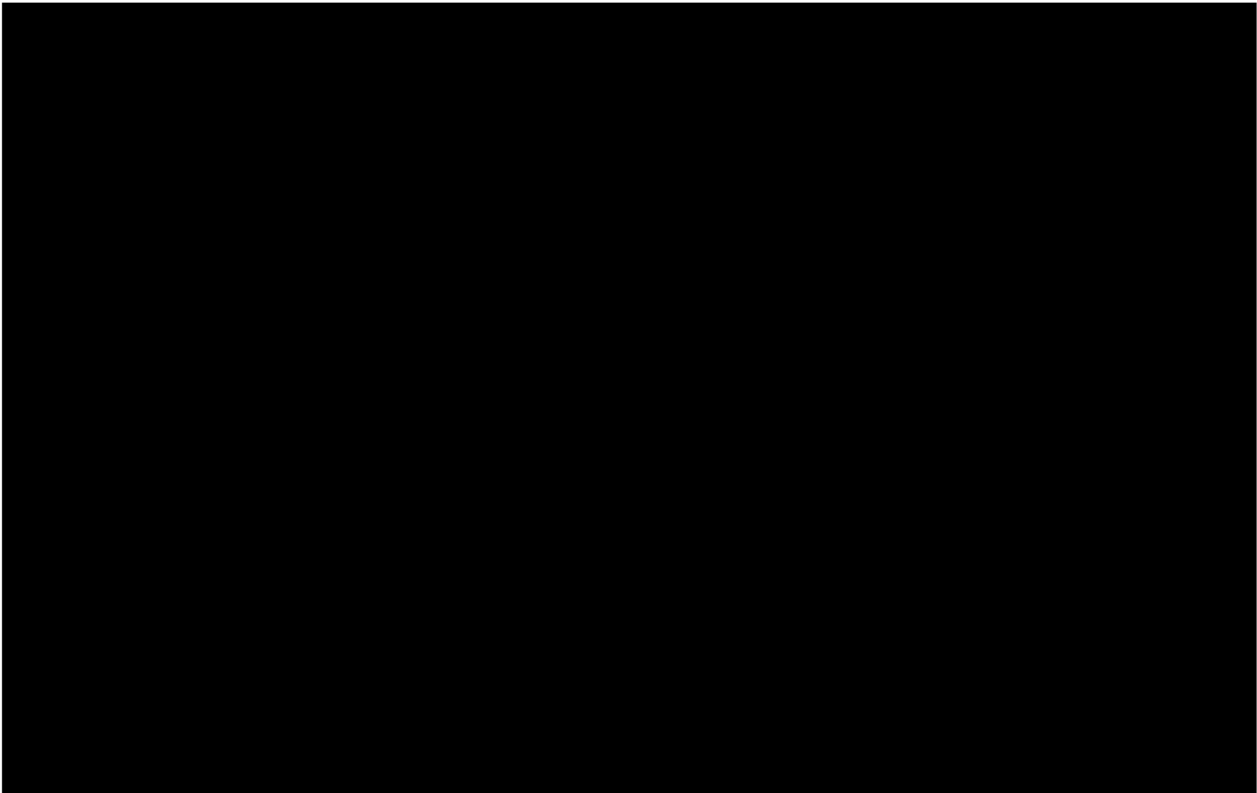
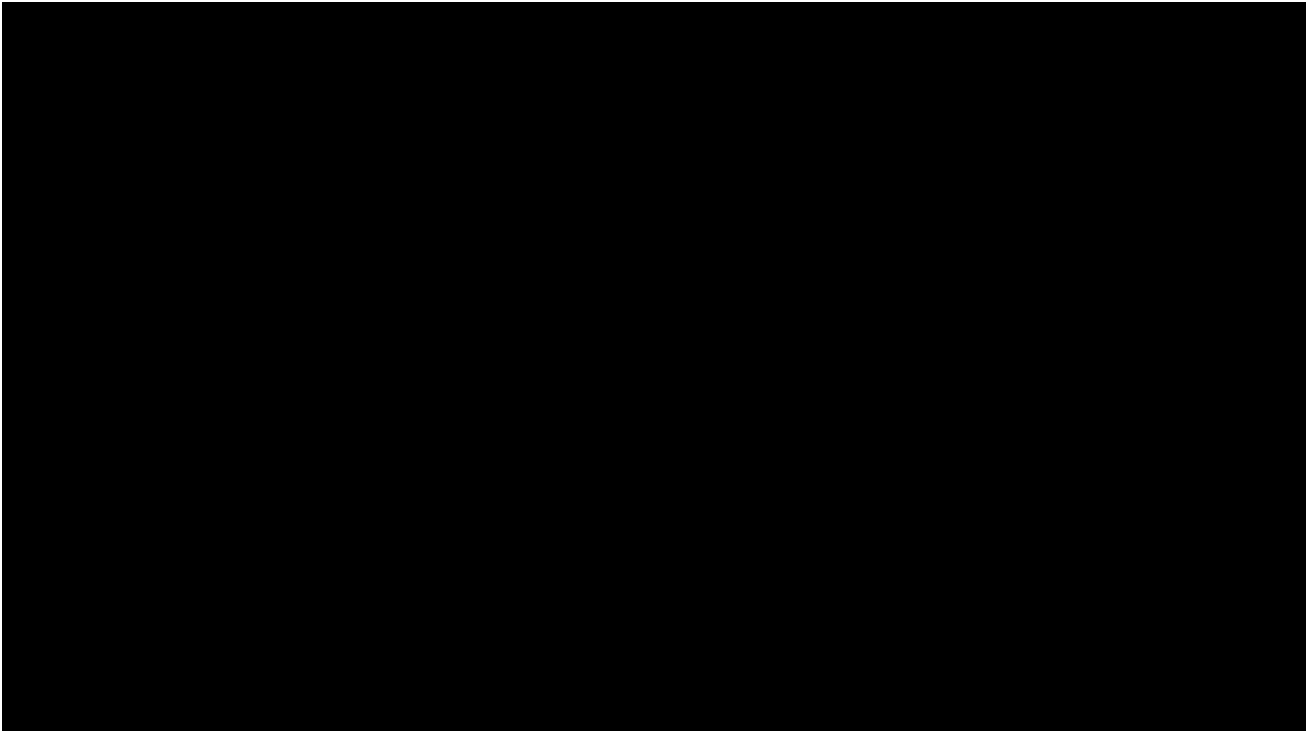


Figure 7. [REDACTED]



Ocean Wind's highly detailed Supply Chain Plan (Attachment 2.3) describes how local and global investments with suppliers will support the Project. [REDACTED]

[REDACTED]

[REDACTED] The company's position has enabled this development of the Supply Chain Plan, as it has the leverage to support the establishment and maturation of a sustainable supply chain and identify opportunities across its portfolio.

Ørsted successfully deployed supply chain plans in several key markets. In the United Kingdom (UK), Ørsted built a robust industry in response to the country's growing ambitions for offshore wind. Ørsted's 2,000-MW build-out on the UK's East Coast was accompanied by a multi-billion-dollar investment by supply chain partners, the creation of 1,600 construction jobs and 500 long-term O&M jobs, including for example, the establishment of factories by Siemens Gamesa and Mitsubishi Vestas to produce wind turbine blades. Ocean Wind will dedicate significant resources to establish a supply chain in New Jersey that will benefit New Jersey's first flagship project and future projects as the State moves forward to achieve its target of 3,500 MW by 2030.

Ørsted is similarly committed to establishing long-term, constructive and mutually beneficial relationships with local unions, supporting the professional development and deployment of union labor in this new industry. [REDACTED]

[REDACTED]



ES.2.5 Commitment to Developing New Jersey's Offshore Wind Industry

"We are also planting the seeds for the **innovation economy** to grow again in New Jersey...One of the world's leading offshore wind energy companies – Ørsted – has announced their intention to open an office in Atlantic City"

– Governor Murphy, Apr. 25, 2018

Ocean Wind is committed to growing the innovation economy in New Jersey. This means not only delivering low cost offshore wind energy and high economic value but also catalyzing an offshore wind ecosystem in the State.

To establish New Jersey's offshore wind industry, Ocean Wind is committing up to \$15 million in an initial contribution to the "Ocean Wind Pro-NJ" Grantor Trust (Pro-NJ Trust) upon award to the Project that will:

- Enable MBE/WBE or small business entry to the offshore wind industry
- Advance in-State port development
- Build coastal grid resiliency and reliability

The Pro-NJ Trust will be deployed alongside Ocean Wind and will serve not only this first commercial-scale project but the entire offshore wind industry and the communities it serves for decades to come. The Pro-NJ Trust consists of several building blocks: supporting businesses entering the offshore wind supply chain and supporting the development of offshore wind infrastructure for these businesses. Providing grants during this first phase of offshore wind development will allow businesses to make early investments that will enable them to benefit from all three of New Jersey's offshore wind procurements as well as projects developed elsewhere along the East Coast. The Pro-NJ Trust will ensure that the offshore wind industry is developed in New Jersey in a sustainable and inclusive way.

In addition to supporting offshore wind industry stakeholders, Ocean Wind is committed to supporting and engaging diverse stakeholders in its home communities. Ocean Wind has been engaging in its home communities since acquiring the lease in May of 2016. This includes participation in panels, networking events, conferences, and symposiums. Ocean Wind is proud to support numerous civic organizations Statewide, with a particular focus on not-for-profit institutions in and around the Project, including the Marine Mammal Stranding Center, The New Jersey Corporate Wetlands Restoration Partnership (CWRP), the Urban Coast Institute, the Jersey Shore Partnership, the Research & Development Council of New Jersey, and many others.

Ocean Wind Pro-NJ Grantor Trust

Icon: Dollar sign in a gear
 Ocean Wind promises to commit \$15 million to help facilitate and kick-start a strong and sustainable offshore wind industry in New Jersey for decades to come.

Icon: Person silhouette
 The Fund will support small and minority-owned businesses, helping them to enter and succeed in the offshore wind industry.

Icon: Ship and waves
 The Fund will be dedicated to developing the in-state port, energy grid and coastal transportation infrastructure.

Icon: Staircase
 In addition to the initial \$15 million funding, Ocean Wind will add additional monies if required, guaranteeing its commitment to economic development within New Jersey.

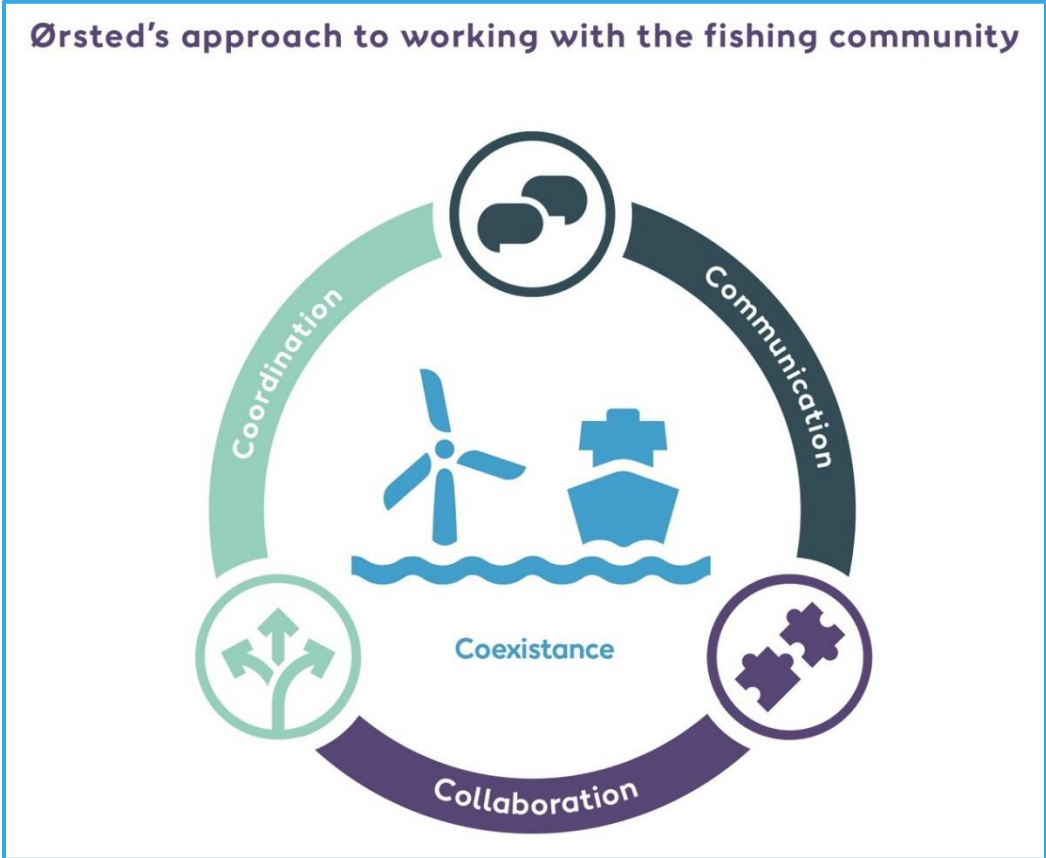
Workforce development is another critical component of Ocean Wind’s direct engagement in the region over the long-term. Ocean Wind will institute the Competitive Edge program established by Joseph Jingoli & Son, Inc. that has operated successfully in Atlantic City for several decades. Ocean Wind’s embedded Competitive Edge program will focus on three specific aspects of workforce development critical for this new industry: (1) working with union partners to provide construction training opportunities to the local community, including people in recovery, (2) educating students who have a long-term interest in entering the offshore wind workforce and (3) establishing an apprenticeship program to train local residents with an immediate interest in joining the offshore wind industry.

Ocean Wind has also partnered with Rutgers University, Stockton University and Rowan University on research initiatives relating to metrological/oceanographic and marine science programs, coastal resources and stakeholder programs, and workforce development programs. In addition, the Project is exploring ways to engage the student body through internships and guest lecture opportunities at universities in the State. These diverse educational initiatives established by Ocean Wind will grow the State’s knowledge base and ultimately support the sustainable, strategic growth of offshore wind in the State.

Ocean Wind has fully embraced the concept of “early and often” community engagement. Ørsted has a track record of success in local community engagement with respect to projects in

Massachusetts, Rhode Island, Connecticut, New York, and Maryland. Through years of direct engagement, the Ørsted team has established credibility with these crucial stakeholders on issues such as distance from shore, marine mammal and avian species protection, cable landfall and onshore construction impacts, and many other topic areas. In New Jersey, Ocean Wind has developed a systematic and strategic approach to bringing the proposed Project to local communities for their feedback and input. Among the key stakeholder groups have been the coastal communities in Atlantic and Cape May counties. The Ocean Wind team has visited numerous mayors and representatives in the coastal communities. To help demonstrate the strength of these relationships, Letters of Support are attached to this application.

Also among the key stakeholder groups are the commercial and recreational fishing communities, which play a critical role in the cultural and economic fabric of New Jersey. Using the best management practices including “early, often, and transparent communications,” Ørsted has successfully coexisted with the fishing community in Europe and at the Block Island Wind Farm. Ocean Wind will bring that record of success to the fishing community in and around New Jersey.



The relationships that Ocean Wind has developed through these varied initiatives will contribute to the success of the Project, providing mutual benefits for the Project, the State of New Jersey's goals, and the communities in which Ocean Wind operates.

ES.3.6 Environmental Stewardship

Ørsted has a legacy of environmental stewardship.

Over a decade ago, the company initiated a transformation from a fossil fuel company to a renewable energy company. Since then, Ørsted has reduced its coal consumption by 73 percent and committed to fully phasing out coal by 2023. The company invested in offshore wind, becoming the global leader in offshore wind development. In 2017, Ørsted divested its oil and gas business, completing the transformation to a renewable energy company. Along with the divestment, the company changed its name from DONG Energy (Danish Oil and Natural Gas) to Ørsted, because the prior name no longer reflected the company's activities. Ørsted has established the goal of producing 100 percent renewable energy, and is on track to reduce carbon emissions by 96 percent by 2023.

Ocean Wind recognizes the importance of being an environmental steward and ensuring that the construction and operation of the Project is compatible with existing social, economic and environmental uses within and around the Project. Ørsted has extensive experience in the permitting of complex infrastructure projects across Europe, including the undertaking of environmental impact assessments as part of the development process. Moreover, Ørsted has been a leader in this field including research and development of technologies.

The development and operation of an offshore wind farm is an inherently positive environmental endeavor due to a reduction in air emissions compared to traditional forms of energy generation. What makes the Ocean Wind Project distinctive is Ocean Wind's commitment, experience, and ability to provide added value in promoting tangible environmental benefits to New Jersey including:

- Optimization of the turbine layout, utilizing the eastern edge of Lease Area to minimize visual impact to local communities of New Jersey;
- Integration of engineering and environmental constraints in early planning and design to minimize conflict and promote early stakeholder engagement;
- Unrivalled experience and knowledge in developing utility sized projects that enables a robust and transparent assessment of environmental impacts.

Since 2016 Ocean Wind has been evaluating and minimizing the potential impacts of the project on New Jersey and the neighboring outer continental shelf (OCS). Ocean Wind is proud to be the first project off the New Jersey coast to have its Site Assessment Plan (SAP) approved by the U.S. Bureau of Ocean Energy Management (BOEM), the lead Federal agency for offshore wind on the OCS, in May of 2018. This approval authorized the successful deployment of two met-ocean buoys within the Lease Area to record wind data. Ocean Wind was also granted the first ever Air Permit by the Environmental Protection Agency (EPA Region-2) for the operation of the met-ocean buoys on the OCS.

The Ocean Wind Project is the most developed of any proposed New Jersey project, having undertaken geophysical and geotechnical investigations to explore the seabed and subsea ground conditions within the Lease and Project area since 2017. Ocean Wind believes that the maturity of the project design, available information such as the New Jersey Ecological Baseline Study coupled with Ørsted's extensive experience means Ocean Wind's understanding of the potential environmental impacts of the Project cannot be matched. This commitment to the

Project and the State of New Jersey ensures the assessment and mitigation of potential environmental effects is both robust and credible.

ES.3 Scale matters

Ørsted is committed to driving down the cost of offshore wind globally and in bringing the lowest cost offshore wind energy to New Jersey. A key driver to lowering costs is scale. [REDACTED] there is a material price advantage associated with the scale economies attendant to larger-scale windfarms. Significant upfront investment in lease acquisition, permitting, procurement and certain construction activity is largely fixed and unchanging irrespective of windfarm size. The ability to spread these fixed costs over the greater production of a larger windfarm will result in a lower cost per megawatt-hour to the ratepayer. Additionally, a larger project is more likely to attract the investment and clean energy jobs that the State wishes to attract through this solicitation.

A large-scale project is needed to achieve New Jersey's goal of the lowest cost for ratepayers and the greatest economic benefits in terms of jobs and economic development opportunities. In addition, a large-scale project would further put New Jersey ahead of other states competing for their share of offshore wind economic development. Ørsted, through Ocean Wind, is perfectly situated to develop a large scale project for New Jersey. New Jersey can confidently rely upon Ocean Wind to deliver such a large scale project.

ES.5 Consistency with the New Jersey Energy Master Plan

New Jersey's 2015 Energy Master Plan (EMP) sets out the important public policy objectives that are behind the State's clean energy strategy. The five goals set forth in the EMP include: (1) driving down the cost of energy for all customers; (2) promoting a diverse portfolio of new, clean, in-state generation; (3) rewarding energy efficiency and energy conservation/reduce peak power production; (4) capitalizing on emerging technologies for transportation and power production; and (5) maintaining support for the renewable energy portfolio standard. These five goals are indicative of the diverse set of grid-related, economic and environmental priorities that drive this and future offshore wind procurements in the State. The following application highlights how this Project achieves - and indeed excels - in bringing these benefits to the New Jersey ratepayer and citizens at large.

Confidentiality Statement

The portions of this application that contain trade secret information are redacted from the public version of the application. Ocean Wind has submitted a confidential/privileged version of the application to the New Jersey Board of Public Utilities (Board or BPU) that includes the redacted information and that should be treated as a non-public record that is exempt from disclosure to the maximum extent permissible under applicable laws and as expressly set forth in this application.

STATE OF NEW JERSEY
BOARD OF PUBLIC UTILITIES

IN THE MATTER OF THE APPLICATION OF :
OCEAN WIND, LLC FOR APPROVAL AS A :
QUALIFIED OFFSHORE WIND PROJECT, :
PURSUANT TO N.J.S.A. 48:3-87.1 and N.J.A.C. :
14:8-6.1, et seq. :

STATEMENT OF

[REDACTED], of full age, states:

1. I am the Senior Policy Advisor for Orsted North America Inc., the sole member of Ocean Wind, LLC (“Ocean Wind”), and I am authorized to make this Statement on behalf of Ocean Wind.

2. On this date, December 28, 2018, Ocean Wind has submitted through the Board of Public Utilities (“BPU” or “Board”) New Jersey Offshore Wind Solicitation-1,100 MWs website (the “Website”) [REDACTED] for approval as a Qualified Offshore Wind Project. Relative to [REDACTED] Ocean Wind has submitted a Confidential Copy (unredacted) and a Public Copy (redacted) of [REDACTED] application.

3. All of the information redacted by Ocean Wind in the Public Copy was redacted because the portions redacted are Trade Secrets of Ocean Wind.

4. Specifically, the information redacted consists of formulae, practices, processes, designs, instruments, patterns, commercial methods, or compilations of information not generally known or reasonably ascertainable by others by virtue of which Ocean Wind obtains an economic advantage over its competitors. This is valuable commercial information that provides Ocean Wind with an advantage over its competitors who do not have that information, and is not generally available.

5. These Trade Secrets are exempt from disclosure under the Open Public Records Act, N.J.S.A. 47:1A-1 et seq. and the Board's regulations at N.J.A.C. 14:1-12.1(b).

6. The information redacted from the Public Copy shall remain confidential until Ocean Wind agrees otherwise.



Dated: December 28, 2018

Ocean Wind OREC Application

Acronym	Definition
\$/MWh	Dollars per megawatt hour
ACE	Atlantic City Electric Corporation
AEO	Annual Energy Outlook
AEP	Annual Energy Production
AIS	Air-insulated switchgear
aMSL	Above mean sea level
APAC	Asia-Pacific
AURORA	North American power market simulations
BAFO	Best and Final Offer
BGS	Basic Generation Service
BITS	Block Island Transmission System
BIWF	Block Island Wind Farm
Board or BPU	New Jersey Board of Public Utilities
BOEM	Bureau of Ocean Energy Management
BOP	balance of plant
BST	Basic Safety Training
°C	Degrees Celsius
CAA	Civil Aviation Authority
CapEx	Capital expenditure
CBA	Cost-Benefit Analysis
CBA	Community Benefits Agreement
CFU	Call Forwarding Unlimited
CH ₄	Methane
CIR	Capacity Interconnection Right
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
COD	Commercial Operation Date
COP	Construction and Operations Plan
CP	Capacity Performance
Cp	Coefficient of power
CRMC	Coast Resource Management Council
Ct	Combustion turbine
CTV	Crew Transfer Vessel
CWRP	Coastal Wetlands Restoration Partnership
DE	Germany
DK	Denmark
DKK	Danish Krone
DNP	Defect Notification Period
DNV GL	International accredited registrar and classification society
DOB	Depth-of-burial
DOE	US Department of Energy
DOT	United States Department of Transportation

Ocean Wind OREC Application

Acronym	Definition
DP2	Vessel with dynamic positioning (also cable installation vessel)
DRC	Dynamic reactive carbon
DTS	Distributed temperature sensing
e.g.	For example
EAT	Earthing auxiliary transformer
EDC	Electric Distribution Company
EIA	Environmental Impact Assessment
EIA	US Energy Information Administration
EIS	Environmental Impact Statement
EMS	Environmental management system
EPA	US Environmental Protection Agency
EPC	Engineering, Procurement, Construction
EPP	Environmental Protection Plan
ER&T	PSEG Energy Resources and Trade LLC
ERP	Emergency response plan
ESP	Electrical service platforms
EU	European Union
FAS/FES	Fire alarm system/Fire emergency systems
FAT	Factory acceptance test
FFO	Funds from operations
FLiDAR	Floating LiDAR
FONSI	Finding of No Significant Impact
FR	France
GA	Generating assets
GAAP	Generally accepted accounting principles
GDP	Gross Domestic Product
GHG	Greenhouse gas
GIP	Global Infrastructure Partners
GIS	Gas Insulated Switchgear
GSOE	Garden State Offshore Energy, LLC
GUM	Guide to the Expression of Uncertainty in Measurement
GW	Gigawatt
GWh	Gigawatt-hours
GWO	Global Wind Organization
HDD	Horizontal directional drilling
Hg	Mercury
HSE	Health, Safety, and Environment
HTV	Heavy transport vessel
HV	High voltage
Hz	Hertz
i.e.	That is

Ocean Wind OREC Application

Acronym	Definition
ICC	Inter-Connection cable
ICPC	International Cable Protection Committee
IEC	International Electrotechnical Commission
IPC	Internal Platform Cable
IPO	Initial Public Offering
IRS	Internal Revenue Service
ISA	Interconnection Service Agreement
ISO	International Organization of Standardization
IT	Information technology
ITC	Investment Tax Credit
ITT	Invitation to tender
JCGM	Joint Committee for Guides in Meteorology
kg/m ³	Kilograms per cubic meter
km	Kilometer
KPI	Key performance indicator
kV	Kilovolt
kVA	Kilovolt-ampere
kWh	Kilowatt-hour
LCOE	Levelized cost of energy
LiDAR	Light detection and ranging
LIPA	Long Island Power Authority
LV	Low voltage
m	Meter
m/s	Meters per second
MAAC	Mid-Atlantic Area Council
MBE	Minority Business Enterprise
MEC	Munitions and explosives of concern
MLLW	Mean low low water
MMSC	Marine Mammal Stranding Center
MOPR	Minimum Offer Price Rule
MOU	Memorandum of Understanding
MP	Monopile
MP/TP	Monopile/transition piece
mph	Miles per hour
MV	Medium voltage
MVA	Megavolt-amp
MW	Megawatt
MWh	Megawatt-hour
N.J.A.C.	New Jersey Administrative Code

Ocean Wind OREC Application

Acronym	Definition
N.J.R.	New Jersey Regulations
NA	North America
NA	Not applicable
NEPA	National Environmental Policy Act
NGO	Non-governmental organization
NJCWRP	New Jersey Corporate Wetlands Restoration Partnership
NJDEP	New Jersey Department of Environmental Protection
NJDOT	New Jersey Department of Transportation
NJEA	New Jersey Education Association
NJEDA	New Jersey Economic Development Authority
NL	Netherlands
nm	nautical mile
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOSB	National Ocean Science Bowl
NO _x	Oxides of nitrogen, especially as atmospheric pollutants
NPCC	Northwest Power Coordinating Council
O&M	Operations and Maintenance
OCS	Outer Continental Shelf
OEM	Original equipment manufacturer
OnSS	Onshore substation
OPEX	Operational expenditure
OREC	Offshore Renewable Energy Certificate
Ørsted	Ørsted A/S and its subsidiaries
Ørsted A/S	Ørsted A/S, the corporate parent of Ørsted NA
Ørsted NA	Orsted North America Inc., the Owner of Bidder
Ørsted WPNA	Orsted Wind Power North America LLC, an affiliate of Bidder
OSB	Offshore Structures Britain
OSS	Offshore substation
OWA	Offshore Wind Accelerator
OWEDA	Offshore Wind Economic Development Act
P.L.	Public law
PCC	Platform connecting cable
PCER	NJDEP Office of Permit Coordination and Environmental Review
PE	Polyethylene
PEG	PSEG's parent company, Public Service Enterprise Group (NYSE)
PJM	PJM Interconnection LLC
PLA	Project Labor Agreement
PLGR	Pre-lay grapnel run
PM _{2.5}	Particulate matter 2.5 micrometers or less in diameter.
PMI	Project Management Institute

Ocean Wind OREC Application

Acronym	Definition
PNNL	Pacific Northwest National Laboratory
POI	Point of Interconnection
PPA	Power Purchase Agreement
Project	The Ocean Wind Project/Ocean Wind Lease Area
PRO-NJ Trust	Ocean Wind Pro-New Jersey Grantor Trust
PSA	Pile Soil Analysis
PSE&G	Public Service Electric and Gas Company
PSEG	Public Service Enterprise Group
PSEG ER&T	PSEG Energy Resources and Trade LLC
PSEG Power	PSEG Power LLC
PSEG Renewable	PSEG Renewable Generation LLC
PSO	Protected species observers
PTC	Production Tax Credit
PV	Photo-voltaics
PVC	Polyvinylchloride
PWA	Prevailing Wager Act
Q1	First quarter
QC	Quality Control
R&D	Research and design
R&E	Regulation and enforcement
REC	Renewable Energy Certificate
RFC-East	Reliability First Council - East
RFI	Request for Information
RFP	Request for Proposal
RFQ	Request for Quotations
RGGI	Regional Greenhouse Gas Initiative
ROW	Right-of-way
RPM	Reliability Pricing Model
rpm	Revolutions per minute
RPS	Renewable Portfolio Standard
RUE	Right-of-use and easement
RV	Research vessel
SAP	Site Assessment Plan
SAT	Site acceptance test
SCADA	Supervisory control and data acquisition
SCP	Supply Chain Plan
SCS	Substation control system
SDG	United Nations Sustainable Development Goals
SGRE	Siemens Gamesa Renewable Energy
SISA	System Impact Study Agreement
SIT	Site integration test

Ocean Wind OREC Application

Acronym	Definition
[REDACTED]	[REDACTED]
SLD	Single line drawing
SO ₂	Sulfur dioxide
SOV	Service Operational Vessel
[REDACTED]	[REDACTED]
State	The State of New Jersey
SWA	Service and Warranty Agreement
SWG	Switch gear
t	US ton; 2,000 pounds
T&I	Transport and installation
TBC	To be completed
TBD	To be decided
TCP	Tax Credit Program
TETRA	Terrestrial trunked radio
TJB	Transition joint bay
TP	Transition piece
TRBM	Trawl Resistant Bottom Mounted
TSA	Turbine Supply Agreement
TW	Taiwan
UCAP	Unforced capacity
UK	United Kingdom
US or U.S.	United States of America
USACE	US Army Corps of Engineers
USCG	US Coast Guard
USD	US dollars
UXO	Unexploded ordnance
VDC	Vehicle dynamic control
VHF	Very high frequency marine radio
WBE	Women's Business Enterprise
WEA	Wind Energy Area
WTG	Wind turbine generator
XLPE	Cross-linked polyethylene

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Attachment 1.1 – Resumes for Key Employees and Other Employees

1 Business Information

Business information – Summary

Ocean Wind offers New Jersey the most credible and trusted choice to deliver the State's first offshore wind farm. Ørsted built the world's first offshore wind farm in 1991 off the coast of Denmark. 25 years later, Ørsted built America's first offshore wind farm, serving Rhode Island. As of today, Ørsted has constructed 5.1 GW of offshore wind capacity, nearly 30 percent of globally installed offshore wind capacity. In addition to Rhode Island, the states of New York, Virginia, Maryland and Connecticut have each entrusted Ørsted with the profound responsibility of delivering their first offshore wind farms. Ørsted's pioneering experience, together with the support of PSEG, which brings over a century of proven success in New Jersey energy project development and management, will allow Ocean Wind to deliver New Jersey's first offshore wind farm on-schedule, with the highest levels of local support.

Business information – Checklist

The information required under New Jersey Administrative Code (N.J.A.C.) 14:8-6.5 is cross-referenced to the associated document sections in the checklist below.

Checklist Item	Document Reference
Full business information, including the developer's name, primary contact person, website, telephone numbers, email address, and street address. N.J.A.C. 14:8-6.5(a)(1).	Section 1.1
Key employees including resumes of employees that have an identifiable track record in construction and operation of power plants of similar size and scope. N.J.A.C. 14:8-6.5(a)(1)(i).	Section 1.2, Table 1-1, Attachment 1.1
Description of any work done to date by the key employees in developing projects of similar scope, especially any ocean-based energy project or New Jersey large-scale energy project siting work. N.J.A.C. 14:8-6.5(a)(1)(ii).	Section 1.3, Table 1-2
Disclosure in detail of any prior business bankruptcies, defaults, disbarments, investigations, indictments, or other actions against either the applicant, its parent company, affiliates, subsidiaries, or any key employees identified. N.J.A.C. 14:8-6.5(a)(1)(iv).	Section 1.5
Commitments with respect to changes in key employees. N.J.A.C. 14:8-6.5(a)(1)(v).	Section 1.6
Documentation, including but not limited to letters of intent/commitment/contract to substantiate any claims that manufacturing services related to the qualified offshore wind project will be sourced from a New Jersey location. N.J.A.C. 14:8-6.5(a)(1)(vii).	Section 1.7

- PSEG Energy Resources and Trading LLC (PSEG ER&T or ER&T) will provide Energy Commodity Marketing and Risk Management Services to optimize the Project's revenues to be credited back to customers, as further described in Section 6.

In addition, if PSEG Renewable exercises its option [REDACTED] [REDACTED] PSEG Renewable is expected to coordinate with its affiliates, subject to the BPU affiliate rules, to lead the development, permitting and construction of the on-shore portions of the project's transmission facility, as further described in Section 14.

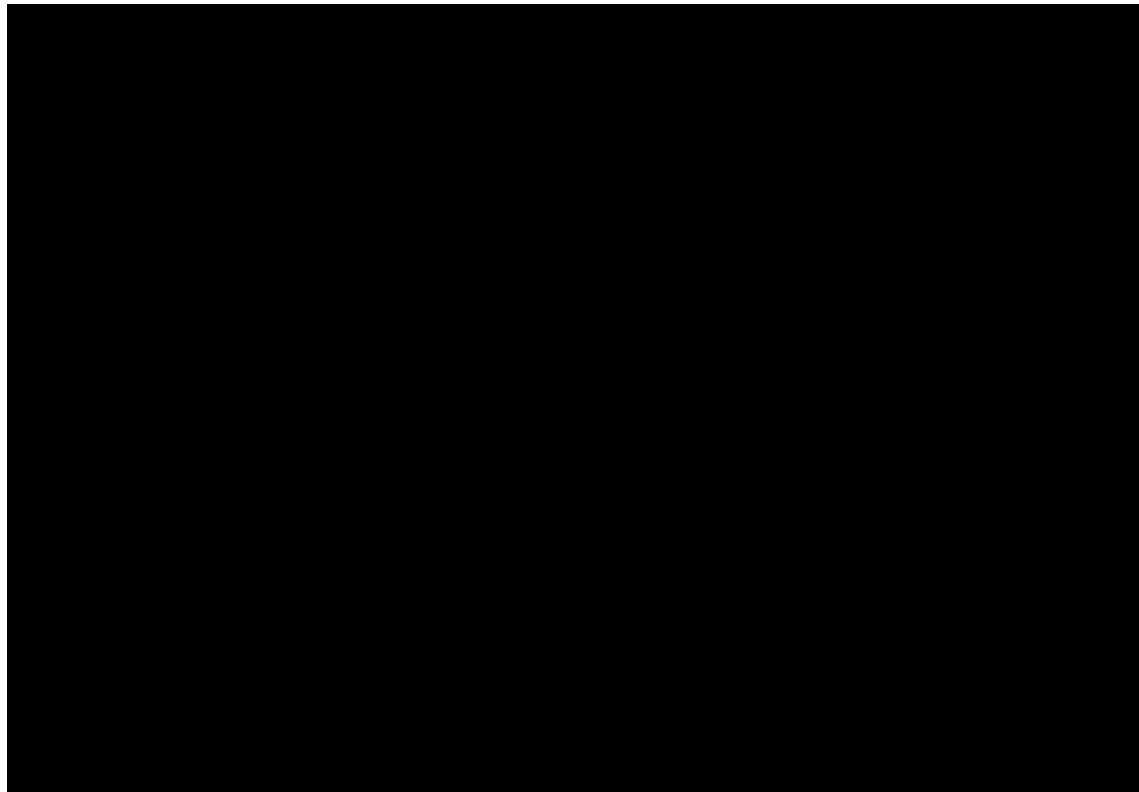
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

1.1.3 Corporate [REDACTED]

Figure 1-1 is the corporate structure of Ørsted. Ocean Wind is a wholly-owned indirect subsidiary of its ultimate parent company, Ørsted A/S. Ørsted North America Inc. (Ørsted NA) is the direct parent company of Ocean Wind. Ørsted Wind Power North America LLC (Ørsted WPNA), which is wholly owned by Ørsted NA, is an affiliate of Ocean Wind and will provide certain project-development services to Ocean Wind.

Figure 1-2 is the organizational structure of the Ocean Wind Project.

Figure 1-1. Ørsted corporate organizational structure.



1.2 Key Employees

N.J.A.C. 14:8-6.5(a)(1)(i). The proposal must list all key employees and include resumes of employees that have an identifiable track record in construction and operation of power plants of similar size and scope;

The Ocean Wind Project team has substantial experience in offshore wind project development, including origination, permitting, interconnection, engineering, financing, procurement, construction and operations. Collectively, the Key Employees have an identifiable track record in construction and operation of power plants of similar size and scope as set forth herein.

Table 1-1 is a list of the Key Employees directly involved in the management of the Ocean Wind Project. N.J.A.C. 14:8-6.1 defines a Key Employee as “any individual employed by the applicant in a supervisory capacity or empowered to make discretionary decisions with respect to the project.”

Under this definition the following six Ørsted personnel are identified as Key Employees:

- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]

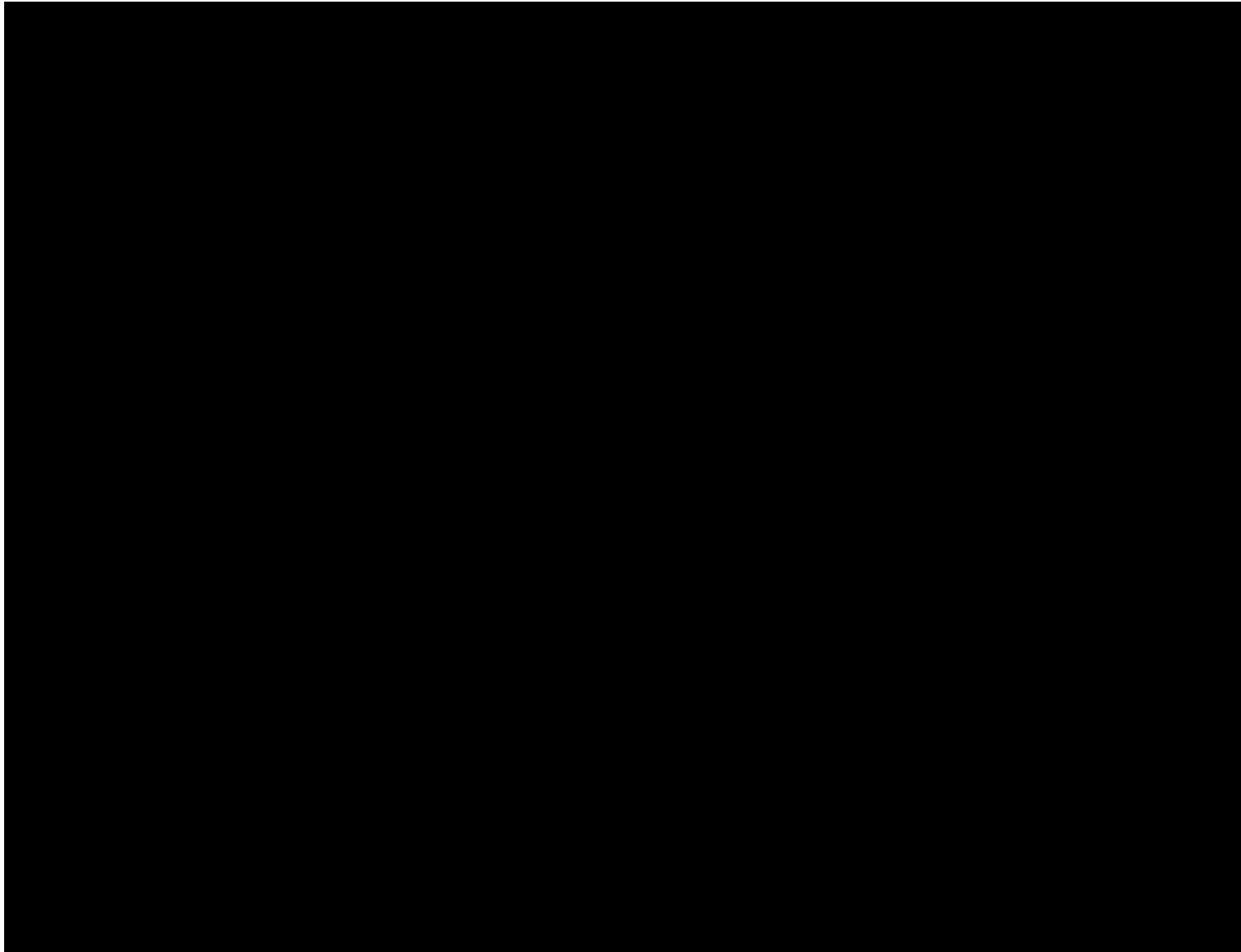
Regardless of whether it exercises the option to participate in the Project, PSEG has agreed, subject to terms mutually agreeable with Ørsted, to provide certain services to the Project. Key among them is managing the market aspects of offshore wind power. Accordingly, the following PSEG employees should be considered a “Key Employee”:

- [REDACTED]

Resumes of the Key Employees are provided first in Attachment 1.1. Additionally, resumes of other team members have been included to demonstrate the depth of experience represented in the Ocean Wind team. They are not, however, Key Employees as defined in N.J.A.C. 14:8-6.1.

Project teams in Ørsted and PSEG are typically assembled on a given project for a finite period of time. This means that the Ocean Wind team is composed of members from the wider Ørsted and PSEG organizations. Each role in a project development team is defined in a set of internal guidelines, clearly laying out the responsibilities and mandate for that role. It means that a role in one project is handled in the same way as in another.

Figure 1-2. Ocean Wind Project organization.



The Project organization will change during the Project life cycle. The Project is currently in the development phase, and will transition into a Project execution organization at or around the time of approval of the Construction and Operations Plan (COP) by the Bureau of Ocean Energy Management (BOEM) (hereinafter, referred to as the Realization Milestone), and Ocean Wind will gradually transition the Project to a team within Ørsted's Engineering, Procurement, Construction (EPC) organization. The Project Development Manager will transfer his or her authority to an EPC Program Director, the Technical Project Manager will transfer his or her responsibilities to an EPC Director, and the other Key Employees will gradually transfer their responsibilities.

Typically, the first EPC team member to enter a project is the EPC Director, who organizes the construction aspects of the project. Transfer to the EPC organization is complete after the Realization Milestone. The Board will be notified of the change of each Key team member allowing sufficient time for its approval of the change.

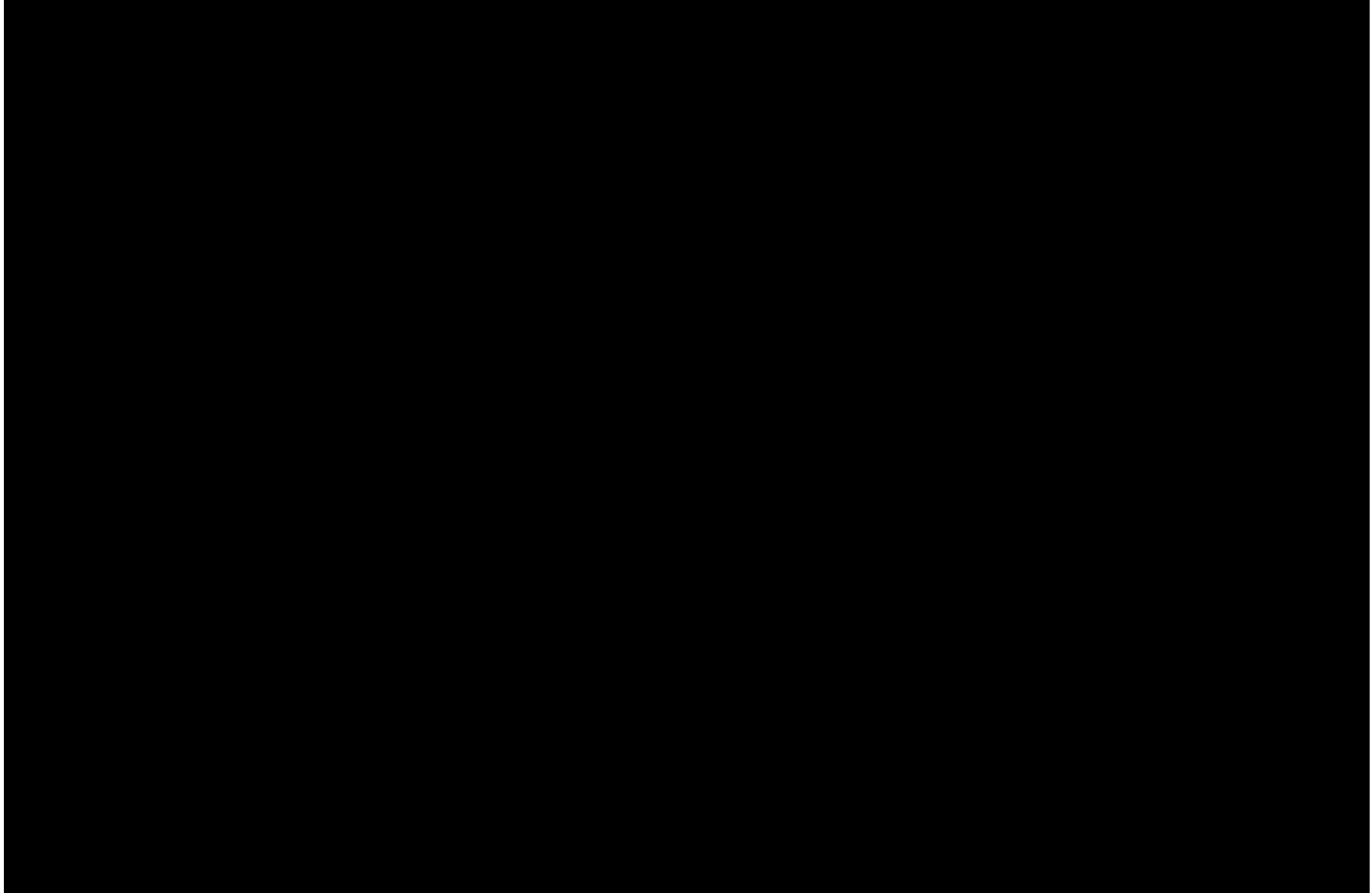
Ocean Wind will rely on an experienced team to lead and manage the successful implementation of the Project throughout all aspects of development. Ørsted has successfully employed similar management models on dozens of previous projects.

1.3 Key Employee experience

N.J.A.C. 14:8-6.5(a)(1)(ii). The applicant shall describe any work done to date by the key employees in developing projects of similar scope, especially any ocean-based energy project or New Jersey large scale energy project siting work;

Ørsted's leadership in global offshore wind development is unparalleled with nearly three times the installed capacity of its closest competitors (see Section 1.4 for additional details). Over the past 25 years, Ørsted has constructed 5.1 gigawatts (GW) of offshore wind capacity, with another 5.6 GW under construction, taking its operation base to 9.0 GW of capacity by 2022. In short, Ørsted is in the unique position of having and fostering a deep talent pool of personnel to draw from with hands-on experience developing, constructing, and operating projects of a similar scope. Table 1-2 is a list of previous projects and the involvement of the Key Employees in the projects to demonstrate the relevant experience of the Key Employees who will develop the Project. The resume listing the experience for the PSEG Key Employee can be found in Attachment 1.1.

Table 1-1. Key Employees in the project organization, roles, and experience.



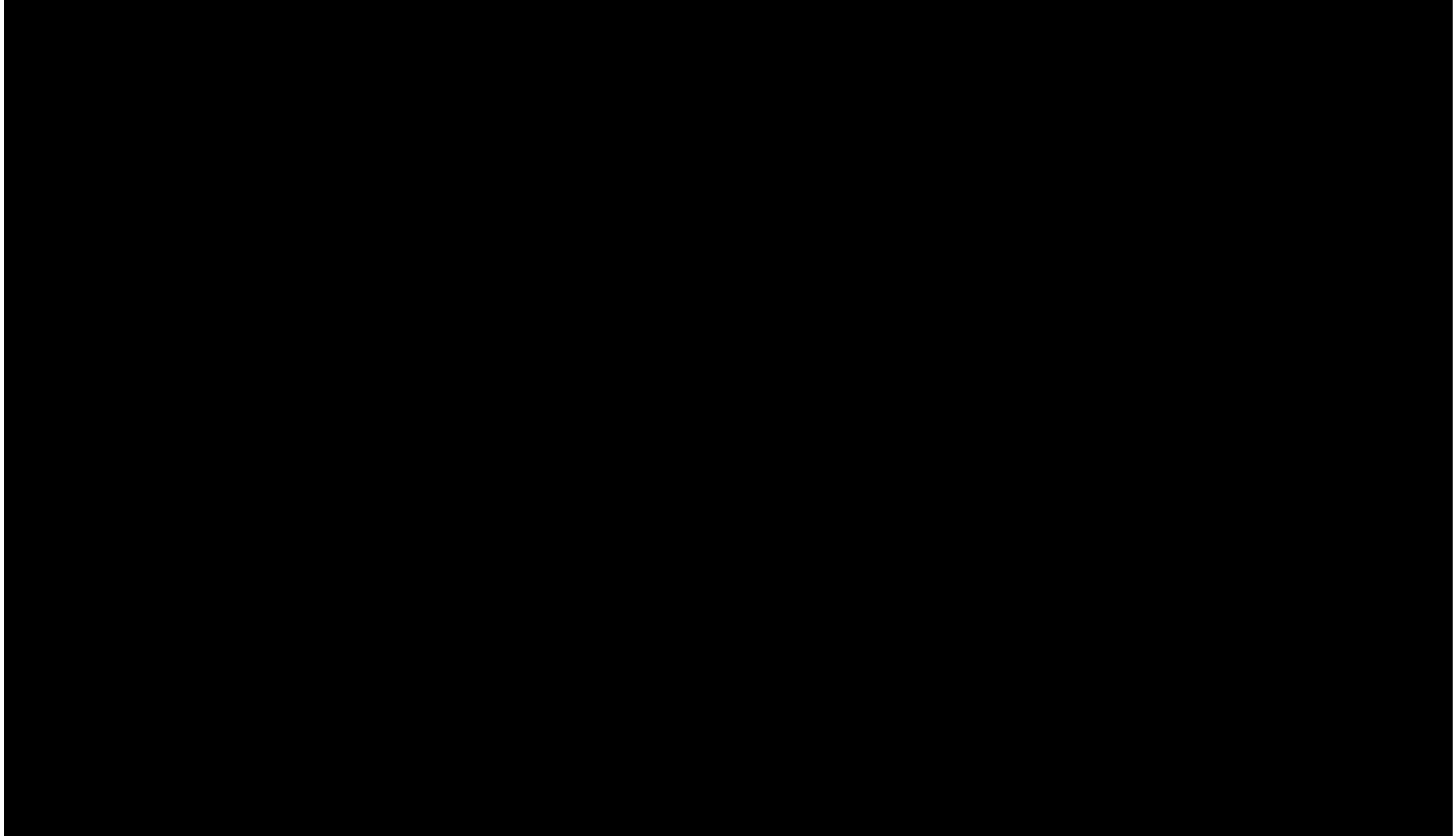


Table 1-2. Previous projects, key and other employees.

Project/Program	Location	Offshore / Nearshore	Size	Technology	Employee(s)	In-Service Date	Status
Anholt	Kattegat (DK)	Offshore wind	400 MW	Siemens Gamesa SWT-3.6-120		2013	In operation
Avedøre Holme	Øresund (DK)	Nearshore wind	10.8 MW	Siemens Gamesa SWT-3.6-107/120		2009 / 2011	In operation
Horns Rev 2	North Sea (DK)	Offshore wind	209.3 MW	Siemens Gamesa SWT-2.3-93		2010	In operation
Horns Rev 1	North Sea (DK)	Offshore wind	160 MW	Vestas V80-2 MW		2003	In operation
Nysted	Fehmarnbelt (DK)	Offshore wind	165.6 MW	Bonus SWT 2.3-82		2003	In operation
Vindeby	Smålandsfarvandet (DK)	Offshore wind	4.95 MW	Bonus B35/450		1991	Decommissioned
OWP West	North Sea (DE)	Offshore wind	240 MW	TBD		2024	Under development
Borkum Riffgrund West 2	North Sea (DE)	Offshore wind	240 MW	TBD		2024	Under development
Gode Wind 3	North Sea (DE)	Offshore wind	110 MW	TBD		2023	Under development
Borkum Riffgrund 2	North Sea (DE)	Offshore wind	450 MW	MVOW 8.3 MW-164		2018	Under development

Project/Program	Location	Offshore / Nearshore	Size	Technology	Employee(s)	In-Service Date	Status
Code Wind 1	North Sea (DE)	Offshore wind	380 MW	Siemens SWT 6.0-154		2016	In operation
Code Wind 2	North Sea (DE)	Offshore wind	252 MW	Siemens SWT 6.0-154		2016	In operation
Borkum Riffgrund 1	North Sea (DE)	Offshore wind	312 MW	Siemens SWT 4.0-120		2015	In operation
Borssele 1 & 2	North Sea (NL)	Offshore wind	752 MW	Siemens Gamesa 8 MW		2020	Under construction
Hornsea 2	North Sea (UK)	Offshore wind	1,386 MW	TBD		2022	Under development
Hornsea 1	North Sea (UK)	Offshore wind	1,200 MW	TBD		2020	Under construction
Walney Extension	Irish Sea (UK)	Offshore wind	660 MW	MHI-Vestas V164-8.0 MW and Siemens SWT-7.0-154		2018	Under construction
Race Bank	North Sea (UK)	Offshore wind	573 MW	SWT-6.0-154		2018	Under construction
Burbo Bank Extension	Irish Sea (UK)	Offshore wind	258 MW	V164-8.0 MW (MHI Vestas Offshore Wind)		2017	In operation
Westernmost Rough	North Sea (UK)	Offshore wind	210 MW	SWT-6.0-154		2015	In operation
West of Duddon Sands	Irish Sea (UK)	Offshore wind	388.8 MW	SWT-3.6-120		2014	In operation

Project/Program	Location	Offshore / Nearshore	Size	Technology	Employee(s)	In-Service Date	Status
Gunfleet Sands Demo	Thames Estuary (UK)	Offshore wind	12 MW	SWT-6.0-120	[REDACTED]	2013	In operation
Lincs	North Sea (UK)	Offshore wind	270 MW	SWT-3.6-120		2013	In operation
London Array 1	Thames Estuary (UK)	Offshore wind	630 MW	SWT-3.6-120		2013	In operation
Walney 1	Irish Sea (UK)	Offshore wind	183.6 MW	SWT-3.6-107		2011	In operation
Walney 2	Irish Sea (UK)	Offshore wind	183.6 MW	SWT-3.6-120		2011	In operation
Gunfleet Sands 1	Thames Estuary (UK)	Offshore wind	108 MW	SWT-3.6-107		2010	In operation
Gunfleet Sands 2	Thames Estuary (UK)	Offshore wind	64.8 MW	SWT-3.6-107		2010	In operation
Burbo Bank	Irish Sea (UK)	Offshore wind	90 MW	SWT-3.6-107		2007	In operation
Barrow	Irish Sea (UK)	Offshore wind	90 MW	V90-3 MW Offshore (Vestas)		2006	In operation
Block Island	Rhode Island (US)	Offshore Wind	30 MW	GE Haliade		2016	In operation
Formosa 1 – Phase I	Taiwan Strait (TW)	Offshore wind	8 MW	4.0 MW SWT-120		2017	In operation
Formosa 1 – Phase II	Taiwan Strait (TW)	Offshore wind	8 MW	4.0 MW SWT-120		2017	In operation
CHW01+02a	Taiwan	Off shore wind	900 MW	SGRE 8.0-167		2021	under development

Project/Program	Location	Offshore / Nearshore	Size	Technology	Employee(s)	In-Service Date	Status
Skipjack	Maryland (US)	Offshore Wind	120 MW	TBD	[REDACTED]	2022	Under development
South Fork	Rhode Island (US)	Offshore Wind	130 MW	TBD		2022	Under development
CHW02b+04	Taiwan	Offshore wind	920 MW	TBD		2023	under development
Revolution Wind	RI, CT (US)	Offshore wind	600 MW	TBD			
Bay State Wind	Massachusetts (US)	Offshore Wind	TBD	TBD		2023	Under development

Sources: Danish Energy Agency, Fraunhofer Institute for Solar Energy Systems and European Energy Exchange

DE = Germany NL = Netherlands UK = United Kingdom
 DK = Denmark TBD = to be determined US = United States of America
 MW = megawatts TW = Taiwan

1.4 Ocean Wind's experience and qualifications

N.J.A.C. 14:8-6.5(a)(2)(v). Applicants shall also provide the professional qualifications for the wind energy consultant as an attachment to the application to demonstrate sufficient expertise.

1.4.1 Ørsted's qualifications

Ørsted is the world's largest developer of offshore wind and the only company to have successfully navigated the permitting, legal, financial, installation and operational challenges of offshore wind in Europe, in Asia, and in America.

Over the past 25 years, Ørsted has constructed 5.1 GW of offshore wind capacity – approximately 30 percent of the world's total installed offshore wind capacity (see Table 1-2), three times that of Ocean Wind's nearest competitor. Ørsted's existing activities span a number of markets which include Denmark (DK), the United Kingdom (UK), Germany (DE), the Netherlands (NL), the United States (US), and Taiwan (TW).

Ørsted's unparalleled offshore wind experience:

- 25+ years of experience
- 2,000+ dedicated employees
- Dedicated in-house EPC arm
- 25 operational projects
- 5.1 GW constructed capacity
- 7 projects under construction
- 8.8 GW of capacity by 2022
- First and only major offshore wind farm decommissioning

Ørsted has also become the go-to partner for states up and down America's eastern seaboard as they seek to develop offshore wind resources. In addition to successfully constructing America's first offshore wind farm, off the coast of Rhode Island, Ørsted has also been awarded contracts to develop the first offshore wind farms for New York, Virginia, Maryland and Connecticut.

1.4.2 Ørsted's European experience

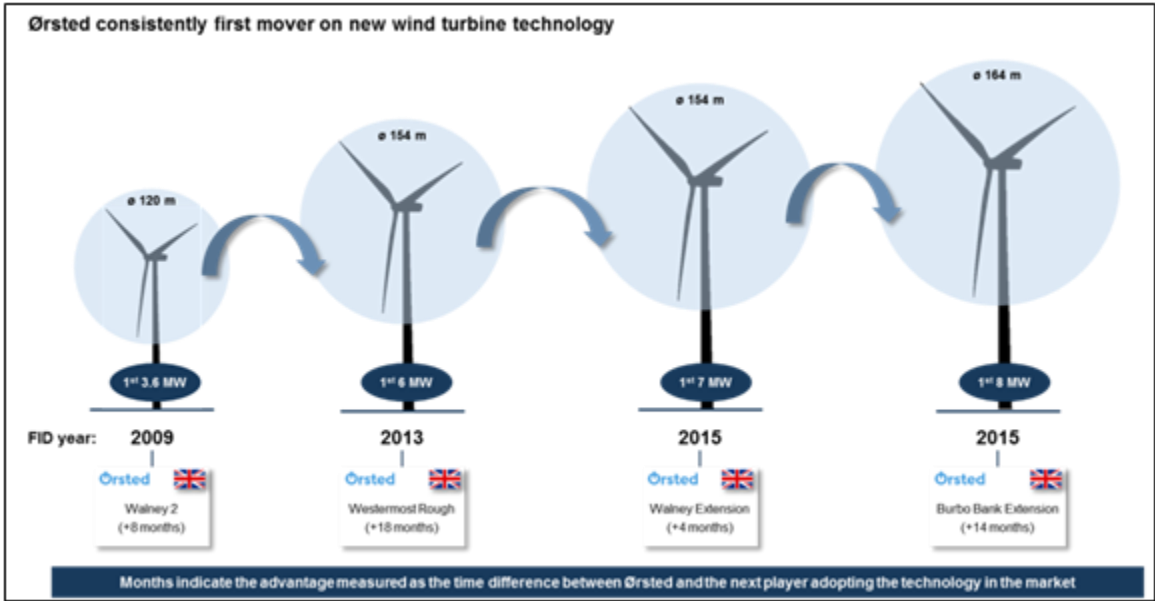
Ørsted's experience in European offshore wind development, construction, operation, and decommissioning is relevant to the Ocean Wind Project. A partial list of previous projects is provided in Table 1-2. Examples of Ørsted's applicable expertise in development and operations of offshore wind energy projects include:

- Designed and constructed the largest wind farm in operation today (London Array);
- Successfully executed development of over 20 competitively-awarded projects;
- Awarded contracts to develop what will be the largest wind farms in the world once constructed (Hornsea 1 and 2's combined 2,600 megawatts [MW]);
- Permitted complex projects with input and consent required from numerous stakeholders including regulatory agencies, non-governmental organizations, and the fishing industry;
- Designed and planned high voltage (HV) transmission solutions capable of delivering power from offshore wind projects to the identified onshore grid connection point, from as far away as 50 miles (Walney Extension, Race Bank, and Hornsea 1);
- Constructed offshore wind farms in challenging marine environments, including far from shore projects, high wave heights, high wind speeds and rough sea conditions;

- First [redacted]; and
- First [redacted]

Based on this experience gained from the development, construction, and operation of offshore projects in Europe, Ørsted has designed the Ocean Wind project using technical solutions that are appropriate and proven. Ørsted’s understanding of lifecycle cost and risk, gained from almost three decades of offshore wind experience, allows capture of the first-mover advantage on key technology, as demonstrated in Figure 1-3.

Figure 1-3. First mover advantage on WTG technology.



Ørsted’s “develop, build, own, and operate model” means the company is invested in the long-term success of the wind farm. Ørsted remains responsible for delivering on its promises over the life of the asset; the company’s decades-long track record demonstrates that it lives up to its commitments. Ørsted’s financial success is inextricably linked to the performance of generation assets over their useful life. This means that Ocean Wind’s interests are well aligned with those of the New Jersey ratepayers.

1.4.3 Ørsted’s American experience

Ørsted has established itself as the clear leader in the United States through its recent acquisition of Deepwater Wind and its portfolio, as well as the integration of the legacy Deepwater Wind team into its own management. The resulting American-based development team has unmatched experience in all aspects of offshore wind development through the largest portfolio in the country.

1.4.3.1 Block Island Wind Farm

America's first offshore wind farm – the 30 MW Block Island Wind Farm (BIWF) – began commercial operations in December 2016 and generates enough power for 17,000 homes each year. In connection with the BIWF project, the Ørsted team also developed a transmission system – the Block Island Transmission System (BITS) – 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. Together, these two projects provide the equivalent of firm power to the Block Island Power Company, which enabled it to retire its existing diesel-fired generating station in 2017 when the BIWF project commenced commercial operations.

The Ørsted team 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 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 Rhode Island Coastal Resource Management Council (CRMC). The BIWF project required permits or consultation with more than 20 federal, state, and local authorities.

Through the development of the BIWF project, the Ørsted team 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. The Ørsted team 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.

1.4.3.2 South Fork Wind Farm

The Ørsted team is actively developing the South Fork Wind Farm – a 130 MW offshore wind farm located approximately 35 miles east of Montauk, New York. It 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" – and is scheduled to come online in December 2022.

The Ørsted team 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 January 2017, the Long Island Power Authority (LIPA) Board of Trustees approved a Power Purchase Agreement (PPA) with South Fork Wind. As with BIWF, the Ørsted team has implemented a comprehensive stakeholder and community engagement program for the South Fork Wind Farm project that has received strong community support.

1.4.3.3 Skipjack Wind Farm

The Ørsted team 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. Following receipt of a fully-approved, un-appealable order from the Maryland Public Service Commission in May 2017, the Skipjack Wind Farm will be in-service by the end of 2022.

1.4.3.4 Revolution Wind

The Revolution Wind project is a new offshore wind farm to be located in the Rhode Island-Massachusetts Wind Energy Area (WEA). In May and June 2018 Deepwater Wind was selected to receive PPAs by the States of Rhode Island and Connecticut respectively, which collectively total 600 MWs of nominal nameplate capacity. The Revolution Wind project is scheduled to commence commercial operations in December 2023.

1.4.4 PSEG's qualifications and experience

PSEG is a diversified energy company, with operations primarily in the Northeastern and Mid-Atlantic regions. PSEG's principal direct wholly owned subsidiaries are Public Service Electric and Gas Company (PSE&G) and PSEG Power LLC (PSEG Power). Through its indirect wholly owned subsidiary, PSEG Renewable, PSEG has the option to acquire [REDACTED]

PSE&G is a public utility engaged principally in the transmission of electricity and distribution of electricity and natural gas in certain areas of New Jersey. PSE&G also invests in solar generation projects and energy efficiency and related programs in New Jersey, which are regulated by the Board.

PSEG Power is a multi-regional energy supply company that integrates the operations of its merchant nuclear and fossil fuel generating assets with its power marketing businesses and fuel supply functions through competitive energy sales in well-developed energy markets primarily in the Northeast and Mid-Atlantic. In addition, PSEG Power owns and operates solar facilities in various states.

PSEG ER&T, a subsidiary of PSEG Power, operates a leading wholesale energy business in the Eastern United States. As the trading arm of PSEG Power, PSEG ER&T markets the output of PSEG Power's generation assets, acquires and hedges fuel and power, economically dispatches plants and trades numerous energy-related products.

[REDACTED]

1.5 Disclosures

N.J.A.C. 14:8-6.5(a)(1)(iv). The applicant shall disclose, in detail, any prior business bankruptcies, defaults, disbarments, investigations, indictments, or other actions against either the applicant, its parent company, affiliates, subsidiaries, or any key employees identified in (a)1i above;

There have been no business bankruptcies, defaults, disbarments, investigations, indictments, or other actions involving Ocean Wind or Key Employees.

See the annual reports referenced in Attachment 3.6, which disclose material litigation involving Ocean Wind’s affiliates. A historic Ocean Wind affiliate (Elsam Kraft A/S, which has now been merged with other Ørsted entities) was party to litigation in which the Danish competition authority found that it charged excessive prices in the Danish wholesale power market from July 1, 2003 through July 1, 2006. (Elsam Kraft A/S only became owned by Ørsted A/S on Jul. 1, 2006.) On appeal, however, the High Court of Western Denmark ruled in Ørsted’s favor on May 24, 2018 for the period of Jan. 1, 2005 through July 1, 2006; and the Danish Appeals Permission Board subsequently ruled that that decision may not be appealed to the Danish Supreme Court. Nevertheless, following the Danish competition authority’s finding, consumers also brought claims for damages, for which a litigation provision has been established; those claims remain pending notwithstanding Ørsted’s victory on appeal.

There are no bankruptcies, defaults, etc. for Key Employees.

1.6 Board Approvals

N.J.A.C. 14:8-6.5(a)(1)(v). The applicant shall, for the duration of the project, commit to: notifying the Board, within 30 days, of the departure of any key employee; submitting the expertise and qualifications for any new key employee for approval by the Board; seeking Board approval for any changes to the organizational structure of key employee positions and the level of expertise and qualifications of those key employees; and obtaining prior Board approval for an entity to assume a controlling interest in the proposed project or the approved qualified offshore wind project. Enforcement of this provision shall be a condition of the order granting ORECs;

Refer to the signed “New Jersey OREC Application Form for Qualified Offshore Wind Projects – Commitments” included in Attachment 18.1. As noted above, PSEG Renewable may exercise its option pursuant to the MOU [REDACTED]

[REDACTED]

1.7 Supplier Letters of Support

N.J.A.C. 14:8-6.5(a)(1)(vii). The applicant shall provide documentation, including, but not limited to, letters of intent/commitment/contract, to substantiate any claims that manufacturing services related to the qualified offshore wind project will be sourced from a New Jersey location;

(2) a letter of intent or memorandum of understanding from the turbine manufacturer/supplier to supply the selected turbines; a demonstration of the financial strength of the selected turbine manufacturer/supplier; a declaration from the foundation manufacturer/supplier that states their ability to manufacture and deliver all foundation components within the targeted schedule; a declaration from the undersea cable manufacturer/supplier that states their ability to manufacture and deliver all undersea cable components within the targeted schedule; a letter of intent or memorandum of understanding from the proposed engineering, procurement, and construction (EPC), balance of plant (BOP) contractor, and/or key construction contractors or vendors;

Ocean Wind has developed a Supply Chain Plan (see Attachment 2.3) that lists potential suppliers and the Project’s strategy for utilizing in-state companies and attracting suppliers to the State. Ørsted’s supply chain strategy embraces both long-term collaboration and open competition, optimizing supplier solutions for the Project while making room for new and innovative players to enter the industry.

[REDACTED]

1.8 Ocean Wind’s Master Plan - A Vision for New Jersey

N.J.A.C. 14:8-6.5(b)(1). The filing must be consistent with the New Jersey Energy Master Plan, adopted pursuant to section 12 of P.L. 1977, c. 146 (N.J.S.A. 52:27F-14), in effect at the time the Board deems the application complete;

As New Jersey lays out its 2019 Energy Master Plan, Ocean Wind believes it is important to comprehensively describe how the Project will contribute to the transition of New Jersey’s energy production profile to 100 percent clean energy sources by 2050. The Ocean Wind Lease Area has a total capacity of over 3,500 MW and will be developed [REDACTED] consistent with New Jersey’s energy demands.

Ocean Wind is filing this OREC application in strict compliance with the Board rules and guidance related to the solicitation for 1,100 MW of offshore wind. However, it is important to understand how the development of the Ocean Wind Lease Area contributes to the long-term economic and environmental objectives of the Master Plan. The Master Plan can provide many benefits for New Jersey and its residents and businesses [REDACTED]

[REDACTED] Ocean Wind is committed to New Jersey for decades to come. Many of the economic, social and environmental benefits that are of paramount importance to the people of New Jersey are not strictly quantified by this [REDACTED] application for the solicitation of 1.1 GW.

Understanding the “big picture” of Ørsted’s full build-out of the Ocean Wind site will demonstrate the unrivaled breadth and depth of Ørsted’s commitment to New Jersey and the opportunity that the development of this site presents to New Jersey’s economy, which no other project can achieve.

These benefits include:

- Jobs, training and workforce development;
- Supply chain development;
- Operations; and
- Price reduction and technological innovations

1.8.1 Ocean Wind by 2030

Ocean Wind’s Lease Area comprises a total of 160,000 acres off the coast of Atlantic City. The Lease Area can accommodate over 3,500 MW of offshore energy, enough generation to serve over two million New Jersey households. [REDACTED]

[REDACTED]

1.8.2 Ørsted’s core mission: long-term engagement

Ørsted is a global leader in the offshore wind market with 5.1 GW of power installed in four countries, providing 14 million people with clean energy. Ørsted is unique in that the company’s core competencies extend throughout the value chain: the company designs, develops, builds, owns, and operates its offshore wind farms. This integrated end-to-end business model consists of several core competencies. These include: (1) identifying and progressing viable projects through property acquisition, permitting, and offtake agreements, (2) designing, constructing, and managing sourcing and supply of both equipment and a skilled workforce, (3) operating the project and conducting maintenance and improvement as the company becomes embedded in the community, and (4) managing the asset and meeting ongoing local

commitments. This is unique in the offshore wind industry where developers typically subcontract to a general contractor that manages the engineering, procurement and construction of the wind farm (and which typically adds a significant risk premium to the cost of the project). This risk premium will not apply to Ocean Wind.

In the typical industry model, developers may sell the asset when it is commercially viable. In contrast, Ørsted’s “build to own” model means that the owners, builders and operators’ interests are aligned, so that there is a vested interest in the quality of the project. Ørsted maintains its stake in the project throughout the lifecycle, ensuring that it is responsible for the long-term success of the project and the eventual decommissioning. Ørsted is therefore motivated to ensure that the project is delivered on time, on budget, and serves the communities as promised. For communities served by the wind farm, this is an important consideration as there is a mutual long-term commitment from the company and the community to the success of the project. This model also reduces complexity for supply chain partners, as there are fewer entities involved in construction and an alignment of interests on safety, cost, and quality. Through its long record of successful project development, Ørsted has developed internal expertise that is not available to outside parties. This gives the company a unique advantage in developing future projects.

This completely integrated model gives the company the ability to design and optimize the Project with a view of the total life-cycle cost of the wind farm, reducing overall costs and producing greater value for the ratepayers. The company’s experience and expertise along the entire value chain allows for a greater understanding and management of risks, including political, commercial, public, construction, and other risks. Such an end to end model reduces the levelized cost of energy (LCOE) through fast feedback and learning across the entire Ørsted organization.

Ørsted excels at all aspects of the offshore wind business, allowing the Project to provide real timelines, real costs, real benefits and a true Master Plan perspective. Simply put, New Jersey can count on Ørsted delivering on its plans and commitments. Together, New Jersey and Ørsted can provide economic and environmental value to citizens through a long-term partnership in offshore wind.

1.8.2.1 Vision: jobs, training and workforce development

To successfully build and operate the Project, Ocean Wind will need a skilled local workforce. Ocean Wind is committed to working with New Jersey unions on construction training needs as well as working with local colleges such as Rowan University on training programs for long-term operations and maintenance jobs. The State’s long-term

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Ørsted was awarded multiple projects on the East Coast of the UK where Ørsted established an East Coast Hub in Grimsby. Projects include Hornsea 1, Hornsea 2, Westermost Rough, and Race Bank. Ørsted partnered with the Grimsby Institute to offer wind turbine technician apprenticeships.

This program is a three-year apprenticeship that consists of a year of classroom-based learning at the Grimsby Institute followed by two years working on site with Ørsted. If students successfully complete the engineering training program they become full-time employees at Ørsted.

The company also launched a recruiting campaign aimed at attracting additional wind turbine technicians responsible for maintaining and repairing turbines. Similar to the UK, [REDACTED] Ocean Wind will require long-term employees for the operation of the wind farm.

commitment to offshore wind guarantees a continued pipeline of project work and enables local educational institutions to invest in training programs. While early projects may require additional support from experienced workers who have supported other projects, later phase projects have the potential to phase out the use of external workers and use experienced local workers.

Rowan University is well positioned both technically and geographically to support workforce development for the offshore wind industry. They have a long history of and passion for bringing real-world opportunities to their students through hands-on training programs and engineering clinics. Ocean Wind has been in discussions with Rowan on ways it could support offshore wind operations and maintenance training at its main campus in Glassboro where it already has a large industrial park for training programs, materials testing, and other such programs. For example, with Ocean Wind's financial support, Rowan could erect a representative wind turbine tower to help train for climbing, repair, Operations & Maintenance (O&M), and health and safety. In addition, it already partners with other industry members with which there may be synergies for training and workforce development in the region.

With multiple projects coming online over the next decade, Ocean Wind is looking to partner with local institutions such as Rowan and Stockton University [REDACTED]

Ørsted is a recognized industry leader in its commitment to training workers for employment and in its major contributions to the development of industry wide standards. These industry standards, covering everything from the safety of turbine calibrations to the level of training required for employment throughout the offshore wind value chain, are now used to certify wind farms and wind farm components, (i.e., the bricks and mortar), as well as the workforce itself.

Ørsted is an original member of the G+, a global health and safety organization for the offshore wind industry. The organization brings together business leaders, health and safety experts and organizations operating in the industry to establish best management practices and promote world class safety performance across the sector.

Ørsted is also an important member of the Global Wind Organisation (GWO), a world-wide training body that underwrites and coordinates training for the wind sector (both on and offshore). GWO training standards establish the training courses recommended by members of the GWO. By complying with the GWO standards and criteria, certified Training Providers are considered by GWO members to be competent and proficient. Any individual with a GWO certificate is deemed knowledgeable within the field of basic safety in the wind industry and receives a Basic Safety Training (BST) certificate. This certificate serves as a confirmation that a technician or other wind turbine professional possesses the knowledge to stop unsafe work situations. All of these standards and training guidelines were developed with Ørsted expertise and are now in the public domain.

Ørsted's commitment to the development of a certified competent work force is long standing across the globe. Ocean Wind's commitment to training a New Jersey workforce is outlined in the Economic Development Plan (Section 16). With a full build-out of the Lease Area, Ocean Wind will make New Jersey a hub of excellence for training and standard development.

Ørsted recognizes the vital link that offshore wind can be in the economic growth and stability chain for the State of New Jersey. The company is eager to provide job growth in the technological, scientific and clean energy sectors. By investing in New Jersey’s workforce, Ocean Wind will continue to foster local, site specific workforce assistance at the same time that the company fosters workforce education globally. To support the 3.5-GW State commitment, Ocean Wind is committed to developing a competent, safety-proficient workforce to fuel New Jersey’s growing clean energy sector.

1.8.2.2 Vision: supply chain development

The creation of a supply chain is one of the premier benefits of establishing New Jersey as a hub for the offshore wind industry. Ørsted has fostered the creation of a robust supply chain in Europe and has the experience and project capacity to enable similar development in the US. The company’s experience in the UK in particular will help inform the supply chain approach in New Jersey, to the benefit of both Ocean Wind and the State.

Like New Jersey, the UK government established a clear offshore wind commitment and provided certainty for a 10-year procurement pipeline. This 10-year commitment led to the efficient phasing in of the project pipeline which in turn led to the appropriate phasing of the supply chain.

In the UK, Ørsted began with a long-term, hands-on commitment like the company is making to New Jersey. In the Humber region of the UK, the Company developed a partnership with a local entity, Offshore Structures Britain (OSB), to build, manage and maintain a transition piece (TP) Facility. OSB began by re-furbishing existing facilities for the Burbo Bank Project. Ørsted worked closely with OSB to provide personnel and expertise, transferring the company’s expertise on TP design and manufacturing to OSB. Transferring expertise and developing supply chain sophistication ensured that OSB was able to build a facility to meet Ørsted’s long-term project needs and produce the necessary components.

A long-range approach, such as New Jersey’s Offshore Wind Master Plan, [REDACTED] allows the Company to work with strategic partners and suppliers on manufacturing facilities that require long-term customer commitments. Ørsted has also worked with a UK foundation fabricator, supporting the sourcing of the Company’s supply. Ørsted informed the supplier about the exact components needed for foundations so the company could purchase the appropriate parts for the Project. In this way, Ørsted has consistently deployed its resources to invest and grow the local supply chain in the UK.

In the UK today, there are 11 operational wind farms employing over 900 UK workers, totaling approximately \$7.6 billion of UK investment and contracting with nearly 100 UK supply chain companies. Ørsted is eager to begin similar project and supply chain development in New Jersey.

1.8.2.3 Vision: operations

For the first phase of development, Ocean Wind is establishing an O&M site in South Jersey, [REDACTED]

However, there are also additional direct and indirect jobs created and a need for the development of additional O&M facilities.

In the UK, the East Coast Hub consisted of a facility initially designed to support Westernmost Rough, Race Bank and Hornsea 1 (see Figure 1-4). However, the facility was built with the capacity to support other East Coast wind farms in the Ørsted pipeline. The facility is a multi-million-dollar establishment which, when it was built, transformed the way wind farms were supported. The operational hub includes a marine coordination center, a warehouse to store components, and is served by high-tech vessels capable of accommodating up to 60 crew and technicians while remaining at sea for long periods of time. The company chartered state-of-the-art Service Operational Vessels (SOVs) that were supplied by Ostensjo Rederi and designed by Rolls-Royce. Crews of technicians from Ørsted and turbine supplier Siemens work together on those vessels for shifts of two weeks. This operational hub in Grimsby created both direct and indirect job opportunities in the UK's Humber region and helped support the local supply chain. By 2019, the company expects to have invested around \$7.5 billion in the Humber region.

Figure 1-4. East Coast Hub operations and maintenance facility.



With the development of Ocean Wind on a similar trajectory to Ørsted's UK projects, the company would utilize its experience to employ a similar strategy for servicing wind farms from an operational center in South Jersey. Just as the Grimsby Hub does in the UK, an operational center in South Jersey would represent a vote of confidence in the New Jersey offshore wind industry and confirm the company's long-term commitment to the region.

1.8.2.4 Vision: price reduction and technological innovations

Perhaps the most illustrative example of the benefits of the Master Plan for Ocean Wind is seen in the area of innovation and technology development. New technologies are developed in the most robust, well established pipelines. The more familiar the region and development, the more likely it is for Ørsted or a supplier to identify opportunities for innovation and take the time and bear the risks of creating new methods or deploying new physical components.

In well-established, larger markets, Ørsted may establish areas within a lease block for a technology carve out. This area of technology carve out can be used by universities, Non-Government Organizations (NGOs) and industry-wide organizations as laboratories for innovation. In Europe, Ørsted works with the Offshore Wind Accelerator (OWA), a joint collaborative R&D initiative established by the Carbon Trust and nine offshore wind developers. The initiative aims to reduce the cost of offshore wind, overcome market barriers, develop industry best practices and trigger the development of new industry standards. The OWA prioritizes projects based on likely savings and potential for OWA to influence the outcomes.

Ørsted's most recent R&D project through the OWA is the Pile Soil Analysis (PSA), a research project aimed at investigating how monopiles (MPs) behave in different soil and environmental conditions to refine the design methodologies reducing fabrication costs. The project has been led by Ørsted through the OWA; collaborating partners include the University of Oxford, Imperial College London and Environmental, Social and Governance amongst others. The project involved large scale field tests of 28 MPs at two different onshore sites and has shown some very encouraging results which could offer significant improvements to design methodologies.

[REDACTED]
[REDACTED]
[REDACTED] New Jersey has established itself as a leader in the development of offshore wind and by continuing to lead through solicitations of 1,200 MW in 2020 and 2022, the State can mature the in-state industry to enable greater innovation.

1.8.3 PSEG

PSEG was an early and consistent supporter of offshore wind in New Jersey, through its Garden State Offshore Energy (GSOE) Joint Venture with Deepwater Wind, which was formed in 2007. GSOE was a winning bidder in the 2008 New Jersey solicitation for offshore wind, although the state ultimately decided not to pursue offshore wind at that time. In addition, PSEG has a long-standing commitment to developing and investing in programs that support wider use of clean and renewable energy, green jobs, and economic growth in New Jersey. PSEG is excited to combine its vision for a clean energy future with its decade-long commitment to offshore wind to help Governor Murphy achieve his stated goal of bringing 3,500 MWs of clean, renewable offshore wind to New Jersey.

PSEG strives to be a leader in building an economically strong, environmentally responsible energy future. Environmental stewardship and sustainability are deeply woven into its history, and PSEG believes that environmental stewardship and its focus on sustainability align with its

corporate vision of “people providing safe, reliable, economic and greener energy” PSEG has taken bold steps toward a low-carbon future. The company is an active advocate for energy efficiency adoption, renewable energy development, vehicle electrification and clean power generation which, along with its commitment to offshore wind, will help move New Jersey toward a low-carbon future.

During 2018, PSEG was named — for the 11th consecutive year — to the Dow Jones Sustainability North America Index, which recognizes companies for their commitment to economic, environmental and social responsibility.

PSEG is pursuing aggressive action to address the threat of climate change. Recently, PSEG announced an ambitious new climate goal to reduce its carbon footprint by 13 million metric tons of carbon dioxide (CO₂)-equivalent emissions by 2030, from 2005 levels. The development of renewables, such as offshore wind, will continue to occupy center stage in the transformation of the energy sector. New Jersey, under the leadership of Governor Phil Murphy, is embarking upon the nation’s largest effort to develop offshore wind generation – a significant step toward New Jersey’s goal of 3,500 MW of offshore wind by 2030 and achieving 100% carbon free generation by 2050. PSEG is excited to participate in making this effort a reality.

PSE&G submitted a \$4 billion Clean Energy Future program to the BPU earlier this year, to make critical investments in clean energy and advanced technology that would help make New Jersey a national leader in energy efficiency and jumpstart other clean energy priorities consistent with the state’s Clean Energy Law passed in May 2018.

PSE&G’s proposal is among the most significant advances in New Jersey energy policy ever presented in this state. It calls for historic investments in energy efficiency, electric vehicle charging infrastructure, utility-scale energy storage capabilities, and technology that will help PSE&G take great leaps forward in reliability and resiliency.

The energy efficiency proposal has the potential to remove approximately 24 million tons of CO₂ over its lifetime.

Business information – Attachments

Attachment 1.1 – Resumes for Key Employees and other employees

Attachment 1.1 – Resumes for Key Employees and Other Employees

REDACTED FROM PUBLIC COPY

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Attachment 2.5 – Wind Energy Assessment

Attachment 2.6 – PJM RPM Capacity Calculation

2 Project description

Project description – Summary

Core message

Ocean Wind is putting New Jersey first with every aspect of this proposal. Ocean Wind is offering [REDACTED] economic development benefits. Ocean Wind has assembled the team that New Jersey can most depend upon to deliver its first offshore wind farm, which combines Ørsted’s global leadership in offshore wind engineering, procurement and construction with the former Deepwater Wind’s capabilities in permitting and project development with PSEG’s unmatched experience permitting, constructing and operating transmission assets in New Jersey.

Ørsted’s US and global offshore wind experience ensures that Ocean Wind is the most beneficial, credible, and viable Project for the State of New Jersey. Ocean Wind’s technical design was developed using the skills and knowledge of an engineering team whose experience is unmatched in the offshore wind industry. As described in Section 1, the Ocean Wind team has a depth of experience in designing and executing successful offshore wind farms that spans multiple markets and has a successful track record that is unrivalled.

Project description – Checklist

The information required under N.J.A.C. 14:8-6.5 is cross referenced to the associated document sections in the checklist below.

Checklist Item	Document Reference
Type, size, and number of proposed turbines and foundations N.J.A.C. 14:8-6.5(a)(2).	Attachment 2.1
History, to date, of the same type, size, and manufacturer of installed turbines and foundations globally N.J.A.C. 14:8-6.5(a)(2).	Section 2.1
Configuration of turbine array, location of cable and system equipment, and a description of points of interconnection N.J.A.C. 14:8-6.5(a)(2)	Section 2.1
Detailed implementation plan and schedule N.J.A.C. 14:8-6.5(a)(2)	Section 2.6
Letter of intent from the turbine manufacturer/supplier proposed EPC, balance of plant (BOP) contractor, and/or key construction contractors or vendors N.J.A.C. 14:8-6.5(a)(2)	Section 2.7
Demonstration of experience N.J.A.C. 14:8-6.5(a)(2)(i)	Section 2.8
Financial strength of turbine manufacturer N.J.A.C. 14:8-6.5(a)(2)	Section 2.7
Foundation manufacturer affirming ability to deliver N.J.A.C. 14:8-6.5(a)(2)	Section 2.7
Undersea cable manufacturer affirming ability to deliver N.J.A.C. 14:8-6.5(a)(2)	Section 2.7

Checklist Item	Document Reference
Wind turbine generator certification. N.J.A.C. 14:8-6.5(a)(2)	Section 2.7
Demonstrate applicable experience in projects of the size and scope proposed N.J.A.C. 14:8-6.5(a)(2)(i)(1)	Section 2.8
Demonstrate that the wind technology is viable, cost competitive, and suitable for use under varying and expected meteorological and climate conditions; N.J.A.C. 14:8-6.5(a)(2)(i)(2)	Section 2.9
Indicate the areas used for all aspects of the project including the location(s), the construction staging area(s), and port usage; N.J.A.C. 14:8-6.5(a)(2)(i)(3)	Section 2.4
Include a map with the location of the site(s) clearly marked by lat/long and the BOEM R&E [regulation and enforcement] block numbers; N.J.A.C. 14:8-6.5(a)(2)(i)(4)	Section 2.8
Describe any current uses, conflicts, or characteristics of the ocean and land areas identified pursuant to (a)(2)(i)(4) above; N.J.A.C. 14:8-6.5(a)(2)(i)(5)	Section 2.2
Specify whether the project is located at one site, or divided among several sites; N.J.A.C. 14:8-6.5(a)(2)(i)(6)	Section 2.2
Define the attributes which make the site(s) attractive and list any potential problems, constraints or limitations with siting an energy facility at that location or locations; N.J.A.C. 14:8-6.5(a)(2)(i)(7)	Section 2.2
To the fullest extent possible, indicate the major types of equipment that have been selected to be installed, and the characteristics specified; N.J.A.C. 14:8-6.5(a)(2)(i)(8)	Section 2.2
Indicate whether the project team plans to own or lease equipment; N.J.A.C. 14:8-6.5(a)(2)(i)(9)	Section 2.1
Describe the selected equipment, the specifications, warranties, how long it has been commercially available, approximately how many are currently in service, and where they are installed; N.J.A.C. 14:8-6.5(a)(2)(i)(10)	Section 2.2
Include a description of the ability of the equipment to work in New Jersey's offshore and near shore climates and the basis for that conclusion; and N.J.A.C. 14:8-6.5(a)(2)(i)(11)	Section 2.9
Indicate the equipment's delivery time once an order has been placed. N.J.A.C. 14:8-6.5(a)(2)(i)(12)	Section 2.1
Affirm right to replace or update equipment identified in the proposal with more technologically advanced equipment that is equal to or better than the equipment subject to Board approval. N.J.A.C. 14:8-6.5(a)(2)(ii)	Section 2.2
Describe construction plans in detail, identifying proposed subcontractors, with evidence of the capability of performing necessary tasks, as well as proposed time frames for completion of all necessary tasks. N.J.A.C. 14:8-6.5(a)(2)(iii)	Section 2.7
Identify all applicable Federal and State statutes and regulations and municipal code requirements, with the names of the Federal, State and local agencies to contact for compliance, and a commitment to provide proof of all such compliance on an ongoing basis. N.J.A.C. 14:8-6.5(a)(2)(iv)	Section 2.4
Indicate the proposed nameplate capacity for the entire project and the anticipated number of individual units for the selected technology N.J.A.C. 14:8-6.5(a)(2)(v)	Section 2.9
Estimate the net yearly energy output for the project, accounting for losses and include any assumptions, such as the assumed capacity factor, that are the basis for the estimate; N.J.A.C. 14:8-6.5(a)(2)(v)	Section 2.9

Checklist Item	Document Reference
Provide a wind resource and energy assessment from a wind energy consultant for the exact manufacturer, model, and specifications of turbines selected for the project; N.J.A.C. 14:8-6.5(a)(2)(v)	Section 2.9
Provide the professional qualifications for the wind energy consultant as documentation to the application to demonstrate sufficient expertise. N.J.A.C. 14:8-6.5(a)(2)(v)	Section 2.9
Account for, to the fullest extent possible, the coincidence between time of generation for the project and peak electricity demand: N.J.A.C. 14:8-6.5(a)(2)(vi)	Section 2.9
Provide an estimate, with documented support, of the amount of electrical capacity the project will make available, that is calculated consistent with PJM rules and procedures; Provide an estimate, with support, of the amount of energy being generated over the term of the life of the turbines; and N.J.A.C. 14:8-6.5(a)(2)(vi)	Section 2.7
Estimate, with support, the level of generation that their proposed project will be able to provide over the life of the equipment, assuming the project runs for the equipment's full life. N.J.A.C. 14:8-6.5(a)(2)(vi)	Section 2.9

Project description – Documentation

Ocean Wind has carefully crafted its Project offerings to help the State of New Jersey meet its nation-leading offshore wind target, as well as its goals of establishing an enduring local supply chain with the first-in-the-nation permanent largescale offshore wind workforce.

[REDACTED]

Through Ørsted’s globally unmatched capabilities in engineering, procurement and construction, Ocean Wind is able develop, build, operate, and maintain a cost-effect utility-scale offshore wind farm that will deliver tremendous value to the State and its ratepayers, as detailed in Sections 11 and 16. Every single component of the Project will be robustly built.

In 1991, Ørsted built the first offshore wind farm in the world.

In 2016, Ørsted built the first offshore wind farm in America.

As of today, Ørsted has constructed roughly 25 percent of all the offshore wind generating capacity in operation globally.

By leveraging the development expertise of Deepwater Wind, which was recently acquired by Ørsted, Ocean Wind is able to ensure that its Project is delivered with the highest-possible level of public support and the least controversy. As an example, Ørsted is committed to minimizing the visual and environmental impacts on the New Jersey coastline. The location of the Project has been strategically selected to minimize the visual impacts on the New Jersey coastline while maximizing the wind resource captured by the WTGs. The Ocean Wind team has voluntarily incorporated this Design Basis after extensive engagement with coastal communities and environmental advocates, showing Ørsted’s ability to listen to key stakeholders.

Through Ocean Wind's relationship with PSEG and its non-utility affiliates, if PSEG exercises its option to acquire [REDACTED] membership interest of the Ocean Wind, PSEG Renewable will coordinate with its affiliates subject to the Board affiliate rules, to lead the development, permitting and construction of the on-shore portions of the Project's transmission facility.

2.1 Project size [REDACTED]

Ocean Wind is pleased to offer the State of New Jersey [REDACTED]:

- a) [REDACTED]
- b) [REDACTED]
[REDACTED]
- c) [REDACTED]
[REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

[REDACTED]

Ocean Wind is pleased to include with the [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

[REDACTED]
[REDACTED]
[REDACTED] the
Project will consist of WTC foundations, associated inter-array cabling, new onshore and offshore

substations, transmission cables, and onshore work for connection to the wholesale electric grid. The Project may be developed and constructed in phases. The interconnection will be administered by PJM Interconnection LLC (PJM). The point of interconnection may vary, [REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

2.2 Major equipment

N.J.A.C. 14:8-6.5(a)(2). A detailed description of the project, including maps, surveys, and other visual aides. The description shall include, but need not be limited to: the type, size, and number of proposed turbines and foundations; the history, to date, of the same type, size, and manufacturer of installed turbines and foundations globally; the configuration of turbine array, location of cable and balance of system equipment, and a description of points of interconnection;

i. The project developers shall:

(8) To the fullest extent possible, indicate the major types of equipment that have been selected to be installed, and the characteristics specified;

(9) Indicate whether the project team plans to own or lease equipment;

(10) Describe the selected equipment, the specifications, warranties, how long it has been commercially available, approximately how many are currently in service, and where they are installed; where they are installed;

(11) Include a description of the ability of the equipment to work in New Jersey's offshore and near shore climates and the basis for that conclusion; and

(12) Indicate the equipment's delivery time once an order has been placed;

ii. For actual construction successful applicants are permitted to replace or update equipment identified in the proposal with more technologically advanced equipment that is equal to or better than the equipment identified in the proposal subject to Board approval.

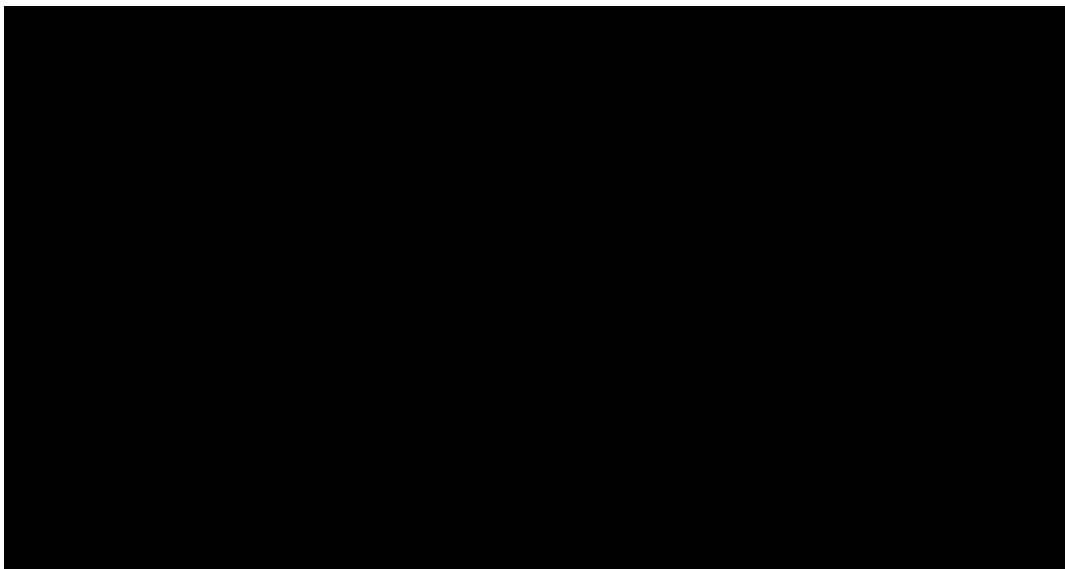
2.2.1 Project Design Basis

[REDACTED]
[REDACTED]
[REDACTED] The Design Basis sets a high bar for what Ocean Wind needs to achieve [REDACTED], a challenge Ørsted has successfully met many times.

Table 2-1 lists the technical solutions of the Project's Design Basis. [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

Sections 2.1.2 and 2.1.3 describe, [REDACTED], the major types of equipment that have been selected for the Design Basis. [REDACTED]. A complete list of components and major subcomponents needed is provided in Attachment 2.1.

Table 2-1. Ocean wind Design Basis.

A large rectangular area of the page is completely blacked out, indicating that the content of Table 2-1 has been redacted.

2.2.1.1 Foundations

The monopile/transition piece (MP/TP) foundation design for all of the WTG locations discussed in this section reflects the Design Basis¹ planned type of foundation based on the preliminary site data obtained for the Project. This foundation is Ørsted's preferred foundation in Europe and has been perfected over the past 17 years

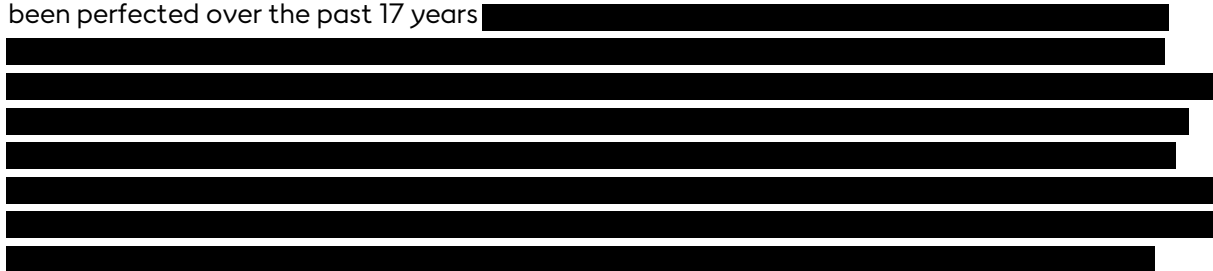
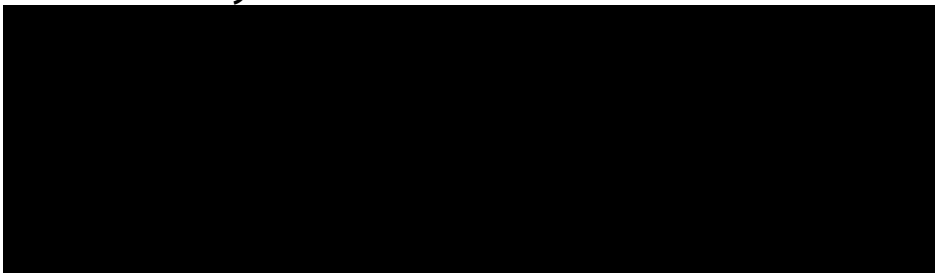
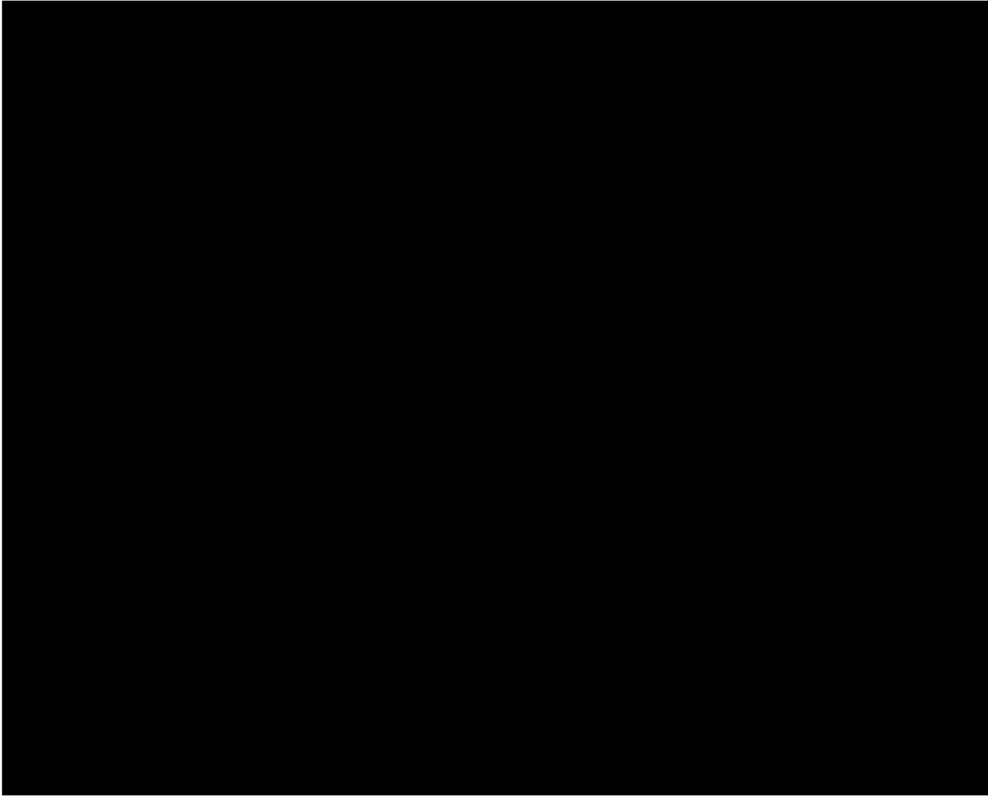
A block of text is redacted with multiple horizontal black bars of varying lengths, obscuring the details of the foundation design.

Table 2-2. Key MP/TP foundation details.

A large rectangular area of the page is completely blacked out, indicating that the content of Table 2-2 has been redacted.

¹ 



2.2.1.2 Wind turbine generator

The Design Basis of the Ocean Wind Project is the [REDACTED] Figure 2-2 and Figure 2-3 and detailed in Table 2-3. Attachment 2.2 provides the environmental product declaration and brochure for the WTG. [REDACTED]

[REDACTED]

The number of WTGs and foundations is provided in Attachment 2.1. [REDACTED]

[REDACTED]

[REDACTED]

² [REDACTED]

Table 2-3. WTG specifications (dimensions and weights).

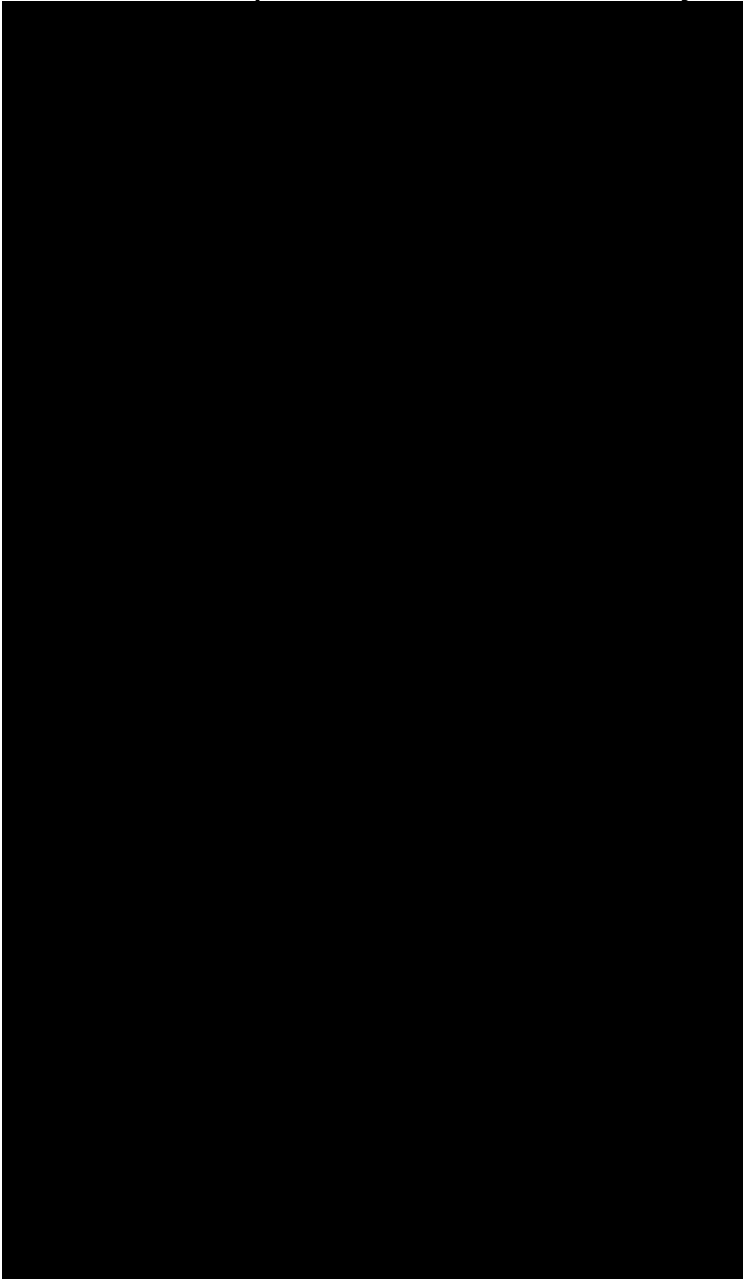


Figure 2-2. WTG exterior – Design Basis.

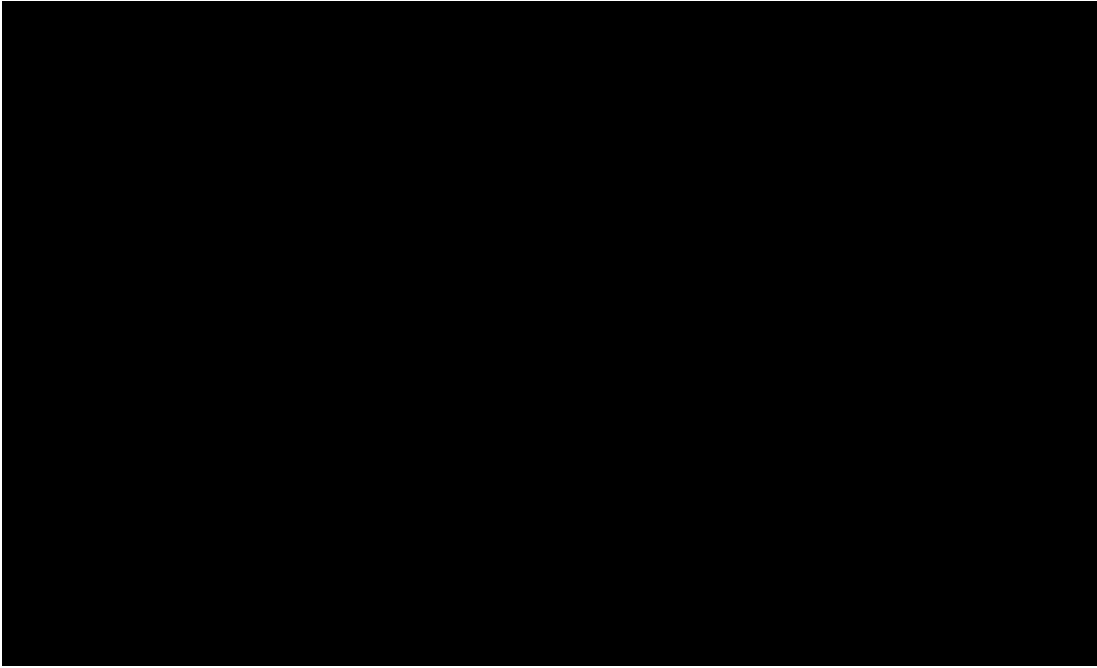


Figure 2-3. WTG interior – Design Basis.

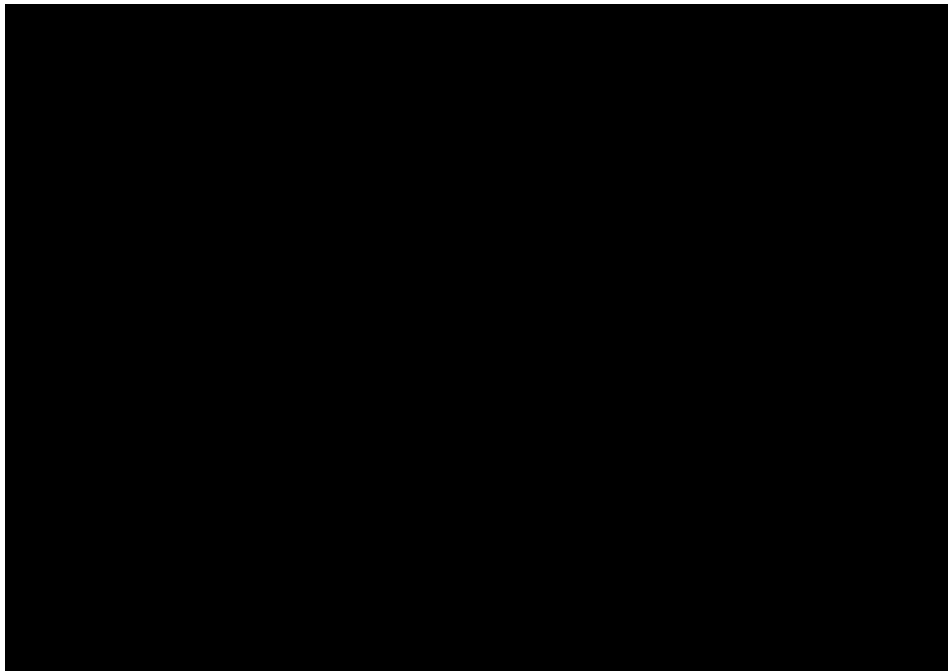


Table 2-4. [REDACTED].

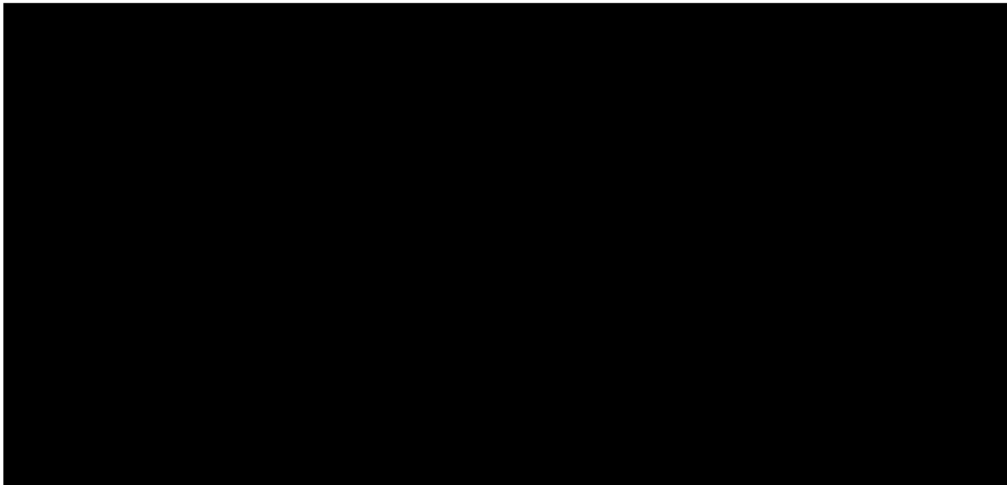
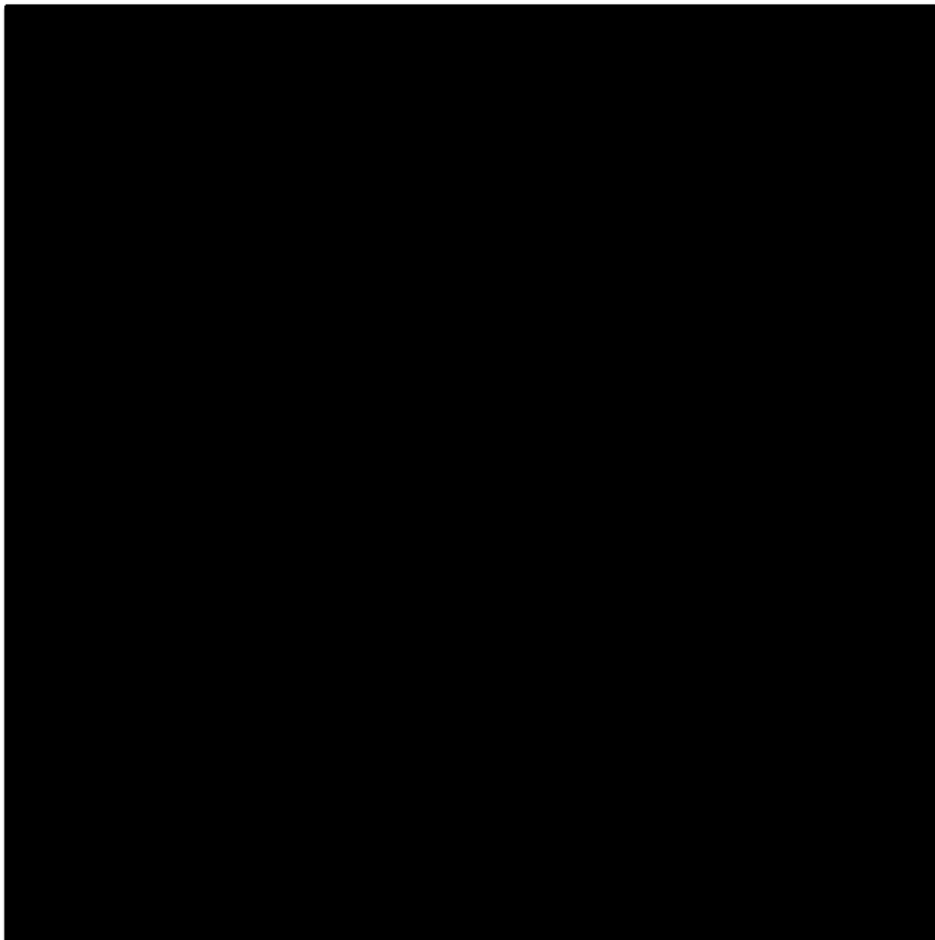
A large black rectangular redaction box covering the entire content of Table 2-4.

Figure 2-4. Unparalleled experience [REDACTED]



While the above-described WTG platform is [REDACTED] Ocean Wind's Design Basis, [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED] Existing installations and those under construction [REDACTED]
[REDACTED] are listed in Table 2-5. [REDACTED] The key details of the WTG platforms are compared in Table 2-6.

Table 2-5. Projects using the [REDACTED]

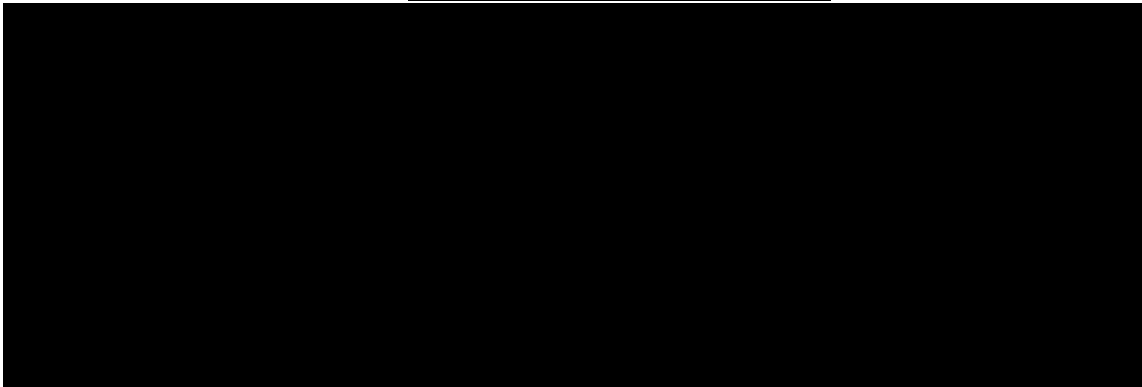
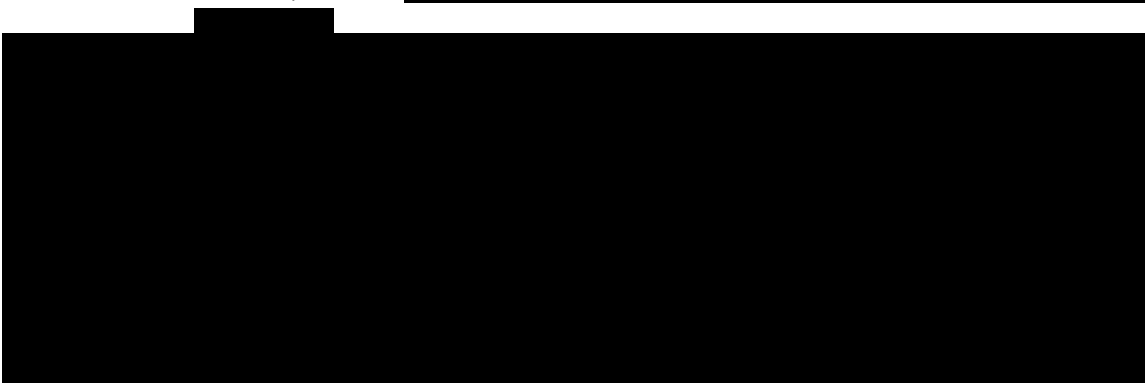
A large rectangular area of the document is completely redacted with a solid black box, obscuring the content of Table 2-5.

Table 2-6. WTG key details [REDACTED]

A large rectangular area of the document is completely redacted with a solid black box, obscuring the content of Table 2-6.

2.2.1.3 Electrical system

The electrical system is comprised of the cables and components required to step up/down the voltages at the WTG's and to transport the electricity generated from the wind farm to the point(s) of interconnection (POI). The system consists of a low voltage (LV) side from the WTG to the offshore substation (OSS) and a high voltage side from the OSS to the POI. Specifications for the electrical systems are provided in Attachment 2.1.

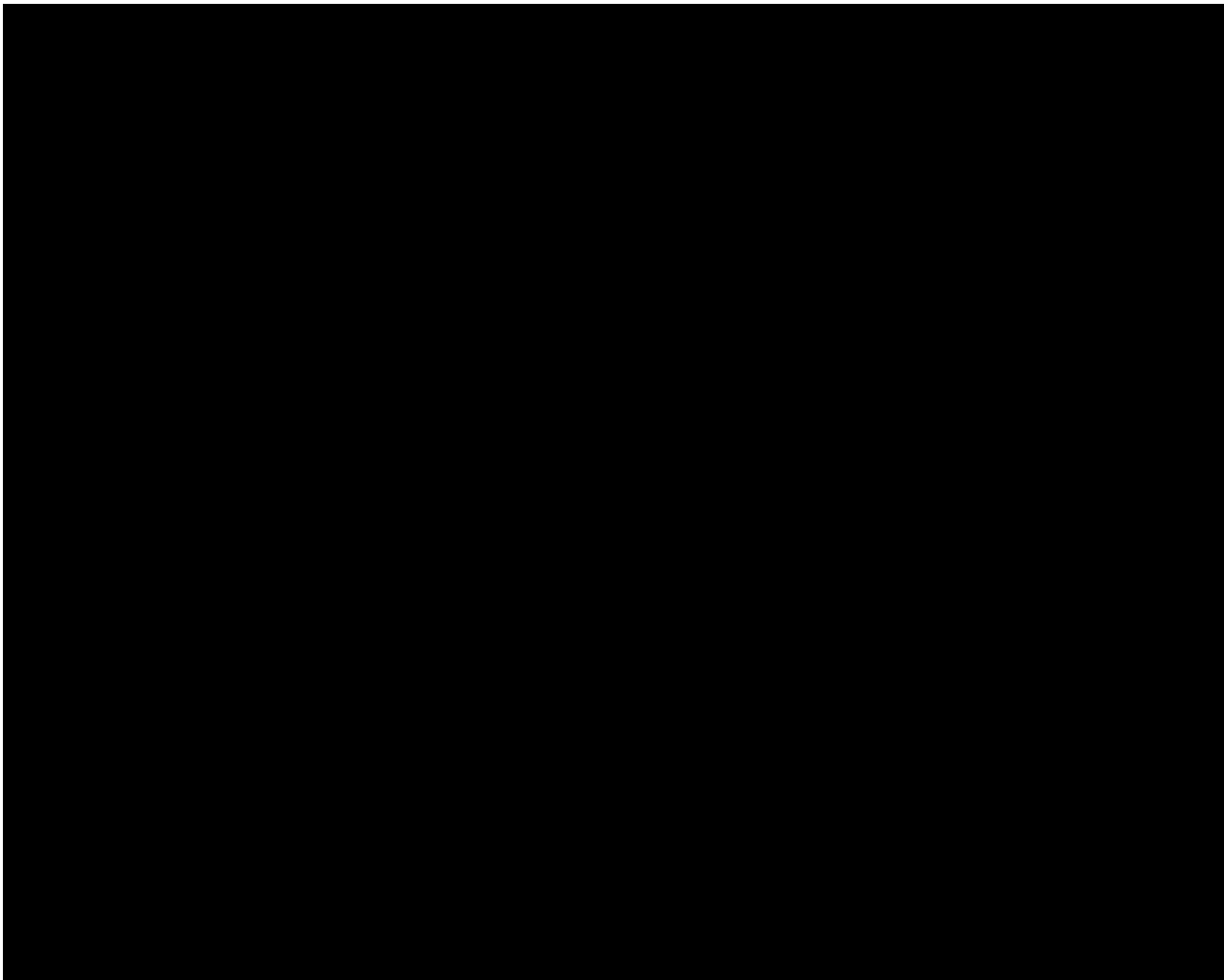
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

2.2.1.3.1 *Number and Type of Equipment*

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED] The OnSS, in turn, connects to the 'grid' via the existing substation – referred to by PJM as the POI.

In addition to switch gear (SWG) and power transformers, the OnSSs will comprise [REDACTED] [REDACTED] thereby providing the required functionality to achieve compliance with the local grid connection requirements. Table 2-7 below presents a schedule of all transmission and distribution major equipment associated with both the onshore and offshore substations.

Table 2-7. Schedule of Major Transmission & Distribution Equipment.



2.2.1.3.2 Array cables

Inter-array cables will connect the WTGs to the OSS. The WTGs are arranged in "strings" with several WTGs per string (which is buried), based on the power capacity of the platform connecting the cables and the WTG rating. The number of WTG's that connect to an array cable is based on the power capacity of the WTG and the cables and the cable rating. Attachment 2.1 provides the array cable layout. The Project is also considering connecting the WTGs directly to the POI using array cables as the main exporting cables. This will remove the need of an OSS between WTG and POI but increase the number of cable to shore needed.

The Ocean Wind Project will use [REDACTED] array cables. [REDACTED]
[REDACTED]
[REDACTED] The components of the array cables are shown and design specifications are provided in Figure 2-5. The array cable schedule is provided in Table 2-8.

Figure 2-5. Example of a [REDACTED] array cable specification.

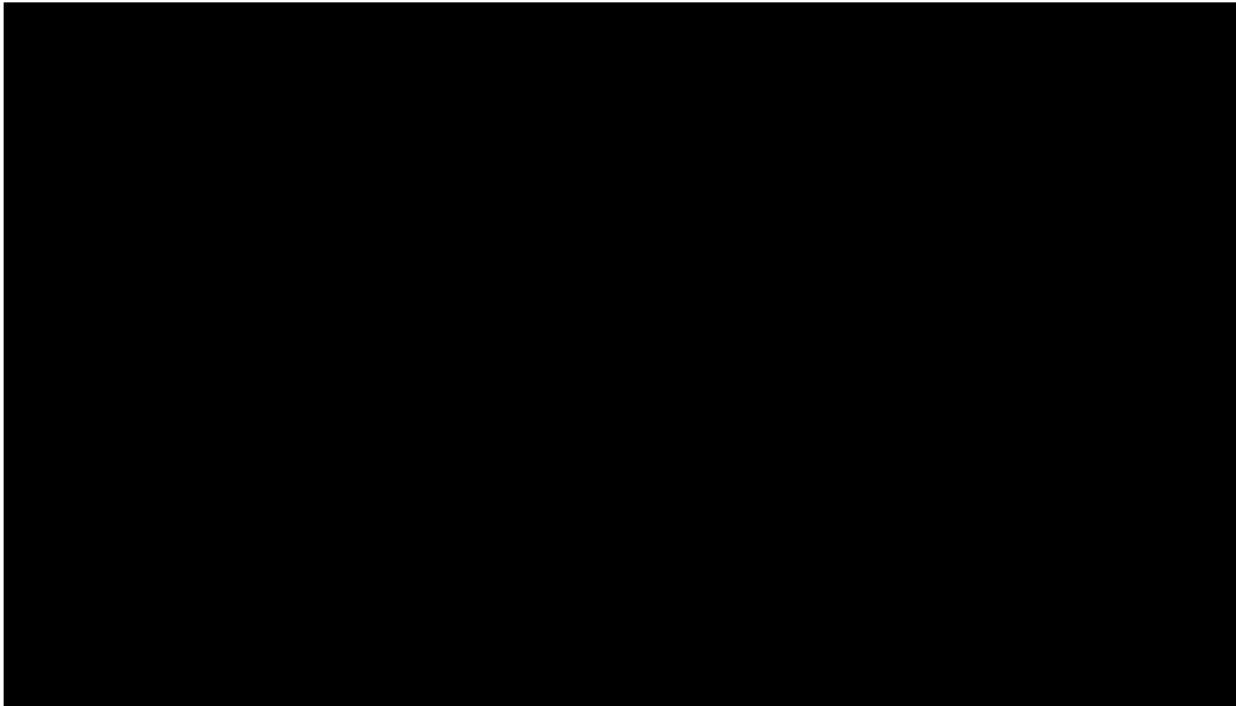
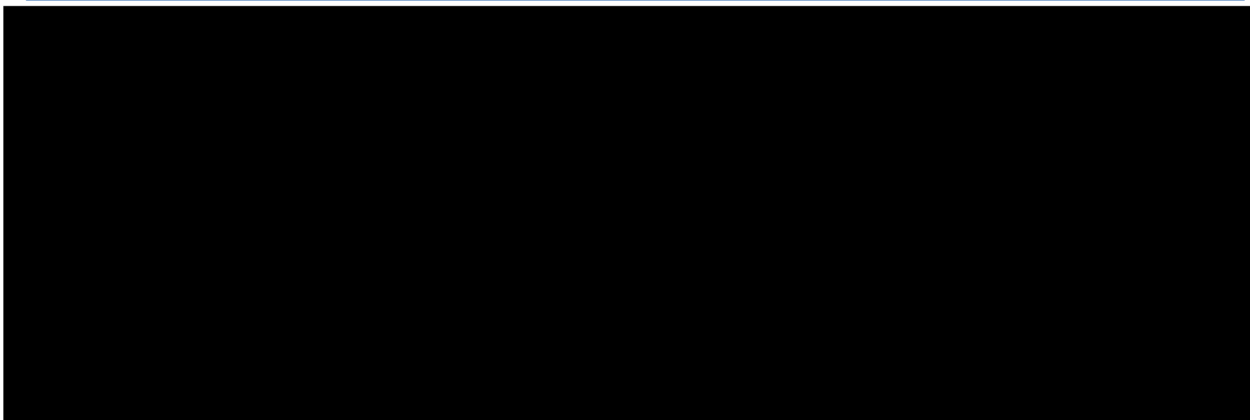


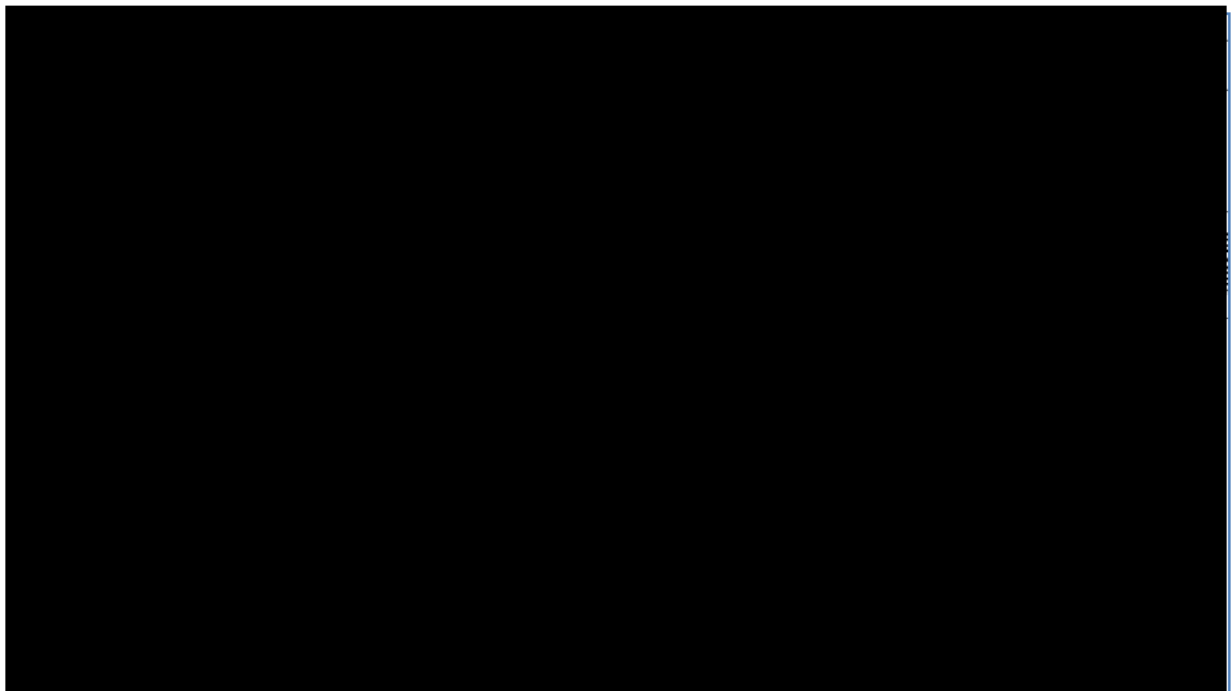
Table 2-8. Array cable schedule.

A large rectangular area that has been completely redacted with a solid black fill, obscuring the data in Table 2-8.

[Redacted]
[Redacted]
[Redacted]

[Redacted] Critical for a successful project is the effective management of interfaces and in this respect the design of OSS cable management system will be critical (i.e., export and array cables routed such that ease of installation is considered), clashes are avoided, and minimum bending radii (in both horizontal and vertical planes) are respected. Figure 2-6 illustrates a plan view of a typical cable management system suspended above a cable deck.

Figure 2-6. Plan view of OSS cable management system.



2.2.1.3.3 HV and MV Electrical Equipment

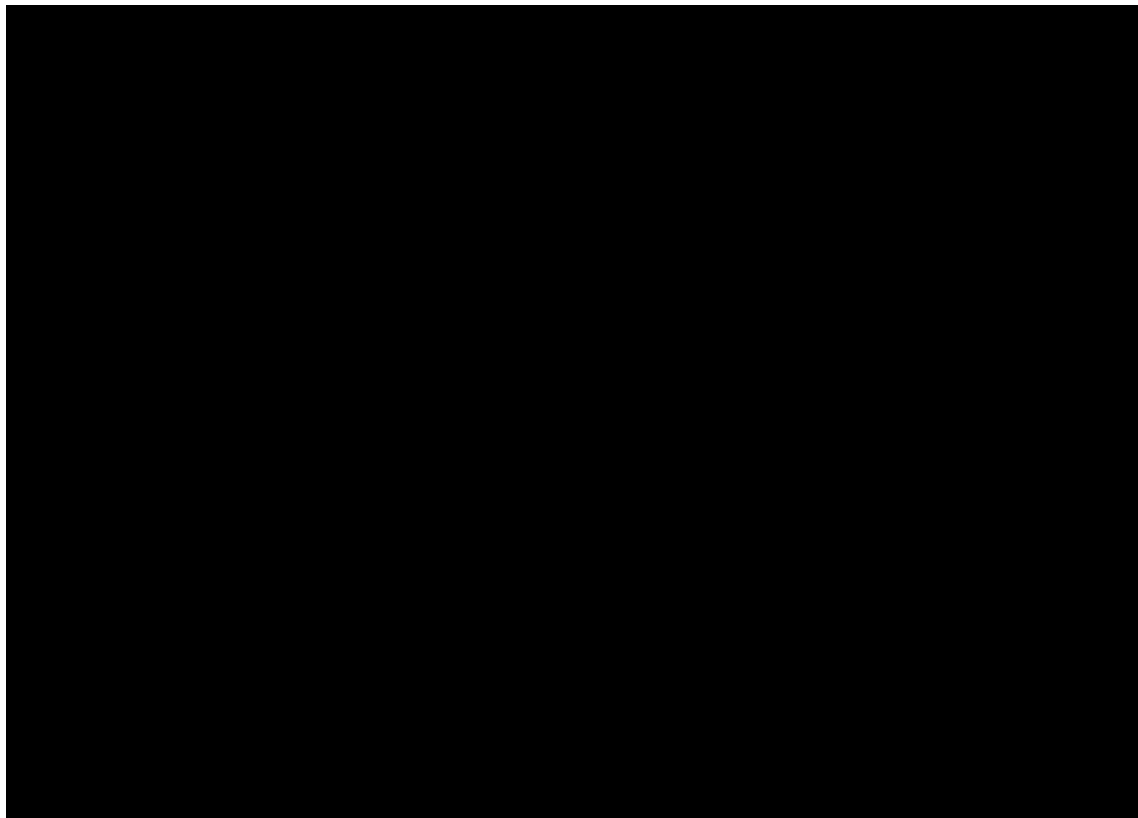
Medium voltage 'ring-main' SWG [REDACTED] and connects to the subsea array cables which are laid and buried in the seabed and routed to the OSS. The subsections below describe the electrical SWG pertaining to the OSS and OnSS, respectively.

2.2.1.3.4 Offshore Substation HV & MV Electrical Equipment

[REDACTED]

[REDACTED] Figure 2-7 presents a simplified single line drawing (SLD) of the OSS primary electrical equipment.

Figure 2-7. Simplified OSS single line drawing.



- [Redacted]
- [Redacted]
- [Redacted]
- [Redacted]
- [Redacted]
- [Redacted]
- [Redacted]

2.2.1.4 Transmission and other assets (OSS, OnSS, SCADA, high voltage components, and cables)

This section summarizes the major transmission and related assets for the Project. Section 14 provides additional details on the interconnections.

2.2.1.4.1 Offshore substation

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[REDACTED]

[REDACTED]

- [REDACTED]
- [REDACTED]
- [REDACTED]

Figure 2-8. Offshore substation (London Array)



2.2.1.4.2 Onshore substation

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] Ørsted has managed the process from placing orders, arranging logistics to the site, installing, testing, and commissioning complete HV systems and has demonstrated experience with end-to-end component installation.

2.2.1.4.3 SCADA module

[REDACTED]

- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]

In addition, this section discusses sourcing strategy for the control system and panel manufacturing.

2.2.1.4.4 Substation control system

A Substation Control System (SCS) will be designed, supplied, installed, commissioned, and tested to control and supervise the wind farm infrastructure


[REDACTED]

[REDACTED] The SCS will have interfaces to:

Ørsted's Hornsea 1 - 1.2 GW OnSS: World's largest built for offshore wind

Ørsted has delivered the largest OnSS, which was built for Hornsea 1, an offshore wind project. This OnSS is capable of converting power from 174 turbines, 7.0 MW each.

[REDACTED]



- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]

[REDACTED]

2.2.1.4.5 *Wind farm control system; WTG SCADA system*

The wind farm control system will include the integration of the wind turbine generator SCADA system (WTG SCADA). The purpose of the wind turbine SCADA system is to monitor and control the turbines in the wind farm. The software and hardware in the wind turbine SCADA system and wind farm control system will be supplied by the WTG supplier. [REDACTED]

- [REDACTED]
- [REDACTED]

The main functions of the wind farm control system are to ensure compliance with local grid connection requirements, which include but are not limited to:

- Fault ride-through;
- Voltage control;
- Frequency response;
- Active power control;
- Reactive power control;
- System protection; and
- Response to external commands such as signals for fast power reduction and wind farm tripping.

2.2.1.4.6 *Metering system*

Metering system will be designed, supplied, installed, commissioned and tested to enable settlement of produced/supplied energy.

2.2.1.4.7 *Information technology network ("backbone" network)*

The information technology (IT) network package will consist of a variety of components that are designed to act together as a base network for all types of IT equipment both on- and offshore, including components that need to be connected to the outside world. The IT network package will include all of the components and services that are needed to design, supply, install, and commission a complete system that will consist of:

- IT network installation works;
- IT network;
- Fiber network; and
- Panels for IT network systems.

2.2.1.4.8 *Radio communication and information systems*

The communication and information systems package will allow voice conversations and identification of the wind farm. The radio communication and information systems package will include all of the components and services that are needed to design, supply, install, commission, and test the radio communication systems as part of the SCADA system.

[REDACTED]

[REDACTED]

- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED];
- [REDACTED]
- [REDACTED];
- [REDACTED];
- [REDACTED]
- [REDACTED]

2.2.1.4.9 *Sourcing strategy for the control system*

[REDACTED]

2.2.1.4.10 *Panel manufacturing*

[REDACTED]

2.2.1.4.11 *Export cables*

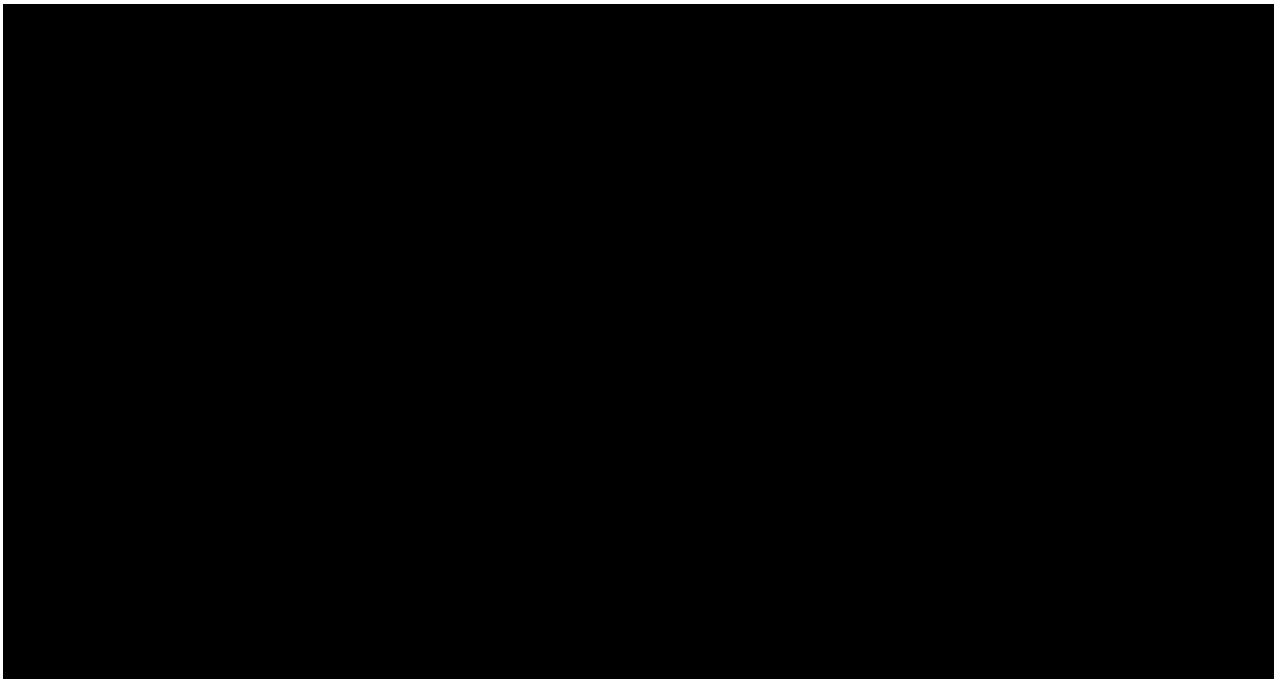
The export cable system connects the OSS to the OnSS, delivering HV power to the PJM grid. The actual voltage and size of the cables will be determined as the Project design optimization matures.

[Redacted text block]

[Redacted text block]

[Redacted text block]

Figure 2-9. [Redacted caption text]



2.2.1.4.12 Onshore Substation HV and MV Electrical Equipment

The offshore substations are connected to the new onshore substation(s) via the export cable circuits. The onshore substation, in turn, connects to the 'grid' via the existing substation(s) – referred to by PJM as the POI. In addition to SWG and power transformers, the onshore substation(s) will comprise [REDACTED] thereby providing the required functionality to achieve local grid code compliance. [REDACTED]

[REDACTED]

- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]

2.2.2 Past performance of same or similar equipment

Ørsted manages execution risk by using proven technology. Ørsted has used similar equipment in previous projects. [REDACTED]

[REDACTED]

[REDACTED] Therefore, all equipment used in this Project has a long history of reliable operation and poses no practical technological risk. Furthermore, Ørsted has installed, operated and maintained equipment from the majority of the manufacturers identified in Attachment 2.1. Table 2-9 identifies similar equipment in use by the same manufacturers planned for the Project.

2.2.3 Suitability for use in the New Jersey offshore/nearshore environment

As detailed in Section 2.10.2, all of the equipment included in the Project's Design Basis is suitable to operate in the waters off of New Jersey, both offshore and nearshore as described below. This equipment is being used successfully in the North Sea which can experience a wide range of heavy

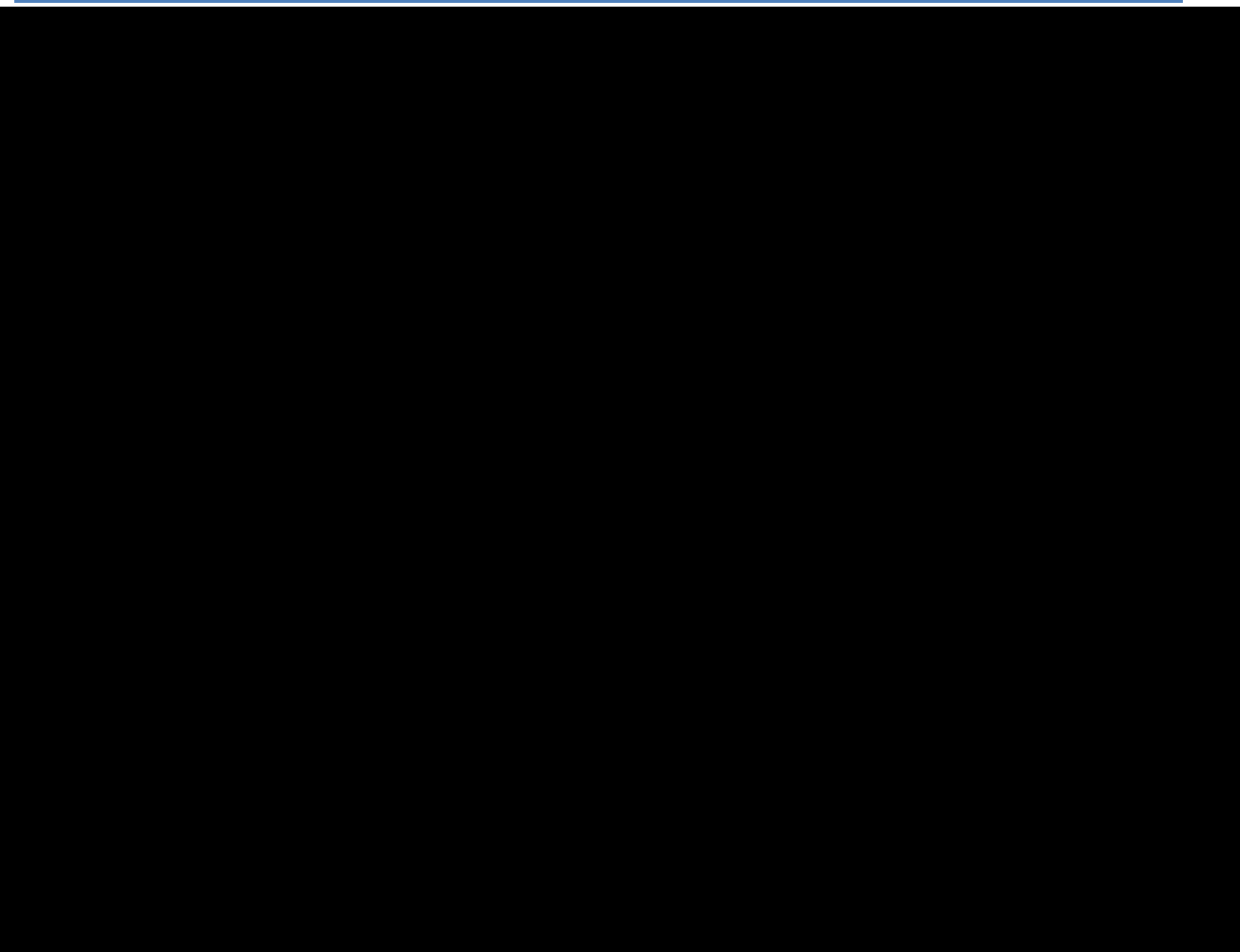
seas and rough conditions. [REDACTED]
[REDACTED]

2.2.3.1 Foundations and wind turbine generators

[REDACTED] the Design Basis [REDACTED]
[REDACTED]
[REDACTED] platform is being designed according to the International Standard International Electrotechnical Commission (IEC) 61400, which certifies that the platform can, for example, operate in an offshore marine environment and survive loads and hurricanes. [REDACTED]
[REDACTED]

The MP/TP solution for WTG foundations has been Ørsted's preferred solution for nearshore wind farm projects. Ørsted has been responsible for installing approximately 1,000 MP/TP foundations. Ørsted's MP/TPs were designed to IEC Standards, which ensures suitability with the local marine and ocean environment. [REDACTED]

Table 2-9. Same or similar equipment in operation.



2.2.3.2 Transmission infrastructure and other assets

Ørsted has successfully developed, built, and operated full scope transmissions systems for a number of United Kingdom offshore wind farms including Race bank, Walney 1 & 2 London Array, West of Duddon sands, and Walney Extension (currently the largest offshore wind farm in the world). The Ocean Wind Project will be using this experience and supplier knowledge to successfully deploy a transmission system in New Jersey.

2.2.4 Warranties and guarantees

2.2.4.1 Foundations and wind turbine generators

[REDACTED]

[REDACTED]

[REDACTED]

2.2.4.2 Transmission infrastructure and other assets

[REDACTED]

Ocean Wind’s onshore transmission system will be subject to detailed engineering design in function and constructability and in accordance with New Jersey building codes, statutes, and regulations. The onshore transmission system will be designed to the applicable standards by Professional Engineers who are licensed in the State of New Jersey and certified by an independent body, certifying that the onshore transmission system is capable of operating in the New Jersey onshore coastal environment and surviving conditions such as flooding, a saline environment, and typical geographical weather patterns.

[REDACTED]

Ocean Wind plans to be responsible for the O&M throughout the lifespan of the Project. During this period, Ocean Wind will ensure and deliver a comprehensive cyclical maintenance program to keep the system operating.

[REDACTED]

[REDACTED]

2.2.5 Ownership or lease

[REDACTED]

2.2.6 Estimated time for delivery

Section 13 provides the Project schedule, including delivery times for major equipment.

2.2.7 Equipment replacement and substitution

Ocean Wind may, at its discretion, replace or update equipment identified in the proposal with more technologically advanced equipment that is equal to or better than the equipment identified in the proposal, subject to Board approval.

2.3 Site plan and configuration

N.J.A.C. 14:8-6.5(a)(2)i.

i. The project developers shall:

(5) Describe any current uses, conflicts, or characteristics of the ocean and land areas identified pursuant to (a)2i(4) above;

(6) Specify whether the project is located at one site, or divided among several sites;

(7) Define the attributes which make the site(s) attractive and list any potential problems, constraints or limitations with siting an energy facility at that location or locations;

[REDACTED] The final design of the wind farm is still subject to further optimization [REDACTED] The key offshore components of the wind farm are:

Ocean Wind OREC Application

- WTGs;
- Wind turbine foundations;
- OSS platforms;
- [REDACTED]
- Array cables;
- Subsea export cable(s) and subsea interlink cables; and
- Scour protection around foundations and on array and export cables as required.

The key offshore components of the wind farm are:

- Landfall site with an associated transition jointing bay to connect the offshore and onshore export cables;
- Onshore export cables;
- Temporary construction areas and access roads; and
- OSS in proximity to the grid connection location

2.3.1 Offshore Lease Area

The Project is located off the coast of Atlantic City, New Jersey. The WTG array will be 15 miles (13 nm) from the New Jersey coastline at the nearest point. The Lease Area is adjacent to the Lease Area of a wind farm that is owned by US Wind. The Project's wind farm array will be in the Ocean Wind Lease Area and will be built in phases to match the timing of the Board's solicitations.

Ocean Wind has chosen the WTG and OSS positions in the Lease Area to maximize the amount of energy captured from the wind and to minimize losses in array cables and export cables. Ocean Wind will continue to optimize the Project's array layout based on further information from geotechnical investigation campaigns and the COP process and from consultation with local stakeholders. Array cable and foundation locations are shown in Attachment 2.1.

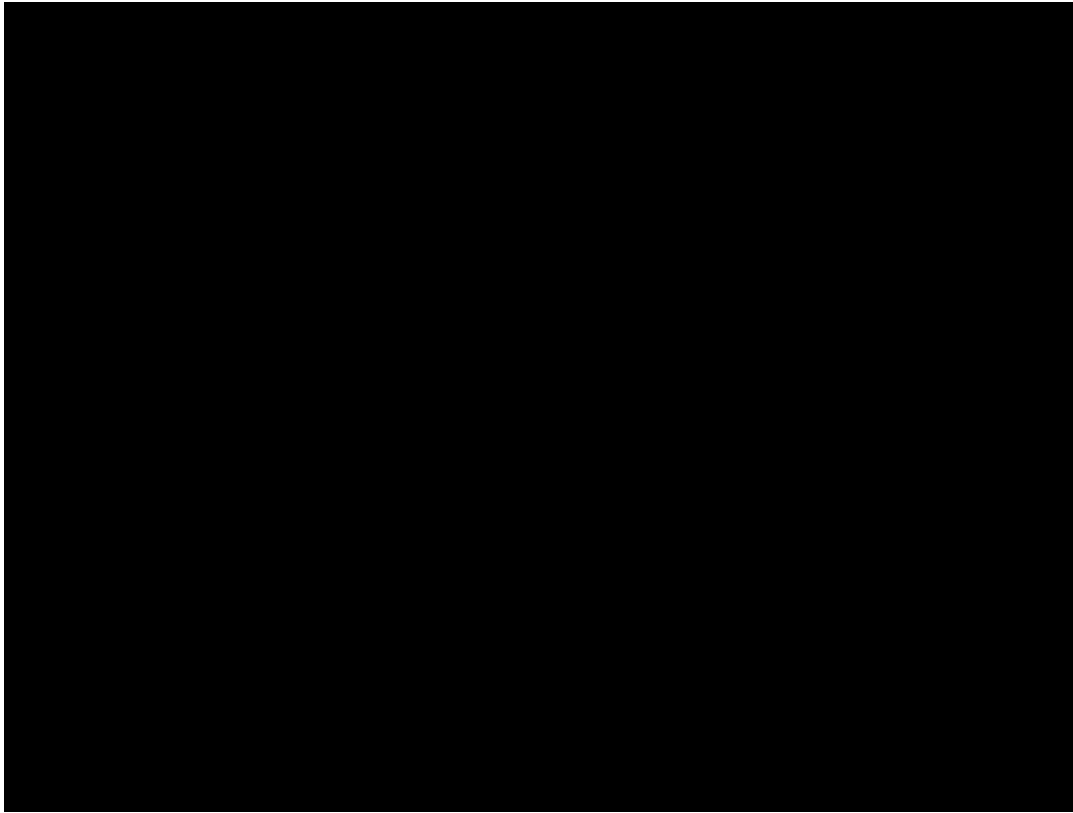
2.3.2 Marine terminals and waterfront facilities

Ørsted will leverage its worldwide supply chain to combine local efficiencies with local expertise and resources to make use of New Jersey-based major marine terminal and waterfront-based activities (see Figure 2-10).

2.3.2.1 Construction and O&M base

Ocean Wind continues to evaluate port sites along the South Jersey shoreline, as proximity to the lease area is a critical consideration for reducing travel time from the O&M port to the lease area. Other factors essential to the viability of a port location in servicing of the windfarm include adequate quayside, sailing speeds to and from the lease area, other planned uses of the port, and local support.

Figure 2-10. Locations of major marine terminal and waterfront activities.



[Redacted text block]

Further details are provided in Section 7.

2.3.2.2 Foundation final assembly

[Redacted text block]

2.3.2.3 Wind turbine assembly and load out

[Redacted text block]

[REDACTED]

[REDACTED]

- [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

- [REDACTED]

[REDACTED]

2.3.2.4 OSS superstructure assembly

[REDACTED]

2.3.2.5 Export cable manufacturer

[REDACTED] From this port, installation vessels will load the cable carrousel for transport and installation (T&I) at the offshore array area.

2.3.2.6 Array cable manufacturer

[REDACTED]

2.3.3 Suitability and potential use conflicts

2.3.3.1 Offshore lease areas

Ocean Wind holds BOEM Renewable Energy Lease No. OCS-A 0498, which provides Ocean Wind with the exclusive right, subject to all applicable laws and the conditions in the Lease, to develop the Project in the Lease Area. Potential impacts and use conflicts associated with the proposed development of the Project, and mitigation measures proposed by Ocean Wind to avoid or minimize those impacts and conflicts, are addressed in Sections 15 and 16, and will be thoroughly analyzed in Ocean Wind’s COP.

2.3.3.2 Transmission assets

Once the final export cable route is established, Ocean Wind will look to enter into cable crossing agreements with the owners of any offshore cables that might be crossed by the export cable. Crossing agreements in US waters are supported by the International Cable Protection Committee (ICPC) which is also active in Europe and provides a framework for establishing cable crossing agreements with which Ocean Wind is familiar. The onshore portions of this work will

likely be located in areas with industrial use highly suitable for this work and already interconnected to the grid. Any conflicts with transmission lines and substations will be mitigated.

2.3.3.3 Marine terminals and waterfront facilities

2.3.3.3.1 Foundation Hub – [REDACTED]

[REDACTED]

2.3.3.3.2 O&M and EPC Base – [REDACTED]

The site areas are intended to offer an opportunity for a combined base for Crew Transfer Vessel (CTV) operations covering both the construction phase as well as the operations phase. [REDACTED]

[REDACTED]

2.3.3.3.3 Cable Hub – [REDACTED]

The intended terminal area and quay infrastructure is suitable and planned for various cable staging and operations [REDACTED]

[REDACTED]

2.3.3.3.4 WTC Hub – [REDACTED]

[REDACTED]

2.4 Permits and approvals

N.J.A.C. 14:8-6.5(a)(2).

iv. Applicants shall identify all applicable Federal and State statutes and regulations and municipal code requirements, with the names of the Federal, State and local agencies to contact for compliance, and a commitment to provide proof of all such compliance on an ongoing basis.

The Project will require the permits and approvals that are detailed in Section 10 and Attachment 10.1. Ocean Wind will provide proof of permit application and the received approvals/permits that are required for Project development, operation, and decommissioning, as applicable.

2.5 Proposed approach to staging and deployment of major Project components

N.J.A.C. 14:8-6.5(a)(2)

i. The project developers shall: (3) Indicate the areas used for all aspects of the project including the location(s), the construction staging area(s), and port usage;

iii. Applicants shall describe construction plans in detail identifying proposed subcontractors with evidence of the capability of performing necessary tasks as well as proposed time frames for completion of all necessary tasks.

This section describes the approach for staging and deployment of the major Project components. The proposed contractors and evidence of their capability to perform the necessary tasks within the required time frames are addressed in this section. The marine terminals and laydown areas that are required to support the implementation are addressed in Section 2.3.2.

To acquire the necessary equipment and install the Project, Ocean Wind will rely on Ørsted's EPC organization, which has more than 900 employees, including technical specialists and dedicated managers for the implementation of the package scopes in the Project. [REDACTED]

The equipment in the major installation package includes:

- Foundations;
- WTGs;
- Array cables;
- Export cables;
- OSS;
- Onshore cables; and
- OnSS.

[REDACTED] Specialized vessels required for offshore work are addressed in Section 2.7.3 and including identification of the responsible parties for deployment of various Project activities.

The coordination and management of the offshore construction work will be carried out under the Ørsted EPC Director with dedicated construction site staffing. This approach will give the in-house EPC organization full control of the installation campaign for the purpose of maintaining quality and meeting deadlines. CTVs will be used to transport crews from shore to the work areas.

2.5.1 Foundations

The foundation construction and installation package will consist of MP and TP fabrication, TP outfitting, and on-site MP and TP installation. Figure 2-11 and Figure 2-12 show the transportation and installation of an MP and TP.

Figure 2-11. Transportation and Installation of an MP.

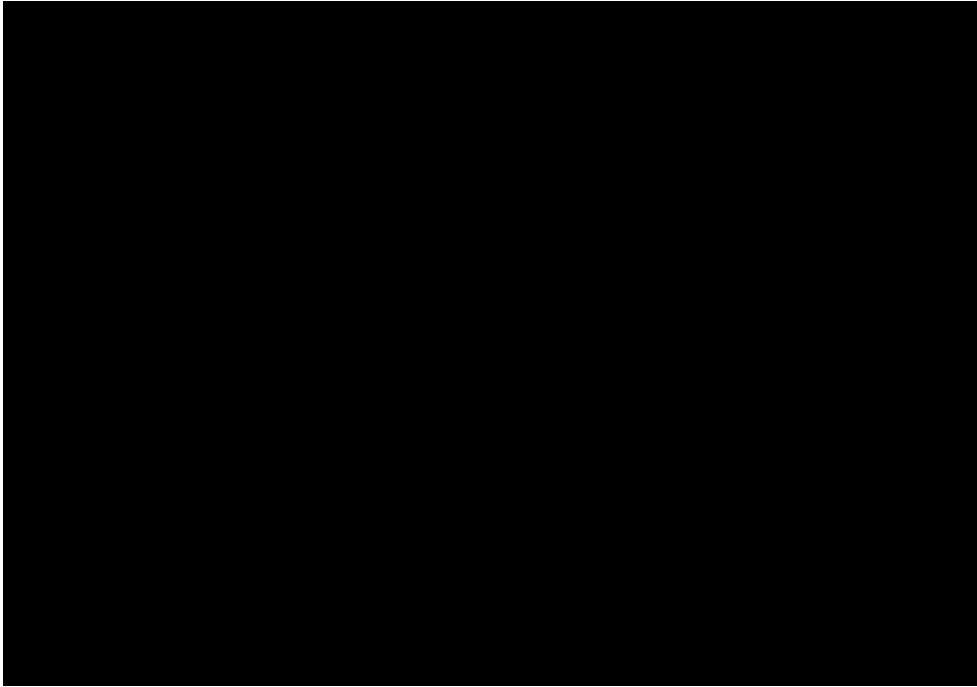
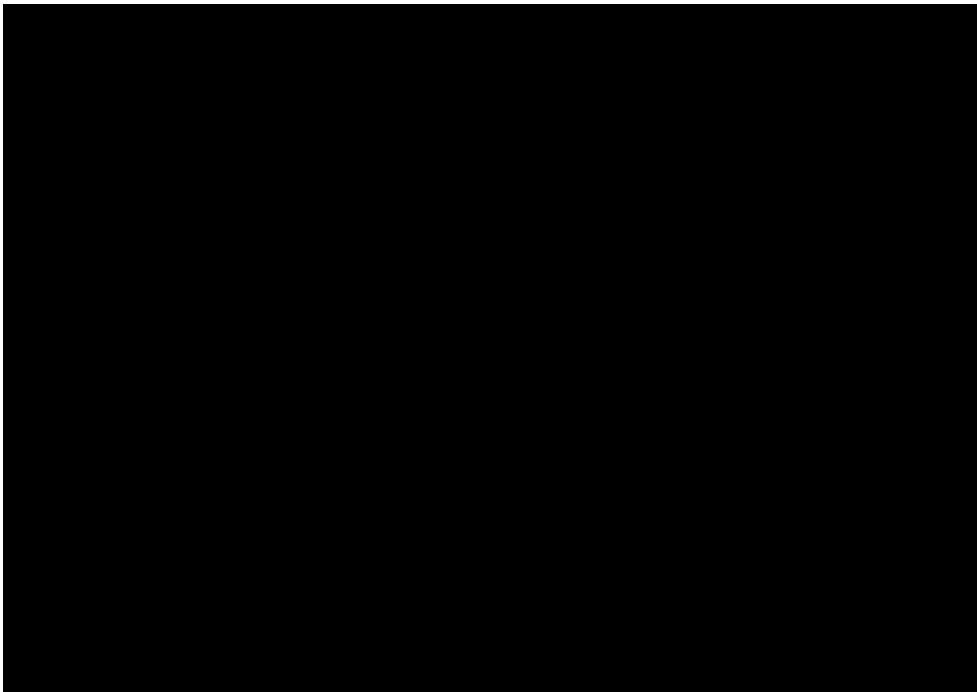


Figure 2-12. Installation of a TP.



2.5.1.1 MP and TP tube fabrication and transit

The construction of MP and TP tubes [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

2.5.1.2 MP installation

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

[REDACTED]

2.5.2 Wind turbine generator

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

2.5.2.1 Wind turbine generator pre-assembly

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

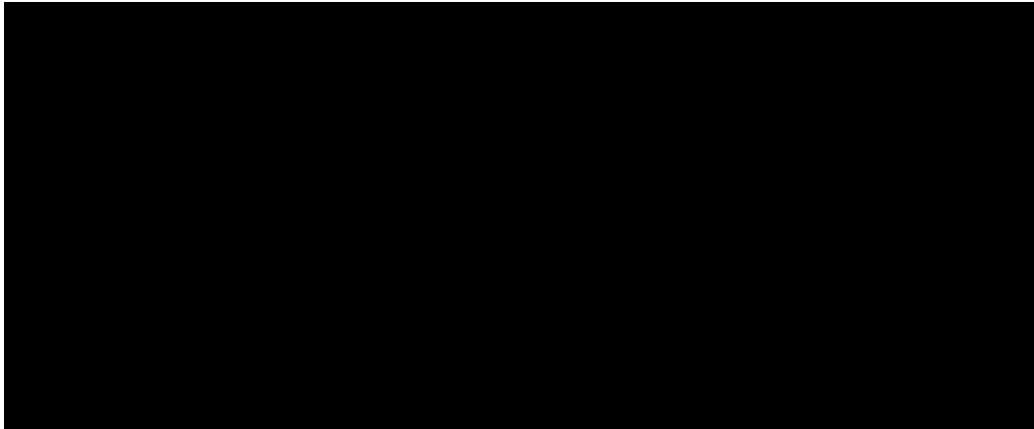
The main and most resource demanding pre-assembly activity is tower assembly and outfitting. Incoming tower sections are inspected [REDACTED], and temporarily stored by means of purpose built heavy-duty tower lift-trucks.

[REDACTED]

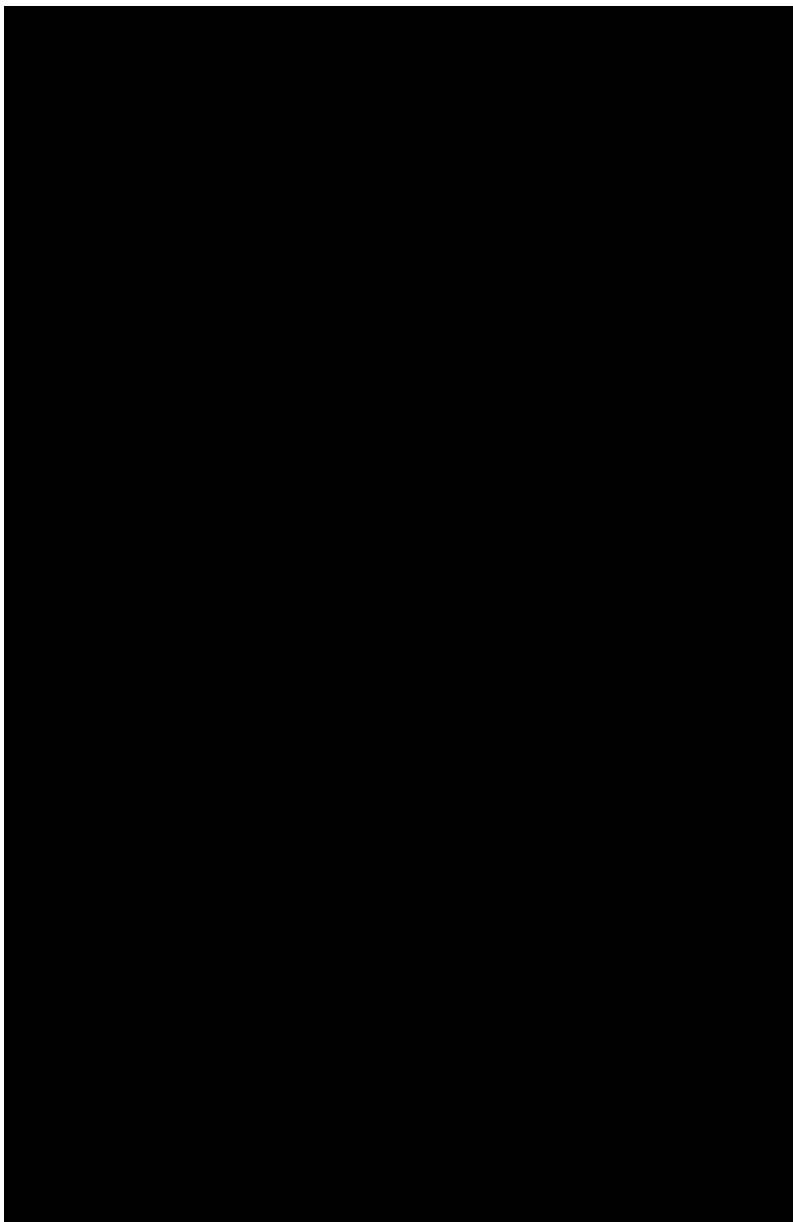
[REDACTED]

[REDACTED]

[REDACTED]



Source: Gode Wind, 2015

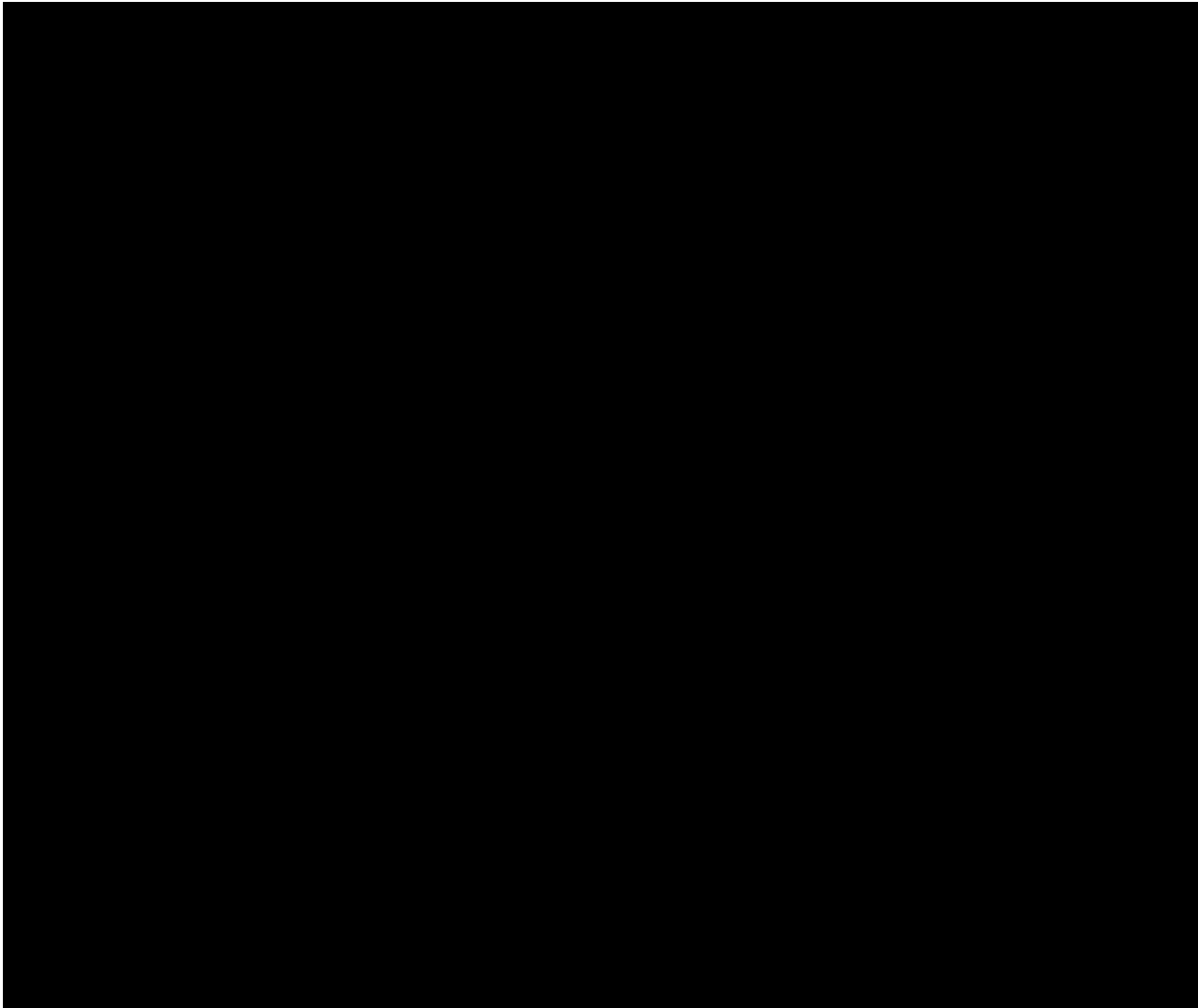


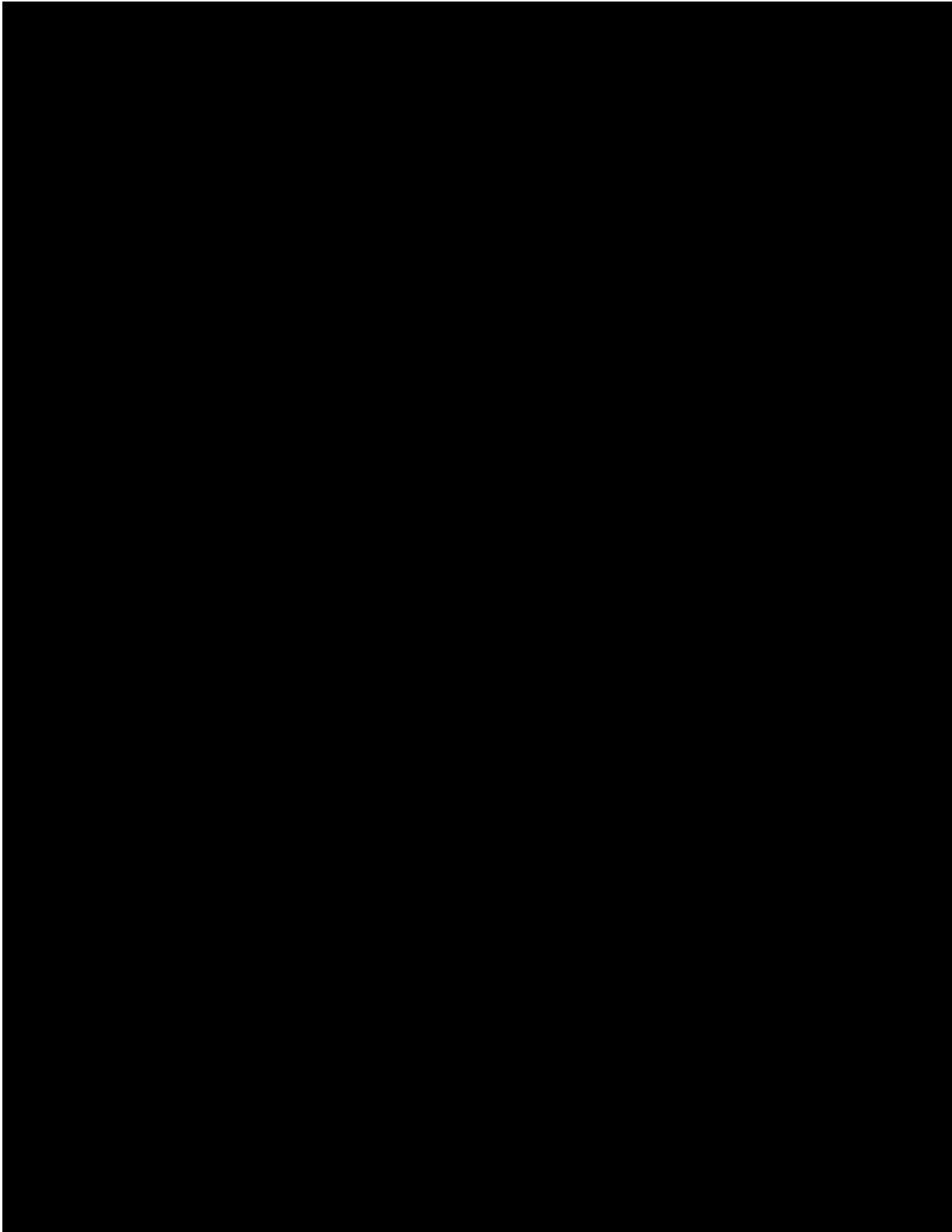


2.5.2.2 Wind turbine generator installation

[Redacted text block]

[Redacted text block]





2.5.2.3 Wind turbine generator commissioning

After installation, the WTG is connected to the grid and commissioned. [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

Figure 2-20. DP2 vessel and CTV.



Source: Code Wind 1 & 2, 2015.

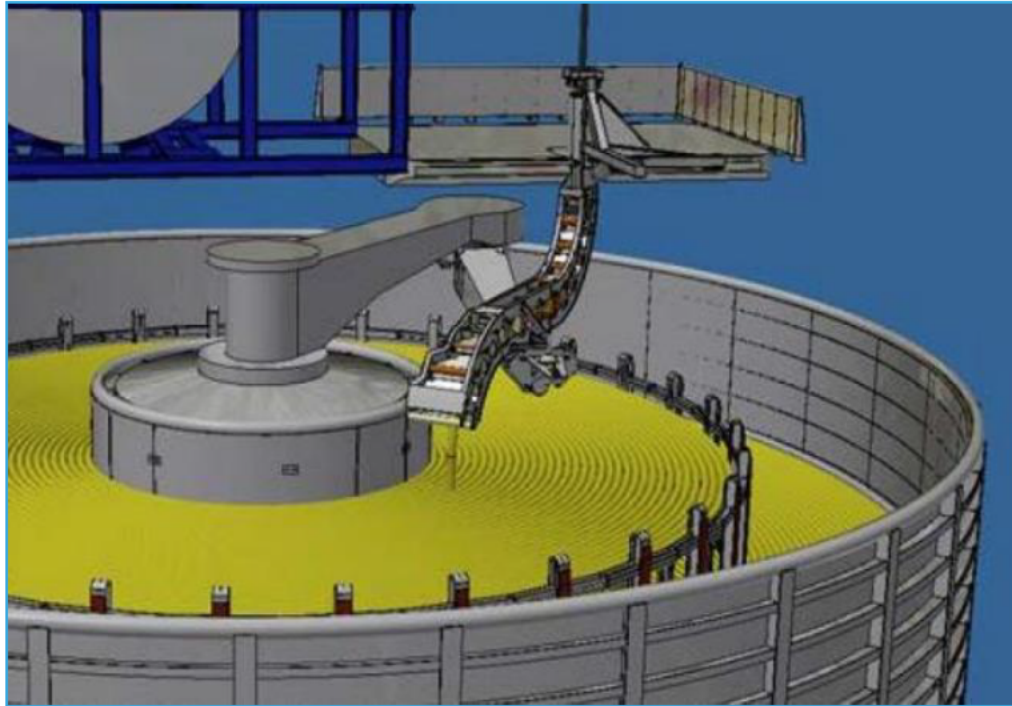
2.5.3 Electrical – array cable

The [REDACTED] array cables that will be installed in the field will comprise the PCCs and ICCs; they will be installed as either pre-cut sections or continuous lengths or a combination of both. The array cables may be simultaneously laid and buried, or – if the seabed conditions allow – post-lay burial will be performed using a jetting tool.

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

Figure 2-21 provides an illustration of typical subsea cable being spooled from a factory/quayside turntable.

Figure 2-21. Subsea cable being spooled from factory/quayside turntable.

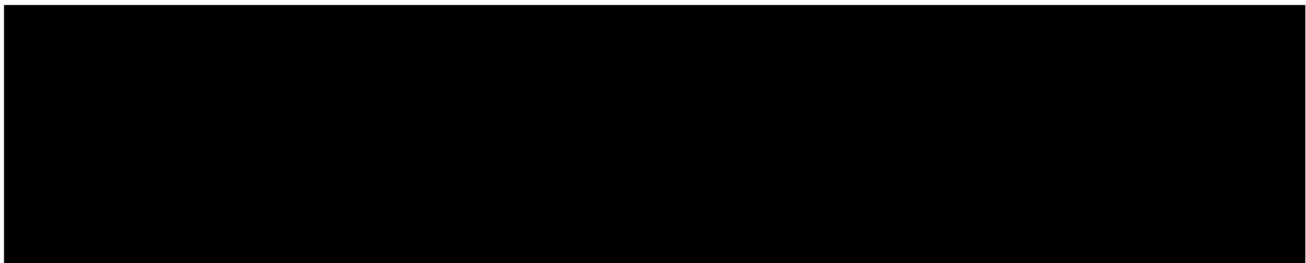


[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED] The following are steps in

installing the cables.

Route Preparation

A full site characterization along the array cable route has yet to be carried out to determine the seabed conditions. Prior to installation, the route may be cleared of boulders and sandwaves, as shown in Figure 2-22.



[Redacted text block]

[Redacted text block]

[Redacted text block]

[Redacted text block]

[Redacted text block]

[Redacted text block]

[Redacted text block]

[REDACTED]

[REDACTED]

2.5.4 Offshore substation

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED] Transit time will depend on the location of the fabrication yard. [REDACTED]
[REDACTED]
[REDACTED]

[REDACTED] a MP type foundation for the substructure the installation of the substructure will follow the same procedure outlined in Section 2.5.3 and will carried out by the same vessels used for covering the MP/TP scope.

An end to end commissioning schedule will be developed to ensure the safe operational function, performance and integration of the individual mechanical and electrical systems and associated communication signals on board the OSS. [REDACTED]
[REDACTED]

[REDACTED] Additionally, a series of off-load tests will be performed for first energization of HV equipment offshore.

2.5.5 Onshore substation

2.5.5.1 Onshore substation fabrication and installation

Ocean Wind will be responsible for the detailed design, procurement, construction, and commissioning of the OnSS. All of the major equipment will be installed upon completion of the concrete foundations and cable duct banks. The equipment manufacturers will be responsible for transportation, rigging, and placing the equipment on the concrete foundations.

Figure 2-26. Installation of an offshore substation.

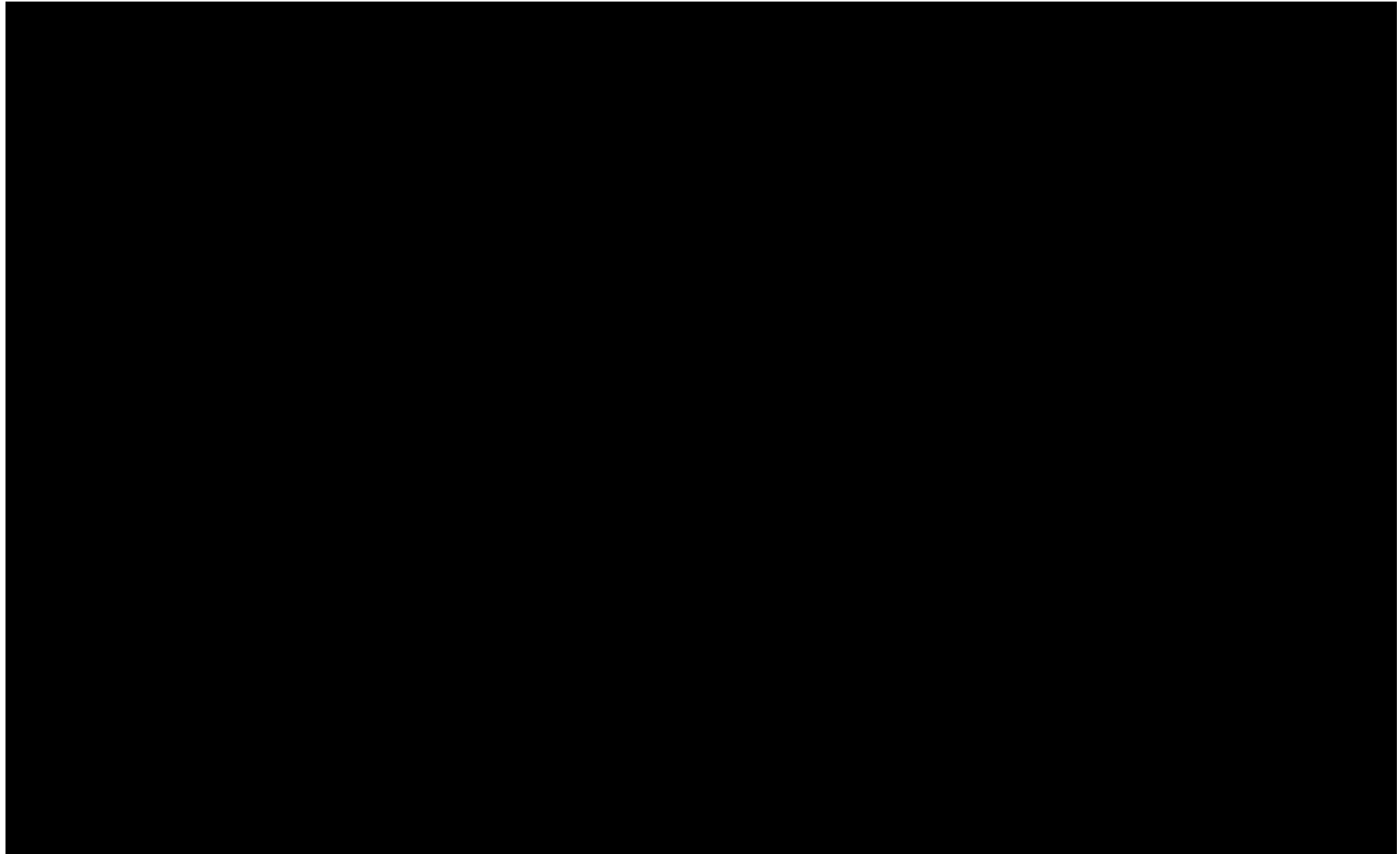


[REDACTED]

[REDACTED]

The intention of the Project is to award an EPC-type contract for construction of the OnSS and to use, to the extent possible, local (New Jersey) labor to complete the construction and commissioning of the OnSS.

Table 2-10. Responsible parties for deployment of Project activities.



2.5.5.2 Onshore substation commissioning

All equipment, [REDACTED], if required, will be tested as soon as it is installed and control and protection equipment is available. Testing will be performed by competent and licensed contractors working in accordance with the test methodologies and plan that was reviewed and verified by qualified engineers. All tests will be documented by prescribed test reports and accepted by Ørsted. Commissioning will be performed in strict adherence to the International Organization for Standardization’s (ISO’s) protocol on receiving permits and clearances. Described below is the sequence of the commissioning events:

1. HV and MV breakers: Upon the installation of all breakers and control panels, each breaker will be acceptance tested. The acceptance testing will include operability of the breakers, functional testing of control and protection schemes, alarms and indications, and remote control (SCADA) operability.
2. Control center: The control center will be acceptance tested at the manufacturer’s facility. Upon the installation at the site, each control and protection scheme will be tested and commissioned along with other equipment.
3. [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
4. Step-up transformers: Upon the installation of the step-up transformers, they will be acceptance tested and commissioned.
5. Commissioning of the OnSS: Upon the acceptance testing of the substation control center and once the modifications to the substation are completed and in service, the commissioning of the OnSS will commence. The final commissioning will take approximately four weeks.

2.5.6 Export cable

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

The export cable route consists of offshore sections, consisting of farshore (Federal waters) and nearshore (State waters) areas, as well as an onshore section, comprised of landfall and buried terrestrial cable. This section addresses construction methodology. For details regarding potential points of interconnection and export cable routing, please see Section 14.

2.5.6.1 Offshore

The offshore export cable(s) will be loaded from the berth of the cable manufacturer on to either the installation vessel directly or transported to the designated load-out harbor by freighter; interim storage for the cables may be required at the load-out harbor. The cables will be spooled on to the installation vessel in sections, as may be dictated by the vessel’s turntable capacity or

[Redacted]

[Redacted]

[Redacted]

[Redacted]

2.5.6.2 Onshore

[Redacted]

[Redacted]

[Redacted]

[REDACTED]

[REDACTED]

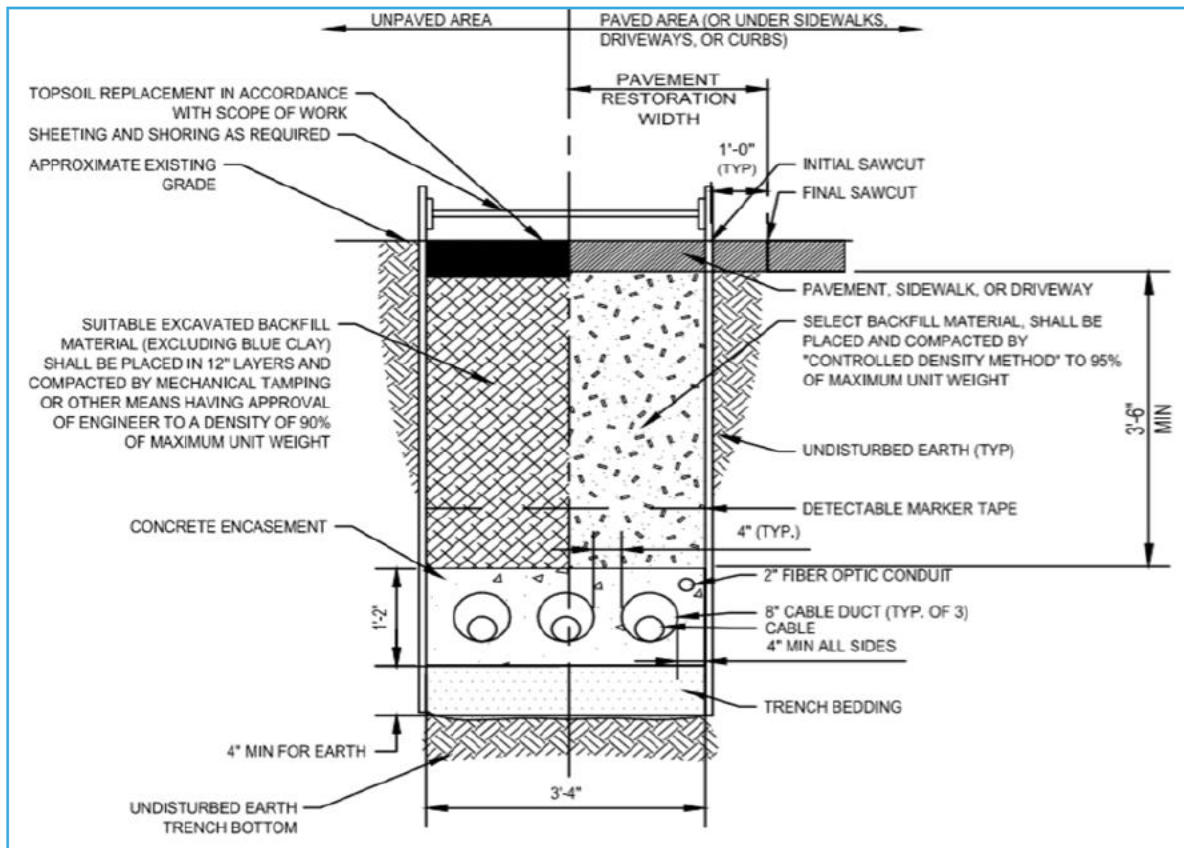
[REDACTED]

[REDACTED]

[REDACTED]



Figure 2-29. Typical cable trench arrangement.



The construction of the duct bank includes the following steps:

1. Survey and mark splice vault locations; survey and mark duct bank location
2. Set up erosion and siltation controls, including silt sacks or similar protection for existing storm drains
3. Set up traffic management measures, in coordination with local police and public works officials
4. Open roads and install duct bank
5. Repave roads as agreed with local town
6. Clean up work area, remove erosion controls

The duct bank installation will be performed using conventional construction equipment (e.g., hydraulic excavator, loader, dump trucks, and flatbed trucks) to deliver PVC pipe, crew vehicles, cement delivery trucks, and paving equipment).

The proposed trench arrangement would be required to consider the following:

- The minimum overall width required for both the cable trench and the associated construction activities, such as excavations, trench support, vehicle movements and general safety, taking into consideration the permissible working area and in line with the United States Department of Transportation (DOT) to specify the standards by which traffic signs, road surface markings, and signals are designed and installed to avoid, and minimize, the impacts on residents, businesses whilst maintaining the flow of traffic within the community to minimize any disruption.
- The appropriate size of ducts and arrangement for both ease of installation and thermal effects influencing the cable design and sizing.
- The minimum depth of cover to the top of the cables, in line with industry practices in the US or New Jersey area.
- Any protective covers necessary in line with US or New Jersey industry practices.
- The overall depth and alignment of the trench will be on the location of the preexisting utilities that be predetermined.
- The use of any high-quality concrete or backfill materials to reduce the spacing between cables to minimize the overall trench width and depth and to enhance the thermal resistivity properties of the material to best influence the cable design.
- The use of any advanced construction or duct installation techniques to minimize construction activities and decrease the overall construction time.
- The identification of preferred joint bay positions along the route, taking into consideration the maximum cable pulling length between joint bays based on the maximum installation on limitations of the cable, the location and size of any joint bays will be designed and sited to cause minimal disruption to local houses, local access, road junctions, traffic arrangements and disruption to local residents and road users.
- Traffic management and lane closure arrangements to minimize disruption to local residents and road users.
- Any alternative construction techniques such as HDD are to be considered at particular areas of engineering difficulty or areas sensitive to local residents, road users or other constraints.
- Identification of any alternative location for installation of the cables, such as roadside verges.
- The splice vaults are typically two-piece (top and bottom) pre-formed concrete "boxes" with holes at both ends to connect with the PVC piping to the cables to be spliced.

Once the duct bank is in place, the cables (one cable per duct) can be pulled using a winch wire driven by a winch.

2.6 Implementation schedule

N.J.A.C. 14:8-6.5(a)(2). ...a detailed implementation plan and schedule that highlights key milestone activities and completion dates during the permitting, financing, design, equipment solicitation, manufacturing, shipping, assembly, infield installation, testing, equipment commissioning, and service startup

A detailed lifecycle Project schedule is provided in Section 13 and includes key milestone activities and completion dates during the permitting, financing, design, equipment solicitation, manufacturing, shipping, assembly, in-field installation, testing, equipment commissioning, and service start-up. The estimated delivery time for major equipment after an order has been placed is also addressed.

2.7 Supplier and contractor capacity to perform

N.J.A.C. 14:8-6.5(a)(2).

i. The project developers shall: ... a letter of intent or memorandum of understanding from the turbine manufacturer/supplier to supply the selected turbines; a demonstration of the financial strength of the selected turbine manufacturer/supplier; a declaration from the foundation manufacturer/supplier that states their ability to manufacture and deliver all foundation components within the targeted schedule; a declaration from the undersea cable manufacturer/supplier that states their ability to manufacture and deliver all undersea cable components within the targeted schedule; a letter of intent or memorandum of understanding from the proposed engineering, procurement, and construction (EPC), balance of plant (BOP) contractor, and/or key construction contractors or vendors; ... and either selected certified wind turbine generators or provide a detailed certification plan that is underwritten by a certifying body. iii. Applicants shall describe construction plans in detail identifying proposed subcontractors with evidence of the capability of performing necessary tasks as well as proposed time frames for completion of all necessary tasks.

[REDACTED]

2.7.1 Supply Chain Plan

A detailed Ocean Wind Supply Chain Plan (SCP), provided in Attachment 2.3, will serve as a guide for supply chain activities for the Project. This SCP describes Ocean Wind's local supply goals and the minimum the Project will achieve based on a range of opportunities. The SCP provides (1) the local content and competition targets for developing a sustainable, competitive supply chain, (2) a description of Ørsted's procurement philosophy; (3) a description of Ørsted's long-term strategic priority to reduce the cost of offshore wind power; and (4) supply chain opportunities in New Jersey. The plan also addresses the status of supplier selections and information on supplier capacity to provide critical supplies and services.

2.7.2 Status of supplier selections

2.7.2.1 WTG supplier

[REDACTED]

2.7.2.2 Foundation supplier

[REDACTED]

2.7.2.3 Subsea cable supplier

[REDACTED]

2.7.2.4 Other contractors

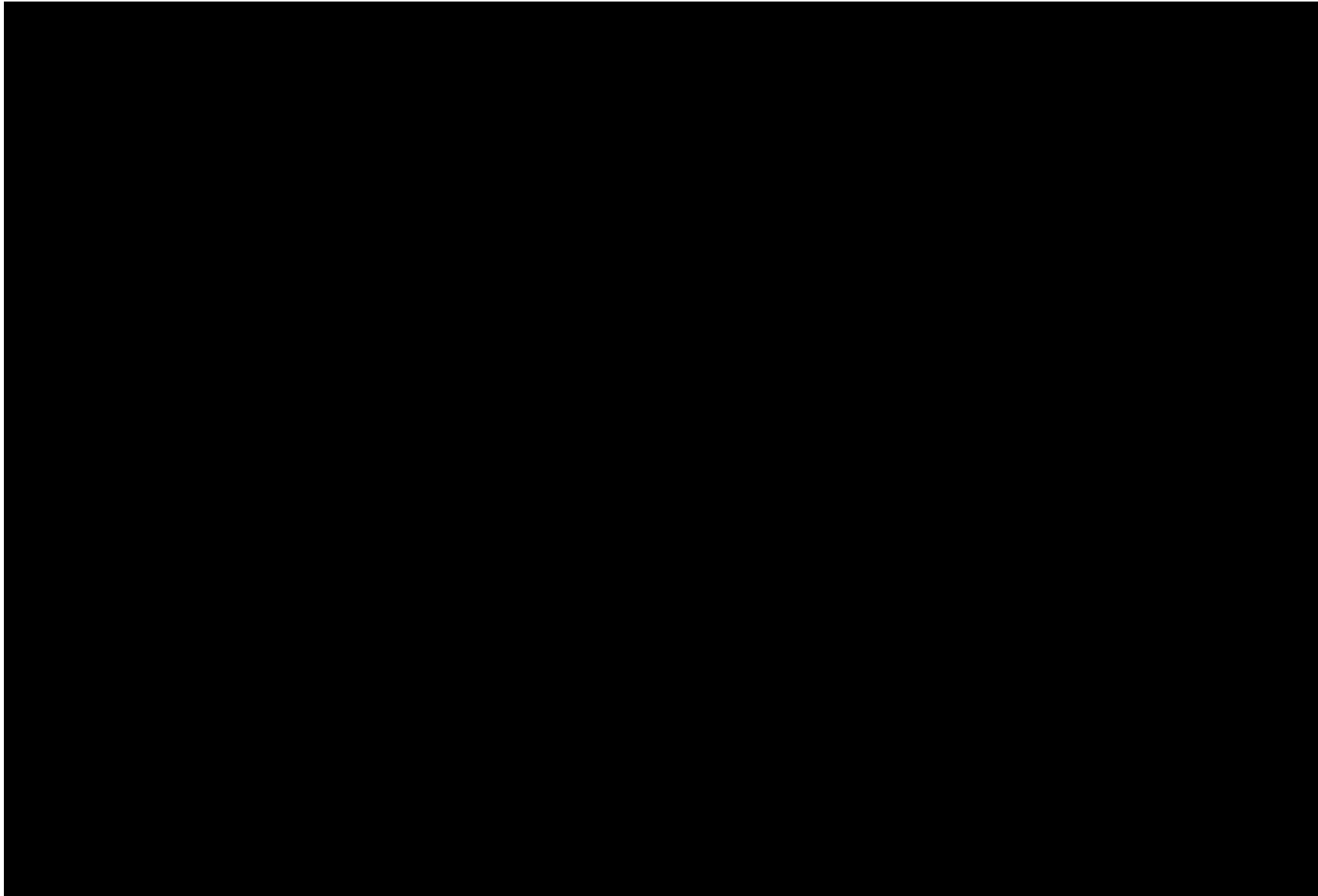
Ørsted will be the EPC contractor for the Ocean Wind Project. Unlike other companies in the business, Ørsted has, through its history, taken the role of EPC contractor, giving greater control of the full scope of the works as well as the construction risk. In addition, this increased hands-on approach gives Ørsted data which can drive constant improvements, and has fostered the reduction in costs, realized during the past years. [REDACTED]

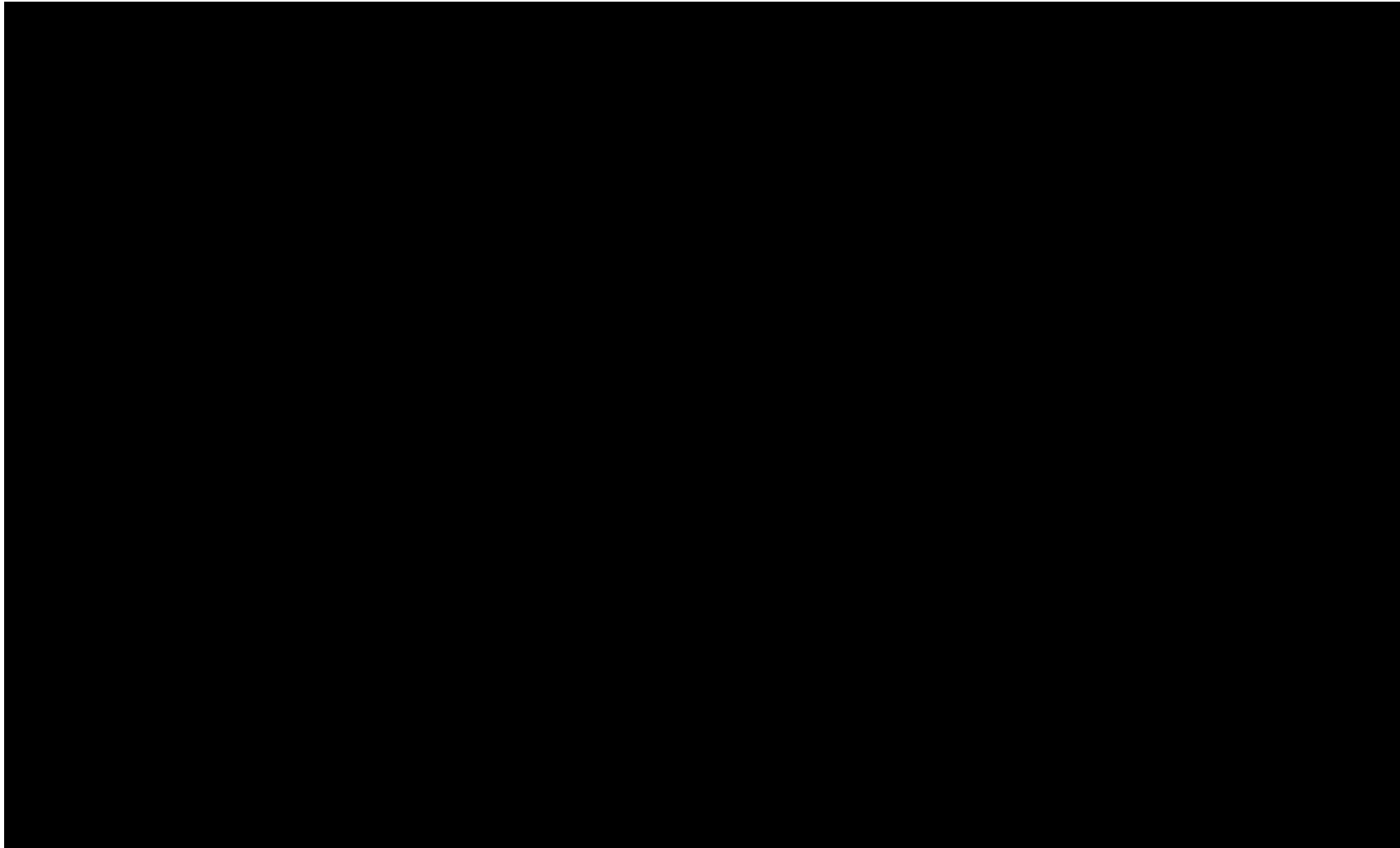
[REDACTED]

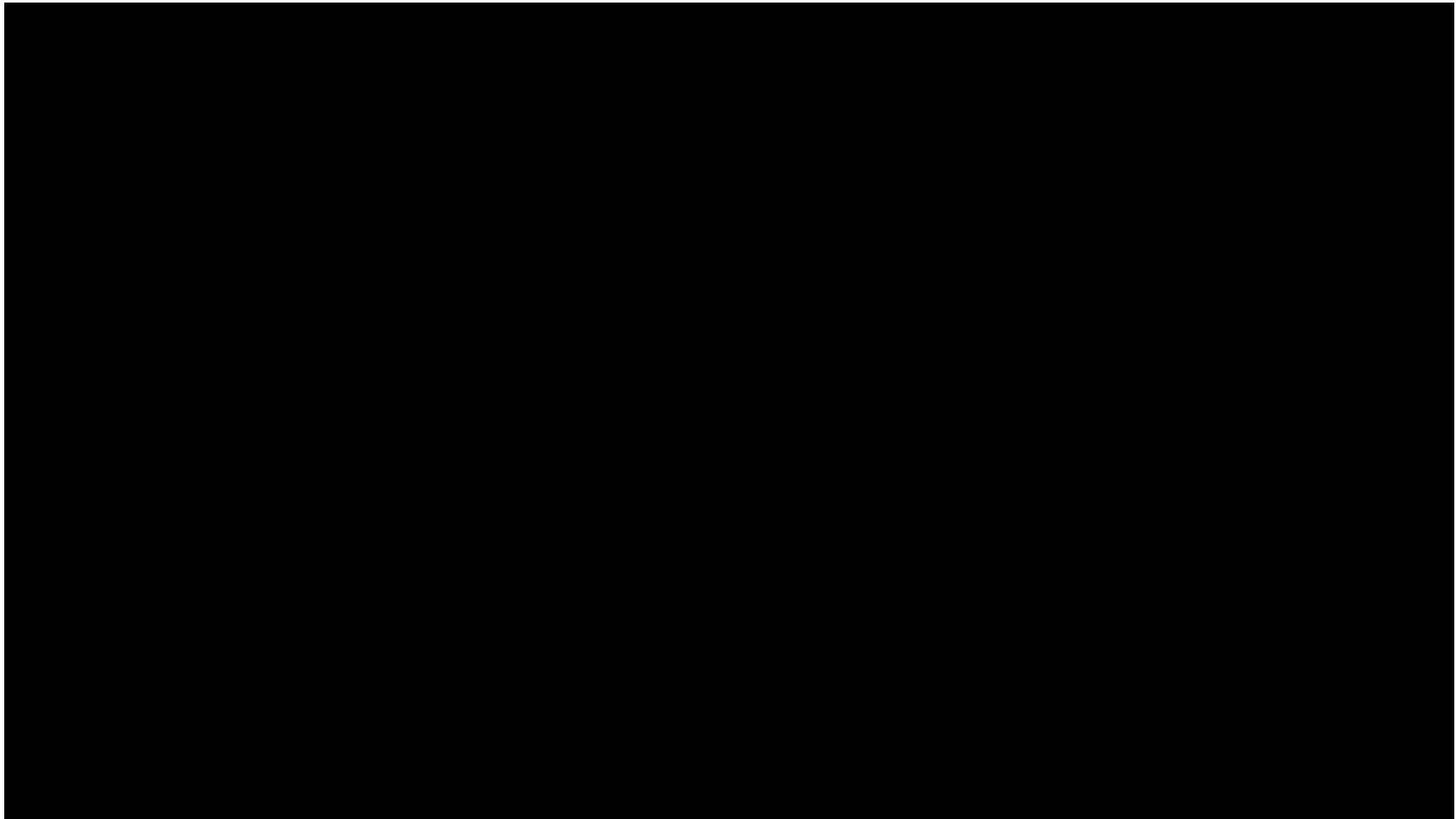
2.7.3 Maritime vessels

Vessels needed for the Project are listed in Table 2-11 in the following sections, Ocean Wind details the use of maritime vessels with regard to geoscience investigations; WTG, foundation, and cable installation; staging; and O&M. [REDACTED]

[REDACTED]







2.7.3.1 Geoscience investigations

As part of the Project, Ocean Wind must contract vessels to perform substantial investigations of the seabed as well as the environment to gain an understanding of the potential impacts the Project may have and to complete necessary modeling and design; this work commenced in 2016. To date, the Project has made use of both US and non - US flagged vessels. [REDACTED]

Finally, as shown in Table 2-12, Ocean Wind has already completed an early geotechnical and geophysical investigation, which is important because supply and installation contracting schedules are closely linked between scopes. The investigation will contribute significantly to the robustness of the construction time schedule.

Table 2-12. Ongoing and completed work under the Geoscience and Permitting Work Streams.

Scope	Description	Vessel	Status
Desktop studies of site	Included geological studies of site, export cable routes and UXO/MEC factual study	[REDACTED]	Completed 2017 and 2018
Geophysical 1A screening survey	900 x 900 m line separation grid reconnaissance for accurate bathymetry, supporting seabed mapping and structural modelling	[REDACTED]	Completed 2017
Geotechnical 1A investigation	38 positions investigated for Initial seabed geological formation and geological classification	[REDACTED]	Completed 2018
Geophysical 1B	Ultra-high-resolution survey as per 1a but with greater resolution to better understand and evaluate seabed conditions (90 m line separation grid in WTG corridors)	[REDACTED]	Initiated 2018 (Not to be included in COP Submission 1)
Geophysical WTG Area of Potential Effect Survey (Archaeological)	High-resolution survey to comply with BOEM Guidelines (infill to obtain 30 m line separation grid in WTG corridors)	[REDACTED]	Initiated 2018 (Not to be included in COP Submission 1)

BOEM = Bureau of Ocean Energy Management; m = meters; UXO = unexploded ordnance; MEC = munitions and explosives of concern; RV = research vessel

2.7.3.2 Heavy lift vessel for TPs and WTGs

[REDACTED]

[REDACTED]

Today, Ørsted maintains an ongoing dialogue with the major offshore wind installation players about the development of new installation vessels, methods, tools, and concepts, which is part of Ørsted's work to reduce the cost of offshore wind energy.

[REDACTED]

- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]

[REDACTED]

2.7.3.3 Cable installation

[REDACTED]

³ [REDACTED]

2.7.4 Wind turbine generator certification

The WTG will be provided with a Type Certificate for the rotor nacelle assembly that is issued by an independent Certifying Body [REDACTED]. The combined supporting structure consisting of foundation and WTG tower will be provided with a Site-Specific Certificate, also issued by an independent Certifying Body, taking the site-specific conditions into consideration.

2.8 Developer's experience

N.J.A.C. 14:8-6.5(a)(2).

i. The project developers shall: ... a demonstration of the applicant's experience in projects of similar size and scope proposed, including the use of other turbine types; (1) Demonstrate applicable experience in projects of the size and scope proposed;

2.8.1 Ørsted's global experience

Ørsted brings unparalleled experience in offshore wind, detailed in Section 1.4, including more than 25 years of experience and operations of 25 offshore wind projects, and with a track record of bringing projects to market on time and within budget. Ørsted's 2000+ employees and dedicated in-house EPC arm and vast experience allows Ocean Wind to offer a competitive and achievable Project with confidence.

2.8.2 Ørsted's American experience

Through its recent acquisition of Deepwater Wind, Ørsted has gained unmatched development capabilities in the United States. Deepwater Wind was the first company to have successfully navigated the permitting, legal, financial, installation and operational challenges of offshore wind in the US. In addition to building the first offshore wind farm in the US in Rhode Island waters, Deepwater Wind was also awarded the second (the 90 MW South Fork Wind Farm for Long Island), third (the 120 MW Skipjack Wind Farm for Maryland), and fourth (the 200 MW Revolution Wind project for Connecticut) US offshore wind revenue contracts, and also has successfully negotiated and is awaiting regulatory approval of the Rhode Island PUC for a contract to supply an additional 400 MW of offshore wind power.

[REDACTED]

[REDACTED]

2.8.3 PSEG's New Jersey experience

[REDACTED]

Throughout New Jersey, PSEG has developed a reputation for running a highly reliable and well-maintained transmission infrastructure, and as a participant in the Ørsted Project, PSEG would bring this expertise and history to bear on the operation and maintenance of the Project.

2.9 Energy resource plan

N.J.A.C. 14:8-6.5(a)(2).

i. The project developers shall: (4) Include a map with the location of the site(s) clearly marked by longitude and latitude and the Federal Bureau of Ocean Energy Management, Regulation and Enforcement block numbers;

v. Applicants shall indicate the proposed nameplate capacity for the entire project and the anticipated number of individual units for the selected technology; and estimate the net yearly energy output for the project, accounting for losses and include any assumptions, such as the assumed capacity factor, that are the basis for the estimate. Applicants shall provide a wind resource and energy assessment from a wind energy consultant for the exact manufacturer, model, and specifications of turbines selected for the project. Applicants shall also provide the professional qualifications for the wind energy consultant as an attachment to the application to demonstrate sufficient expertise.

vi. Applicants shall account for, to the fullest extent possible, the coincidence between time of generation for the project and peak electricity demand; provide an estimate, with documented support, of the amount of electrical capacity the project will make available, that is calculated consistent with PJM rules and procedures; provide an estimate, with support, of the amount of energy being generated over the term of the life of the turbines; and estimate, with support, the level of generation that their proposed project will be able to provide over the life of the equipment, assuming the project runs for the equipment's full life;

The energy resource of the proposed wind farm is calculated by Ocean Wind's Energy Yield Department using collected offshore data, industry accepted tools, and in-house developed tools for the purpose of estimating the energy yield of the farm.

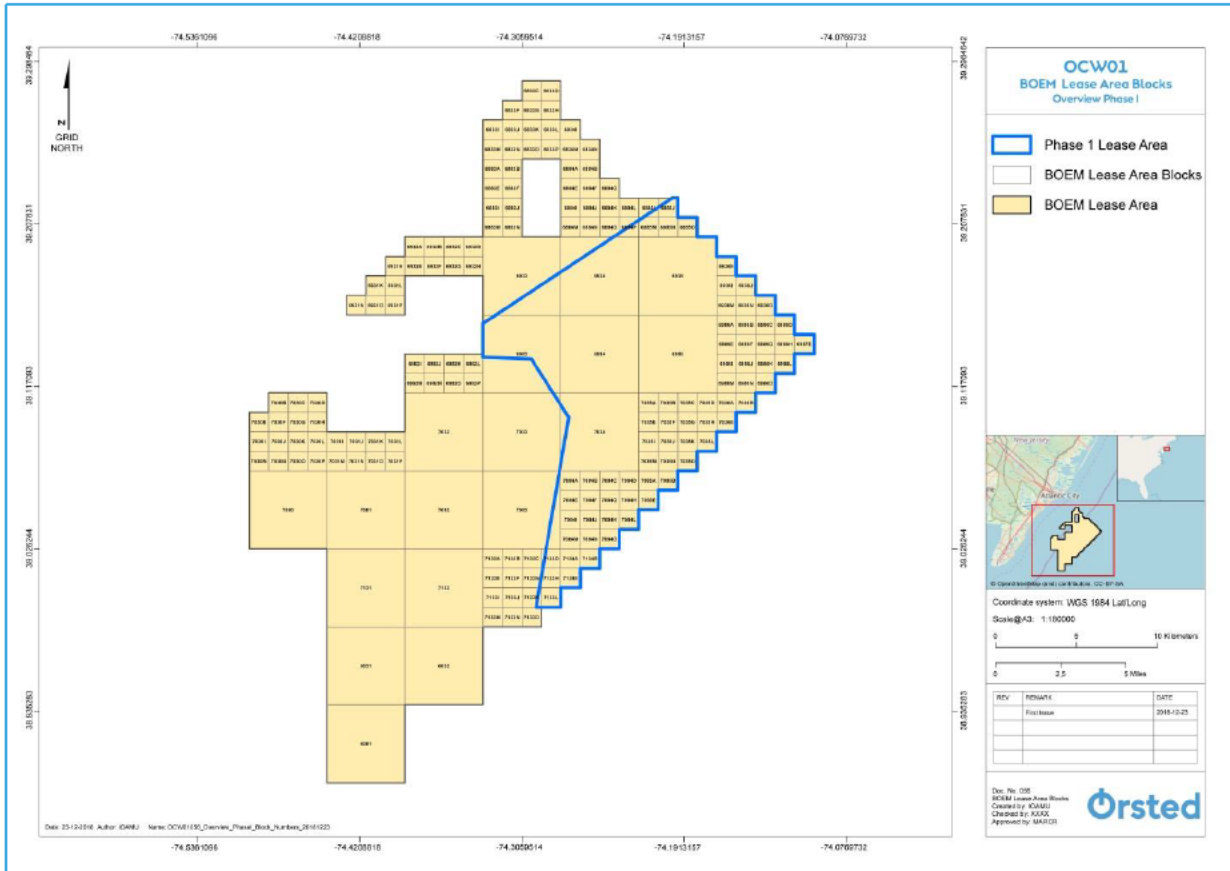
Garden State Offshore Energy, LLC (GSOE), a [REDACTED] joint venture between PSEG and Ørsted, developed a floating light detection and ranging (LiDAR) or FLiDAR with the support of a grant from the New Jersey Board of Public for a period of approximately 15 months spanning 2014 to 2015. Specifically, GSOE deployed a [REDACTED]

[REDACTED]

[REDACTED] The Lease Area is shown on Figure 2-30.

⁴ State of New Jersey, Board of Public Utilities; Docket Nos. EO08110971 and EO08121064; In the Matter of Offshore Wind Rebate Program for the Installation of Meteorological Towers; Aug. 18, 2010

Figure 2-30. Site locus.



2.9.1 Annual energy output

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[Redacted text block]

The wind turbine data used for the assessment is listed in Table 2-13.

Table 2-13. Design Basis wind turbine data.

Turbine Type	Rated Power	Max Cp*	Hub Height	Rotor Diameter
[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]

MW = megawatt; m = meter; Cp = coefficient of power
* See Table 12-1 for details on the different size projects

The Net AEP (P50 and P90) is presented in Attachment 2.5.

[Redacted text block]

[Redacted text block]

[Redacted text block]

⁵ JCGM (Joint Committee for Guides in Metrology), "Evaluation of Measurement Data – Guide to the Expression of Uncertainty in Measurement" (2008). https://www.bipm.org/utils/common/documents/jcgm/JCGM_100_2008_E.pdf (accessed No. 29, 2018).

2.9.2 Wind resource and energy assessment

Ocean Wind has contracted with a fully compliant unaffiliated third party to provide an independent assessment of the wind resource and energy yield of the Project specific to the manufacturer, model, and specifications of turbines identified as the Design Basis. The professional qualifications of the wind energy consultant and the study report are provided in Attachment 2.5.

A robust wind climate prediction regime is paramount to an accurate assessment of the energy resource profile for the Project. Ocean Wind has dedicated significant resources to data collection, modelling and calibration. This work increases the confidence in the energy production projection essential to the Project's business case. [REDACTED]

[REDACTED]. Finally, a set of assumptions for the expected efficiencies and availabilities has been thoroughly developed based on Ørsted's more than two decades of experience in wind farm operations.

[REDACTED]

2.9.2.1 NJORD wind resource campaign

[REDACTED]

Figure 2-31. Overview of the data available by area.

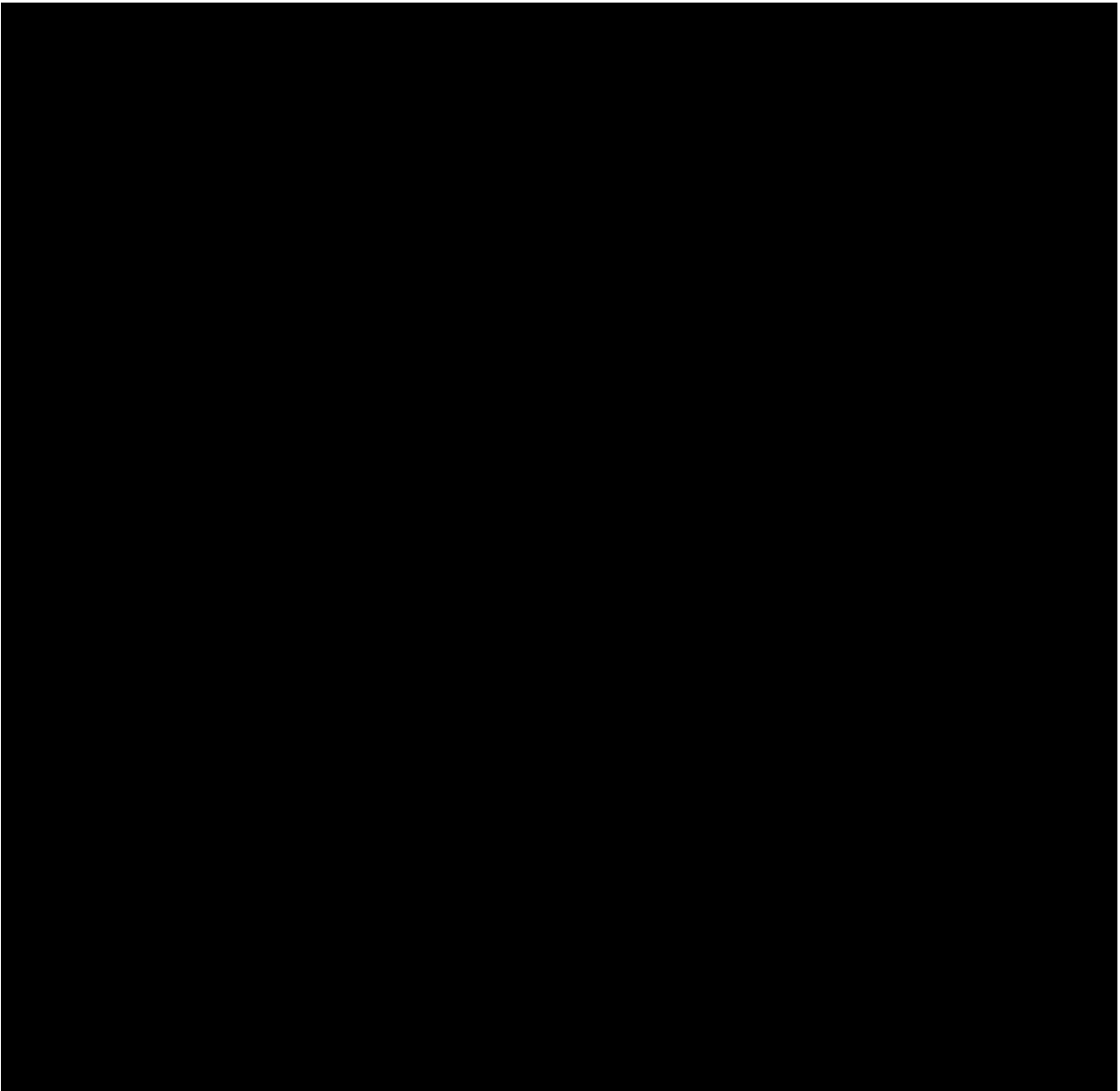
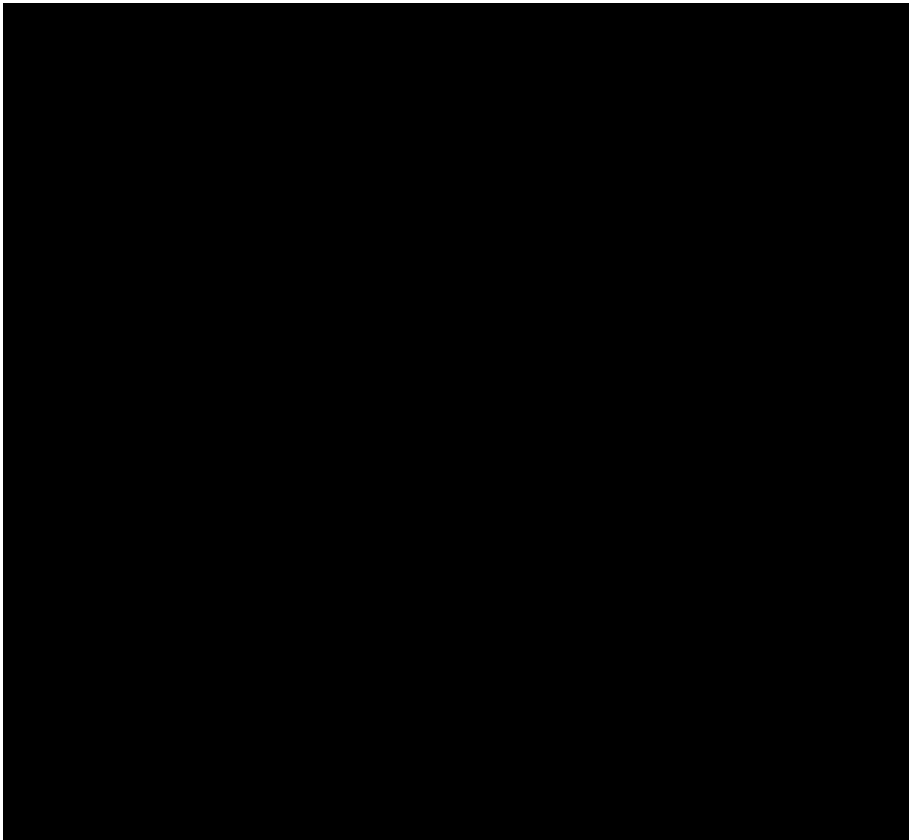


Figure 2-32. [REDACTED]



2.9.2.2 PNNL floating LiDAR

The US Department of Energy (DOE) has made data from an AXYS WindSentinel FLiDAR available through the Pacific Northwest National Laboratory (PNNL) web site.⁶ The FLiDARs has been deployed at the coast of Atlantic City for 15 months from Nov. 2015 to Feb. 2017. The LiDAR mounted on this buoy is a Windicator. The LiDAR measured wind speed and direction at heights of 55, 70, 90, 111, 130, and 160 m aMSL (above mean sea level). [REDACTED]

[REDACTED]

[REDACTED]

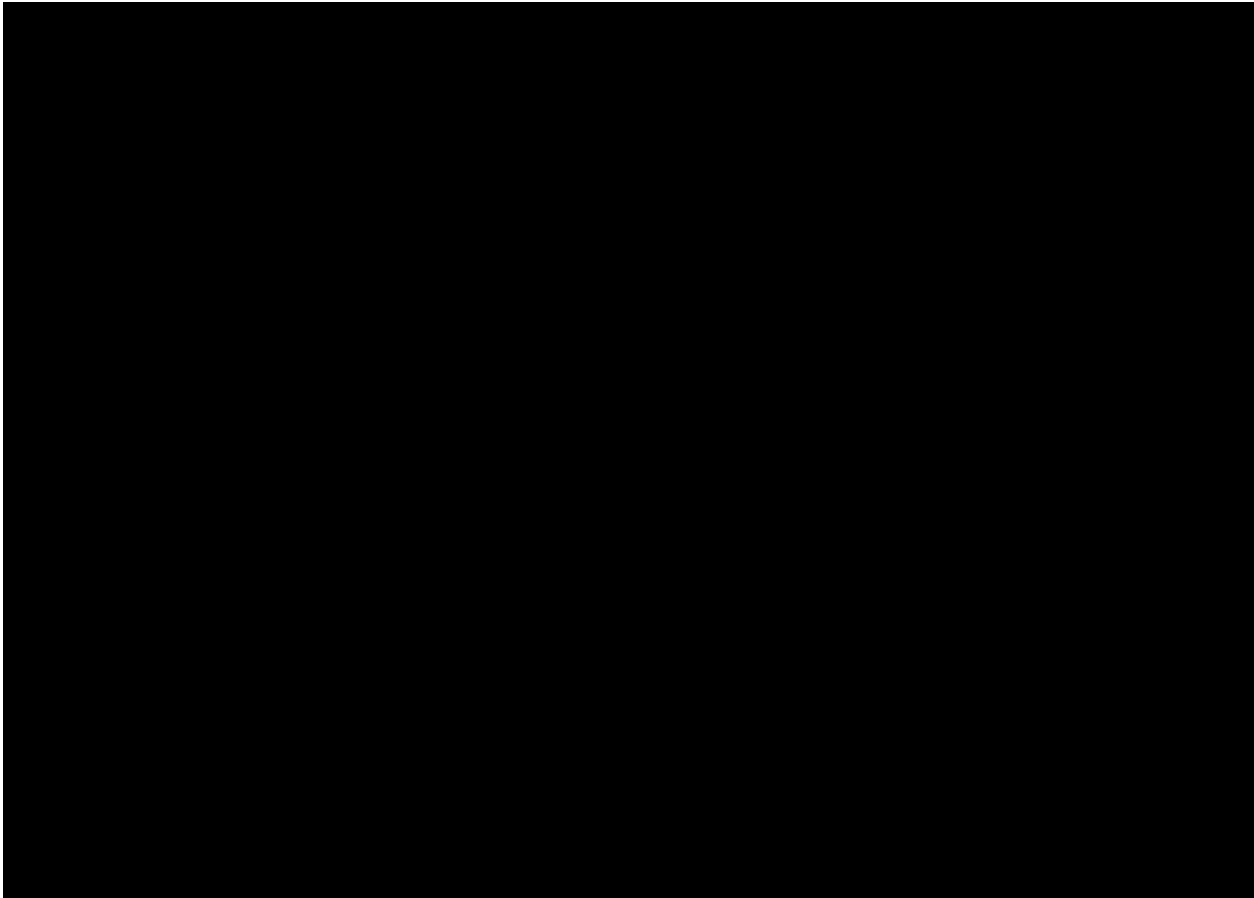
[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

⁶ <https://www.energy.gov/eere/wind/accessing-energy-department-s-lidar-buoy-data>



2.9.2.3 [Redacted]

[Redacted text block]

[Redacted text block]

[Redacted text block]

⁷ Carbon Trust, *Offshore Wind Accelerator Recommended Practices for Floating Lidar Systems* (2016). <https://www.carbontrust.com/media/673560/owa-floatinglidarrecommendedpractice-25oct2016-final.pdf> (accessed Nov. 29, 2018).



2.9.2.4 Mesoscale data

Several nodes of modelled mesoscale data from Vortex are available, spanning the site [REDACTED]. Each node consists of three hourly time series based on the input sources [REDACTED]. Data from 50 to 150 m aMSL are available. Most nodes have a little more than 10 years of data. The node NN112 has a little more than [REDACTED] of data. The nodes contain the most recent data available at the time of writing; [REDACTED].

2.9.2.5 Site wind climate

The final representative wind climate for the Project phase 1 site is shown in Figure 2-35 and Figure 2-36. The estimated long-term mean representative wind speed for the average turbine position of the Project phase 1 is [REDACTED].

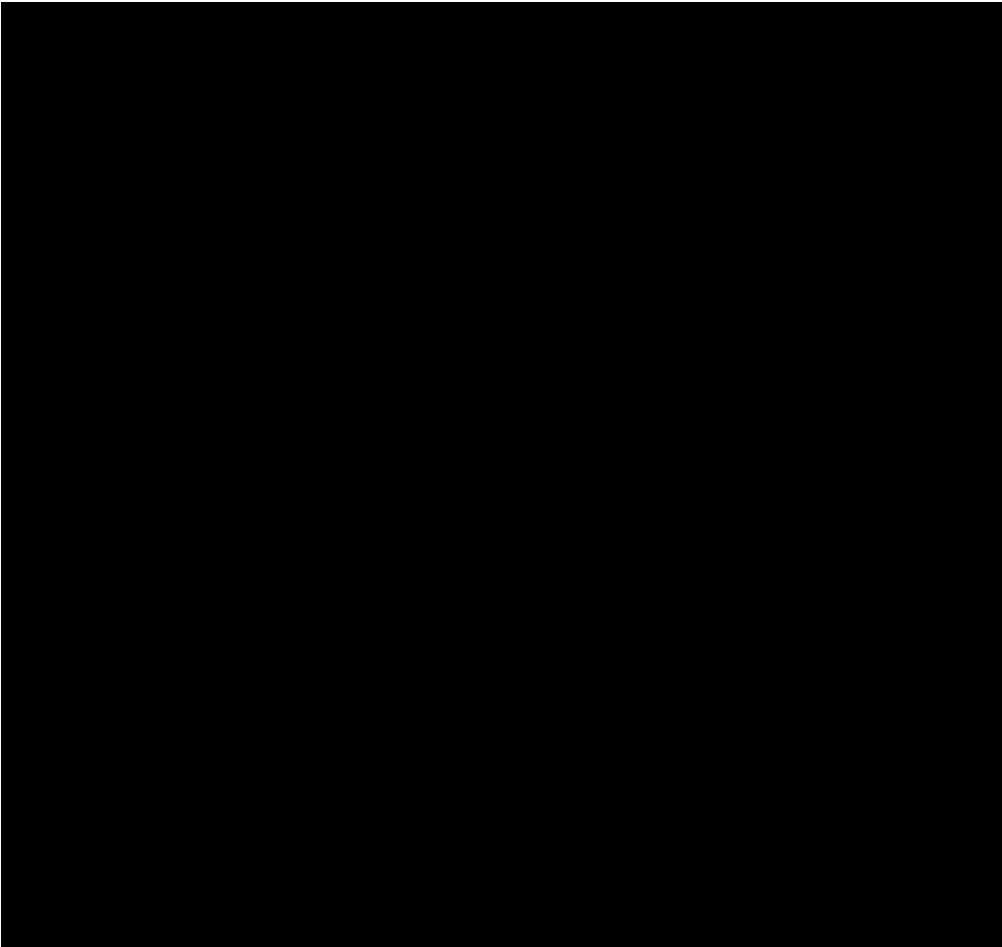
2.9.3 Power curve



[Redacted]

[Redacted]

[Redacted]



2.9.4 Generation and peak electrical demand

PJM operates a Capacity Market called the Reliability Pricing Model (RPM). To participate in the RPM wind generators must request Capacity MW from PJM as part of the interconnection process. PJM performs a resource adequacy assessment for the Project according to the PJM Manual 21. The resource adequacy is performed for the months of June to August for hours of 2:00 p.m. to 6:00 p.m., when the electrical system typically experiences its highest demand. The Project has supplied wind speed measurements to PJM for this analysis. Using the wind speed data, the Project was able to agree on a [REDACTED]. An overview of the PJM calculation is provided in Attachment 2.6. Please note, the winter months have a significantly higher capacity factor. [REDACTED]

This capacity from the Project will diversify the energy mix available in the RPM, thereby increasing reliability in the PJM system over the life of the asset. Furthermore, due to its higher winter capacity factors, the Project will alleviate the price volatility experienced by extreme weather during the cold winter months in New Jersey.

2.10 Technology viability, cost competitiveness, and suitability

N.J.A.C. 14:8-6.5(a)(2).

i. The project developers shall: (2) Demonstrate that the wind technology is viable, cost competitive, and suitable for use in New Jersey's offshore environment under varying and expected meteorological and climate conditions;

2.10.1 Site conditions

2.10.1.1 Meteorological conditions

This section describes the site-specific meteorological conditions at the Ocean Wind offshore wind farm site.

2.10.1.2 Wind

2.10.1.2.1 Operational conditions

The New Jersey Atlantic Coast is governed by southwesterly and westerly winds (primarily side-shore and offshore conditions). Average wind speed at the Ocean Wind site is approximately eight m/s.

2.10.1.2.2 Extreme conditions

Extreme wind conditions in New Jersey waters are influenced by both winter storms and tropical hurricanes. Several Nor'easters occur every winter season, but the design-driving wind speeds (with recurrence periods of 50 to 500 years) occur during the more rare passage of tropical hurricanes.

The more severe tropical hurricanes on the US East Coast occur farther south (i.e., south of Cape Hatteras). Farther northeast, the coast line between Long Island and Cape Cod is also exposed and is occasionally hit by severe tropical hurricanes. The slightly more sheltered coast line between Cape Hatteras and New York City is only rarely affected by severe hurricanes.

This result is confirmed by US onshore building codes. Studies by leading US hurricane experts show that extreme 50-year wind speeds for New Jersey waters are similar to conditions in northwest Europe. The rarer 500-year events are more severe than in Europe but still less severe than in Taiwan. Final release of the site-specific hurricane study is pending, but it is expected that the 500-year design wind gust will be in the range of 75 m/s (165 miles per hour (mph)), corresponding to a Category 3 hurricane.

Evaluation of the extreme wind conditions is based on a simulation of 300,000 years of synthetic storm tracks by leading US hurricane specialists using observed, historical storm tracks and validated against measurements from onshore masts, dropsondes, and the NOAA network of offshore buoys. The Project will be designed based on the most recent hurricane and storm data available which reflects the recent hurricanes that occurred on the East Coast.

2.10.1.2.3 Other meteorological conditions

Hub-height temperatures at the site are generally moderate, but high temperatures can occur in the summer. Combined with winds from land, conditions could occasionally exceed the cooling

capacity of WTGs and cause minor curtailment. Extreme temperatures are pronounced due to the close proximity of the large North American continental mass. Extreme lows will be below typical offshore wind farm conditions, and icing could occasionally occur in winter. Lightning, humidity, and other conditions are all within requirements for standard wind turbine classes.

2.10.1.2.4 Meteorological input data

The meteorological design conditions are based on analyses of the following, primary data sources:

- On-site and regional LiDAR, buoy, and met-mast measurements;
- Local, regional, and global computer simulations of meteorological conditions;
- Site-specific extreme wind (hurricane) study;
- Relevant US and international standards for offshore wind and oil and gas; and
- In-house experience from the development of more than 20 offshore wind sites in Europe, Taiwan, and the US.

2.10.1.3 Marine conditions

This section describes the site-specific marine conditions at the Ocean Wind offshore wind farm site.

2.10.1.3.1 Waves

Operational conditions

With dominant winds blowing from shore, operational wave conditions in New Jersey waters are moderate with average, significant wave heights of 1.1 m, similar to existing offshore wind development areas in northwest Europe. The wave climate is dominated by swell primarily from southern directions with longer than average wave periods due to the direct exposure to the Atlantic Ocean.

Extreme conditions

Although extreme wind speeds are governed by tropical hurricanes, extreme wave heights from hurricanes are not excessive due to the orientation of the shore. Extreme waves from Nor'easters are equally important in the assessment, and design values are similar or lower than existing offshore wind development areas in the northwest Europe.

Final release of the site-specific wave study is pending, but it is assumed that the design maximum wave height will be below 20 m (i.e., lower than at the more exposed Bay State Wind lease area offshore Massachusetts and Ørsted's projects in the German Bight).

Evaluation of the extreme wave conditions are based on simulation of storm tracks by leading US hurricane specialists, using observed, historical storm tracks and validated against measurements from onshore masts, dropsondes, and the NOAA network of offshore buoys.

Other marine conditions

Current and tides are generally low in this area, similar to open ocean conditions. Extreme current and water levels are wind driven but are generally low in this area, similar to open ocean conditions.

2.10.1.3.2 *Marine input data*

The marine design conditions are based on analyses of the following:

- On-site and regional measurements of waves, current, and sea level;
- Local and regional computer simulations of waves, current, and sea-level;
- Site-specific extreme wave (hurricane) study;
- Relevant US and international standards for offshore wind and oil and gas; and
- In-house experience from the development of more than 20 offshore wind sites in Europe, Taiwan, and the United States.

2.10.1.3.3 *Ground and soil conditions*

This section describes the site-specific soil conditions at the Ocean Wind offshore wind farm site.

Bathymetry

Water depths vary [REDACTED]. The depths tend to deepen going away from the shoreline [REDACTED], representing the complex depositional environment during the Holocene Epoch. In broad delineations, the ridge-swale area west of the Lease Area is characterized by sands with various concentrations of embedded gravel. The Great Egg Valley area in the central part of the Lease Area is characterized by sands, and the shoal-retreat massif in the eastern part is characterized by more sands.

Geophysical

Based on Ocean Wind's initial geophysical surveys, [REDACTED] and have a consistent northeast/southwest orientation.

Soil

The subsurface geological conditions have been extensively influenced by sea-level fluctuations causing the shoreline to regress and transgress over geological time. This is in the area characterized by well-defined soil units [REDACTED]

2.10.2 Suitability of proposed technical equipment

2.10.2.1 Wind turbine generators

The WTG model was chosen to ensure that the site-specific conditions at the Project site do not exceed the certified, maximum allowable conditions as prescribed by US and international design codes.

The structural reliability of the WTGs is ensured not only by the fulfillment of the conditions in the type certificate but also through thousands of site-specific load case calculations performed by the WTG supplier, based on the Design Basis input compiled by Ocean Wind, both of which are reviewed and certified by the independent certification agency.

2.10.2.2 Foundations

Water depths, soil, and metocean conditions [REDACTED] and conventional foundation types such as MPs are feasible for the New Jersey offshore wind development areas. All support structures will be custom built for the Project site and designed to withstand a 500-year storm event per US and international design standards for areas exposed to tropical cyclones.

The 500-year storm event is, however, primarily driving the sub-seabed part of the support structure. Most of the steel dimensions and tonnages are rather driven by the operational (fatigue) wave climate. Ørsted in-house software [REDACTED] and 20 years of unparalleled experience designing more than 1,000 offshore wind foundations will ensure safe and cost-optimal support structures for the soil and metocean conditions at the Project site.

2.10.2.3 Electrical service platform/OSSs

The electrical service platforms (ESPs) are custom built to fit the Project site and designed to withstand a 10,000-year storm event per US and international design standards. The structural design is carried out by an external, offshore structural design expert, and the design is reviewed and certified by the independent certification agency.

2.10.2.4 Cables

Cables are designed to ensure that the site-specific conditions at the Project site are considered. This will be done based on specific geotechnical investigations, yet to be carried out. Cables will be buried and post-construction burial surveys will be carried out to ensure they are buried to the correct depths, which allows protection from storm events.

2.10.2.5 O&M vessels

Proximity to shore combined with moderate wave heights due to the primary wind direction from the shore will make all conventional access methods feasible including conventional, small CTVs.

2.10.3 Cost competitiveness

Based on the criteria Ocean Wind knows of at the Project area, the design proposed offers an efficient power station in terms of cost and use of the existing natural resources, and allows for future development in the Ocean Wind Lease Area. By using the global procurement arm of Ørsted, and the deep relationships established with suppliers, this Project will offer to rate payers a cost effective wind farm that will operate long into the future. The Project will act as the spring board for future development of the offshore wind industry in New Jersey. Ørsted prides itself on completing its projects on time and on budget (e.g., Block Island, Race Bank, London Array, Burbo Bank, Westermost Rough).

2.10.4 Project viability and reasonableness of time frame

Building large-scale wind farms offshore is not easy. Supported by Ørsted's track record of achievement, Ocean Wind is the right partner to get the job done and keep New Jersey ahead of the interstate competition for offshore wind jobs and economic development opportunities.

Project viability is supported by the Ørsted legacy of more than 20 offshore wind farms already developed, constructed, and in operation in Europe, with additional four wind farms under construction (see Section 1).

Technical design and constructability are retained in-house and are based on almost three decades of experience of engineering, procuring, and constructing offshore wind farms and complex onshore transmission lines. This in-house experience and technical know-how is what sets Ørsted apart from all other offshore wind developers. Further, Section 13 highlights the team's ability to execute the Project in a commercially reasonable time frame.

Since May 2016, Ocean Wind has been actively engaged in the development of the Project. Among eligible bidders, Ocean Wind believes it is furthest along in several key Project development areas, including but not limited to interconnection, site control, and environmental permitting. Having received Site Assessment Plan approval from BOEM, Ocean Wind has deployed equipment within the Lease Area for the all-important task of gathering data on wind and other environmental conditions. Moreover, Ocean Wind has developed solid contingency plans and optionality across major Project parameters (e.g., suppliers, logistics, interconnection points) to ensure that it has the flexibility to respond to unforeseen events to deliver as committed.

As discussed throughout this document, major work streams – including permitting, interconnection, site control, and supply chain development and procurement – are already well underway, limiting the possibility of future surprises that could delay or derail the Project. Moreover, Ocean Wind has built considerable flexibility and redundancy into all of these work streams and major equipment to adapt as new data are collected and the design advances.

Ocean Wind has proposed what it believes to be an aggressive yet realistic schedule for commercial operation given critical path items. Ocean Wind is well aware of the State's desire to bring these resources on-line as quickly as possible in order to realize the price, reliability, diversity, economic development, and environmental benefits that offshore wind can bring and is striving to meet these expectations. Furthermore, the team is taking significant steps to de-risk the Project

timeline. [REDACTED]
[REDACTED]

[REDACTED]

- Front-loading Ocean Wind’s site survey activities as much as possible, being the first to mobilize vessels for the geophysical and geotechnical survey campaign to document seabed conditions.

By the same token, Ocean Wind strives to make commitments that are responsible and well informed. The proposed risk reduction strategy strikes the right balance between an optimized engineering, procurement, permitting, and construction schedule and is in New Jersey’s best interests (see Section 13 for schedule details).

Project description – Attachments

Attachment 2.1 – Project Equipment Specifications and Layout

Attachment 2.2 – Design Basis Environmental Product Declaration

Attachment 2.3 – Ocean Wind Supply Chain Plan

Attachment 2.4 – Supplier Letters of Support

Attachment 2.5 – Wind Energy Assessment

Attachment 2.6 – PJM RPM Capacity Calculation

Attachment 2.1 – Project Equipment Specifications and Layout

Attachment 2.1 – Project Equipment Specifications and Layout

REDACTED FROM PUBLIC COPY

Attachment 2.2 – Design Basis Environmental Product Declaration

REDACTED FROM PUBLIC COPY

Attachment 2.3 – Ocean Wind Supply Chain Plan

Attachment 2.3 Supply Chain Plan

REDACTED FROM PUBLIC COPY

Attachment 2.4 – Supplier Letters of Support

Attachment 2.4 Supplier Letters of Support /Declarations

REDACTED FROM PUBLIC COPY

Attachment 2.5 – Wind Energy Assessment

Attachment 2.5 – Wind Energy Assessment

REDACTED FROM PUBLIC COPY

Attachment 2.6 – PJM RPM Capacity Calculation

Attachment 2.6 PJM Ocean Wind Capacity Calculation

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List of Attachments

Attachment 3.1 – Annual Pro Forma Income Statements

Attachment 3.2 – Annual Pro Forma Balance Sheets

Attachment 3.3 – Annual Cash Flow Projections

Attachment 3.4 – Business Plan

Attachment 3.5 – Full Cost Accounting

Attachment 3.6 – Key Supplier Financial Statements

3 Project financial analysis

Project financial analysis – Summary

Core message

The financial strength of Ørsted and its market-leading experience in financing, constructing, and operating offshore wind generation around the world, drives the financial viability of the proposed project. Factors contributing to the benefit of New Jersey ratepayers include:

- Reliance on various regulated and unregulated revenue streams.
- Certainty provided by predictable, long-term OREC revenue necessary for Ørsted and its affiliates to make the substantial capital contributions needed to finance the Project.
- Flexibility in financing combined with the considerable financial strength of Ørsted, creates access to the lowest-cost sources of capital.
- [REDACTED]
- Plans to secure tax credits [REDACTED]
- Should PSEG elect to participate in Ocean Wind [REDACTED] it would rely on its extensive experience and strong track record in New Jersey [REDACTED]

Project financial analysis – Checklist

The information required under N.J.A.C. 14:8-6.5 is cross referenced to the associated document sections in the checklist below.

Checklist Item	Document Reference
Pro forma income statements, including all tax credits or other subsidies relied upon N.J.A.C. 14:8-6.5(3)(i); BPU Guidelines Subsection 3.3	Section 3.1, Attachment 3.1
Balance sheets N.J.A.C. 14:8-6.5(3)(ii).	Section 3.2, Attachment 3.2
Cash flow projections for the proposed OREC period, including the internal rate of return, and a description and estimate of any State or Federal tax benefits that may be associated with the project. N.J.A.C. 14:8-6.5(3)(iii).	Section 3.3, Attachment 3.3
A comprehensive business plan with fully documented estimates of all associated and relied upon revenue and expense projections. N.J.A.C. 14:8-6.5(3)(iv).	Section 3.4, Attachment 3.4
A full cost accounting of the project, including total construction, the feasibility study used to determine the construction costs, and decommissioning costs. N.J.A.C. 14:8-6.5(3)(v).	Section 3.5, Attachment 3.5

Checklist Item	Document Reference
Two years of audited financial statements, in US GAAP including accompanying financial notes to these statements for the applicant and/or parent company. N.J.A.C. 14:8-6.5(3)(vi).	Section 3.6,
Two years of audited financial statements, in US GAAP including accompanying financial notes to these statements for the key project suppliers. N.J.A.C. 14:8-6.5(3)(vii).	Section 3.6, Attachment 3.6
Show a levelized cost of energy (LCOE) over the 20-year lifespan of the project using a 7% discount rate and the project's P(50) output. (BPU Guidance Subsection 3.3).	Table 3-2

Project financial analysis – Documentation

The Project’s financial viability is based on several factors including, primarily, the financial strength of Ørsted and its market-leading experience in financing, constructing, and operating offshore wind generation around the world. Ørsted has constructed 25 wind farms over two decades with an additional five under construction, which has allowed it to implement lessons learned in securing optimal conditions for constructing projects on time and within budget. Experience in operating more than 1,000 turbines uniquely positions Ørsted to operate cost-efficiently and at the same time deliver high park availability¹ to benefit New Jersey ratepayers. Combining Ørsted’s financial strength with its proven track record of offshore wind development ensures a strong foundation for the delivery and operation of a world-class wind farm.

While the Project’s financial ability is primarily based upon the financial strength of Ørsted, and its market-leading experience in financing, constructing and operating offshore wind generation, it is anticipated that at some time during the 20-year initial OREC period, another entity may acquire an equity interest in Ocean Wind. [REDACTED]

Ørsted’s five current construction projects, with a total installed capacity of approximately 5.6 GW are all progressing according to plan and all are on budget.

Should PSEG elect to participate in the Ocean Wind Project as an equity owner, it would rely on its extensive experience to provide financing in accordance with the MOU described in Section 1. Similar to Ørsted, PSEG typically finances investments out of its corporate balance sheet instead of at the project-level with non-recourse debt due to its financial strength combined with its proven construction track record. PSEG is also a long-term investor with a history of operating power plants in New Jersey, and has had a strong commitment to the communities of New Jersey and to the natural environment.

The initial 20-year OREC period, awarded through this solicitation process, will create a predictable long-term revenue stream in order to produce clean, renewable energy from offshore wind generation. The prospect of predictable, long-term revenue will give Ørsted and its affiliates the certainty necessary to make the substantial capital contributions needed to finance the Project and also significant flexibility in financing it. This flexibility, combined with the considerable financial strength of Ørsted, will create access to the lowest cost sources of capital, ultimately reducing the cost of the clean energy delivered from the Project to New Jersey ratepayers. [REDACTED]

¹ Park availability represents, as a percentage, the factor that needs to be applied to the gross energy to account for the loss of energy associated with the amount of time the turbines are unavailable to produce electricity and/or the loss of energy associated with the downtime of the balance of plant.

During or prior to the construction period, Ocean Wind may determine to replace or update equipment identified in this application with more technologically advanced equipment that is equal to or better than the equipment identified in this application. Prior to making any actual substitution, Ocean Wind will notify the Board in advance of its intent to make such replacement or update, and will demonstrate to the Board that such replacement or update is more technologically advanced than the equipment that is listed in this application and is equal to or better than such equipment. If appropriate, Ocean Wind would meet with Board Staff and Rate Counsel to discuss any such replacement or update prior to making the decision.

The Project is expected to qualify for [REDACTED] tax credits which Ocean Wind will monetize efficiently, thus maximizing cost-savings for New Jersey ratepayers.

[REDACTED]

3.1 Pro forma income statements

*N.J.A.C. 14:86.5(a)(3). A complete financial analysis of the project, which includes:
(i). Pro forma income statements;*

Attachment 3.1 presents annual pro forma income statements for the Project [REDACTED]. The income statements reflect Ørsted's current expectations of revenue generation and cost levels for the Project. Revenue streams include ORECs, power prices, Renewable Energy Certificates (RECs), and the capacity market (including ancillary services). [REDACTED]

[REDACTED]

For tax purposes, the Project investment will be depreciated in accordance with IRS guidelines [REDACTED]

[REDACTED]

[REDACTED] For accounting purposes, the major assets of the Project will be depreciated over their operating lifetimes, as shown in Table 3-1.

Table 3-1. Accounting depreciation period by asset type.

Asset Type	Depreciation Period
Generation facilities (wind turbine generators)	[REDACTED]
Transmission lines (lead lines or expandable transmission)	[REDACTED]

Asset Type	Depreciation Period
Offshore substation	[REDACTED]
Onshore substation	[REDACTED]

3.2 Balance sheets

*N.J.A.C. 14:86.5(a)(3). A complete financial analysis of the project, which includes:
(ii). Balance sheets*

Attachment 3.2 presents annual pro forma balance sheets for the Project [REDACTED]

As indicated in Table 3-1., the investment will be depreciated [REDACTED] The [REDACTED] method is used to accelerate the recognition of depreciation. [REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

In addition, BOEM’s regulations will require Ocean Wind to post a “decommissioning bond or other financial assurance, in an amount determined by BOEM based on anticipated decommissioning costs,” prior to the construction of facilities authorized by the COP (30 C.F.R. § 585.516).

The Project will build up a cash reserve to cover operational risks, and to have funding in place for the decommissioning of the Project [REDACTED] The cost of decommissioning a wind farm is substantial, and it is important to plan and budget adequately to be able to restore the seabed of the site to the original conditions.

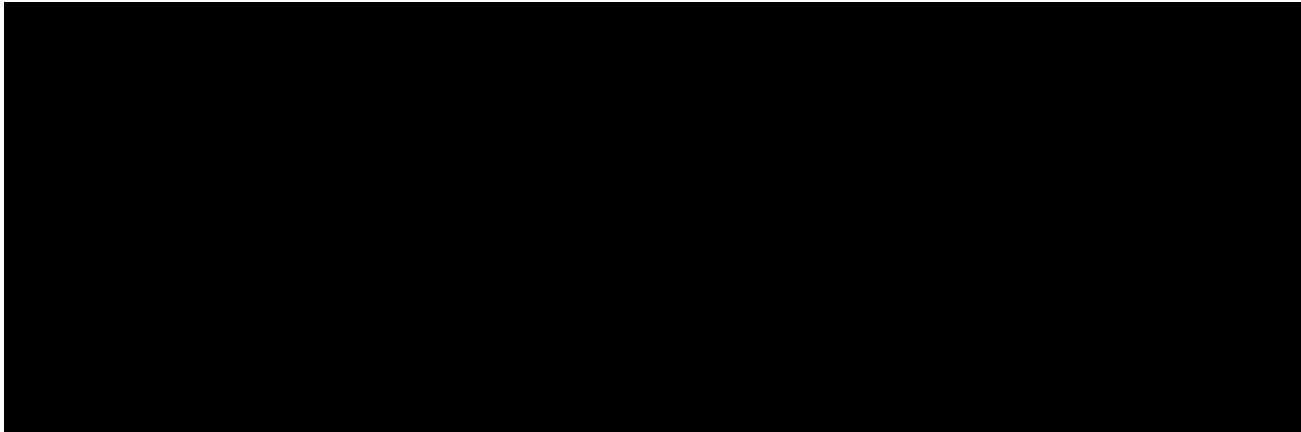
3.3 Cash flow projections

*N.J.A.C. 14:86.5(a)(3). A complete financial analysis of the project, which includes:
(iii). Cash flow projections for the proposed OREC period, including the internal rate of return, and a description and estimate of any State or Federal tax benefits that may be associated with the project;*

Attachment 3.3 presents the annual cash flow projections for the Project [REDACTED]
[REDACTED] The LCOE over the lifespan of the Project, using [REDACTED]
[REDACTED]

Table 3-2. [REDACTED]

[REDACTED]



[Redacted]
[Redacted]
[Redacted] Ocean

Wind plans to apply for all current eligible State and Federal grants, rebates, tax credits, and programs available to offset the cost of the Project or provide tax advantages. A detailed overview is presented in Section 5.

Concerning tax credits, the Project is uniquely positioned to qualify for the Federal Investment Tax Credit (ITC) on an accelerated schedule that will maximize value, passing resulting cost reductions to New Jersey ratepayers.

The ITC is available for wind facilities that commence development by Dec. 31, 2019, but its value decreases every year after 2016, as follows:

- By Dec. 31, 2016 – 100% value or 30% of Qualified Energy Property
- By Dec. 31, 2017 – 80% value or 24% of Qualified Energy Property
- By Dec. 31, 2018 – 60% value or 18% of Qualified Energy Property
- By Dec. 31, 2019 – 40% value or 12% of Qualified Energy Property

[Redacted]
[Redacted]
[Redacted]
[Redacted] Ørsted's

proven track record of timely project execution, world-class O&M and the ability to finance the Project [Redacted]

3.4 Business plan

N.J.A.C. 14:86.5(a)(3). A complete financial analysis of the project, which includes:

(iv). A comprehensive business plan with fully documented estimates of all associated and relied upon revenue and expense projections;

Ørsted has developed a business plan for the Project, as is the norm for the company’s project development process. The business plan is provided in Attachment 3.4 and fully documents estimates of all associated and relied-upon revenue and expense projections during the 20-year OREC period.

3.4.1 Revenue projections

[REDACTED] ancillary services. The business case is calculated based on Ørsted’s power price projections. Additional details on revenue streams and market rates assumptions are provided in Section 6.

The 20-year ORECs awarded through this solicitation process will create a predictable, regulated, long-term revenue stream allowing Ørsted the certainty necessary to fund the Project from the lowest cost sources of capital. [REDACTED]

[REDACTED] The cost to New Jersey ratepayers for clean, green energy is demonstrated in the cost-benefit analysis in Section 11. The OREC is denominated in US dollars per megawatt-hour (USD/MWh). Revenue forecasts are provided in the pro forma income statements in Attachment 3.1. Attachment 6.1 provides an overview of the price forecasts behind the revenue forecasts.

[REDACTED]

Revenue generation will be subject to the produced power. Using state-of-the-art wind turbines and optimizing wind farm layout to reduce wake losses will ensure high power production. Additional details on the expected power production are presented in Section 6.

3.4.2 Operational expenditures

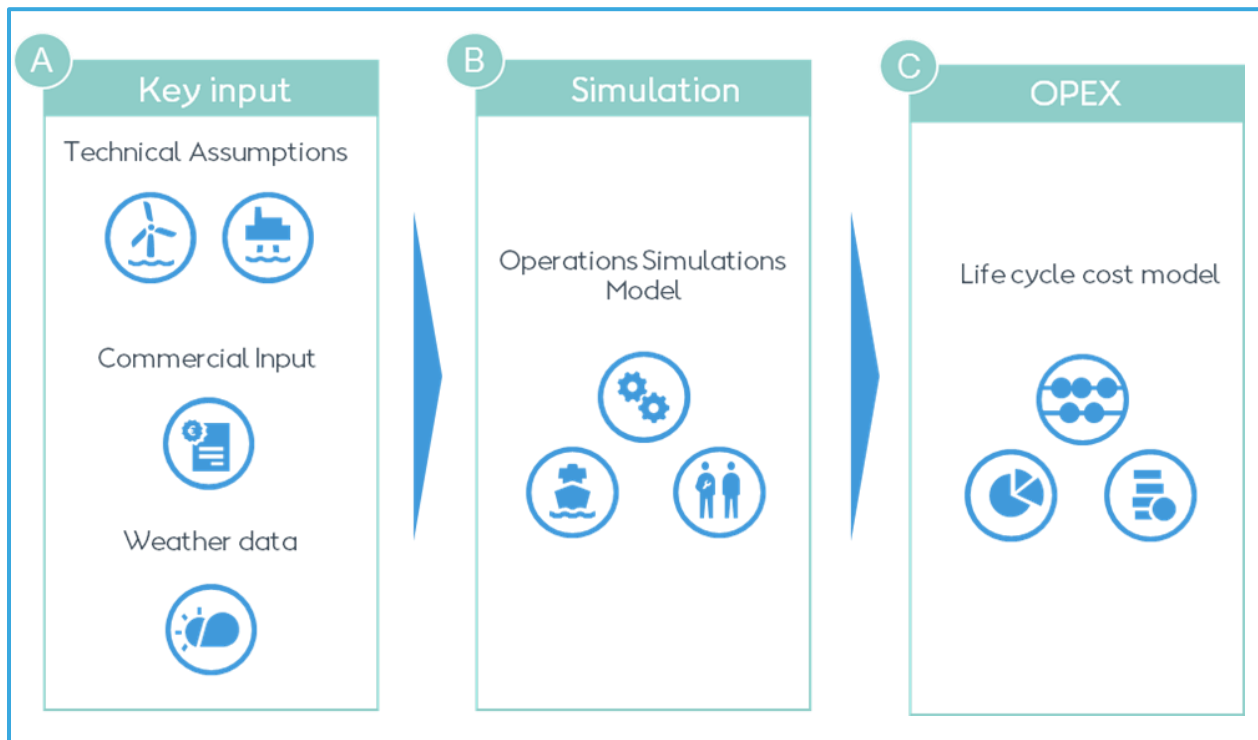
Ørsted is the largest operator of offshore wind farms in the world, servicing more than 1,000 wind turbines. Ørsted’s knowledge and experience will enable the efficient operation of the Project, which will minimize operational expenditures (OPEX), deliver high park availability, and reduce the cost of clean energy to New Jersey ratepayers.

Ørsted nurtures a culture of harvesting knowledge and lessons learned from one site and applying them across the portfolio. The extensive in-house knowledge gives Ocean Wind the best foundation for realistic and precise OPEX forecasting, which is essential for the operational feasibility of a wind farm.

Figure 3-1 is a simple overview of the method for forecasting OPEX. The forecast is based on an extensive database containing operational and commercial information gathered over 25 years. Inputs are divided into [REDACTED]

[REDACTED] compiled in a logistical model used to determine the best logistical setup. The logistical setup feeds into a life-cycle model that provides a full OPEX budget as output in which the current estimates are adjusted for expected inflation and efficiency improvements over time.

Figure 3-1. OPEX budgeting methodology



Compiling an efficient and realistic forecast of OPEX is the key component in making informed decisions based on a solid foundation, thereby reducing the risk of financial surprises during the operational lifetime of the Project.

The projected annual OPEX for the Project are provided in Attachment 3.4. The projections include direct O&M costs, operational insurance costs, and annual lease payments to BOEM. The Project is also subject to minor production fees paid to PJM for various monitoring, settlement and scheduling services. A breakdown of the lifetime OPEX is included in Attachment 3.4

The Project will be subject to State and Federal tax payments during its operational lifetime. [REDACTED]

3.5 Full cost accounting of project

*N.J.A.C. 14:86.5(a)(3). A complete financial analysis of the project, which includes:
(v). A full cost accounting of the project, including total construction, the feasibility study used to determine the construction costs, and decommissioning costs;*

The following sections describe the full cost accounting of the Project, including total construction costs based on Ørsted's proprietary methodology and decommissioning costs.

3.5.1 Construction costs and methodology

Ørsted uses a standardized, thorough methodology for calculating constructions costs. Estimates are based on its significant construction knowledge, extensive database of supplier costs, and close relationships with vendors. [REDACTED]

[REDACTED]

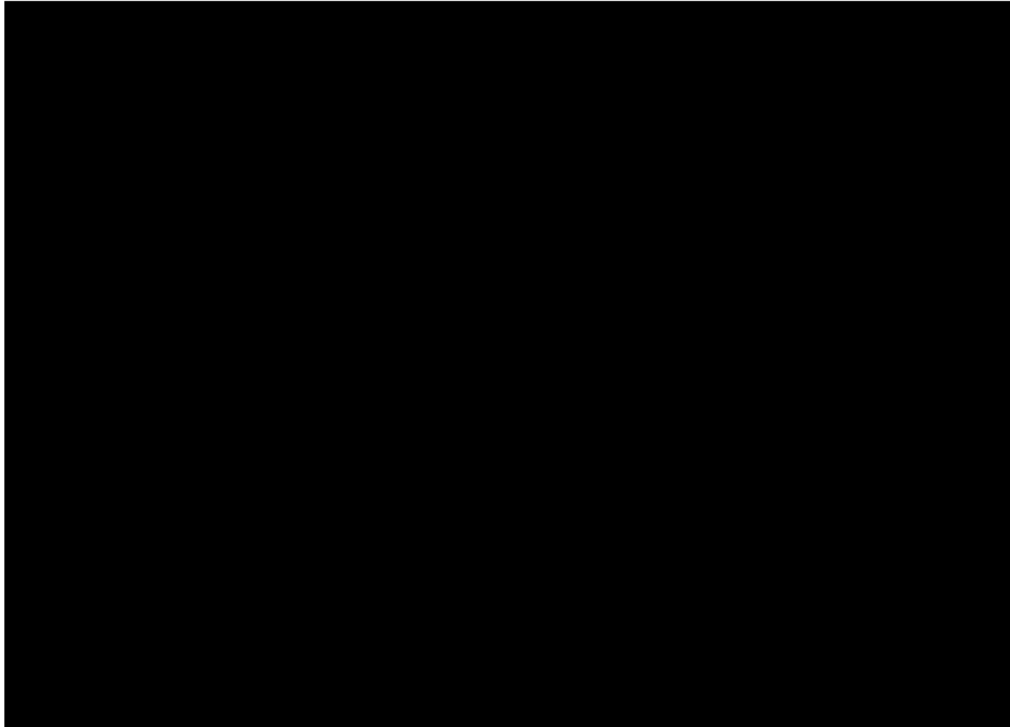
Attachment 3.5 includes a summary of total costs incurred during the development, construction, operation and decommissioning of the Project. [REDACTED]

Through Ørsted's culture of constantly capturing and implementing improvements, the company has incorporated construction knowledge gained through two decades, enabling it to deliver projects on budget and on time. Compared to competitors with less experience, Ørsted's knowledge is unique and significantly reinforces its ability to keep construction schedules and deliver on the promise of [REDACTED]

As shown in Figure 3-2, [REDACTED] CapEx is made up by the costs for core generation and transmission. In addition, construction costs include expected Project costs (i.e. resources and insurance costs), expected combined cost for [REDACTED] Ørsted's construction track-record and detailed budgeting approach, based on realized cost estimates as well as in-depth negotiations with vendors, results in a Project based on a realistic and reliable construction budget.

Ørsted's unique in-house engineering capabilities, unrivalled know-how and deep experience allows it to reduce costs along a broad front, such as optimizing the design of foundations resulting in significantly lighter structures and large cost reductions. Ørsted has previously demonstrated this with several projects including:

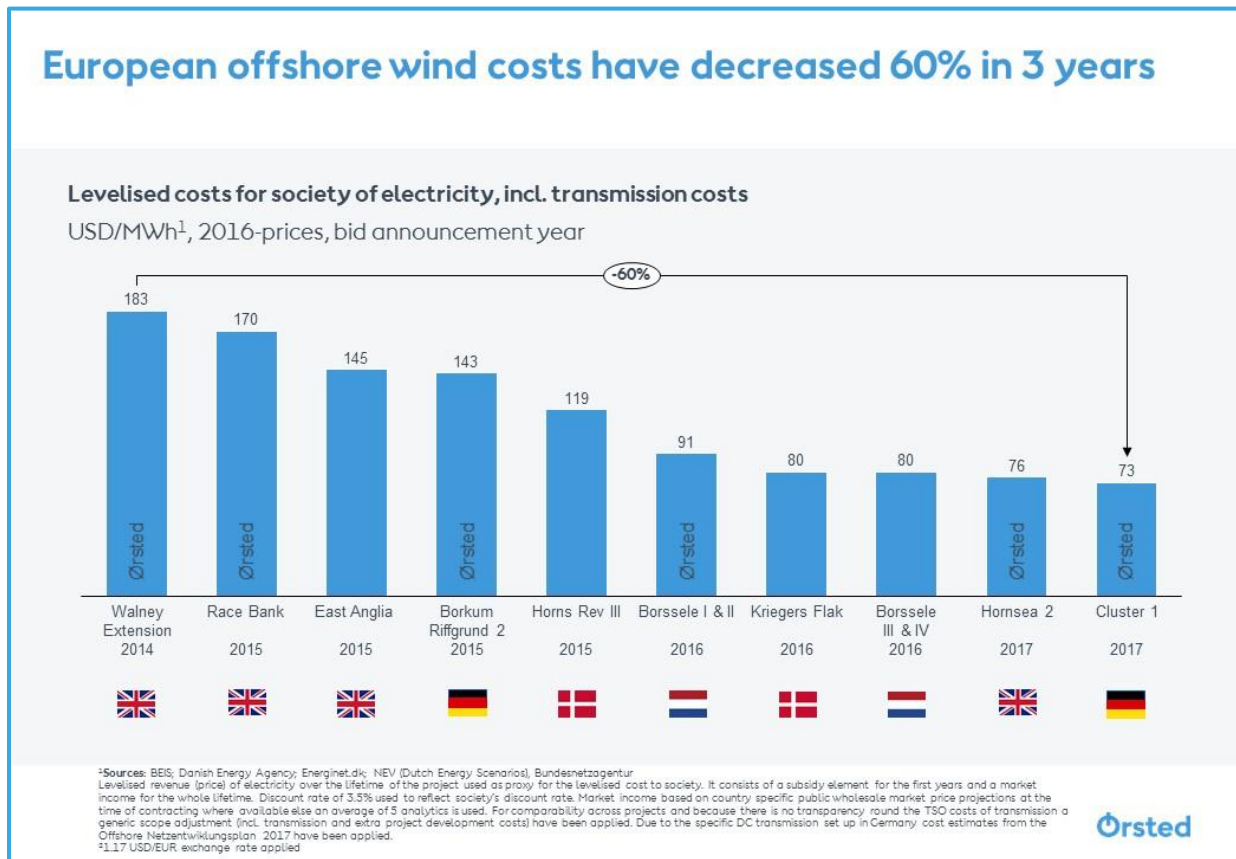
- Walney 1 & 2 offshore wind farms: original design was redesigned internally resulting in 200 tons lighter structure (22% difference); and*
- Race Bank offshore wind farm: original foundation design was redesigned resulting in reduced average foundation weight by 180 tons (21% difference).*

Figure 3-2. CapEx breakdown on package level.

For the different scopes, contract prices are tracked. Contract values as well as additional costs associated with each contract are registered. [REDACTED]

[REDACTED] In addition, the technical and construction management teams are constantly improving designs and installation technology together with Ørsted's suppliers through long-term relationships to the benefit of ratepayers and society. Ørsted has played a major role in the reduction in LCOE. Figure 3-3 shows the development in LCOE during recent years with Ørsted projects marked.

Ørsted's multi-disciplinary Product Line team is dedicated to scrutinizing all cost items and providing improved engineering solutions where they have impacts on cost and performance. This scrutiny is brought to bear on the supply chain as well, in collaboration with suppliers, enabling them to reduce costs and provide higher value with their products. Ocean Wind is determined to bring this process of continual refinement and cost reduction to bear on the Project. Moreover, Ocean Wind is committed to developing a US-based supply chain. Ørsted's long-term, synergistic relationship with suppliers enables Ørsted to provide suppliers with greater visibility into its entire portfolio of future US projects and to secure commitments to incrementally growing a local manufacturing presence. This confidence in Ørsted's role in shaping US market development has enabled some of Ørsted's trusted suppliers, [REDACTED] [REDACTED] to make firm commitments for this project, expressed in their written support (see Attachment 2.6).

Figure 3-3. Levelled costs of electricity for Ørsted's offshore wind farms over time.

In past years, Ørsted has consistently been instrumental in bringing technological advances into projects, for example:

- The first offshore wind project applying battery technology (Burbo Extension).
- The first project with the present Siemens D6/D7/D8 platform (Westermøst Rough).
- The first project with the MHI Vestas V164 platform (Burbo Bank Extension), bringing MHI Vestas back as a supplier to the offshore wind market.

Ørsted's in-house Product Line team will apply the most recent technological advances; an optimized design, supply chain, and logistical train; and safe and environmentally sound solutions and work methods to the US offshore wind market, thus delivering cost savings to New Jersey's ratepayers. The bid anticipates future price reductions and passes those savings on to the ratepayers of New Jersey.

The construction and development costs for the bid case are provided in Attachment 3.5.

3.5.2 Decommissioning cost

It is important to Ørsted to restore the seabed to its former condition leaving no impact on the environment. Ørsted is the first offshore wind farm owner/operator to successfully decommission a

major offshore wind farm. The valuable experience gained from this major decommissioning project served to refine Ocean Wind's decommissioning cost estimate. As with construction costs, Ørsted employs a bottom-up methodology to assess decommissioning risks and the required contingencies to manage the risks. The decommissioning costs for each bid case are provided in Attachment 3.5. Further, as noted above, Ocean Wind will be required by BOEM regulations to post financial assurance covering decommissioning costs prior to the construction of facilities authorized by the COP.

3.6 Audited financial statements

N.J.A.C. 14:86.5(a)(3). A complete financial analysis of the project, which includes:

(vi). Two years of audited financial statements, including accompanying financial notes to these statements, of the applicant and/or parent company in US GAAP. If not in US GAAP, the applicant shall provide an opinion from an accounting firm that attests to the financial statements and accompanying financial notes and the strength of the applicant and/or parent company and has provided professional qualifications that demonstrate that expertise; and

(vii). Audited financial statements for two years, in US GAAP, including accompanying financial notes to these statements, for key projects suppliers including, but not limited to, the turbine manufacturer and EPC contractor. If not in US GAAP, the applicant shall provide opinions from an accounting firm that attests to the financial statements, including accompanying financial notes to these statements, and the strength of the key project suppliers and has provided professional qualifications that demonstrate that expertise.

3.6.1 Ørsted

Ocean Wind does not have any audited financial statements or annual reports. Therefore, the annual reports for Ørsted A/S (formerly known as DONG Energy A/S), are provided for the last two fiscal years,² ending Dec. 31, 2017.

Audited financial statements for key project suppliers are provided in Attachment 3.6.

3.6.2 PSEG

PSEG's audited financing statements and other SEC filings can be found at <https://investor.pseg.com/sec-filings>.

² 2017- [Ørsted Annual Report 2017 Final](#) and 2016 -[Dong Energy Annual Report 2016](#)

Project Financial Analysis – Attachments

Attachment 3.1 – Annual Pro Forma Income Statements

Attachment 3.2 – Annual Pro Forma Balance Sheets

Attachment 3.3 – Annual Cash Flow Projections

Attachment 3.4 – Business Plan

Attachment 3.5 – Full Cost Accounting

Attachment 3.6 – Key Supplier Financial Statements

Attachment 3.1 – Annual Pro Forma Income Statements

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Attachment 3.2 – Annual Pro Forma Balance Sheets

REDACTED FROM PUBLIC COPY

Attachment 3.3 – Annual Cash Flow Projections

REDACTED FROM PUBLIC COPY

Attachment 3.4 – Business Plan

REDACTED FROM PUBLIC COPY

Attachment 3.5 – Full Cost Accounting

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Attachment 3.6 – Key Supplier Financial Statements

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4 Proposed Financing Method

Proposed financing method – Summary

Core message

[REDACTED]

Proposed financing method – Checklist

The information required under N.J.A.C. 14:8-6.5 is cross referenced to the associated document sections in the checklist below.

Checklist Item	Document Reference
Equity investors, fixed income investors, and any other sources of capital. N.J.A.C. 14:8-6.5(4)(i).	Section 4.1
A letter of intent to offer credit from credible financiers, letter of commitment from equity investors, and/or a guarantee from an investment-grade party. N.J.A.C. 14:8-6.5(4)(ii).	Section 4.1.2
Demonstrated ability to finance construction through market sources, which may include tax-exempt bond financing through the New Jersey Economic Development Authority. N.J.A.C. 14:8-6.5(4)(iii).	Section 4.3
Detailed financial plan including all sources of capital including but not limited to equity, and long- and short-term debt, and other sources. N.J.A.C. 14:8-6.5(4)(iv).	Section 4.4
Names, functions, and fees of all financial and legal advisors. N.J.A.C. 14:8-6.5(4)(iv).	Section 4.4
If and under what conditions equity or other ownership interests in the Project can be transferred to other parties and consideration involved. Notify the Board in writing of any changes within 30 days and such changes will be subject to Board approval pursuant to this subchapter. N.J.A.C. 14:8-6.5(4)(iv).	Section 4.4.1
Commitment that audited financial statements will be filed with the Board quarterly and annually. N.J.A.C. 14:8-6.5(4)(v).	Section 4.4.2

Proposed financing method – Documentation

This section describes Ocean Wind’s proposed financing method for the Project, demonstrates Ørsted’s ability to finance the Project construction, and provides a detailed financial plan including all sources of capital.

4.1 Sources of capital

N.J.A.C. 14:8-6.5(a)(4). The proposed method of financing the project, which includes: (i). Identification of equity investors, fixed income investors, and any other sources of capital.

4.1.1 Ørsted Sources of capital

Ørsted's financial strength translates into one of Ocean Wind's greatest assets. Ørsted's strong corporate balance sheet, Investment Grade credit rating of BBB+/Baa1 and history of profitable growth demonstrate that it has the financial capability necessary to undertake and successfully deliver on its promise to develop, construct, operate and own a world-class wind farm in service for New Jersey ratepayers.

Ørsted has significant financial headroom within its current BBB+/Baa1 credit rating target. [REDACTED]

[REDACTED]

[REDACTED]

- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] Ørsted's United States operations have recently merged with the leading United States offshore wind development firm, Deepwater Wind, and in doing so, Ørsted has acquired both Deepwater Wind's development and operating assets, along with the individuals responsible for the project and tax equity financing of the first operating offshore wind farm in the US, the Block Island Wind Farm. In February of 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 Societe Generale. The financing was awarded Renewable Energy Deal of the Year in 2015 by Project Finance International and IJ Global. The financing of Block Island included six leading lenders and two world-class tax equity investors – Citi and GE. Deepwater Wind's team brings an institutional knowledge in non-recourse project financing and tax equity financing that simply does not exist within other companies. In particular, and if non-recourse project financing proves to be the most effective way to reduce costs to ratepayers, with Deepwater Wind as a new addition to the team, Ørsted feels especially confident in its ability to deliver on tax equity, a difficult mechanism to effectively utilize without the requisite experience.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Ørsted will both operate and manage a project for its entire lifetime. Unlike many of Ørsted's competitors, which divest their interest in a project upon completion of construction, Ørsted is a long-term investor. The result is a project developer who is more earnestly concerned with creating and maintaining strong relationships with the community and constructing a project that will operate effectively throughout its lifetime.

[REDACTED]

[REDACTED] Ørsted has a dedicated Partnerships team and a proven track record of structuring and pioneering mutually beneficial long-term partnerships with financial, institutional and strategic investors in offshore wind (through 20 partnership projects to date). In fact, in November 2018 Ørsted completed the largest single project divestment ever when it agreed to sell 50 percent of the 1,218 MW Hornsea 1 offshore wind farm to Global Infrastructure Partners (GIP) for approximately \$5.75 billion. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] See Table 4-1 for a comprehensive list of offshore wind projects developed and financed by Ørsted [REDACTED]

Ørsted's ability to finance Ocean Wind [REDACTED]

[REDACTED]

[REDACTED] This flexibility ultimately drives down the cost for the Project and in the long term will benefit New Jersey ratepayers.

Table 4-1 lists the offshore wind projects that Ørsted has financed and developed since 2012, and Table 4-2 lists the offshore wind projects that Ørsted financed and developed from 1992 to 2011.

4.1.2 Ocean Wind with PSEG equity participation

In the event that PSEG elects to participate in Ocean Wind as an equity owner, as described in Section 1, PSEG will contribute capital [REDACTED]

[REDACTED]

4.2 Evidence supporting proposed financing method

N.J.A.C. 14:8-6.5(a)(4)(ii). Evidence such as: a letter of intent to offer credit from credible financiers; a letter of commitment from equity investors; and/or a guarantee from an investment grade party.

As demonstrated here, Ørsted is an investment grade party and [REDACTED]

[REDACTED] Refer to Section 4.1 for details regarding Ørsted’s financing plans.

PSEG Renewable’s parent company, Public Service Enterprise Group (NYSE:PEG) is a publicly traded diversified energy company with annual revenue of \$9.1 billion in 2017. Should PSEG elect to participate in Ocean Wind as an equity owner, it would rely on its extensive experience to provide financing [REDACTED]

[REDACTED]

[REDACTED] PSEG is also a long-term investor with a history of operating power plants in New Jersey with a strong commitment to the communities of New Jersey and to the natural environment.

- Ørsted is traded on the Nasdaq Copenhagen Stock Exchange, with an equity market capitalization of approximately \$23 billion.
- Ørsted was listed as a publicly traded company in June 2016. The Initial Public Offering (IPO) was the largest in Europe in the last 5 years and the largest IPO ever in Denmark both in terms of deal size and market cap.
- Ørsted has syndicated revolving credit facilities [REDACTED]
- Ørsted invested approximately \$4.7 billion in new energy infrastructure in 2016 and 2017.

Table 4-1. Offshore wind projects financed and developed by Ørsted (construction starting in 2012 to present).

Project Name	Location	Type	Size	Construction Start (Year)	Construction Capital Structure / % Ørsted	Commercial Operation (Year)	Permanent Capital Structure (Year)	Permanent Capital Structure / % Ørsted	Status
Hornsea 2	UK	OSW	1386 MW	Expected 2020	██████████ ██████████	2022	TBD	██████████	Under Construction
Borssele 1&2	NL	OSW	700 MW	2020	██████████ ██████████	2021	TBD	██████████	Under Construction
Borkum Riffgrund 2	DE	OSW	450 MW	2017	██████████ ██████████	2019	2017	██████████ ██████████	Under Construction
Hornsea 1	UK	OSW	1,218 MW	2016	██████████ ██████████	2019	2018	██████████ ██████████	Under Construction
Walney Extension	UK	OSW	660 MW	2015	██████████ ██████████	2018	2017	██████████ ██████████	Operating
Race Bank	UK	OSW	573 MW	2015	██████████ ██████████	2018	2016	██████████ ██████████	Operating
Burbo Bank Extension	UK	OSW	258 MW	2015	██████████ ██████████	2017	2016	██████████ ██████████	Operating
Gode Wind 1	DE	OSW	332 MW	2015	██████████ ██████████	2016	2015	██████████ ██████████	Operating
Gode Wind 2	DE	OSW	252 MW	2015	██████████ ██████████	2016	2014	██████████ ██████████	Operating
Westermost Rough	UK	OSW	210 MW	2014	██████████ ██████████	2015	2014	██████████ ██████████	Operating
Borkum Riffgrund 1	DE	OSW	312 MW	2013	██████████ ██████████	2015	2012	██████████ ██████████	Operating
West of Duddon Sands	UK	OSW	389 MW	2013	██████████ ██████████	2014	2010	██████████ ██████████	Operating
Anholt	DK	OSW	400 MW	2012	██████████ ██████████	2013	2011	██████████ ██████████	Operating
Gunfleet Sands 3	UK	OSW	12 MW	2012	██████████ ██████████	2013	2012	██████████ ██████████	Operating

DE = Germany
DK = Denmark
MW = megawatts
NL = Netherlands
OSW = offshore wind
TBD = to be determined
UK = United Kingdom

Table 4-2. Offshore wind projects financed and developed by Ørsted (construction starting in 1991 to 2011).

Project Name	Location	Type	Size	Construction Start (Year)	Construction Capital Structure / % Ørsted	Commercial Operation (Year)	Permanent Capital Structure (Year)	Permanent Capital Structure / % Ørsted	Status
Lincs	UK	OSW	270 MW	2011	██████████	2013	2009	██████████	Operating
London Array 1	UK	OSW	630 MW	2011	██████████	2013	2004	██████████	Operating
Walney 1 & 2	UK	OSW	367 MW	2010	██████████	2012	2009	██████████	Operating
Avedøre Holme	DK	OSW	10.8 MW	2009	██████████	2009	2009	██████████	Operating
Horns Rev 2	DK	OSW	209 MW	2008	██████████	2010	2007	██████████	Operating
Gunfleet Sands 1 & 2	UK	OSW	173 MW	2008	██████████	2010	2011	██████████	Operating
Burbo Bank	UK	OSW	90 MW	2006	██████████	2007	2006	██████████	Operating
Barrow	UK	OSW	90 MW	2005	██████████	2006	2004	██████████	Operating
Nysted	DK	OSW	165.6 MW	2002	██████████	2003	2010	██████████	Operating
Horns Rev 1	DK	OSW	160 MW	2002	██████████	2003	2006	██████████	Operating
Middelgrunden	DK	OSW	20 MW	2000	██████████	2001	2000	██████████	Operating
Vindeby	DK	OSW	5 MW	1991	██████████	1991	1991	██████████	Decommissioned

DK = Denmark
 MW = megawatts
 OSW = offshore wind
 UK = United Kingdom

4.3 Ability to finance through market sources

N.J.A.C. 14:8-6.5(a)(4)(iii). A demonstrated ability to finance construction through market sources, which may include tax exempt bond financing through the New Jersey Economic Development Authority.

4.3.1 Ørsted's ability to finance through market sources

Ørsted intends to finance the construction of the Project [REDACTED] as described in Section 4.1

Financial and cash flow data for Ørsted are provided in Table 4-3 and Table 4-4.

Table 4-3. Ørsted selected consolidated financial data – balance sheet and income statement, 2014 to 2017.

Category	Subcategory	Amount by Year (in millions of dollars)			
		2017	2016	2015	2014
Balance sheet data	Total assets	\$22,365	\$20,833	\$22,507	\$22,882
	Capital employed	\$10,733	\$9,305	\$9,300	\$9,999
Income statement data	Revenue	\$9,083	\$9,342	\$9,989	\$9,354
	Earnings before interest and taxes	\$2,478	\$2,082	\$281	\$339

Source: Ørsted 2017 Annual Report
Note: All values are based on a Danish Krone (DKK) to U.S. dollar (USD) exchange rate of 0.15

4.3.2 PSEG's Ability to finance through market sources

If PSEG elects to participate in Ocean Wind as an equity owner, PSEG would provide financing for the construction of the Project [REDACTED]

Table 4-4. Ørsted selected consolidated cash flow data – funds from operations and debt issuances, 2014 to 2017.

Category	Amount by Year (in millions of dollars)			
	2017	2016	2015	2014
Cash flow from operating activities	\$156	\$1,721	\$1,148	\$1,460
Interest-bearing net debt	-\$232	\$528	\$1,403	\$607

Source: Ørsted 2017 Annual Report
Note: All values are based on a Danish Krone (DKK) to U.S. dollars (USD) exchange rate of 0.15

As demonstrated, Ørsted is a large, growing company and has a market capitalization of approximately **\$27.24 billion**.¹ Moreover, Ørsted possesses deep capital-market expertise, as evidenced by Ørsted's access to public debt markets. For example, in November 2017, Ørsted successfully issued green hybrid capital securities and green senior unsecured bonds totaling €1.25 billion (approximately \$1.5 billion).

¹ As of Dec. 3, 2018

Ocean Wind will obtain development, construction, and permanent financing [REDACTED] [REDACTED] Ørsted is committed to financing the Project [REDACTED] [REDACTED] for development, construction, or operation, although in the future Ocean Wind may elect to seek external financing as set forth in the Financial Plan and subject to Board review and approval, if required.

4.4 Financial plan

N.J.A.C. 14:8-6.5(a)(4)(iv). A detailed financial plan including all sources of capital including, but not limited to, equity, long and short term debt, and other sources. Such financial plan shall include the names, functions and fees of all financial and legal advisors. The plan shall specify if and under what conditions equity or other ownership interests in the project can be transferred to other parties and consideration involved. The developer shall notify the Board in writing of any changes within 30 days and such changes will be subject to Board approval pursuant to this subchapter; and (v). A commitment that audited financial statements shall be filed with the Board on a quarterly and annual basis;

[REDACTED]

[REDACTED]

- [REDACTED]
- [REDACTED]
 - [REDACTED]
 - [REDACTED]

[REDACTED]

[REDACTED]

4.4.1 Changes in equity or other ownership interests

[REDACTED]

[REDACTED]

4.4.2 Audited financial statement filings

Ocean Wind is committed to filing audited financial statements with the Board on a quarterly and annual basis. Refer to the signed "New Jersey OREC Application Form for Qualified Offshore Wind Projects – Commitments" included in Attachment 18.1.

4.4.3 Change in law

[REDACTED]

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Attachment 5.1 – Federal and State tax incentives

5 Cost offset programs

Cost offset programs – Summary

Core message

By virtue of Ørsted’s financial strength and proven track record, this Project is uniquely positioned to qualify for substantial federal tax benefits afforded by the Investment Tax Credit or the Renewable Electricity Production Tax Credit and the New Markets Tax Credit. Due to significant planned capital investment and the creation of new jobs in New Jersey, the Project will qualify for the Grow New Jersey Tax Credit or the New Jersey Wind Energy Facility Tax Credit. The combination of federal and state tax incentives will maximize the Project’s value to the state, passing all resulting cost reductions to New Jersey ratepayers.

Cost offset programs – Checklist

The information required under N.J.A.C. 14:8-6.5 is cross referenced to the associated document sections in the checklist below.

Checklist Item	Section Reference
Documentation to demonstrate that the developer has applied for all current eligible State and Federal grants, rebates, tax credits, and programs available to offset the cost of the project or provide tax advantages. N.J.A.C. 14:8-6.5(5).	Section 5.1 and Attachment 5.1
Documentation of all Federal or State tax incentives for which it is applying or has applied or otherwise are applicable, even if such incentives have not been sought or approved. N.J.A.C. 14:8-6.5(5)(i).	Section 5.1 and Attachment 5.1
Provide in a financial pro forma all tax credits or other subsidies upon which they are relying on in their pricing proposal. N.J.A.C. 14:8-6.5(5)(ii).	Section 5.2
Commit that the cost difference in the event that changes in the project reduces or eliminates tax benefits, or tax benefits do not materialize for any reason including changes in tax laws, will not be made up by ratepayers, suppliers, or providers. N.J.A.C. 14:8-6.5(5)(iii).	Section 5.3
Demonstrate a commitment to pass along tax credits or other governmental benefits to ratepayers that are greater than projected. This pass along of benefits will be effective without the need for any subsequent Board approval/confirmation following an initial Board Order approving OREC pricing, and will serve as a condition of the OREC approval. N.J.A.C. 14:8-6.5(5)(iv).	Section 5.3

Cost offset programs – Documentation

The information provided in this section outlines Ocean Wind’s plan to apply for all current eligible State and Federal grants, rebates, tax credits, and programs available to offset the cost of the Project or provide tax advantages.

5.1 Federal and state tax incentives

*N.J.A.C. 14:8-6.5(a)(5). Documentation to demonstrate that the developer has applied for all current eligible State and Federal grants, rebates, tax credits, and programs available to offset the cost of the project or provide tax advantages.
(i) The developer shall document all Federal or State tax incentives for which it is applying or has applied or otherwise are applicable, even if such incentives have not been sought or approved.*

Federal or State tax incentives for which Ocean Wind is applying or has applied or otherwise are applicable are summarized below, and detailed in Attachment 5.1.

5.1.1 Federal tax incentives

5.1.1.1 Investment Tax Credit / Production Tax Credit

[REDACTED]

Ocean Wind is uniquely positioned to qualify for the federal ITC/PTC on an accelerated schedule that will maximize value, passing resulting cost reductions to New Jersey ratepayers.

Ørsted will adopt a strategy that will allow the Project to qualify for the ITC or PTC subject to timely execution of the award. [REDACTED]

[REDACTED]

[REDACTED] The selection of the appropriate tax credit is made when the Project (that is, the “Qualified Energy Property”) is placed in service.

5.1.1.2 New Markets tax credit

In addition to the ITC/PTC qualification strategy, the Project may qualify for the federal New Markets Tax Credit Program depending upon the location of Project operations. In general, a qualified company receives cash up front to reduce its cash investment in businesses and real estate projects in low income communities. Qualified projects include asset purchases, real estate development and ongoing business operations. A maximum of 39 percent of the project cost can be claimed. In general, after fees and interest payments, the Company receives a forgivable loan of approximately 20 percent of the qualified investment.

5.1.2 State tax incentives

5.1.2.1 Grow New Jersey tax credit

The Grow New Jersey Tax Credit Program is the State’s primary job growth and retention incentive program. The program awards a tax credit calculated based on number of jobs, average salary, capital investment, and location. Qualified eligible businesses receive a tax credit per job per year for a period of up to ten years for each new or retained full time job located in the qualified business facility. The credit is awarded over a ten-year period after the project is complete and certified and the business submits annual payroll reports.

The credit can be applied against New Jersey corporate income tax or sold in the open market. The program covers six incentive zones with varying base credit amounts (up to \$5,000). In addition to the base credit, there are a number of bonus credits that increase the base amount (\$500-\$5,000). Requirements for eligibility include job creation minimum requirements (10-50 jobs depending on industry) and minimum capital investment requirements. The Project must demonstrate a 110 percent net benefit of the award amount to New Jersey, meet New Jersey Economic Development Authority (NJEDA) green building standards, prevailing wage affirmative action guidelines, and must commit to operating at the Project site for 1.5 times the grant term.

Businesses must apply for the tax credits by July 2019. Ørsted intends to apply for these state tax credits.

5.1.2.2 New Jersey Wind Energy Facility tax credit

New Jersey recently adopted new regulations to implement the Offshore Wind Economic Development Tax Credit Program (TCP). Under the program, NJEDA may approve up to \$100 million in tax credits for the development of certain qualified wind energy facilities in wind energy zones (South Jersey Port District). The tax credits are equal to 100 percent of the claimants’ qualified capital investments made, except as may be limited by the net positive economic benefits test. Taxpayers may apply 10 percent of the total credit amount per year over a 10-year period against their corporation business tax.

The eligibility requirements for the TCP are as follows:

- Make at least \$50 million in new capital investments in a qualified wind energy facility; and
- Employ at least 300 new, full-time employees at that facility.

[REDACTED] The recently issued regulations describe how to compute the number of new, full-time employees required. The calculation includes new, full-time positions resulting from an equipment supply coordination agreement with equipment manufacturers, suppliers, installers and operators associated with the supply chain required to support the qualified wind energy facility. Ocean Wind is collaborating with its equipment manufacturers, suppliers, installers and operators associated with the supply chain in order to potentially qualify for this credit. If eligibility requirements can be met, the eligible party will apply for this credit.

Businesses must apply for the tax credits by July 1, 2024 and satisfy the capital investment and employment conditions for award of the credits by July 1, 2027.

It should be noted that the TCP is mutually exclusive with other New Jersey programs. [REDACTED]

The foregoing notwithstanding, this Section 5.1.2.2 is not intended to, and does not, condition any of the offers presented in this OREC Application upon the receipt of such state tax credit. While Ocean Wind has and plans to continue to make its vendors and suppliers aware of this and other incentive programs, whether or not Ocean Wind receives any such tax credit will have no impact of any kind on the pricing detailed in Section 12 or the economic development guarantees set forth in Section 16.

5.1.3 Other cost offset programs

No other cost offset programs have been identified at this time.

5.2 Accounting of tax credits

N.J.A.C. 14:8-6.5(a)(5)(ii). Applicants shall provide in a financial pro forma all tax credits or other subsidies upon which they are relying on in their pricing proposal.

Sections 3 and 4 provide a financial pro forma of all tax credits or other subsidies upon which Ørsted is relying on in their pricing proposal.

5.3 Changes in tax law or benefits

N.J.A.C. 14:8-6.5(a)(5)(iii). The applicant shall commit that the cost difference in the event that changes in the project reduces or eliminates tax benefits, or tax benefits do not materialize for any reason including changes in tax laws, will not be made up by ratepayers, suppliers, or providers.

(iv). The applicant shall demonstrate a commitment to pass along tax credits or other governmental benefits to ratepayers that are greater than projected. This pass along of benefits will be effective without the need for any subsequent Board approval/confirmation following an initial Board Order approving OREC pricing, and will serve as a condition of the OREC approval;

Refer to the signed "New Jersey OREC Application Form for Qualified Offshore Wind Projects – Commitments" included in Attachment 18.1.

[REDACTED]

[REDACTED]

Cost offset programs – Attachments

Attachment 5.1 – Federal and State tax incentives

Attachment 5.1 – Federal and State tax incentives

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Attachment 6.1 – Revenue Plan and Financial Expectations

6 Projected electrical output and market Rates

Projected electrical output and market rates – Summary

Core message

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] This approach is detailed in the Section below.

Projected electrical output and market rates – Checklist

The information required under N.J.A.C. 14:8-6.5 is cross referenced to the associated document sections in the checklist below.

Checklist Item	Document Reference
Provide projected electrical output and anticipated market prices over the anticipated life of the project, including a forecast of electricity revenues from the sale of energy derived from the project and capacity, as well as revenues anticipated by the sale of any ORECs, Renewable Energy Certificates (RECs), air emission credits or offsets, or any tradable environmental attributes created by the project. N.J.A.C. 14:8-6.5(a)(6).	Attachment 6.1
Submit a project revenue plan which forecasts revenues as well as identifies the strategy for offering the electricity provided in the electric market and for generating all expected revenues. N.J.A.C. 14:8-6.5(a)(6)(i).	Attachment 6.1
Link the anticipated revenues to the project time schedule and costs for the entire project lifecycle term extending to the expected life of the turbines and eventual decommissioning. N.J.A.C. 14:8-6.5(a)(6)(ii).	Section 6.1 and Attachment 6.1
Specify financial expectations and marketing strategies for securing revenue from expected capacity based payments in PJM markets, energy based payments in PJM markets, Renewable Energy Certificate (REC) revenue from Renewable Portfolio Standard (RPS) or voluntary markets, and emission credits from various air emission reduction cap and trade programs. N.J.A.C. 14:8-6.5(a)(6)(iii).	Section 6.2 and Attachment 6.1
Specify the total installed capacity in megawatts for the entire project as well as expected term of OREC energy production in megawatt hours. N.J.A.C. 14:8-6.5(a)(6)(iv).	Attachment 6.1
Specify the total amount of clean energy being generated over the term of the OREC program and the life of the turbines. N.J.A.C. 14:8-6.5(a)(6)(v).	Attachment 6.1

Projected electrical output and market rates – Documentation

[REDACTED]

[REDACTED]

6.1 Project revenue plan

N.J.A.C. 14:8-6.5(a)(6) The projected electrical output and anticipated market prices over the anticipated life of the project, including a forecast of electricity revenues from the sale of energy derived from the project and capacity, as well as revenues anticipated by the sale of any ORECs, Renewable Energy Certificates (RECs), air emission credits or offsets, or any tradable environmental attributes created by the project.

(i). The applicants shall submit a project revenue plan which forecasts revenues as well as identifies the strategy for offering the electricity provided in the electric market and for generating all expected revenues;

(ii). The project revenue plan must link the anticipated revenues to the project time schedule and costs for the entire project lifecycle term extending to the expected life of the turbines and eventual decommissioning;

The Project revenue plan (see Attachment 6.1) forecasts revenues as well as identifies the strategy for offering the electricity provided into the electric market and the strategy for generating all expected revenues from the projected electrical output. A forecast of electricity revenues from the sale of energy derived from the Project and capacity is provided. [REDACTED]

[REDACTED]

The projected revenues are linked to the Project time schedule and costs for the complete Project lifecycle term [REDACTED]

The Project will receive a dollar per megawatt hours (\$/MWh) OREC payment as outlined in the OREC funding mechanism for each MWh of power produced that results in certificates issued. [REDACTED]

[REDACTED]

- [REDACTED]
- [REDACTED]
- [REDACTED]

■ [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

6.1.1 [REDACTED]

Ocean Wind is planning to retrieve the value of the energy produced from the Project in the PJM power wholesale market and return this value to the ratepayers. [REDACTED]

[REDACTED]

[REDACTED]

- [REDACTED]
- [REDACTED]
- [REDACTED]

Production exceeding the volume cap is captured under the OREC banking mechanism set forth in the Board's proposed funding rules, 50 N.J.R. 1879, *et seq.* See also 'Guidelines for Application Submission for Proposed Offshore Wind Facilities'.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

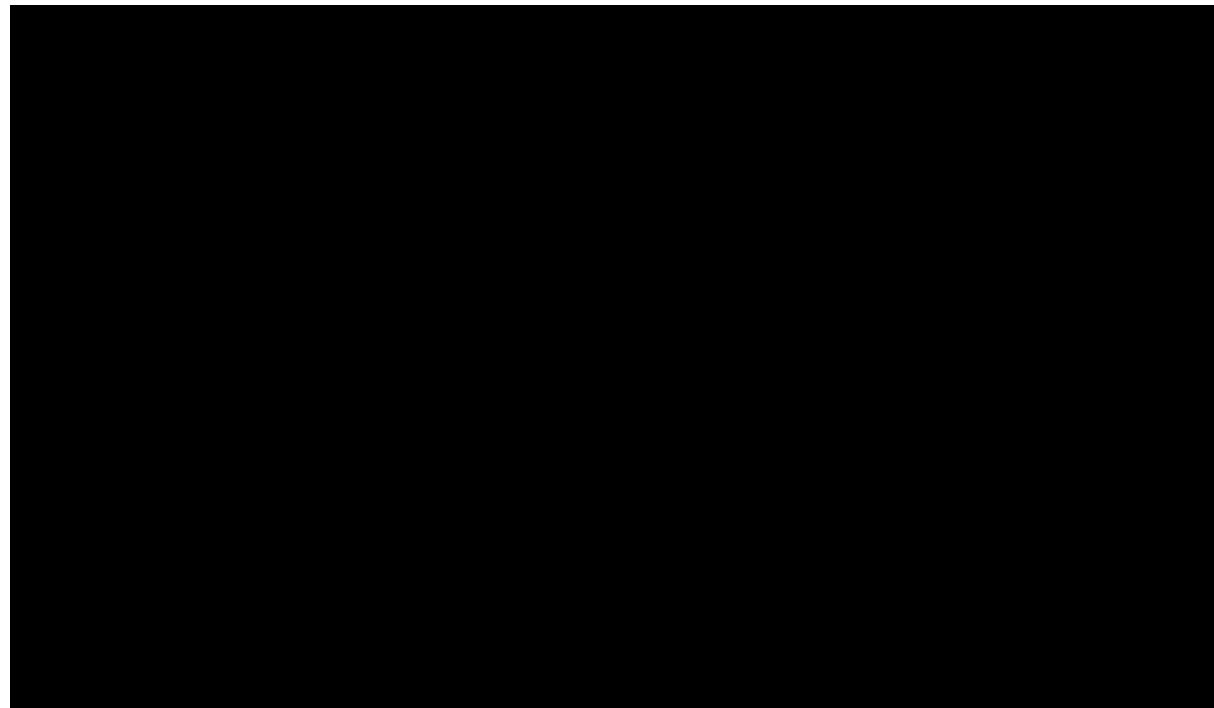
[REDACTED]

[Redacted text block]

[Redacted text block]

[Redacted text block]

Figure 6-1. [Redacted]

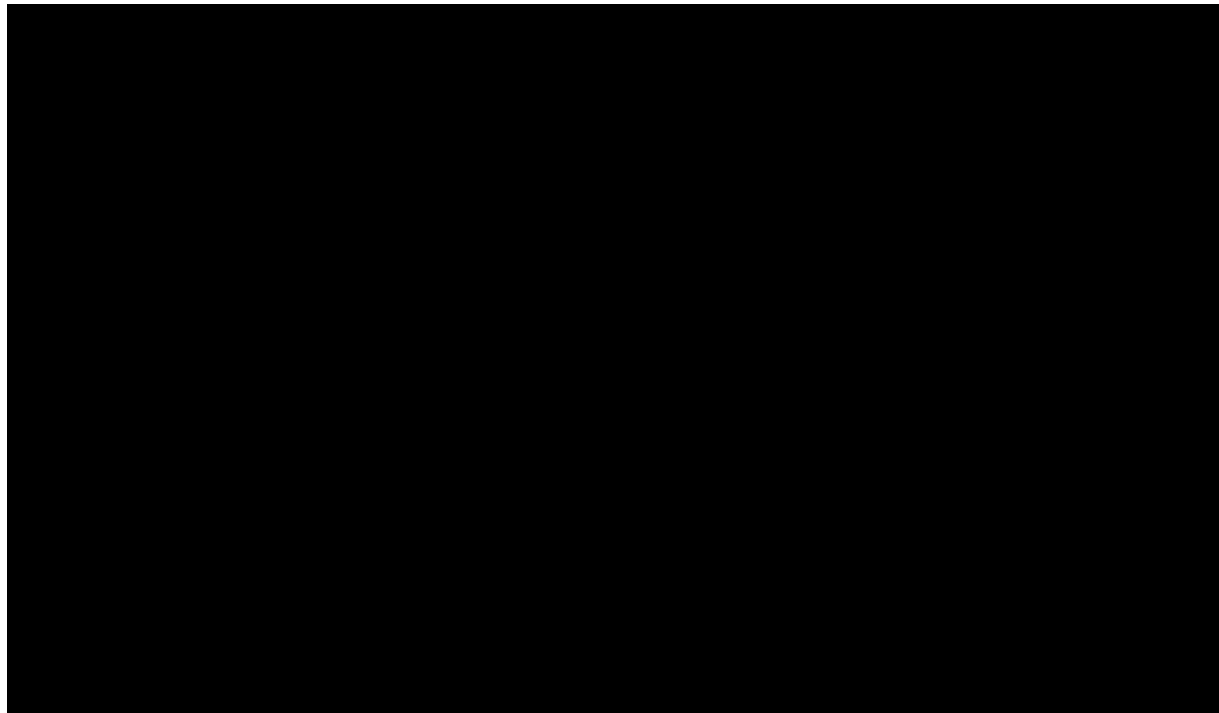


6.1.2 [REDACTED]

[REDACTED]

[REDACTED]

Figure 6-2. [REDACTED]



6.1.3 [REDACTED]

[REDACTED]

[REDACTED] Currently, the PJM capacity market is undergoing a major redesign intended to address the issue of “price suppression” ostensibly caused by resources that are receiving out-of-market revenue streams participating in capacity markets.

Market participants differ on how subsidized resources should be handled in the capacity market.

[REDACTED]

[REDACTED]

[REDACTED]

- | [REDACTED]
- | [REDACTED]
- | [REDACTED]
- | [REDACTED]

Further, the capacity market includes performance bonuses and penalties. [REDACTED]

[REDACTED]

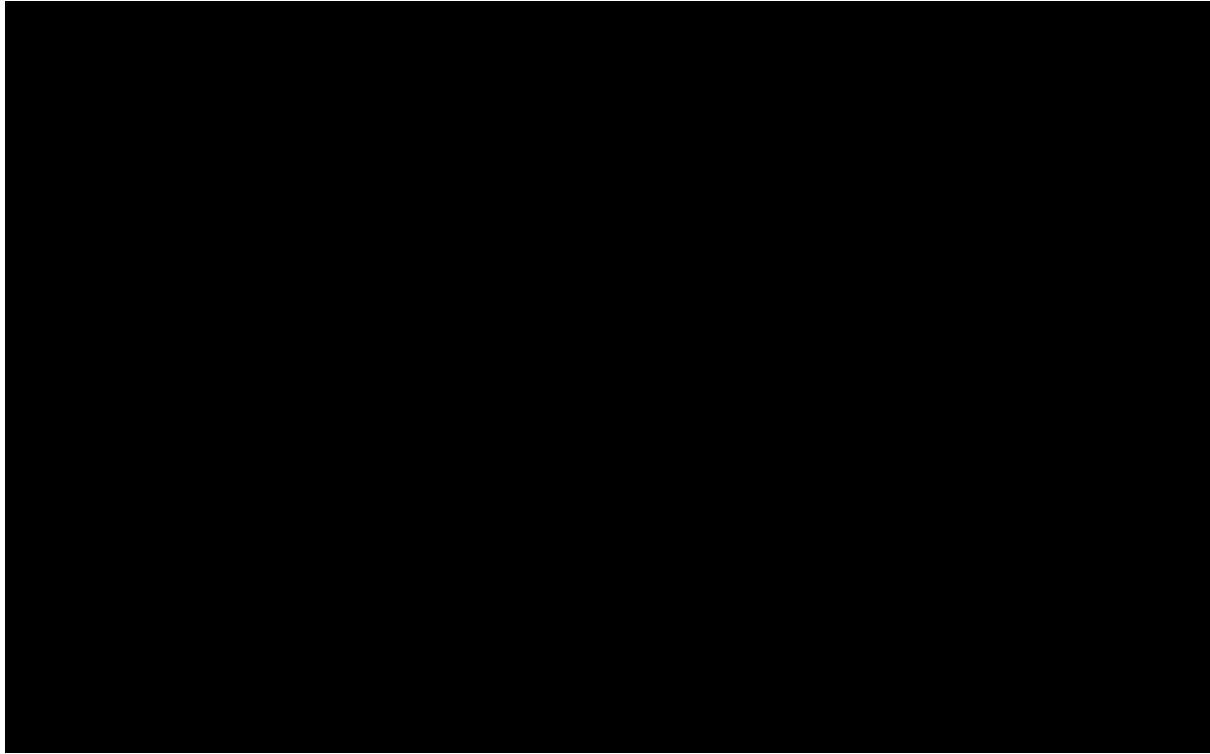
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[REDACTED]

[REDACTED]

[REDACTED]

Figure 6-3. [REDACTED]



6.1.4 [REDACTED]

[REDACTED]

[REDACTED]

6.2 Financial expectations and marketing strategies

N.J.A.C. 14:8-6.5(a)(6)(iii). Applicants shall specify financial expectations and marketing strategies for securing revenue from expected capacity based payments in PJM markets, energy based payments in PJM markets, Renewable Energy Certificate (REC) revenue from Renewable Portfolio Standard (RPS) or voluntary markets, and emission credits from various air emission reduction cap and trade programs;

(iv). Proposals must include the total installed capacity in megawatts for the entire project as well as expected term of OREC energy production in megawatt-hours; and

(v). The total amount of clean energy being generated over the term of the OREC program and the life of the turbines must also be provided.

The quantified revenue projections of each of the revenue items outlined in the Project revenue plan above are further specified in the sections below. The total installed capacity (in MW) for the Project and the associated energy production (in MWh) for the initial OREC period and the entire Project lifecycle are addressed in Attachment 6.1. The total amount of clean energy that will be generated by the Project over the life of the turbines and the initial OREC period are addressed in Attachment 6.1.

6.2.1 [REDACTED]

Attachment 6.1 provides revenue projections (volume x price) for PJM power markets from the Commercial Operation Date (COD) [REDACTED] and includes explanatory notes.

[REDACTED]

[REDACTED]

- | [REDACTED]
- | [REDACTED]
- | [REDACTED]

[Redacted text block]

[Redacted text block]

- [Redacted list item]

- [Redacted list item]

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- [Redacted list item]
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- [Redacted sub-item]
 - [Redacted sub-item]

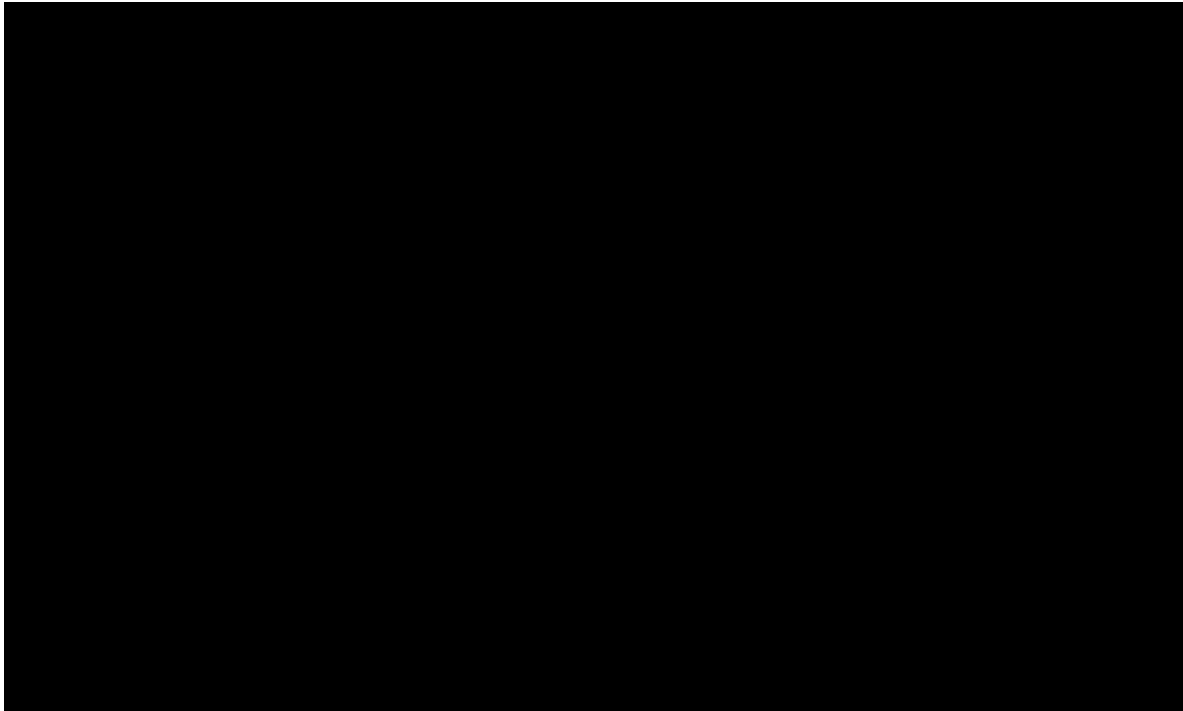
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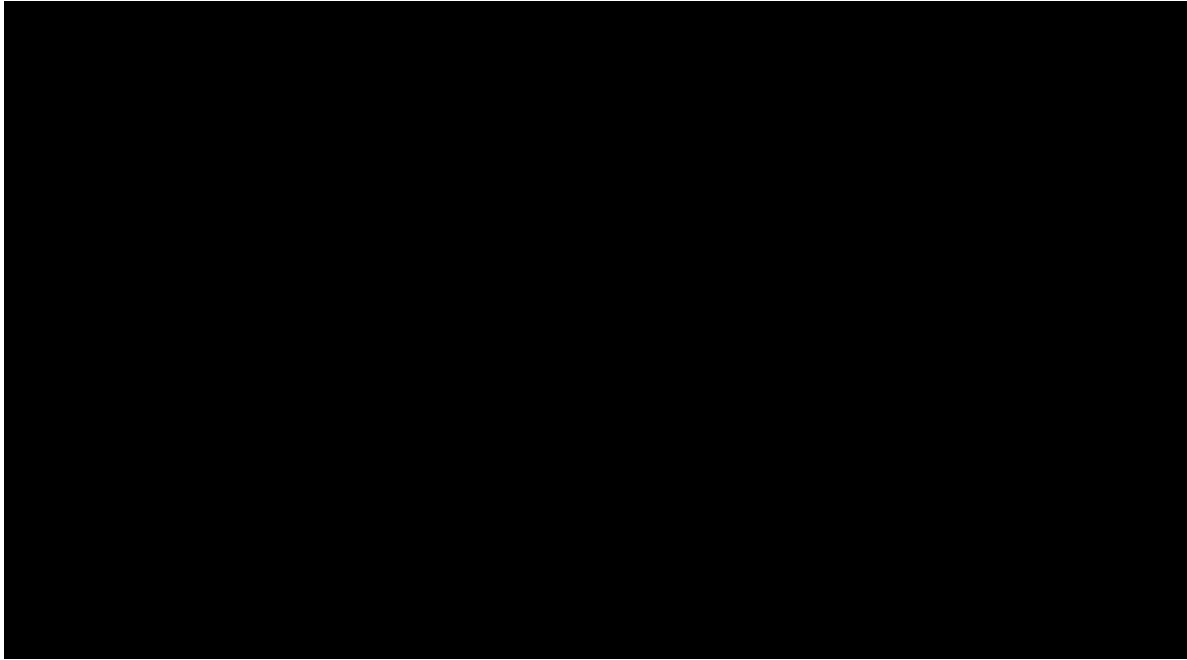
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Figure 6-4. [Redacted text]



[Redacted text block]

Figure 6-5. [REDACTED]



[REDACTED]

[REDACTED]

[REDACTED]

6.2.2 [REDACTED]

[REDACTED]

6.2.3 [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

6.2.4 [REDACTED]

[REDACTED]

[REDACTED]

6.2.5 [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

6.3 Storage Features

Ocean Wind recognizes the importance of energy storage to the State and is supporting the Governor's mandate of 2,000 MW of energy storage [REDACTED]

[REDACTED] If the Board elects to proceed with either of the following storage features, Ocean Wind will explore cost recovery pathways, [REDACTED]

6.3.1 [REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]

[REDACTED]
[REDACTED]

6.3.2 Construction of new battery energy storage facilities

Ørsted is exploring the use of battery energy storage to add value to stand-alone large-scale renewables. These storage projects align with the State's goal to meet its energy storage deployment targets. [REDACTED]

[REDACTED]
[REDACTED]

[REDACTED]
[REDACTED] Ørsted, recognizing the increasing importance of energy storage to ratepayers as intermittent renewable generation continues to grow, created an energy storage team in 2017 with global headquarters in Austin, TX. Ørsted currently has four operational or under construction projects in the UK, Denmark, and Taiwan, and has been building a pipeline in the U.S. [REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

[REDACTED]
[REDACTED]

[REDACTED]

Based on the results of these activities, their resulting costs and revenue streams, and the Board's determination to engage the storage option, Ocean Wind will explore cost recovery pathways as needed, [REDACTED]

Projected electrical output and market rates – Attachments

Attachment 6.1 – Revenue Plan and Financial Expectations

Attachment 6.1 – Revenue Plan and Financial Expectations

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Attachment 7.1 – Ocean Wind Operations and Maintenance Plan

7 Operations and Maintenance Plan

Operations and Maintenance Plan – Summary

Core message

Ørsted is the largest operator of offshore wind farms worldwide with a capacity of more than 5 GW and over 1300 turbines across 25 offshore wind farms. Ørsted is also the only company with experience operating and maintaining an offshore wind farm in the U.S. – the Block Island Wind Farm off the coast of Rhode Island. Ørsted will implement an O&M program for the Project that draws on lessons learned over more than two decades of experience and that is rooted in maximizing the safety and availability of the wind farm. Ørsted is continuously improving and optimizing its O&M processes across the company’s portfolio. This depth of experience combined with unique expertise in the U.S. will allow Ocean Wind to deliver an O&M program that will ensure maximum production without compromising safety.

Operations and Maintenance Plan – Checklist

The information required under N.J.A.C. 14:8-6.5 is cross referenced to the associated document sections in the checklist below.

Checklist Item	Document Reference
Detail routine, intermittent, and emergency protocols. N.J.A.C. 14:8-6.5(a)(7)(i).	Section 7.2, Attachment 7.1
Demonstrate that the applicant has the financial capacity and technical expertise to perform all necessary upkeep/maintenance over the life of the project. N.J.A.C. 14:8-6.5(a)(7)(ii).	Section 7.3.1
Identify the primary risks to the built infrastructure and how the potential risks, including, but not limited to, hurricanes, lightning, fog, rogue wave occurrences, and exposed cabling, shall be mitigated. N.J.A.C. 14:8-6.5(a)(7)(iii).	Attachment 7.1
Describe emergency shutdown provisions in the event of a need for the immediate stoppage of turbine blades. N.J.A.C. 14:8-6.5(a)(7)(iv).	Section 7.5, Attachment 7.1
Identify specific and concrete elements to ensure both construction and operational cost controls. N.J.A.C. 14:8-6.5(a)(7)(v).	Section 7.6
Provide proof of insurance. N.J.A.C. 14:8-6.5(a)(7)(vi).	Section 7.6.2
Identify the projected plan for the subsequent operational term, assuming any necessary Federal lease agreements are maintained and renewed. N.J.A.C. 14:8-6.5(a)(7)(vii).	Attachment 7.1
Include a complete operations and maintenance (O&M) plan for the life of the plant. N.J.A.C. 14:8-6.5(a)(7)(viii).	Section 7.7, Attachment 7.1

Operations and Maintenance Plan – Documentation

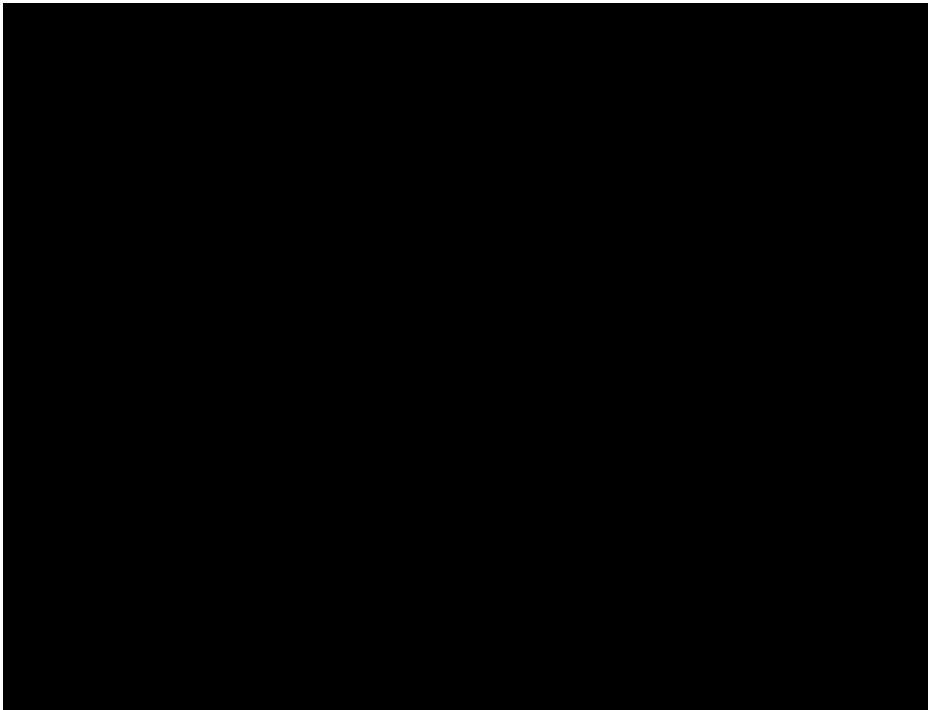
The Project's O&M strategy and practices will be subject to ongoing review to capture industry advancements and learnings within Ørsted's wider operational portfolio. The Project will also collect data from the implementation of inspection and monitoring systems and practices, which will drive additional improvements. This proven approach ensures that the Project's O&M Plan maximizes energy production and minimizes safety hazards and risks.

The scope of the O&M Plan includes the offshore wind farm and all of the Project's transmission assets, including all HV assets up to the grid interface. The preliminary O&M Plan provided in Attachment 7.1 covers the period after the Project commissioning date when steady-state operations begin.

7.1 Operations and maintenance team structure

The team structure of Ørsted's operating wind farms is provided in Figure 7-1 and Attachment 7.1.

Figure 7-1. Team structure.



7.1.1 Location of the operations and maintenance base

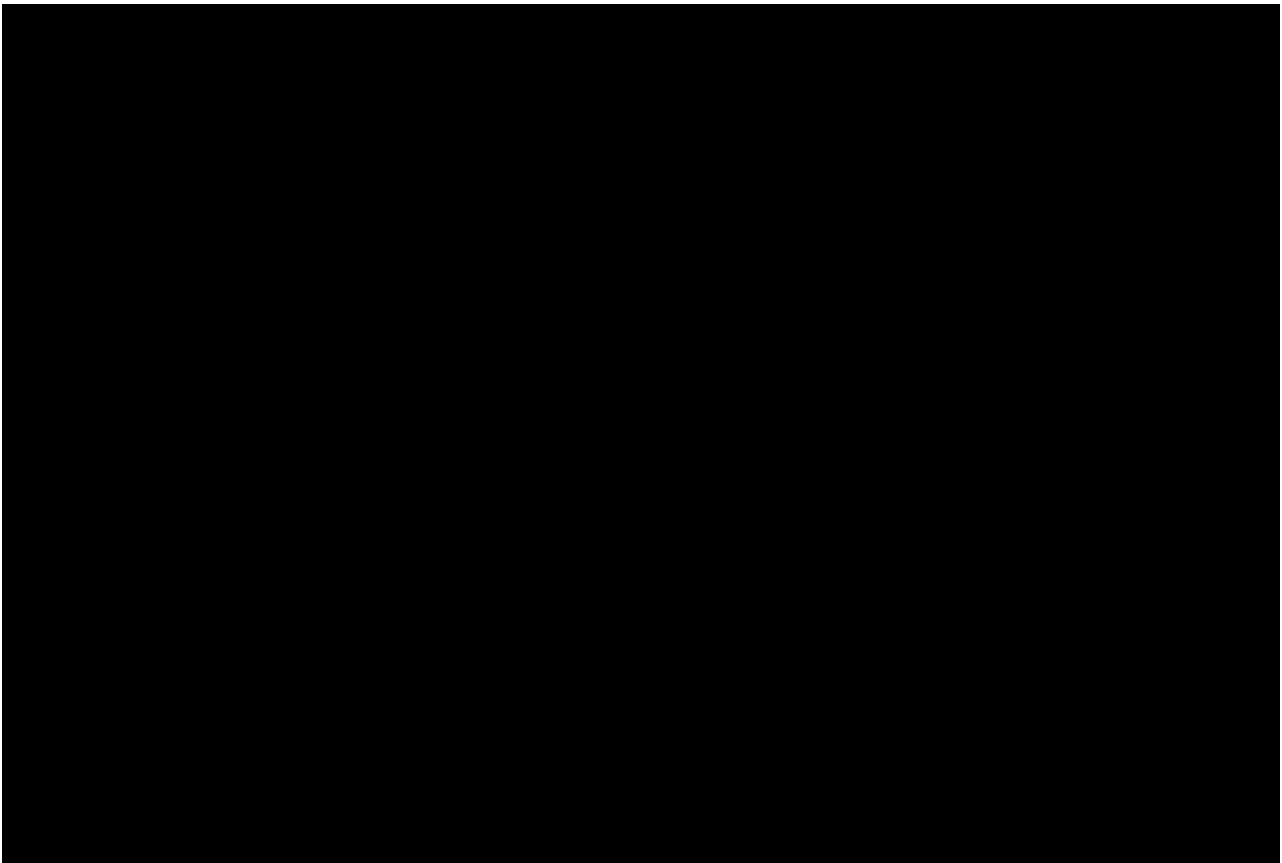
Ocean Wind intends to develop and use an O&M base in South Jersey to support the servicing of the Project over its useful life.

Ocean Wind continues to evaluate port sites along the South Jersey shoreline, as proximity to the Lease Area is a critical consideration for reducing travel time from the O&M port to the Lease Area. Other factors essential to the viability of a port location in servicing of the wind farm include

adequate quayside, sailing speeds to and from the Lease Area, other planned uses of the port, and local support.

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED] A final decision will be made on O&M facilities upon further due diligence demonstrating commercial viability and subject to establishing site control and all necessary permits.

Figure 7-2. [REDACTED]



7.1.2 Local content and job creation

Ocean Wind will create numerous long-term jobs associated with O&M over the life of the Project. In order to identify the best candidates, Orsted will actively recruit and train local residents in the counties proximate to the Lease Area. Orsted intends to work with local training providers to ensure that skills and competencies can be sourced locally for the following roles:

- Onsite management;
- Administrative support;
- Health, Safety, and Environment (HSE) specialist(s);
- Technical specialists; and

- WTG and HV asset technicians.

7.1.3 Role of Project sponsor

Ocean Wind or its designated third party contractor will be accountable for performing all scheduled and unscheduled maintenance and all inspections related to the foundations, WTGs, array cables, OSS, export cables, OnSS, and onshore O&M facilities.

Ocean Wind is evaluating maintenance contractors throughout New Jersey. Service agreements, where required, are expected to be executed as described in the O&M Plan (Attachment 7.1).

7.1.4 [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

7.1.5 Scheduling of maintenance and equipment testing

A final maintenance schedule will be developed in the early execution phase and will consider the equipment and features of the Project. These considerations include the activities involved in surveys and the frequency of the surveys, inspections, and regular maintenance to be performed per industry best practices. The O&M Plan provides a high-level overview of the frequency of scheduled inspections and how maintenance will be performed. Ørsted will draw on its extensive experience to achieve reliability and operational targets to guarantee the success of the Project.

Maintenance of the Project will include scheduled and unscheduled maintenance, all necessary condition monitoring, inspections, and diagnostics, asset integrity assessments, and major overhauls to ensure the integrity and operational status of the assets. This information is further described in the O&M Plan (Attachment 7.1).

To support O&M, the Project will be remotely controlled 24 hours a day, 7 days a week via the SCADA systems for wind turbines and the BOP equipment. Condition

Ørsted has a history of consistently maintaining operational controls throughout the Project lifetime.

monitoring will be accomplished via monitoring systems implemented on key components and via the alarms in the SCADA systems. Diagnostic evaluations will be completed by inspecting logs in the SCADA systems and by conducting diagnostic on-site investigations.

Preventive maintenance will be performed to ensure that the performance of the substations and line equipment is highly reliable. Equipment maintenance will be performed in accordance with the interconnection agreements. In addition, all protective system maintenance will be performed in accordance with Northeast Power Coordinating Council (NPCC) Standard PRC-005-2 — Protection System Maintenance.

Substation equipment will be maintained by qualified personnel in accordance with applicable industry standards and good utility practice to provide maximum operating performance and reliability.

7.2 Routine, intermittent, and emergency operations and maintenance protocols

N.J.A.C. 14:8-5.6(a)(7) An operations and maintenance plan for the initial OREC term of the project is required and must:

(i). Detail routine, intermittent and emergency protocols.

Ørsted has developed processes and procedures to ensure that routine, intermittent, and emergency situations are handled in a way that ensures efficiency and minimizes the potential consequences of an incident. The preliminary site-specific routine, intermittent, and emergency protocols for the Project are detailed in Attachment 7.1.

7.3 Financial capacity and technical expertise

N.J.A.C. 14:8-5.6(a)(7) An operations and maintenance plan for the initial OREC term of the project is required and must:

(ii). Demonstrate that the applicant has the financial capacity and technical expertise to perform all necessary upkeep/maintenance over the life of the project.

7.3.1 Financial capacity

As discussed in Section 4, Ørsted is a stable and diverse energy company with a robust balance sheet that reflects the financial strength needed to complete and operate the Project.

Ørsted has built a strong, fully integrated, end-to-end business that captures the entire value chain, including development, financing, construction, ownership, operations, and decommissioning. The model allows each business unit to leverage the strengths of the wider organization and ensures that the knowledge acquired at each stage of the wind farm lifecycle is captured and applied to subsequent projects.

7.3.2 Operation and maintenance services experience

Ørsted operates more offshore wind turbines than any other operator in the world, currently servicing 25 commercial-scale offshore wind farms (see Figure 7-3 and Table 7-1), including the only operational wind farm in the U.S. – the Block Island Wind Farm. The O&M component of the

Project will benefit from Ørsted's highly trained, professional engineers and experienced personnel who install, maintain, and repair equipment.

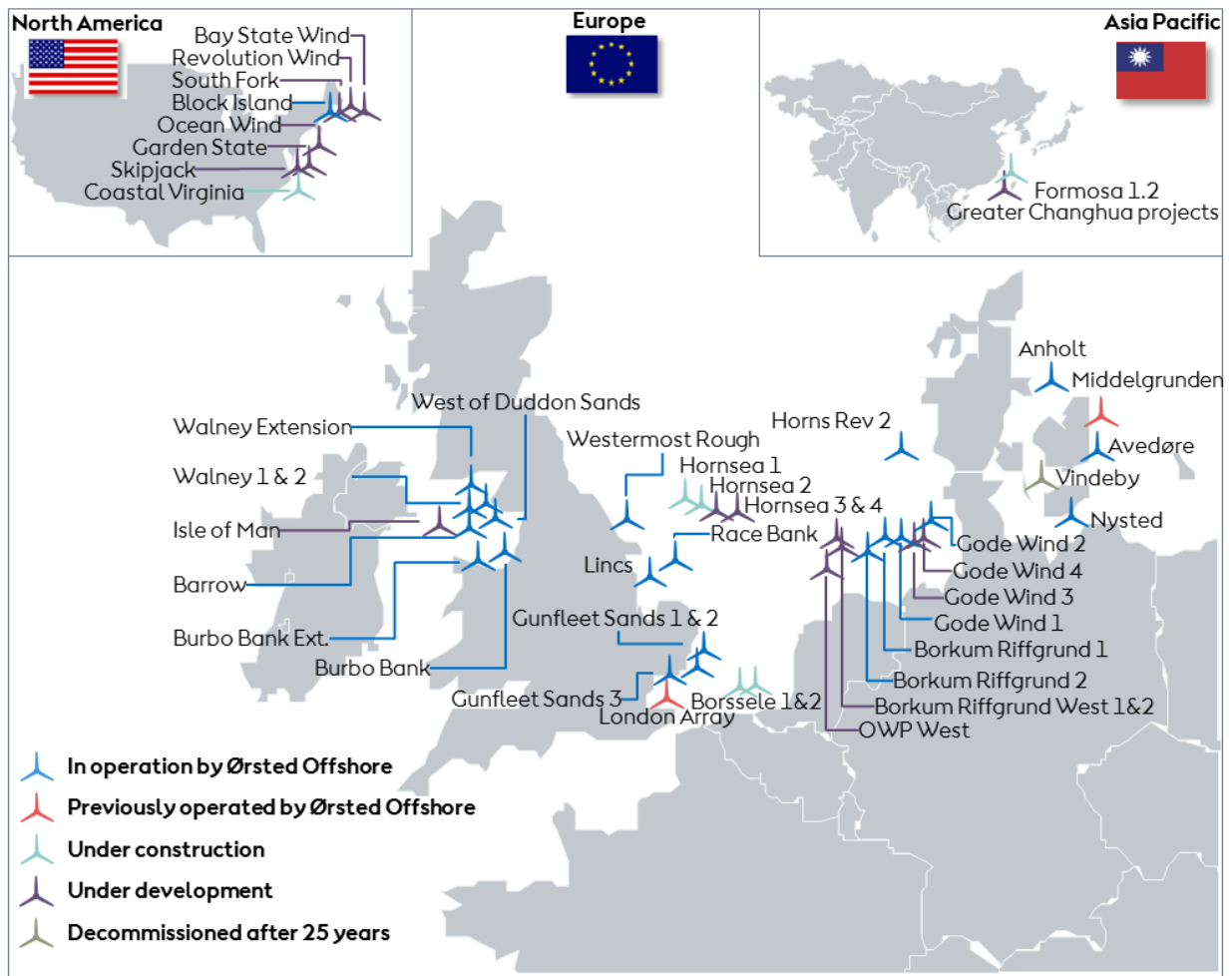
Table 7-1. Ørsted's offshore operated sites as of 2018.

Project	Total Capacity (MW)	WTG (Number / Capacity in MW)	Country	Scope of Operations ⁽¹⁾	Ørsted Operational Period
Block Island	30	5/6	USA	GA	2018 to present
Vindeby	5	11/0.45	DK	GA	1991–2017
Middelgrunden	40	20/2	DK	GA	2001–2018
Nysted	165.6	72/2.3	DK	GA	2003–ongoing
Barrow	90	30/3	UK	GA	2006–ongoing
Burbo Bank	90	25/3.6	UK	GA	2007–ongoing
Avedøre Holme	10.8	3/3.6	DK	GA	2009–ongoing
Horns Rev II	209.3	91/2.3	DK	GA	2009–ongoing
Gunfleet Sands 01+02	172.8	48/3.6	UK	GA	2012–ongoing
Walney 01	183.6	51/3.6	UK	GA	2012–ongoing
Walney 02	183.6	51/3.6	UK	GA	2012–ongoing
Anholt Offshore	400	111/3.6	DK	GA	2013–ongoing
Gunfleet Sands Demonstration	12	2/6	UK	GA	2013–ongoing
Lincs	270	75/3.6	UK	GA	2017–ongoing
London Array, Phase 1	315	175/3.6	UK	GA	2013–2017
West of Duddon Sands	388.8	108/3.6	UK	GA	2014–ongoing
Westermost Rough	210	35/6	UK	GA	2014–ongoing
Borkum Riffgrund 1	312	78/4	DE	GA+OSS	2015–ongoing
Gode Wind 1	330	55/6	DE	GA+OSS	2016–ongoing
Gode Wind 2	252	42/6	DE	GA+OSS	2016–ongoing
Burbo Bank Extension	256	32/8	UK	GA	2017–ongoing
Race Bank	573	91/6.3	UK	GA	2018–ongoing
Walney Extension (03)	280	40/7	UK	GA	2018–ongoing
Walney Extension (04)	388	47/8.3	UK	GA	2018–ongoing
Borkum Riffgrund II	450	56/8	DE	GA+OSS	2019–ongoing

⁽¹⁾ The scope of operations is dependent on the country-specific conditions and whether and to which the extent the transmission assets are operated by the transmission system operator.

DK = Denmark; DE = Germany; GA = generating assets; MW = megawatt; OSS = offshore substation; UK = United Kingdom

Figure 7-3. Unparalleled operations and maintenance experience.



7.4 Primary risks to the built infrastructure

N.J.A.C. 14:8-5.6(a)(7) An operations and maintenance plan for the initial OREC term of the project is required and must:

(iii). Identify the primary risks to the built infrastructure and how the potential risks, including, but not limited to, hurricanes, lightning, fog, rogue wave occurrences, and exposed cabling, shall be mitigated.

Attachment 7.1 (Chapter 10.3.4) identifies and describes the primary risks and mitigation measures associated with the built infrastructure and the surrounding natural environment.

7.5 Emergency shutdown provisions

N.J.A.C. 14:8-5.6(a)(7) An operations and maintenance plan for the initial OREC term of the project is required and must:

(iv). Describe emergency shut down provisions in the event of a need for the immediate stoppage of turbine blades.

As described in Attachment 7.1 (Chapter 9.2.3), Ocean Wind has developed processes and procedures described in a site-specific Emergency Response Plan (ERP) to ensure that emergency situations are handled in a way that minimizes the consequences of an incident.

7.6 Operations and maintenance cost

Section 3 describes Ocean Wind’s full cost plan, including O&M costs.

7.6.1 Construction and operational cost control

N.J.A.C. 14:8-5.6(a)(7) An operations and maintenance plan for the initial OREC term of the project is required and must:

(v). Identify specific and concrete elements to ensure both construction and operational cost controls.

7.6.1.1 Construction and cost control

Section 3.5.1 describes Ocean Wind’s approach to construction cost controls.

7.6.1.2 Operations and maintenance cost control

[Redacted]

[Redacted]

[Redacted]

[Redacted]

- [Redacted]
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7.6.2 Proof of insurance

*N.J.A.C. 14:8-5.6(a)(7) An operations and maintenance plan for the initial OREC term of the project is required and must:
(vi). Provide proof of insurance.*

Ocean Wind will maintain the types and levels of insurance that are appropriate for the Project.

7.6.3 Consideration of operations and maintenance cost

*N.J.A.C. 14:8-5.6(a)(7) An operations and maintenance plan for the initial OREC term of the project is required and must:
(vii). Be integrated into the financial analysis of the project, and must identify the projected plan for the subsequent operational term, assuming any necessary Federal lease agreements are maintained and renewed.*

Ocean Wind has integrated the cost of O&M into the financial analysis of the Project (see Section 3). For the full O&M plan, see Attachment 7.1.

7.7 Complete Operations and Maintenance Plan

*N.J.A.C. 14:8-5.6(a)(7) An operations and maintenance plan for the initial OREC term of the project is required and must:
(viii). Include a complete operation and maintenance plan for the life of the plant.*

Attachment 7.1 provides an O&M plan for the Project. The O&M Plan is defined for the Design Basis. After the Realization Milestone (COP approval by BOEM), the O&M Plan will become more specific and relevant to the contracted BOP.

Operation and Maintenance Plan - Attachments

Attachment 7.1 – Ocean Wind Operations and Maintenance Plan

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8 Estimated carbon dioxide emissions impact

Carbon dioxide emissions impact – Summary

Core message

Significant carbon emissions will be avoided by the Project through the displacement of fossil fuel-based generation, and the Project will generate significant health and environmental benefits to the State of New Jersey and improve the quality of life for residents.

New Jersey’s admirable push toward renewable energy generation is ideally matched with Ørsted’s core values. Taken together with Ørsted’s collective experience and financial and technical capability, Ocean Wind is confident that these reductions in net carbon will be realized at the earliest opportunity.

Carbon dioxide emissions impact – Checklist

The information required under **N.J.A.C. 14:8-6.5** is cross referenced to the associated document sections in the checklist below.

Checklist Item	Section Ref
The anticipated carbon dioxide emissions impact of the project. Data must be supplied on the environmental air impacts of each proposed wind-farm. N.J.A.C. 14:8-6.5(a)(8) .	Sections 8.1, 8.2, 8.3
Description of the impact of the construction, operation and decommissioning of the project on emission of carbon dioxide, sulfur dioxide, nitrous oxide, and particulate matter. BPU Guidelines Subsection 3.8 .	Sections 8.1

Carbon dioxide emissions impact – Documentation

This section summarizes the anticipated carbon dioxide emissions impact of the Project. Details regarding emissions for carbon dioxide as well as other air pollutants are provided in Attachment 11.5, Attachment 11.6, and Attachment 11.7.

8.1 Project carbon dioxide emission estimates

N.J.A.C. 14:8-6.5(a)(8). The anticipated carbon dioxide emissions impact of the project. Data must be supplied on the environmental air impacts of each proposed windfarm;

Significant CO₂ emissions are avoided through the displacement of fossil fuel-based generation. The estimated CO₂ emissions vary based on the scale of the project for construction and decommissioning-related activities. By virtue of the power of wind energy, zero emission are

produced during operation of the turbine. While there are no carbon emissions created through the generation of energy, there are emissions associated with construction, operation and decommissioning, which are discussed below. Other emissions, such as nitrogen oxides (NO_x), sulfur dioxide (SO₂), and particulate matter 2.5 micrometers or less in diameter (PM_{2.5}), are discussed in detail in Section 11. The net emissions, including CO₂ emission estimates for the Project are presented in Table 8-1. Detailed information on emissions is available in Attachment 11.5, Attachment 11.6, and Attachment 11.7.

Table 8-1. Net emission reductions [REDACTED] Project size (tons)

Project size (MW)	Net CO ₂	Net NO _x	Net SO ₂	Net PM _{2.5}
[REDACTED]				

Note: Negative numbers show added emissions and positive numbers show reductions.

Emissions avoided over the life of the Project are shown in Table 8-2. Emissions avoided are a benefit to the health and welfare of New Jersey ratepayers.

Table 8-2. Avoided emissions [REDACTED] Project size (tons)

Project size (MW)	CO ₂	NO _x	SO ₂	PM _{2.5}
[REDACTED]				

Note: Negative numbers show added emissions and positive numbers show reductions.

Total emissions associated with construction, operation and decommissioning are presented in Table 8-3. The emission impacts are much less than the emissions that would be avoided from the Project, resulting in a net reduction in emissions (with the exception of PM_{2.5}).

Table 8-3. Added emissions [REDACTED] Project size (tons)

Project size (MW)	CO ₂	NO _x	SO ₂	PM _{2.5}
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

Note: Negative numbers show added emissions and positive numbers show reductions.

8.1.1 Emissions during construction and decommissioning

Methods for calculating CO₂ emissions for the respective types of emission sources are described in Attachment 11.7. Greenhouse gas (GHG) emissions are presented in CO₂ equivalent or “CO₂e”, because the different GHG constituents have different global warming potentials.

Construction activities will produce air emissions including combustion engine emissions (vessels, compressors, generators, cranes, etc.). Additional construction activities such as welding will generate some minor emissions.

Construction-related offshore equipment can be categorized based on the construction activities as follows:

- Wind Turbine Generator Foundation Installation [REDACTED]
- Offshore-Substation Foundation Installation [REDACTED]
- Wind Turbine Generator Installation [REDACTED]
- Offshore-Substation Installation [REDACTED]
- Export Cable Installation [REDACTED]
- Inter Array Installation [REDACTED]

These marine activities will also include a variety of generators, compressors, and pumps. Support and supply vessels will be operated for some activities, and they will have propulsion engines, auxiliary generators, compressors, and winches.

For each type of equipment, emission estimates were based on the duration of use (days, months, etc.), operational characteristics (hours per day, etc.), engine operating load (percent of maximum rated capacity by activity), and published emission factors.

The CO₂ emission estimates during construction and decommissioning are presented in Attachment 11.5 and Attachment 11.7.

8.1.2 Emissions during operations

The operation of WTCs does not generate greenhouse gas emissions or other pollutants, as would result from a conventional fossil fuel generating station. Therefore, no CO₂ emissions will occur as a result of the Project's generation of electricity. The primary category of sources for which CO₂ emissions were calculated is Marine Vessels/Engines, including offshore emergency generators.

Routine operation and maintenance would incur periodic mobile emissions associated with transit of O&M vessels to and from the O&M base. Marine vessels are required to ferry supplies and crew to and from the offshore sites. In order to calculate emissions from marine vessels, vessel count, propulsion hours per vessel, and auxiliary hours per vessel are required for each phase. Propulsion hours and auxiliary hours of operation are calculated using the known distance, speed, total number of round trips, as well as engine power ratings and load factors. Distances were calculated using the known coordinates of sea ports and location of the Project.

The CO₂ emission estimates during operations are presented in Attachment 11.5 and Attachment 11.7.

8.2 Benefits of displaced fossil fuel generation

The Project would represent the addition of a significant new large-scale, clean energy resource to meet regional power demands, and enough generation to meet the needs of as many as [REDACTED] New Jersey residences (Table 8-4). An injection of clean energy into the grid will displace significant fossil fuel generation in the PJM system. The estimated reduction in CO₂ associated with displaced fossil fuel generation is provided in Attachment 11.5 and Attachment 11.6. The method to estimate displaced carbon emissions is described in Section 11.3.3 and Attachment 11.7.

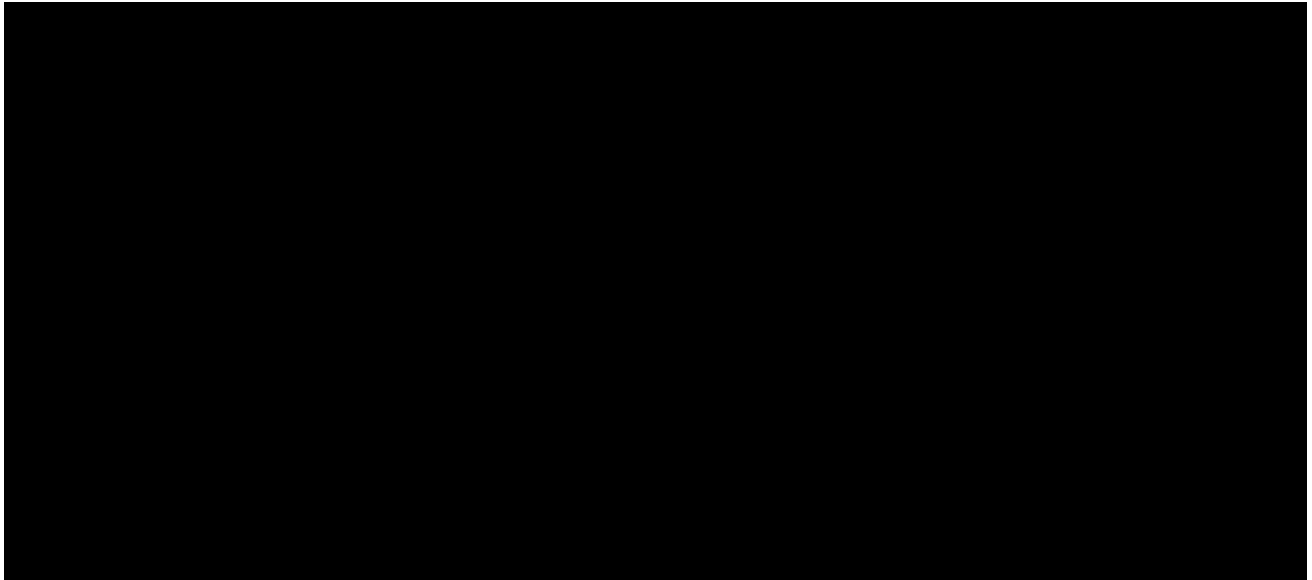
Table 8-4. Additional NJ homes served by Ocean Wind's clean energy

[REDACTED]

8.3 Net carbon dioxide emission impact

Given the cumulative effects of carbon emissions, Ocean Wind understands and supports the State's desire to achieve the earliest possible reductions in CO₂ emissions. Ocean Wind believes it has put forth the most realistic and defensible operational date for the Project given critical path items, including but not limited to securing BOEM approval of the COP. This factor, taken together with Ørsted's collective experience and financial and technical capability, should inspire confidence that the expected reductions in net carbon will be realized at the earliest opportunity. The net CO₂ emission impact is summarized in Table 8-5 [REDACTED] and detail is provided in Attachment 11.5 and Attachment 11.6.

Table 8-5. Net CO₂ emission reductions (U.S. tons)



Note: Negative numbers show added emissions and positive numbers show reductions.

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Attachment 9.1 – Decommissioning case study

9 Decommissioning plan

Decommissioning plan – Summary

Core message

Ørsted is one of only two companies worldwide to have successfully completed the decommissioning of an offshore wind farm, which occurred at Vindeby in Denmark during 2016-2017. This decommissioning plan identifies the steps needed to determine the useful life of an offshore wind farm, the actions necessary to remove both offshore and onshore structures, and the costs associated with decommissioning.

Decommissioning plan – Checklist

The information required under N.J.A.C. 14:8-6.5 is cross referenced to the associated document sections in the checklist below.

Checklist Item	Document Reference
Estimate of an expected useful economic life; specification of a Project decommissioning plan. N.J.A.C. 14:8-6.5(a)(9)(i).	Section 9.1
Estimate of the anticipated cost of decommissioning (including expected regulatory and engineering requirements); segregated decommissioning funds. N.J.A.C. 14:8-6.5(a)(9)(ii).	Section 9.3
Commitment that any decommissioning costs in excess of the estimate will not be made up by ratepayers, suppliers, or providers. N.J.A.C. 14:8-6.5(a)(9)(iii).	Section 9.3

Decommissioning plan – Documentation

This section describes the Ocean Wind decommissioning plan, including provisions for financial assurance for decommissioning and compliance with applicable State and Federal statutes and regulations.

9.1 Expected useful economic life of major equipment

N.J.A.C. 14:8-6.5(a)(9)(i). Proposals must estimate an expected useful economic life as well as specify a project decommissioning plan for the technology and installation area proposed.

Table 9-1 details the expected useful economic life of the Project’s major permanent structures and equipment, which are described in Section 2.1.

Table 9-1. Estimated useful economic life of major equipment

Major Equipment	Expected economic life
Wind turbine generators	[REDACTED]
Wind turbine foundations	[REDACTED]
Offshore substation topside	[REDACTED]
Offshore Substation foundations	[REDACTED]
Offshore cables	[REDACTED]
Onshore cables	[REDACTED]
Onshore substation	[REDACTED]

9.2 Decommissioning plan

N.J.A.C. 14:8-6.5(a)(9). A decommissioning plan for the project including provisions for financial assurance for decommissioning and which complies with any applicable State and Federal statutes and/or regulations.

Ocean Wind has developed a decommissioning plan for the Project, and it is summarized below. Ocean Wind will draw on Ørsted’s rare experience successfully completing the decommissioning of Vindeby in Denmark in 2017. Attachment 9.1 provides a detailed presentation regarding the Vindeby decommissioning.

9.2.1 Decommissioning planning, design, and regulatory approvals

Ocean Wind will execute decommissioning of the Project in conformance with applicable regulations in effect at the time of decommissioning.

9.2.2 Decommissioning procedures

9.2.2.1 Wind turbine generator

The dismantling and removal of turbine components (e.g., blades, nacelle, tower) will largely be a reversed installation process that is subject to the same constraints (Figure 9-1). [REDACTED]

[REDACTED] Although decommissioning may not require the same level of precision and care as installation, it will be undertaken in the same controlled manner and in accordance with a risk management plan to ensure the same or higher level of safety.

Figure 9-1. Removal of blades, Vindeby, Denmark



Ørsted completed the first and only decommissioning of a major offshore wind project in 2017.

9.2.2.2 Monopiles

In decommissioning MP foundations, it is anticipated that the foundations will be cut below the seabed level in accordance with standard practices (Figure 9.2 and Figure 9-3).

The exact depth will depend on seabed conditions (e.g., dynamics, site characteristics at the time of decommissioning) and developing industry best practices. The cutting process is likely to be via [REDACTED]

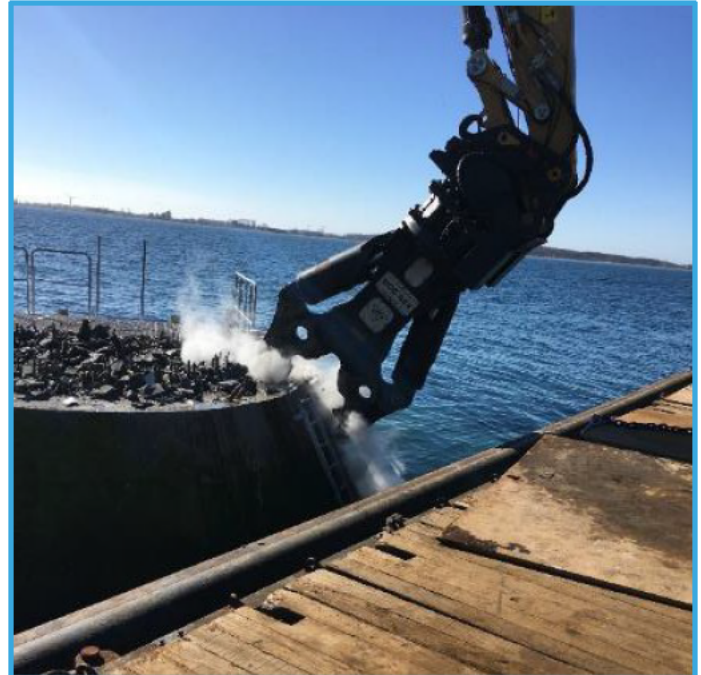
9.2.2.3 Scour protection

Scour protection will be left in situ as the default to preserve the marine habitat that may have been established over the life of the wind farm. If removal is deemed necessary, it will be done according to the best practices at the time of removal.

Figure 9-2. Removal of monopile, Vindeby, Denmark.



Figure 9-3. Decommissioning of foundation, Vindeby, Denmark.



9.2.2.4 Offshore substations

Decommissioning the offshore substation will comprise the dismantling and removal of the topside and the foundation (substructure). The operation will be a reversed installation process that is subject to the same constraints. Although decommissioning may not require the same level of precision and care as installation, it will be undertaken in the same controlled manner and in accordance with a risk management plan to ensure the same or higher level of safety.

9.2.2.5 Offshore cables

Offshore cables will be left in situ or removed. If the cables are left in situ, the cable ends will be weighed down and buried to ensure that they are not exposed. Cables may be left in situ in certain locations, such as pipeline crossings, to avoid unnecessary risk to the integrity of the third-party cable or pipeline.

9.2.2.6 Onshore substation

The onshore substation will first be disconnected from the high-voltage transmission system and de-energized, and all associated equipment will be earthed (Figure 9-4). Any auxiliary supplies will remain at the site for decommissioning purposes. Potential hazards and pollutants will be identified, and a risk mitigation plan will be implemented to ensure that removal is carried out with minimal risk of damage to the surrounding environment. All electrical equipment items and electrical plant items will be dismantled and removed. Parts will be processed for reuse, recycling, or disposal.

Figure 9-4. Dismantling of onshore substation, Vindeby, Denmark.



9.2.2.7 Onshore cables

Onshore cables may be either left in-situ or removed. If cables are buried and left in-situ the cable ends will be buried to ensure they are not exposed. If buried cables are removed in most locations, they may be left in-situ in certain locations such as road-crossings to avoid unnecessary risk to the integrity of the surrounding. If cables are installed overhead, they may be used to connect other projects or removed.

9.2.3 Waste management

Offshore wind turbines have a large amount of material that must be removed after the structures are decommissioned. Disposal will be according to decommissioning industry best practices and the applicable regulations at the time of decommissioning. The appropriate waste hierarchy will also be followed: reuse is considered first and maximized when possible, followed by recycling, incineration with energy recovery, and lastly, disposal.

9.3 Decommissioning costs

N.J.A.C. 14:8-6.5(a)(9)(ii). The decommissioning plan must include the anticipated cost of decommissioning the project based on applicable and/or anticipated regulatory and engineering requirements and provide for the necessary future funding. Segregated decommissioning funds shall be required; (iii). The applicant shall commit that any decommissioning costs in excess of the anticipated costs stated in the application shall not be made up by ratepayers, suppliers, or providers.

Most cost estimates of decommissioning offshore wind farm projects currently have significant uncertainty because of the lack of decommissioning experience and also because of the uncertainty of when the actual decommissioning will occur since market conditions, technology, and environmental knowledge may all change.

[REDACTED]

(In addition, BOEM's regulations will require Ocean Wind to post a "decommissioning bond or other financial assurance, in an amount determined by BOEM based on anticipated decommissioning costs," prior to the construction of facilities authorized by the COP, (30 C.F.R. § 585.516).

The assumptions that were used in the estimate are provided in the following subsections.

9.3.1 Disassembly cost assumptions

The calculated cost of disassembly is based [REDACTED] It is assumed that from now until the actual decommissioning, there will be an improvement in access, weather criteria, fit-to-purpose vessels, or methods of decommissioning. In making this assumption, Ocean Wind has assumed the substantial risk of increased cost exposure, especially as it relates to potential changes in waste management regulations.

9.3.2 Service cost assumptions

[REDACTED]

A precondition for the anticipated decommissioning cost is an expectation that there will be continuing growth in the offshore wind energy sector and future industrialization of the sector and related sectors, including the decommissioning of offshore wind farms.

[REDACTED]

However, Ocean Wind expects that decommissioning activities may be able to exploit preferential rates due to the flexibility in timing of decommissioning activities.

9.3.3 Market influences

Cost estimates are based on Ørsted's experience with decommissioning, construction, and projected cost escalation at this time. Future market influences may affect actual costs at the time of decommissioning.

9.4 Responsibility for decommissioning costs

As previously noted, there is significant uncertainty in the estimate of the cost of decommissioning cost for decommissioning activities that will occur in the future. Ocean Wind commits that costs in excess of the estimate will not be made up by ratepayers, suppliers, or providers. Refer to the signed "New Jersey OREC Application Form for Qualified Offshore Wind Projects – Commitments" included with this application in Attachment 18.1. Furthermore, as noted above, Ocean Wind will be required by BOEM regulations to post financial assurance covering decommissioning costs prior to the construction of facilities authorized by the COP.

Decommissioning plan – Attachments

Attachment 9.1 – Decommissioning case study

Attachment 9.1 – Decommissioning case study

Decommissioning of Vindeby

– THE WORLDS FIRST Offshore Wind FARM

Learnings from the Vindeby site

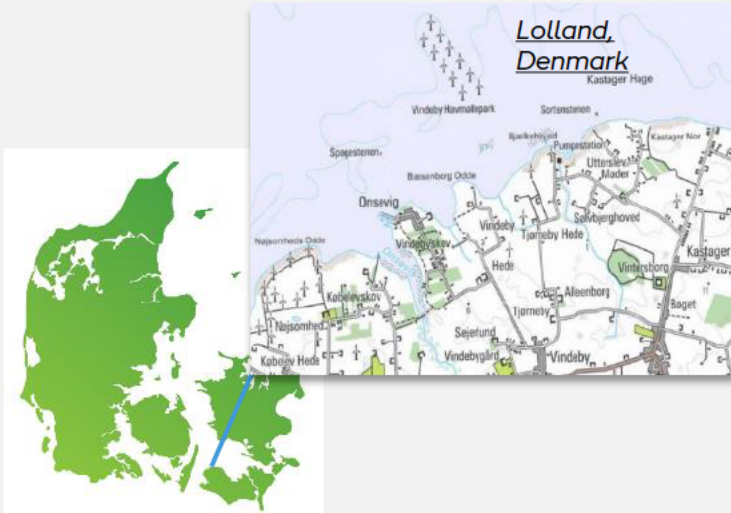


Offshore wind started 25 years ago with Vindeby in 1991

- **Vindeby was the world's first offshore windfarm**
- **Key milestone marking the beginning of the offshore wind industry**

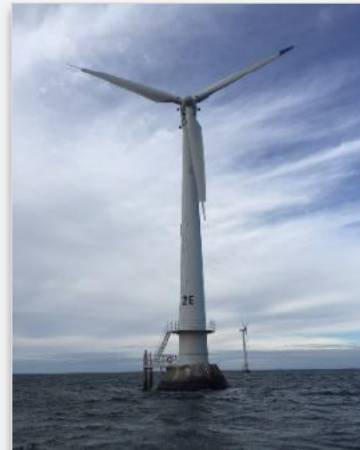
Vindeby

- 4.95 MW installed capacity
- Inaugurated September 1991
- Lifetime production: ~ 243 GWh
- Built by Elkraft/SEAS
- Located ~1.5 km offshore near Vindeby Lolland



Wind turbines

- *11 Bonus 450 kW*
- *Installed in one piece*
- *Hub height 35 m*
- *Blade length 17 m*
- *Service harbour: Onsevig, Lolland*

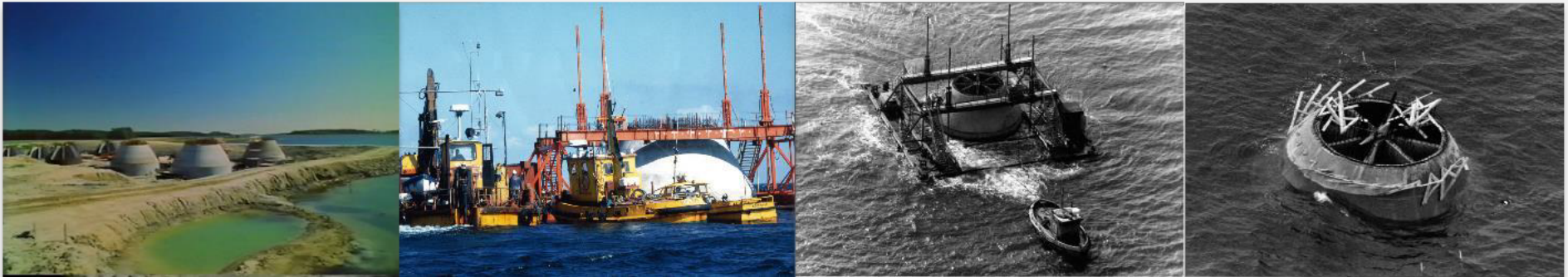


Foundations

- *Gravity based*
- *5 m water depth*
- *Reinforced concrete shell filled with sand*
- *Weight ~1.500 t (filled) & ~ 500 t (dry)*
- *Built locally at Onsevig harbour*



Construction of Vindeby 25 years ago



Why decommission Vindeby ?

Considerations started early 2015

- The consent was expiring in 2016 – extension could be applied for
- Most turbines were operational but needing increasing maintenance
- Blades, towers, foundations, cables could continue to produce, but maintenance of i.e. corroding bolts at flange was needed
- Inspection showed need to refurbish gearboxes to continue operation – not feasible given turbine size, power prices and cost of overhaul



Vindeby Decommissioning Consent

Consenting authority

The Danish Energy Agency DEA acts as a “One Stop Shop” for the consent for decommissioning incl. consultation of all relevant authorities on national and regional level.

The onshore part was under the jurisdiction of the local municipality, which gave the consent to remove the onshore cables etc. (no offshore substation for Vindeby)

As this decommissioning is/was the first in Denmark no fixed process was in place

The DEA was open for a dialogue when decommissioning of Vindeby was due

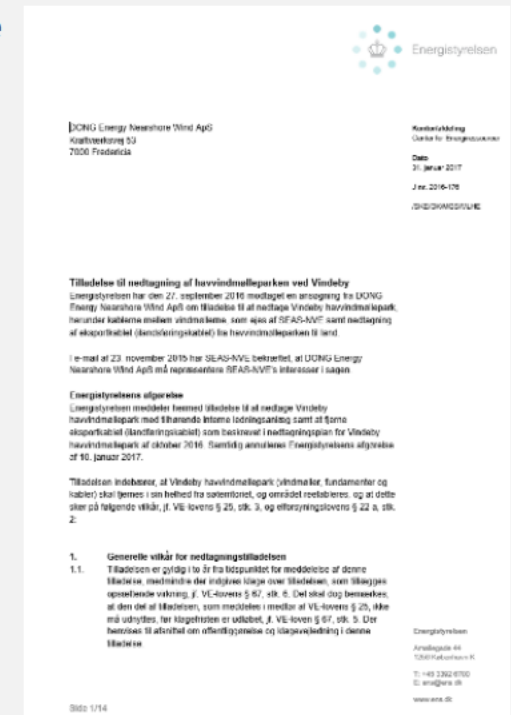
The agreed approach became in essence the same as for building wind farms

- Application for decommissioning containing:

- Method description and logistics
- Environmental Impact Assessment (EIA)



- Consultation of relevant authorities
- Consent for decommissioning with conditions



Project timeline

2015

- Jan – First strategic considerations as consent expires Sept 2016
- March – Technical report shows necessity to refurbish gearboxes to continue operation
- September – First talks to Danish Energy Agency on regulatory process
- October – Decision to decommission Vindeby is taken

2016

- January – Contract with NIRAS re. tender material, decom method and scrap/waste management
- April – Invitation to tender
- July – Environmental surveys (flora/fauna)
- August – Contract award
- September – Decommissioning plan and Environmental Statement sent to Danish Energy Agency

2017

- Jan – Approval from Danish Energy Agency (2 rounds)
- March – Start of decom. works
- May – Expected end of works (actual September)
- June/July – Environmental surveys (flora/fauna/sediment) (actual September-October)
- December – Final reporting to Danish Energy Agency

2020

- June/July – Environmental surveys (flora/fauna)

Decommissioning method

- SSE – Turn key contractor
 - Subcontractors to SSE:
 - BMS (Krangården) – Lifting services
 - Connected Wind – Turbine decommissioning
 - Barslund – Foundation decommissioning
-

- **Decommissioning method**

Turbines: *Take down one blade first, then nacelle with 2 blades and finally the tower*

Foundations: *Open from the top, pump up ballast consisting of marine sand onto a barge and sail to position where it can be discharged into the ocean again.*

Foundations would be cut into smaller pieces and lifted onto barge and sailed to Nyborg harbour for further treatment using known procedures for scrapping concrete as bridges etc.

Cables: *Pulled directly up from seabed and rolled onto a hydraulic cable drum or cut to smaller pieces*

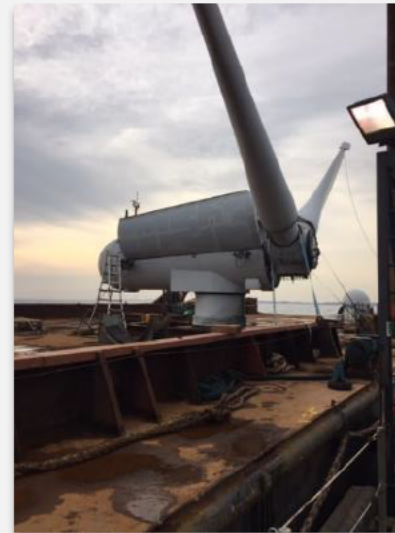
Handling: *All parts to be placed on a barge and sailed to Nyborg for further treatment*

Removal of onshore facilities by SEAS-NVE* - February 2017

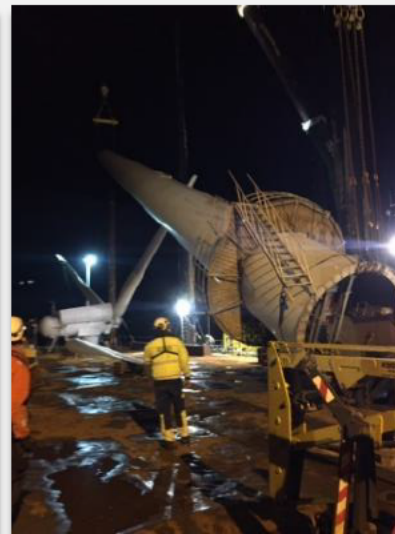


*Offshore and onshore cables property of SEAS-NVE

Dismantling of turbines



- Blade length: 17 m
- Blade weight: 2.2 t
- Hub height: 37.5 m
- Nacelle weight: 27.6 t
- Tower weight: 20 t

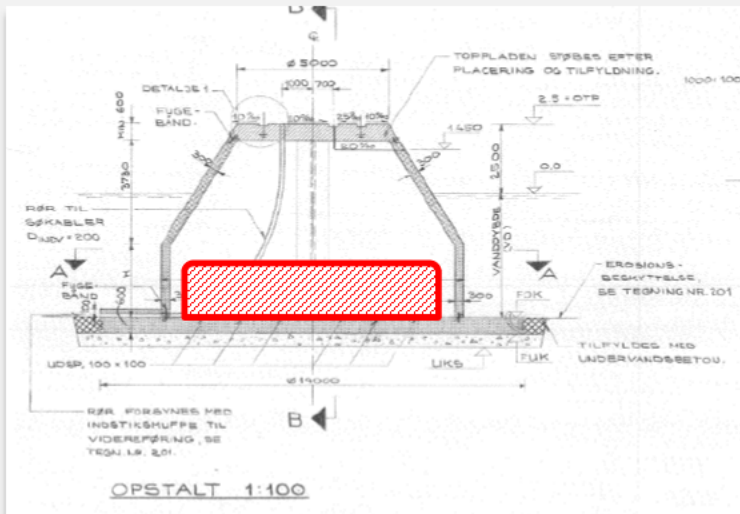


Dismantling of turbines

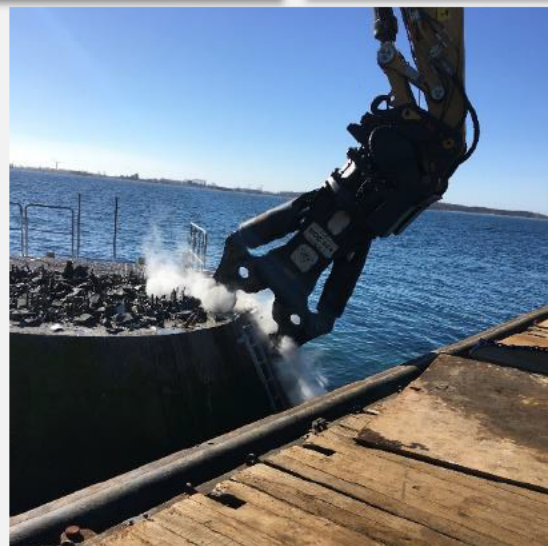


VINDEBY
DECOMMISSIONING

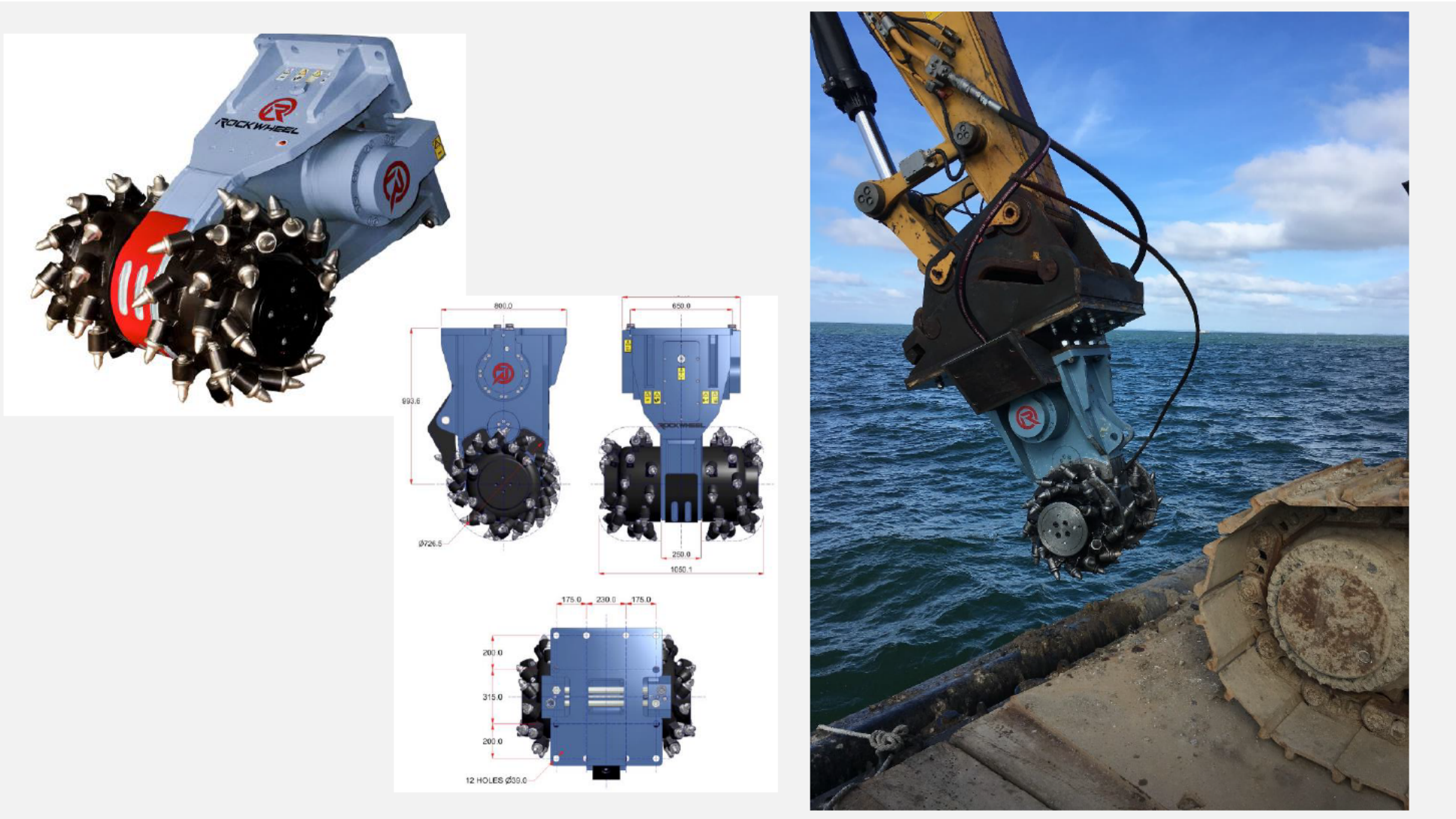
Dismantling – Foundations (start week 14 2017)



- Conical reinforced concrete gravitation foundations
- Concrete compressive strength 77,9 MPaHub
- Cylindrical part on top of bottom plate with a diameter of ca 10 m
- Bottom plate with 14 m in diameter and a thickness of 60 cm
- Foundations divided into eight internal chambers filled with "marine sand"
- Weight ranges between 710 and 1105 t with ballast (366 and 559 t without)



Dismantling – Foundations with Drum Cutter

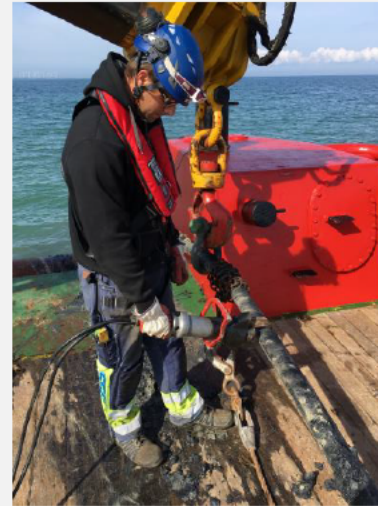


Dismantling - Cables

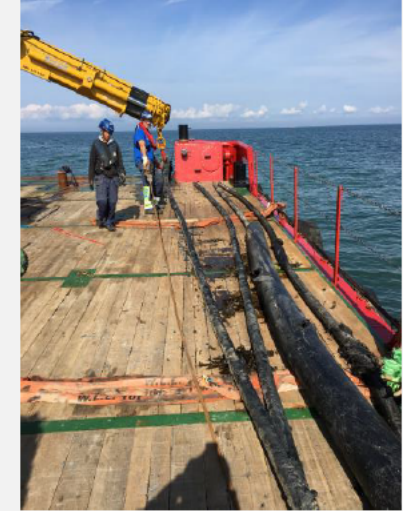
Cables were pulled directly up from seabed and cut into smaller pieces



Cable pulling



Cable cutting



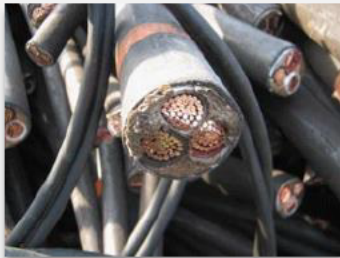
Cables on deck

- Array cables and export cable - 12 kV, 3x150mm² PEX-Cu-LRT subsea cable with 4 optical fibres
- Reinforced with zinc threads and asphalt
- 3 km array cables and 3 km export cable both buried to a depth of 1 m below sea level
- The array cables are at the cable entrances at the turbines covered with rocks and sandbags

Waste Management and Recycling

All non-reusable components were disposed of by certified companies that can handle the scrap fractions present

Cables and
Electrical
components



Metal and
Concrete



Blades



BOBERG RECYCLING



ØSTFYN GENVINDING APS





H. J. HANSEN GENVINDING






Miljøskærm®

Much effort has been put into influencing best practice in e.g. recycling & durability testing

- 1 **miljøservice**
...in del af naturens kredsløb
Marin fouling/macroalgae
- 2 **LM WIND POWER**
Blades for testing
- 3 **SIEMENS**
Siemens Wind Power
2 pieces gearboxes for test and exhibition
- 4 **ENERGI MUSEET**
1 piece complete turbine for exhibition
- 5 
ØSTFYN GENVINDING APS
Concrete
- EKOKEM**
Saving natural resources
Contaminated concrete
- Nyborg Jernhandel**
v. Jesper H. Pedersen ApS
Iron reinforcement
- 
H.J.HANSEN
Udvikling gennem generationer
Metal and steel



- 6 **Miljøskærm®**
Reuse of blades
- 
7 **CONNECTED WIND SERVICES**
2 complete turbines for spare parts and recycling
- 
8 **DTU Technical University of Denmark**
Test of blades, gear boxes and concrete
- 9 
HEMPEL
Inspection of paint and surface protection
- 10 **CLEMCO DANMARK**
Inspection of paint and surface protection
- 11 **DONG energy**
Examination of cable parts

Thank you



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Table 10-2. Timeline of completed project activities and milestones.....	10-4
Table 10-3. Projected timeline for receipt of Project permits, licenses, and environmental assessments and/or environmental impact statements.....	10-5

List of Attachments

- Attachment 10.1 – PJM Attachment N: Queue Availability
- Attachment 10.2 – Permit matrix
- Attachment 10.3 – List of submitted permit applications and submittals to other agencies
- Attachment 10.4 – List of permits and approvals received
- Attachment 10.5 – Acquisition of real property rights

10 Required permits and approvals

Required permits and approvals – Summary

Core message

The Ocean Wind team is confident in its ability to deliver the required permits and approvals on schedule and without controversy. The team has unmatched experience and a proven record of responsibly working with the appropriate authorities to receive required permits. Ørsted successfully developed and permitted America's first offshore wind farm – the Block Island Wind Farm – which began operations in December 2016. Ørsted has gained invaluable experience from working with regulators, stakeholders, and U.S. vendors through the Block Island Wind Farm project. Similarly, PSEG has over a century of experience permitting onshore transmission facilities. Ocean Wind is pursuing the required permits and has made significant progress, which includes:

- Approval of a Site Assessment Plan by BOEM in May, 2018, before any other project in the region.
- Consultations with the NJDEP regarding potential routes and designs under their jurisdiction.
- Significant community outreach with federal, state and local representatives, as well as broad groups of project stakeholders.

The permits and approvals required to construct and operate the Project are substantially similar to those received for the construction and operations of the Block Island Wind Farm and in-process for Ørsted's South Fork, Skipjack and Revolution Wind projects. Based on Ørsted's experiences with comparable American projects, and its constructive working relationship with federal, state and local resource agencies, Ocean Wind is confident in its ability to deliver a project that the State of New Jersey and its local communities will be proud of.

Required permits and approvals – Checklist

The information required under N.J.A.C. 14:8-6.5 is cross referenced to the associated document sections in the checklist below.

Checklist Item	Page Reference
Document that project is in the PJM queue or that the proposed project is PJM queue eligible N.J.A.C. 14:8-6.5(a)(10)(ii).	Section 10.1, Attachment 10.1
Identify all local, State and/or Federal permits and/or approvals required to build and operate the project and the expected time to obtain such permits and/or approvals. N.J.A.C. 14:8-6.5(a)(10)(iii).	Section 10.2, Attachment 10.2
Identify the nature of its ocean lease and land ownership requirements for all aspects of the project including all required interconnection areas. N.J.A.C. 14:8-6.5(a)(10)(iv).	Sections Error! Reference source not found. and 15.5
Demonstrate progress in securing leases and land required, propose a plan for accomplishing remaining steps toward acquiring leases or land ownership. The type and number of entities securing leases or owning land must be indicated. N.J.A.C. 14:8-6.5(a)(10)(v).	Sections Error! Reference source not found. and 15.5
Identify each appropriate State or Federal agencies they will be contacting for land acquisition issues and provide the Board with a summary of the required arrangements. N.J.A.C. 14:8-6.5(a)(10)(vi).	Sections Error! Reference source not found. and 15.5
Applicants are required to demonstrate adequate financial resources to acquire any land or leases needed to undertake this project. N.J.A.C. 14:8-6.5(a)(10)(vii).	Sections Error! Reference source not found. and 15.5

Required permits and approvals – Documentation

N.J.A.C. 14:8-6.5(a)(10). A list of all State and Federal regulatory agency approvals, permits, or other authorizations required pursuant to State and Federal law for the offshore wind project, and copies of all submitted permit applications and any issued approvals and permits for the offshore wind project.

Ocean Wind has reviewed Federal, State, and local permitting requirements to identify the applicable regulatory framework for the construction and operation of an offshore wind energy project. Ocean Wind and its consultants have extensive experience in permitting projects of similar size and complexity and have undertaken significant activities in advancing the permitting process ahead of responding to this solicitation.

Ocean Wind will secure the State and Federal regulatory agency permits, approvals, or other authorizations that are required for the Project. Ocean Wind is the most advanced New Jersey project in the permitting process and takes seriously its role in setting a precedent for New Jersey's offshore wind industry. The following sections provide the documentation, as required by the regulation.

10.1 PJM queue eligibility and position

N.J.A.C. 14:8-6.5(a)(10)(ii). Applicants shall show that they are currently in the PJM queue or that the proposed project is PJM queue eligible.

Ocean Wind's detailed Interconnection Plan is found Section 14. Documentation of Ocean Wind's position in the PJM queue can be found here.¹ [REDACTED]

[REDACTED]

Table 10-1 shows the information contained in the PJM queue for the Project.

[REDACTED]

Table 10-1. Maximum facility output.

[REDACTED]

¹ <https://www.pjm.com/planning/services-requests/interconnection-queues.aspx>

The executed PJM Attachment N documents in Attachment 10.1 are provided as evidence that the Project is eligible for PJM queue positions [REDACTED] (see Attachment 10.1). [REDACTED]

10.2 Required permits, licenses, and environmental assessments and/or environmental impact statements

N.J.A.C. 14:8-6.5(a)(10)(iii). Each applicant shall identify all local, State and/or Federal permits and/or approvals required to build and operate the project and the expected time to obtain such permits and/or approvals.

10.2.1 Required local state and federal permits

The permit matrix in Attachment 10.2 lists the permits, licenses, and environmental assessments, and/or environmental impact statements that are required to construct and operate the Project and identifies the regulatory agencies that are responsible for issuing approval of the same. The matrix also details the current status of any permit applications and permits that have been secured by the Project.

The Environmental Impact Assessment can be found in Attachment 11.11.

The Project schedule provided in Section 13 is based on Ocean Wind’s understanding of the permits, licenses, environmental assessments, and/or environmental impact statements that are required to construct and operate the Project. Ocean Wind’s understanding is informed by consultation with Federal and State regulatory agencies, Ørsted’s environmental assessment experience, and a review of the relevant US and New Jersey regulations.

10.2.2 Anticipated timeline for seeking and receiving required permits

A summary of milestones achieved to date is provided in Table 10-2.

Table 10-2. Timeline of completed project activities and milestones.

Activity/Milestone	Date
Lease OCS-A 0500	Effective date: Mar. 1, 2015
Lease assigned to Ocean Wind	May 10, 2016
12-month extension of the Preliminary Term	Date granted by BOEM: Mar. 1, 2017
Site Assessment Plan (SAP) Survey Plan	Submitted to BOEM Feb. 2017
Incidental Harassment Authorization for SAP surveys	Date authorized by NMFS : Jun. 8, 2017
SAP Survey Plan	Date accepted by BOEM: Jun. 15, 2017
Preliminary site assessment activities including geophysical surveys	Completed Aug. 1, 2017
Nationwide Permit 6 for SAP geotechnical surveys	Date granted by USACE: Sep. 6, 2017
SAP	Submitted to BOEM:

Activity/Milestone	Date
Certain Federal and State agency approvals have a statutory start date such that the receipt of approval must be timed to within 6 to 12 months of start of construction even if the materials that are needed to support permit application are available.	
BOEM = Bureau of Ocean Energy Management; COP = Construction and Operations Plan; SAP = Site Assessment Plan	

The permitting process involves multiple agencies and other stakeholders at the Federal, State, and local levels.



10.3 Permit documentation

*N.J.A.C. 14:8-6.5(a)(10)(i). An award to build an OSW facility is contingent upon the successful entity obtaining all required local, State and/or Federal permits and/or approvals. **iii.** Developers shall provide the Board with copies of each permit or approval within 14 days of receipt by the developer. This is a continuing obligation upon the developer and shall serve as a condition of any OREC award*

The permitting matrix can be found in Table 10-2. Copies of the permit applications will be provided to the Board within 14 days of receipt. Additionally, Ocean Wind will regularly update the Board on the progress of the permits.

10.4 Plan for securing land ownership and leases

*N.J.A.C. 14:8-6.5(a)(10)(iv) Applicants shall identify the nature of its ocean lease and land ownership requirements for all aspects of the project including all required interconnection areas. **(v)** Progress must be demonstrated in securing leases and land required, and applicants shall propose a plan for accomplishing remaining steps toward acquiring leases or land ownership. The type and number of entities securing leases or owning land must be indicated. **(vi)** Applicants shall identify each appropriate State or Federal agencies they will be contacting for land acquisition issues and provide the Board with a summary of the required arrangements. **(vii)** Applicants are required to demonstrate adequate financial resources to acquire any land or leases needed to undertake this project. **(viii)** The books and records of the applicant shall be subject to review and audit by the Board, or any other State entity or State designee.*

10.4.1 Lease and ownership requirements

The following characterizes the nature of Ocean Wind's lease and land ownership requirements for the Project [REDACTED].

10.4.1.1 Offshore lease

Ocean Wind holds Commercial Lease of Submerged Lands for Renewable Energy Development on the Outer Continental Shelf (OCS-A 0498) (the "Lease") from the U.S. Department of the Interior's BOEM under the Outer Continental Shelf Lands Act. The Lease grants Ocean Wind the exclusive right to seek BOEM approval for renewable-energy development of the Lease area².

Ocean Wind is performing the necessary site assessment and planning activities to receive approval from BOEM to construct and operate the Project.

The export cable route will cross Federal and New Jersey State Waters before landing onshore and routing to the proposed OnSS. The Lease provides for a Project Easement in Lease Addendum D, which grants the leaseholder the right to locate and operate the cables to the boundary of Federal and State Waters. Within State Waters, a tidelands license/grant will be required for the export cable to traverse across all lands that are currently and formerly flowed by the mean high tide of a natural waterway.

² <https://www.boem.gov/Assignment-Approval-Lease-OCS-A-0498/>

The Lease area—[REDACTED]—is currently used for recreational and commercial boating activities, and will continue to be used for such purposes during the construction and operation of the Project. Potential impacts on marine and ocean uses in the Project Area, as well as mitigation for such impacts, are expected to be addressed in the COP and BOEM’s NEPA analysis.

In order to protect the public and the offshore assets of the Project, Ocean Wind will work both with the US Coast Guard (USCG) to establish aids to navigation and Notices to Mariners and with NOAA in order to map the Project appropriately on nautical charts. Ocean Wind will engage local fishing and boating organizations and community leaders during construction. These organizations and individuals will support the Project by acting as observers on vessels as well as assisting with communications of safety information to their organizations and members.

10.4.1.2 Marine terminals and other waterfront facilities

Marine terminals and other waterfront facilities will be vital to the execution of the Project. As discussed in [REDACTED] Ocean Wind has identified several waterfront facilities for purposes of installation and O&M. [REDACTED]

[REDACTED]

10.4.1.3 Other facilities

In 2018, Ocean Wind opened its Atlantic City office, establishing operations in New Jersey and furthering its commitment to the State. Other land-based facilities will be required for execution of the Project.

10.4.1.4 Onshore substation and easements

10.4.2 Onshore site control requirements are subject to the selection of the final Point of Interconnection, as detailed in Section 14.6.State licenses and easements

New Jersey’s territorial jurisdiction extends three nautical miles from the mean high-water line. Ocean Wind will apply to the NJDEP for necessary rights for cable(s) within New Jersey Territorial Waters and Tidelands. See Sections 10 and **Error! Reference source not found.** for additional details on Project permitting.

The permits that will be required for the onshore route depends upon the final point of interconnection selected, as detailed in Section 14. The New Jersey Department of Transport (NJDOT) will likely be involved in the approval process. [REDACTED]

[REDACTED]

10.4.3 Plan and status of ocean lease and land acquisition

As detailed in Section **Error! Reference source not found.**, Ocean Wind holds BOEM Lease OCS-A 0498, which provides for all required site control for Wind Farm and the federal waters portion of the Export Cable. No additional site control is required for the portions of the Project in Federal waters.

The site control required for the portion of the Project's Export Cable that is in State waters is addressed in Section **Error! Reference source not found.**. The site control required for the portions of the Project's Export Cable and its onshore substation and interconnection facilities are addressed in Section 14.6.

10.4.4 Financial resources for land acquisition and leases

Ocean Wind has estimated the total cost of acquiring the necessary property interests for the Project within the full cost accounting for the Project provided in Section 3. [REDACTED]

[REDACTED]

Required permits and approvals – Attachments

- | | |
|------------------------|---|
| Attachment 10.1 | PJM Attachment N; Queue Availability |
| Attachment 10.2 | Permit Matrix |
| Attachment 10.3 | List of Permit Applications and Submittals to Other Agencies (copies to be provided to the New Jersey Board of Public Utilities) |
| Attachment 10.4 | List of Permits and Approvals Received (copies to be provided to the New Jersey Board of Public Utilities under separate cover) |

Attachment 10.1 – PJM Attachment N: Queue Availability



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Attachment 10.2 – Permit matrix

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Attachment 10.3 – List of submitted permit applications and submittals to other agencies

(copies to be provided to the New Jersey Board of Public Utilities)

Attachment 10.3 – List of Permit Applications and Submittals to Other Agencies

Agency	Submittal Name	Submitted
BOEM	Ocean Wind Offshore Wind Farm Project – Site Assessment Plan	Last revised Feb. 23, 2018
BOEM	Oil Spill Response Measures in support of Site Assessment Activities for the Ocean Wind Lease Area	Dec. 19, 2017
BOEM	High Resolution Geophysical and Geotechnical Survey Plan, Phase 1: HRG 1a ECR Survey Plan	Nov. 18
BOEM, Office of Renewable Energy Programs,	FLiDAR Deployment confirmation	
BOEM	High Resolution Geophysical and Geotechnical Survey Plan (Recoannaisance)	Last revised Nov. 2018
BOEM	High Resolution Geophysical and Geotechnical Survey Plan	May 2018
NMFS	Request for the Taking of Marine Mammals Incidental to the Site Characterization of the Ocean Wind Offshore wind Farm Lease Area (OCS-A-0498)	Apr. 10, 2018

Attachment 10.4 – List of permits and approvals received

(copies to be provided to the New Jersey Board of Public Utilities)

Attachment 10.4 – List of Permits and Approvals Received

Agency	Submittal Name	Submitted	Issued
Department of Homeland Security, U.S. Coast Guard	Private Aids to Navigation Application	Oct. 11, 2017	Jun. 7, 2018

Attachment 10.5 – Acquisition of real property rights



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SECTION 11

(including attachments)

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12 OREC Pricing Method and Schedule

OREC pricing method and schedule – Summary

Core message

Ocean Wind's highest priority is to deliver New Jersey's first offshore wind farm successfully – without the delays or controversy that have plagued other American offshore wind projects – at the best value to the State and its ratepayers. Ocean Wind appreciates the historic significance of New Jersey's OREC program and is conscious of the need to earn public trust in the fairness of the transaction between the State and its offshore wind partners. Accordingly, Ocean Wind is committed to a transparent discussion with the State about the costs and risks of developing a large-scale offshore wind project and an enduring supply chain to support it and future projects. Ocean Wind is confident that with the right investments in this first solicitation, New Jersey can position itself to receive not only America's most cost-effective offshore wind power, but also the most economic development from this high-growth industry.

OREC pricing method and schedule – Checklist

The information required under **N.J.A.C. 14:8-6.5** is cross-referenced to the associated document sections in the checklist below.

Checklist Item	Document Reference
Provide a proposed OREC pricing method and schedule for the Board to consider. N.J.A.C. 14:8-6.5(12).	Attachment 18.1
Payment will not occur until electricity is produced by a qualified offshore wind project. N.J.A.C. 14:8-6.5(12)(ii).	Section 12.4
Include a total price that reflects capacity, energy and other elements of generation. N.J.A.C. 14:8-6.5(12)(iii).	Section 12.3
OREC pricing will be on a pay for performance basis, with payments to be on a \$/MWh basis, subject to any quantity caps, with the offshore wind developer responsible for any cost overruns. Ratepayers will not be responsible for any cost overruns and for costs associated with non-performance. N.J.A.C. 14:8-6.5(12)(iv).	Section 12.4
The pricing proposal satisfies the cost-benefit standards set forth in the statute and the Board's regulations; the Board may approve the application subject to the application satisfying other required conditions. N.J.A.C. 14:8-6.5(12)(v).	Section 12.5
The Board may conditionally approve an application at a lower OREC price if that OREC price would allow an applicant to satisfy the cost-benefit standards. The applicant may then accept or reject the lower OREC price. N.J.A.C. 14:8-6.5(12)(vi).	Section 12.5

Checklist Item	Document Reference
<p>Describe the OREC pricing method that represents the calculation of the price based on the total revenue requirements of the project over a 20-year period including the cost of equipment, financing, taxes, construction, operation, and maintenance, offset by any state or Federal tax or production credits and other subsidies or grants. The value of the electricity and related capacity payments associated with the ORECs shall not be deducted when calculating the OREC price. N.J.A.C. 14:8-6.5(12)(vii).</p>	<p>Section 12.2</p>
<p>Specify the following for the OREC pricing proposals: (1) Total equipment, construction, operation, and maintenance costs of the project; (2) Tax credits, subsidies, or grants the project will qualify for; (3) Debt service costs and return on equity assumptions; (4) Taxes and depreciation assumptions; (5) The nameplate capacity of the project; (6) The expected energy output of the project; (7) The assumed capacity factor and the number of ORECs to be produced by the project; and (8) The price per OREC (megawatt hours (MWh)) necessary to make the project commercially viable. N.J.A.C. 14:8-6.5(12)(viii).</p>	<p>Section 12.1, Section 3, Section 4, Section 5, Attachment 3.4, Attachment 3.5, & Attachment 18.1</p>
<p>The value of electric energy, capacity payments, and any other environmental attributes or other benefits shall be returned to ratepayers for the term of the OREC pricing method. To the extent that the project produces energy revenues exceeding those associated with the sale of ORECs, the applicant may propose that it retain up to 25 percent of the incremental energy revenues, but not any other environmental attributes or other benefits, with the remainder to be returned to ratepayers. The annual amount of revenues from whatever source expected to be generated by the project shall be reflected in the revenue plan. N.J.A.C. 14:8-6.5(12)(ix).</p>	<p>Section 12.5</p>
<p>Provide an OREC Price levelized for 20 years or escalated at a fixed rate over the 20 year period. Explain any differences between the OREC price and the LCOE. BPU Guidelines Subsection 3.12.</p>	<p>Section 3.5 & Attachment 18.1</p>
<p>Separated out both interconnection and system upgrade costs. BPU Guidelines Subsection 3.12.</p>	<p>Section 14 & Attachment 18.1</p>

OREC pricing method and schedule – Documentation

The Ocean Wind team brings unmatched experience and credibility to fully execute on New Jersey’s first offshore wind project, as detailed in Section 1. This section demonstrates Ocean Wind’s commitment to a transparent process that demonstrates how the offered pricing has been carefully crafted to provide both cost-effectiveness and equity to ratepayers, while at the same time supporting the underlying economic viability of the Project.

12.1 OREC pricing method

- N.J.A.C. 14:8-6.5(a)(12)(viii). OREC pricing proposals shall specify:*
- (1). Total equipment, construction, operation, and maintenance costs of the project;*
 - (2). Tax credits, subsidies, or grants the project will qualify for;*
 - (3). Debt service costs and return on equity assumptions;*
 - (4). Taxes and depreciation assumptions;*
 - (5). The nameplate capacity of the project;*
 - (6). The expected energy output of the project;*
 - (7). The assumed capacity factor and the number of ORECs to be produced by the project; and*
 - (8). The price per OREC (megawatt hours (MWh)) necessary to make the project commercially viable.*

[REDACTED]

1. The pricing method and schedule reflect the total equipment, construction, operation, and maintenance costs of the Project, which are outlined in Attachment 3.4 and 3.5.
2. The Project will qualify for [REDACTED] The tax credits, subsidies, and grants that the Project will aim to qualify for are outlined in Section 5.
3. [REDACTED]
4. [REDACTED]
5. Nameplate capacity of the Project is identified in Attachment 18.1.
6. Expected energy output of the Project is identified in Attachment 18.1.
7. Assumed capacity factor and the number of ORECs to be produced by the Project are identified in Attachment 18.1.
8. Price per OREC megawatt-hours necessary to make the Project commercially viable is identified in Attachment 18.1. [REDACTED]

[REDACTED]

12.2 OREC pricing schedule

N.J.A.C. 14:8-6.5(a)(12)(vii). The OREC pricing method shall represent the calculation of the price based on the total revenue requirements of the project over a 20-year period including the cost of equipment, financing, taxes, construction, operation, and maintenance, offset by any state or Federal tax or production credits and other subsidies or grants. The value of the electricity and related capacity payments associated with the ORECs shall not be deducted when calculating the OREC price.

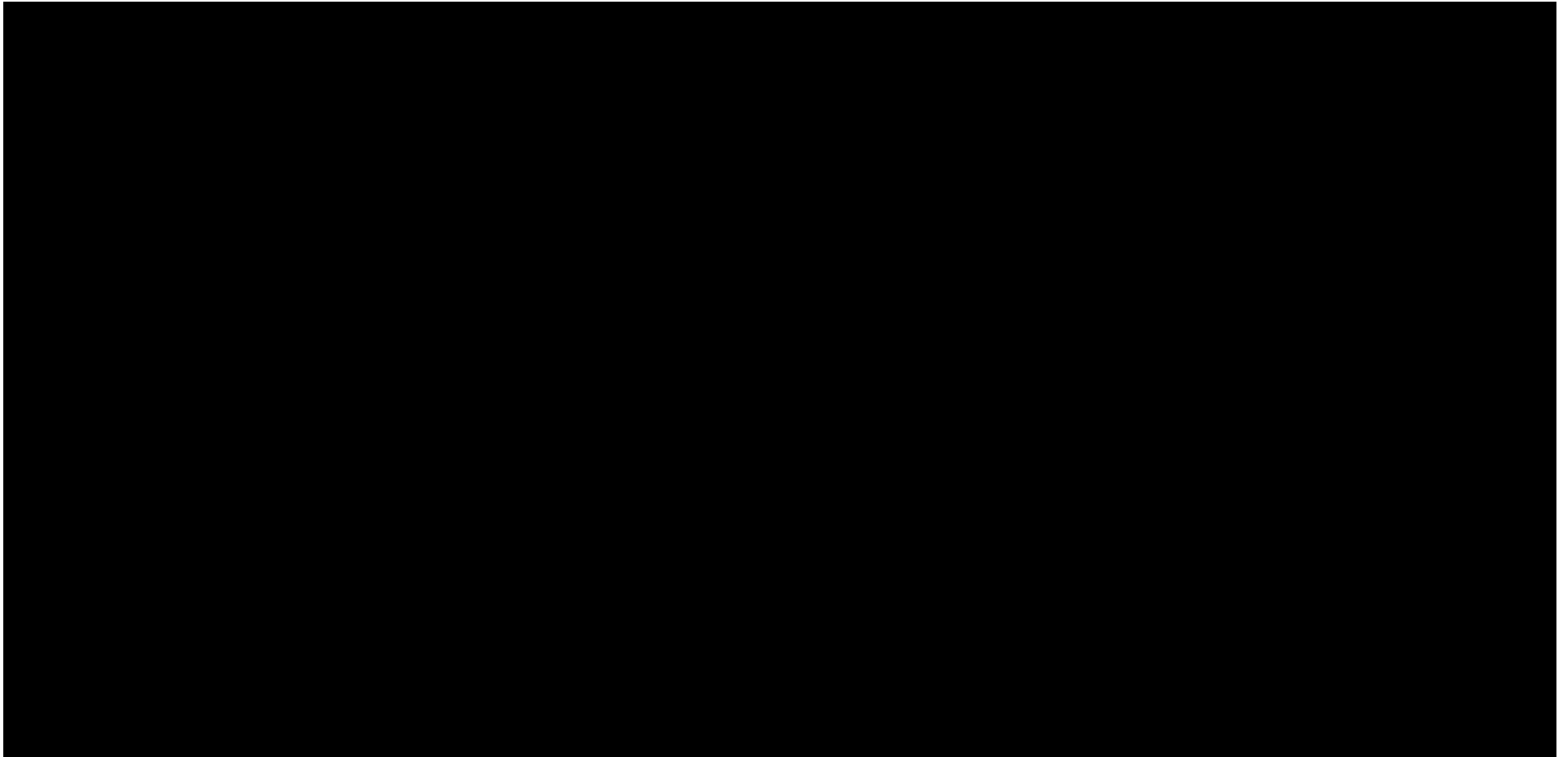
Ocean Wind has provided an OREC pricing schedule (Attachment 18.1) that represents the calculation of the OREC price per megawatt-hour each year during the 20-year OREC period based on the total revenue requirements of the Project over a 20-year period, including the cost of equipment, financing, taxes, construction, operation, and maintenance, offset by any Federal or State tax or production credits and other subsidies or grants. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Table 12-1. OREC pricing



12.3 OREC pricing

N.J.A.C. 14:8-6.5(a)(12)(iii). The burden remains on the applicant to propose a reasonable OREC price. The Board will then accept, modify or reject the proposed price of the OREC and the associated term. The Board requires a fixed, flat OREC price for the proposed term or a fixed price for every contract year. All proposals must include a total price that reflects capacity, energy and other elements of generation.

12.4 Payments

N.J.A.C. 14:8-6.5(a)(12)(ii). Payment will not occur until electricity is produced by a qualified offshore wind project.

(iv). OREC pricing will be on a pay for performance basis, with payments to be on a \$/MWh basis, subject to any quantity caps, with the offshore wind developer responsible for any cost overruns. Ratepayers will not be responsible for any cost overruns and for costs associated with non-performance.

See Attachment 18.1. Ocean Wind confirms its understanding that payment will not occur until electricity is produced by a qualified offshore wind project. [REDACTED]

N.J.A.C. 14:8-6.5(a)(12)(v). If the pricing proposal satisfies the cost-benefit standards set forth in the statute and the Board's regulations, the Board may approve the application subject to the application satisfying other required conditions.

(vi). The Board may conditionally approve an application at a lower OREC price if that OREC price would allow an applicant to satisfy the cost-benefit standards. The applicant may then accept or reject the lower OREC price.

This OREC application satisfies the cost-benefit standards as shown in Section 11.

12.5 Value of electric energy, capacity payments, and other benefits

N.J.A.C. 14:8-6.5(a)(12)(ix). The value of electric energy, capacity payments, and any other environmental attributes or other benefits shall be returned to ratepayers for the term of the OREC pricing method. Such other benefits include, but are not limited to, tax credits, subsidies, grants, or other funding not previously identified in the application and not included in the calculation of the OREC price submitted to the Board. To the extent that the project produces energy revenues exceeding those associated with the sale of ORECs, the applicant may propose that it retain up to 25 percent of the incremental energy revenues, but not any other environmental attributes or other benefits, with the remainder to be returned to ratepayers. The annual amount of revenues from whatever source expected to be generated by the project shall be reflected in the revenue plan.

The OREC pricing method represents the calculation of the price based on the total revenue requirements of the Project over a 20-year period, including the cost of equipment, financing,

taxes, construction, operation, and maintenance, offset by any Federal or State tax or production credits and other subsidies or grants.

[REDACTED]

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Attachment 13.1 – Project construction schedule

13 Life cycle project schedule

Life cycle project schedule – Summary

Core message

The proposed schedules for the development and construction of the Project are achievable, supported by Ørsted's history with planning and executing multiple large scale offshore wind projects. Leveraging Ørsted's experience through unique tools, Ocean Wind has planned for contingencies and unexpected events. Ørsted's ability to execute Projects as committed is supported by its history of offshore wind farms already developed, constructed and in current operation in Europe, with 3.4 GW of offshore wind farms currently under construction.

Life cycle project schedule – Checklist

The information required under N.J.A.C. 14:8-6.5 is cross referenced to the associated document sections in the checklist below.

Regulatory Requirement	Section #
Submit a timeline for the permitting, licensing and construction of the proposed offshore wind project. N.J.A.C. 14:8-6.5(a)(13).	Section 13.1
Specify the expected project time requirements in the aggregate from start to finish. N.J.A.C. 14:8-6.5(a)(13).	Section 13.2
Specify the time required to accomplish each specific activity for project design, resource monitoring, impact studies, permitting, construction, and decommissioning activities. N.J.A.C. 14:8-6.5(a)(13).	Section 13.3
Delineate milestones for each category of activity. N.J.A.C. 14:8-6.5(a)(13).	Section 13.4

Life cycle project schedule – Documentation

N.J.A.C. 14:8-6.5(a)(13) A timeline for the permitting, licensing and construction of the proposed offshore wind project. The proposal must specify the expected project time requirements in the aggregate from start to finish as well as the time required to accomplish each specific activity related to project design, resource monitoring, impact studies, permitting, construction, and decommissioning activities with associated milestones delineated for each category of activity;

Ørsted has significant experience building and operating offshore wind projects and has used this extensive knowledge to produce a realistic project life-cycle schedule for the Project from

initiation to the operation phase (Attachment 13.1). [REDACTED] timing of each phase and the critical path through the schedule are discussed below.

13.1 Timeline for permit acquisition

The timeline for permit acquisition is provided in Section 10 and is reflected in the overall project schedule discussed in the sections that follow.

13.2 Aggregate time requirements

Figure 13-1 provides an overview schedule with generalized timelines for each phase of project development. [REDACTED]



[REDACTED] This schedule ensures that there is sufficient time for design certification and fabrication of components.

13.3 Time requirements for major project activities

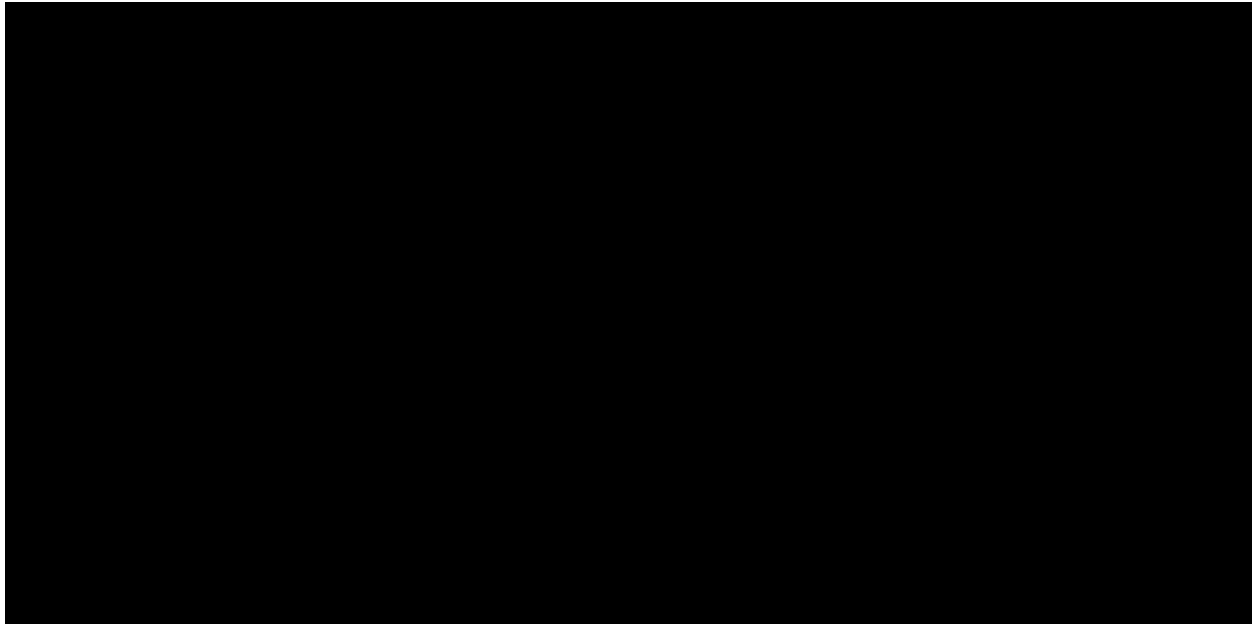
The following describes the key activities in the schedules for project design, resource monitoring, impact studies, permitting, construction, and decommissioning activities. The durations for each activity and for each of the bid cases are shown in Attachment 13-1.

- **Design.** Design activities are underway for each of the main packages of the Project. Design activities are expected to be complete within [REDACTED] months of the initiation of activities; which is approximately [REDACTED] months after submittal of the OREC application.
- **Resource Monitoring, Impact Studies and Permitting.** Ocean Wind is preparing the COP for the Project and holding regular meetings with BOEM and associated agencies to ensure all permits are in place in advance of construction activities. The COP is expected to be submitted [REDACTED]
- **Procurement.** [REDACTED]
- **Fabrication.** Fabrication of main components begins with the onshore part of the export cable and finish with the final WTG delivered at site ready for installation.
- **Construction.** Construction will begin upon receipt of the COP and other required regulatory approvals (approximately [REDACTED] months after the OREC application submittal). The sequence of construction activities is as follows:
- **Construction of the OnSS and OSS.** The OnSS will start the Project construction; OnSS construction will be complete with testing and energization, approximately [REDACTED] months after the start of construction. The installation of the OSS will start after the energizing of

the OnSS, followed by commissioning and energization. OSS installation and commissioning is expected to occur over [REDACTED] month period.

- [REDACTED]
[REDACTED]
[REDACTED]

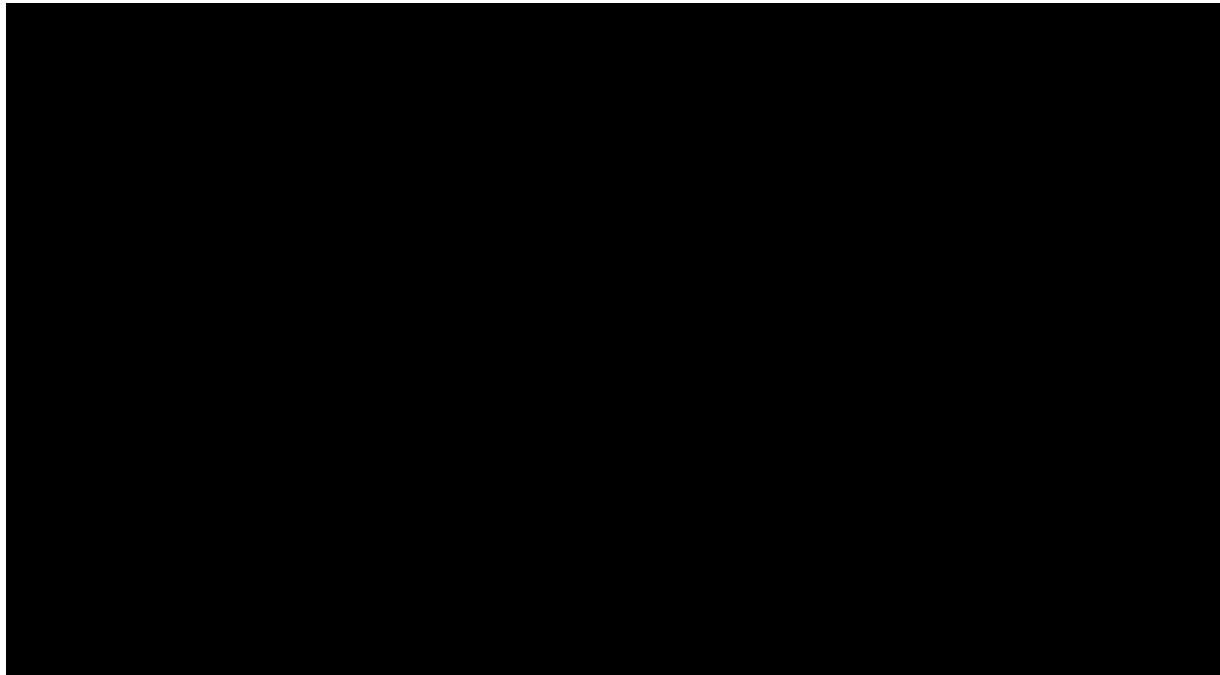
Figure 13-1. Project overview schedule [REDACTED]



[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

Table 13-1. Major tasks for deployment

Figure 13-2. Project Lifecycle schedule by Project phases.



13.4 Major milestones

The major milestones for each phase of the Project are listed in Table 13-2. A milestone schedule is provided in Figure 13-3 shows the Project plan with the main activities and milestones required to deliver the Project as planned. [REDACTED]

[REDACTED]

[REDACTED]

Table 13-2. Major milestones by phase

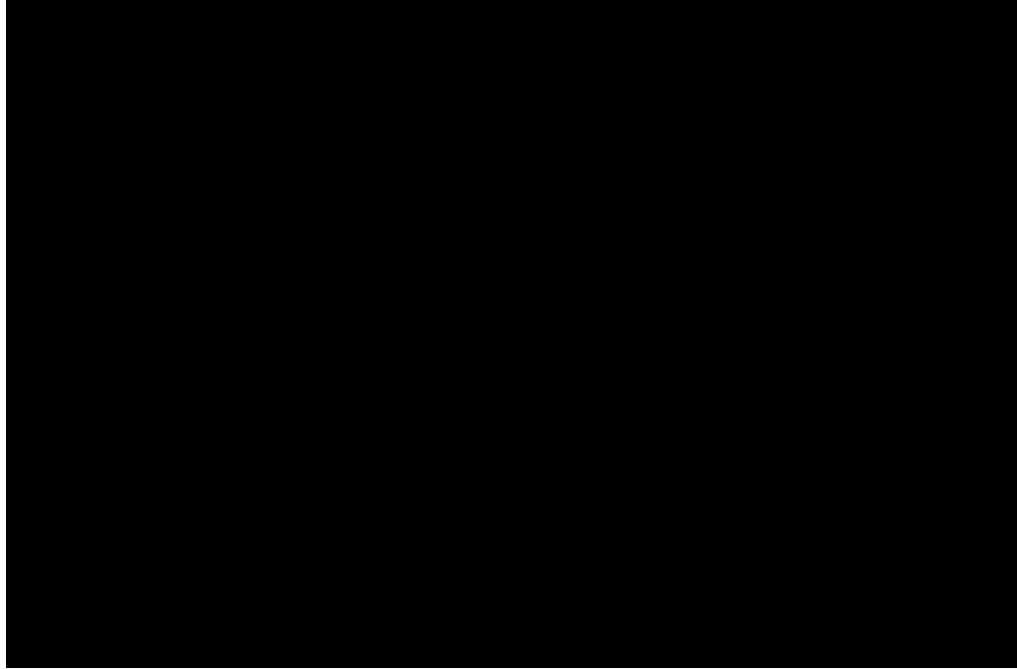
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Table 13-3. Key Milestone dates for the different bids

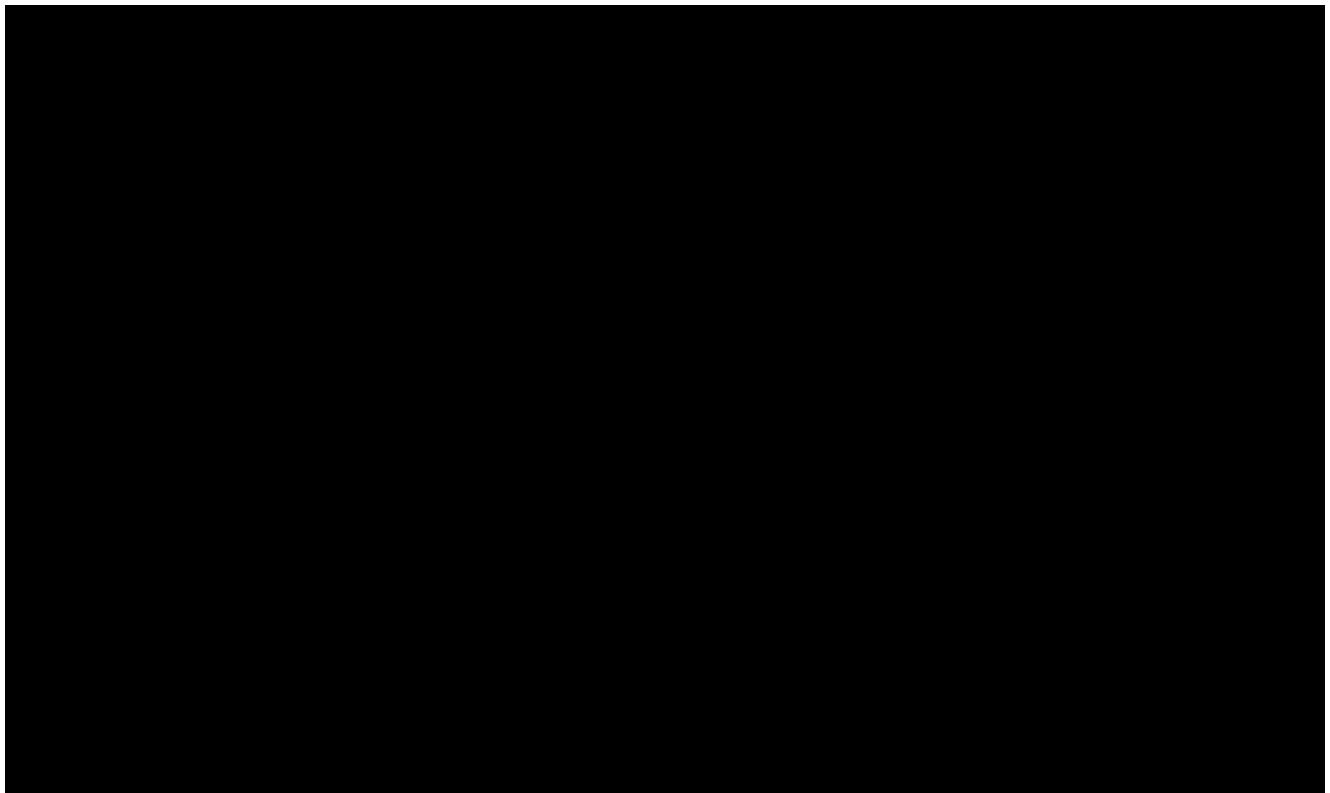
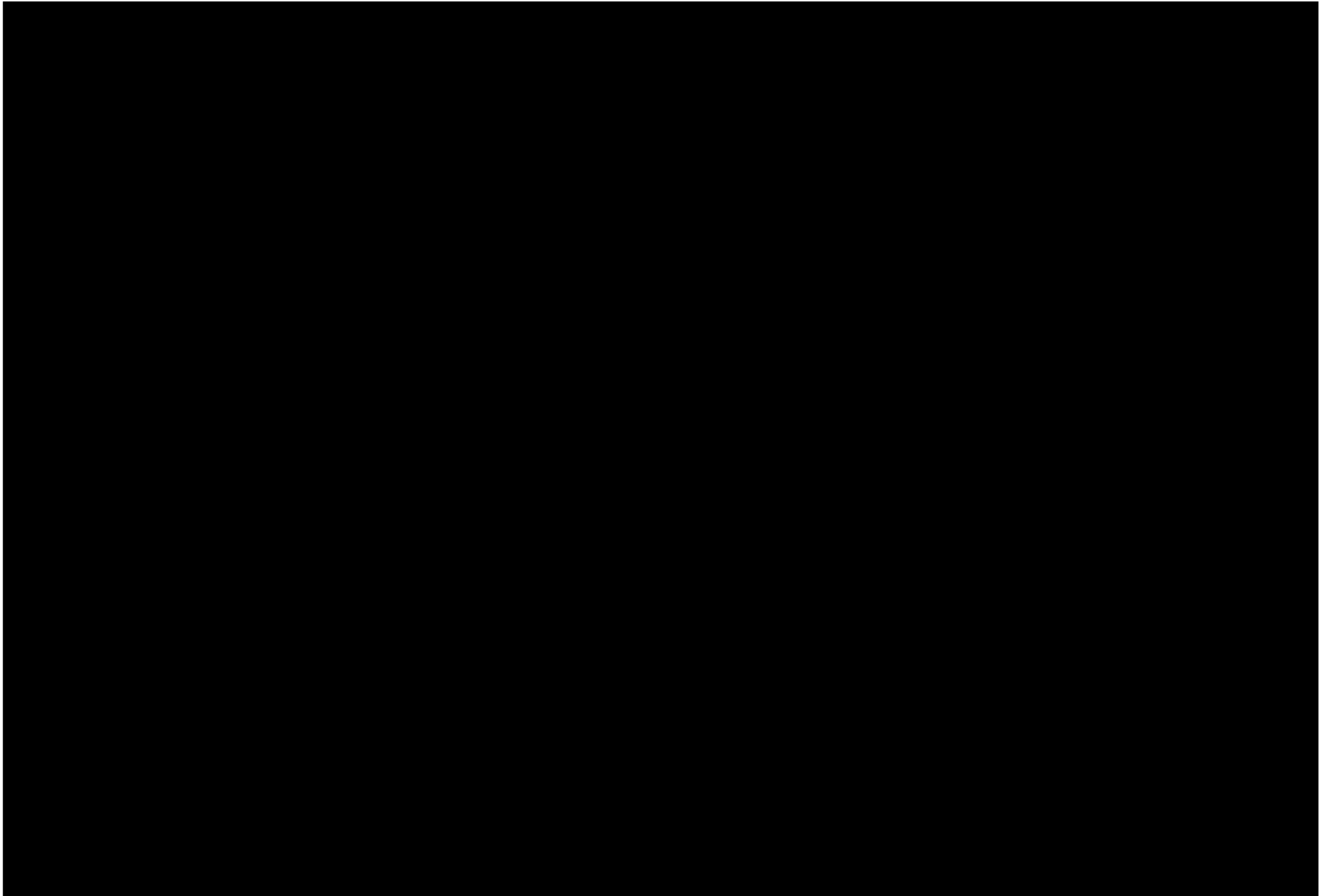
A large black rectangular redaction box covers the entire content of Table 13-3.

Figure 13-3. Major milestones and activities [REDACTED]



13.5 Schedule management

13.5.1 Planning and management tools to predict and track the construction campaign

While refining the construction campaign for the Project, Ocean Wind will utilize Ørsted’s vast experience from previous planned and executed projects. [REDACTED]

[REDACTED]

[REDACTED] A Monte Carlo analysis provides a P20,¹ P50 and P80 duration for the installation campaign.

These two tools, together with the experience of the project management team enables Ocean Wind to precisely estimate how long the installation campaign will take. The tools will also determine the most optimal time to launch and furthermore calculate what float is necessary between the construction scopes thereby ensuring a smooth campaign without either too much float or unnecessary downtime on construction vessels.

13.5.2 Schedule contingencies and float time

Offshore construction is a complex operation with many factors at play. Conditions on the site might require that the primary scopes - foundation, inter-array cables, and WTGs – not necessarily follow the same “typical” sequence. [REDACTED]

[REDACTED] to ensure that adequate flexibility remains in the schedule.

[REDACTED]

¹ P20; P50; P80 refer to the confidence level of the probability of the modelled duration not being exceeded. Looking across the last 37 years of recorded weather for the site, load out harbors etc., the modelled installation campaign would in 20 percent, 50 percent or 80 percent of the time be executed within the modelled period.

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Life cycle project schedule – Attachments

Attachment 13.1 – Project construction schedule

Attachment 13.1 – Project construction schedule

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Attachment 14.1 – [REDACTED]

Attachment 14.2 – [REDACTED]

Attachment 14.3 – [REDACTED]

14 Interconnection plan

Interconnection plan – Summary

Core message

Drawing on the extensive experience of both Ørsted and PSEG, Ocean Wind has developed a robust interconnection strategy that minimizes schedule risk and cost risk for New Jersey’s ratepayers. For each Project size offered, Ocean Wind has identified [REDACTED] points of interconnection. Additionally, Ocean Wind has filed [REDACTED] interconnection requests with PJM. For each potential point of interconnection, Ocean Wind has performed extensive analysis of potential transmission system upgrades required, in advance of any results from the PJM interconnection process. Additionally, Ocean Wind has carefully considered the complexities associated with cable landfall and onshore site control acquisition and permitting.

Interconnection plan – Checklist

The information required under N.J.A.C. 14:8-6.5 is cross referenced to the associated document sections in the checklist below.

Checklist Item	Document Reference
Document tasks required and discuss issues associated with electrical interconnection, including the distance between the project and a suitable point to interconnect with the electrical grid. Discuss each proposed point of interconnection. N.J.A.C. 14:8-6.5(a)(14)(i)	Section 14.1 and Section 14.2
Identify land acquisition requirements, new equipment to be installed, upgrades to existing equipment required, and any feasibility studies required and the time frame for review. N.J.A.C. 14:8-6.5(a)(14)(ii)	Section 14.6
Describe in detail how the proposed project will address and mitigate load constraints in the electric distribution and PJM transmission system for each site. N.J.A.C. 14:8-6.5(a)(14)(iii)	Section 14.4 & Attachment 14.3
Demonstrate to the greatest extent possible how the project will address current or potential future load pocket or constraint problems with the electric distribution system and the PJM transmission system. N.J.A.C. 14:8-6.5(a)(14)(iv)	Section 14.5
Indicate the location of transmission lines and all points of interconnection to the PJM system serving New Jersey. N.J.A.C. 14:8-6.5(a)(14)(v)	Section 14.2
Provide information to the Board for costs associated with network upgrades that flow from the project even if not directly caused by the interconnection. N.J.A.C. 14:8-6.5(a)(14)(vi) .	Section 14.7, Attachment 14.1 & Attachment 14.2

Interconnection plan – Documentation

N.J.A.C. 14:8-6.5(a)(14) A plan for interconnection, including engineering specifications and costs.

The following provides a detailed discussion regarding the plan for interconnection, including engineering specifications and costs.

14.1 Issues associated with electrical interconnection

N.J.A.C. 14:8-6.5(a)(14)(i) Applicants shall document tasks required and discuss issues associated with electrical interconnection, including the distance between the project and a suitable point to interconnect with the electrical grid. Each proposed point of interconnection shall be discussed.

The interconnection of a utility-scale offshore wind farm at any place in the United States faces at least two principle sources of risk and uncertainty:

- 1) Schedule risk associated with obtaining the required landfall, onshore site control and permits necessary for the Project’s export cable and OnSS.
- 2) Uncertainty associated with the costs of upgrading the onshore transmission system to accommodate the injection of the Project’s output.

Building upon Ørsted’s two-decades of offshore wind grid integration, as well as PSEG’s century of experience building transmission in New Jersey, Ocean Wind is implementing an interconnection plan that mitigates both of these sources of risk and uncertainty. The principles of this plan are:

- **Pursue Multiple Alternatives.** Ocean Wind has identified and is pursuing [REDACTED] POIs for [REDACTED] as detailed in Table 14-1. The distance between the Project and each POI is provided in Section 2. This approach mitigates the risk of on-shore site control and permitting, as well as the uncertainty of upgrade costs. The Project’s final POI will be definitively established only after the receipt of the following: (a) a fully-approved, un-appealable, mutually-acceptable OREC Order specifying a particular Project site; (b) all required site control for the cable landfall and all on-shore portions of the Project’s export and interconnection facilities; (c) all the required Project permits, detailed in Section 10; and (d) actual upgrade costs [REDACTED]

Table 14-1. Planned points of interconnection and alternate [REDACTED]

	230kV	230kV	230kV
--	-------	-------	-------

- **Use the PJM Process to Determine Upgrade Costs.** Ocean Wind identified the potential alternative points of interconnection based on extensive analysis of the New Jersey transmission system performed by independent experts and detailed in Section 14.7 and Section 14.2. As a first step in determining the actual cost of upgrades, Ocean Wind has filed interconnection with PJM, as detailed in Table 14-2 and Section 14.2.

[REDACTED]

Table 14-2. PJM Interconnection requests.

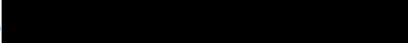
[REDACTED]

[REDACTED]

- **Provide Transparency with a Cost Pass-Through for Interconnection Costs.** [REDACTED]

[REDACTED] As detailed in Section 14.7, this is considered to be a reasonable estimate, given the analysis prepared by [REDACTED]. However, as also detailed in the same section, [REDACTED]



14.2 Location of transmission lines and potential 

N.J.A.C. 14:8-6.5(a)(14)(i) Applicants shall document tasks required and discuss issues associated with electrical interconnection, including the distance between the project and a suitable point to interconnect with the electrical grid. Each proposed point of interconnection shall be discussed. (v). The applicant shall indicate the location of transmission lines and all points of interconnection to the PJM system serving New Jersey.


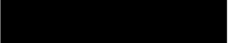
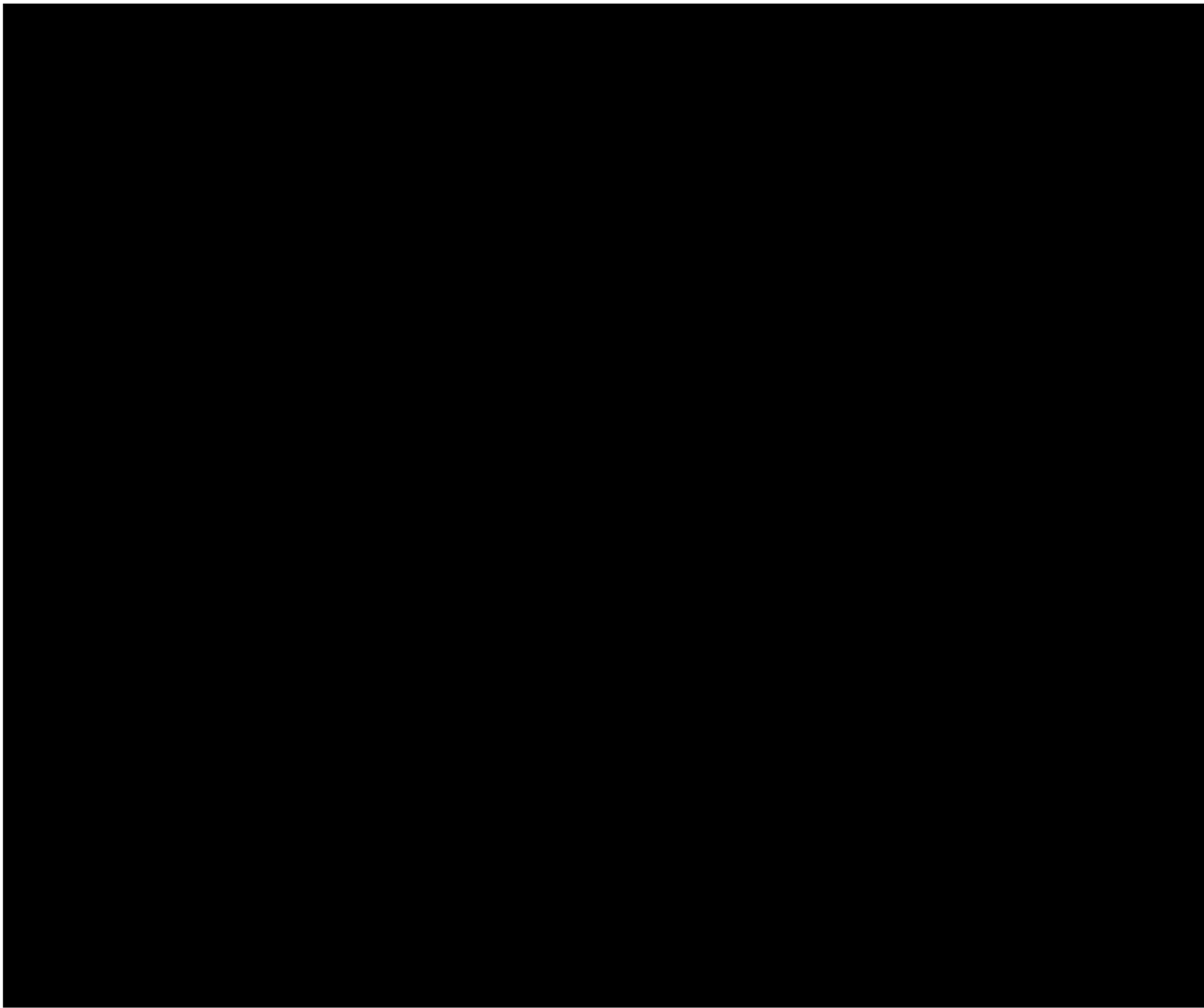
The Project has identified  of interconnection for  offered, as shown in Figure 14-1 and discussed in the following sections.

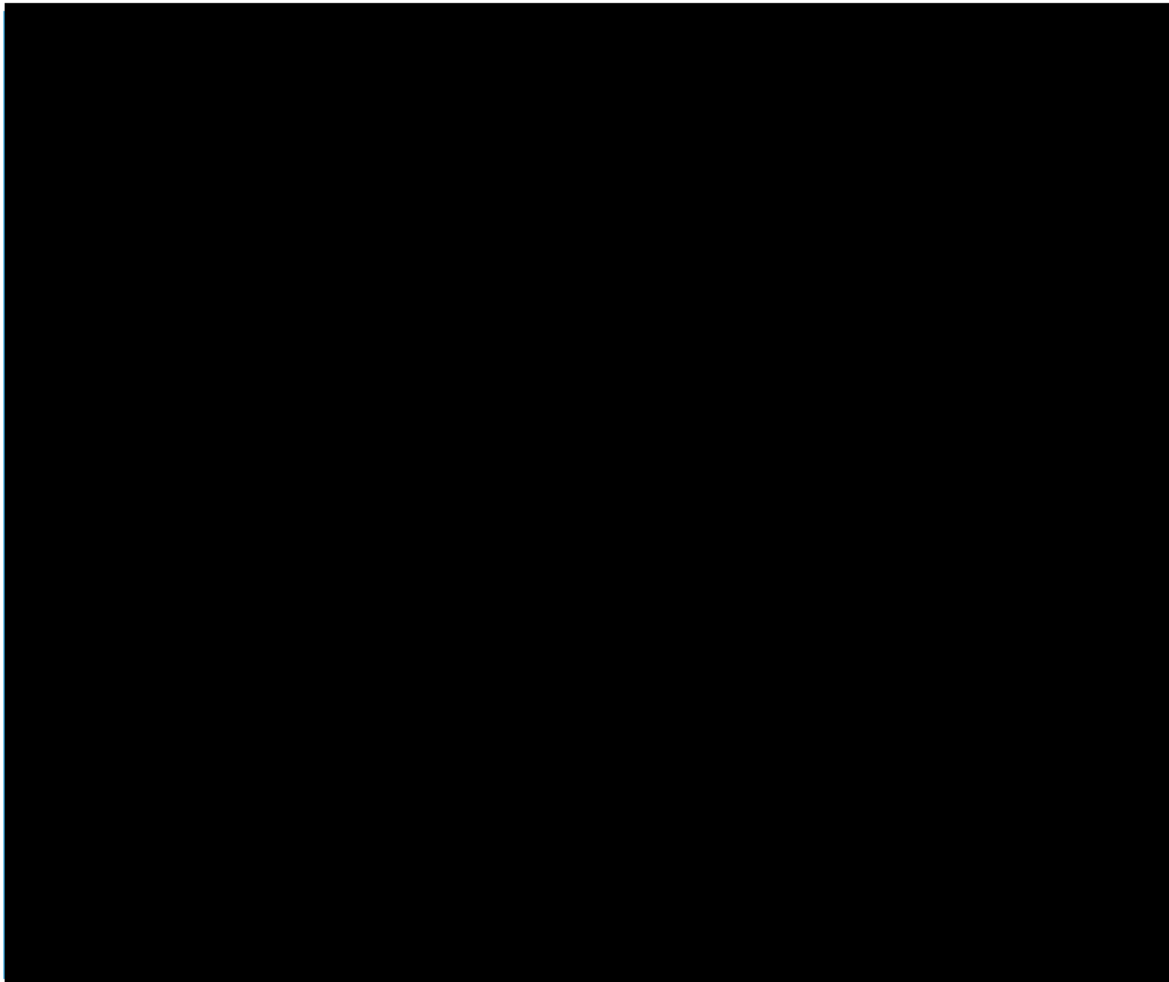
Figure 14-1. 



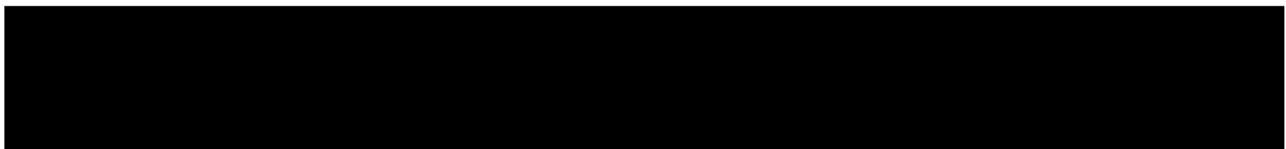
14.2.1 [REDACTED]



Figure 14-2. [REDACTED]



14.2.2 [REDACTED]



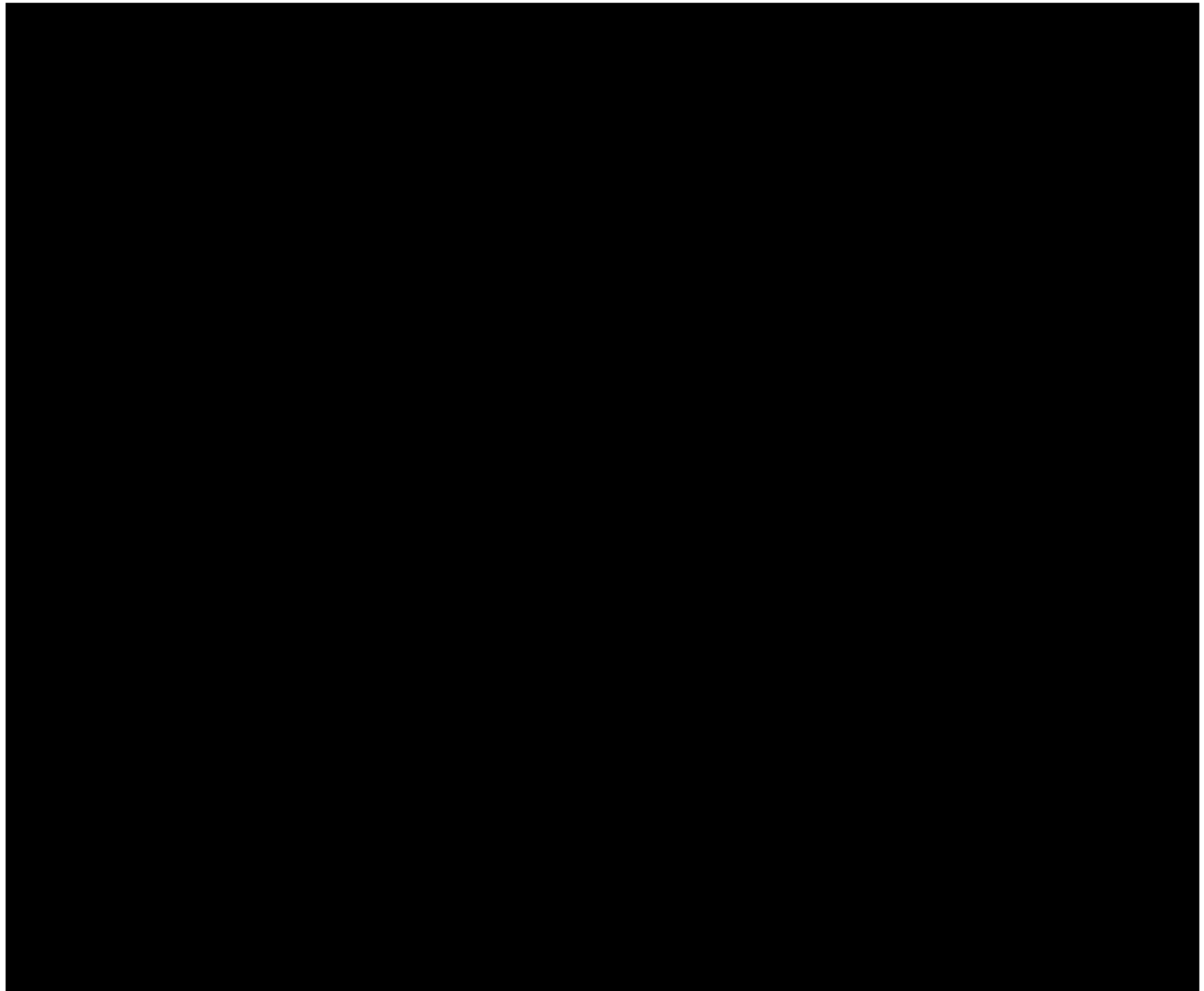
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14.2.3

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Figure 14-3.

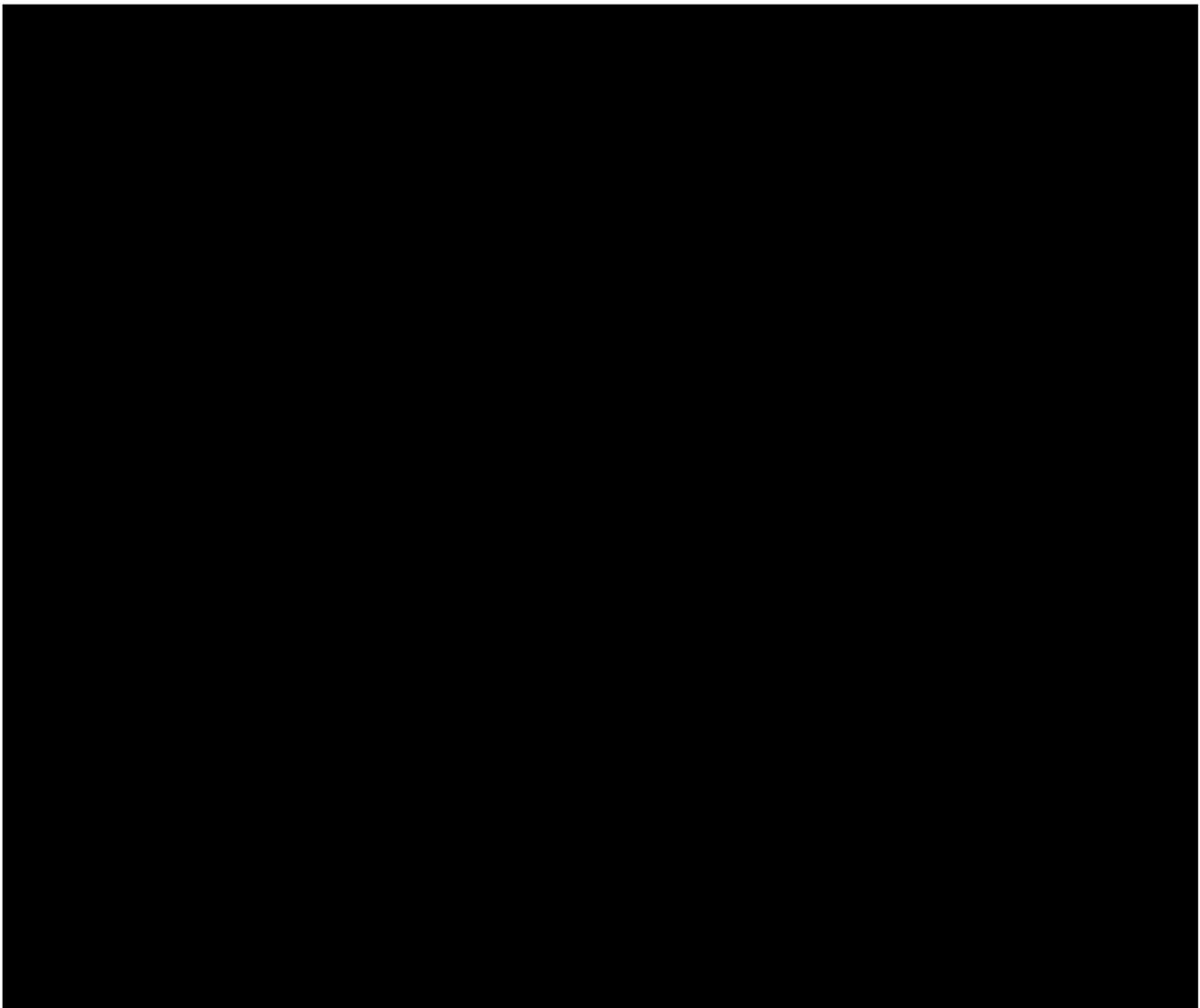
[REDACTED]



14.2.4



Figure 14-4.



14.2.5

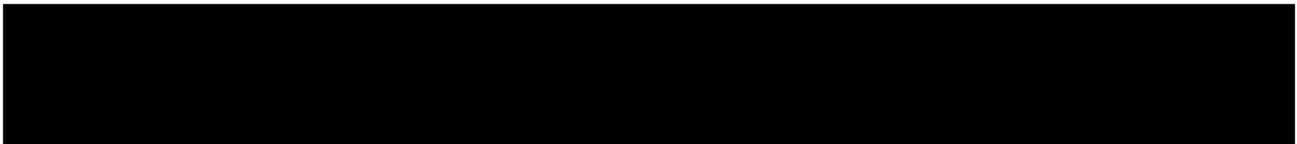
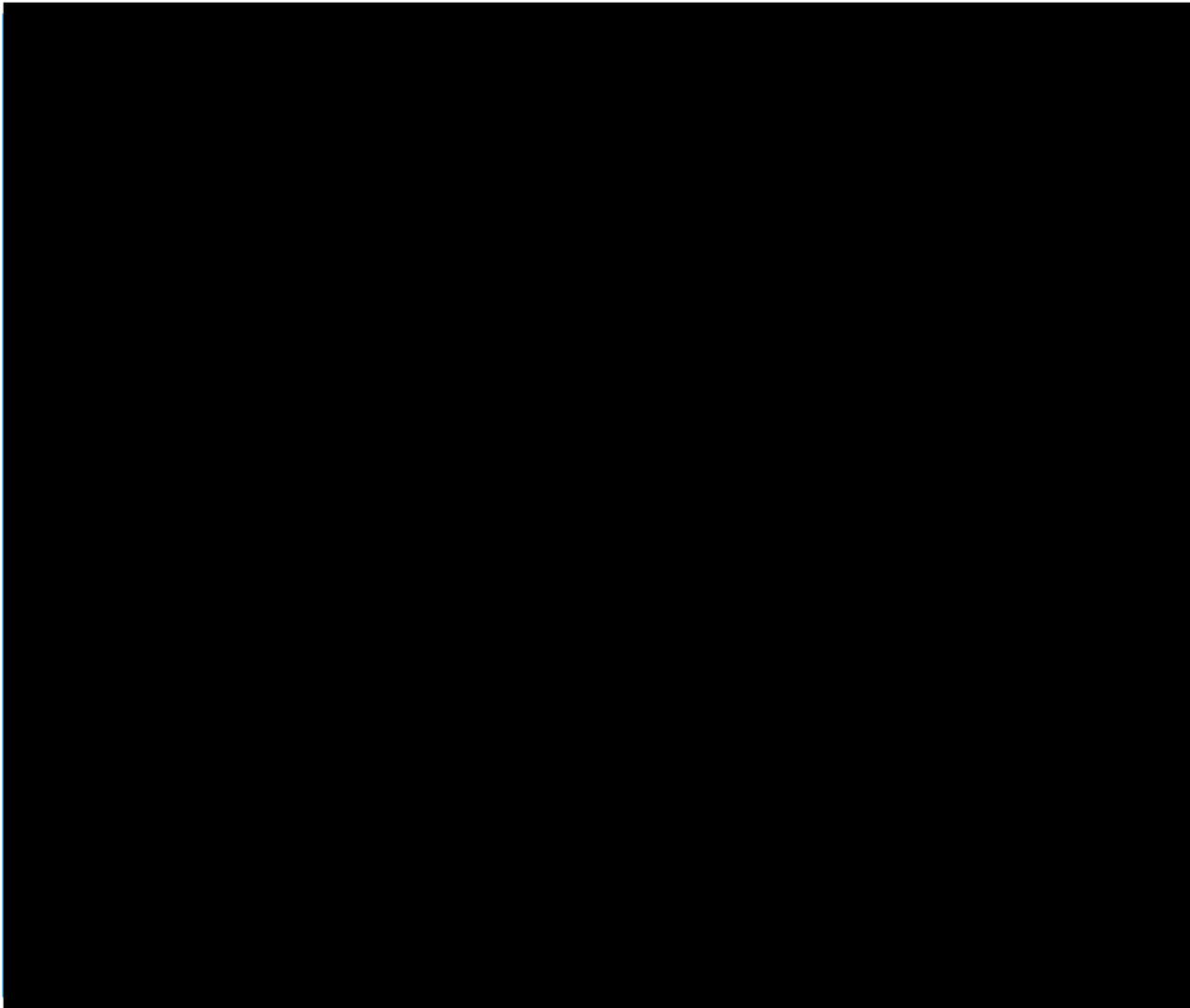




Figure 14-5. [Redacted]



14.2.6 [Redacted]

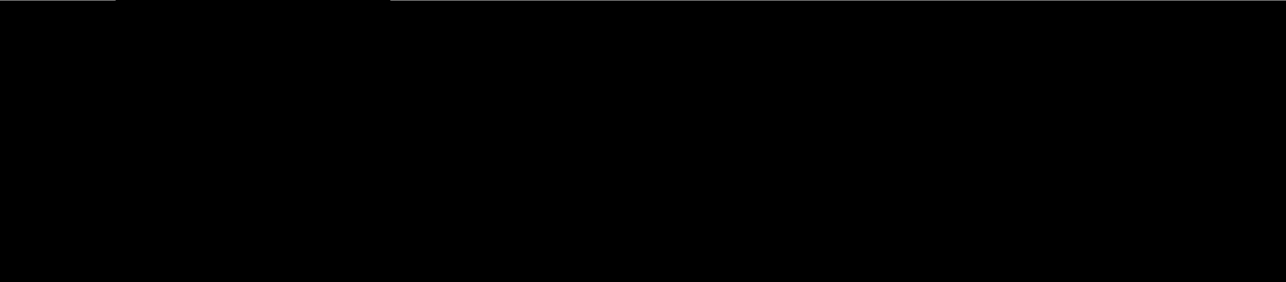
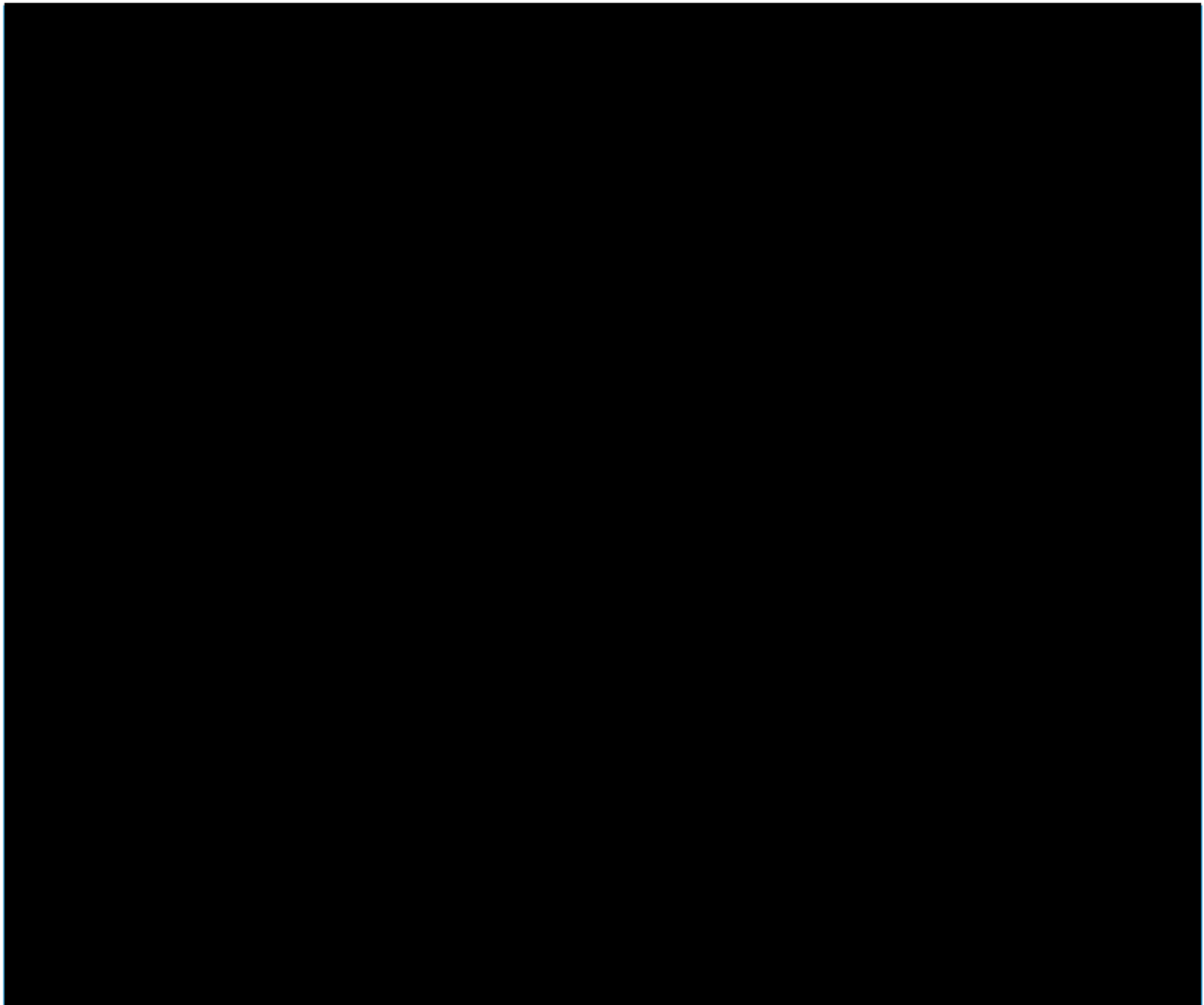


Figure 14-6.

[REDACTED]



14.2.7

[REDACTED]

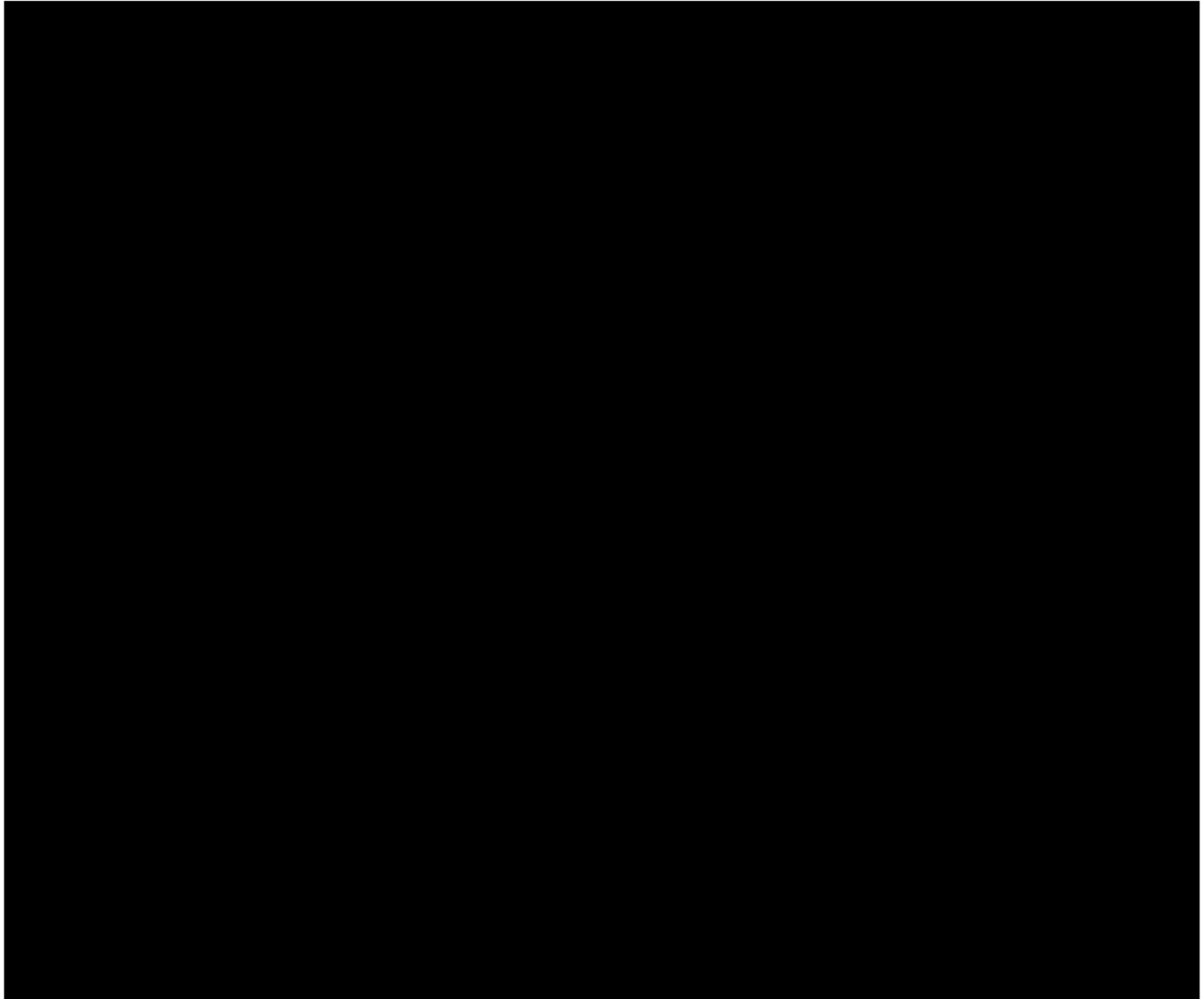
[REDACTED]

14.2.8

[REDACTED]

[REDACTED]

Figure 14-7. [REDACTED]



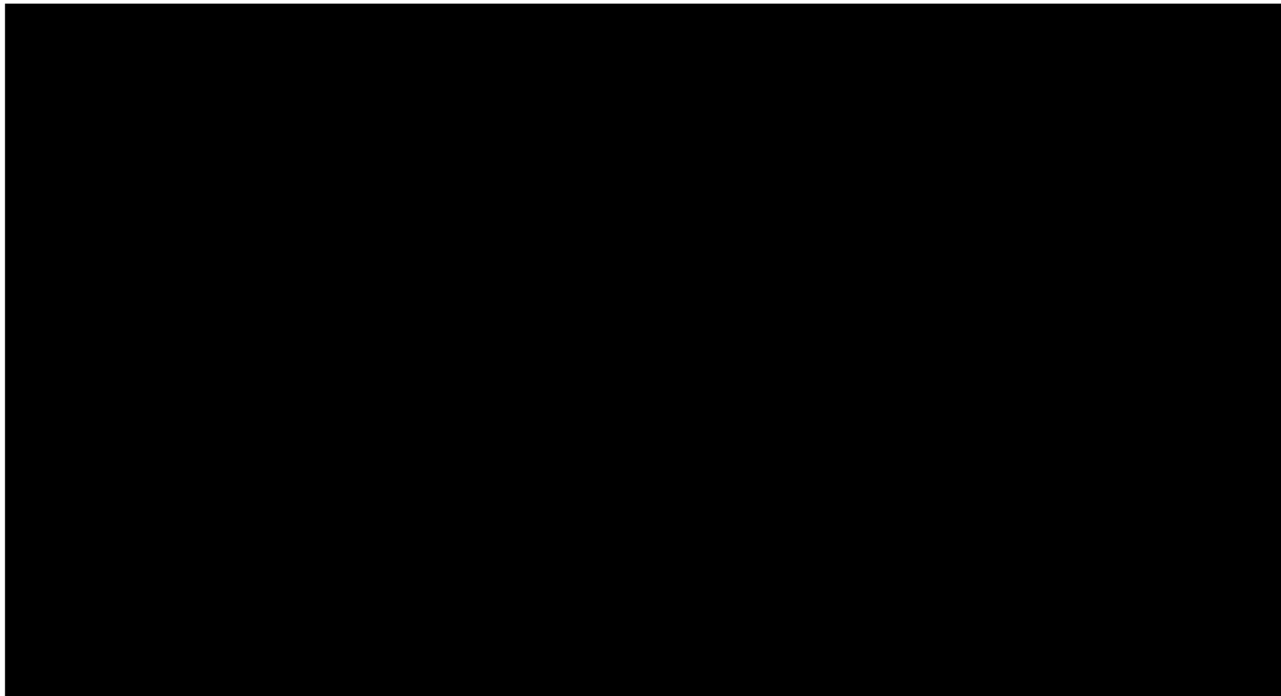
14.2.9 [REDACTED]

[REDACTED]

14.3 List of tasks and schedule associated with electrical interconnection

The interconnection [REDACTED] described in Table 14-2 [REDACTED]. The overall interconnection process with PJM takes [REDACTED]. The PJM timeline is shown in Figure 14-8. At the time of this application submission, [REDACTED] interconnection requests are in the feasibility study stage with results from PJM [REDACTED].

Figure 14-8. PJM Interconnection timeline [REDACTED]



The PJM feasibility study will assess the Project's impact on the onshore transmission system in terms of thermal impact on onshore transmission lines and short circuit impact on the onshore system. PJM will identify any upgrades necessary to mitigate any overloads found. PJM models all active projects on the system, and also models all prior queued projects with a 53% commercial probability.

Upon completion of the Feasibility Study, Ocean Wind will execute a System Impact Study Agreement with PJM [REDACTED] and may elect to modify the current interconnection requests prior to the commencement of the System Impact Study. The System Impact Study is a more detailed assessment of the Project's impact onto the onshore grid. As well as assessing for circuit overloads and short circuit impact, PJM will undertake a stability analysis. PJM will perform cost allocation for any upgrades identified in the System Impact Study with other projects in the interconnection queue. [REDACTED]

Upon completion of the System Impact Study, Ocean Wind will enter into a Facilities Study Agreement with PJM. The Facilities Study phase is when more detailed engineering is performed

on the grid upgrades identified in the System Impact Study phase. [REDACTED]
[REDACTED]

Following the facilities study, Ocean Wind will negotiate and execute an Interconnection Services Agreement (ISA) with PJM and the affected transmission company. The ISA is the agreement which will ultimately allow the Project to connect to the onshore grid. [REDACTED]
[REDACTED] queue shown in Table 14-1.
[REDACTED]
[REDACTED]

As described above, the PJM interconnection process will identify grid upgrades required in the Feasibility study in [REDACTED]. More accurate details of the grid upgrades will be established by PJM [REDACTED] and the upgrades will be assessed further in the Facilities Study, [REDACTED]
[REDACTED]. In order to get a better understanding of the grid upgrades required, Ocean Wind has hired third party consultants to perform studies according to the PJM process to assess any onshore grid upgrades.

14.4 Mitigation of load constraints

N.J.A.C. 14:8-6.5(a)(14)(iii). A detailed description of how the proposed project will address and mitigate load constraints in the electric distribution and PJM transmission system must be included for each site.

By delivering clean energy generating capacity into the New Jersey electrical system, the Project will help moderate system peak load requirements [REDACTED]. In addition, Ørsted’s proprietary site layout optimization tools will enable Ocean Wind to minimize the shadowing effect between the WTGs (wake losses) and maximize the wind climate usage.

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]

14.5 Current and future transmission system operation and reliability

N.J.A.C. 14:8-6.5(a)(14)(iv). The proposal must demonstrate to the greatest extent possible how the project will address current or potential future load pocket or constraint problems with the electric distribution system and the PJM transmission system.

14.5.1 New Equipment to be installed

A one-line diagram for the Design Basis transmission system is provided as Figure 14-9. In the diagram, WTCs are abstracted and do not appear, and the diagram is oriented with the array system at the bottom and grid interconnect at the top.

In the Design Basis, the proposed Project will consist of the following major components:

- **Wind Farm Array System and WTCs** – [REDACTED]. The individual WTC size and total number of WTCs may change in order to optimize Project cost and performance. Each WTC will be equipped with its own dedicated [REDACTED] generator step-up transformer. These transformers have a no-load tap changer. Refer to Section 2 for further information on the WTCs. The individual WTCs and their generator step-up transformers will be connected to a [REDACTED] submarine array cable network, which will terminate at an OSS. Section 2 provides further information on the array cables.
- **OSS** – The OSS contains the transformers and switchgear required to connect the array cables and transform the voltage up to transmission voltage for export to shore. [REDACTED]
[REDACTED]
[REDACTED]
- **Export Circuits** – The export circuits will connect the OSS to a new OnSS built near the onshore Point of Interconnection. Each export circuit will consist of a submarine cable portion and an underground cable portion (the length will depend on routing). [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
- **OnSS** – A new onshore substation will be constructed to terminate the export circuits from the OSS. Further information on the OnSS can be found in Section 2.
- **POI Substation Upgrades** – The upgrades of the existing onshore substations will be provided by PJM upon completion of the Feasibility Study (see Section 14.2).
- **Upgrades to the Existing Onshore Transmission System** – Upgrades required for the onshore connection points are discussed in Section 14.5.2

Figure 14-9. Design Basis one line diagram.



14.5.2 Upgrades required to current transmission system

The upgrades required to interconnect the Ocean Wind Project with the New Jersey transmission system [REDACTED] To determine the range of possible upgrades and associated costs, Ocean Wind retained [REDACTED] to prepare independent assessments. The [REDACTED] attached as Attachment 14-1, assessed the other projects in the PJM queue and accounted for expected generation retirements. [REDACTED]

[REDACTED] details the proposal for managing such uncertainty equitably and transparently.

14.5.3 Future benefits for transmission system

The Project is expected to improve the reliability and efficiency of the transmission system in New Jersey as summarized in Table 14-3 and the following sections.

Table 14-3. Benefits to the PJM system of the Ocean Wind Project.

Capability	System Stability	System Balancing	Network Optimization
Sub-second speed of frequency response	✓	✓	
Fast ramp-down/de-load	✓	✓	
Fast ramp-up at all operating ranges	✓	✓	
Automated response in system events	✓	✓	✓
Real-time "available power estimation"	✓	✓	

14.5.3.1 Enhancing Electricity Reliability

The scale of the Project will help effectively [REDACTED] and increase the diversity of New Jersey's energy mix, thereby making it more reliable and resilient. Indeed, some of the Project's key reliability benefits stem from the fact that the nameplate capacity is spread across a large number of wind turbines, each of which act as an independent power plant. As such, even if one of these power plants fail, the remaining wind turbines will continue to produce power. This reliability strength is amplified by Ørsted's unparalleled O&M experience, which will enable Ocean Wind to maintain availability of the Project at a rate well above industry average. Among other measures, the Project will include multiple circuits from offshore to onshore which minimizes the risk of loss of generation and provides a greater degree of redundancy of the Project for PJM.

14.5.3.2 Project benefits to the Capacity Market (RPM)

PJM operates a Capacity Market called the Reliability Pricing Model (RPM). To participate in the RPM wind generators must request Capacity MW from PJM as part of the interconnection process. PJM will perform a resource adequacy assessment for the Project according the PJM Manual 21. The resource adequacy is performed for the months of June to August for hours ending in 2pm to 6pm, when the electrical system sees highest demand. The Project supplied wind speed measurements to PJM for this analysis. [REDACTED]

[REDACTED] This capacity from the Project will diversify the energy mix available in the RPM, thereby increasing reliability in the PJM system over the life of the asset. [REDACTED]

[REDACTED]. Refer to Section 6 for further details on the Capacity Market.

14.5.3.3 Project Benefits to the Ancillary Service Market

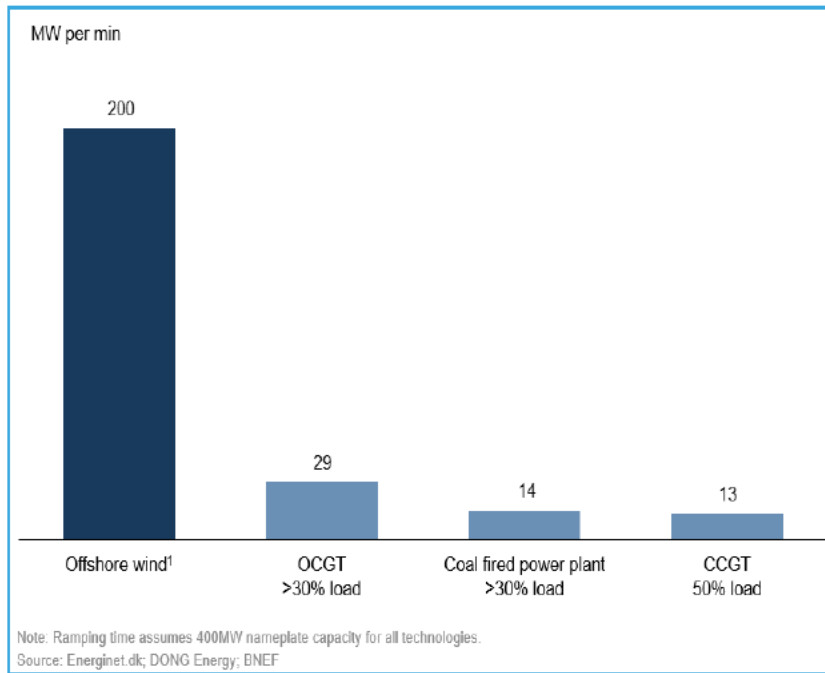
The Project will deploy control systems [REDACTED]

This significantly improves the voltage stability of the grid system.

14.5.3.4 Project’s Operating Flexibility Benefits for PJM

The Project will be capable of automatically change its power output in response to a “regulation” signal from PJM: either able to rapidly ramp down from maximum output and operate at a lower level (anywhere down to zero output) or, if requested by PJM to operate at an intermediate output level ahead of time, able to rapidly ramp up and operate at a higher level (anywhere up to maximum output). This capability will provide PJM with the generation output flexibility control and ensure the security of supply during periods of varying renewable production or when generation suddenly “trips” off the system). The Project is able to change its output far faster than conventional generation in response to a regulation signal thereby stabilizing the system more quickly and thereby reducing the overall volume of generation that is required to provide regulation (i.e., a 1-MW fast response can have the equivalent impact of a 1.5-MW slow response). By utilizing this proven capability from the Project, PJM will have access to a more flexible resource and can further optimize its requirement for regulation (see Figure 14-10).

Figure 14-10. Up and downwards regulation of production.



Note: At wind speeds of 8 m/s and above.

14.6 Land acquisition requirements

N.J.A.C. 14:8-6.5(a)(14)(ii). Land acquisition requirements, new equipment to be installed, upgrades to existing equipment required, and any feasibility studies required and the time frame for review must be identified.

The requirements for onshore site control depend upon, and in some cases will dictate, the final point of interconnection selected.

As a matter of general principle, Ocean Wind prefers to build project assets where people want them; and to avoid building project assets where people don't want them.

This strategic flexibility allows Ocean

Wind to minimize schedule risks and the uncertainty associated with upgrade costs.

14.6.1 Nature of onshore land requirements

14.6.1.1 Cable landfall

The offshore cables will come ashore at a beach or other sea-land interface (the "Landfall") to be confirmed. At the Landfall, the Project will require an easement or comparable right that will must provide sufficient space for construction, installation, operations and maintenance of a

buried conduit under the beach or sea-land interface as well as a buried cable splicing vault or Transition Joint Bay (TJB).

14.6.1.2 OnSS

Ocean Wind will require site control necessary to construct, install, operate and maintain an OnSS in close proximity to its POI.

14.6.1.3 Terrestrial cable route

The onshore portion of the export cable will run from the TJB to the OnSS, using existing infrastructure where possible, such as roads. [REDACTED]

[REDACTED]

14.6.2 [REDACTED]

[REDACTED]

14.6.3 Plan for completing onshore land acquisition

Ocean Wind is evaluating the feasibility of potential cable landfall locations in parallel with the evaluation of potential [REDACTED] of interconnection. As design is refined and final routes and facilities are selected during the interconnection and permitting processes, Ocean Wind will undertake the following steps [REDACTED]

- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]

[REDACTED]

14.7 Costs associated with upgrades

N.J.A.C. 14:8-6.5(a)(14)(vi). Applicants shall provide information to the Board for costs associated with network upgrades that flow from the project even if not directly caused by the interconnection.

Ocean Wind is committed to delivering this Project on-schedule and at the best value for the State of New Jersey. As detailed in Section 14.5.2, [REDACTED]). While [REDACTED]

- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]

Table 14-4. Example calculation of monthly interconnection payment

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]



Interconnection plan - Attachments

Attachment 14.1 – [REDACTED]

Attachment 14.2 – [REDACTED]

Attachment 14.3 – [REDACTED]

Attachment 14.1 – [REDACTED]

REDACTED FROM PUBLIC COPY

Attachment 14.2 – [REDACTED]

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Attachment 14.3 –



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15 Environmental Protection Plan

Environmental Protection Plan – Summary

Core message

Protecting New Jersey’s environment and valuable coastal economies is a priority in the planning and execution of the Ocean Wind project. Ørsted has unmatched experience working with agencies and stakeholders to develop its projects with the highest degree of environmental responsibility, based on its successful permitting of the operating Block Island Wind Farm and its on-going work on the fully-contracted South Fork, Skipjack, Revolution Wind and Coastal Virginia offshore wind energy projects. Similarly, PSEG has over a century of experience as a local energy company serving as a steward of New Jersey’s natural resources. Ocean Wind’s environmental protection plan builds on this unmatched collective experience. As part of this plan, Ocean Wind has committed to:

- Optimize the turbine layout utilizing eastern edge of lease area to minimize visual impact to local communities of New Jersey
- Operate the Project at the highest levels of availability of maximize improvements in New Jersey’s air quality
- Coordinate closely with local communities, governments and stakeholders to maximize the public support for its proposed transmission cable routes
- Minimize visual impact to local communities of New Jersey with no turbine placed less than 15 miles from the coast.

Environmental Protection Plan – Checklist

The information required by the *Guidelines for Application Submission for Proposed Offshore Wind Facilities* is cross referenced to the associated document sections in the checklist below.

Checklist Item	Document Reference
Demonstrate that the protection of environmental resources is a priority when planning an offshore wind project during the development of the construction and operations plan; must demonstrate the stewardship and protection of State and Federal lands, waters, and associated natural resources, including fisheries and marine mammals.	Section 15.1
Describe the plans for acquiring all project permits as specified in N.J.A.C. 14:8-6.5 (10). Describe how the applicant plans to ensure the environmental protection measures required under N.J.A.C 14:8-6.5 are fully realized.	Section 15.3

Ocean Wind OREC Application

Checklist Item	Document Reference
Provide information regarding the direct emissions impacts of the project, including carbon dioxide, sulfur dioxide, particulate emissions. Include the project's direct emissions impacts of Nitrogen Oxides (NO _x)	Section 15.2
Document the anticipated carbon dioxide emissions impact of the project and its contribution to the State's greenhouse gas reduction goals.	Section 15.2
Document environmental impacts required under N.J.A.C 14:8-6.5 (11). Address the project's effect on finfish and shellfish, as well as commercial and recreational fisheries off the coast of NJ. Describe in detail how impacts, if any, will be mitigated. Provide an assessment of direct impacts, cumulative impacts to natural resources.	Section 15.2
Demonstrate that all activities are consistent with the NJDEP Baseline Ecological Studies.	Section 15.2.2
Identify the nature of its ocean lease and land ownership requirements for all aspects of the project including all required interconnection areas.	Section 15.6
Demonstrate progress in securing leases and land required. Propose a plan for accomplishing remaining steps toward acquiring leases or land ownership. Indicate the type and number of entities securing leases or owning land.	Section 15.6
Identify each appropriate State or Federal agencies they will be contacting for land acquisition issues and provide the Board with a summary of the required arrangements.	Section 15.6
Demonstrate adequate financial resources to acquire any land or leases needed to undertake this project.	Section 15.6

Environmental Protection Plan – Documentation

Consistent with the Guidelines for Application Submission for Proposed Offshore Wind Facilities (BPU 2018), this section presents the Environmental Protection Plan (EPP) developed by Ocean Wind which provides for the stewardship and protection of State and Federal lands, waters and associated natural resources. This plan addresses Ocean Wind's environmental stewardship philosophy, with three technical components, each of which is addressed in the sections that follow:

- Ørsted Environmental Stewardship and Protection Philosophy
- Environmental impact analysis
- Permitting and compliance plan
- Land acquisition and ownership

15.1 Approach to environmental stewardship and protection

Guidelines for Application Submission for Proposed Offshore Wind Facilities; BPU 2018. Demonstrate how the bidder will ensure the stewardship and protection of State and Federal lands, waters and associated natural resources.

The Ocean Wind team has been engaging with interested and affected stakeholders and conducting sound site assessment activities to support the development of appropriate mitigation and minimization measures. Ocean Wind is carefully developing this Project to minimize risk of delay or controversy as the result of environmental concerns.

Ocean Wind is working diligently to put in place a program to document, avoid, minimize and mitigate environmental impacts associated with the Project. The environmental permitting process described in Section 10 provides the context within which these issues are addressed. Details of Ocean Wind's proposed permit compliance plan, through which Ocean Wind will demonstrate compliance with applicable regulations and commit to specific avoidance, minimization and mitigation measures is provided in the Section 15.3.

15.1.1 Stakeholder engagement

As part of the development of the BIWF, Ørsted conducted extensive pre-survey coordination with BOEM, USACE, NOAA NMFS, the USFWS, and many other state and local agencies. In addition to the regulatory authorities, Ørsted engaged key stakeholders early on in the process and established constructive relationships with the Native American tribes, the commercial and recreational fishing community, and both regional and national environmental non-governmental agencies that advocate for marine mammal and ocean conservation.

Ocean Wind recognizes the importance of being an environmental steward and ensuring that the construction and operation of the Project are compatible with existing social, economic and environmental uses.

15.1.2 Fishing interests

The commercial and recreational fishing communities play a critical role in the cultural and economic fabric of New Jersey. The commercial and recreational fishing industry representatives are critical stakeholder groups for Ocean Wind, and it is Ocean Wind's belief that commercial and recreational fishing can co-exist with offshore wind. Ørsted has designed, developed, built, and now operates 25 wind farms with active fishing communities around each of these 25 sites. Using best management practices, Ørsted has successfully co-existed with the fishing community in Europe and at the Block Island Wind Farm. As further detailed in Section 16, Ocean Wind will bring that record of success to the fishing community in and around New Jersey

Fisheries

Dong Energy (now Ørsted) promotes and finances collaborative research into the potential impacts of offshore wind farm construction and commercial fisheries in the UK.

*Roach, M., Cohen, M., Forster, R., Revill, A. S., and Johnson, M. The effects of temporary exclusion of activity due to wind farm construction on a lobster (*Homarus gammarus*) fishery suggests a potential management approach. – ICES Journal of Marine Science, <https://doi.org/10.1093/icesjms/fsy006>*

15.1.3 Visual

Ocean 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 for the [REDACTED] project will be located over 15 miles from the closest point to New Jersey's shore (including Ocean, Atlantic and Cape May counties). Ocean Wind will conduct a visual impact assessment and conduct community outreach to potentially affected stakeholders based on that assessment.

15.1.4 Corporate Philosophy

Ørsted has a strong legacy of environmental stewardship exemplified by more than 25 years of successful offshore wind development around the world. In 2017, the company committed to developing 100 percent renewable energy and divested itself of its oil and gas interests. Along with this commitment, the company changed its name from Danish Oil and Natural Gas (DONG Energy) to Ørsted. Today, 85 percent of Ørsted's capital is deployed towards renewable energy solutions in wind, biofuels, storage and customer solutions.

Ørsted operates its business with respect for ecosystems and biodiversity. Its environmental specialists are involved in projects beginning in the early due-diligence activities and project development, ensuring environmental impacts are considered starting at an early stage. This responsibility to the environment continues through construction and operation, where specialists assess and document potential impacts on animal species, plants, and habitats and take preventive measures where needed. All Ørsted operational sites and associated offices are certified to the ISO 14001 Environmental Management System (EMS) standard. In addition, Ørsted recently launched a

Ornithology

Ørsted, a leader in environmental protections for offshore wind development, supports research and development of technologies such as the ground breaking ORJIP bird collision avoidance study that found empirical evidence of very high avoidance of an operational wind farm in the UK

<https://www.carbontrust.com/resources/reports/technology/bird-collision-avoidance/>

Biodiversity Policy that sets out the principles that underpin Ørsted's efforts to protect the natural environment in the areas where the company constructs and operates offshore wind farms.¹

Ørsted's environmental stewardship philosophy is further evidenced in its commitment to achieve a 96 percent reduction in carbon emissions by 2023. Ørsted's goal for carbon emission reductions is more ambitious than those levels agreed upon in the Paris Climate Agreement, which aim to keep the global temperature rise below 2°C. Ørsted has already reduced its carbon footprint by more than 50 percent in the span of a decade.

Ørsted's extensive team of internal and external subject matter experts, in consultation with outside advisory groups, is transferring the accumulated experience and lessons learned from Ocean Wind's state-of-the-art offshore environmental impact minimization and mitigation program to the Ocean Wind Project. Examples of the benefits of this knowledge transfer are illustrated in the call out boxes within this section. Ørsted's commitment to impact minimization and mitigation is evidenced by the successes of its past projects developed within environmentally sensitive ecosystems throughout Europe, and it will parlay that expertise to mitigate impacts to New Jersey's vital coastal resource.

Archaeology

Most people wouldn't associate renewable energy sources with historical artifacts, but it just goes to show the variety of activities needed to build an offshore wind farm," Bronagh Byrne, Environment and Consents Manager from Ørsted, said.

Bronze age fines in UK

<https://www.offshorewind.biz/2018/02/06/hornsea-one-digs-up-lincolnshires-past/>

15.2 Environmental impact analysis and mitigation

Guidelines for Application Submission for Proposed Offshore Wind Facilities; BPU 2018. Describe all environmental impacts - including but not limited to impacts on emissions, seabed conditions, marine and avian species - of the construction, operation and decommissioning of the project. Detail any measures the bidder proposes to mitigate the identified impacts.

15.2.1 Impact analysis and mitigation approach

Ocean Wind has implemented impact analysis techniques early in the design and planning of the Project to support the Cost Benefit Analysis (See Section 11) and reduce the potential for impact on the environment. Impact analysis is an iterative process throughout the development and operation of any large infrastructure project. Ocean Wind is applying the mitigation hierarchy to avoid impact where possible through sensitive route planning and site selection to mitigate any adverse impacts that cannot practicably be avoided, and to provide full and fair compensation when necessary (see below).

¹ <https://orsted.com/-/media/WWW/Docs/Corp/COM/Sustainability/Orsted-Offshore-Wind-Biodiversity-Policy.ashx?la=en&hash=062A5D7C9700A8D99FCDA1E016C67606>



Work is ongoing to evaluate the potential impacts of siting and routing of the Project components and the results of these evaluations will inform the identification of specific export cable and onshore transmission routes, this includes consideration of physical, regulatory and/or environmental constraints associated with various options. The initial route analysis aims to identify potentially sensitive resources to avoid and minimize impacts during site selection. These routing studies are documented in a series of reports (see Appendix A of the Environmental Impact Analysis presented in Attachment 11.11).

BOEM has published regulations found in 30 CFR Part 585 to establish procedures for the issuance and administration of leases, right-of-way (ROW) grants, and right-of-use and easement (RUE) grants for renewable energy production on the Outer Continental Shelf (OCS). Under these regulations, Ocean Wind is required to submit a COP that contains information describing all planned Project facilities planned for construction along with plans for construction, commercial operations, and conceptual decommissioning. Specifically, the COP (as detailed in 30 CFR 585.626 (a) and (b) and 30 CFR 585.627) must include all relevant information to assist BOEM in complying with its National Environmental Policy Act (NEPA) obligations and other relevant laws. BOEM, under its NEPA obligations, will be required to perform an Environmental Impact Statement (EIS) that will take into consideration the potential impact of the whole project including those activities that fall under New Jersey's jurisdiction. Furthermore, the NJDEP Office of Permit Coordination and Environmental Review (PCER) proactively coordinates relevant NEPA reviews of large complex projects across multiple NJDEP Programs. Ocean Wind has been coordinating with the PCER since 2017 to minimize, where practicable, the impacts of the project. These regulations and processes provide the necessary consultation and regulatory decisions to ensure the project will be developed in a manner that minimizes environmental impacts.

Environmental impact analyses have already been performed by BOEM for activities associated with the development of the Ocean Wind project. In February 2012, a Finding of No Significant Impact (FONSI) was issued in response to an EA prepared by BOEM. Under its NEPA obligations, BOEM evaluated the environmental impact of Commercial Wind Lease Issuance and Site Assessment Activities on the Atlantic OCS Offshore New Jersey, Delaware, Maryland, and Virginia. (77 FR 5560).

In April 2018, BOEM approved the Site Assessment Plan (SAP) for Lease OCS-A 0498 (Ocean Wind LLC) that allows for the installation of two floating light and detection ranging buoys (FLiDARs) and one metocean/current buoy in addition to permit/approvals referenced therein.

Ultimately the impact

assessment will be performed by BOEM under NEPA and during the review of other Federal and state permits as detailed in the Permitting Plan. [REDACTED]

[REDACTED]

[REDACTED] However, Ocean Wind recognizes that commercial and recreational fisheries are key stakeholder and play a critical role in the cultural and economic fabric of New Jersey and further engagement is necessary.

Appropriate mitigation measures will be developed after the proper investigatory process and upon appropriate engagement with the relevant stakeholder groups and the communities of New Jersey. Ocean Wind is committed to undertake this process once the design and analysis have been performed. However, Ocean Wind, as part of its Standard Operating Procedures, commits to use of BMPs to reduce the level of impact and commits to work with the regulatory agencies and stakeholders to identify appropriate mitigation activities. Such mitigation measures may include, but are not limited to, those summarized in Table 15-2.

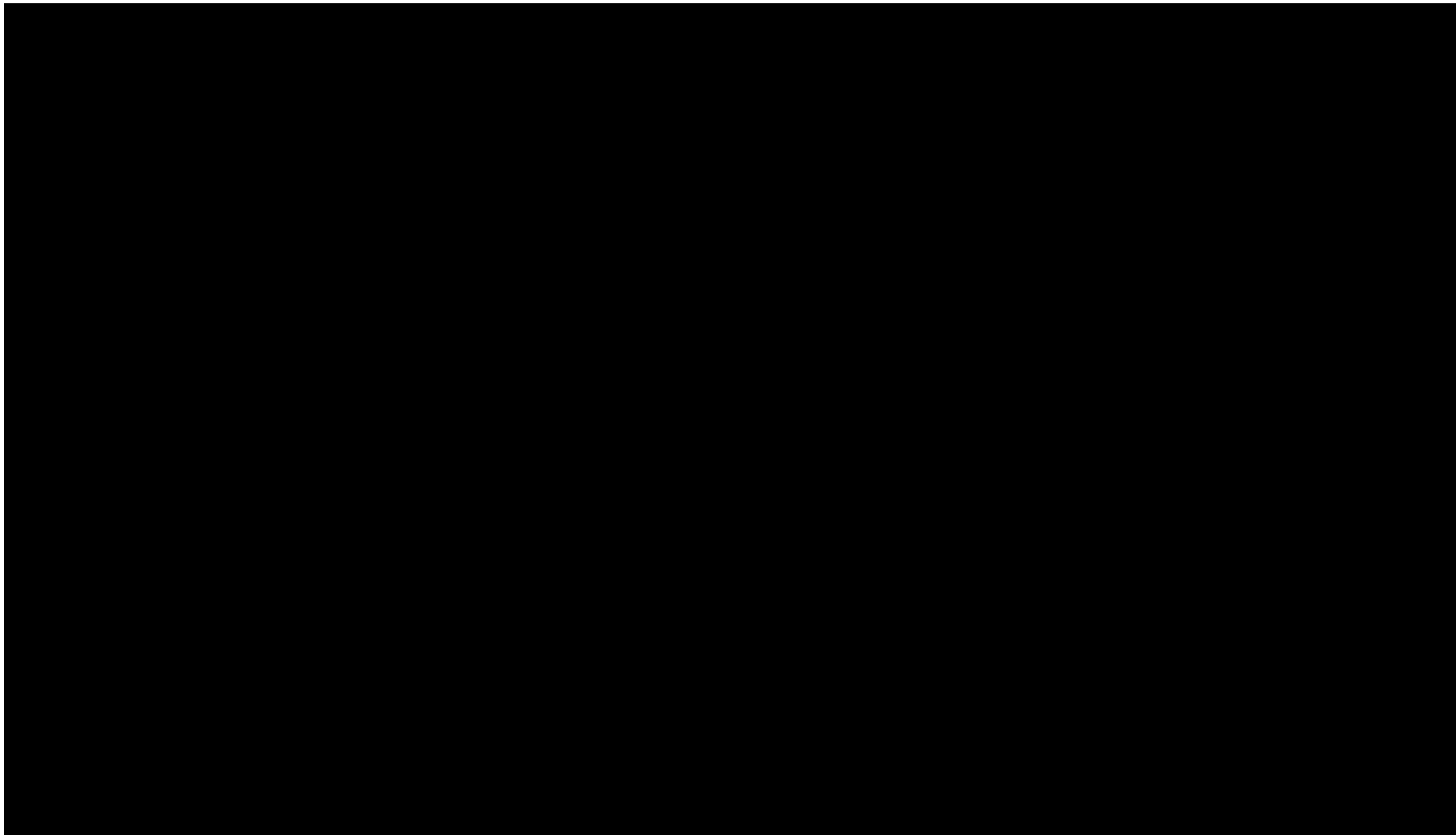
15.2.2 Consistency with NJDEP Baseline Ecological Studies

Ørsted has reviewed available data to characterize potential effects of Project construction and operation (as required). This data evaluation was also intended to identify potential data gaps (i.e., information not readily available or sufficient to meet the BOEM information requirements (See 30 CFR 585.626 and 30 CFR 585.627).

Of the existing data compiled and evaluated, the intensive Ocean/Wind Power Ecological Baseline Studies (EBS) carried out by the New Jersey Department of Environmental Protection (NJDEP) between 2008 to 2009 are of particular value to the Project. The NJDEP EBS collected background information on conditions, species, and resources present on the waters of the Atlantic Ocean offshore of New Jersey (including the Ocean Wind Project Area). The EBS was specifically commissioned and executed to supply a detailed dataset to support future offshore wind power development and provides detailed and focused data on the species assemblages and conditions within the EBS study area.

Ocean Wind expects to rely heavily on the data collected for the EBS, capitalizing on the investment made in the EBS by the taxpayers of New Jersey. In fact, the EBS will be the primary data source for key resources in the COP such as marine mammals, sea turtles and avian resources. In addition to the EBS, Ocean Wind will also draw on other existing data sources where such data are sufficient for the intended use and considered representative of the Project area. Ocean Wind intends to make further use of the EBS as baseline data as it will inform future monitoring activity. More generally, the EBS has and will continue to be important to the growing offshore wind industry off the New Jersey coast. Further studies will be conducted to supplement existing and available data and are planned to address specific data needs as the design and permitting processes continues, especially to address resources that may have been impacted after publication of the EBS because of Superstorm Sandy.

Table 15-1. [REDACTED]

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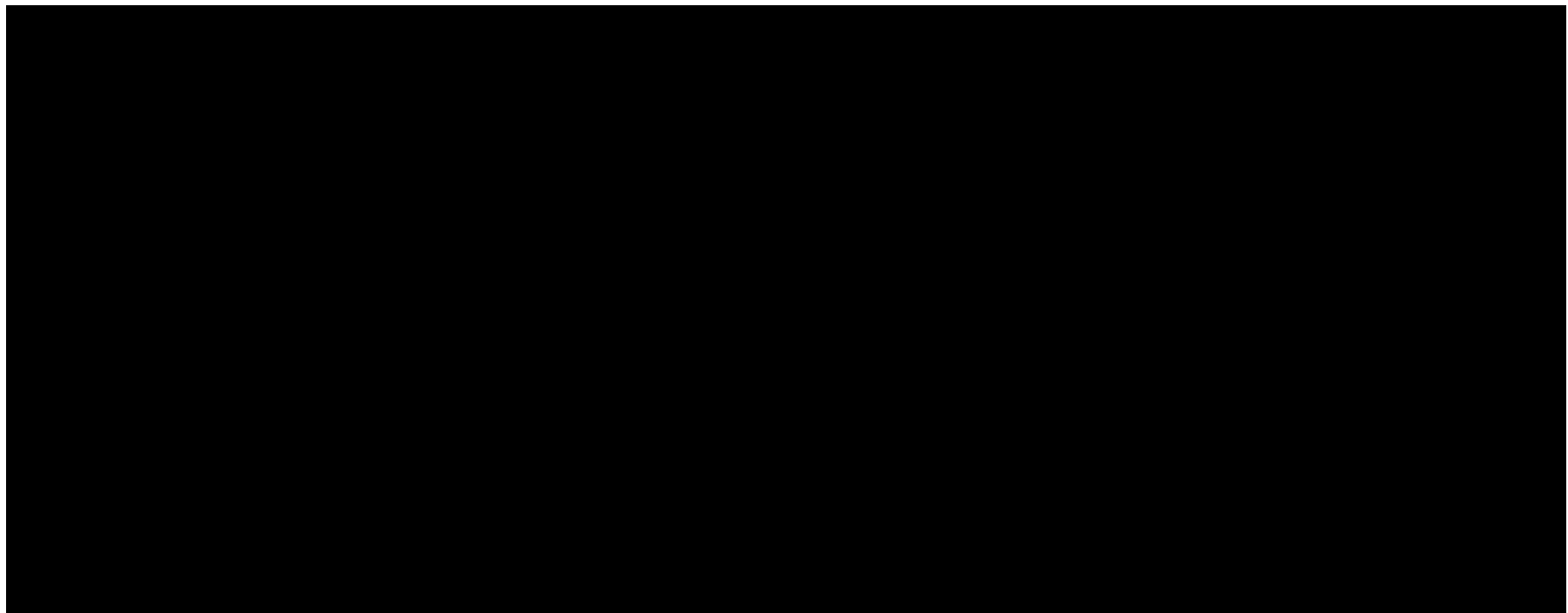
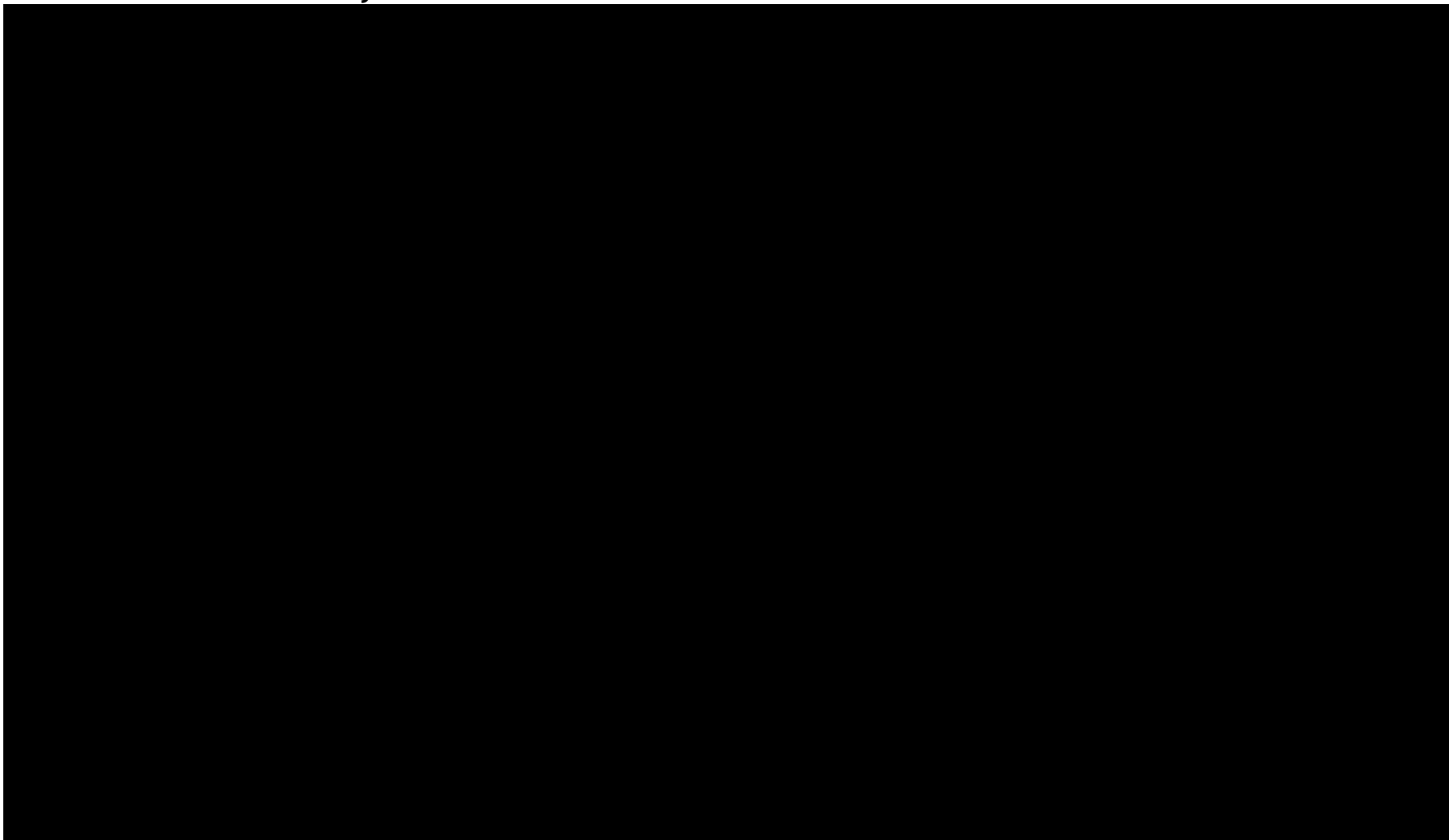
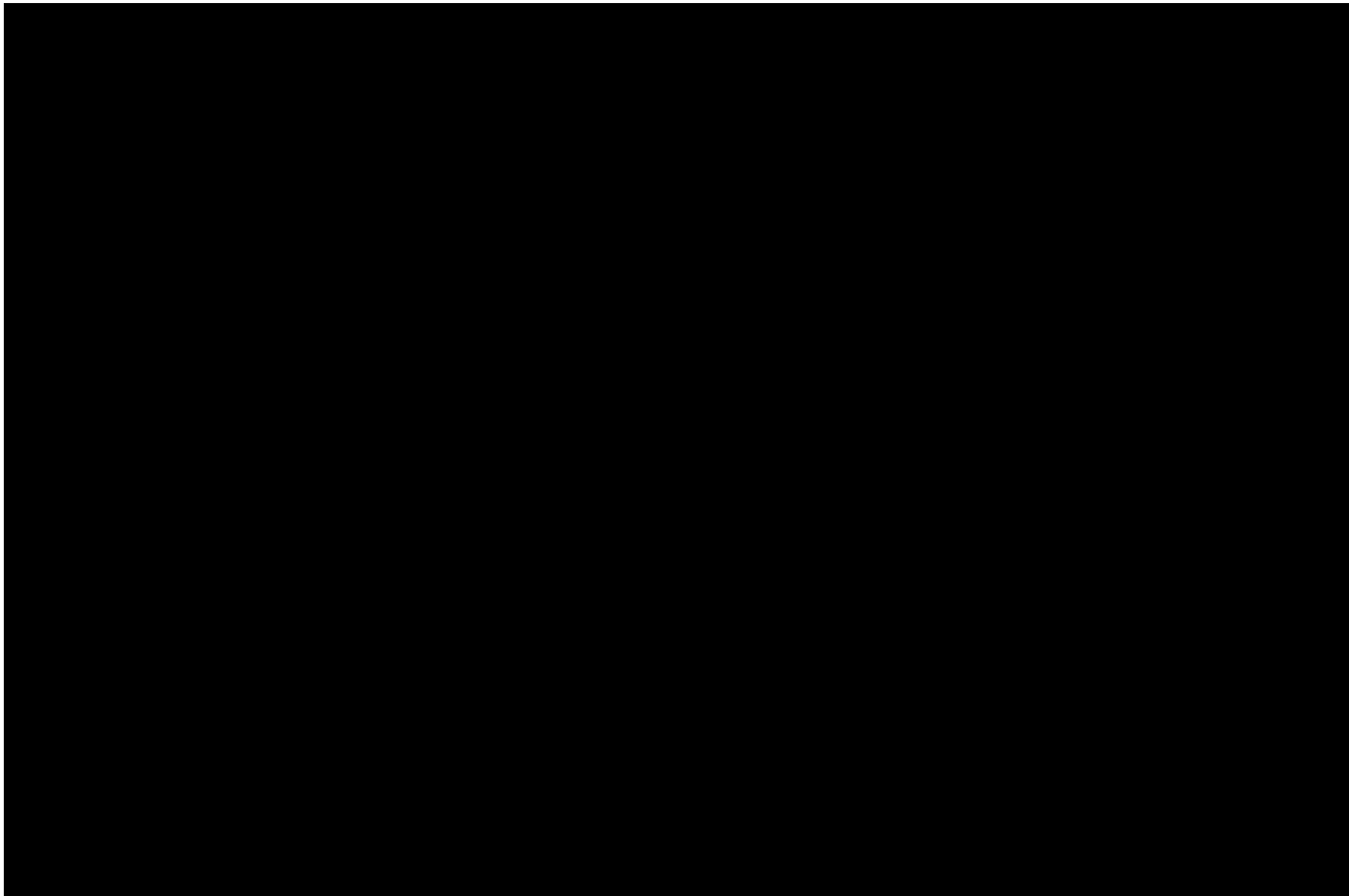
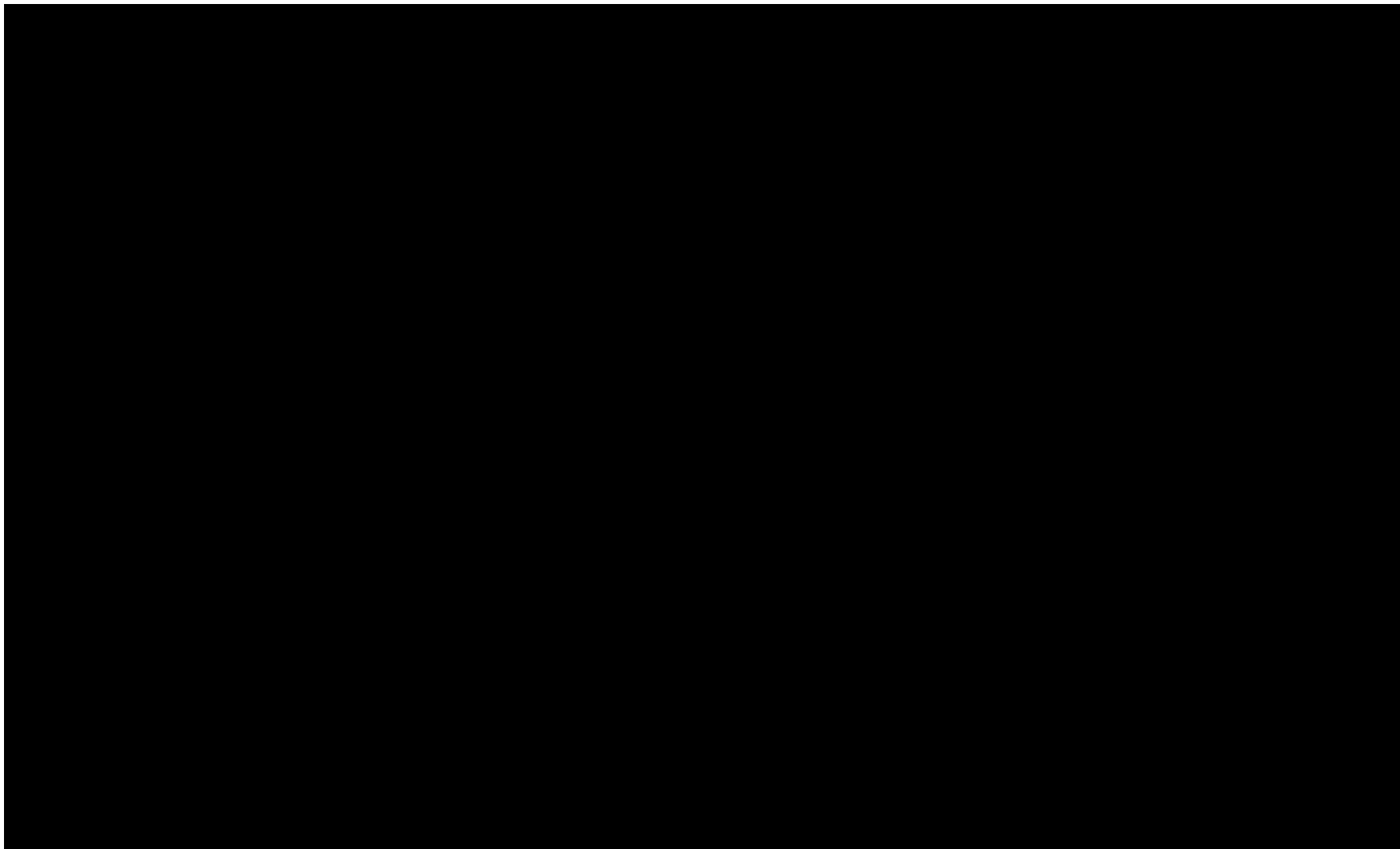
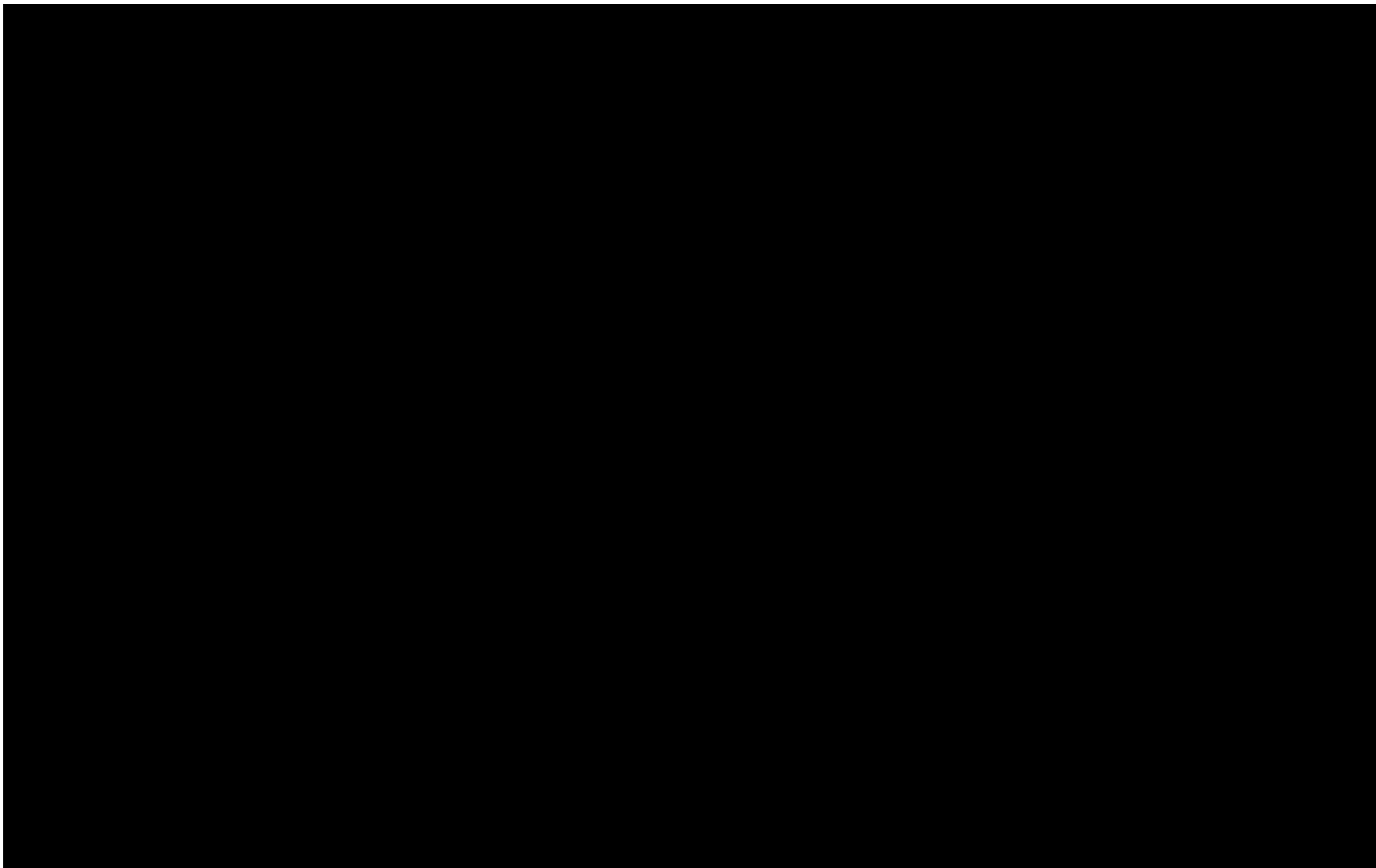


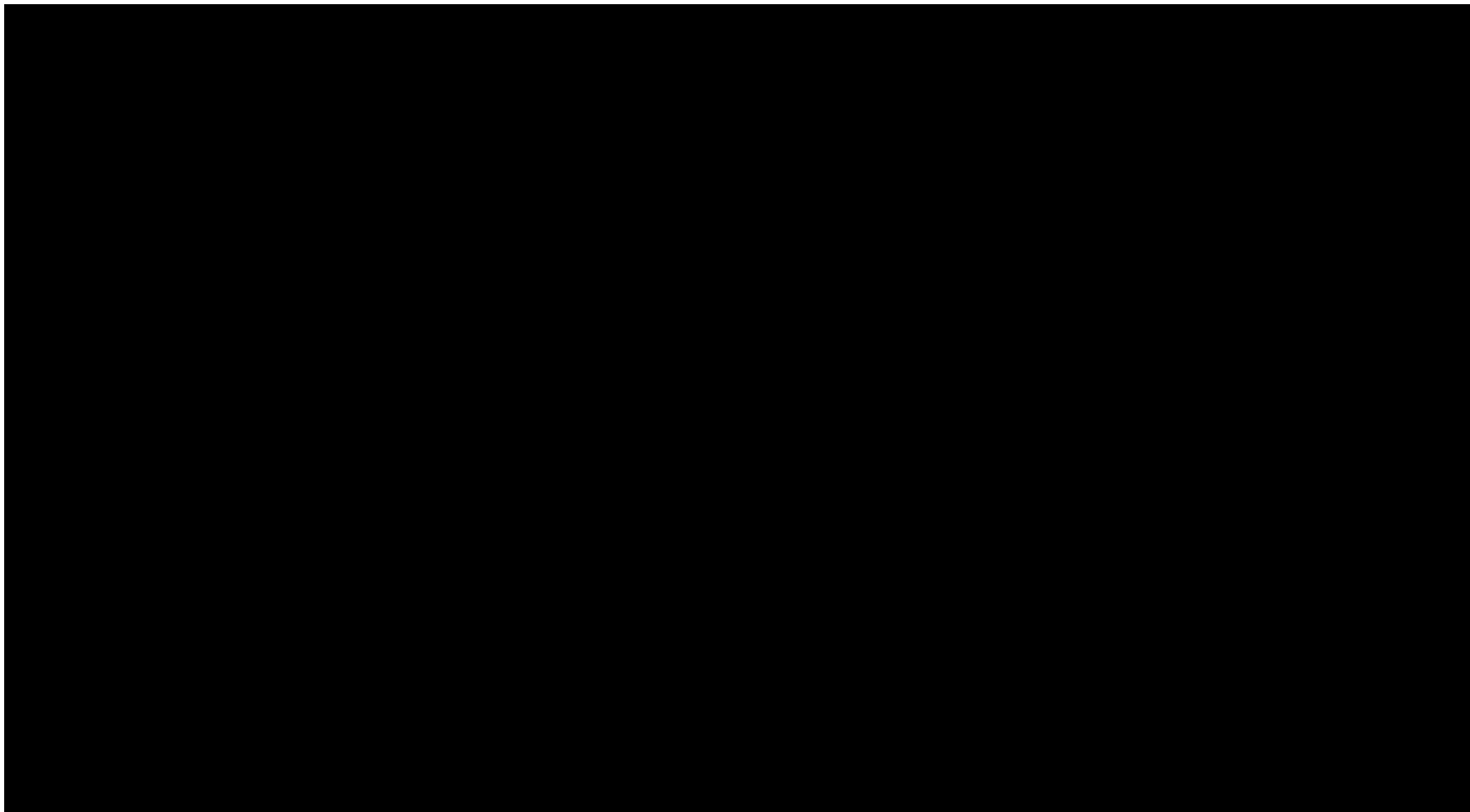
Table 15-2. Potential mitigation measures

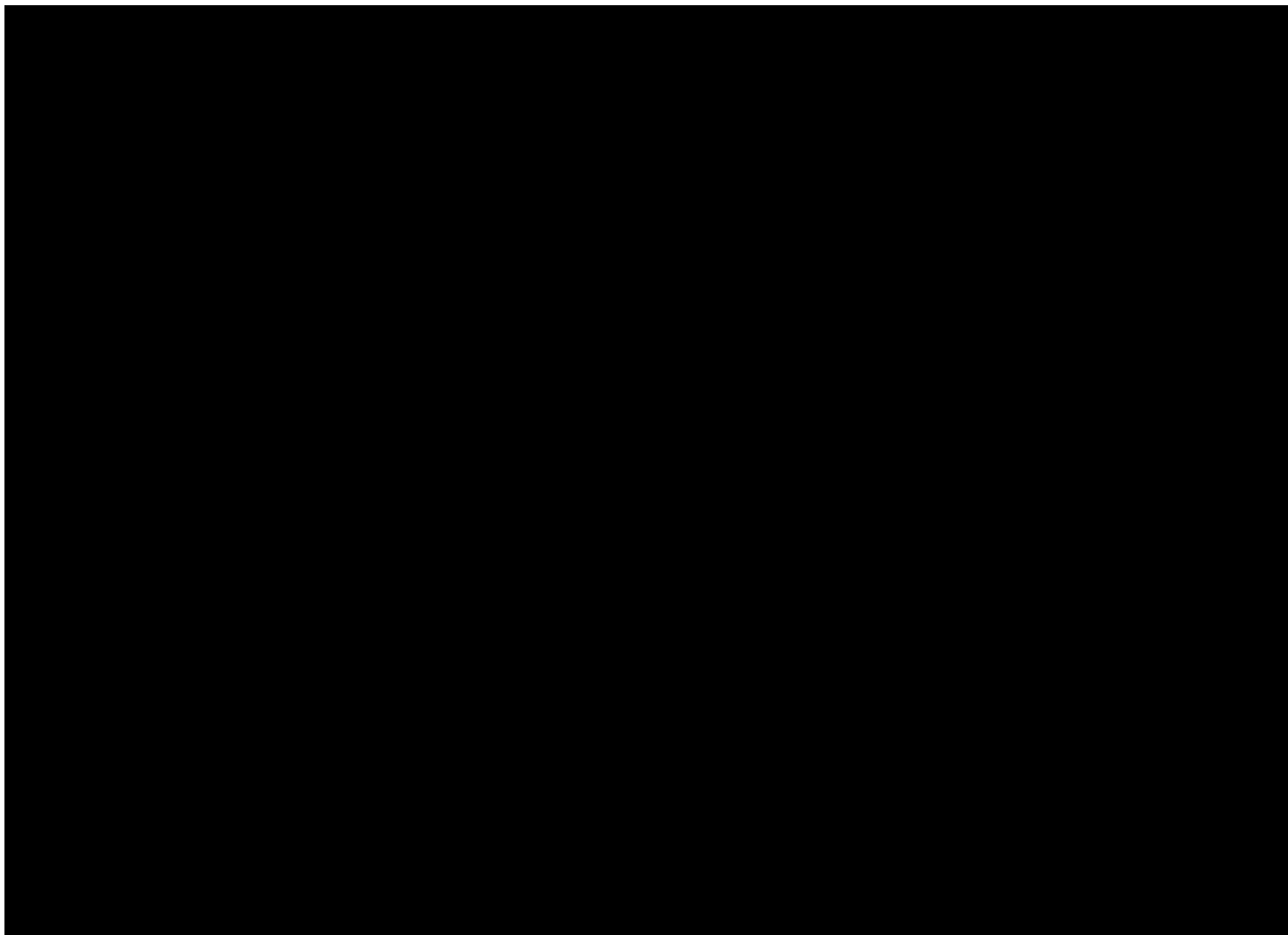


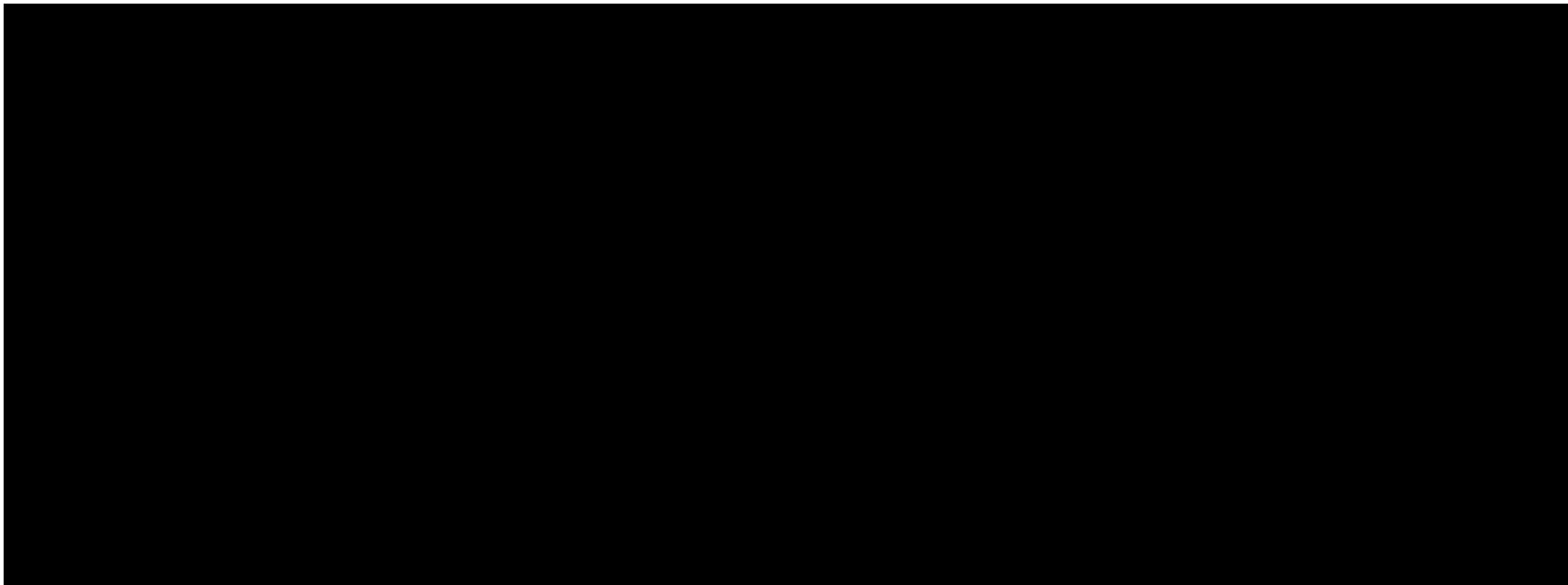












15.3 Permitting and compliance plan

Guidelines for Application Submission for Proposed Offshore Wind Facilities; BPU 2018. The Environmental Protection Plan shall also summarize the bidder's plans for acquiring all project permits as specified in N.J.A.C. 14:8-6.5 (10).

Ocean Wind will secure the required State and Federal environmental permits and approvals and implement the Project in accordance with the conditions of those permits and approvals as provided in the sections that follow. Section 10 provides a detailed permit matrix which identifies the various permits and approvals required for the Project consistent with the requirements under N.J.A.C. 14:8-6.5 (10). Ocean Wind will provide copies of submitted permit applications and issued permits, approvals or other authorizations as they become available.

As additional details of the Project design are developed, Ocean Wind expects to update and refine the list of required permits to identify those which may no longer be applicable, and/or new permits that should be added.

15.3.1 Permit acquisition plan

Ocean Wind understands that constructing the Project is contingent upon obtaining all required local, State and Federal permits and approvals. Ocean Wind is working with federal and state agencies, Native American Tribes, and other stakeholders to appropriately assess environmental resources of concern, avoid and/or mitigate potential effects, and obtain the necessary permits and approvals to support the construction and operation of the Project.

Ocean Wind has engaged a multidisciplinary team of internal and external professionals to design and engineer a Project that minimizes environmental impacts, regularly communicates with regulatory agencies during the design phase to obtain their input, and incorporates sufficient information regarding the Project and environmental setting to provide for an accurate and efficient review of the Project. Ocean Wind believes that early engagement and continued communications with regulatory agencies throughout Project design and permitting is a key element of Ocean Wind's Permit Acquisition Plan thus ensuring a credible and buildable project is permitted. Steps to be undertaken under the plan include:

- Initiate One-Stop Permit Coordination with PCER; initiated in 2017 (a NJDEP Permit Case Manager has been assigned to the Project) with a follow up in 2018
- Conduct a Pre-application meeting (general) – aimed at providing a basic introduction to the Project to all involved agencies
- Continue dialogue with NJDEP and relevant departments on early design and route selection options providing an early co-operative review of constraints and options to avoid future conflict.
- Conduct permit/media specific pre-application meetings – to discuss specific aspects of design, obtain early input regarding agency concerns, and to define specific permit application requirements.
- Request applicability determinations – seek informal or formal applicability determinations where specific applicability is unclear.

- Continue coordination through the NJDEP Permit Case Manager and individual regulators as appropriate.

Internal communications between Ocean Wind Project Management, its design engineers and its permitting team are also critical to the timely receipt of all required permits. Ocean Wind already has and will continue to implement a formal communications plan that includes regular team webinars/meetings to provide opportunities for the permitting team to present detailed responses to all Requests for Information (RFIs) identifying the specific information required by regulators for each specific permit application and to further discuss regulatory requirements that may affect design and/or construction.

Ocean Wind will continue such internal communications throughout Project design to ensure compliance with relevant rules and regulations via a team established to support the execution and operation of the project. Communication is essential to verify that necessary changes are reflected in permit applications or application addenda submitted to the applicable regulatory agencies. Similarly, should design changes be required after permit issuance, these ongoing communications will identify the nature and scope of any associated permit modifications that may be required.

Several required permits allow for public comment and/or hearings, which will provide an opportunity for input from stakeholders as part of the permitting processes. In addition, overarching documents such as the COP and the EIS provide for further communication of permitting requirements and the status of permit acquisition throughout Project development.

15.3.2 Permit and regulatory compliance

Ocean Wind prioritizes compliance with permit conditions both in design documents and when executing work. Permit compliance is one aspect of execution planning. Actions to facilitate and ensure compliance with applicable permits and approvals may include the following:

- Monitoring and documenting compliance with a dedicated team of permitting & compliance monitoring professionals.
- Compiling permit binders (hard copy and electronic) containing copies of all permits/approvals issued and approved plans as such approvals are received.
- Providing copies of permit binders to contractors and key Ocean Wind staff responsible for execution and the oversight of execution.
- Providing ready reference maps showing locations addressed by one or more permits, and/or where construction restrictions may apply.
- Utilizing field mark out of resource boundaries and restricted areas.
- Employing environmental inspectors to provide intensive compliance oversight within or adjacent to sensitive areas, and periodic compliance checks in other locations.
- Reviewing and tracking design changes which may occur after application submittal and/or permit receipt for potential need for submittal of amended plans, or application for permit modifications.

- Reviewing and tracking field changes which may occur after construction start to determine if permit modifications or new permits are required.

Ocean Wind commits, at a minimum, to construction, to the operation and decommissioning of the Project in accordance with applicable Federal, State and municipal laws, regulations, standards and related binding conditions of approval/permits. As noted above Ørsted operational sites are all ISO 14001 compliant. ISO 14001 is the international standard that specifies requirements for an effective EMS that provides a framework to effectively monitor environmental performance requirements.

15.4 Other Environmental Initiatives

In Ørsted's Sustainability Commitment, the company commits to operating in a way that creates progress towards the UN Sustainable Development Goals (SDGs). The SDGs express a global agreement of society's greatest challenges towards 2030.

15.4.1.1 Protecting Biodiversity through Wetlands Restoration

Ocean Wind believes that supporting robust wetlands is important to healthy coastal ecosystems and healthy coastal economies. To that end, Ocean Wind is a member and strong supporter of the New Jersey Corporate Wetlands Restoration Partnership. Through this partnership the Project has the opportunity to support incredible wetlands restoration projects in coastal areas and throughout the state. The Project looks forward to continued participation in this group and funding of specific programs as the Ocean Wind project development progresses.

[Redacted text block containing multiple lines of blacked-out content]



15.4.1.3 Support for the Science and Environmental Education

The National Ocean Science Bowl (NOSB) is an academic competition and program that addresses a national gap in environmental and earth sciences in public education by introducing high school students to and engaging them in ocean science and helping them become knowledgeable citizens and environmental stewards. The NOSB is one of the only ways students gain exposure to all of ocean science and related careers as they are beginning to chart their course in life.

Ocean Wind's support of the NOSB helps to guarantee students and teachers continue to benefit from participation in regional competitions. Contributing to an NOSB regional competition helps cover costs associated with hosting the event, as well as allowing the host site to leverage additional donations and in-kind support for activities, career/mentoring events, and prizes. Support of that regional champion team's travel to the Finals also ensures the students do not miss out on the opportunities that the NOSB provides to gain hands-on science experience, explore of a variety of coastal and marine environments, enjoy cultural experiences, and gain exposure to a variety of ocean, freshwater, and energy career avenues while attending. Overall, Ocean Wind's support helps to show the exceptionally bright and talented NOSB students, and their families, the company's commitment to their future as well as a clean energy future for our country.

Ocean Wind is proud to participate in and be a sponsor of the Shore Bowl, New Jersey's NOSB state competition. In 2019, the competition will be held at Rutgers University and the Ocean Wind team will provide financial sponsorship and be present to volunteer and engage with the participants of the Bowl as well as the hosts and leadership.

15.4.1.4 Supporting NGOs in Marine Research and Protection

Ocean Wind is proud to support the Marine Mammal Stranding Center (MMSC). Located in Brigantine, New Jersey and a part of the national network of stranding centers, they have responded to over 5,100 strandings of whales, dolphins, seals, and sea turtles that have washed ashore, for over 40 years throughout New Jersey. The MMSC is dedicated to responding to marine mammals and sea turtles in distress along all of New Jersey's waterways and to the rehabilitation of these animals for release back into the wild. In situations where animals may not be released, every effort is made to secure a proper, enriching facility to provide lifetime care. They are further committed to the well-being of marine mammals and to inspire responsible stewardship of our oceans through educational programs and collaboration.

Ocean Wind is proud to support the MMSC in a variety of ways, including sponsoring the national stranding network's annual meeting. This annual meeting is the epicenter of dialogue among the network of stranding centers around marine mammal research and protection; Ocean Wind's participation in that meeting helps Ocean Wind remain fully engaged in that dialogue, as well. By sponsoring and participating in that event and other functions and events hosted by the MMSC, Ocean Wind can further understand how to support the important work they do for marine mammals in the region. Attached is a letter of support from the MMSC for the Ocean Wind project.

15.5 Health and Safety

15.5.1 Recognition

On April 13, 2018, the National Ocean Industries Association (“NOIA”) presented the 2018 Safety-in-Seas Safety Practice Award to Ørsted (then Deepwater Wind) in recognition of its innovative safety practices during and after the installation of the Block Island Wind Farm. These safety innovations include the design and use of a Crew Transfer Vessel (“CTV”) and a transfer/ascent/descent system using Self-Retracting Lifeline (SRL) fall-arrest technology.

Ørsted logged over 40,000 offshore person-hours without a safety incident during Block Island Wind Farm’s first year of operation.

Of this prestigious award, NOIA President Randall Luthi said the following:

“Deepwater Wind [now Ørsted] broke ground as the developer of America’s first offshore wind farm, and has done so again as the first renewable energy company to win the NOIA Safety in Seas Award. Safe offshore operations, both traditional and non-traditional, are essential in meeting our nation’s energy needs, and I congratulate Deepwater Wind for setting the bar for excellence in safe offshore wind operations while paving the way for the nascent U.S. offshore wind industry.”

Ørsted’s award-winning entry was evaluated by an independent panel of judges from the U.S. Coast Guard, the Bureau of Safety and Environmental Enforcement, the Transportation Research Board, and an industry safety consultant. Aries Marine Corporation, Chevron USA-Gulf of Mexico Business Unit, Frank’s International and Talos Energy were also nominated for the 2018 safety practice award.

NOIA has held the SIS awards competition since 1978 to recognize those who contribute to improving the safety of life in the offshore energy industry.

15.5.2 General Principles

Ocean Wind is aware of its responsibility to its personnel, which it takes very seriously. Ocean Wind is working systematically and responsibly to implement and comply with all legal and administrative requirements, industry best practice, and its self-set targets regarding the protection of the environment and health and safety of all persons, whether directly or indirectly involved in the Project.

The company’s principles include:

- Emissions: Reduction of emissions harmful to environment and health
- Resources: Targeted work on most resource-efficient production of energy, use more environmentally friendly raw materials, reduction of environmentally harmful chemicals
- Waste: Waste will be avoided and recycled as possible
- Environment and Nature: Immediate consideration of the environment and surrounding natural areas when planning new projects, as well as the thorough investigation of the impact of new projects on the environment; and

- Employees: Ensuring a safe, healthy and attractive workplace for employees.

Compliance with these defined minimum standards is mandatory for all project participants. Ørsted continuously updates and develops these minimum standards with the collaboration of all project participants to achieve a continuous improvement of the HSE goals.

15.5.3 Company Policy of Ørsted

During development, construction, operation, maintenance and decommissioning or repowering of Ørsted offshore windfarms, Ørsted will make every effort to ensure environmental protection and the health and safety of all persons that might be affected by the Project's activities.

For this purpose, the management of Ørsted has released the policy for quality, health, safety and environment

Ørsted's strives, based on its vision and values to procure, produce, distribute and trade in energy and associated services with a focus on customers and employees as well as the society and the environment in which Ocean Wind operates.

Ørsted incorporates quality, health, safety and the environment in decisions and actions. Ørsted strives to:

- Ensure that customers are satisfied and to provide advice on appropriate use of products and services;
- Motivate, educate and involve employees in the quality, health, safety and environment work;
- Promote a healthy and safe working environment through prevention of injuries and work-related illnesses;
- Continuously minimize resource consumption and environmental impact;
- Prioritize suppliers and business partners that have and practice a similar quality, health, safety and environmental policy;
- Set targets, evaluate results and continuously improve these and be among the best in the industry;
- Ensure compliance with legislation and apply recognized norms and standards; and
- Communicate openly about targets and results relating to quality, health, safety and the environment.

15.5.4 Safety Management System and Communication Lines

15.5.4.1 Overall objectives

The health and safety of all persons involved directly or indirectly into the Project and the protection of the environment, are the primary objectives of all those concerned with the successful HSE management of the Project. Consequently, HSE objectives for the Project are that all work will be completed without injury to, or damage to the health of any person whether

engaged on the works or not, and without damage to the environment. These objectives also apply to sub-contractors and any third party involved in the Project.

Compliance with regulatory requirements is considered a minimum standard and Ørsted aims to implement best practices applicable to the offshore wind industry. Furthermore, continuous improvement will be pursued, and the highest practicable health, safety and environmental standards are to be identified and sought.

15.5.4.2 Project HSE Strategy

Ocean Wind believes that all incidents are preventable and that the protection of health, safety and environment is a serious and shared responsibility amongst all project participants.

To ensure participation of sub-contractors in the goal to achieve a safe project, the Project will establish a strong relationship with its sub-contractors that are based on:

- Packages' specific HSE strategy and programs.
- Early engagement with sub-contractors.
- Key sub-contractor's incident reduction plans; providing such a plan has been a requirement in some of the tender processes.

The plan shall demonstrate how the sub-contractor will improve their HSE performance to contribute to achieving the project target and the need for continual improvement of HSE in the offshore wind industry.

15.6 Ocean lease and land ownership

Guidelines for Application Submission for Proposed Offshore Wind Facilities; BPU 2018. Identify the nature of its ocean lease and land ownership requirements for all aspects of the project including all required interconnection areas. Demonstrate progress in securing leases and land required. Propose a plan for accomplishing remaining steps toward acquiring leases or land ownership. Indicate the type and number of entities securing leases or owning land. Identify each appropriate State or Federal agencies they will be contacting for land acquisition issues and provide the Board with a summary of the required arrangements.

15.6.1 Lease and ownership requirements

Ocean Wind has described the nature of its ocean lease and land ownership requirements for the offshore portions of the Project in Section 10, and of the onshore portions of the project, including all required interconnection areas in Section 14.

15.6.2 Property right, ownership and lease progress and plan

The progress to date toward securing the required offshore site control is detailed in Section 10. The same is described for the required onshore site control in Section 14.

15.6.3 Types and number of entities involved

Real property rights will primarily be acquired by Ocean Wind, but may in some circumstances be acquired by its affiliates, primarily OWPNA

15.6.4 State and federal agencies

The role of federal and state agencies is addressed in Section 10.

Ocean Wind OREC Application

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- Attachment 16.1 – [REDACTED]
- Attachment 16.2 – Educational Institution Memoranda of Understanding
- Attachment 16.3 – Letters of Support
- Attachment 16.4 – Outreach Engagements

16 Economic development plan

Economic development plan – Summary

Core message

Ørsted and PSEG offer a comprehensive economic development program that leverages the unique assets and resources of each organization to anchor New Jersey as a hub of the offshore wind industry. First, Ørsted will leverage its global supply chain to **maximize job creation** for this first project. Second, Ocean Wind will **invest in State infrastructure** that is critical for the growth of the offshore wind industry and that will create future job opportunities. Third, Ørsted is already working to **bring a supply chain to New Jersey**, [REDACTED] to establish a manufacturing facility [REDACTED]. Fourth, Ocean Wind is committed to **developing a globally-competitive workforce** in New Jersey [REDACTED]. Fifth, Ocean Wind is partnering with three of New Jersey's leading academic institutions to support the development of an **offshore wind cluster**. Finally, Ocean Wind is backing-up its commitments by **providing financial guarantees with substantive penalties for non-attainment of key promises in the form of capital expenditure and job guarantees**. Under this proposed arrangement, Ocean Wind will not only serve as the State's first offshore wind project, but also as a partner with the State on economic development, working together to nurture a long-term, sustainable offshore wind industry in New Jersey.

Economic development plan – Checklist

The information required by the *Guidelines for Application Submission for Proposed Offshore Wind Facilities* is cross referenced to the associated document sections in the checklist below.

Checklist Item	Document Reference
Provide detail and a narrative description of the plan for investments in infrastructure, supply chain, workforce development, and other offshore wind cluster-building programs, and the associated economic benefits for the State.	Section 16.1 - Section 16.8
Provide context for the cost-benefit analysis, outline other expected economic development impacts not captured in the cost-benefit analysis (i.e., impacts that are difficult to quantify), and show how Ocean Wind and the Project plan can attain and deliver the economic benefits described in the application as required under N.J.A.C 14:8-6.5.	Section 16.2 – Section 16.6
Summarize the economic impacts of the proposed project over 20 years as noted in the project's Cost-Benefit Analysis with a focus on investments and impacts in five key areas of economic development: (a) blue-collar workforce development, (b) white-collar workforce development, (c) marshaling ports, (d) manufacturing ports, and (e) O&M ports.	Section 16.1 - Section 16.5
Clearly differentiate what are the direct, indirect, and induced impacts on both jobs and output, and provide rationale for supporting assumptions.	

Checklist Item	Document Reference
Consistent with N.J.A.C 14:8-6.5 (11), the Economic Development Plan includes details of the location, type or occupation and salary of employment opportunities to be created by the project with job totals expressed as full-time equivalent positions assuming 1,820 hours per year.	Section 16.1 & Section 16.8
Propose consequences if claimed benefits do not materialize, and the employment impact may become conditions of any OREC award.	Section 16.8
Any State grants or other subsidies from the New Jersey Economic Development Authority or other agencies associated with the proposed wind project that was included as part of the project cost-benefit analysis.	Section 16.7

Economic development plan – Documentation

The U.S. offshore wind industry is growing rapidly. Resilient domestic infrastructure, a sustainable supply chain, and a skilled local workforce are all critical to successfully deliver the billions of dollars of global wind power projects currently in development. With this application, Ocean Wind is offering to develop these critical components of an offshore wind industry in New Jersey, similar to the development brought to fruition by Ørsted’s investment in the UK’s Humber region.



Ocean Wind will achieve these goals by delivering a highly focused, strong and unique economic development program for New Jersey. This program is not aspirational, instead, it is built on Ørsted’s long term experience in developing offshore wind hubs around the world as well as PSEG’s experience in New Jersey. The Project’s economic development program is based on the following five principles:

1. **Leveraging supplier relationships to maximize local content:** Ocean Wind has the global credibility and experience to successfully deliver New Jersey’s first project and attract suppliers to New Jersey. By leveraging Ørsted’s unparalleled global supply chain and PSEG’s unrivalled local knowledge, Ocean Wind can maximize job creation and local investment from the very beginning of development, as detailed in Section 16.1. Ocean Wind is already working to bring self-sustaining manufacturing to New Jersey. [REDACTED]
2. **Developing World-class Offshore Wind Infrastructure:** The offshore wind industry is in need of strong and reliable infrastructure. The State that moves first to build offshore wind infrastructure will have the long-term benefit of promoting local jobs. Ocean Wind plans to establish the “Ocean Wind Pro-NJ” Trust to support new businesses in the offshore wind industry and the development of offshore wind infrastructure for these businesses. [REDACTED]
[REDACTED]
[REDACTED]
Additionally, Ocean Wind is planning to establish an operations and maintenance hub [REDACTED], generating permanent in-state jobs. The Project’s infrastructure plans are described in Section 16.2.
3. **Enabling a Globally-competitive Local Workforce:** Ørsted and PSEG appreciate the need for a skilled workforce. [REDACTED]
[REDACTED]
Additionally, Ocean Wind is planning to implement the Competitive Edge workforce development program by Jingloli. Further details on workforce development commitments are provided in Section 16.4.
4. **Cultivating A Thriving Local Offshore Wind Cluster:** The next generation of offshore projects and leaders need great researchers and teachers. Ørsted has committed to

working with three of New Jersey's leading institutes of higher education to fund research and teaching focused on offshore wind, as detailed in Section 16.5

- 5. Upholding All Commitments to the State:** Ocean Wind is committing to dollar-specific guarantees on capital expenditures and a specific job creation schedule, ensuring the Project delivers on its promises, as detailed in Section 16.8.

Details on these initiatives are provided below. Ocean Wind's investments will result in significant positive economic impacts to the State, including benefits to employment, wages, taxes, and output as addressed in Section 11. Attachment 11.3 outlines the jobs created by the Project in New Jersey. Attachment 11.2 outlines the economic effects, including the growth in New Jersey gross domestic product (GDP).

In addition to Ocean Wind's economic development commitments, the Company is also committing to meaningful investments in New Jersey communities as described in Sections 16.5.3, 16.5.4 and 16.6.1.

16.1 Job creation and economic development

Guidelines for Application Submission for Proposed Offshore Wind Facilities; Board 2018. The Economic Development Plan should:

summarize the economic impacts of the proposed project over 20 years as noted in the project's Cost-Benefit Analysis with a focus on investments and impacts in five key areas of economic development: (a) blue-collar workforce development, (b) white-collar workforce development, (c) marshaling ports, (d) manufacturing ports, and (e) O&M ports.

should clearly differentiate what are the direct, indirect, and induced impacts on both jobs and output, and provide rationale for supporting assumptions.

Consistent with N.J.A.C 14:8-6.5 (11), The Economic Development Plan should include details of the location, type and salary of employment opportunities to be created by the project with job totals expressed as full-time equivalent positions assuming 1,820 hours per year.

16.1.1 Approach to local content

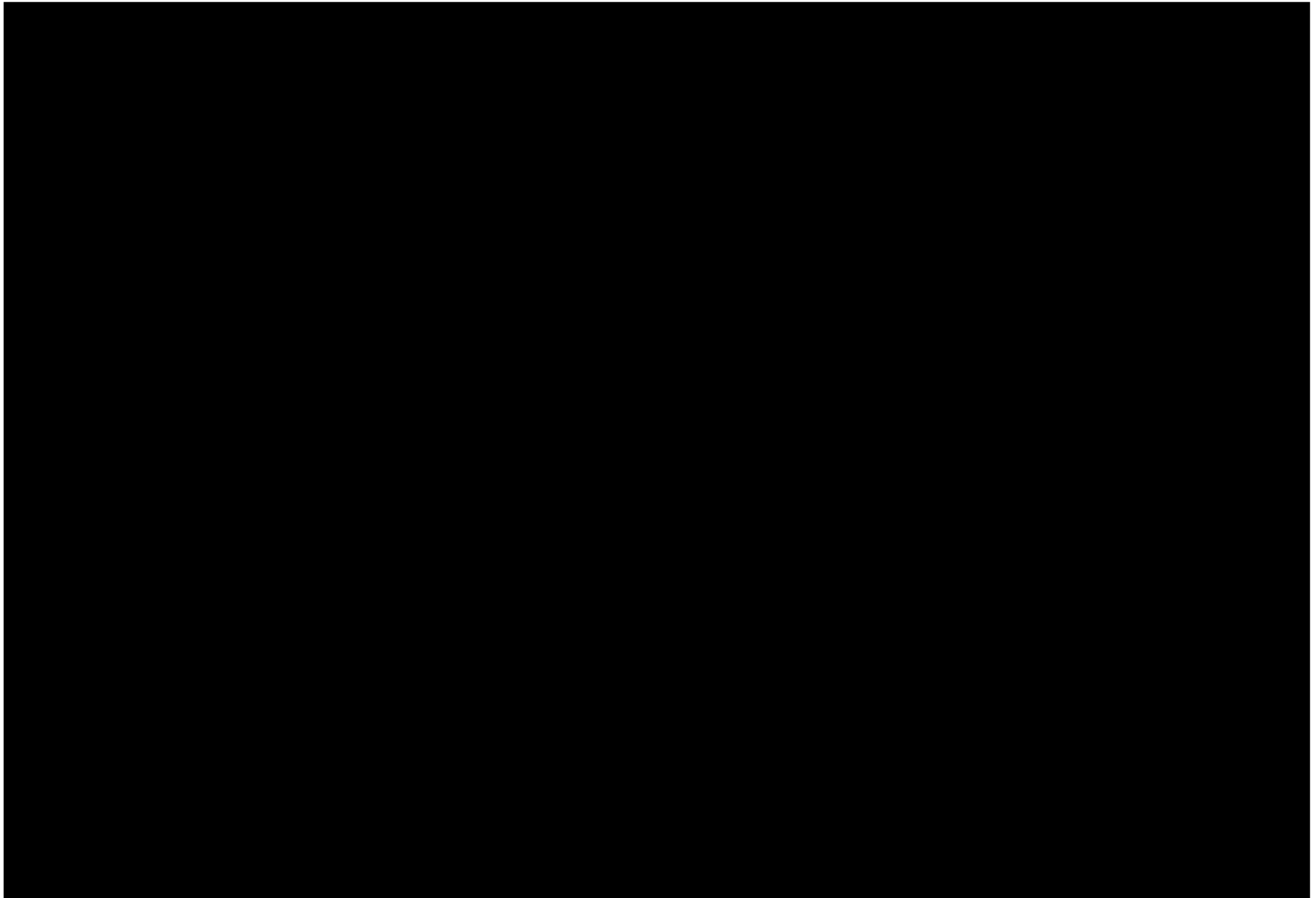
Ocean Wind has developed a comprehensive construction and logistics plan for the fabrication of this Project, which is detailed in Section 2 and summarized in Figure 16-1.

The construction of the Project, as detailed in Section 2, will deliver significant economic benefits to the State of New Jersey. The Project will create employment in New Jersey during the development, construction, operations, and decommissioning phases. Ocean Wind has prioritized high in-state job creation and spending. By delivering on these priorities, the Project will maximize value to New Jersey ratepayers.

The construction phase will employ iron workers, carpenters, welders, electricians, dock builders and pile drivers, wind technicians, and other construction and union jobs.

The development phase will employ many professional jobs including engineers, environmental scientists, financial analysts, and other professional roles.

Figure 16-1: Map of Ocean Wind job creation and economic development in New Jersey



The operations phase will employ plant technicians, maintenance crews, and other support jobs.

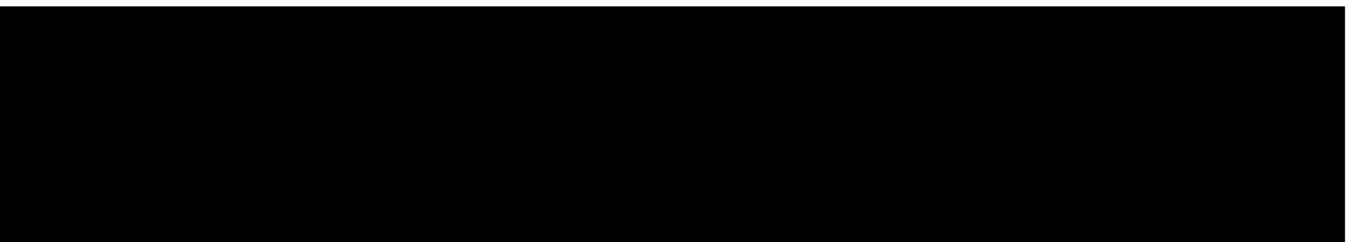
Finally, the decommissioning phase will employ construction and workers in other support roles.

The economic benefits of the proposed project, including job totals, output and investment in manufacturing, marshalling and O&M ports over 20 years are described in Section 11.

16.1.2 Job creation

Ocean Wind is leveraging the resources of both Ørsted and PSEG to maximize local job creation on this first project. Table 16-1 below shows Ocean Wind's estimated total job creation in New Jersey – Direct, Indirect and Induced job-years – for each project size.

Table 16-1. Estimated New Jersey Job Creation



16.1.3 Increase in State GDP

In addition to job creation, the Ocean Wind Project will contribute significantly to the GDP of the State of New Jersey, as detailed in Table 16-2 and further discussed in Section 11.

Table 16-2. Increase in New Jersey Gross Domestic Product (PV 2019\$)

16.2 Industry infrastructure development

Guidelines for Application Submission for Proposed Offshore Wind Facilities; Board 2018. The Economic Development Plan should:

provide detail and a narrative description of the applicant’s plan for investments in infrastructure, supply chain, workforce development, and other offshore wind cluster-building programs, and the associated economic benefits for the State.

provide context for the cost-benefit analysis, outline other expected economic development impacts not captured in the cost-benefit analysis (i.e., impacts that are difficult to quantify), and show how Ocean Wind and the Project plan can attain and deliver the economic benefits described in the application as required under N.J.A.C 14:8-6.5.

summarize the economic impacts of the proposed project over 20 years as noted in the project’s Cost-Benefit Analysis with a focus on investments and impacts in five key areas of economic development: (a) blue-collar workforce development, (b) white-collar workforce development, (c) marshaling ports, (d) manufacturing ports, and (e) O&M ports.

As part of its commitment to support the development of a sustainable offshore wind industry in New Jersey, Ocean Wind’s proposal includes multiple investments in infrastructure that will support the future development of even more offshore wind facilities to serve New Jersey and other states. The benefits of the following investments have not been included in the quantification of the Project’s net benefits: [REDACTED]

¹ Public Policy Center at UMass Dartmouth. “Draft Construction and Operations Plan, Volume III, Appendix III-L, Proposed Vineyard Wind Offshore Wind Energy Project, 800 MW; Estimated Contribution to Employment and Economic Development.” December 2017. Online 12/24/18. Available: <https://www.boem.gov/Vineyard-Wind-COP-Volume-III-Appendix-III-L/>

[REDACTED]

- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]

[REDACTED]

16.2.1 [REDACTED] Fabrication Facility [REDACTED]

[REDACTED] This new manufacturing facility would serve as a valuable piece of infrastructure that can drive down costs for future projects and increase long-term manufacturing jobs in New Jersey.

16.2.2 Operations and Maintenance Facility [REDACTED]

As detailed in Section 7, Ocean Wind will require new operations and maintenance facility to be located near the Project. [REDACTED]

16.2.3 Pro-NJ Grantor Trust

To catalyze a strong and sustainable offshore wind industry in New Jersey, Ocean Wind is committing an initial investment of \$15 million in a to-be-established Pro-NJ Trust upon award to the Project, which will:

- Enable MBE/WBE or small business entry to the offshore wind industry
- Advance in-state port development

- Build coastal grid resiliency and reliability

Reliable infrastructure in many sectors, including energy, transport, and ports is critical to support growth of the offshore wind industry in a sustainable and inclusive way. The Ocean Wind Pro-NJ Trust will be deployed alongside the Project and will serve not only this first commercial-scale project but the entire offshore wind industry and the communities it serves for decades to come.

The Pro-NJ Trust will consist of several building blocks: supporting businesses entering the offshore wind supply chain and supporting the development of offshore wind infrastructure for these businesses.

Providing grants during this first phase of offshore wind development will allow businesses to make early investments that will enable them to benefit from all three of New Jersey’s offshore wind procurements as well as projects developed elsewhere along the East Coast.

Consistent with Ørsted policy, Ocean Wind is proposing that the Pro-NJ Trust be managed by an independent third party which will ensure that the administration of the fund is at arms-length of Ørsted, Ocean Wind, and potential beneficiaries. The administrator will establish an advisory committee, members of which may be recommended by the Board. The committee will advise as to grant decisions and ensure that grants promote and attract diverse participation in the supply chain.

The second building block of the Pro-NJ Trust supports offshore wind infrastructure, in-state port development and infrastructure resiliency initiatives to mitigate climate change impacts.



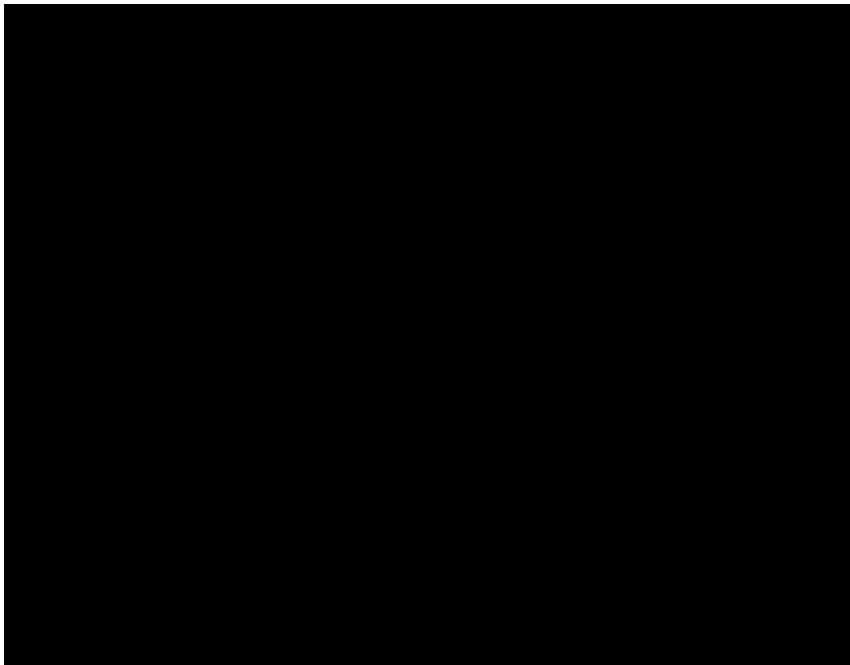
16.3 Supply chain development

Guidelines for Application Submission for Proposed Offshore Wind Facilities; Board 2018. The Economic Development Plan should:

provide detail and a narrative description of the applicant's plan for investments in infrastructure, supply chain, workforce development, and other offshore wind cluster-building programs, and the associated economic benefits for the State.

provide context for the cost-benefit analysis, outline other expected economic development impacts not captured in the cost-benefit analysis (i.e., impacts that are difficult to quantify), and show how Ocean Wind and the Project plan can attain and deliver the economic benefits described in the application as required under N.J.A.C 14:8-6.5.

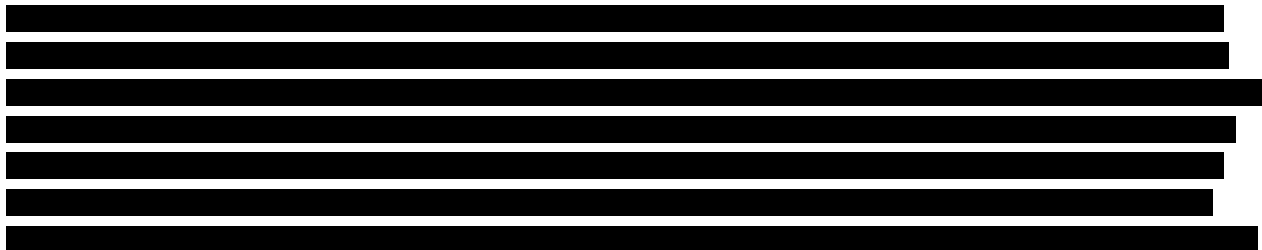
summarize the economic impacts of the proposed project over 20 years as noted in the project's Cost-Benefit Analysis with a focus on investments and impacts in five key areas of economic development: (a) blue-collar workforce development, (b) white-collar workforce development, (c) marshaling ports, (d) manufacturing ports, and (e) O&M ports.



Ocean Wind's highest priority is delivering offshore wind at the best possible value to New Jersey ratepayers. Low cost and high investment in the local supply chain are key factors in delivering on this goal. As such, Ocean Wind has developed a complete Supply Chain Plan that outlines how the Project will achieve low costs and high in-state economic investment (Attachment 2.5). The Supply Chain Plan outlines how Ørsted's vast experience, outstanding record, and global presence has allowed the company to leverage experience between offshore wind farm

projects, suppliers and countries and develop the offshore wind supply chain. Ørsted's unique position has helped it to shape the development of offshore wind, support the establishment and maturation of a sustainable supply chain and identify opportunities across its portfolio.

A key component of Ocean Wind's Supply Chain Plan is establishing manufacturing in New Jersey.



This investment, along with significant investments in local suppliers and global suppliers interested in investing in New Jersey, are described in Ocean Wind's Supply Chain Plan.

16.4 Workforce development

Guidelines for Application Submission for Proposed Offshore Wind Facilities; Board 2018. The Economic Development Plan should:

provide detail and a narrative description of the applicant's plan for investments in infrastructure, supply chain, workforce development, and other offshore wind cluster-building programs, and the associated economic benefits for the State.

provide context for the cost-benefit analysis, outline other expected economic development impacts not captured in the cost-benefit analysis (i.e., impacts that are difficult to quantify), and show how Ocean Wind and the Project plan can attain and deliver the economic benefits described in the application as required under N.J.A.C 14:8-6.5.

summarize the economic impacts of the proposed project over 20 years as noted in the project's Cost-Benefit Analysis with a focus on investments and impacts in five key areas of economic development: (a) blue-collar workforce development, (b) white-collar workforce development, (c) marshaling ports, (d) manufacturing ports, and (e) O&M ports.

16.4.1 Union engagement

Ocean Wind has determined that the Project is subject to the New Jersey Prevailing Wage Act (PWA), N.J.S.A. 48:2-29.47, a New Jersey statute that requires the payment of prevailing wages and benefits under the PWA to workers employed in the performance of any construction undertaken in connection with financial assistance provided by the Board. As such, Ocean Wind will pay prevailing wage to all workers, laborers and mechanics, apprentices, or helpers performing the public work. Ocean Wind is unique among developers as it serves as its own EPC contractor, managing the full construction of its projects. Therefore, Ocean Wind is able to manage and direct its work with unions

over the life of the project. By working closely with New Jersey trades, Ocean Wind will have a stable, skilled workforce for the construction of this and future Projects.

16.4.2 Training

Ocean Wind is committed to training and hiring a local workforce to build and operate the Project [REDACTED]

[REDACTED] Community involvement through workforce development is critical for Ocean Wind, allowing Project benefits to flow directly into the city and sustaining the Project's engagement in the region over the long-term.



Ocean Wind is planning to institute the Competitive Edge program established by Joseph Jingoli & Son, Inc. that has operated successfully in Atlantic City for several decades. Ocean Wind's embedded Competitive Edge program will focus on three specific aspects of workforce development critical for this new industry: (1) working with union partners to provide construction training opportunities for the local community, including people in recovery, (2) educating students who have a long-term interest in entering the offshore wind workforce and (3) establishing an apprenticeship program to train local residents with an immediate interest in joining the offshore wind industry.

During the construction phase, Ocean Wind will work with its New Jersey union partners to ensure that adequate safety and skills training takes place for all workers participating in the Project. As described in the Ørsted Master Plan (see the Executive Summary), Ørsted is on the steering committee of the Global Wind Organization (GWO). GWO members collaborate by sharing evidence and risk information which helps identify

Ørsted systematically collects data from its offshore wind farms to continuously improve environmental protection standards as well as the health and safety standards for employees.

work where the creation of standardized training can enhance safety for technicians and deliver productivity benefits. By complying with GWO standards and criteria, certified training providers are considered competent and proficient. Ørsted will use this expertise to ensure that all workers engaged in the Ocean Wind Project are appropriately trained to GWO standards, an Ørsted requirement to work on its projects offshore. Through its partnership with the unions, Ocean Wind will support workforce development initiatives such as providing training for trainers, sponsoring training initiatives on existing wind farms to transfer knowledge and skills to the new workforce and developing additional training courses with educational partners.

Ocean Wind is committed to engaging the local community to grow the workforce and will work with its union partners on community outreach. Specifically, Ocean Wind intends to work with Competitive Edge on engaging graduates from the Atlantic and Cape May County Recovery Court system to support construction training opportunities to people in recovery. Ocean Wind also intends to participate in Competitive Edge's Training to Hire program, a workforce initiative that partners with Friends in Action, an Atlantic-city based non-profit organization. Through this type of workforce development, Ocean Wind hopes to take advantage of the available potential workforce locally in the Atlantic City area.

Ocean Wind also intends to work with Jingoli Live Classroom to teach local students about clean energy and offshore wind. The program will prepare students for a career in offshore wind, training

local students on the fundamental skills needed to enter the industry and meeting with leaders in the company to learn about career opportunities.

During the operational phase of the Project, Ocean Wind will need a highly trained workforce. For its O&M workforce, Ocean Wind will work with local resources such as community and district leaders to identify local residents with the appropriate education who are interested in joining the offshore wind industry. Following the successful model established in the Competitive Edge Program, Ocean Wind will work with its educational partners to establish a combined classroom and on-site apprenticeship program that prepares workers for a career at Ocean Wind supporting its O&M activities.

Through these Competitive Edge initiatives aimed at developing a local workforce and using its experience in developing a highly-skilled workforce in other markets, Ocean Wind aims to benefit the project and the community by attracting local talent to the offshore wind industry. Ocean Wind's community involvement will help establish a large and diversified base of workers to support the Project and the new offshore wind industry in New Jersey [REDACTED]

16.5 Other offshore wind cluster-building programs

Guidelines for Application Submission for Proposed Offshore Wind Facilities; Board 2018. The Economic Development Plan should:

provide detail and a narrative description of the applicant's plan for investments in infrastructure, supply chain, workforce development, and other offshore wind cluster-building programs, and the associated economic benefits for the State.

provide context for the cost-benefit analysis, outline other expected economic development impacts not captured in the cost-benefit analysis (i.e., impacts that are difficult to quantify), and show how Ocean Wind and the Project plan can attain and deliver the economic benefits described in the application as required under N.J.A.C 14:8-6.5.

summarize the economic impacts of the proposed project over 20 years as noted in the project's Cost-Benefit Analysis with a focus on investments and impacts in five key areas of economic development: (a) blue-collar workforce development, (b) white-collar workforce development, (c) marshaling ports, (d) manufacturing ports, and (e) O&M ports.

Ocean Wind is committed to growing the offshore wind industry in New Jersey. This means not only delivering low cost clean energy and high economic value but also catalyzing an offshore wind cluster in the State.

16.5.1 Educational initiatives

Building an entirely new industry is necessarily a partnership between business, government and academia. Ocean Wind believes in funding and sharing collaborative research and development that supports the growth of the American offshore wind industry.

In addition to researching issues relevant to the offshore wind industry, it is vital to advance scientific research associated with the interactions between offshore wind and other uses of the marine environment. Relevant scientific research that is transparently shared can bring vital information that can help shape mutually beneficial policies. Ocean Wind has established partnerships with institutes of higher education to create mutually supportive programs, specifically Rutgers University, Stockton University, and Rowan University. Letters of support and MOUs describing these

partnerships are included as Attachment 16.2. They articulate the institutions' commitments to working with Ocean Wind, as all parties understand and agree on the benefits that offshore wind can bring to New Jersey. Rutgers University, Stockton University, and Rowan University all have a strong desire to bring cutting edge industry to their faculty, research programs, and students through a variety of opportunities with Ocean Wind.

These opportunities for engagement include:

Research initiatives with Rutgers University

- Through an open-access data collection and sharing program funded by the Board, Rutgers University has been collecting **offshore wind data** through their virtual meteorological tower network. Combined with the work they are doing with their network of submersible gliders, they have developed a world-class data resource right here in New Jersey. Ocean Wind has been engaging closely with the Rutgers meteorological team, including a two-day onsite workshop at the New Brunswick and Tuckerton campuses in October 2018. Data and information exchanges have been constant since that meeting and the collaboration is strong.
- An innovative program is also being explored with the marine science program in coordination with the Rutgers University glider team. Using special instrumentation on an offshore glider, **marine mammals** can be detected and therefore avoided during survey operations or offshore wind farm construction.
- Rutgers University has a strong connection to the **commercial fishing industry** through their full-time marine extension agent. The Ocean Wind team is exploring ways in which we can work collaboratively with the marine extension agent and others in the fisheries program to engage with the commercial fishing industry in the state.

Research initiatives with Stockton University

- Partnering with Stockton University is a natural fit for Ocean Wind. With its new **Atlantic City campus**, Stockton is a neighbor of the Ocean Wind's Atlantic City office, and has a front row seat to the development of this new industry. Stockton is currently working with Atlantic City to conduct a new Center for Marine and Environmental Science; Ørsted is a member of the Advisory Board helping to guide the Feasibility Study for the Center's development.
- Stockton has robust **coastal resources and stakeholder programs**. The Ocean Wind team is engaging with faculty and staff in both programs to understand where there are synergies for work together, including cooperative research programs and stakeholder engagement forums.

Partnerships with Rowan University

- Rowan University has a strong and vibrant history of workforce development and training students for the practical aspects of cutting-edge career opportunities. To that end, the Ocean Wind team has been working with Rowan to understand how Ocean Wind might leverage that commitment to engage Rowan's student body in offshore wind training programs, particularly around the engineering and technical aspects of offshore wind development.

- Rowan University's Engineering Clinics are well-known for helping forge partnerships with corporate partners who have pressing technical challenges that need the perspective of bright, young minds. In these Clinics, students are partnered with industry representatives who present a technical question and then work with students to develop innovative solutions. Ocean Wind looks forward to working with students in such Clinics.

Ocean Wind supports the concept that thought leaders in New Jersey need to understand the fundamentals of offshore wind to support the development of a true offshore wind industry community. To that end, Ocean Wind is providing financial support to help "train the trainers" at Rutgers, Stockton and Rowan Universities. Ocean Wind will enable faculty and staff to engage in professional development opportunities by providing resources to attend conferences and other educational initiatives to learn more about the Project and offshore wind in general. These educational engagements will grow the State's knowledge base, and ultimately support the sustainable, strategic growth of offshore wind in the State.

In addition, Ocean Wind is exploring ways to engage the student body through internships and guest lecture opportunities at universities in the State. Many students in New Jersey are already engaged in offshore wind research projects. Through its R&D program, Ocean Wind is providing feedback on projects and working to determine the appropriate places for engagement within Ocean Wind and Ørsted.

16.5.2 Offshore research & development

Rutgers has a robust meteorological and oceanographic monitoring program that has been ongoing for decades, with specific focus on ocean wind modeling due to support from the Board over the past decade. Ocean Wind is working with Rutgers to help validate the models it has developed using Ocean Wind's two ocean-deployed meteorological buoys that were deployed in mid-2018. By sharing the data collected from the buoys with Rutgers, they are able to validate the measurements they are getting from their meso-scale models and improve their forecasting and outputs.

In addition, Rutgers is a world-leader in real-time ocean observing and weather modeling through the deployment of their robust ocean glider fleet. These gliders are autonomous ocean-going instruments that can be outfitted with a variety of sensors to help answer some of the most pressing questions about ocean resources. Ocean Wind is engaging with Rutgers to use the glider network to help detect the presence of marine mammals in the area by using acoustic sensors on the gliders. It is important for the team to understand the location of marine mammals in and around the Lease area to help mitigate potential impacts to sensitive species.



Rutgers has a robust fish and fisheries program. Ocean Wind is working with the Rutgers team to engage with stakeholders and understand what types of projects would be most relevant to the commercial and recreational fishing community in the State.

16.5.3 Community engagement

Ocean Wind has fully embraced the concept of “early and often” community engagement. The project has developed a systematic and strategic approach to bringing the project to local communities for their feedback and input.

The key stakeholder groups include the coastal communities in Atlantic and Cape May counties. The Ocean Wind team has engaged numerous mayors and representatives in coastal communities including:

- Ocean City
- Upper Township
- Lacey Township
- Ocean Township
- Margate
- Longport
- Brigantine
- Atlantic City
- Avalon
- Stone Harbor
- Sea Isle City
- Cape May
- North Wildwood
- City of Wildwood
- Ventnor
- Wildwood Crest

To help demonstrate the relationships Ocean Wind has built in the State, the Project has provided letters of support from a variety of community groups including local coastal communities, universities, business organizations, environmental groups, and others (see Attachment 16.3).

Ocean Wind has been engaging in its home communities since acquiring the Lease in May of 2016. This includes participation in panels, networking events, conferences, symposiums, and receptions (Table 16-3 and Table 16-4). Through this engagement, Ocean Wind has become integrated into the communities in which it operates and contributes to educating the citizens of New Jersey on offshore wind and clean energy. This has been mutually beneficial, contributing to the Project's ability to develop efficiently and effectively in coastal communities and informing citizens about the State's clean energy goals and initiatives. Ocean Wind has contributed over \$100,000 to networking events since 2016 and over \$100,000 to memberships in local organizations. This has resulted in strong relationships between Atlantic City, surrounding areas, and the Project.

Table 16-3. Networking: sponsorships and conferences.

Year	Event	Organizer
2017	Investing in South Jersey... Where the Action Is 2017	NJ Alliance for Action
2017	Meet the Decision Makers - Board Commissioner	NJBIA
2017	Impact Symposium	NJBIA
2017	2017 Year-Long Sponsorship	Chamber of Commerce of Southern New Jersey
2017	Summer Clambake	Greater Atlantic City Chamber
2017	New Jersey League of Municipalities	New Jersey League of Municipalities
2018	Atlantic City Mayor Lunch	Chamber of Commerce of Southern New Jersey
2018	Legislative Reception	Chamber of Commerce of Southern New Jersey
2018	American Heart Association Heart Walk - South Jersey Gas	American Heart Association
2018	Utility and Energy Leadership Forum	Chamber of Commerce of Southern New Jersey
2018	Annual Sound Off for South Jersey	Southern New Jersey Development Council
2018	Atlantic City Airshow/NJ Friends of the Guard and Reserve	AC Chamber/NJ Friends of the Guard and Reserve
2018	American Fisheries Society Annual Conference	American Fisheries Society
2018	Dancing with Dolphins Annual Fundraiser	Marine Mammal Stranding Center
2018	2018 Year-Long sponsorship (multiple events)	CCSNJ
2018	Annual Meeting and Installation Dinner	Cape May County Chamber of Commerce
2018	Annual sponsorship	Sustainable Jersey
2018	Eagle Awards Dinner	NJ Alliance for Action
2018	Annual Bacharach Hospital Foundation Celebration	Bacharach Hospital Foundation
2018	Offshore Wind Roundtable	NJ Spotlight
2018	Coastal and Ocean Championship Awards	Urban Coast Institute
2018	NJEL Awards	NJ Environmental League
2018	The Wetlands Institute	The Wetlands Institute
2018	The New Jersey Corporate Wetlands Restoration Partnership (CWRP)	The New Jersey Corporate Wetlands Restoration Partnership (CWRP)

Year	Event	Organizer
2018	New Jersey League of Municipalities	New Jersey League of Municipalities

Table 16-4. Ocean Wind memberships.

Memberships
Southern New Jersey Development Council
Chamber of Commerce of Southern New Jersey
Greater Atlantic City Chamber of Commerce
New Jersey Energy Coalition
New Jersey Business & Industry Association
New Jersey Alliance for Action
Research & Development Council of New Jersey
Cape May County Chamber of Commerce
The Jersey Shore Partnership
New Jersey Corporate Wetlands Restoration Partnership

16.5.4 Ørsted Cares

Ocean Wind is working with New Jersey SHARES, Inc. (NJ SHARES) to develop “Ørsted Cares,” a grant program designed to provide assistance for Atlantic and Cape May County electric and gas utility customers who are in an emergent situation or facing imminent service termination and in need of immediate utility bill payment assistance. NJ SHARES is a nationally recognized 501(c)3 non-profit organization that provides assistance to individuals and families living in New Jersey who are in need of temporary help in paying their energy bills. NJ SHARES partners with over 250 human service agencies operating out of more than 300 sites statewide to provide critically needed energy assistance to families that are not eligible for other programs. Throughout the state, partners address a broad spectrum of needs. Providing case management services, they assist households with counseling, nutrition, housing, employment, as well as energy issues. Working together with our partner agencies we provide a holistic solution to the household's temporary or ongoing needs.

Ocean Wind applauds the excellent work of NJ SHARES in supporting those in need in the community. Ørsted Cares will build on this foundation to deliver support to electric and gas customers in need. Customers who qualify can submit basic information to NJ SHARES to receive monthly grants to cover the costs of their utility bills. Ocean Wind is proud to partner with NJ SHARES on this program and have included their letter of support for the Project in Attachment 16.3.

16.6 Environmental initiatives

Guidelines for Application Submission for Proposed Offshore Wind Facilities; Board 2018. The Economic Development Plan should:
provide detail and a narrative description of the applicant’s plan for investments in infrastructure, supply chain, workforce development, and other offshore wind cluster-building programs, and the associated economic benefits for the State.
provide context for the cost-benefit analysis, outline other expected economic development impacts not captured in the cost-benefit analysis (i.e., impacts that are difficult to quantify), and

show how Ocean Wind and the Project plan can attain and deliver the economic benefits described in the application as required under N.J.A.C 14:8-6.5.

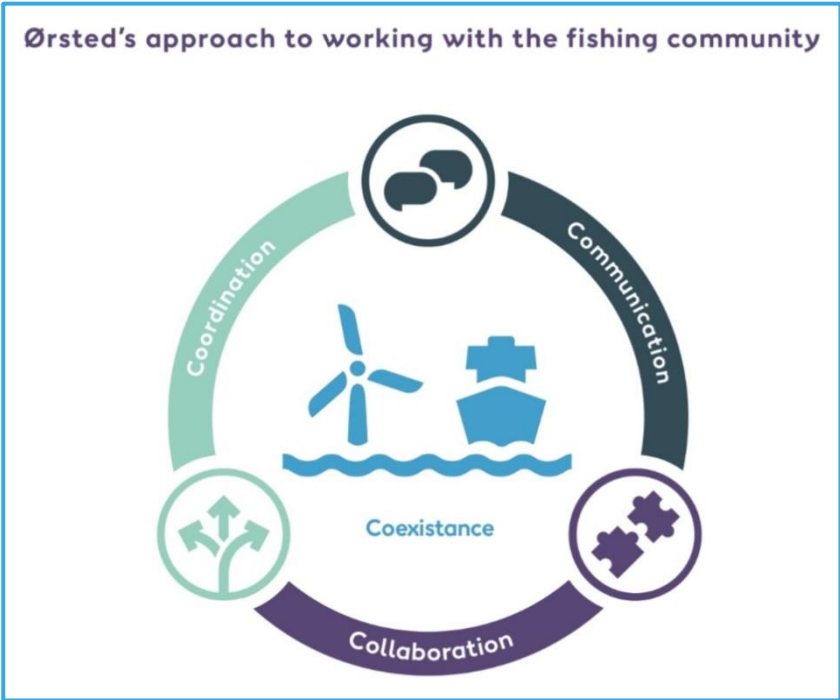
Ocean Wind is heavily invested in supporting New Jersey's environmental initiatives.

16.6.1 Fisheries engagement

The commercial and recreational fishing communities play a critical role in the cultural and economic fabric of New Jersey. New Jersey has a variety of ports where fish are landed, as well as a supply chain that depends on those fish landings like processors, coops, and ice houses. The commercial and recreational fishing industry representatives are critical stakeholder groups for Ocean Wind.

It is Ocean Wind's strong belief that commercial and recreational fishing can co-exist with offshore wind. Ørsted has designed, developed, built, and now operates 25 wind farms with active fishing communities around each of these 25 sites. Using the best management practices, including "early, often, and transparent communications," Ørsted has successfully co-existed with the fishing community in Europe and at the Block Island Wind Farm. Ocean Wind will bring that record of success to the fishing community in and around New Jersey. To this end, Ocean Wind has developed a "4 Cs Approach" to fishing engagement.

To date, the Ocean Wind team has had over 300 individual outreach engagements with fishermen based in New Jersey or who fish off the coast of the State. See Attachment 16.4 for a listing of those engagements. Though it is still relatively early in the Project's development cycle, the Ocean Wind team has been proactive in reaching out to commercial and recreational fishermen in New Jersey and surrounding regions.



Ocean Wind recognizes that fish are a regional resource. With the recent acceleration in changing water temperatures off the New Jersey coast, fishermen who are based in New Jersey are more frequently heading to waters further north and south to maintain the level of their fish catches. In response to this geographic expansion, Ocean Wind has reached outside of the State boundaries to engage stakeholders.

Ocean Wind has retained a New Jersey Fisheries Liaison who has over 35 years of experience as a commercial fisherman, and is actively participating in a variety of research initiatives with BOEM,

Rutgers University, the University of Delaware, Stonybrook University, and others. The expansion of the team will allow Ocean Wind to increase its fishing engagement as the Project develops.

16.6.2 Other environmental initiatives

Other environmental initiatives, and their benefits to the economy of the State of New Jersey are detailed in Section 15.4.

16.7 State grants and subsidies

Guidelines for Application Submission for Proposed Offshore Wind Facilities; Board 2018. The Economic Development Plan should:

- *any State grants or other subsidies from the New Jersey Economic Development Authority or other agencies associated with the proposed wind project that was included as part of the project cost-benefit analysis.*

The Project does not anticipate applying for or receiving any state grants or subsidies from the New Jersey Economic Development Authority or other agencies associated with the proposed wind project, and therefore has not included any subsidies in the cost-benefit analysis. Ocean Wind is actively encouraging its suppliers to take advantage of the many incentives which exist. Ocean Wind has commissioned an independent report, prepared by ██████████, on the State incentive programs to provide suppliers with independent professional advice. Ocean Wind is engaged in continuing discussions with EDA for the purpose of assisting members of Ørsted's supply chain in identifying sources of grants and subsidies.

16.8 Guaranteed local spending and job creation

Guidelines for Application Submission for Proposed Offshore Wind Facilities; Board 2018. The Economic Development Plan should:

- *propose consequences if claimed benefits do not materialize, and the employment impact may become conditions of any OREC award.*

16.8.1 Approach to Local Content

With this Application, Ørsted makes serious commitments to invest and create jobs in the State of New Jersey, which will establish New Jersey as an integral part of the emerging American offshore wind supply chain. In addition to the company's extensive experience developing a homegrown offshore wind supply chain in diverse European markets, documented throughout the application, Ørsted has demonstrated the ability to bring these commitments to fruition thanks to prior experience sourcing local content and investing in local infrastructure in Maryland for the Skipjack Wind Farm (SJWF). SJWF is required to demonstrate similar positive net economic benefits to the State of Maryland, including commitments to local job creation and specific levels of local investment. In addition, SJWF must make significant investments in the Maryland Offshore Wind Business Development Fund. Ørsted's ability to proactively build relationships with Maryland-based businesses is yielding results even in the early phases of the development period: as of November 2018, 68% of SJWF total capital expenditures have been spent in-state.

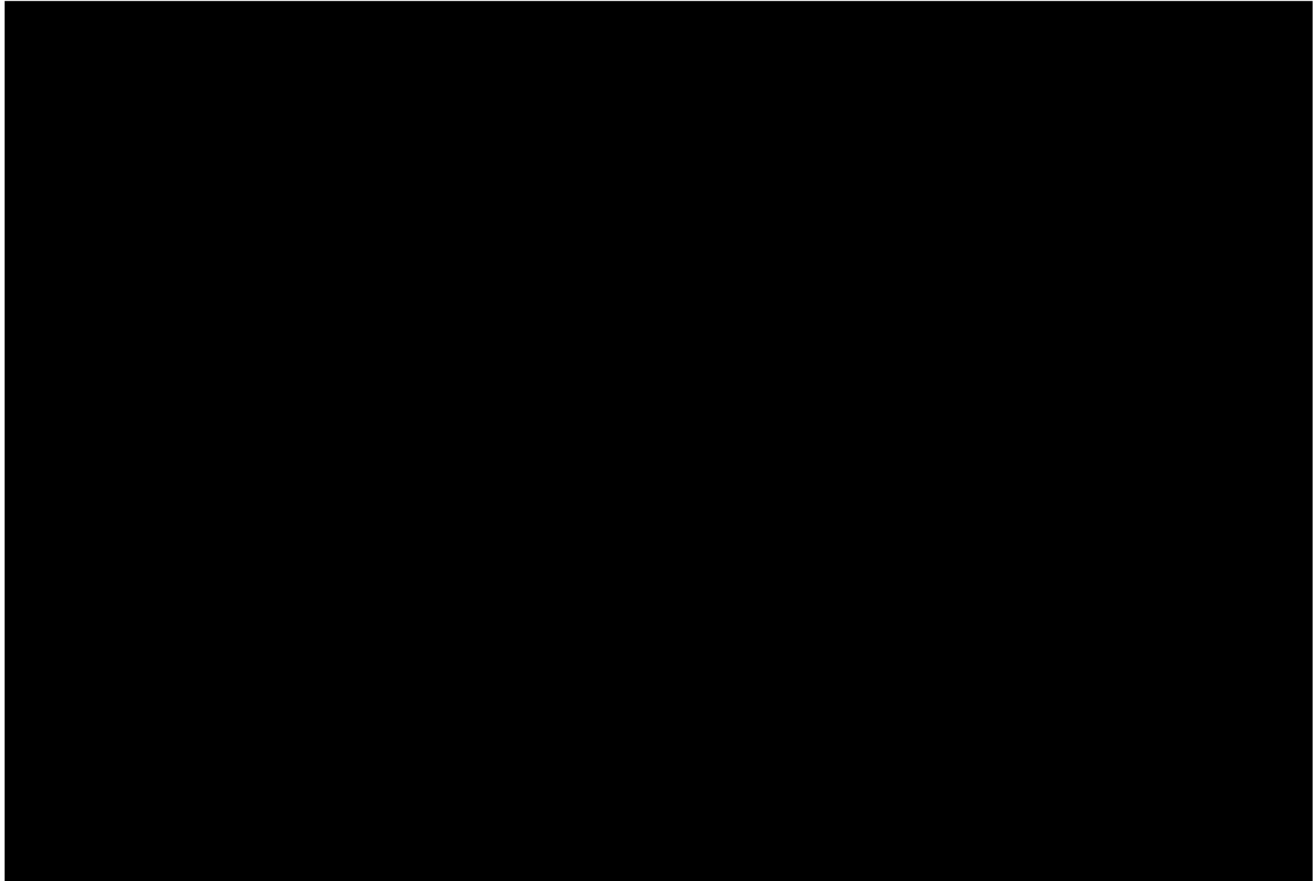
Since the inception of the SJWF project in 2016, Ørsted has developed and refined a system for tracking local content and job creation. This system is an asset which could be replicated for Ocean Wind and Ørsted is prepared to provide regular reports to the BPU summarizing progress toward

commitments. The Ørsted team is intimately familiar with achieving local content requirements and will bring valuable experience and best practices to the Project.

16.8.2 Summary of Local Content Guarantee

As detailed in Section 16.4, Orsted makes the following commitments in connection with this Application (Table 16-5).

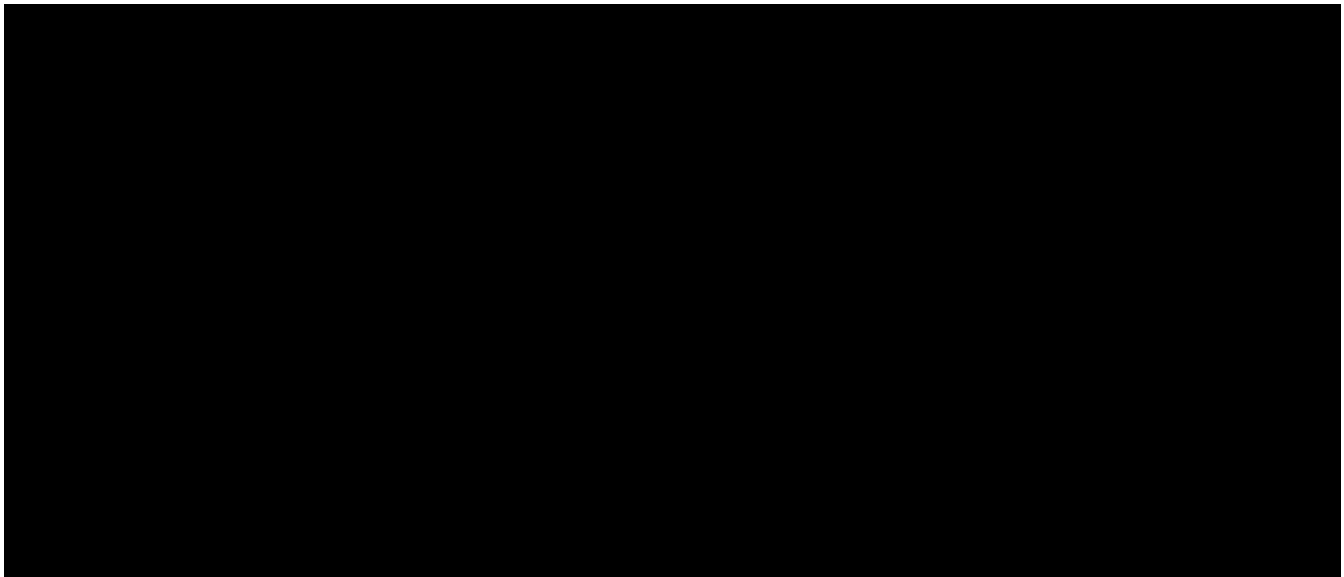
Table 16-5. Spending and Job Guarantees



16.8.3 Reconciliation of Expected and Guaranteed Economic Benefits

The development, construction, operation and maintenance activities of Ocean Wind is projected to translate into direct and secondary (indirect and induced) benefits in New Jersey.

- Direct benefits quantify the immediate effects of Orsted's capital investments in the state and jobs created directly by Orsted, through direct hire or contracting.
- Secondary benefits can be segmented into two types of impacts—Indirect and Induced.
 - Indirect benefits are broader supply chain effects generated through the expanded volume of local business transactions.
 - Induced impacts refer to activities that result from income spending by workers involved in the first two categories.



16.8.4 Measurement, Verification, and Reporting

The Applicant proposes the following definitions in order to ensure consistency and shared understanding, and is open to further discussions with the BPU to refine or revise these definitions as needed.

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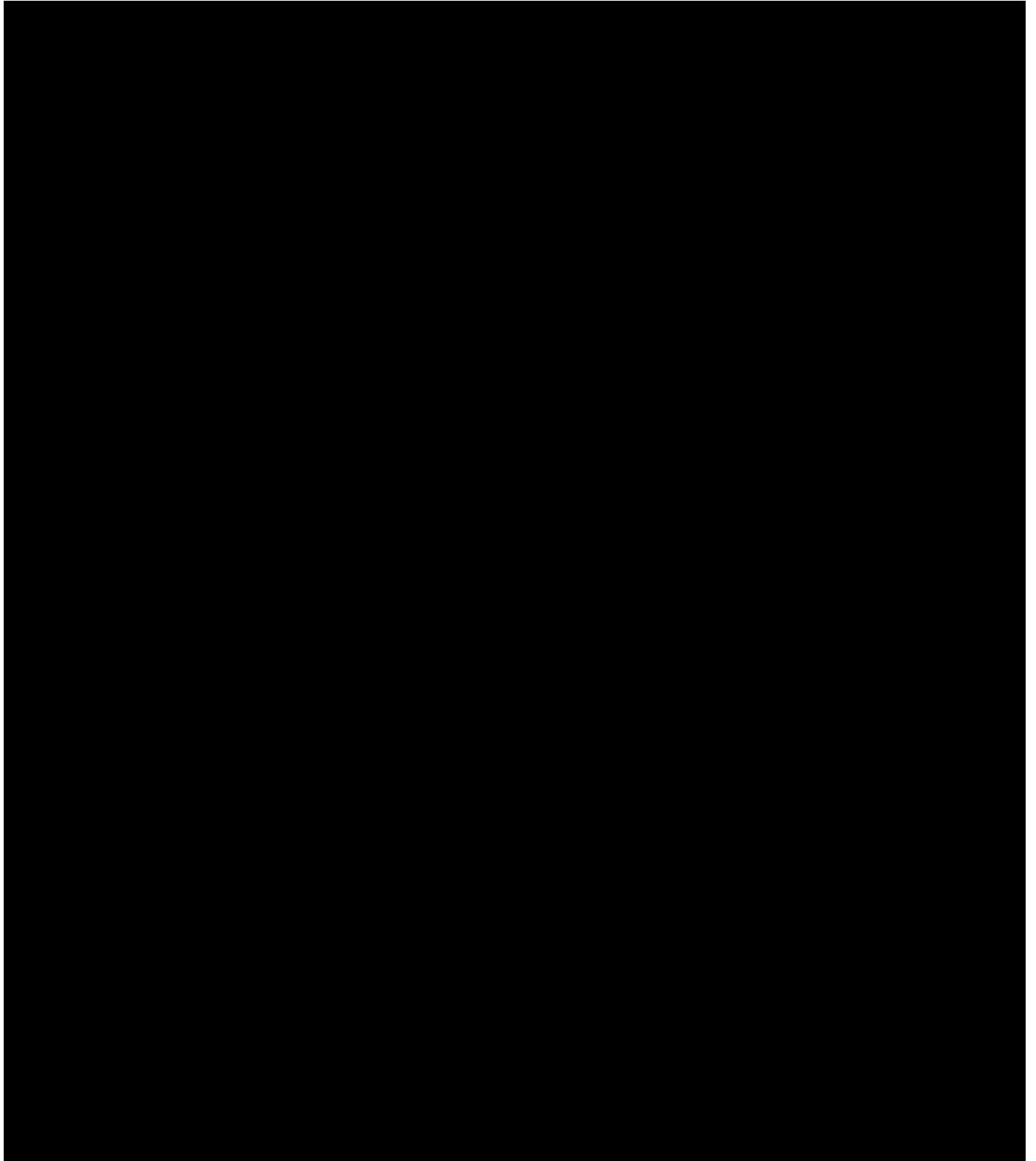
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16.8.5 Proposed Consequences

If the commitments outlined in this Application are not realized, Orsted is prepared to make additional contributions to the Pro-NJ Trust to support small businesses entering the offshore wind industry and the development of offshore wind infrastructure for these businesses.



4. It is anticipated that Pro-NJ Trust funds will be utilized to promote the goals set forth in the Economic Development Plan, as discussed in Section 16.4.

Economic development plan – Attachments

- Attachment 16.1 
- Attachment 16.2 Educational Institution Memoranda of Understanding
- Attachment 16.3 Letters of Support
- Attachment 16.4 Outreach Engagements

Attachment 16.1 – 

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Attachment 16.2 – Educational Institution Memoranda of Understanding

December 19, 2018

New Jersey Board of Public Utilities
44 S. Clinton Avenue
Trenton, NJ 08625

To Whom It May Concern:

The State of New Jersey has made significant commitments to the advancement of offshore wind to benefit New Jersey residents and ratepayers, and to further the advancement of renewable energy while doing its part to curb climate change. Governor Murphy's vision outlined in Executive Order #8 has laid out an ambitious, yet achievable, goal of 3.5 GW of installed offshore wind capacity for New Jersey by 2030, and Rutgers, The State University of New Jersey stands ready to support the State in this goal.

Rutgers has an established track record of academic achievement in a variety of areas related to offshore wind, and has conducted numerous research studies in collaboration with state agencies such as the Board of Public Utilities (BPU) and the Department of Environmental Protection. For instance, NJ BPU has supported the Rutgers University Center for Ocean Observing Leadership (RUCOOL) with funding over the past decade to advance offshore wind resource modeling of New Jersey's coastal waters, work which helped guide the designation of the existing NJ Wind Energy Areas and investigations into the more recent New York Bight call areas. Funding has also supported work at the Rutgers Edward J. Bloustein School of Planning and Public Policy to investigate grid integration and pricing issues for offshore wind and to further explore economic impacts. These are but a few of the many areas in which Rutgers has supported and continues to support State efforts to advance offshore wind.

As part of Rutgers' commitment to serve the State of New Jersey in its goal to advance offshore wind, Rutgers intends to collaborate with offshore wind developers to ensure the best science is used to develop offshore wind in a meaningful and responsible way. Possible areas of research include, but are not limited to, studies and projects to better inform stakeholders of both the benefits and challenges of offshore wind development, and to help make a successful industry flourish in New Jersey. Rutgers plans to utilize established criteria to evaluate potential partners to ensure that they have an established track record in offshore wind development, are making a serious commitment to projects and plans in NJ, and have research interests which align with the mission and goals of Rutgers.

Through these collaborations, Rutgers stands firm in its commitment to serve the State of New Jersey and help our state achieve its renewable energy goals, particularly in the development of a strong offshore wind industry that benefits all who make New Jersey their home or place of business.

We authorize Ocean Wind, LLC to include this letter in its application for an Offshore Renewable Energy Certificate to the NJ BPU.

Sincerely,



S. David Kimball, PhD

MEMORANDUM OF UNDERSTANDING

This Memorandum of Understanding (the “MOU”) is effective as of December 21, 2018 (the “Effective Date”), by and among Ocean Wind LLC, a Delaware limited liability company having a principal place of business at One International Place, 100 Oliver Street, Suite 2610, Boston, MA 02110 (“Ocean Wind”), and Stockton University, a public institution of higher education organized and existing under the laws of the State of New Jersey having a principal place of business at 101 Vera King Farris Drive, Galloway, NJ 08205 (the “University”). Ocean Wind and the University may each be referred to herein as a “Party” and together as the “Parties.”

RECITALS

WHEREAS, Ocean Wind holds U.S. Bureau of Ocean Energy Management (“BOEM”) Renewable Energy Lease No. OCS-A 0498, covering an area on the U.S. Outer Continental Shelf offshore New Jersey (the “Lease Area”), and Ocean Wind—itsself and through various Affiliates (as defined in Section 6.a, below)—is proposing to develop, construct, own, and operate an offshore wind generation facility in the Lease Area (the “Project”);

WHEREAS, the University offers degree programs in Marine, Environmental, Geological, and Biological Sciences that encompass study in Marine Biology and Oceanography through a number of field and laboratory courses, seminars, independent studies, internships and research opportunities, with a dedicated Marine Field Station that supports academic study and research in the New Jersey coastal area;

WHEREAS, the State of New Jersey, through its Offshore Wind Economic Development Act, N.J. Stat. 48:3-87 (“OWEDA”), has committed to procure 3.5 Gigawatts of offshore wind energy by 2030;

WHEREAS, the Parties agree that New Jersey would benefit from offshore wind energy procurement pursuant to OWEDA through the development of sustainable renewable energy sources, reduction in greenhouse-gas emissions associated with electricity production, increased reliability for the regional electric grid, and economic activity associated with manufacturing, design, permitting, construction, operation, and maintenance of offshore wind farms;

WHEREAS, the Parties agree that New Jersey is uniquely well-suited to foster the development of offshore wind energy, including by virtue of its institutes of higher education, which boast outstanding research capabilities and talented student bodies, particularly in engineering and other fields of study that are of significant relevance to offshore wind energy;

WHEREAS, the New Jersey Board of Public Utilities (the “BPU”) has—pursuant to OWEDA, the BPU’s regulations, N.J.A.C. § 14:8-6, and New Jersey Executive Order No. 8 dated January 31, 2018—issued an order opening a window until December 28, 2018 for applications by qualified offshore wind projects (“QOWPs”) for Offshore Renewable Energy Certificates (“ORECs”) associated with up to 1.1 Gigawatts of offshore wind energy; and

WHEREAS, Ocean Wind—itself and through various Affiliates—intends to submit one or more applications for approval of the Project as a QOWP entitled to ORECs associated with electric power generated by the Project and delivered to the electric transmission system in New Jersey by December 28, 2018 (collectively, the “OREC Applications”);

NOW, THEREFORE, in consideration of the mutual understanding, goals, and covenants set forth herein, the Parties, intending to be legally bound, agree as follows:

1. **Purpose.** The purpose of this MOU is to describe the Parties’ intentions as to the basis on which (I) Ocean Wind will support research and academic programs held by the University to develop collaborative research capabilities of faculty and students and (II) the University will contribute academic study and research to support the development, construction, operation and maintenance of the Project and offshore wind energy as a sustainable renewable energy source.
2. **Ocean Wind Obligations.**
 - a. **Initial Funding Obligation.** No later than thirty (30) days following the Effective Date, Ocean Wind or an Affiliate thereof shall make a financial contribution to the University through a single wire-transfer payment in the amount of \$25,000 (twenty-five thousand Dollars) (the “Initial Funding”).
 - b. **Contingent Funding Obligation.**
 - i. In the event that the BPU issues a final, non-appealable order that grants one of the OREC Applications (the “BPU Order”), Ocean Wind or an Affiliate thereof shall make a further financial contribution to the University in an amount agreed to by the Parties (the “Contingent Funding”) to provide funding for the scope of work defined and agreed to by the parties and set forth in an amendment to this MOU or in a separate written agreement (the “Contingent Agreement”) executed by the Parties within two hundred-forty (240) days after the date on which the BPU informs Ocean Wind that all of the OREC Applications are complete such that the 180-day period for BPU review of the OREC Applications has commenced in accordance with N.J.A.C. 14:8-6.3(c) (the “Deadline”); provided, however, that such Deadline shall be extended on a day-for-day basis for such additional period of time as is mutually agreed upon by (a) the BPU and Ocean Wind for review of the OREC Applications or (b) Ocean Wind and the University.
 - ii. The Contingent Funding shall be payable by wire transfer in multiple installments agreed to by the parties in the Contingent Agreement, the first such installment within thirty (30) days of the date of the later of: (a) the Contingent Agreement and (b) the BPU

Order, and the remaining installments on the first day of each month thereafter.

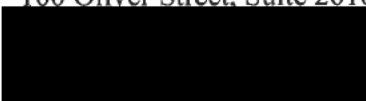
- c. **Other Contingent Obligations.** In the event a BPU Order is issued, Ocean Wind will collaborate in good faith with the University to develop and set forth in the Contingent Agreement mutually acceptable academic and/or research programs to support the development, construction, operation and maintenance of offshore wind energy as a sustainable renewable energy source. For the avoidance of doubt, Ocean Wind shall have no financial obligation to the University beyond the Initial Funding and the Contingent Funding.

3. University Obligations.

- a. **Receipt and Use of Funding.** The University shall:
 - i. acknowledge receipt of the Initial Funding and each installment of the Contingent Funding in writing or by email within three (3) business days of receipt; and
 - ii. use the Initial Funding and the Contingent Funding solely for paying direct costs of the undertakings to which the Parties may mutually agree in writing. Ocean Wind hereby agrees that the University may use the Initial Funding as the University deems necessary or appropriate to support initial review and development of academic and research programs related to offshore wind energy as a sustainable renewable energy source. The University shall have no obligation to refund to Ocean Wind the Initial Funding for any reason.
- b. **Contingent Obligations.** In the event a BPU Order is issued, the University will:
 - i. support Ocean Wind in the development of scopes of work, engagement with relevant university contacts, and other areas of technical support to advance agreed-upon research projects; and
 - ii. collaborate in good faith with the Ocean Wind to develop and set forth in the Contingent Agreement mutually acceptable academic and/or research programs to support the development, construction, operation and maintenance of offshore wind energy as a sustainable renewable energy source.

- 4. **Term and Termination.** This MOU shall commence on the Effective Date set forth above, and shall terminate upon the earlier of: (1) five (5) years from the Effective Date; or (2) written notice from Ocean Wind to the University that Ocean Wind and its Affiliates have failed to obtain a BPU Order pursuant to the OREC Applications.

5. **Amendment.** This MOU may be modified, amended, or supplemented only by written agreement making specific reference hereto executed by the Parties.
6. **Affiliates.** As used herein:
- a. the term "Affiliate" shall mean any Person (as defined below) that controls, is controlled by, or is under common control with a Party, but only for so long as such control, directly or indirectly, meets the following definition. For purposes of this definition, "control" shall mean ownership or control, directly or indirectly, of at least fifty percent (50%) of the shares having voting rights, or other equivalent rights of the subject entity entitled to vote. Notwithstanding anything in the foregoing to the contrary, in the case of Orsted, "Affiliate" shall exclude (I) the Danish government or any member or instrumentality thereof, and (II) any Persons controlled by the Danish government or any member or instrumentality thereof other than Ørsted A/S and the Persons that it directly or indirectly controls; and
 - b. the term "Person" shall mean any natural person, firm, individual, corporation, trust, joint venture, association, company, limited liability company, partnership or other organization or entity, whether incorporated or unincorporated, or any governmental entity.
7. **Notices.** All notices and other communications given or made pursuant to this MOU shall be in writing and shall be deemed effectively given upon the earlier of actual receipt or (I) personal delivery to the Party to be notified, (II) if sent by electronic mail, when the recipient has confirmed receipt by reply electronic mail, or (III) three (3) business days after deposit with an internationally recognized express courier, freight prepaid, specifying next business day delivery, with written verification of receipt. All communications shall be sent to the respective Parties at their address or electronic mail address as set forth below, or to such other address or electronic mail address as subsequently modified by written notice given in accordance with this Article 7.
- a. If to Ocean Wind:

Ocean Wind LLC
c/o Orsted North America Inc.
One International Place
100 Oliver Street, Suite 2610

- with a copy (which shall not constitute notice) to:
- Orsted North America Inc.
One International Place
100 Oliver Street, Suite 2610

Attention: Senior Legal Counsel

b. If to University:

Stockton University
101 Vera King Farris Drive
Galloway, NJ 08205
Attention: Peter F. Straub, PhD, Dean, Natural Sciences and Mathematics
Email: peter.straub@stockton.edu

with a copy (which shall not constitute notice) to:

Stockton University
101 Vera King Farris Drive
Galloway, NJ 08205
Attention: Office of General Counsel
Email: legaldepartment@stockton.edu

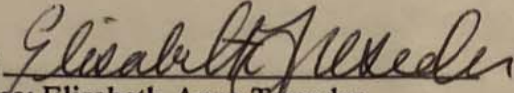
8. **Legal Effect.** Except as expressly set forth in this MOU or any other agreement into which the Parties may enter in the future, no past or future action, course of conduct, or failure to act relating to the Project or the OREC Applications (including, without limitation, oral statements or understandings, handshakes, reliance and changes of position), shall give rise to or serve as a basis for any obligation or other liability, on the part of the Parties, or any of their respective Affiliates. No Party makes any representations or warranties. IN NO EVENT SHALL ANY PARTY BE LIABLE TO THE OTHER PARTY FOR ANY PUNITIVE, EXEMPLARY, INDIRECT, INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF OR IN ANY MANNER RELATED TO THIS MOU, IRRESPECTIVE OF THE CAUSE OR NEGLIGENCE OF ANY PARTY HERETO.
9. **No Partnership or Joint Venture.** By execution of this MOU, the Parties are not creating any partnership, joint venture, agency, or fiduciary obligations among or between the Parties. Rather, the Parties shall be independent contractors, and no Party shall have any power to bind any other Party for any purpose. Nothing contained in this MOU shall be construed to constitute any Party as the agent, attorney in fact, or partner of any other Party.
10. **Governing Law; Venue.** This MOU shall be governed by, and construed in accordance with, the laws of the State of New Jersey, determined without reference to principles of conflicts of law. All proceedings with respect to this MOU or any other dispute between the Parties hereto shall be brought in federal or state court within the State of New Jersey, and the Parties consent both to the personal and subject matter jurisdiction of any such court.
11. **Entire Agreement.** This MOU constitutes the entire agreement between the Parties hereto relating to the subject matter hereof. All prior or contemporaneous

agreements or understandings between the Parties, whether oral or written, are superseded by and merged into this MOU. This MOU may be executed in any number of counterparts (including by facsimile or .pdf transmission), each of which will be deemed an original, but all of which together will constitute one and the same instrument.

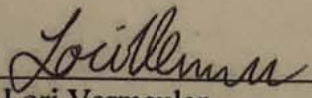
- 12. Waiver.** No delay on the part of any Party in exercising any right, power, or privilege hereunder will operate as a waiver thereof, nor will any waiver on the part of any Party of any right, power or privilege hereunder operate as a waiver of any other right, power, or privilege hereunder, nor will any single or partial exercise of any right, power, or privilege hereunder preclude any other or further exercise thereof or the exercise of any other right, power, or privilege hereunder. No waiver by any Party shall be effective unless it is evidenced by a written agreement making specific reference hereto executed by the Party granting such waiver.
- 13. Costs.** All costs and expenses incurred by a Party or any of its Affiliates in connection with this MOU, or with the negotiations or communications pursuant thereto, shall be borne solely by the Party or its Affiliate or Affiliates that incurred such costs or expenses, unless otherwise expressly agreed to by the Parties in a separate, later written agreement.
- 14. Assignment.** This MOU shall inure to the benefit of and be binding upon the Parties' respective successors and permitted assigns. No Party shall assign any of its rights or obligations under this MOU to any Person without the prior written consent of the other Party, which consent may be withheld at the discretion each of the non-assigning Party.
- 15. No Third-Party Beneficiaries.** Nothing in this MOU is intended or shall be construed to confer any rights or remedies on any Person other than the Parties and their respective successors and permitted assigns.

IN WITNESS WHEREOF, the Parties hereto, by their duly authorized representatives, have executed this MOU as of the Effective Date.

Ocean Wind LLC

By: 
Name: Elisabeth-Anne Treseder
Title: Senior Policy Advisor, North America
Orsted North America Inc. (sole member
of Ocean Wind LLC)

Stockton University

By: 
Name: Lori Vermeulen
Title: Provost and Vice-President for Academic Affairs

MEMORANDUM OF UNDERSTANDING

This Memorandum of Understanding (the “MOU”) is effective as of December 21, 2018 (the “Effective Date”), by and among Ocean Wind LLC, a Delaware limited liability company having a principal place of business at One International Place, 100 Oliver Street, Suite 2610, Boston, MA 02110 (“Ocean Wind”), and Stockton University, a public institution of higher education organized and existing under the laws of the State of New Jersey having a principal place of business at 101 Vera King Farris Drive, Galloway, NJ 08205 (the “University”). Ocean Wind and the University may each be referred to herein as a “Party” and together as the “Parties.”

RECITALS

WHEREAS, Ocean Wind holds U.S. Bureau of Ocean Energy Management (“BOEM”) Renewable Energy Lease No. OCS-A 0498, covering an area on the U.S. Outer Continental Shelf offshore New Jersey (the “Lease Area”), and Ocean Wind—itsself and through various Affiliates (as defined in Section 6.a, below)—is proposing to develop, construct, own, and operate an offshore wind generation facility in the Lease Area (the “Project”);

WHEREAS, the University offers degree programs in Marine, Environmental, Geological, and Biological Sciences that encompass study in Marine Biology and Oceanography through a number of field and laboratory courses, seminars, independent studies, internships and research opportunities, with a dedicated Marine Field Station that supports academic study and research in the New Jersey coastal area;

WHEREAS, the State of New Jersey, through its Offshore Wind Economic Development Act, N.J. Stat. 48:3-87 (“OWEDA”), has committed to procure 3.5 Gigawatts of offshore wind energy by 2030;

WHEREAS, the Parties agree that New Jersey would benefit from offshore wind energy procurement pursuant to OWEDA through the development of sustainable renewable energy sources, reduction in greenhouse-gas emissions associated with electricity production, increased reliability for the regional electric grid, and economic activity associated with manufacturing, design, permitting, construction, operation, and maintenance of offshore wind farms;

WHEREAS, the Parties agree that New Jersey is uniquely well-suited to foster the development of offshore wind energy, including by virtue of its institutes of higher education, which boast outstanding research capabilities and talented student bodies, particularly in engineering and other fields of study that are of significant relevance to offshore wind energy;

WHEREAS, the New Jersey Board of Public Utilities (the “BPU”) has—pursuant to OWEDA, the BPU’s regulations, N.J.A.C. § 14:8-6, and New Jersey Executive Order No. 8 dated January 31, 2018—issued an order opening a window until December 28, 2018 for applications by qualified offshore wind projects (“QOWPs”) for Offshore Renewable Energy Certificates (“ORECs”) associated with up to 1.1 Gigawatts of offshore wind energy; and

WHEREAS, Ocean Wind—itself and through various Affiliates—intends to submit one or more applications for approval of the Project as a QOWP entitled to ORECs associated with electric power generated by the Project and delivered to the electric transmission system in New Jersey by December 28, 2018 (collectively, the “OREC Applications”);

NOW, THEREFORE, in consideration of the mutual understanding, goals, and covenants set forth herein, the Parties, intending to be legally bound, agree as follows:

1. **Purpose.** The purpose of this MOU is to describe the Parties’ intentions as to the basis on which (I) Ocean Wind will support research and academic programs held by the University to develop collaborative research capabilities of faculty and students and (II) the University will contribute academic study and research to support the development, construction, operation and maintenance of the Project and offshore wind energy as a sustainable renewable energy source.
2. **Ocean Wind Obligations.**
 - a. **Initial Funding Obligation.** No later than thirty (30) days following the Effective Date, Ocean Wind or an Affiliate thereof shall make a financial contribution to the University through a single wire-transfer payment in the amount of \$25,000 (twenty-five thousand Dollars) (the “Initial Funding”).
 - b. **Contingent Funding Obligation.**
 - i. In the event that the BPU issues a final, non-appealable order that grants one of the OREC Applications (the “BPU Order”), Ocean Wind or an Affiliate thereof shall make a further financial contribution to the University in an amount agreed to by the Parties (the “Contingent Funding”) to provide funding for the scope of work defined and agreed to by the parties and set forth in an amendment to this MOU or in a separate written agreement (the “Contingent Agreement”) executed by the Parties within two hundred-forty (240) days after the date on which the BPU informs Ocean Wind that all of the OREC Applications are complete such that the 180-day period for BPU review of the OREC Applications has commenced in accordance with N.J.A.C. 14:8-6.3(c) (the “Deadline”); provided, however, that such Deadline shall be extended on a day-for-day basis for such additional period of time as is mutually agreed upon by (a) the BPU and Ocean Wind for review of the OREC Applications or (b) Ocean Wind and the University.
 - ii. The Contingent Funding shall be payable by wire transfer in multiple installments agreed to by the parties in the Contingent Agreement, the first such installment within thirty (30) days of the date of the later of: (a) the Contingent Agreement and (b) the BPU

Order, and the remaining installments on the first day of each month thereafter.


- c. **Other Contingent Obligations.** In the event a BPU Order is issued, Ocean Wind will collaborate in good faith with the University to develop and set forth in the Contingent Agreement mutually acceptable academic and/or research programs to support the development, construction, operation and maintenance of offshore wind energy as a sustainable renewable energy source. For the avoidance of doubt, Ocean Wind shall have no financial obligation to the University beyond the Initial Funding and the Contingent Funding.

3. University Obligations.

- a. **Receipt and Use of Funding.** The University shall:
 - i. acknowledge receipt of the Initial Funding and each installment of the Contingent Funding in writing or by email within three (3) business days of receipt; and
 - ii. use the Initial Funding and the Contingent Funding solely for paying direct costs of the undertakings to which the Parties may mutually agree in writing. Ocean Wind hereby agrees that the University may use the Initial Funding as the University deems necessary or appropriate to support initial review and development of academic and research programs related to offshore wind energy as a sustainable renewable energy source. The University shall have no obligation to refund to Ocean Wind the Initial Funding for any reason.
- b. **Contingent Obligations.** In the event a BPU Order is issued, the University will:
 - i. support Ocean Wind in the development of scopes of work, engagement with relevant university contacts, and other areas of technical support to advance agreed-upon research projects; and
 - ii. collaborate in good faith with the Ocean Wind to develop and set forth in the Contingent Agreement mutually acceptable academic and/or research programs to support the development, construction, operation and maintenance of offshore wind energy as a sustainable renewable energy source.

- 4. **Term and Termination.** This MOU shall commence on the Effective Date set forth above, and shall terminate upon the earlier of: (1) five (5) years from the Effective Date; or (2) written notice from Ocean Wind to the University that Ocean Wind and its Affiliates have failed to obtain a BPU Order pursuant to the OREC Applications.

5. **Amendment.** This MOU may be modified, amended, or supplemented only by written agreement making specific reference hereto executed by the Parties.
6. **Affiliates.** As used herein:
- a. the term "Affiliate" shall mean any Person (as defined below) that controls, is controlled by, or is under common control with a Party, but only for so long as such control, directly or indirectly, meets the following definition. For purposes of this definition, "control" shall mean ownership or control, directly or indirectly, of at least fifty percent (50%) of the shares having voting rights, or other equivalent rights of the subject entity entitled to vote. Notwithstanding anything in the foregoing to the contrary, in the case of Orsted, "Affiliate" shall exclude (I) the Danish government or any member or instrumentality thereof, and (II) any Persons controlled by the Danish government or any member or instrumentality thereof other than Ørsted A/S and the Persons that it directly or indirectly controls; and
 - b. the term "Person" shall mean any natural person, firm, individual, corporation, trust, joint venture, association, company, limited liability company, partnership or other organization or entity, whether incorporated or unincorporated, or any governmental entity.
7. **Notices.** All notices and other communications given or made pursuant to this MOU shall be in writing and shall be deemed effectively given upon the earlier of actual receipt or (I) personal delivery to the Party to be notified, (II) if sent by electronic mail, when the recipient has confirmed receipt by reply electronic mail, or (III) three (3) business days after deposit with an internationally recognized express courier, freight prepaid, specifying next business day delivery, with written verification of receipt. All communications shall be sent to the respective Parties at their address or electronic mail address as set forth below, or to such other address or electronic mail address as subsequently modified by written notice given in accordance with this Article 7.
- a. If to Ocean Wind:

Ocean Wind LLC
c/o Orsted North America Inc.
One International Place
100 Oliver Street, Suite 2610

- with a copy (which shall not constitute notice) to:
- Orsted North America Inc.
One International Place
100 Oliver Street, Suite 2610

Attention: Senior Legal Counsel
[REDACTED]

b. If to University:

Stockton University
101 Vera King Farris Drive
Galloway, NJ 08205
Attention: Peter F. Straub, PhD, Dean, Natural Sciences and Mathematics
Email: peter.straub@stockton.edu

with a copy (which shall not constitute notice) to:

Stockton University
101 Vera King Farris Drive
Galloway, NJ 08205
Attention: Office of General Counsel
Email: legaldepartment@stockton.edu

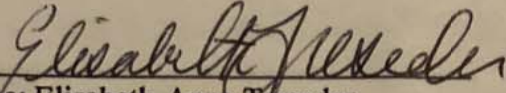
8. **Legal Effect.** Except as expressly set forth in this MOU or any other agreement into which the Parties may enter in the future, no past or future action, course of conduct, or failure to act relating to the Project or the OREC Applications (including, without limitation, oral statements or understandings, handshakes, reliance and changes of position), shall give rise to or serve as a basis for any obligation or other liability, on the part of the Parties, or any of their respective Affiliates. No Party makes any representations or warranties. IN NO EVENT SHALL ANY PARTY BE LIABLE TO THE OTHER PARTY FOR ANY PUNITIVE, EXEMPLARY, INDIRECT, INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF OR IN ANY MANNER RELATED TO THIS MOU, IRRESPECTIVE OF THE CAUSE OR NEGLIGENCE OF ANY PARTY HERETO.
9. **No Partnership or Joint Venture.** By execution of this MOU, the Parties are not creating any partnership, joint venture, agency, or fiduciary obligations among or between the Parties. Rather, the Parties shall be independent contractors, and no Party shall have any power to bind any other Party for any purpose. Nothing contained in this MOU shall be construed to constitute any Party as the agent, attorney in fact, or partner of any other Party.
10. **Governing Law; Venue.** This MOU shall be governed by, and construed in accordance with, the laws of the State of New Jersey, determined without reference to principles of conflicts of law. All proceedings with respect to this MOU or any other dispute between the Parties hereto shall be brought in federal or state court within the State of New Jersey, and the Parties consent both to the personal and subject matter jurisdiction of any such court.
11. **Entire Agreement.** This MOU constitutes the entire agreement between the Parties hereto relating to the subject matter hereof. All prior or contemporaneous

agreements or understandings between the Parties, whether oral or written, are superseded by and merged into this MOU. This MOU may be executed in any number of counterparts (including by facsimile or .pdf transmission), each of which will be deemed an original, but all of which together will constitute one and the same instrument.

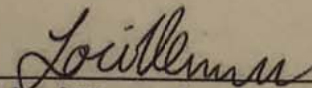
12. **Waiver.** No delay on the part of any Party in exercising any right, power, or privilege hereunder will operate as a waiver thereof, nor will any waiver on the part of any Party of any right, power or privilege hereunder operate as a waiver of any other right, power, or privilege hereunder, nor will any single or partial exercise of any right, power, or privilege hereunder preclude any other or further exercise thereof or the exercise of any other right, power, or privilege hereunder. No waiver by any Party shall be effective unless it is evidenced by a written agreement making specific reference hereto executed by the Party granting such waiver.
13. **Costs.** All costs and expenses incurred by a Party or any of its Affiliates in connection with this MOU, or with the negotiations or communications pursuant thereto, shall be borne solely by the Party or its Affiliate or Affiliates that incurred such costs or expenses, unless otherwise expressly agreed to by the Parties in a separate, later written agreement.
14. **Assignment.** This MOU shall inure to the benefit of and be binding upon the Parties' respective successors and permitted assigns. No Party shall assign any of its rights or obligations under this MOU to any Person without the prior written consent of the other Party, which consent may be withheld at the discretion each of the non-assigning Party.
15. **No Third-Party Beneficiaries.** Nothing in this MOU is intended or shall be construed to confer any rights or remedies on any Person other than the Parties and their respective successors and permitted assigns.

IN WITNESS WHEREOF, the Parties hereto, by their duly authorized representatives, have executed this MOU as of the Effective Date.

Ocean Wind LLC

By: 
Name: Elisabeth-Anne Treseder
Title: Senior Policy Advisor, North America
Orsted North America Inc. (sole member
of Ocean Wind LLC)

Stockton University

By: 
Name: Lori Vermeulen
Title: Provost and Vice-President for Academic Affairs

Attachment 16.3 – Letters of Support



BOROUGH OF AVALON

3100 DUNE DRIVE
AVALON, NEW JERSEY 08202

MARTIN L. PAGLIUGH
MAYOR

TELEPHONE: (609) 967-8200
FAX: (609) 368-1642

November 30, 2018

Mr. Thomas Brostrom
CEO, Orsted U.S. Offshore Wind
One International Place
Boston, MA 02110

Dear Mr. Brostrom,

The Borough of Avalon is a barrier island community in Cape May County, New Jersey. As Mayor of Avalon, I am pleased to provide a letter of support for Orsted's Ocean Wind Project to the New Jersey Board of Public Utilities in response to its solicitation for offshore wind and energy proposals. The procurement of up to 1,100MW of offshore wind energy will help serve the State with clean energy while fostering a new industry that will create opportunities for jobs and economic development.

By building a utility-scale wind farm, like ones built by Orsted in Europe, New Jersey will gain the attention of manufacturers who will likely establish facilities in the Garden State. In addition to workforce training and economic opportunities, Orsted will be able to work side by side with world-class colleges and universities in the development of offshore wind opportunities in New Jersey. Our state may become one of the first states in the nation to focus on, and deliver, this new source of renewable energy to its residents.

Thank you for allowing the Borough of Avalon the opportunity to express our support of Orsted's Ocean Wind Project which will help bring the power of offshore wind to New Jersey.

Sincerely,

Martin L. Pagliugi
Mayor
Avalon, New Jersey



December 3, 2018

Thomas Brostrom
CEO, Ørsted U.S. Offshore Wind
One International Place
Suite 2610
Boston, MA 02110

Dear Mr. Brostrom,

It was a pleasure meeting with you and your Boston and New Jersey team during your recent visit to Atlantic City. I enthusiastically provide you with this correspondence in support of Ørsted's Ocean Wind Project to the New Jersey Board of Public Utilities "BPU" in response to the BPU solicitation for offshore wind energy proposals.

Devco is a state-wide non-profit developer with an anticipated \$500 million in the ground in 2019 and a pipeline of over \$1 billion in projects in predevelopment, we appreciate the impact of 1,100 MW of offshore wind energy could have on the state of New Jersey. This offshore project will not only provide the state with clean energy but will foster new design, manufacturing and construction opportunities that will jump start economic development, and create new jobs and more importantly careers across South Jersey and the region.

New Jersey's oceanic and coastal conditions present the ideal opportunity for the development of offshore wind. The states growing demand for power, the decommissioning of nuclear power plants, and ambitious energy goals give New Jersey a unique opportunity to be at the forefront of this industry. With construction of a utility scale wind farm, similar to those Ørsted has developed in Europe, New Jersey will be well positioned to attract manufacturers who will be incentivized to establish facilities to support this next generation industry.

Devco is the master developer of two groundbreaking initiatives that are focused on growing the innovation economy in New Jersey. The Hub project in New Brunswick and SciTech Scity in Jersey City are seeking to develop innovative ecosystems that incubates new technology in partnership with academic research and establish tech and bio tech companies to accelerate innovation and bring new products to market that will create jobs and grow the economy. It is anticipated that these development initiatives will include partnerships with Rutgers University, Princeton University, NJIT, Stevens Institute of Technology, and a number of national and international research institutions. The Hub and SciTech Scity will provide Ørsted with the platform to engage with academic research institutions to refine and expand their technology here in the state.

I look forward to working with you and am grateful for the opportunity to express my support. Please let me know how we can be of further assistance.

Sincerely,

Christopher J. Paladino



Atlantic County

DL-271-18

Executive Office

Dennis Levinson
County Executive

609/343-2201 FAX: 343-2194
TDD: 348-5551

December 6, 2018

Thomas Brostrøm
CEO, Ørsted U.S. Offshore Wind
One International Place
Suite 2610
Boston, MA 02110

Dear Mr. Brostrøm:

I am pleased to provide this letter of support for Ørsted's Ocean Wind project in response to the New Jersey Board of Public Utilities solicitation for offshore wind energy proposals. The procurement of up to 1,100 MW of offshore wind energy will help serve the state with clean energy while fostering a new industry that will create opportunities for jobs and economic development.

New Jersey's coastline offers steady wind speeds and shallow sea beds, presenting ideal conditions for the development of offshore wind. These assets coupled with the state's large demand for power and ambitious energy goals give New Jersey a unique opportunity to host a new industry and attract the offshore wind supply chain.

By building a utility-scale wind farm, like the ones built in Europe by Ørsted, New Jersey will gain the attention of manufacturers who will likely establish facilities here to support this growing industry. The training and hiring of a local workforce will follow.

In addition to workforce training and economic opportunities, Ørsted will call upon, support and work side-by-side with New Jersey's world-class colleges and universities in the development of offshore wind along our coast.

Ørsted has significant experience in building large, cost-effective offshore wind farms throughout Europe. It is that utility-scale development which will allow New Jersey to be among the first states in the nation to focus on and deliver this new source of renewable energy to its residents.

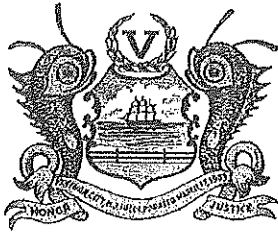
As county executive, I support Ørsted's Ocean Wind project and its efforts to bring the power of offshore wind to New Jersey.

Sincerely,

A handwritten signature in black ink that reads "Dennis Levinson".

Dennis Levinson
County Executive



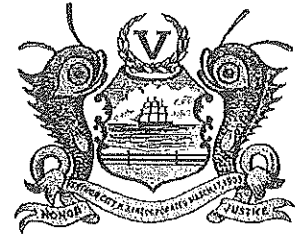


Commissioner
Lance B Landgraf Jr.

City of Ventnor City

City Hall
6201 Atlantic Avenue
Ventnor City, New Jersey 08406

Mayor
Beth Holtzman



Commissioner
Tim Kriebel

December 1, 2018

Thomas Brostrøm
CEO, Ørsted U.S. Offshore Wind
One International Place
Suite 2610
Boston, MA 02110

Dear Mr. Brostrøm:

On behalf of City of Ventnor, I am pleased to provide a letter of support for Ørsted's Ocean Wind Project to the New Jersey Board of Public Utilities in response to its solicitation for offshore wind energy proposals. The procurement of up to 1,100 MW of offshore wind energy will help serve the state with clean energy while fostering a new industry that will create opportunities for jobs and economic development.

New Jersey's coastline offers steady wind speeds and shallow sea beds, presenting ideal conditions for the development of offshore wind. These assets coupled with the state's large demand for power and ambitious energy goals give New Jersey a unique opportunity to host a new industry, ripe with opportunities, which includes attracting the offshore wind supply chain, here. By building a utility-scale wind farm, like the ones built by Ørsted in Europe, New Jersey will gain the attention of manufacturers who will likely establish facilities here to support this growing industry. The training and hiring of a local workforce will follow.

In addition to workforce training and economic opportunities, Ørsted will call upon, support and work side-by-side with New Jersey's world-class colleges and universities in the development of offshore wind here.

Ørsted has significant experience in building large, cost-effective offshore wind farms throughout Europe and it is that utility-scale development that will allow New Jersey to be among the first states in the nation to focus on and deliver this new source of renewable energy to its residents.

Thank you for allowing me/us the opportunity to express my/our support of Orsted's Ocean Wind project which will help bring the power of offshore wind to New Jersey.

Sincerely,

A handwritten signature in cursive script that reads "Beth Holtzman". The signature is written in black ink and is positioned to the right of the typed name.

Beth Holtzman
Mayor



Borough of Longport

Dr. Nicholas M. Russo, Ed.D.
Mayor

James P. Leeds, Sr.
Commissioner

Daniel J. Lawler
Commissioner

December 6, 2018

Thomas Brostrøm
CEO, Ørsted U.S. Offshore Wind
One International Place
Suite 2610
Boston, MA 02110

Dear Mr. Brostrøm:

On behalf of the Borough of Longport, I am pleased to provide a letter of support for Ørsted's Ocean Wind Project to the New Jersey Board of Public Utilities in response to its solicitation for offshore wind energy proposals. This appears to be a worthwhile initiative.

There appears to be a clear correlation between the increased use of fossil fuels and global warming. Wind power provides a safe, clean alternative to this type of energy, thus reducing the negative effects upon the environment and the health of all.

In addition to workforce training and economic opportunities, Ørsted will call upon, support and work side-by-side with New Jersey's world-class colleges and universities in the development of offshore wind here.

It is my understanding that Ørsted has significant experience in building large, cost-effective offshore wind farms throughout Europe. I am hoping that the same product is produced in the United States.

Thank you for allowing me the opportunity to express my support of Ørsted's Ocean Wind project which will help bring the power of offshore wind to New Jersey.

Sincerely,

Nick Russo, Ed. D

Mayor, Borough of Longport



MICHAEL S. BECKER
MAYOR

EXECUTIVE DEPARTMENT
OFFICE OF THE MAYOR
MUNICIPAL BUILDING
9001 WINCHESTER AVENUE
MARGATE CITY, NEW JERSEY 08402

December 7, 2018

Thomas Brostrøm
CEO, Ørsted U.S. Offshore Wind
One International Place
Suite 2610
Boston, MA 02110

Re: Offshore Wind Energy Proposal

Dear Mr. Brostrøm:

On behalf of the City of Margate, I am pleased to provide a letter of support for Ørsted's Ocean Wind Project to the New Jersey Board of Public Utilities in response to its solicitation for offshore wind energy proposals. The procurement of up to 1,100 MW of offshore wind energy will help serve the state with clean energy while fostering a new industry that will create opportunities for jobs and economic development.

New Jersey's coastline offers steady wind speeds and shallow sea beds, presenting ideal conditions for the development of offshore wind. These assets coupled with the state's large demand for power and ambitious energy goals give New Jersey a unique opportunity to host a new industry, ripe with opportunities, which includes attracting the offshore wind supply chain to this area. A wind farm geographically situated near Atlantic County will likely attract compatible manufacturers and needed jobs assisting our local economy.

Thank you for allowing me the opportunity to express my support of Ørsted's Ocean Wind project which will help bring the power of offshore wind to New Jersey.

Sincerely,

A handwritten signature in black ink that reads "Michael Becker". The signature is written in a cursive style.

Mayor Michael Becker

CITY OF ATLANTIC CITY
OFFICE OF THE MAYOR

Frank M. Gilliam Jr.
Mayor

Telephone: (609) 347-5400
Fax: (609) 347-5638

November 29, 2018

Thomas Brostrøm
CEO, Ørsted U.S. Offshore Wind
One International Place
Suite 2610
Boston, MA 02110

Dear Mr. Brostrøm:

On behalf of the City of Atlantic City, I am pleased to provide a letter of support for Ørsted's Ocean Wind Project to the New Jersey Board of Public Utilities in response to its solicitation for offshore wind energy proposals. The procurement of up to 1,100 MW of offshore wind energy will help serve the state with clean energy while fostering a new industry that will create opportunities for jobs and economic development.

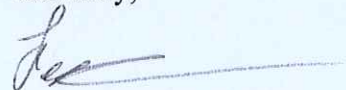
New Jersey's coastline offers steady wind speeds and shallow sea beds, presenting ideal conditions for the development of offshore wind. These assets coupled with the state's large demand for power and ambitious energy goals give New Jersey a unique opportunity to host a new industry, ripe with opportunities, which includes attracting the offshore wind supply chain, here. By building a utility-scale wind farm, like the ones built by Ørsted in Europe, New Jersey will gain the attention of manufacturers who will likely establish facilities here to support this growing industry. The training and hiring of a local workforce will follow.

In addition to workforce training and economic opportunities, Ørsted will call upon, support and work side-by-side with New Jersey's world-class colleges and universities in the development of offshore wind here.

Ørsted has significant experience in building large, cost-effective offshore wind farms throughout Europe and it is that utility-scale development that will allow New Jersey to be among the first states in the nation to focus on and deliver this new source of renewable energy to its residents.

Thank you for allowing me/us the opportunity to express my/our support of Ørsted's Ocean Wind project which will help bring the power of offshore wind to New Jersey.

Sincerely,



Frank M. Gilliam, Jr.
Mayor

December 20, 2018

Thomas Brostrøm
CEO, Ørsted U.S. Offshore Wind
One International Place
Suite 2610
Boston, MA 02110

Dear Mr. Brostrøm:

On behalf of The Greater Atlantic City Chamber of Commerce, I am pleased to provide a letter of support for Ørsted's Ocean Wind Project to the New Jersey Board of Public Utilities in response to its solicitation for offshore wind energy proposals. The procurement of up to 1,100 MW of offshore wind energy will help serve the state with clean energy while fostering a new industry that will create opportunities for jobs and economic development.

New Jersey's coastline offers steady wind speeds and shallow sea beds, presenting ideal conditions for the development of offshore wind. These assets coupled with the state's large demand for power and ambitious energy goals give New Jersey a unique opportunity to host a new industry, ripe with opportunities, which includes attracting the offshore wind supply chain, here. By building a utility-scale wind farm, like the ones built by Ørsted in Europe, New Jersey will gain the attention of manufacturers who will likely establish facilities here to support this growing industry. The training and hiring of a local workforce will follow.

In addition to workforce training and economic opportunities, Ørsted will call upon, support and work side-by-side with New Jersey's world-class colleges and universities in the development of offshore wind here.

Ørsted has significant experience in building large, cost-effective offshore wind farms throughout Europe and it is that utility-scale development that will allow New Jersey to be among the first states in the nation to focus on and deliver this new source of renewable energy to its residents.

Thank you for allowing the Chamber the opportunity to express our support of Ørsted's Ocean Wind project which will help bring the power of offshore wind to New Jersey.

Sincerely,



Joseph D. Kelly, President
Greater Atlantic City Chamber Commerce



ACUA

Atlantic County Utilities Authority

P.O. Box 996 • Pleasantville, NJ, 08232-0996

street address: 6700 Delilah Road, Egg Harbor Twp., NJ, 08234-5623

609.272.6950 • www.acua.com • info@acua.com

December 03, 2018

Thomas Brostrøm
CEO, Ørsted U.S. Offshore Wind
One International Place
Suite 2610
Boston, MA 02110

Dear Mr. Brostrøm:

On behalf of the Atlantic County Utilities Authority (ACUA), I am pleased to provide a letter of support for Ørsted's Ocean Wind Project to the New Jersey Board of Public Utilities in response to its solicitation for offshore wind energy proposals. The procurement of up to 1,100 MW of offshore wind energy will provide the state with clean energy while fostering a new industry that will create opportunities for jobs and economic development.

As home to the first commercial wind farm in New Jersey, ACUA knows the benefits of wind energy first-hand. The 7.5 MW Jersey-Atlantic Wind Farm located at our Wastewater Treatment Facility has saved ACUA and its ratepayers more than \$5.6 million in energy costs and prevented more than 46,551 metric tons of CO₂ from entering the atmosphere since its opening in 2005. The project stands as a testament to the state's leadership and the value of renewable energy. New Jersey is now positioned to grow this leadership role by welcoming the offshore wind industry and its many benefits to our state.

The New Jersey coastline, with its steady wind speeds and shallow sea beds, offers ideal conditions for offshore wind development. These assets, coupled with the state's large demand for power and ambitious clean energy goals, give New Jersey a unique opportunity to host this new industry and attract its supply chain here. By building a utility-scale wind farm, like those built by Ørsted in Europe, New Jersey will gain the attention of manufacturers seeking to establish facilities here to support this growing industry. The training and hiring of a local workforce will follow.

In addition to workforce training and economic opportunities, Ørsted will call upon, support and work side-by-side with New Jersey's world-class colleges and universities in the development of offshore wind.

Ørsted has significant experience in building large, cost-effective offshore wind farms throughout Europe, and it is that utility-scale development that will allow New Jersey to be among the first states in the nation to focus on and deliver this new source of renewable energy to its residents.

Thank you for the opportunity to express our support of Ørsted's Ocean Wind project that will help diversify our economy and create a cleaner environment for residents and future generations to enjoy.

Sincerely,

A handwritten signature in blue ink that reads "Richard S. Dovey". The signature is written in a cursive, slightly stylized font.

Richard S. Dovey
President, Atlantic County Utilities Authority (ACUA)
6700 Delilah Road
Egg Harbor Township, NJ 08232

New Jersey
ALLIANCE for ACTION INC.[®]

PHILIP K. BEACHEM
President

Raritan Center Plaza II • 91 Fieldcrest Avenue, Suite A24 • Edison, New Jersey 08837
(732) 225-1180
www.allianceforaction.com

GERALD T. KEENAN
Executive Vice President

CHRISTIAN HARTMAN
Vice President

November 30, 2018

Mr. Thomas Brostrøm
CEO, Ørsted U.S. Offshore Wind
One International Place
Suite 2610
Boston, MA 02110

Dear Mr. Brostrøm:

On behalf of the NJ Alliance for Action, I am pleased to provide a letter of support for Ørsted's Ocean Wind Project to the New Jersey Board of Public Utilities in response to its solicitation for offshore wind energy proposals. The procurement of up to 1,100 MW of offshore wind energy will help serve the state with clean energy while fostering a new industry that will create opportunities for jobs and economic development.

New Jersey's coastline offers steady wind speeds and shallow sea beds, presenting ideal conditions for the development of offshore wind. These assets, coupled with the state's large demand for power and ambitious energy goals, give New Jersey a unique opportunity to host a new industry, ripe with opportunities. By building a utility-scale wind farm, like the ones built by Ørsted in Europe, New Jersey will gain the attention of manufacturers who will likely establish facilities here to support this growing industry. The training and hiring of a local workforce will follow.

Ørsted has significant experience in building large, cost-effective offshore wind farms throughout Europe. That experience will help New Jersey become a national leader in renewable energy.

Thank you for allowing us the opportunity to express our support of Ørsted's Ocean Wind project.

Sincerely,



Philip Beachem
President



MARINE MAMMAL STRANDING CENTER
P.O. Box 773, 3625 Brigantine Blvd Brigantine, NJ 08203
Phone (609) 266-0538 Fax (609) 266-6300 www.mmsc.org

December 18, 2018

Thomas Brostrøm
CEO, Ørsted U.S. Offshore Wind
One International Place
Suite 2610
Boston, MA 02110

Dear Mr Brostrøm:

On behalf of the Marine Mammal Stranding Center, I am pleased to provide a letter of support for Ørsted's Ocean Wind Project to the New Jersey Board of Public Utilities in response to its solicitation for offshore wind energy proposals. The procurement of up to 1,100 MW of offshore wind energy will help serve the state with clean energy while fostering a new industry that will create opportunities for jobs and economic development.

New Jersey's coastline offers steady wind speeds and shallow sea beds, presenting ideal conditions for the development of offshore wind. These assets coupled with the state's large demand for power and ambitious energy goals give New Jersey a unique opportunity to host a new industry, ripe with opportunities, which includes attracting the offshore wind supply chain, here. By building a utility-scale wind farm, like the ones built by Ørsted in Europe, New Jersey will gain the attention of manufacturers who will likely establish facilities here to support this growing industry. The training and hiring of a local workforce will follow.

In addition to workforce training and economic opportunities, Ørsted will call upon, support and work side-by-side with New Jersey's world-class colleges and universities in the development of offshore wind here.

Ørsted has significant experience in building large, cost-effective offshore wind farms throughout Europe and it is that utility-scale development that will allow New Jersey to be among the first states in the nation to focus on and deliver this new source of renewable energy to its residents.

Thank you for allowing me/us the opportunity to express my/our support of Ørsted's Ocean Wind project which will help bring the power of offshore wind to New Jersey.

Sincerely,

Robert Schoelkopf, Director

A handwritten signature in black ink, appearing to read "Robert Schoelkopf", is written over a light blue horizontal line.



New Jersey Environmental Lobby

204 West State Street, Trenton, NJ 08608 (609) 458-7058

www.njenvironment.org

December 11, 2018

Mr. Thomas Brostrøm
Ørsted U.S. Offshore Wind
One International Place
Suite 2610
Boston, MA 02110

Dear Mr. Brostrøm:

On behalf of the New Jersey Environmental Lobby (NJEL), I am expressing our organization's support for Ørsted's Ocean Wind Project. I understand that the Ocean Wind Project is in response to the New Jersey Board of Public Utilities' solicitation for offshore wind energy proposals. NJEL heartily supports the procurement of up to 1,100 MW of offshore wind energy that will provide clean power and create opportunities for jobs and economic development.

New Jersey's coastline offers steady wind speeds and shallow sea beds, presenting ideal conditions for the development of offshore wind. These assets, coupled with the state's large demand for power and ambitious energy goals, give New Jersey a unique opportunity to host a new industry that will attract an offshore wind supply chain to the State. With a utility-scale wind farm, like those built by Ørsted in Europe, New Jersey will gain the attention of manufacturers who will likely establish facilities here to support this growing industry. We trust that the training and hiring of a local workforce will be a component of the supply chain.

Ørsted's experience in building large, cost-effective offshore wind farms throughout Europe indicates competence in utility-scale development. We expect this competence will allow New Jersey to be among the first states in the nation to deliver this new source of renewable energy to its residents.

We are hopeful of the success of Ørsted's application to the BPU. Please let me know if there is anything else that we can do to advance the progress of renewable energy in New Jersey.

Sincerely,

Anne O. Poole
President, New Jersey Environmental Lobby

newpoole1@verizon.net (direct)
1-609-743-0661 (direct)



New Jersey SHARES, Inc.
1901 North Olden Avenue Extension
Suite 1A
Ewing, NJ 08618

December 5, 2018

Thomas Brostrøm
CEO, Ørsted U.S. Offshore Wind
One International Place
Suite 2610
Boston, MA 02110

Dear Mr. Brostrøm:

On behalf of New Jersey SHARES I am pleased to provide a letter of support for Ørsted's Ocean Wind Project to the New Jersey Board of Public Utilities in response to its solicitation for offshore wind energy proposals. The procurement of up to 1,100 MW of offshore wind energy will help serve the state with clean energy while fostering a new industry that will create opportunities for jobs and economic development.

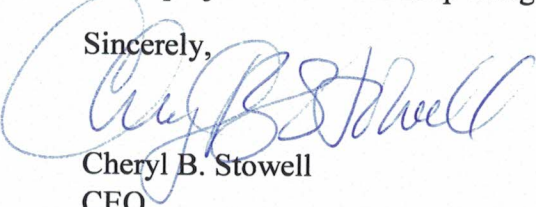
New Jersey's coastline offers steady wind speeds and shallow sea beds, presenting ideal conditions for the development of offshore wind. These assets coupled with the state's large demand for power and ambitious energy goals give New Jersey a unique opportunity to host a new industry, ripe with opportunities, which includes attracting the offshore wind supply chain, here. By building a utility-scale wind farm, like the ones built by Ørsted in Europe, New Jersey will gain the attention of manufacturers who will likely establish facilities here to support this growing industry. The training and hiring of a local workforce will follow.

In addition to workforce training and economic opportunities, Ørsted will call upon, support and work side-by-side with New Jersey's world-class colleges and universities in the development of offshore wind here.

Ørsted has significant experience in building large, cost-effective offshore wind farms throughout Europe and it is that utility-scale development that will allow New Jersey to be among the first states in the nation to focus on and deliver this new source of renewable energy to its residents.

Thank you for allowing me/us the opportunity to express my/our support of Ørsted's Ocean Wind project which will help bring the power of offshore wind to New Jersey.

Sincerely,



Cheryl B. Stowell
CEO

New Jersey SHARES

CONTRACTORS | CONSTRUCTION MANAGERS
JINGOLI

December 21, 2018

Ørsted U.S. Offshore Wind
One International Place
Suite 2610
Boston, MA 02110

Attention: Thomas Brostrøm, CEO

Dear Mr. Brostrøm:

I write this letter on behalf of the Jingoli Competitive Edge program in support of Ørsted's application to the New Jersey Board of Public Utilities to build in response to their solicitation for 1,100 MW of offshore wind.

As you are aware, our Competitive Edge community outreach program identifies individuals who are looking to work in the construction/building trades. We are dedicated to train, hire and mentor individuals of all ages who are seeking jobs. The program also helps us to identify and utilize the services of small and minority-owned businesses who also benefit from their association with our larger, local jobs. We believe strongly in doing our part to stimulate economic growth within the communities in which we work. We are eager to partner with other like-minded corporations and organizations and we believe Ørsted is one of them.

We appreciate Ørsted's intent to develop strong ties in New Jersey, especially in and around Atlantic and Cape May counties as you pursue development of your Ocean Wind project. By supporting local workers, unions and businesses, Ørsted is poised to be a major driver in the New Jersey economy as well as a good corporate citizen.

Our team would be pleased to help identify and train both individuals and businesses, who are often under-represented in the development of large construction projects, as you develop your Ocean Wind project over the next years. We have a long history of doing so in Atlantic City and we would be pleased to be a part of the team dedicated to helping stimulate the economic vitality of Atlantic City and the region.

Thank for this opportunity to support your team and project.

Sincerely,
Joseph Jingoli & Son, Inc.



Joseph R. Jingoli, Jr.
Chief Executive Officer

December 6, 2018

Thomas Brostrøm
Chief Executive Officer
Ørsted U.S. Offshore Wind
One International Place, Suite 2610
Boston, MA 02110

Dear Mr. Brostrøm:

On behalf of the Chamber of Commerce Southern New Jersey (CCSNJ), I am pleased to provide a letter of support for Ørsted's Ocean Wind Project to the New Jersey Board of Public Utilities in response to the Board's solicitation for offshore wind energy proposals. The procurement of up to 1,100 MW of offshore wind energy will help serve the state with clean energy while fostering a new industry that will create opportunities for jobs and economic development.

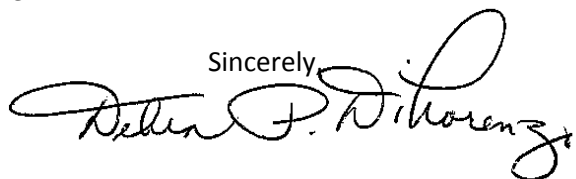
New Jersey's coastline offers steady wind speeds and shallow sea beds, presenting ideal conditions for the development of offshore wind. These assets, coupled with the state's large demand for power and ambitious energy goals, gives New Jersey a unique opportunity to host significant wind advances and development. As the wind industry grows, New Jersey will reap the benefits of job growth in this state of the art industry, as well as the advantages of the offshore wind supply chain required to support projected offshore wind deployment levels.

Additionally, by building a utility-scale wind farm, similar to those built by Ørsted in Europe, New Jersey will gain the attention of manufacturers and other businesses hoping to support this growing industry. As a result, the creation, hiring and training of a local workforce both in and around wind energy will undoubtedly follow. Importantly, in addition to creating workforce training and economic opportunities, Ørsted has committed to call upon, support and work in lockstep with New Jersey's world-class intuitions of higher education in the development of offshore wind.

Ørsted has significant experience in building expansive, cost-effective offshore wind farms throughout Europe. It is this type of utility-scale development that will allow New Jersey to be among the first states in the nation to focus on and deliver this new source of renewable energy to its residents.

For these reasons, the CCSNJ respectfully urges the Board to fully support and accept Ørsted's Ocean Wind project proposal. Thank you for the opportunity to weigh in on this important project to New Jersey's clean energy future.

Sincerely,





December 10, 2018

Thomas Brostrøm
CEO, Ørsted U.S. Offshore Wind
One International Place
Suite 2610
Boston, MA 02110

Dear Mr. Brostrøm:

On behalf of the Research & Development Council of New Jersey, I am pleased to provide a letter of support for Ørsted's Ocean Wind Project to the New Jersey Board of Public Utilities in response to its solicitation for offshore wind energy proposals. The procurement of up to 1,100 MW of offshore wind energy will help serve the state with clean energy while fostering a new industry that will create opportunities for jobs and economic development.

New Jersey's coastline offers steady wind speeds and shallow sea beds, presenting ideal conditions for the development of offshore wind. These assets coupled with the state's large demand for power and ambitious energy goals give New Jersey a unique opportunity to host a new industry, ripe with opportunities, which includes attracting the offshore wind supply chain, here. By building a utility-scale wind farm, like the ones built by Ørsted in Europe, New Jersey will gain the attention of manufacturers who will likely establish facilities here to support this growing industry. The training and hiring of a local workforce will follow.

In addition to workforce training and economic opportunities, Ørsted will call upon, support and work side-by-side with New Jersey's world-class colleges and universities in the development of offshore wind here.

Ørsted has significant experience in building large, cost-effective offshore wind farms throughout Europe and it is that utility-scale development that will allow New Jersey to be among the first states in the nation to focus on and deliver this new source of renewable energy to its residents.

Thank you for allowing me the opportunity to express my support of Ørsted's Ocean Wind project which will help bring the power of offshore wind to New Jersey.

Sincerely,

A handwritten signature in black ink, appearing to read 'Anthony S. Cicatiello', written over a large, stylized circular flourish.

Anthony S. Cicatiello
President

127 Main Street
Chatham NJ 07928
973.274.8336
www.rdnj.org



December 4, 2018

Thomas Brostrøm, CEO
Ørsted U.S. Offshore Wind
One International Place, Suite 2610
Boston, MA 02110

Dear Mr. Brostrøm:

On behalf of the Southern New Jersey Development Council (“SNJDC”)—a non-profit economic development organization that promotes responsible economic growth in South Jersey—I am pleased to provide a letter of support for Ørsted’s Ocean Wind Project to the New Jersey Board of Public Utilities in response to its solicitation for offshore wind energy proposals.

The procurement of up to 1,100 MW of offshore wind energy will help the State meet its ambitious clean energy goals while fostering a ripe, new industry that will create opportunities for jobs, economic development and technical ingenuity.

As you are aware, New Jersey’s coastline offers both steady wind speeds and shallow continental sea beds, presenting ideal conditions for the introduction and development of an offshore wind industry in its coastal waters. These attributes, coupled with the state’s growing demand for power and its ambitious clean energy goals, give New Jersey a unique opportunity to develop and nurture a new industry and establish a wind energy supply chain in New Jersey with the potential of servicing future wind development up and down the Eastern Seaboard.

Ørsted has vast experience in building large, cost-effective offshore wind farms throughout Europe and it is that utility-scale development that will allow New Jersey to be among the first states in the nation to focus on and deliver this new source of clean, renewable energy to its customers.

By building a utility-scale wind farm, New Jersey will gain the attention of manufacturers who will likely establish facilities here to support this growing industry. The training and hiring of a local workforce will follow close behind.

In addition to the creation of workforce development and economic opportunities, Ørsted will call upon, support and work side-by-side with New Jersey’s world-class colleges and universities in the creation of a vibrant, superlative offshore wind industry stretching throughout New Jersey.

Thank you for allowing SNJDC the opportunity to both applaud and support Ørsted’s Ocean Wind project and the many benefits therein.

Sincerely,

A handwritten signature in black ink that reads "Marlene Z. Asselta".

Marlene Z. Asselta
President, **SNJDC**

March 27, 2018

Ms. Laura Morse
Environmental Manager, Orsted
U.S. Wind Power
North American Headquarters
One International Place, Suite 2610
Boston, MA 02110



Dear Ms. Morse,

This letter indicates the National Ocean Sciences Bowl's (NOSB) commitment to an ongoing relationship with Orsted in support of ocean science education and our participants' increased knowledge of the U.S. renewable energy industry.

The NOSB (www.nosb.org) is a nationwide U.S. high school academic competition that engages students in ocean science and exposes them to the breadth of environmental conservation and sustainability issues and careers related to ocean science. As a complex system, the ocean poses challenges and encourages the innovation, engineering, and technology development skills needed to address the growing challenges of climate change, resource depletion, and energy development.

After extensive study throughout the fall and winter each year, nearly 2,000 students across the U.S. compete in the NOSB's 25 regional competitions. The top team from each region then convenes at the National Finals Competition (location changes each year) to compete for the national championship. During the regional and Finals competitions, students participate in educational field trips, gain exposure to research and technology, and/or receive presentations from scientific professionals. Every competition involves volunteers from the ocean science communities, providing students with direct engagement with scientists and potential career paths. By preparing and competing in the NOSB, students increase their knowledge of the ocean, growing issues of importance, and ocean-related careers, and gain research, cooperation, communications, leadership and career building skills, all of which will assist them as our future leaders.

Orsted support would help guarantee students and teachers continue to benefit from participation in NOSB regional competitions. Contributing to an NOSB regional competition helps cover costs associated with hosting the event, as well as allowing the host site to leverage additional donations and in-kind support for activities, career/mentoring events, and prizes. Support of that regional champion team's travel to Finals also ensures the students do not miss out on the opportunities that the NOSB provides to gain hands-on science experience, explore of a variety of coastal and marine environments, enjoy cultural experiences, and gain exposure to a variety of ocean, freshwater, and energy career avenues while attending Finals. Overall, Orsted's support would show the exceptionally bright and talented NOSB students, and their families, the company's commitment to their future as well as a clean energy future for our country.

Sincerely,

Kristen Yarincik
Director, National Ocean Sciences Bowl



Attachment 16.4 – Outreach Engagements

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17 Application fee

N.J.A.C. 14:8-6.5(a)(15). All applicants must place a minimum of \$100,000 on deposit with the State to reimburse the Board for the costs of consultants and other costs associated with the review of the application.

(i) Board staff will direct the applicant, if appropriate, to place an additional amount on deposit with the State, based upon the current and expected costs associated with the application review and related administrative proceedings.

(ii) Failure to replenish the account to the level required by Board staff within 21 days of notification will serve to render the application incomplete and toll the time for review.

(iii). Subsequent to approval of a qualified offshore wind facility, the successful applicant may, at the direction of Board staff, be required to place additional amounts on deposit with the State for the purpose of reimbursing the Board for costs related to regulatory review of the project, including, but not limited to, consulting services, oversight, inspections, and audits.

To defray the cost of reviewing OREC applications, the Board's 'Guidelines for Application Submission for Proposed Offshore Wind Facilities' require a fee of \$150,000 per project, which amount covers a single application plus two variations thereon; each additional application option requires an additional \$25,000 fee. [REDACTED]

The check has been sent to:

NJ BPU,

attn Chief Fiscal Officer

44 South Clinton Ave, 9th Floor, PO Box 350

Trenton, NJ 08625

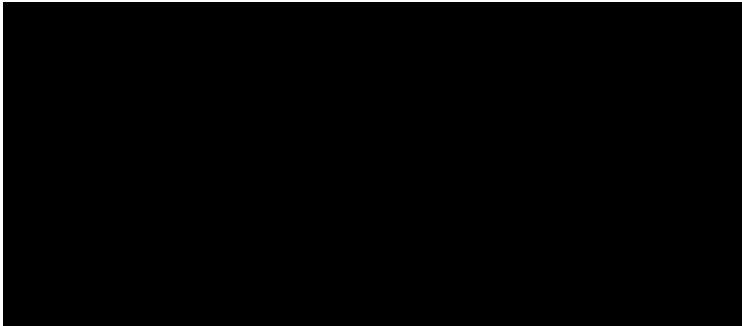
[REDACTED]

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List of Attachments

Attachment 18.1 – OREC application [forms](#)



18 OREC Application

OREC application – Summary

Core message

Ocean Wind has submitted a complete application incorporating favorable pricing and a sound plan for successful development and operation for the benefit of the New Jersey ratepayers.

OREC application – Checklist

The information required by the *Guidelines for Application Submission for Proposed Offshore Wind Facilities* is cross referenced to the associated document sections in the checklist below.

Checklist Item	Document Reference
Provide an application form specific to each bid summarizing the project, bid proposal and OREC Price	Attachment 18.1
Provide a bid summary including nameplate capacity of the project, turbine type, P(50) net capacity factor and location information as well as contact information.	Section 18.2
Provide input regarding base and alternate bids including starting year, “all-in” OREC price inclusive of system upgrade for each of 20 years, and indicate whether system upgrade costs are to be trued up against actuals; if to be trued against actual, provide a separate reporting of system upgrade cost included in the all-in prices.	Section 18.3
Agree to commitment provided in the Commitment section of the online application	Section 18.4

OREC application – Documentation

The following affirms Ocean Wind’s submittal of the OREC application as required by the Board’s guidelines.

18.1 OREC application

Subsection 3.18 Application Form, Guidelines for Application Submission for Proposed Offshore Wind Facilities (2018). In addition, the bidder should submit a completed Offshore Wind Application Form for each offer variant. The form, attached here and also provided on the bid website, allows bidders to provide one base and one alternative offer. Bidders can download additional copies of the form to provide additional offers. The form is divided into three sections.

As required, Ocean Wind has completed the Offshore Wind Application form for the Project offered in this document, a copy of which is provided in Attachment 18.1.

18.2 Bid summary

***Subsection 3.18.1 Bid Summary, Guidelines for Application Submission for Proposed Offshore Wind Facilities (2018).** The Bid Summary tab provides an overview of the offers. Bidders should specify, for each alternative, the nameplate capacity of the project, turbine type, P(50) net capacity factor and location information as well as contact information. Bidders are also asked to provide several points of data from their Cost/Benefit Analysis. Economic impacts should be provided as net present values discounted at 7% to the start of 2019. Emissions Reductions should be provided in tons of net reductions for each pollutant. The levelized OREC prices are calculated by the form on separate sheets.*

Ocean Wind has provided a summary of the bid offer addressed in this document on the appropriate Bid Summary tab for the online application (Attachment 18.1). Included in the summary are the requested data from the CBA including:

- Economic impacts, provided as net present values discounted at 7% to the start of 2019.
- Emissions Reductions, provided in tons of net reductions for each pollutant; and
- Levelized OREC prices, calculated by the form on separate sheets.

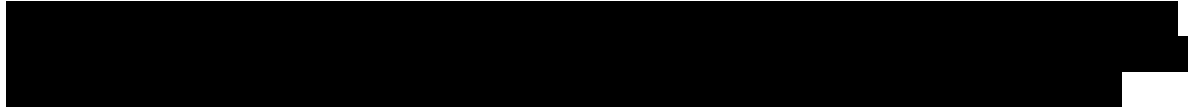
18.3 Base/Alt offer

***Subsection 3.18.2 Base/Alt Offer, Guidelines for Application Submission for Proposed Offshore Wind Facilities (2018).** The bidder should fill out one sheet for each bid variant proposed. The bidder can input the proposed project start year and month. The bidder will then input the proposed OREC price for each calendar year of operation. The sheet will credit the project with 20 full years of project operation. Bidders are asked to provide the “All-in OREC Price” which is the final, ultimate price that ratepayers will pay per OREC in a given year. If the bidder is electing to have their system upgrade cost estimate trued up to actual costs, they should indicate this on the sheet and show separately their “System Upgrade” costs. Note that even if the bidder is requesting this option, their All-in OREC Price should be inclusive of these System Upgrade costs. In addition, bidders should provide, for each of the 20 years during which the project will sell ORECs to ratepayers, estimated market revenues from the project. These should reflect all revenues earned by the project during that time. For years in which the project is only selling ORECS for a portion of the year the market revenues should be shown only for the portion of the year that the State will purchase ORECs. With these inputs, the sheets will automatically calculate levelized prices per MWh for the all-in cost, system upgrades and market revenues.*

Ocean Wind has provided several bids for the Board’s consideration within this application, including the base offering (400 MW) required per the Board’s guidelines. Ocean Wind has provided the required information including starting year, “all-in” OREC price and indication as to whether system upgrade costs are to be trued up against actuals. This information is provided in the application in Attachment 18.1.

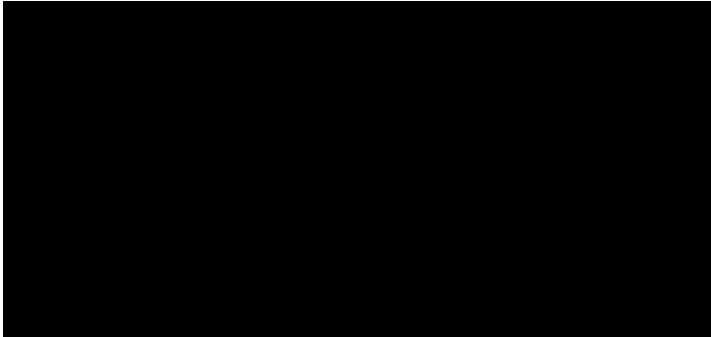
18.4 Commitments

Subsection 3.18.3 Commitment, Guidelines for Application Submission for Proposed Offshore Wind Facilities (2018). This sheet lists the commitments that each successful bidder is expected to make based on the N.J.A.C. If a bidder is unable to make any of these commitments they should provide a full explanation.



OREC application – Attachments

Attachment 18.1 – OREC application forms



Attachment 18.1 – OREC application forms

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