

Ocean Wind

An Ørsted & PSEG project

Ocean Wind 1 Open House

November 6, 2021

Ocean City, NJ

Investing in New Jersey to protect our environment

- The State of New Jersey has set an ambitious goal of generating 7,500 MW of offshore wind energy by 2035
- The Ocean Wind 1 project will **remove 110 million tons of CO₂** during the project's 25+ year lifespan. That's the equivalent of removing 21.6 million cars off Jersey's roads
- Ocean Wind 1 will play a key role in helping the State achieve this goal by generating more than 1,100 MW of clean energy for New Jersey homes and businesses



Who we are

Ørsted Offshore North America

The Ørsted vision is a world that runs entirely on green energy. Ørsted ranks as the world's most sustainable energy company in Corporate Knights' 2021 Global 100 index of the most sustainable corporations and is recognized on the CDP Climate Change A List as a global leader on climate action. Ørsted is the global leader in offshore wind, with 30 years of direct experience building projects around the world, including the world's first offshore wind farm in Denmark and the first U.S. offshore wind farm off the coast of Rhode Island.

PSEG

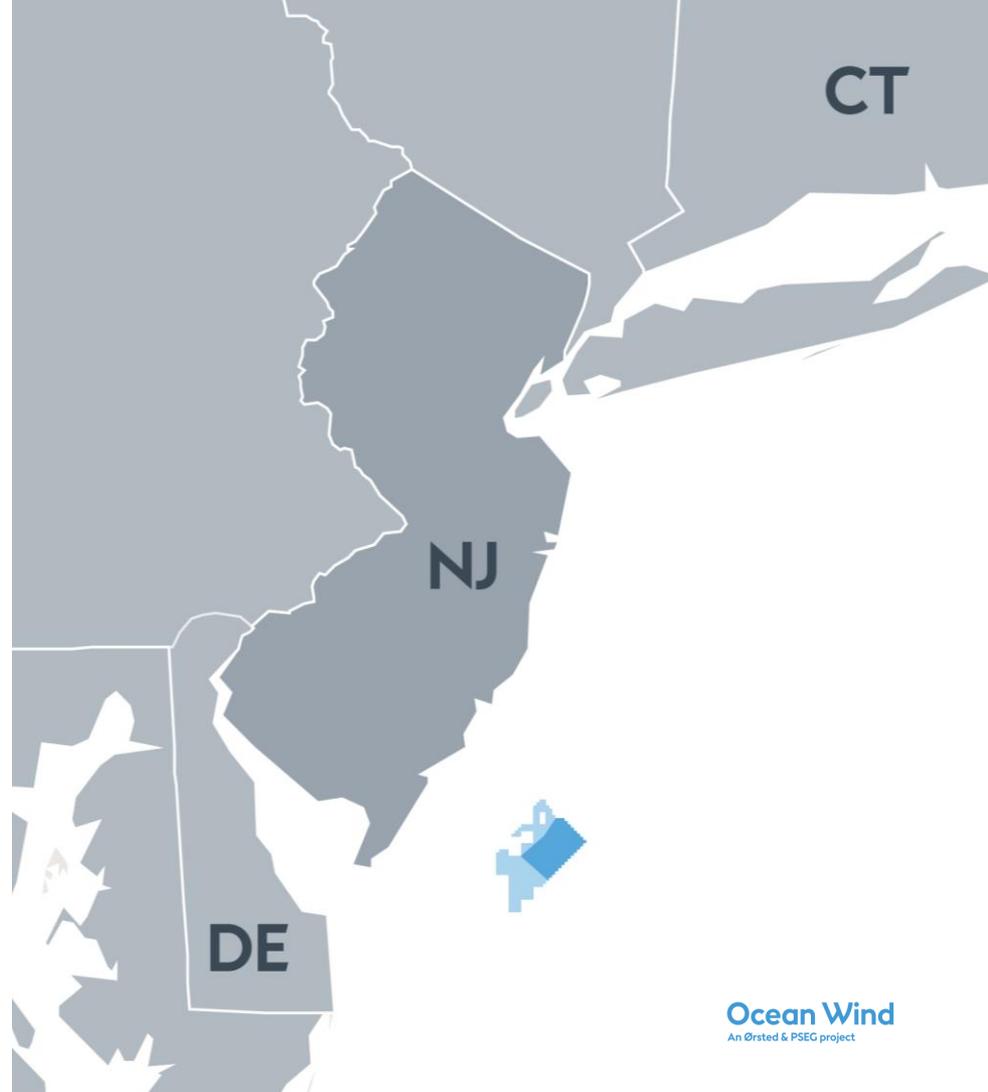
Public Service Enterprise Group Inc. (PSEG is a publicly traded diversified energy company with approximately 13,000 employees. Headquartered in Newark, NJ, PSEG's principal operating subsidiaries are: Public Service Electric and Gas Co. (PSE&G), PSEG Power and PSEG Long Island. PSEG is a Fortune 500 company included in the S&P 500 Index and has been named to the Dow Jones Sustainability Index for North America for 13 consecutive years.



Ocean Wind 1

Project overview

- Located **15-27 miles** off the coast of Southern New Jersey
- **1,100 MW** – Enough power for 500,000 average homes
- Up to **98 turbines** to be installed
- Commercial operations expected by the end of **2024**
- Ocean Wind is a 75/25 Joint Venture with PSEG



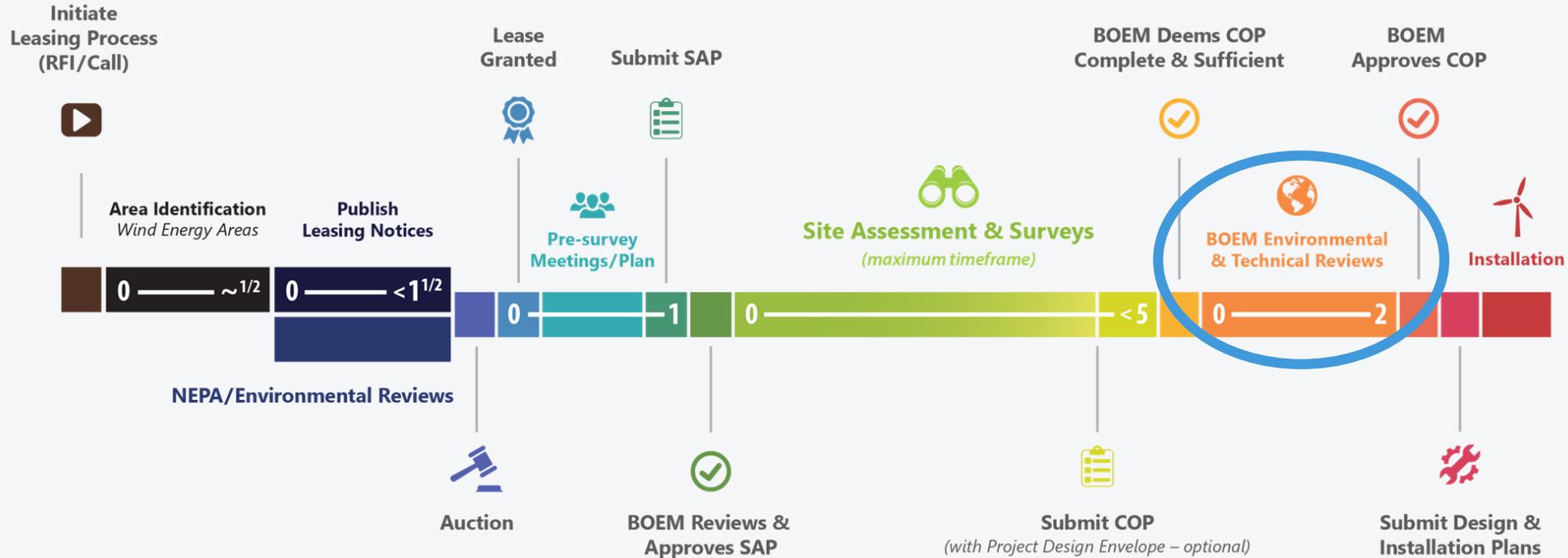


Ocean Wind 1

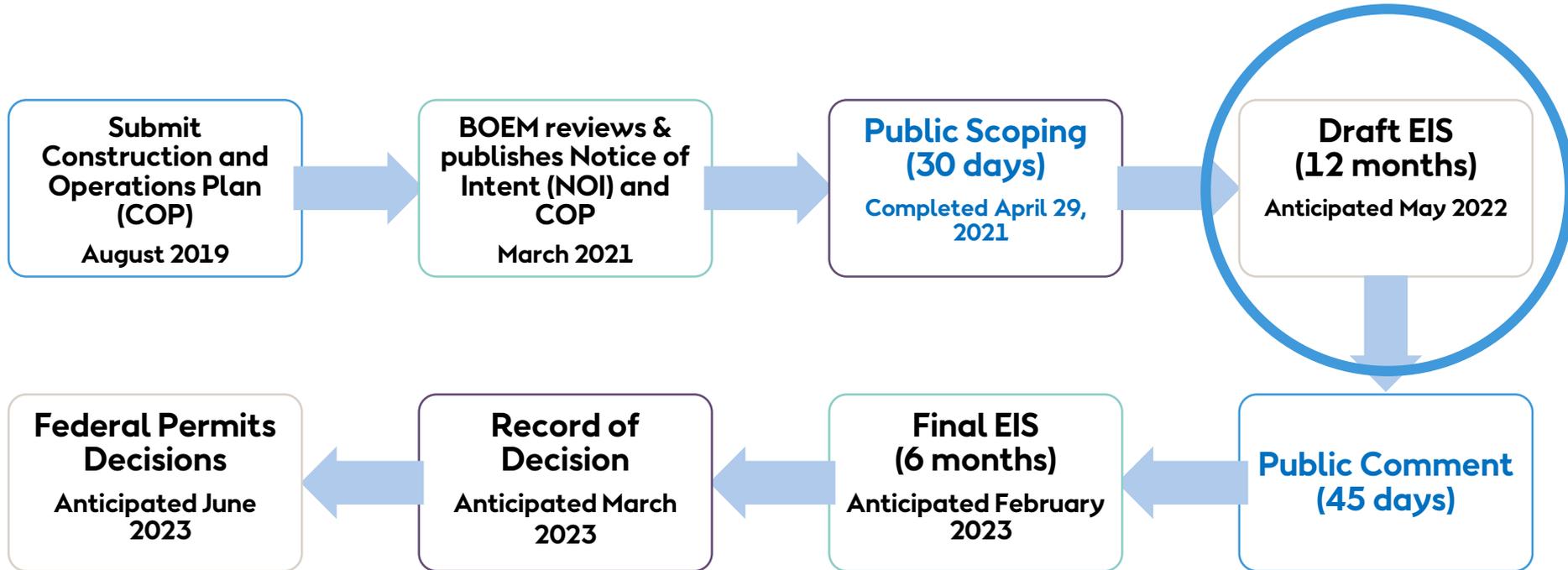
Project benefits

- Investing nearly **\$700 million** in New Jersey.
- Creating more than **1,000 direct jobs** per year during construction
- Investing **\$15 million** in the Pro-NJ Grantor Trust to:
 - Support local **small, women-owned and minority-owned businesses** to enter the emerging offshore wind industry
 - Provide funding for **coastal resiliency projects** in Ocean, Atlantic, and Cape May Counties

Federal Offshore Wind Process:

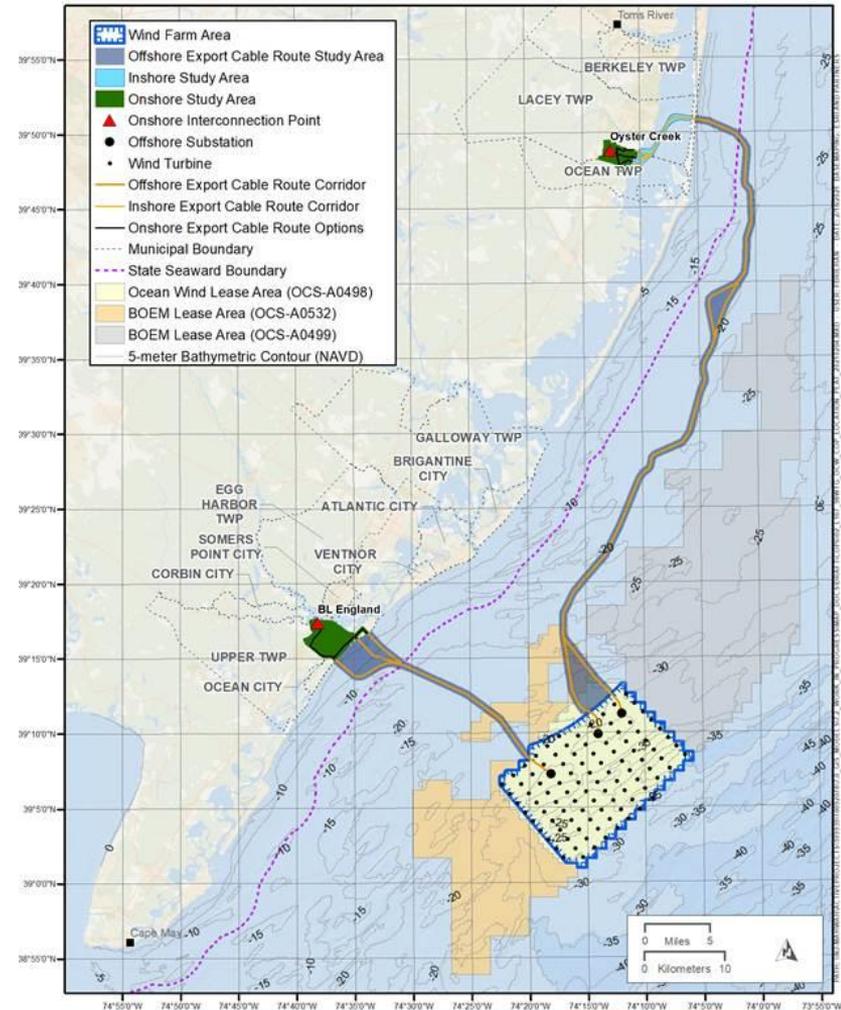


Federal Offshore Wind Process:



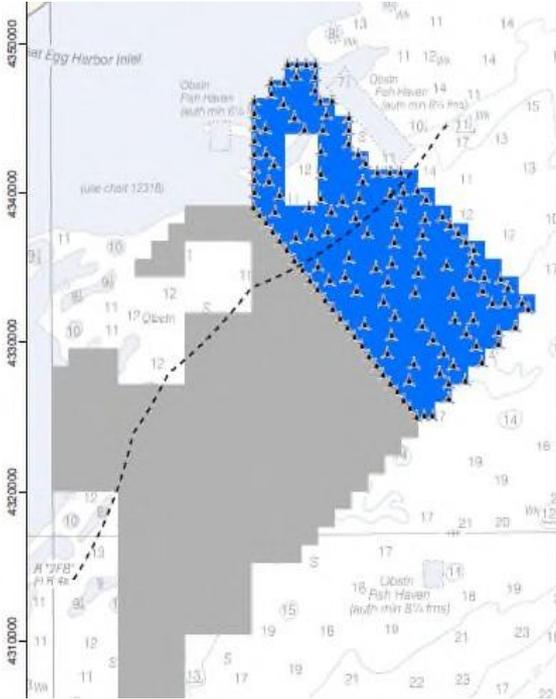
Ocean Wind 1

- Ocean Wind 1 is proposing **two sites for interconnection** that were previously used for energy generation:
 - Oyster Creek (Lacey Township)
 - BL England (Upper Township)

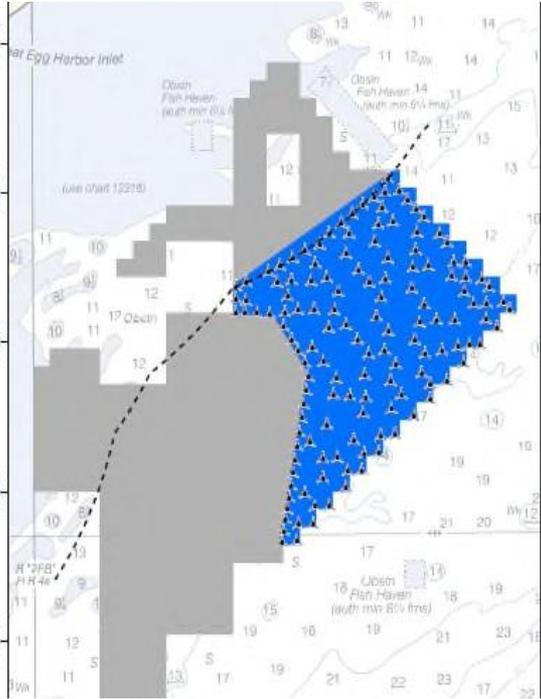


Evolution of the project area

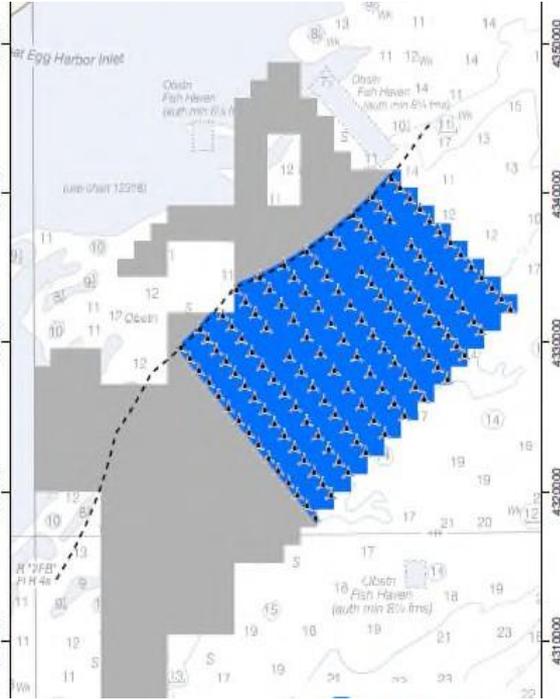
1st Iteration



2nd Iteration



3rd Iteration



Ocean Wind 1 onshore Ocean City

- BL England:
 - Landfall proposed in Ocean City at 35th Street
 - Trenchless technology for installing cable at the beach
 - Cable would follow Roosevelt Blvd into Upper Township and then North Shore Rd
- **No onshore construction during summer months or local summer tourism season on the barrier islands**



Ocean Wind 1

Onshore cables

Onshore Cables

- Onshore cables are planned to mostly be installed in **existing utility rights of way**
- Planned to be buried a minimum of 3-feet deep
- **Restoration** of roadways will be completed following construction

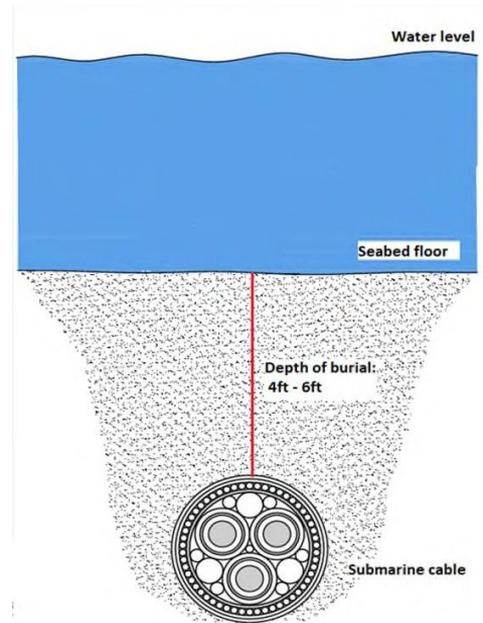


Ocean Wind 1

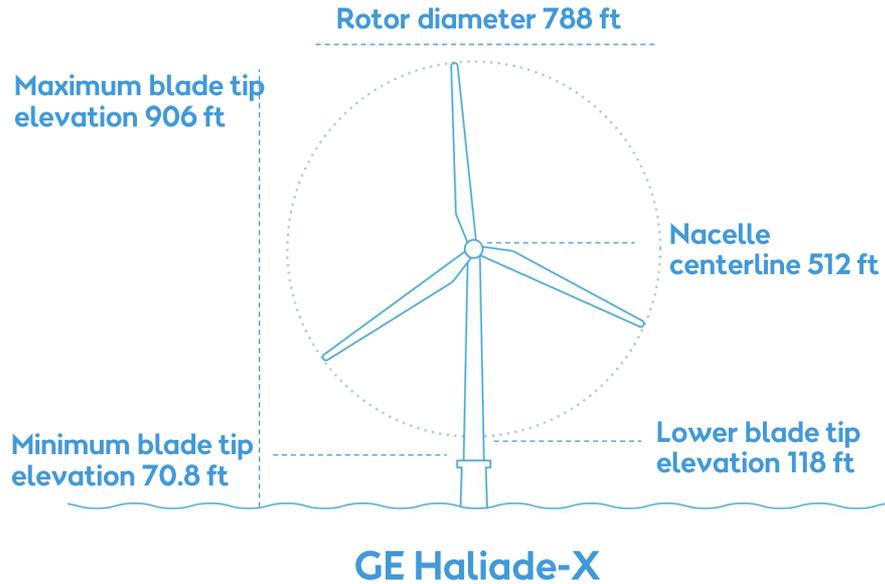
Offshore export cables

Offshore Export Cables

- The offshore cables, both to BL England and to Oyster Creek **will be buried** at a depth between **4 and 6 feet** or as required by regulation and the cable burial risk assessment analysis
- State of the art equipment and vessel technology will be used for installation



Ocean Wind 1 Wind turbine





Decommissioning

- Decommissioning is addressed in the Construction and Operations Plan, which is under Federal regulatory review.
- **Cost of decommissioning will be covered** by the project through a bond.
- Currently, **85-90% of the wind turbine is recyclable**.
- Ørsted is leading a 3-year research project aimed at developing a process to recycle 100% of the turbine blades.

Ocean Wind 1

Lighting

Aircraft Lighting

- Per FAA guidelines, Ocean Wind plans to incorporate an Aircraft Detection and Lighting System (ADLS)
 - Aircraft warning lights **only when an aircraft is within the vicinity** of the wind farm during low light and night conditions
- Studies estimate the lights would be active for a **total of only a few hours over a one-year period**

Navigation Safety Lighting

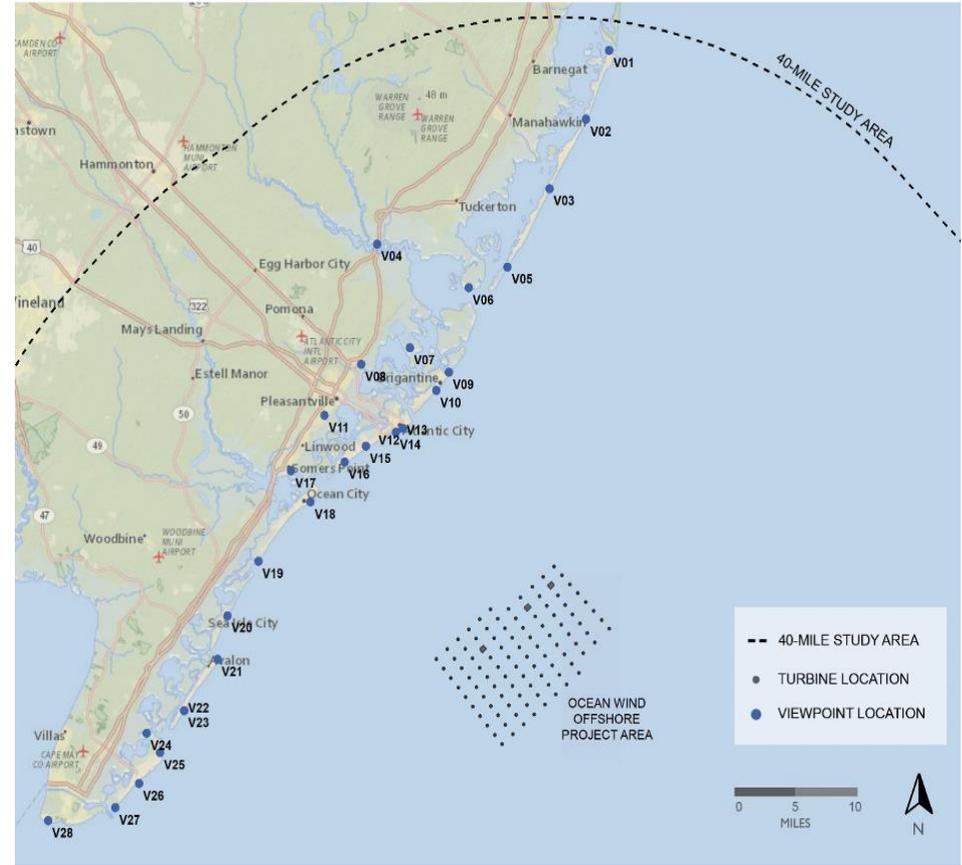
- The turbines will be lit in accordance with U.S. Coast Guard offshore structure Private Aids to Navigation marking guidance
- The structures will be equipped with continuous **amber flashing lights** that are required to be visible for a distance of **5 nm (not visible from shore)**



Ocean Wind 1 Visibility study

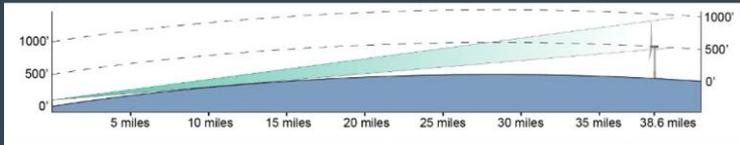
Weather and atmospheric conditions change over the course of each day and season, making it difficult for the average observer to recognize turbine blades at distances >15 miles.

- Curvature of the earth
- Atmospheric conditions
- The thinness of the blades
- Cloud cover
- The time of day
- Haze and fog may have the greatest impact on potential visibility



Project Visibility

Project Visibility: Affected by many factors



Curvature of the Earth



Shorefront Development



Haze & Weather Conditions



Dunes & Vegetation



Viewer Elevation

PLUS:

- Turbine height
- Apparent height
- Diameter of base
- Color and reflectivity
- Horizontal field of view
- Alignment of turbines
- Lighting near viewer
- Visual acuity of observer

Effects of Lighting and Distance



Atlantic City Beachfront



North End of Avalon Beach



Stone Harbor Beach



Wildwood Crest

Visualizations

Ocean City Boardwalk



Visualizations

Jetty at North End of Avalon Beach



Visualizations

Stone Harbor Beach



Visualizations

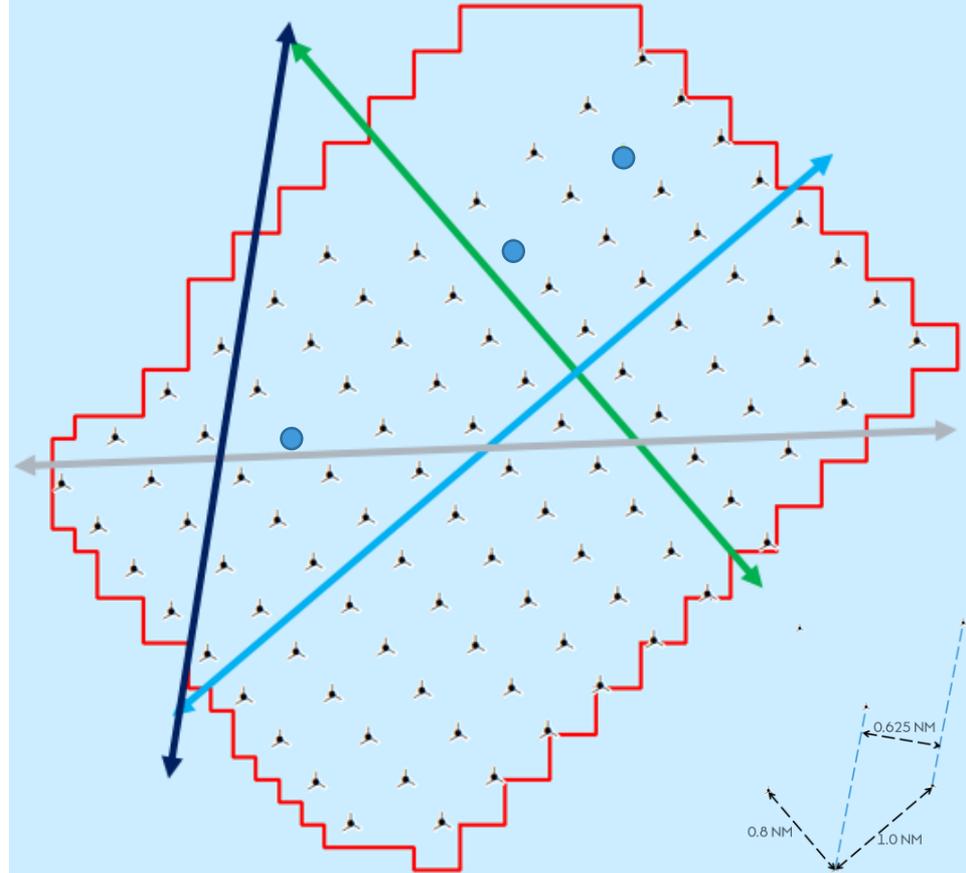
Wildwood Crest Fishing Pier



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Vessel navigation

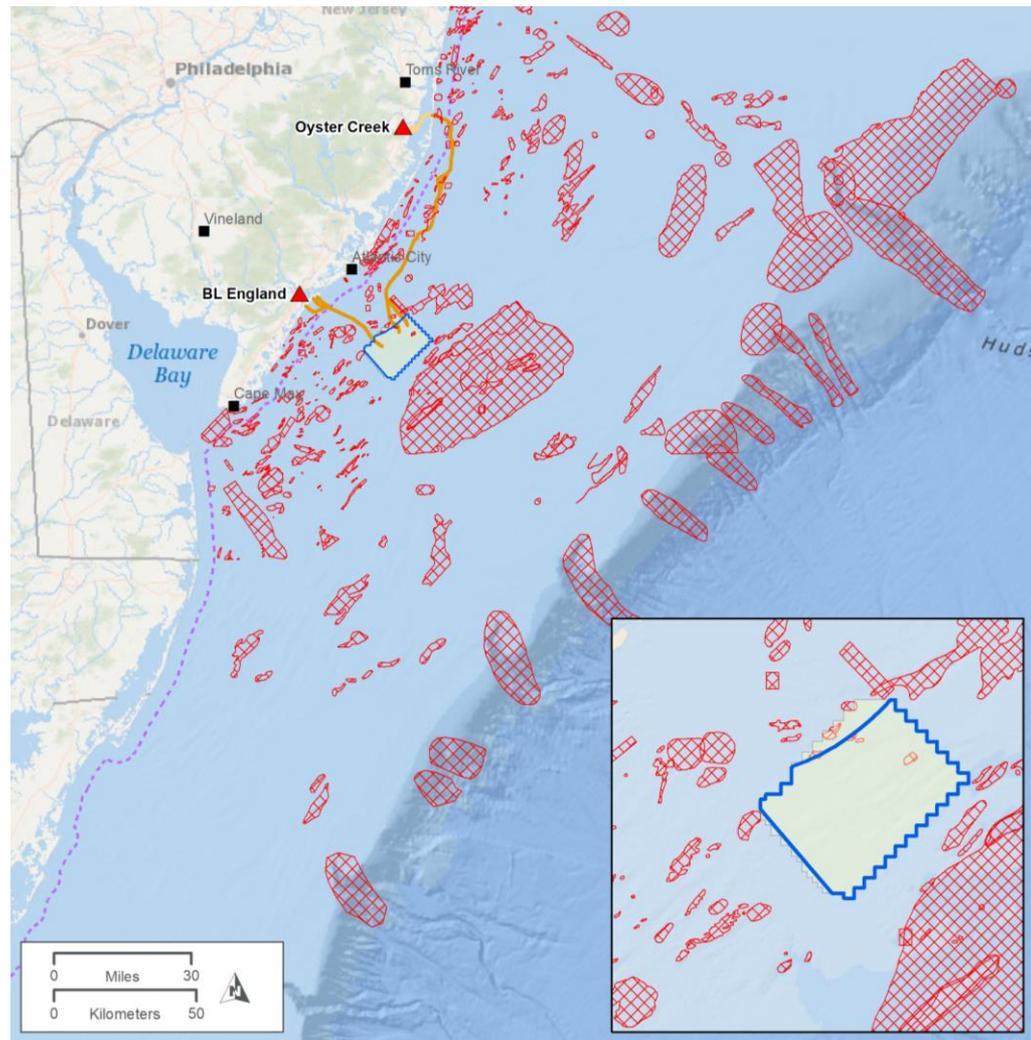
- Grid layout with turbine **spacing 1nm x 0.8nm**, which is roughly equivalent to 2 miles on land
 - Clear lines of transit:
NW – SE, NE – SW, E – W, N – S
 - Northern-most corridor greater than 1nm
- Turbine spacing provides for **vessels moving through and fishing within the array**
- Consistent turbine marking and lighting to aid navigation and safety operations in accordance with U.S. Coast Guard guidelines
- Navigational Safety Risk Assessment included in the federal permit application



Fisheries Data

Available data indicates minimal prime fishing areas in the Ocean Wind 1 lease:

- **Northeast Fisheries Science Center Seasonal Trawl Studies:** conducted between 2003 and 2016
- **USACE Otter Trawl Surveys:** Surveys conducted 1994 to 1999
- **Virginia Institute of Marine Science:** Seasonal nearshore bottom trawl surveys have been conducted annually since 2007
- **National Marine Fisheries Service:** Seasonal annual bottom trawl surveys since 1999
- **NJ Ocean Trawl Program:** Seasonal trawl surveys conducted annually for last 30 years
- **Available GIS data:** prime fishing areas, artificial reefs, shellfish habitat, migratory finfish pathways, etc.



Marine Mammal Detection System: Ecosystem and Passive Acoustic Monitoring (ECO-PAM) Project

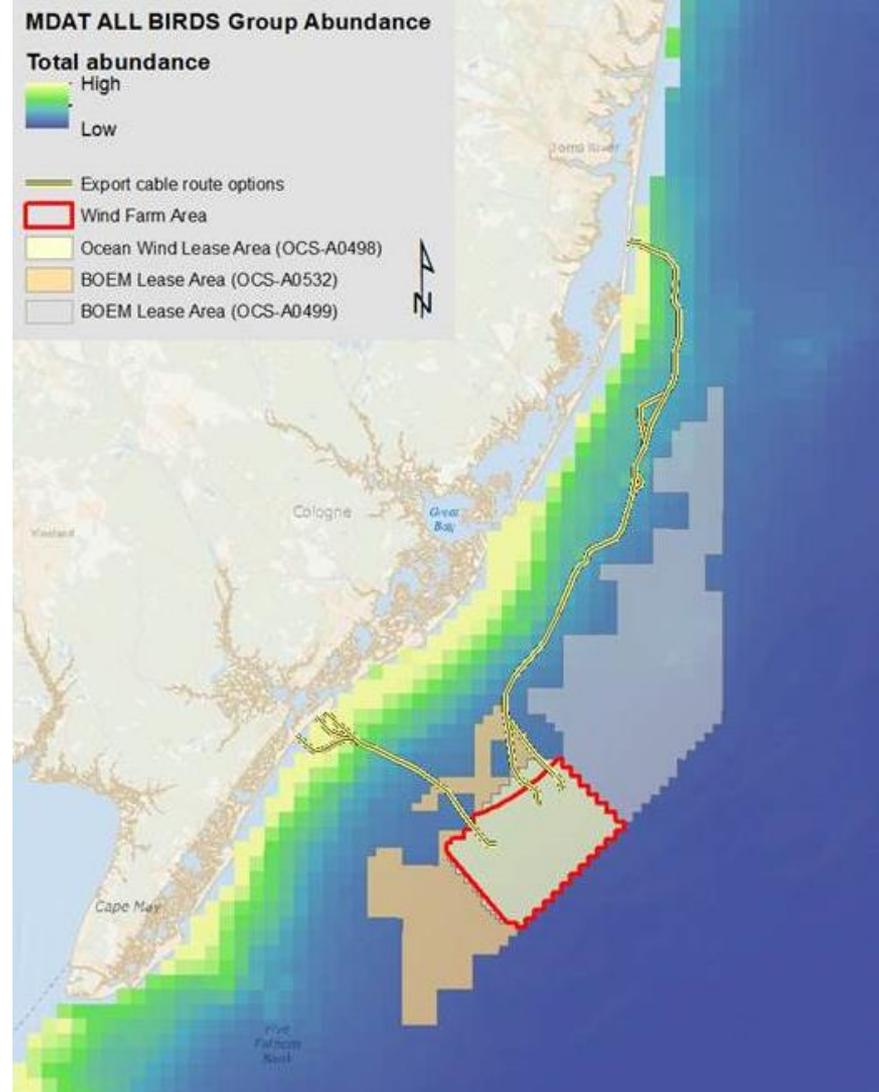
- **3-year project** with:
 - Rutgers University
 - University of Rhode Island (URI)
 - Woods Hole Oceanographic Institution (WHOI).
- **Two sound detection buoys**
- **A glider to capture real-time data** and detections of marine mammal vocalizations.
- Real-time data will provide **better protection of the North Atlantic right whale** during the survey, construction, and operation phases of its U.S. offshore wind projects.



Avian Assessment

Available data indicates bird migratory patterns are close to shore and **outside of the Ocean Wind 1 lease area:**

- **NJDEP Ecological Baseline Survey Avian Boat-based Surveys:** 23 monthly surveys over two years ('08 –'09)
- **Marine Bird Abundance Models, Marine-Life Data and Analysis Team (MDAT):** Regional-scale seasonal predictions of density for 47 species. 1978 -2016
- **Northwest Atlantic Seabird Catalog:** Survey records from 1978-2017
- **Tracking studies:** diving birds, falcon, listed species



Investing in South Jersey

EEW Monopile Manufacturing

- Located at Port of Paulsboro
- Only U.S. monopile manufacturing facility to date
- Will support 500 full-time manufacturing jobs
- Investment of \$250 million from Ørsted



Investing in South Jersey continued

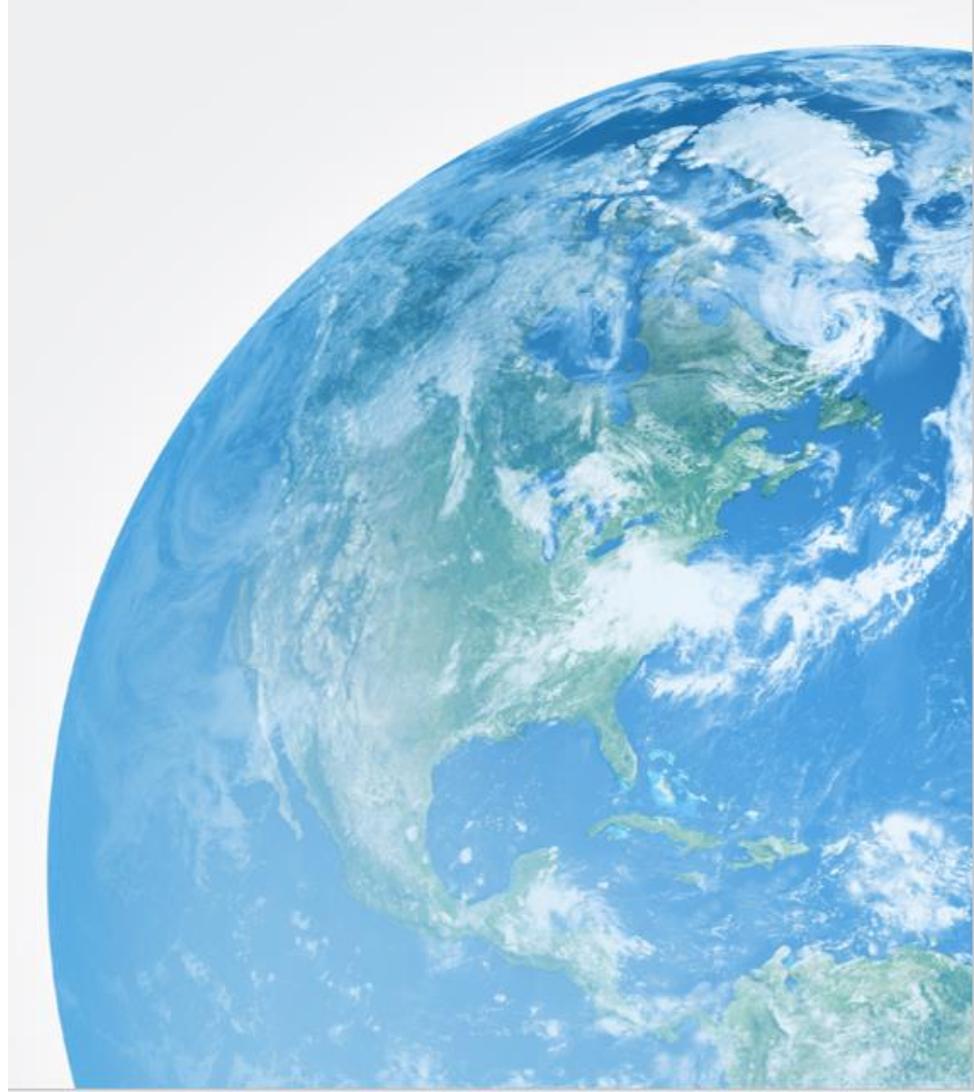
Operations & Maintenance Facility:

- Located in Atlantic City
- Will include office, warehouse and harbor facilities
- Will serve as a hub for the maintenance operations of multiple offshore wind projects
- Will employ approximately 69 full-time employee positions, including:
 - Wind turbine technician
 - Operations planner
 - High voltage engineers
 - Health and safety manager
 - Site assistant
 - Warehouse coordinator



Next Steps

- Continued engagement with local municipal and county officials
- Continue proactive discussions with community leaders and the fisheries
- Information sessions to engage with community members and local residents
- BOEM issues Draft Environmental Impact Statement in May 2022
- BOEM conducts Public Hearing and Comment Period
- Ongoing NJDEP Permit Reviews through 2022
- BOEM Issues Final Environmental Impact Statement in February 2023
- BOEM Issues Record of Decision in March 2023



Thank you

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Questions & Answers