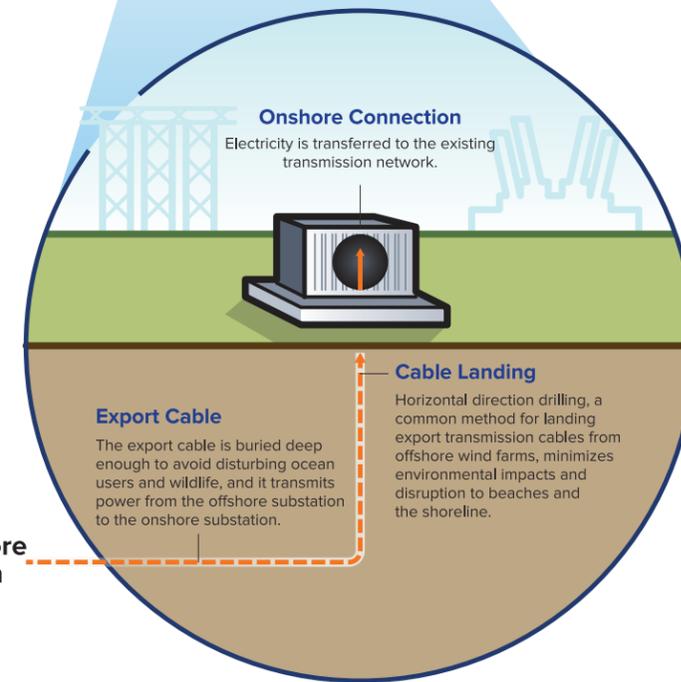
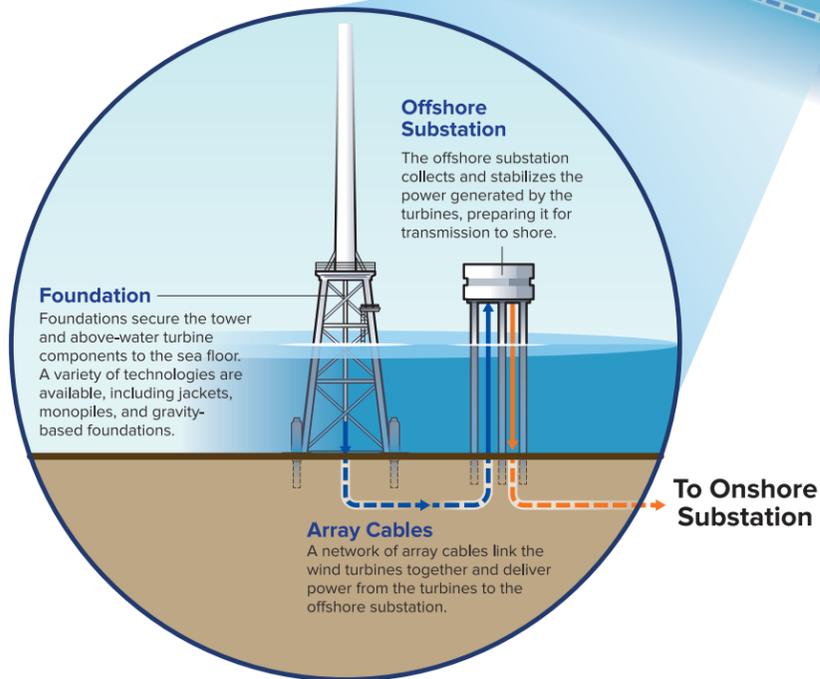
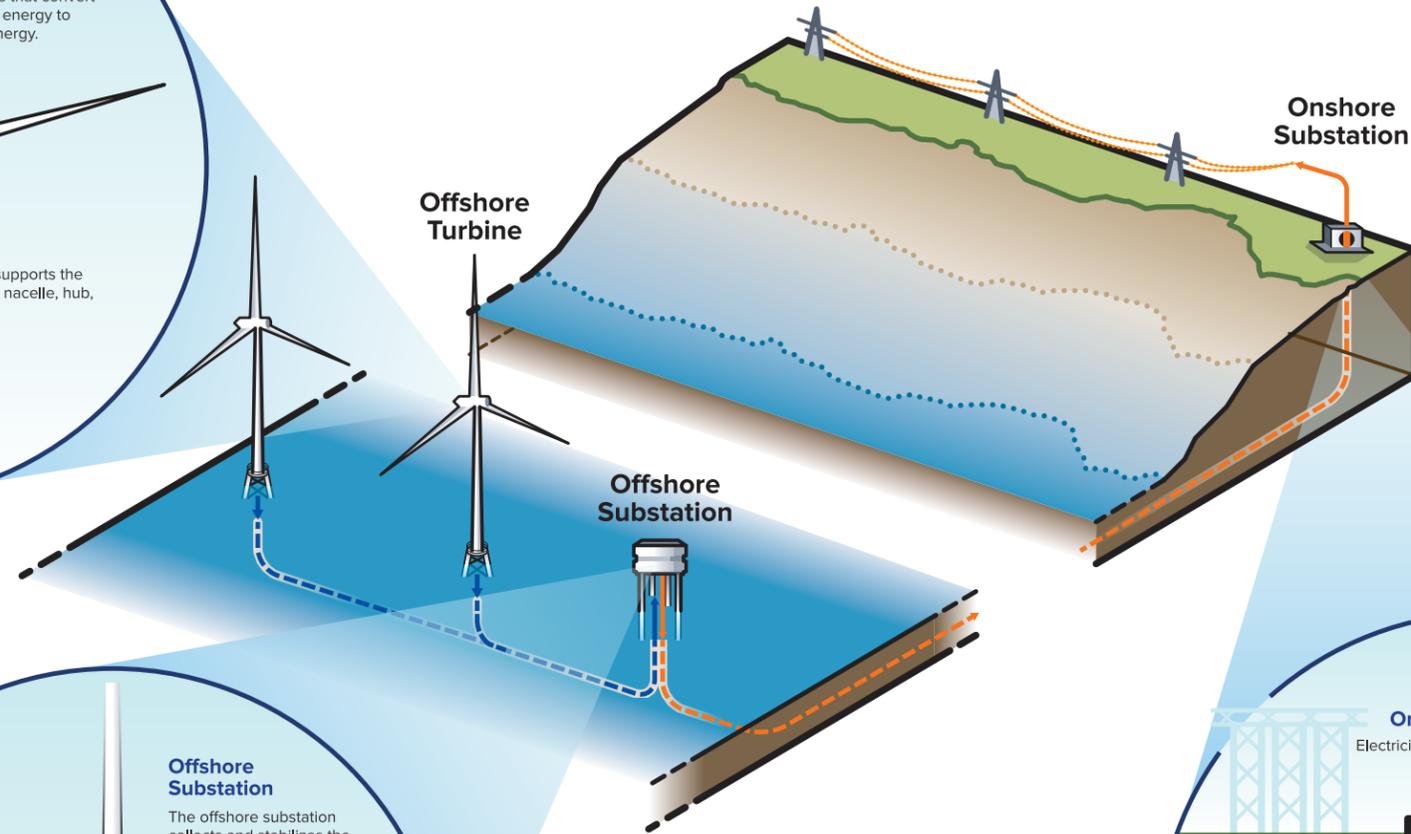
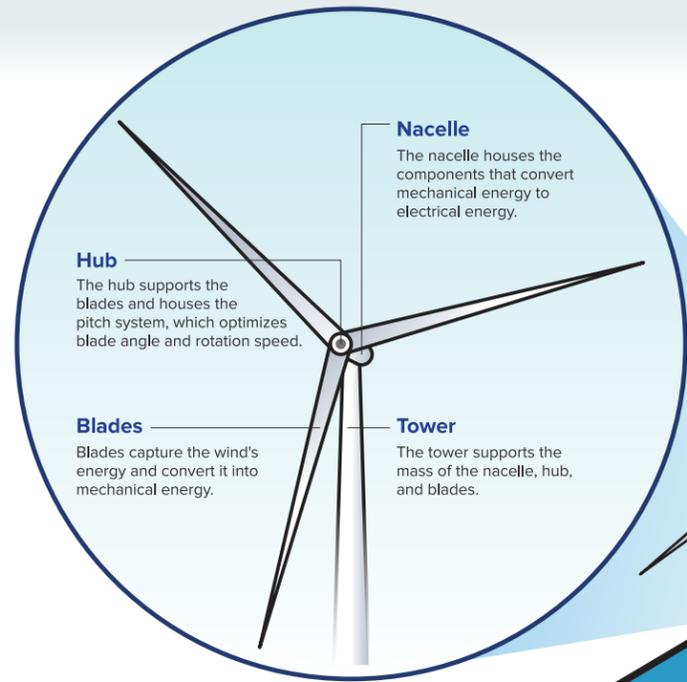


# Offshore Wind 101

**1**  
 offshore wind turbine (8 MW) can power  
**4,000+**  
 homes



Figures Not to Scale

# Supplier Opportunities

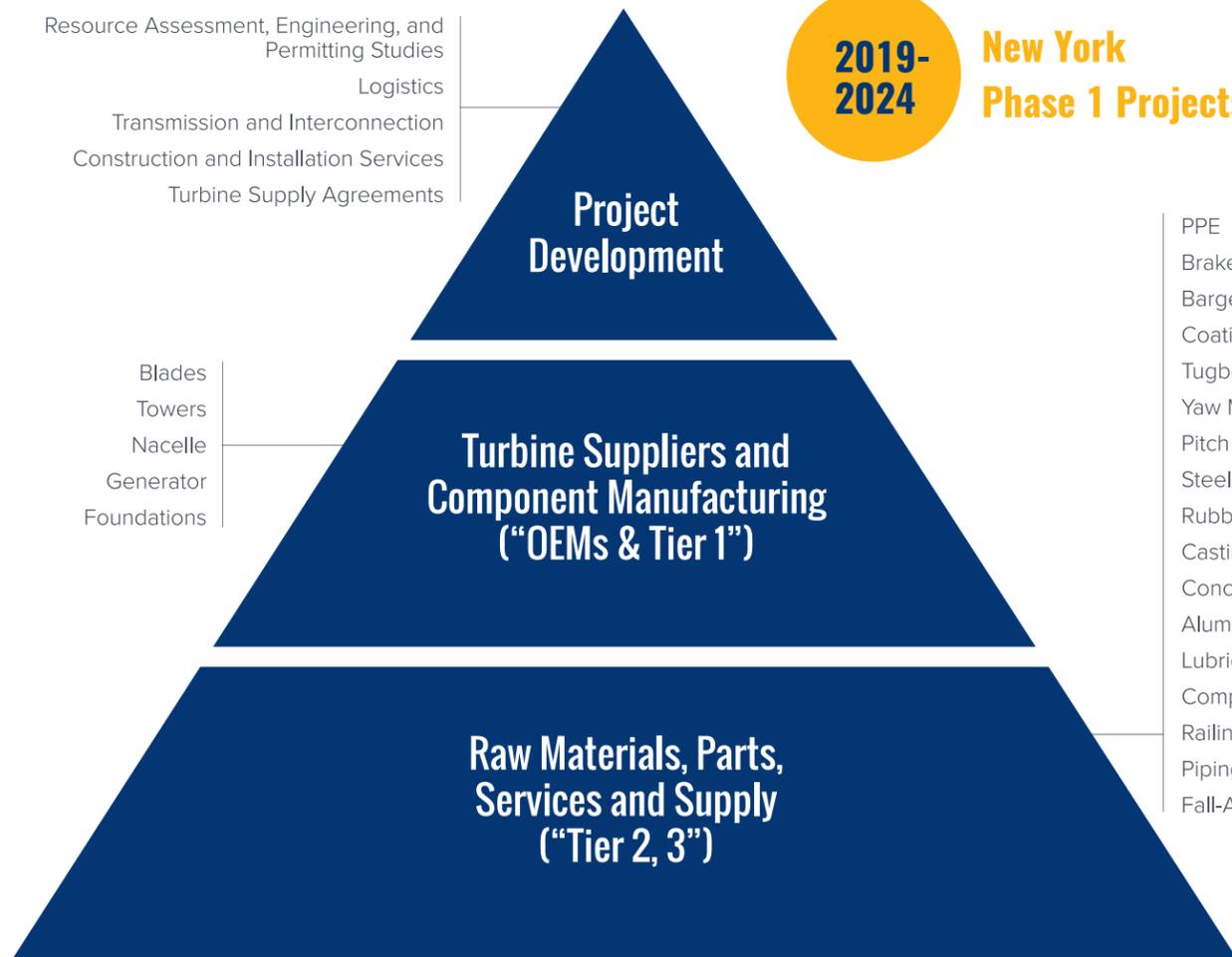
Offshore wind development is still in its early stages in the United States, yet the industry is poised to develop at large scale across the Northeast and Mid-Atlantic. As the pipeline of U.S. projects continues to grow, New York companies are in an ideal position to capitalize on these economic opportunities including supply chain solutions designed to reduce the levelized cost of energy of offshore wind.

## The Offshore Wind Supply Chain Ecosystem

Offshore Wind Developer

Resource Assessment, Engineering, and Permitting Studies  
Logistics  
Transmission and Interconnection  
Construction and Installation Services  
Turbine Supply Agreements

**2019-2024** New York Phase 1 Projects



### Register to be Seen by Offshore Wind Companies

#### Join NYSERDA's Offshore Wind Supply Chain Database

To connect local manufacturers and service providers to global offshore wind developers and equipment manufacturers, NYSERDA is compiling an **Offshore Wind Supply Chain Database**, a central repository for developers to utilize when looking to contract with U.S. companies.

Register your New York company for the Supply Chain Database to be visible to global offshore wind developers and manufacturers.

Visit [nyserdera.ny.gov/offshorewind](https://nyserdera.ny.gov/offshorewind)

# Commercial Fishing

Fishing takes place throughout the region using a variety of methods and gear types. The fishing community is a key stakeholder group whose views are actively being solicited and considered as New York State's plans for offshore wind energy development move forward.



**New York State's Commercial Fishing Technical Working Group** is developing best management practices to minimize risks to fisheries during the siting, construction, and operation of future offshore wind farms. The practices being explored include:

- Requiring developers to provide and abide by a Fisheries Mitigation Plan
- Support and encourage effective stakeholder engagement and communication techniques and practices
- Facilitating the development of industry and fishing collaborative monitoring models to develop trusted baseline data
- Developing and implementing safety procedures
- Requiring developers to consult with the fishing industry and State agencies early in the process and during all phases of development, including decommissioning to support site design and operations
- Hiring a New York State Fishing Liaison to support effective communications
- Supporting scientific research to better understand potential risks to fish and wildlife



**In Summer 2019, NYSERDA selected five multi-year projects following a competitive solicitation to further study important environmental and commercial fishing topics to support the responsible development of offshore wind. Commercial fishing research projects include:**

- Development of strategies and tools to address commercial fishing access
- Creation of a "data trust" for effective inclusion of fishermen's knowledge in offshore wind energy decision making

For more information about fisheries and offshore wind, visit <https://nyfisheriestwg.ene.com> or email [fisheriesandoffshorewind@nyserda.ny.gov](mailto:fisheriesandoffshorewind@nyserda.ny.gov)

# Offshore Wind Development Timeline

## Timeline for 1st phase of projects (approximate dates)



### Research and Stakeholder Engagement

New York State Energy Research and Development Authority (NYSERDA) leads design of project guidelines

2017 - Ongoing



### Permitting and Approvals

Developers identify sites for turbines and substations, map cable routes, and obtain federal, state, and local permits and approvals

2019 - 2023



### Construction and Installation

Developers install foundations, lay cables, build substations, and assemble wind turbines

2022 - 2024



### Operations

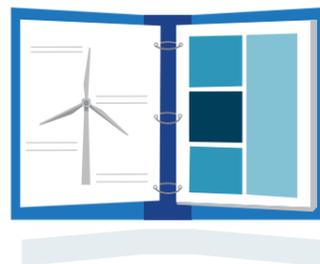
Offshore wind projects produce renewable electricity to power New York State (25+ years)

2024 - 2050+

2019

### Proposal Review and Contract Awards

Developers submit proposals to NYSERDA, who reviews and awards contracts



2020 - 2024

### Manufacturing

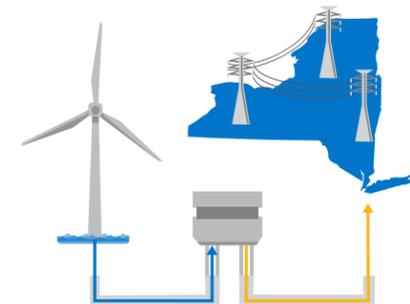
Developers work with supply chain to manufacture and transport components



2024

### Commissioning

Developers and grid operators conduct pre-operational testing



# Environmentally Responsible Development

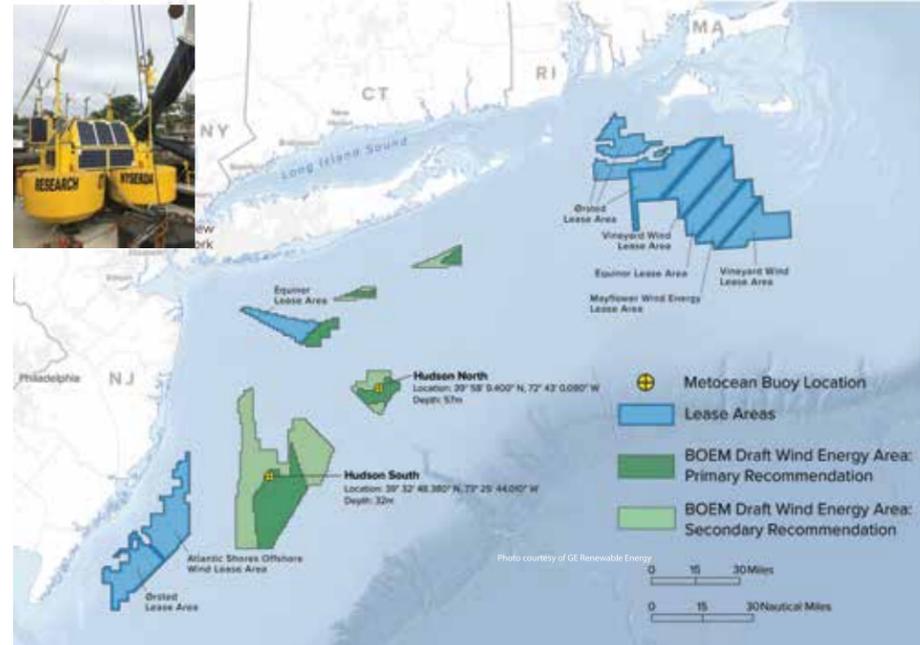
The waters off New York's coast are home to more than 300 fish species, a variety of marine mammals, sea turtles, and sea birds, among a wealth of other ocean and coastal wildlife. In partnership with environmental scientists and nonprofit organizations, New York State is working to understand and minimize the cumulative impacts to species and habitats from offshore wind development and operations.



**New York State's Environmental Technical Working Group is working to plan for and implement the environmentally-responsible development of offshore wind energy. The practices being explored include:**

- Developing best management practices to minimize the risks to wildlife such as marine mammals, birds, and bats during the siting, construction, and operation of future offshore wind farms
- Engaging a broad group of environmental stakeholders to identify research needs and mechanisms for filling those gaps
- Adapting and implementing project-specific Environmental Mitigation Plans

For more information about wildlife and offshore wind, visit [www.briloon.org/offshorewindny](http://www.briloon.org/offshorewindny) or email [environmentandoffshorewind@nyserda.ny.gov](mailto:environmentandoffshorewind@nyserda.ny.gov)



**New York State is conducting fisheries and environmental research to inform offshore wind development.**

NYSERDA has deployed two LiDAR (light detection and ranging) buoys for a 2-year period. Remote sensing will provide continuous data on wind, ocean currents, and wildlife. Features include acoustic monitoring for birds, bats, and marine mammals, and nanotag antennas and fish tag receivers.

NYSERDA's efforts to analyze and collect new offshore environmental data began in 2017, with digital aerial surveys of birds, marine mammals, sharks and fish shoals. This three-year survey collected more than 3.5 million images across the New York Bight.

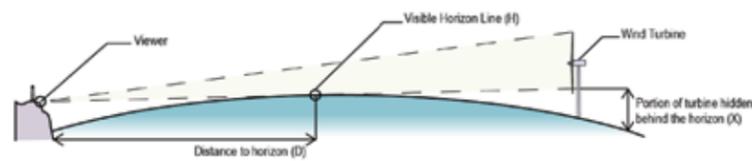


In Summer 2019, NYSERDA selected five multi-year projects following a competitive solicitation to further study important environmental and commercial fishing topics to support the responsible development of offshore wind. Environmental research projects include:

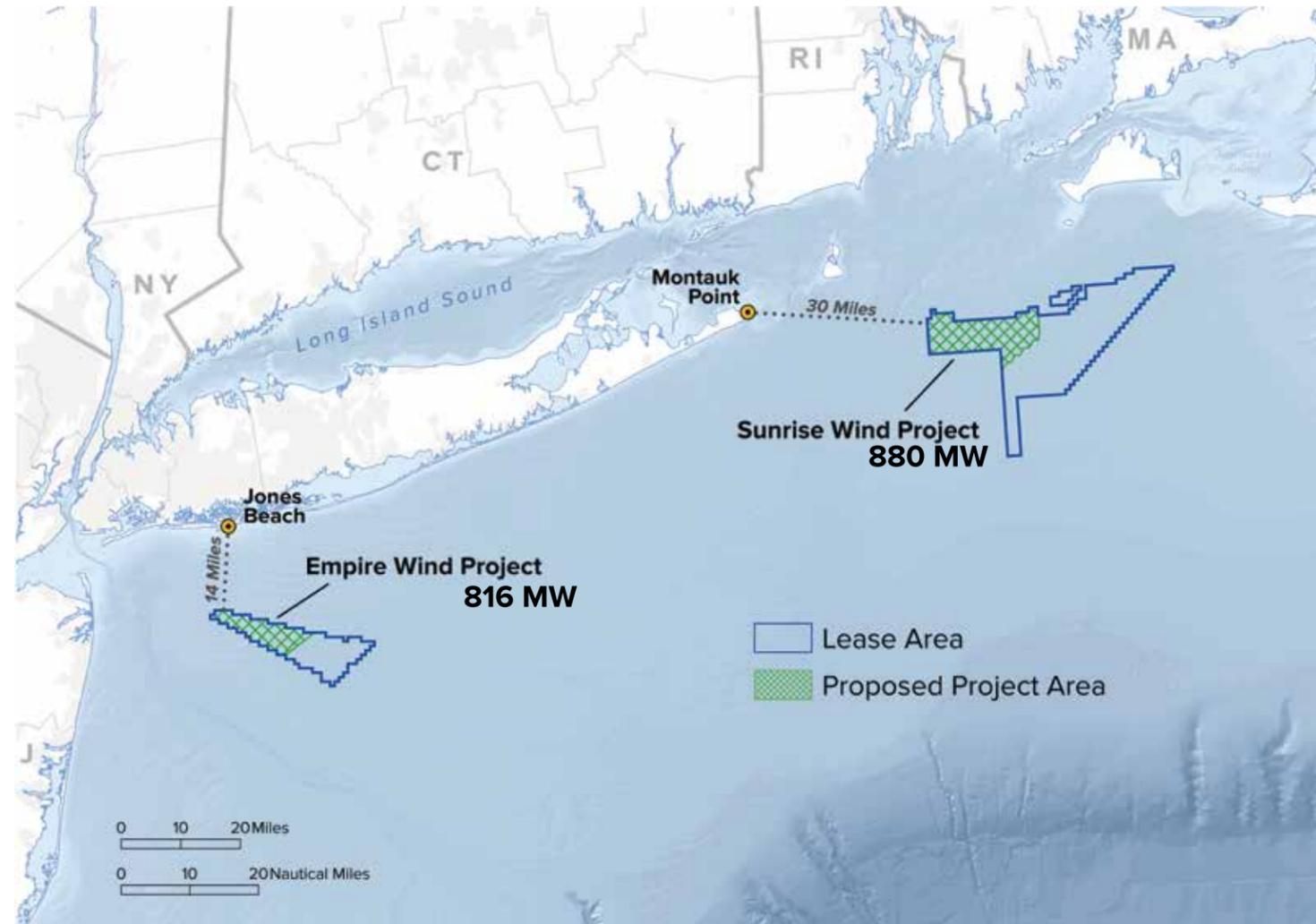
- A multi-scale study of the relationships between forage fish and seabirds and implications for offshore wind development
- Using multi-year, 3-D modeling of ocean environments to better understand wildlife distribution movements
- Development of monitoring protocols for collecting data on birds and bats from nanotag transmitters to inform offshore wind development

# Project Distances and Visibility

Minimizing visual impacts from offshore wind energy is a priority for New York State and was included as a contract requirement in the State's first solicitation for offshore wind. Visibility of offshore wind turbines depends on many factors, including distance from shore, viewer elevation, time of day, weather conditions, the angle of the sun, and seasonal variation.



- When located many miles from shore, offshore wind turbines may not be visible due to the curvature of the Earth
- Turbine visibility is also impacted by weather and lighting conditions
- Turbines may be blocked from view by maritime traffic and common anchorages



For the Empire Wind project, use the “rule of thumb”: If you extend your arm fully to the horizon and raise your thumb, the approximate size of the closest turbines, visible under clear conditions, will be less than a quarter of the size of your thumbnail. The Sunrise Wind project will not be visible from the New York shoreline.

# Offshore Wind Jobs and Infrastructure

## New York has several important attributes that will support its ability to become a national hub for offshore wind energy:

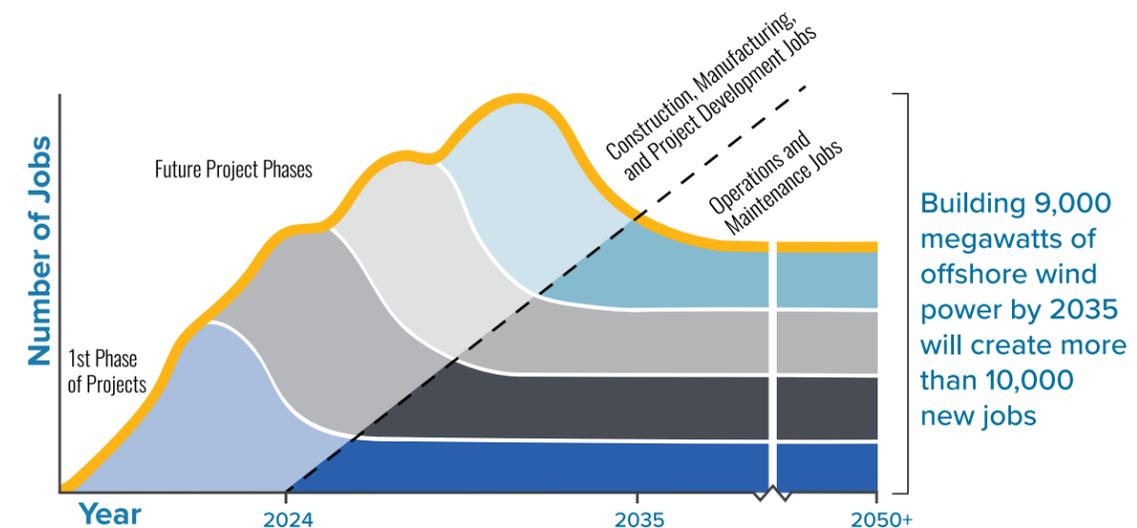
- A nation-leading procurement commitment of 9,000 megawatts of offshore wind energy
- Central location between Northeastern and mid-Atlantic states
- Existing port facilities ideally positioned to service wind farms across the region
- Core manufacturing competencies that are well-suited to the offshore wind industry
- A workforce equipped to support the offshore wind industry

## New York's economy and its communities could benefit from billions of dollars of investments and approximately 10,000 new jobs in installation, operations and maintenance, and manufacturing. The State is investing in clean energy workforce development and infrastructure advancement by:

- Committing \$20 million to a new Offshore Wind Training Institute (OWTI), a collaboration of industry, universities, nonprofits, and organized labor that will offer new training programs and pathways to quality careers in the clean energy sector
- Investing \$200 million in port infrastructure to unlock private sector capital and cultivate a U.S. supply chain

## New York State is working to ensure that this economic development takes the form of high-quality employment opportunities:

- NYSERDA's 2018 solicitation included first-of-a-kind requirements for wage and labor agreements by offshore wind developers



# Award Results: Two Projects, 1,696 Megawatts

As a result of the State’s inaugural solicitation for offshore wind, NYSERDA has selected two projects – Empire Wind (Equinor US Holdings, Inc.) and Sunrise Wind (Bay State Wind LLC, a joint venture of Ørsted A/S and Eversource Energy) to deliver renewable power to New York. These projects will utilize port facilities from the Capital Region to Long Island for different stages of project development.



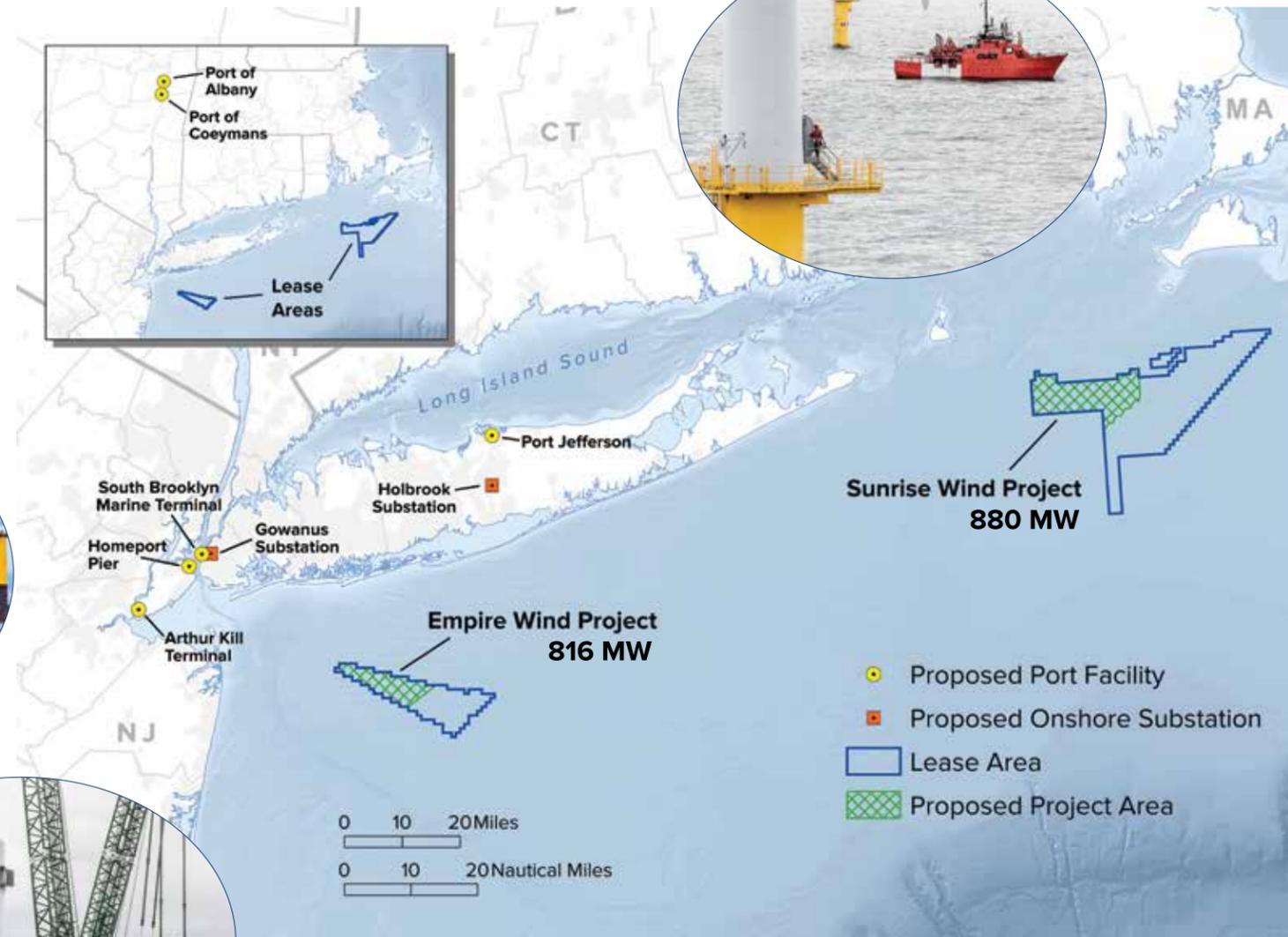
Some manufactured components will be floated down the Hudson River to a staging facility for final assembly before installation



To prepare these components for installation, staging facilities serve as the final assembly point before heading out to the lease area



Supports long-term, well-paying careers for the 25-year lives of the projects

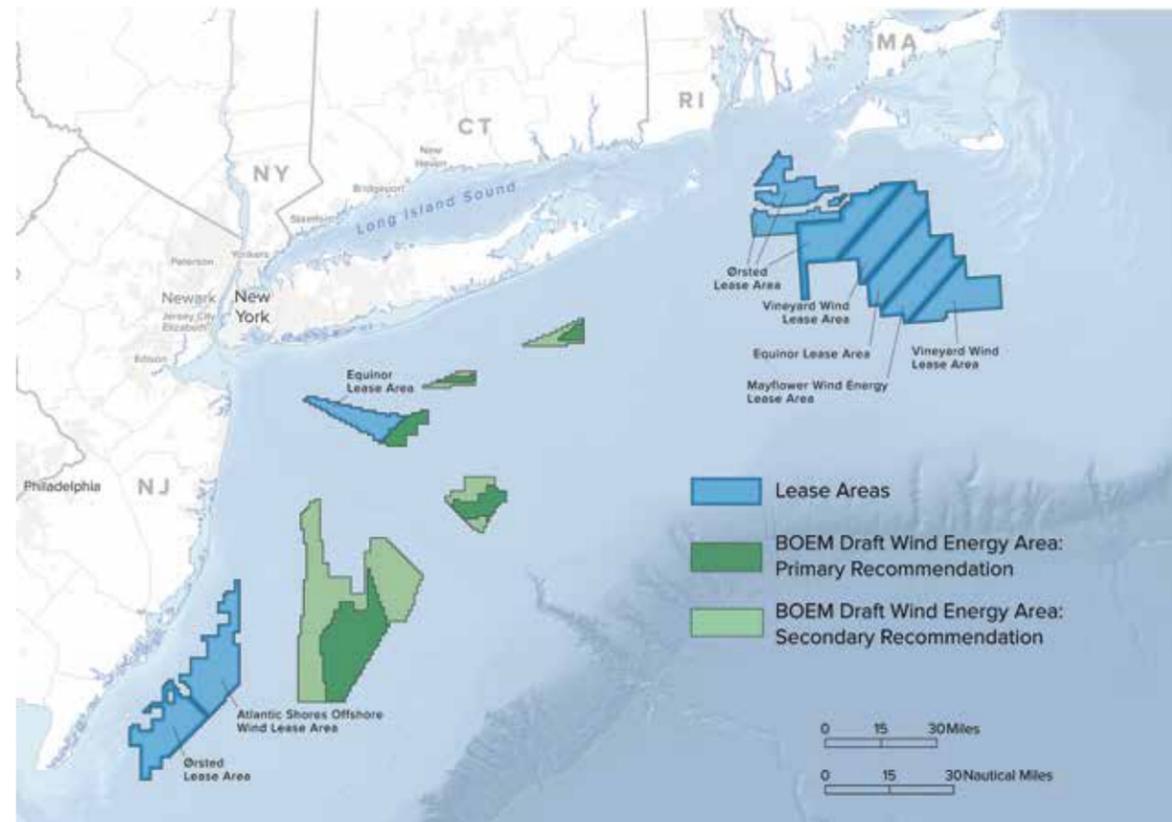


# Offshore Wind in New York State

**New York State's Climate Leadership and Community Protection Act requires that 70 percent of New York's electricity come from renewable sources by 2030.**

To help achieve this goal, New York State is pursuing the development of 9,000 megawatts of offshore wind energy by 2035 — enough to power up to 6 million homes.

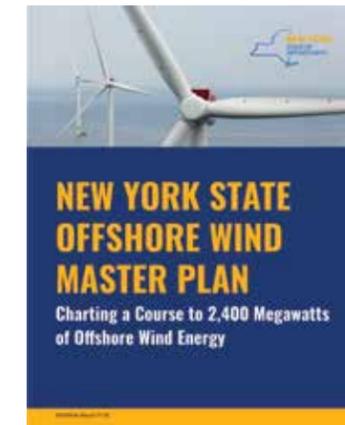
The map below depicts existing lease areas in the New York Bight (in blue). The Bureau of Ocean Energy Management has issued draft Wind Energy Areas for consideration (in green).



**Published in January 2018, the New York State Offshore Wind Master Plan serves as the State's comprehensive roadmap for advancing the responsible and cost-effective development of offshore wind.**

The New York State Offshore Wind Master Plan:

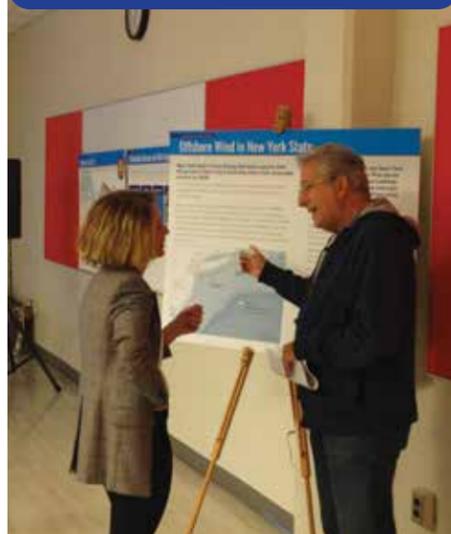
- Identifies the most favorable areas for potential offshore wind energy development
- Describes the economic and environmental benefits of offshore wind energy development
- Addresses mechanisms to procure offshore wind energy at the lowest cost to ratepayers
- Analyzes costs and cost-reduction pathways
- Recommends measures to mitigate potential impacts of offshore wind energy development
- Identifies infrastructure requirements and assesses existing facilities
- Identifies workforce opportunities
- Initiates the convening of four Technical Working Groups: Maritime; Jobs and Supply Chain; Commercial and Recreational Fishing; and Environmental



# Stakeholder Outreach and Public Engagement

NYSDERDA continues to create opportunities for facilitating dialogue with the public and provide timely, transparent responses to questions and concerns. New York's four Technical Working Groups ensure the continued collaboration among those with the technical knowledge, practical experience, and professional interest to responsibly advance offshore wind in the State.

## General Public



- Attend and participate in public information sessions, webinars, workshops, and conferences

## Maritime



- Develop Maritime Best Management Practices
- Define strategies that could help members engage effectively with offshore wind development

## Environmental



- Develop Wildlife Best Management Practices
- Coordinate for adaptive management through Environmental Mitigation Plans
- Identify research needs
- Create a public database of environmental mitigation and monitoring practices

## Jobs and Supply Chain



- Facilitate the connection of local manufacturers with global offshore wind developers and equipment manufacturers
- Ensure certification and training requirements are clear and readily available
- Assess port infrastructure assets and opportunities

## Commercial Fishing



- Develop Fisheries Best Management Practices
- Identify research needs
- Develop a framework for understanding commercial fishing impacts
- Evolve and implement Fishing Mitigation Plans