



NYSERDA

New York State Wind Turbine Package Supplier Forum

Winter 2022

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Welcome, Market Overview and Supply Chain Ecosystem

Greg Lampman, Director, Offshore Wind

Peter Lion, Senior Advisor, Offshore Wind

9,000 MW
of offshore wind
by 2035

An illustration of several offshore wind turbines of varying sizes, receding into the distance over a dark blue sea. The turbines are rendered in shades of grey and white, with their blades slightly blurred to suggest motion. The background behind the turbines consists of light blue, rounded shapes representing clouds or waves.

10,000 JOBS

**ENOUGH TO POWER
6 MILLION HOMES**

**BILLIONS IN
INFRASTRUCTURE**

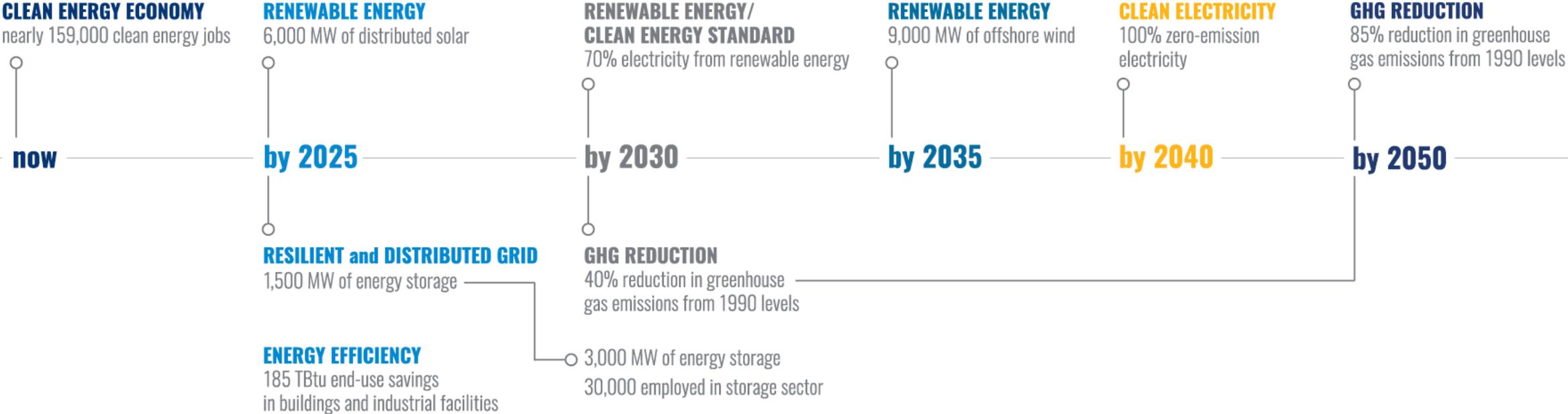
**30% OF NEW YORK'S
ELECTRICITY LOAD**

New York Offshore Wind Supplier Forum

New York is committed to
100% clean
zero-emission electricity
by 2040

most aggressive goal in the nation

New York State Clean Energy Goals



Historic Federal Commitments and Support

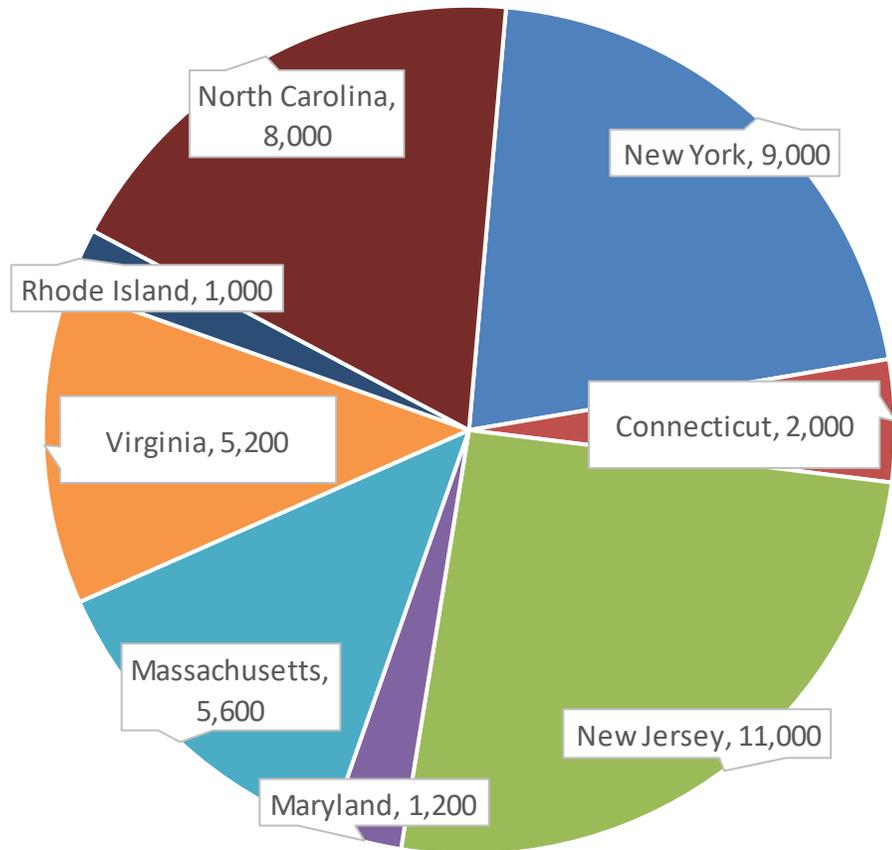
President Biden's Administration has set offshore wind goals of **30 GW by 2030** and **110 GW by 2050**

- > Key elements of the Administration's announcement:
 - New priority **Wind Energy Areas** in the **New York Bight**
 - Advance new lease sales and complete reviews of Construction and Operations Plans by 2021 and proceed with critical permitting and environmental reviews
 - Invest **\$700+ million** for port and intermodal infrastructure-related projects, **\$3 billion** earmarked for offshore wind innovation in the DOE Loan Offer Program plus the establishment of a **Manufacturing Production Tax Credit** for primary components under IRA

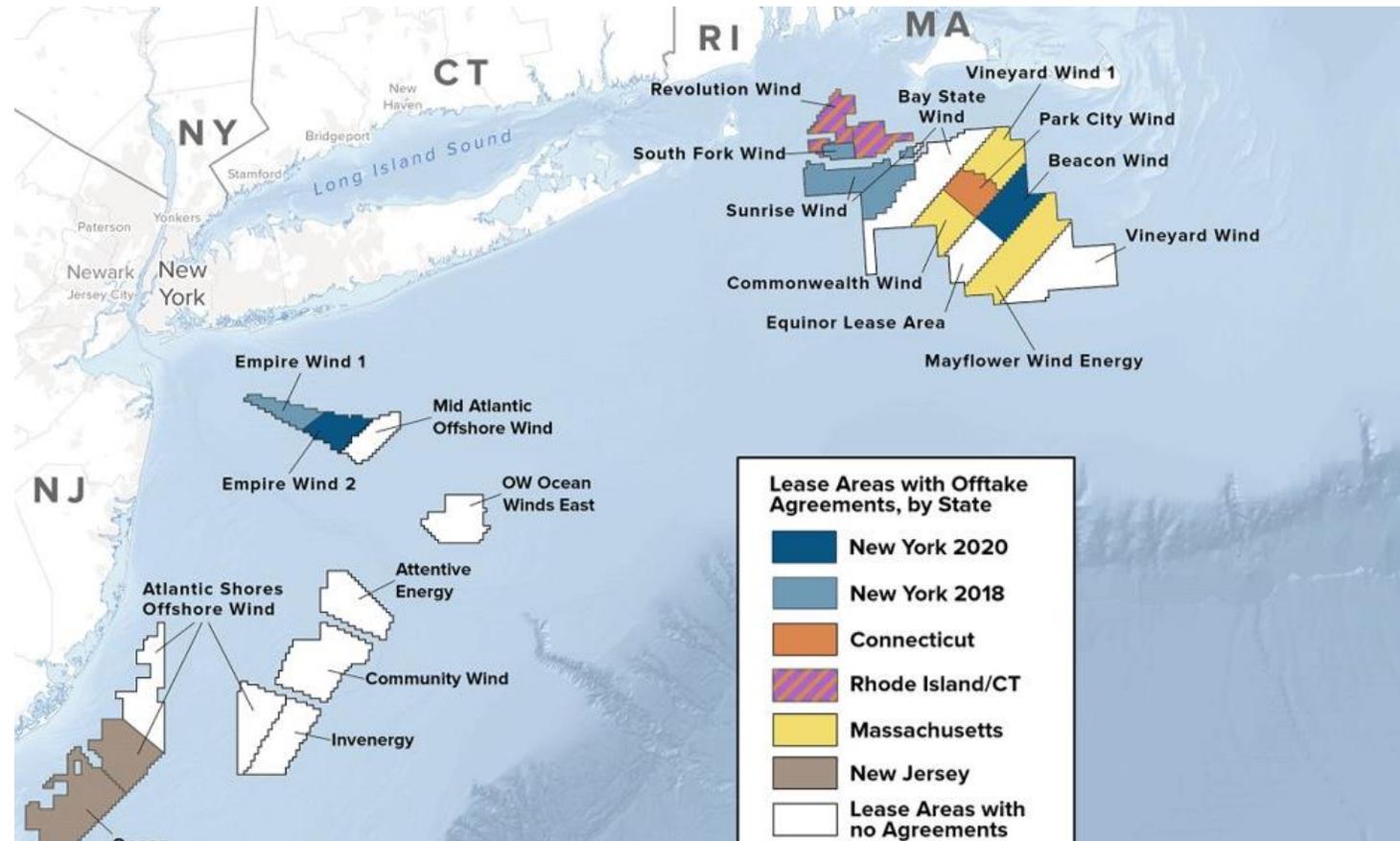


Regional OSW Market Potential of +40 GW

New York 9 GW mandated targeted



Offshore Wind Goals by State (MW)



BOEM

The Federal Role

- “Landlord” of lease areas
- Oversees leasing process
- Oversees all federal permitting processes: Site Assessment Plans, Construction and Operations Plans, Environmental Assessments

New York

The State Role

- Buyer in long-term revenue contracts with projects
- State permitting processes
- Energy policy and strategy development
- Stakeholder engagement
- Supply chain and workforce development
- Research and data development
- Regulatory activities related to offshore energy development

NYSERDA, DOS, DEC, DPS

Developers

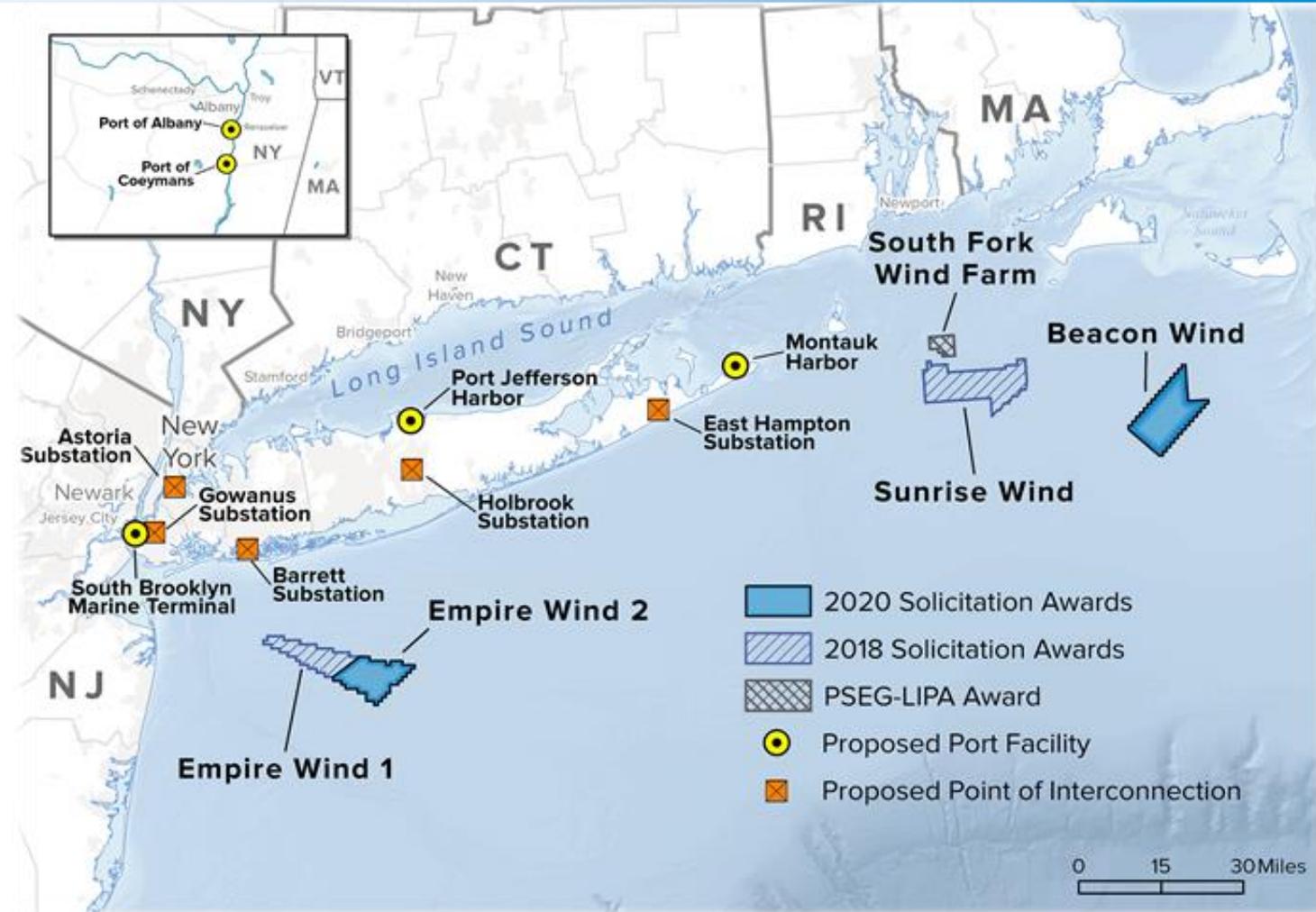
The Industry Role

- Design, finance, build, and operate projects
- Supply chain planning including ports development and top-tier procurement
- Fulfill federal and state permit requirements
- Stakeholder engagement throughout development

More than 4,300 MW in Active Development

Leading the Nation with 5 Projects in Active Development

- > More than **6,800** direct jobs
- > Combined economic activity of **\$12.1 billion** in labor, supplies, development and manufacturing statewide
- > **Recent Project Milestones:**
 - Equinor launches \$5M clean energy community grant program (Ecosystem Fund)
 - BOEM releases Draft Environmental Impact Statement (DEIS) for Empire Wind
 - Sunrise Wind transmission line approved by NYS Public Service Commission



Port Investments and Supply Chain Growth

- > Supported by combined public and private investments of more than **\$700 million for port infrastructure**
- > Nation's first tower and transition piece **manufacturing** at Port of Albany
- > **Advanced Component Manufacturing** at Port of Coeymans
- > State-of-the art **staging** facility at South Brooklyn Marine Terminal (SBMT)
- > Regional **operations and maintenance** hubs at SBMT and Port Jefferson, and additional O&M support at Montauk Harbor
- > With many additional New York port facilities with potential to support the offshore wind industry, New York is attracting **long-term supply chain investments**

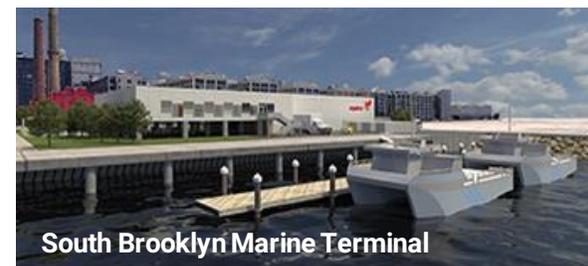




Photo: EEW SPC/Andreas Duerst, Studio 3



New York Third Offshore Wind Solicitation: ORECRFP22-1

Solicitation Overview

- Target minimum of 2 GW new project(s)
- First tranche of \$500 million State funding to support offshore wind supply chain infrastructure
- Transmission improvements (HVDC, Offshore Grid “Mesh-Readiness”, Storage)
- Repurposing Fossil-Fuel infrastructure
- Stakeholder engagement, promoting equity and delivering benefits to NYS Disadvantaged Communities
- Support for environmental and fishing engagement, research and stewardship.
- 2021 NYS PSL Obligations: Buy American (U.S. Structural Iron and Steel), Prevailing Wage, PLAs, and Project Peace Agreements (O&M)

Solicitation Schedule	
RFP Release	July 27, 2022
Notice of Intent to Propose	December 1, 2022
Bid Submission	January 26, 2023
Award Notification	Q1 2023
Contract Execution	Q2 2023

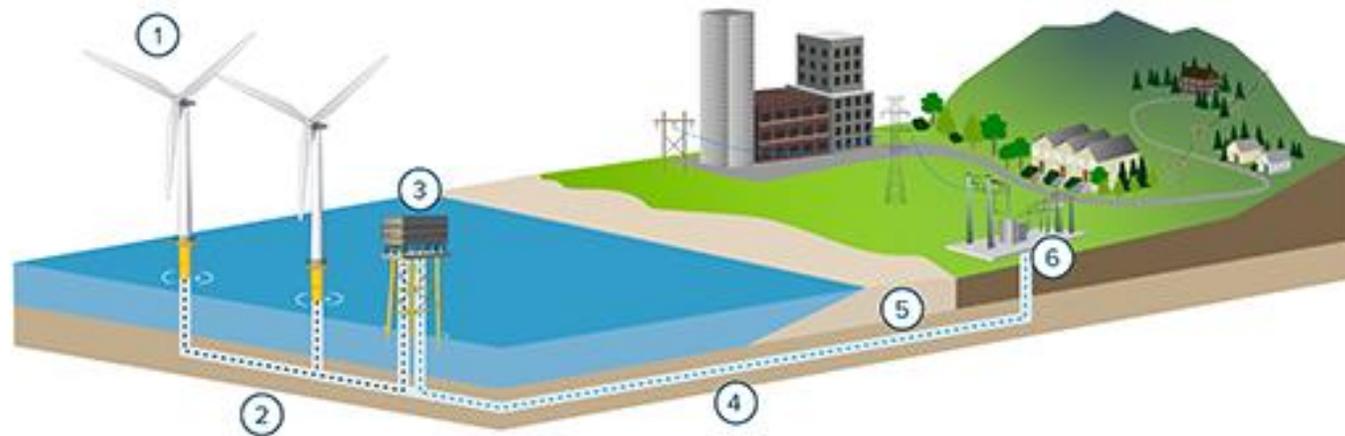
NYSERDA received 6 Notices of Intent to Propose, representing 7 lease areas: Attentive Energy LLC, Bay State Wind LLC, Beacon Wind LLC, Community Offshore Wind LLC, Invenergy Wind Offshore LLC, and Vineyard Offshore LLC

Supply Chain

Overview of Offshore Wind Power Generation

1. Turbines capture the wind's energy and generate electricity.

How Offshore Wind Works



3. Electricity flows through a buried cable to an onshore substation and is transferred to the existing transmission network

2. Foundations secure turbines to the ocean floor and cables transmit electricity to an offshore substation

Foundations, Array Cables, and Offshore Substation

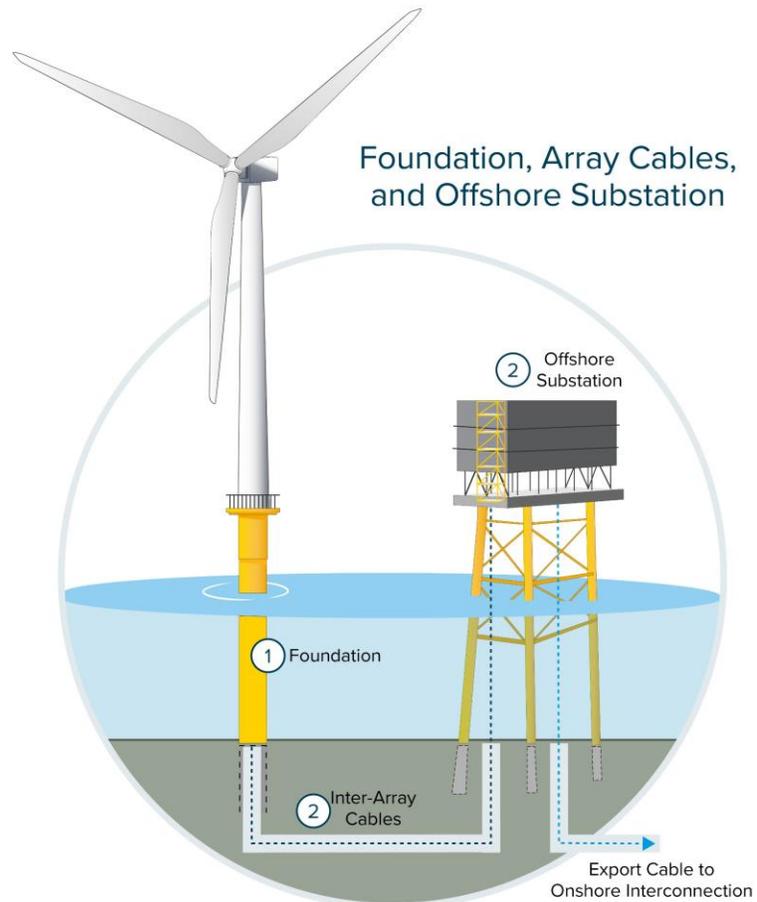


Figure Not to Scale

1. **Foundation** Foundations secure the tower and above-water turbine components to the sea floor. A variety of technologies are available, including jackets, monopiles, and gravity-based foundations.
2. **Array Cables** A network of array cables link the wind turbines together and deliver power from the turbines to the offshore substation.
3. **Offshore Substation** The offshore substation collects and stabilizes the power generated by the turbines, preparing it for transmission to shore.

Turbine Components (Turbine Package)

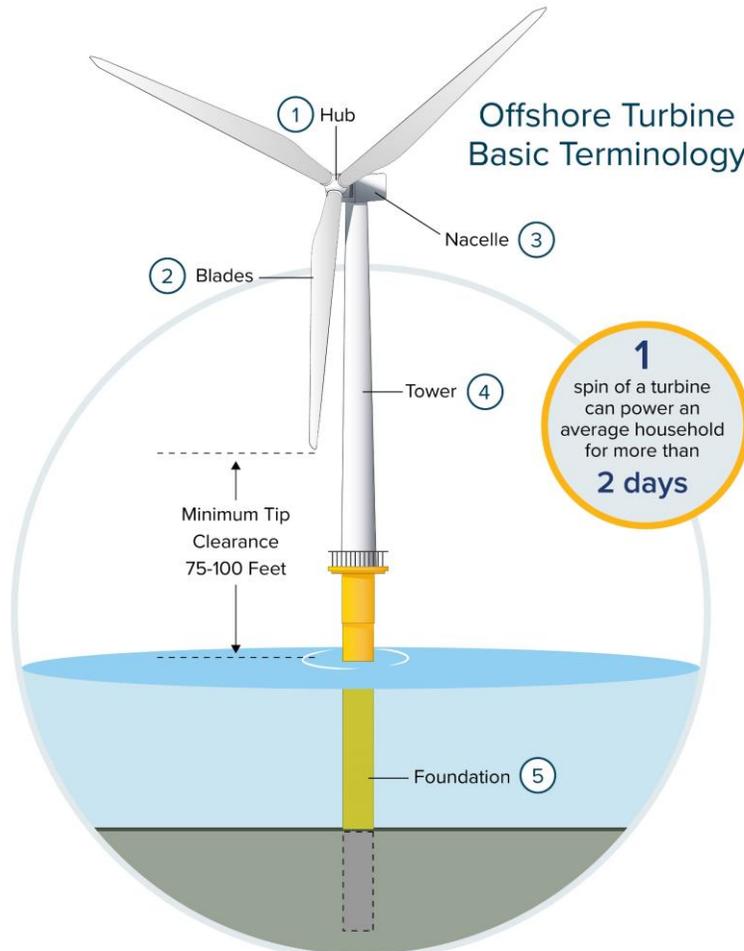


Figure Not to Scale

- 1. Blades** Blades capture the wind's energy and convert it into mechanical energy.
- 2. Nacelle** The nacelle houses the components that convert mechanical energy to electrical energy.
 - > Hub** The hub supports the blades and houses the pitch system, which optimizes blade angle and rotation speed.
- 3. Tower** The tower supports the mass of the nacelle, hub, and blades.

Export Cable and Onshore Connection (Balance of Plant)

Export Cable and Onshore Interconnection

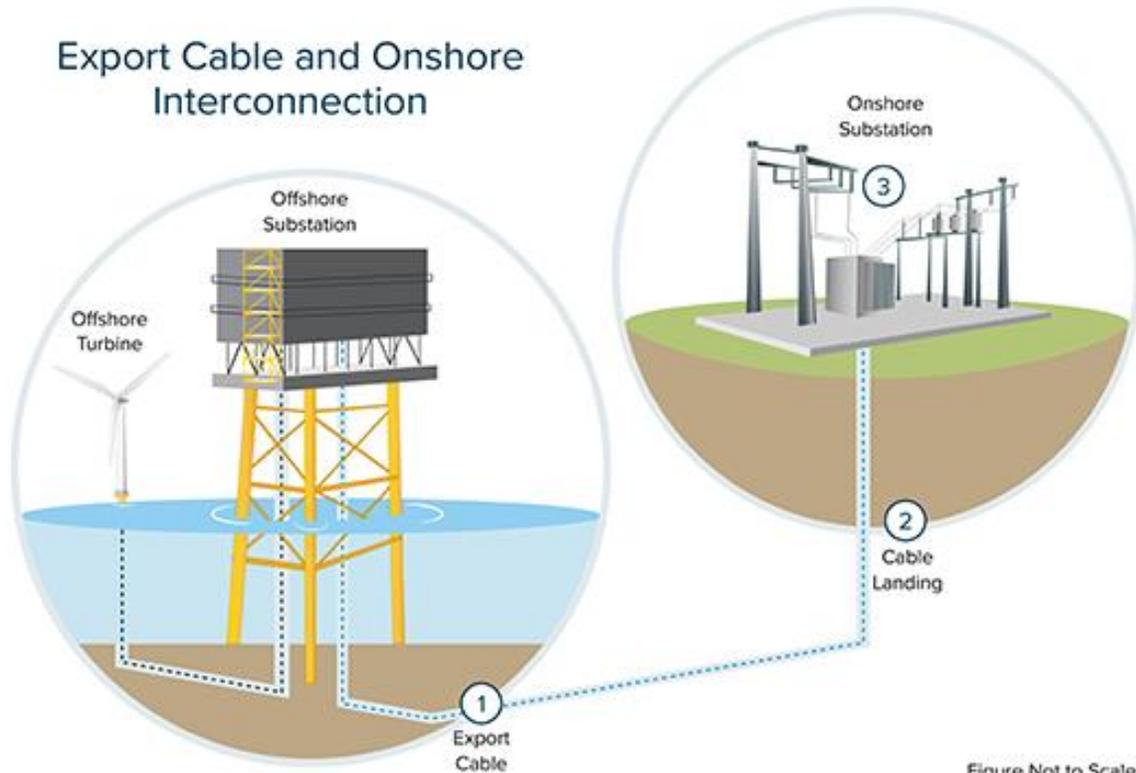
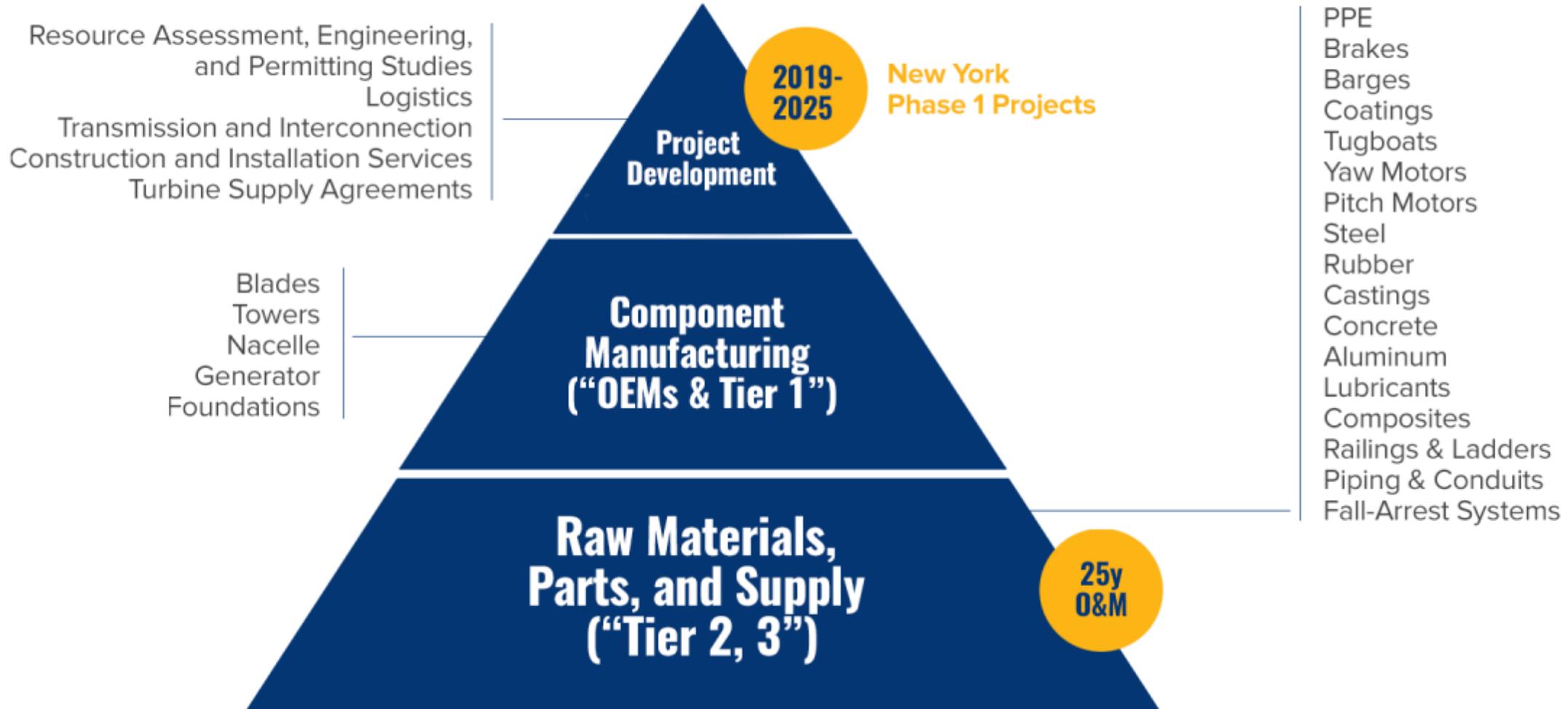


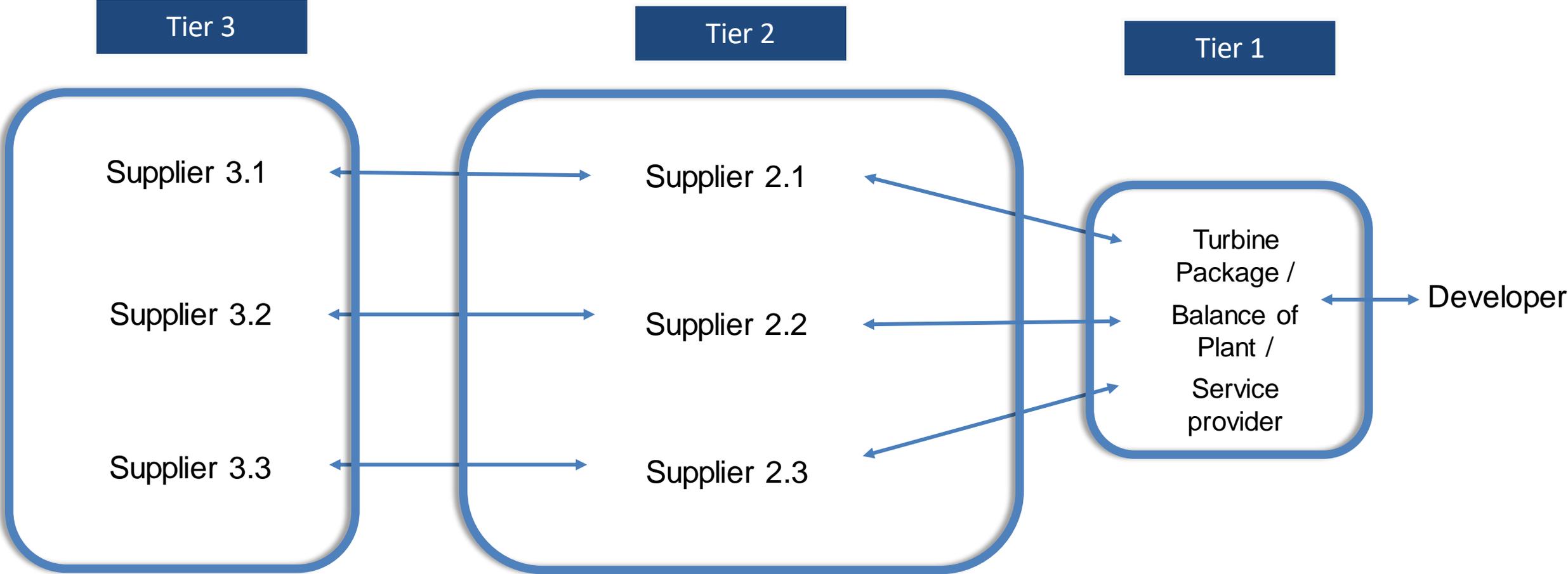
Figure Not to Scale

1. **Export Cable** The export cable is buried deep enough to avoid disturbing ocean users and wildlife, and it transmits power from the offshore substation to the onshore substation.
2. **Cable Landing** Horizontal direction drilling, a common method for landing export transmission cables from offshore wind farms, minimizes environmental impacts and disruption to beaches and the shoreline.
3. **Onshore Connection** Electricity is transferred to the existing transmission network

Offshore Wind Developer



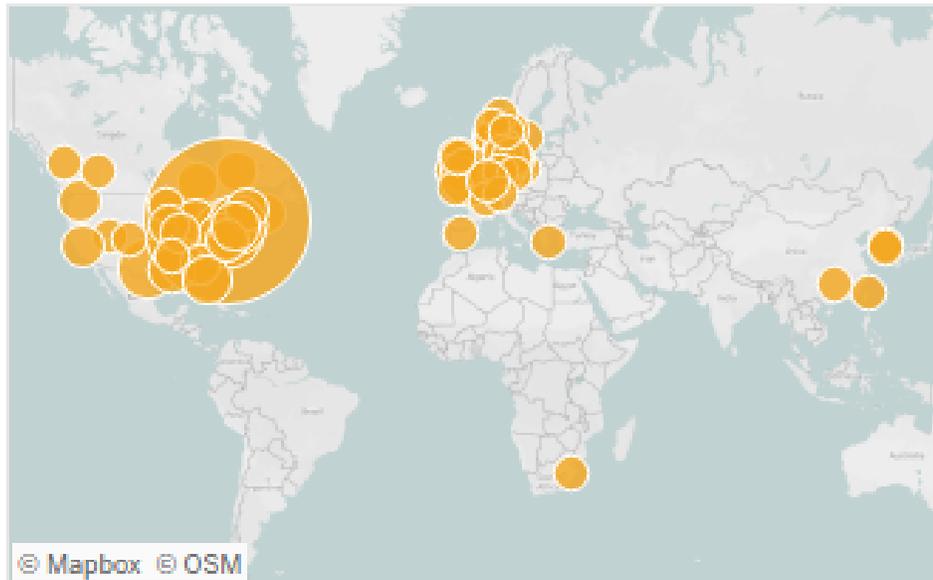
Offshore Wind Contracting Chart



Offshore Wind: NYSERDA Supply Chain Database

- The NYSERDA Supply Chain Database connects interested upstream and downstream suppliers to offshore wind project developers and tier 1 suppliers
- Developers and tier 1 suppliers are expected to search the database for contract values of \$5 million or greater
- To request placement in this database or to update your company's information, please submit your company's information or changes here –

<https://www.nyserda.ny.gov/supply-chain-database>



Organization Type =

Other Organizations	251
Consulting Services	249
Onshore Construction Services	222
Manufactured Products	190
Specialist Services	186
Manufacturing and Fabrication Svcs.	152
Offshore Const./Ops. and Vessels	124
Labor Organizations	115
Not Provided	24

Offshore Wind Priorities: Supply Chain & Workforce

- Minority/Women-Owned Business Enterprises (MWBE)
- Service-Disabled Veteran-Owned Businesses (SDVOB)
- Disadvantaged Communities
- Prevailing Wage, Project Labor Agreements (Construction), and Project Peace Agreements (O&M)

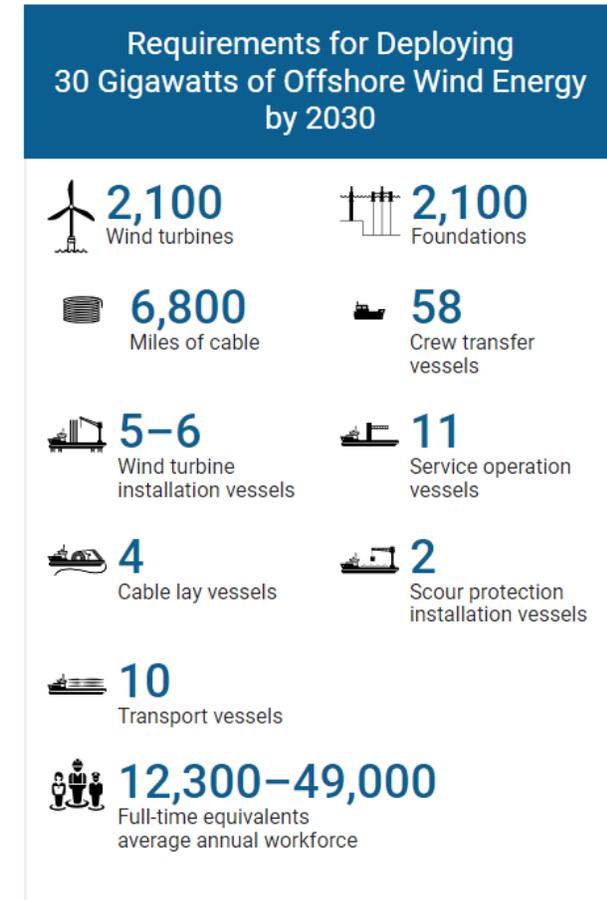
Additional Databases & Resources:

Empire State Development
NYS Department of Labor
Office of General Services



To Achieve President Biden's Goal of 30 Gigawatts by 2030

1. Only one major offshore wind component manufacturing facility was operational as of early 2022
2. Plans announced for 11 new manufacturing facilities in the United States
3. In addition to the need for major component manufacturing, several critical-path subcomponents pose a challenge to domestic manufacturing because of their size or specialty, including:
 - Yaw and pitch bearings
 - Permanent magnets
 - Flanges and other large cast or forged components
 - Steel plates that are rolled into monopiles or towers
 - Electrical systems for offshore substations
 - Mooring chains.



Ports

Types of Port Facilities

Operations & Maintenance

Minimum Upland Area	10 acres
Minimum Air Draft	65 feet
Minimum Water Depth	16 feet

- Used throughout a project's operation (25- yrs) and is designed to maximize a project's availability while minimizing operational cost.
- Ports will be proximately located to projects so that vessels can respond quickly to maintenance events.



Manufacturing

Minimum Upland Area	15 to 25 acres
Minimum Air Draft	50 to 400 feet
Minimum Water Depth	13 to 38 feet

- Supports the manufacturing and fabrication of Tier 1 components.
- Must provide sufficient area for production and storage of completed components; exact physical requirements vary significantly by component.
- Manufacturing ports may be collocated with staging ports, though this is not required.



Staging & Installation

Minimum Upland Area	25 acres
Minimum Air Draft	400 feet
Minimum Water Depth	38 feet

- Used to assemble components in a central location prior to being loaded onto installation vessels for offshore installation.
- Components may be manufactured locally or shipped from distant locations.
- Ports should have abundant area for upland storage of components.



Spotlight:

Port of Albany

Over \$350 million investment to develop
Nation's first tower manufacturing facility



Hudson Valley Community College to train
welders for Offshore Wind



Marmen Welcon – Tower Fabricator
OSW Developer – Equinor and bp

Spotlight:

Port of Coeymans

Sunrise Wind signs \$86 million supply chain deal to construct Advanced Foundation Components for Wind Turbines



230 jobs in Capital Region and Western NY



Western NY - LJUNGSTRÖM – Steel Fabrication
Capital Region - Riggs Distler - Assembly & Staging
OSW Developer - Ørsted and Eversource

Spotlight:

South Brooklyn Marine Terminal

OSW Staging & Marshalling Facility at SBMT

Equinor | bp - U.S. Operations and Maintenance Hub at SBMT



Workforce

10,000 Offshore Wind Jobs

Offshore Wind Project Phases



30+ years Offshore Wind Project

Training New York's Offshore Wind Workforce

Over \$100 Million of Funding

New York State

<p>Offshore Wind Training Institute (OWTI) \$20M NYSERDA \$10M SUNY Stony Brook and Farmingdale \$10M</p>
<p>NYSERDA Workforce ~\$15M</p>
<p>CUNY \$20M: \$10M DOB \$10M NYC EDC</p>

<p>NYSERDA – Environmental Justice, Labor, CBOs, Supply Chain (HVCC Welding, LAGCC Wind Techs)</p>
<p>SUNY - Exclusive to SUNY institute programs</p>
<p>Clean Energy Internships PON 4000 ; Climate Justice Fellowship PON 4772; OJT Training PON 3982</p>
<p>Program Development at CUNY's diverse campus locations in NYC Kingsborough Community College CTV Simulator, At Height Training NYCCT, LGCC, Grove School of Engineering</p>

Federal

<p>SUNY Maritime \$795,000</p>

<p>GWO Training Center Bronx, NYC Campus</p>
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Private Sector

<p>Sunrise Wind (Orsted/Eversource) \$1M</p>
<p>Sunrise Wind (Orsted/Eversource) \$10M</p>
<p>Sunrise Wind (Orsted/Eversource) \$5M</p>
<p>Empire Wind 1 (Equinor/BP) \$5M</p>
<p>Empire Wind 2/Beacon Wind (Equinor/BP) \$47M</p>
<p>NYS Third Offshore Wind Solicitation: Future Opportunity</p>

<p>Upper Hudson Offshore Wind Workforce Development Fund Advance Component Manufacturing</p>
<p>National Offshore Wind Training Center (NOWTC) in Suffolk County Focus on GWO</p>
<p>Stony Brook University Advance Energy and Research Technology Center (AERTC)</p>
<p>Community Workforce Benefit Fund Just access to workforce development and equity</p>
<p>Community Benefits + Workforce Development Split Between 2 Projects; More Info to Come</p>
<p>Community Engagement</p>
<p>Workforce Development</p>
<p>Technology & Innovation Acceleration</p>

New York State Workforce Training Website

OffshoreWindTraining.ny.gov

Career Pathways, Project Phases, Job Descriptions

Select a project phase

Planning and Development

Manufacturing and Assembly

Construction and Installation

Operations and Maintenance

Planning and Development is the initial phase for offshore wind projects that involves identifying sites for needed facilities, collecting and analyzing project data, conducting environmental reviews, securing financing and permits, designing the power plant, and securing all components required for construction. This phase takes at least two years, typically longer, depending on the project, but for New York State's projected development, this phase would take roughly seven years.

Pick a job at any career level

Entry-Level

ENGINEER

MAINTENANCE WORKER

OPERATIONS RESEARCH ANALYST

COMPUTER OCCUPATIONS

Experienced

LEAD ENGINEER

ELECTRICIAN

GENERAL AND OPERATIONS MANAGERS

SUPERVISOR

Advanced

ENGINEERING TEACHER

MASTER ELECTRICIAN

VIEW JOBS RELATED TO EACH JOB TYPE

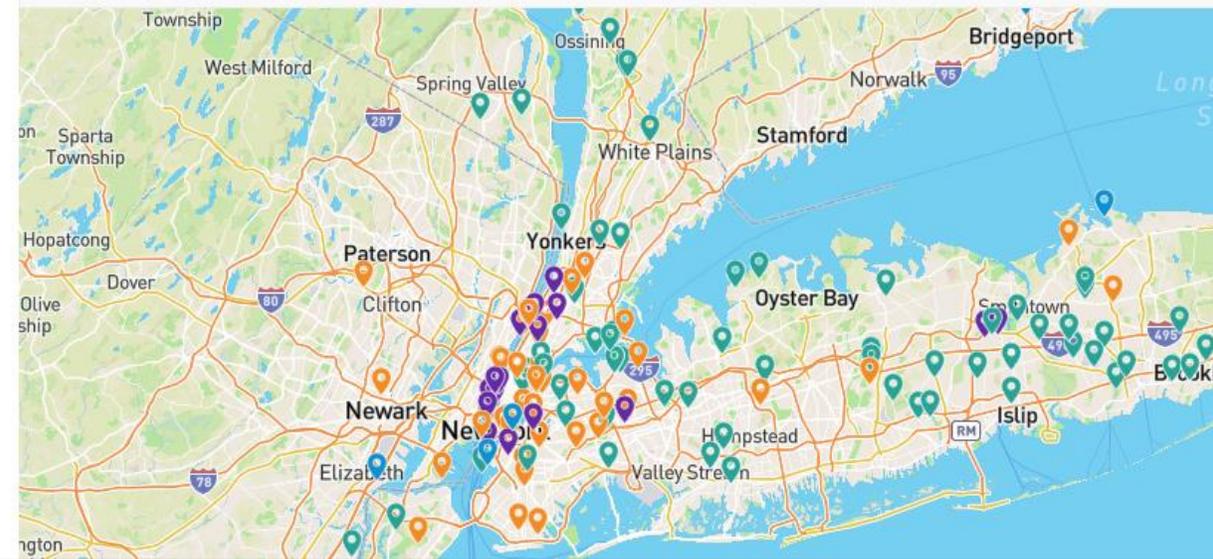
Find Training Locations

View opportunities as:

VIEW AS A MAP

VIEW AS A LIST

Apprenticeships Ports Training Facilities Direct Entry Programs



Offshore Wind Engagement

Offshore Wind Priorities: Engagement

Stakeholder Engagement

- Actively moving the needle on diversity, inclusion, and equity
- Inclusive decision making and building support for the offshore wind industry and clean energy transition
- **Publication Available!**
Guiding Principles of Stakeholder Engagement
 - Stakeholder Engagement Plans

Guiding Principles for Offshore Wind Stakeholder Engagement

Offshore Wind for All: Engaging New York Stakeholders



Learn More:

Learning from the **Experts**

Past webinar slides and recordings:
[Nyscrda.ny.gov/osw-webinar-series](https://nyscrda.ny.gov/osw-webinar-series)

- > Educational **webinar series** facilitated by NYSERDA's offshore wind team and **featuring outside experts** who present on key offshore wind technologies, development practices, and research findings
- > To receive notices of upcoming webinars, **sign up for the offshore wind email list at offshorewind.ny.gov**.

Questions / Discussion