

# NEW YORK OFFSHORE WIND SUPPLIER FORUM



NEW YORK  
STATE OF  
OPPORTUNITY.

NYSERDA

Connect to grow  
your business

November 15, 2018 | New York, NY



## NEW YORK OFFSHORE WIND SUPPLIER FORUM

# Agenda

- 9:30 a.m.–10:00 a.m.**      **Welcome and Introductory Remarks**  
*Richard Kauffman, Chairman of Energy and Finance for New York*  
**Welcome and Introductory Remarks**  
*Hon. Kathy Hochul, Lieutenant Governor, New York State*
- 10:00 a.m.–11:00 a.m.**      **Intro to Offshore Wind and New York State Program Update**
- 11:00 a.m.–11:45 a.m.**      **Panel 1: U.S. Offshore Wind: A 2030 Forecast**
- 11:45 a.m.–12:00 p.m.**      **Break**
- 12:00 p.m.–12:45 p.m.**      **Panel 2: Translating European Supply Chain Experience to New York**
- 12:45 p.m.–1:00 p.m.**      **Keynote Address**  
*Alicia Barton, President and CEO, NYSERDA*
- 1:00 p.m.–1:45 p.m.**      **Lunch**
- 1:45 p.m.–2:00 p.m.**      **Break**
- 2:00 p.m.–4:00 p.m.**      **Matchmaking Roundtables**
- 4:00 p.m.**      **Closing Remarks**



**NYSERDA**

NEW YORK OFFSHORE WIND SUPPLIER FORUM

Program Update and Intro to Offshore Wind

# New York State Offshore Wind

*New York State Energy Research  
and Development Authority*






**NYSERDA**



**New York  
Clean Energy Standard**

**50%**  
**renewable  
energy by  
2030**



**New York State will commit to building:**

**up to 2,400 megawatts of offshore  
wind power by 2030, enough to  
power up to 1.2 million homes**

# Achievement of New York's offshore wind goals will result in significant benefits across the State

*Carbon Reduction*



*Infrastructure*



*Air Quality & Health*



*Workforce*



# Roadmap for advancing the development of offshore wind in a **cost-effective** and **responsible** manner



## NEW YORK STATE OFFSHORE WIND MASTER PLAN

Charting a Course to 2,400 Megawatts  
of Offshore Wind Energy

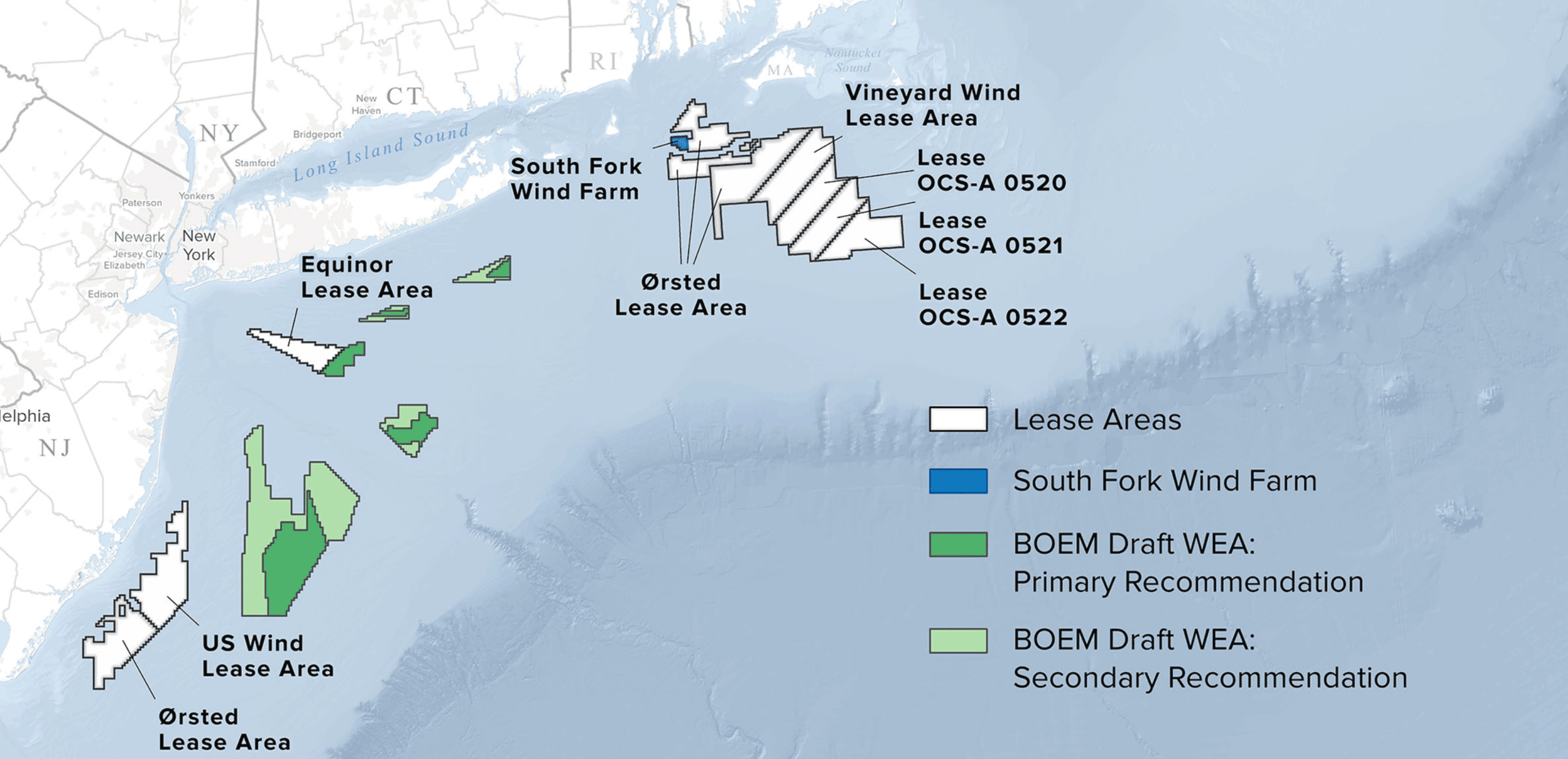




# Collaborating in a 10 GW Regional Market

0 15 30 Miles

0 15 30 Nautical Miles



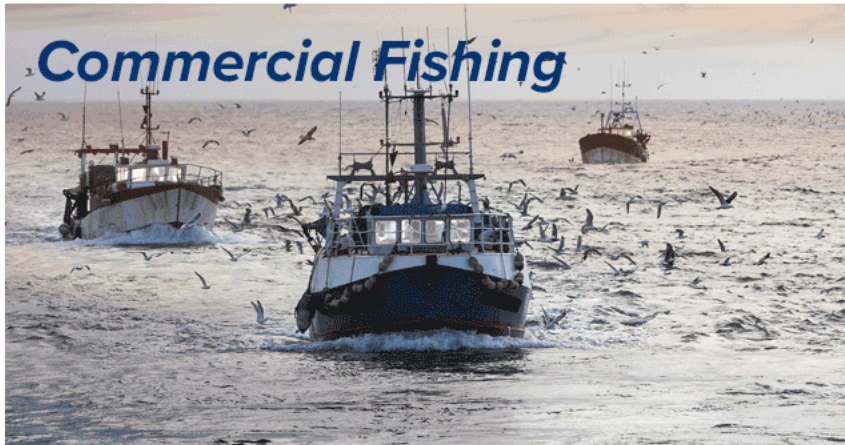
# Collaborating in a 10 GW Regional Market

0 15 30 Miles

0 15 30 Nautical Miles



# Advancing interactions between stakeholders



New York issued an comprehensive solicitation

to develop

**800 MW**

or more of  
offshore wind



**NYSERDA**

**Competitive solicitation to purchase ORECs for projects  
from 200 to 800 MW or more for up to 25 years**

**Released: November 8, 2018**

**Bids Due: February 14, 2019**

**Award(s): April 2019**

**Contract(s): June 2019**



**NYSERDA**

# 2018 Solicitation: Evaluation Criteria



**70% Price**

**20% Economic Benefits**

**10% Project Viability**



NEW YORK  
STATE OF  
OPPORTUNITY.

NYSERDA

**2018 Solicitation:**

**New York  
Supply Chain  
Opportunity**

**Economic Benefit Criteria  
NY Supplier Opportunity Requirement  
NY Supply Chain Database  
Project Labor Agreements  
Prevailing Wage Requirements**



**NYSERDA**

NEW YORK OFFSHORE WIND SUPPLIER FORUM

# Empire State Development

**ESD offers incentives that make New York an attractive and cost-competitive location for offshore wind businesses**

**Beyond traditional incentives, ESD invests in major infrastructure projects that benefit communities and industry**



NEW YORK OFFSHORE WIND SUPPLIER FORUM

Fostering offshore wind by investing

**\$15 Million**

in workforce development and  
infrastructure advancement



NEW YORK  
STATE OF  
OPPORTUNITY.

NYSERDA

**Supporting the growth of an industry by studying**

**New York's ports and  
manufacturing assets**

**Manufacturing**

**Staging**

**Operations and  
Maintenance**



**NEW YORK**  
STATE OF  
OPPORTUNITY.

**NYSERDA**



# National Offshore Wind Research and Development Consortium

the first federally funded public-private partnership focused on advancing research and development to accelerate the offshore wind industry in the United States

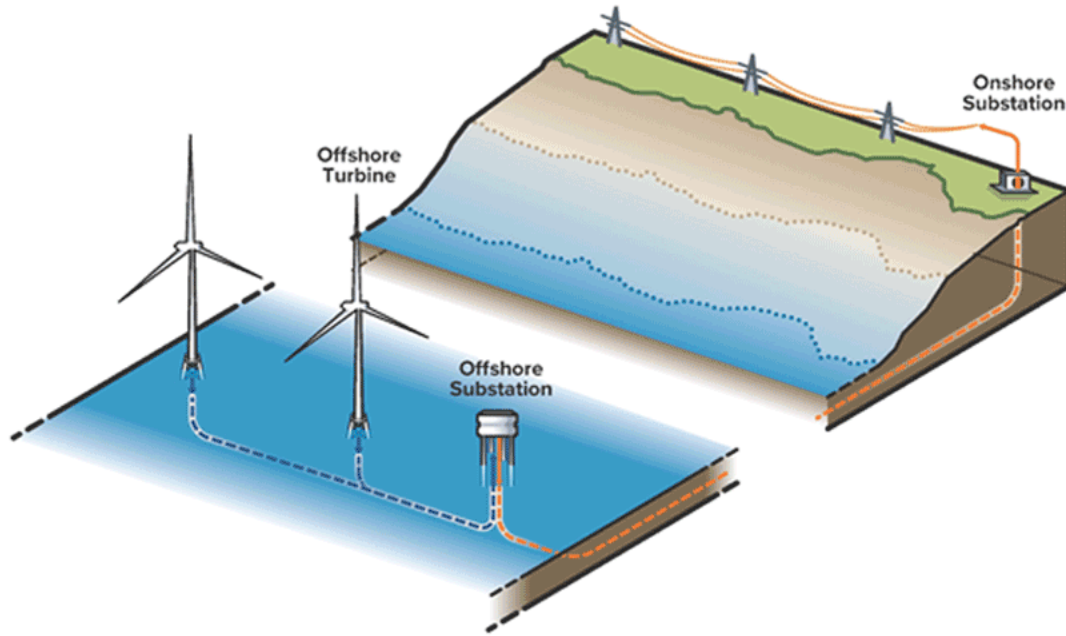


NEW YORK  
STATE OF  
OPPORTUNITY.

**NYSERDA**

# Components of the Offshore Wind Supply Chain

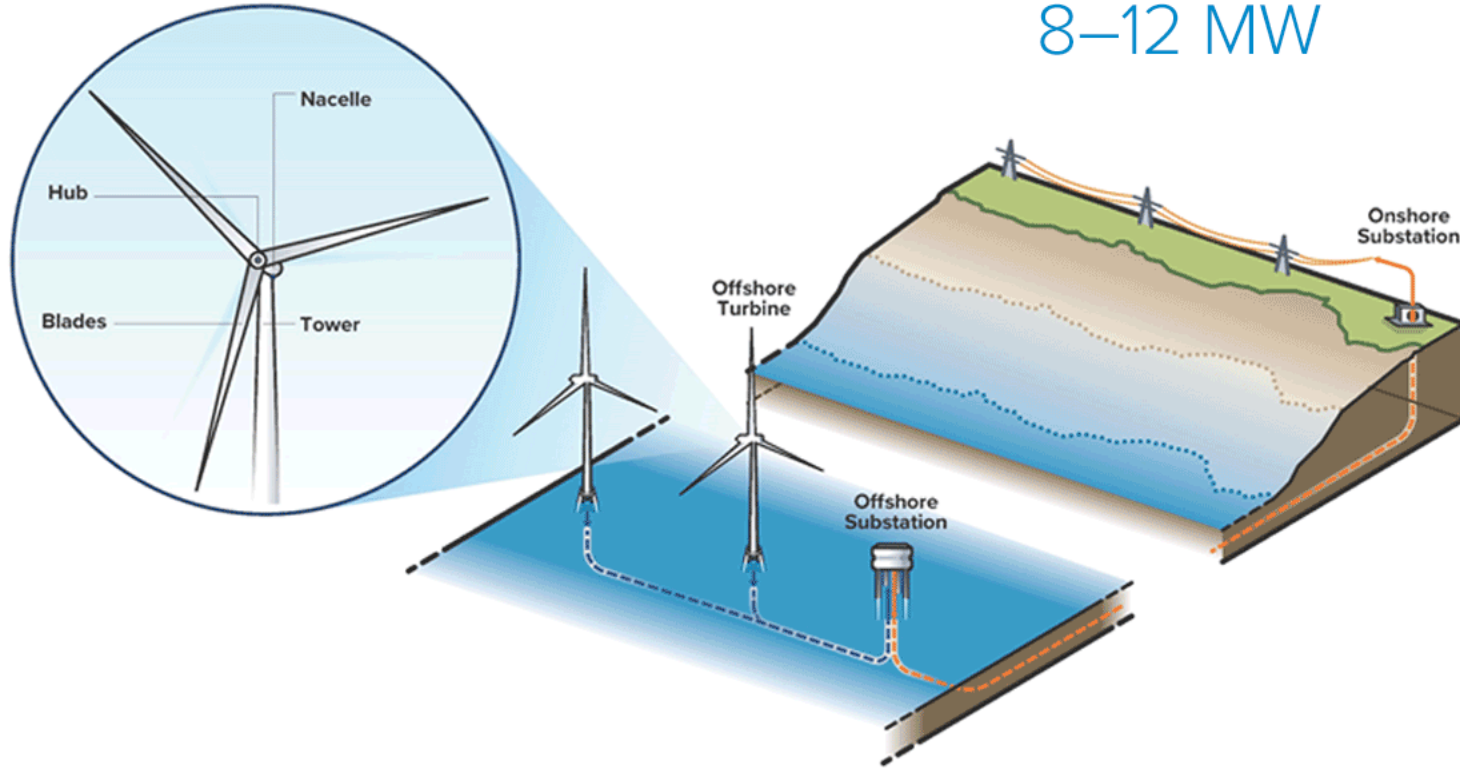
## Turbine Array Connected to Shore



# Components of the Offshore Wind Supply Chain

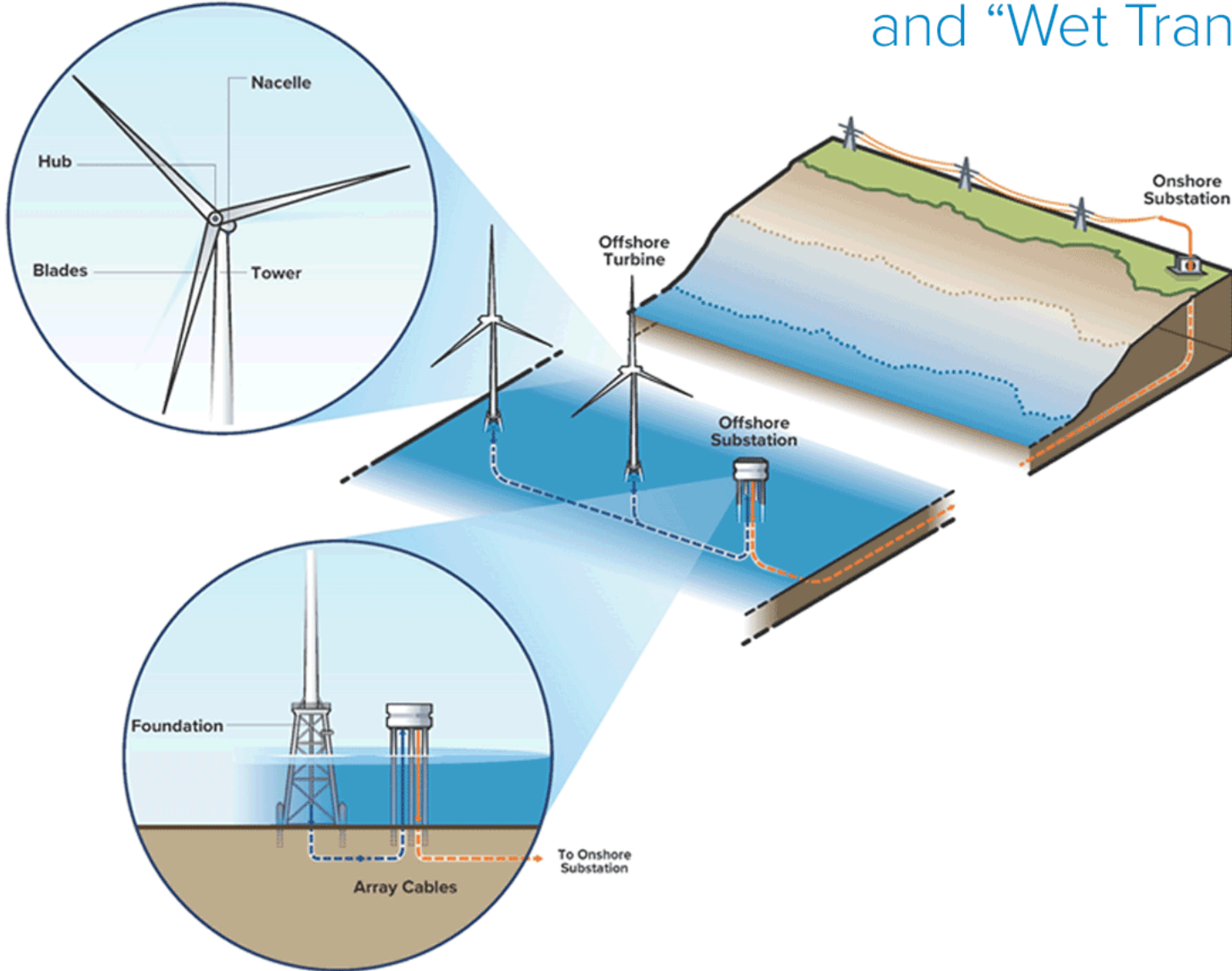
## Wind Turbines

8–12 MW



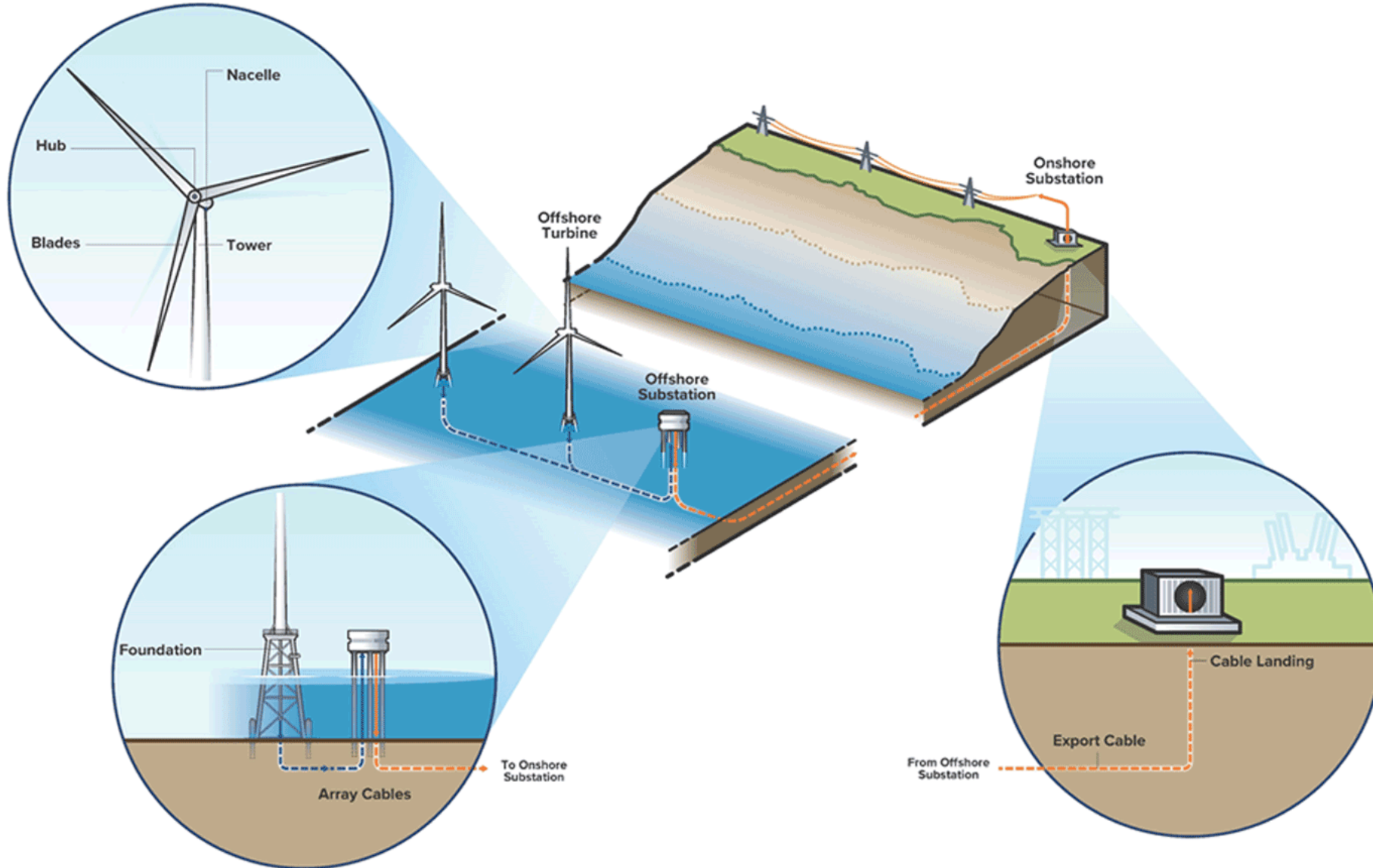
# Components of the Offshore Wind Supply Chain

## Foundations, Offshore Substation, and “Wet Transmission”

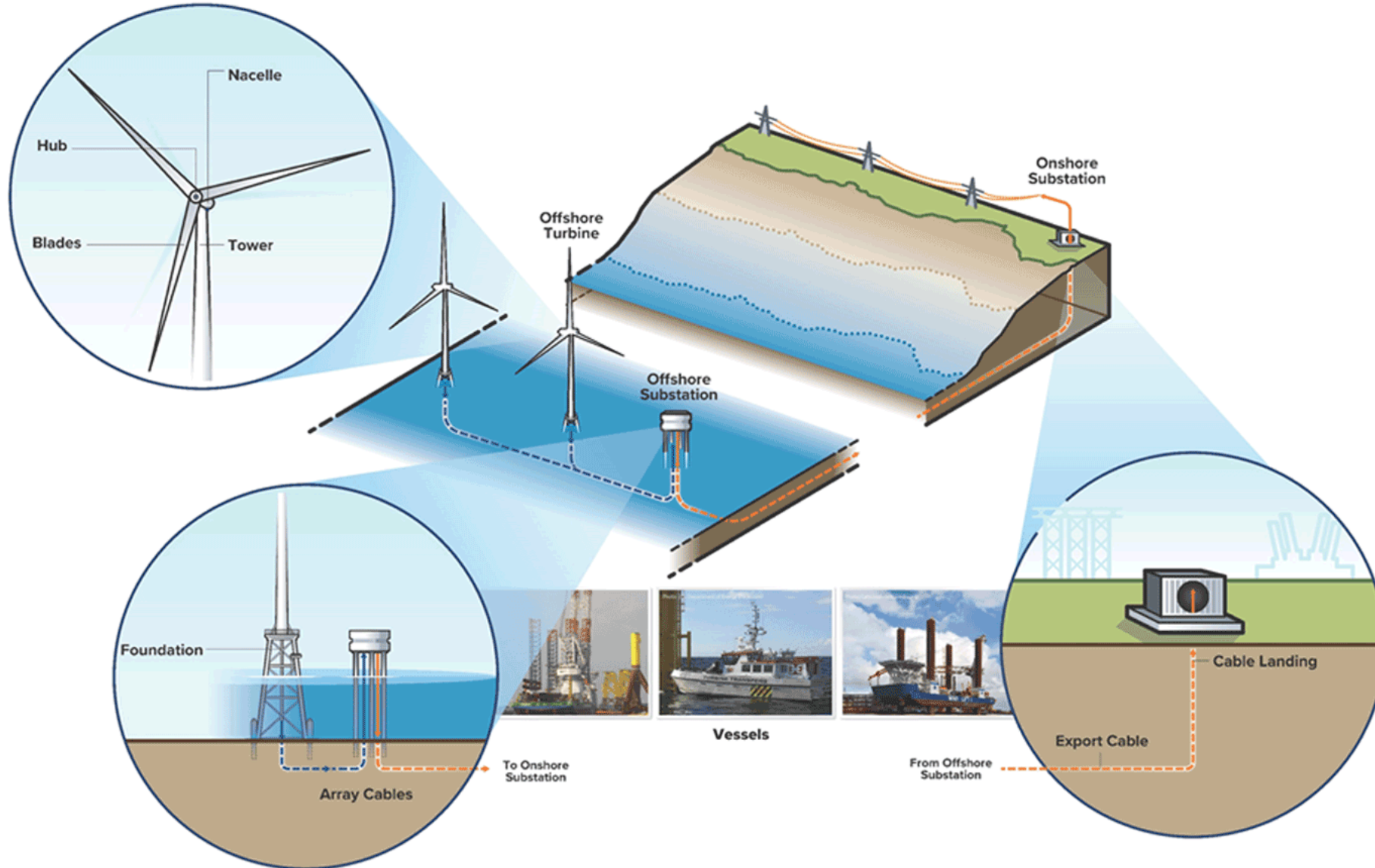


# Components of the Offshore Wind Supply Chain

## Cable-landfall and On-shore Transmission

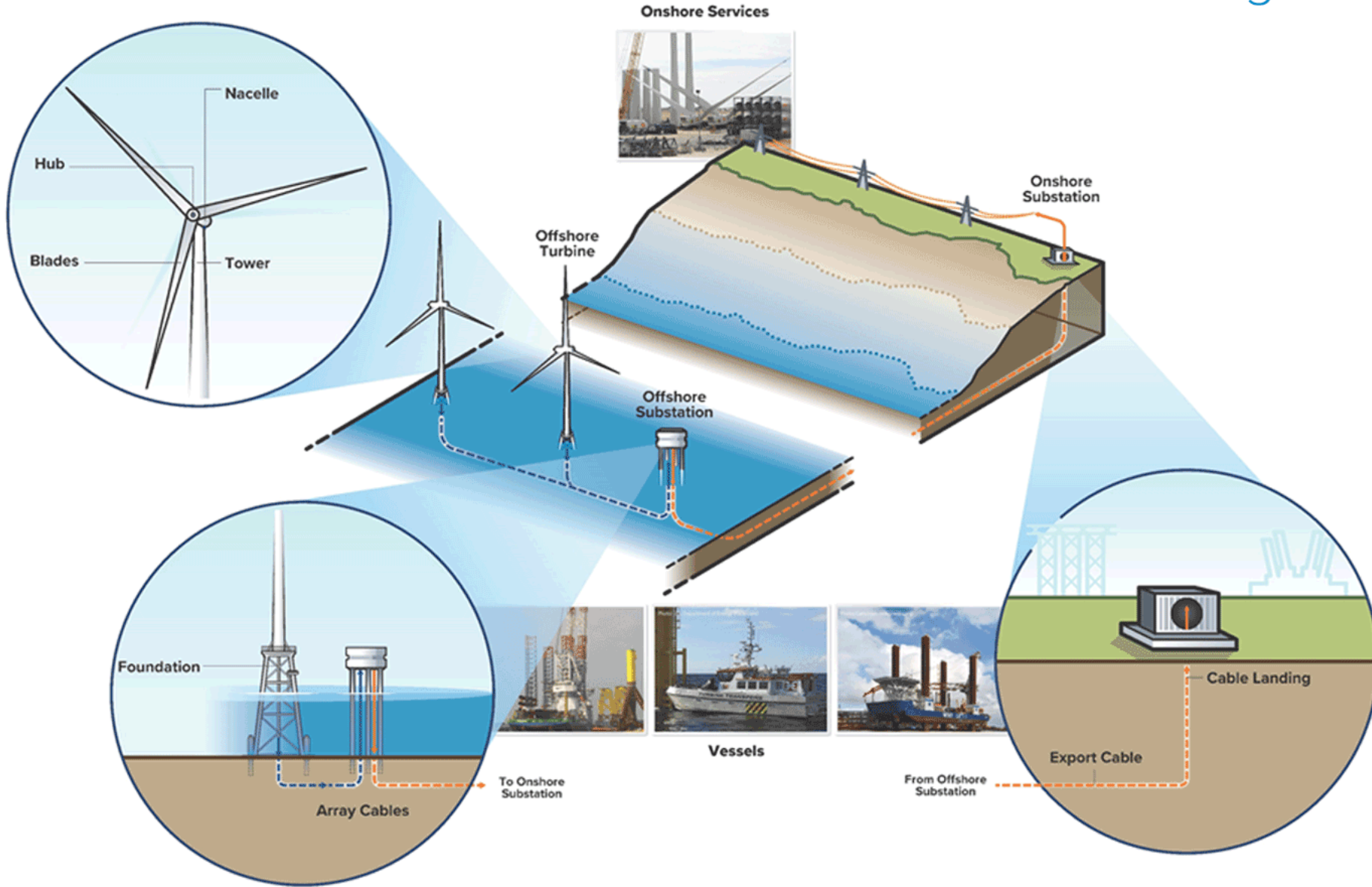


# Components of the Offshore Wind Supply Chain Installation and Support Vessels

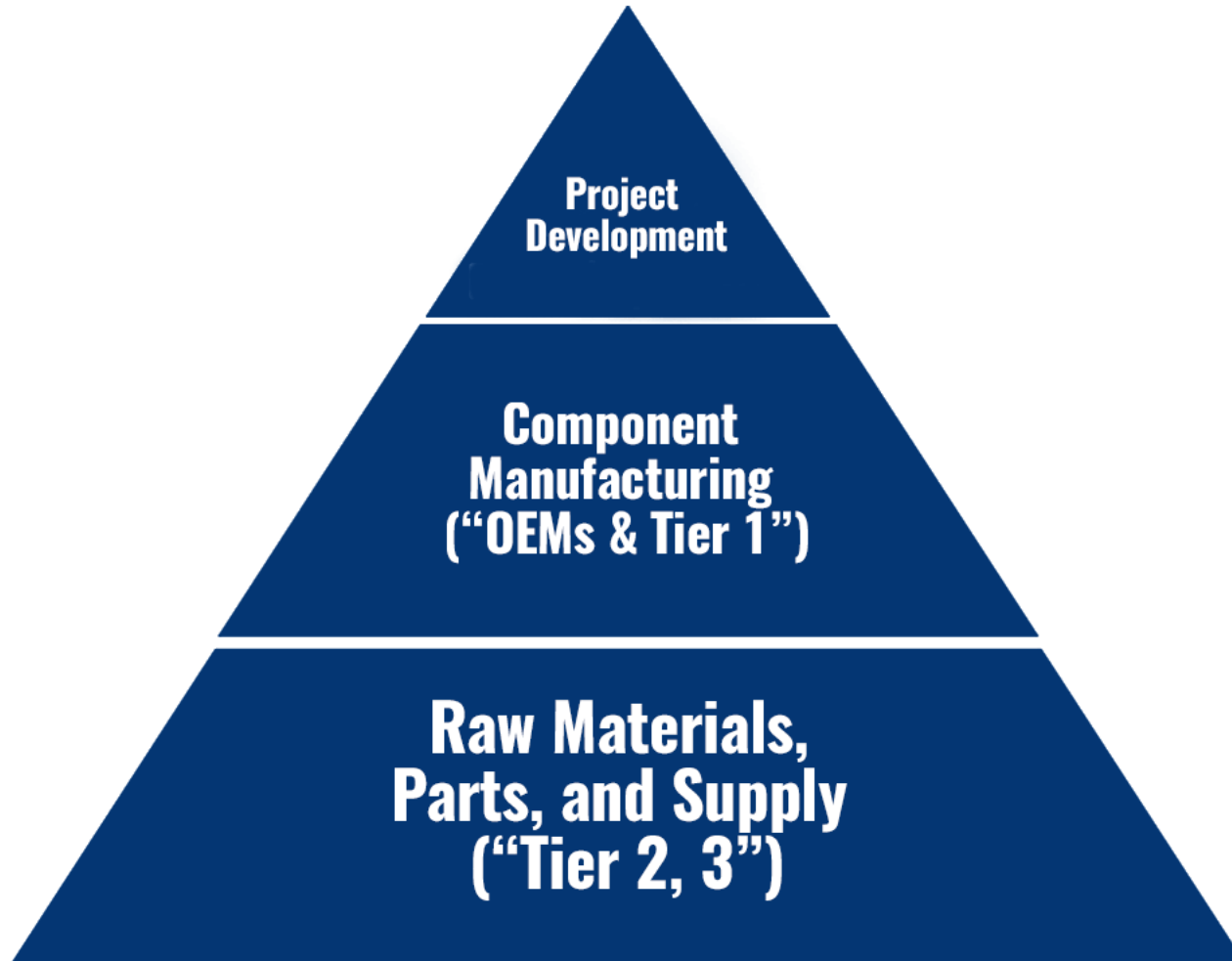


# Components of the Offshore Wind Supply Chain

## On-shore Marshalling and Equipment Staging



**Offshore  
Wind Developer**

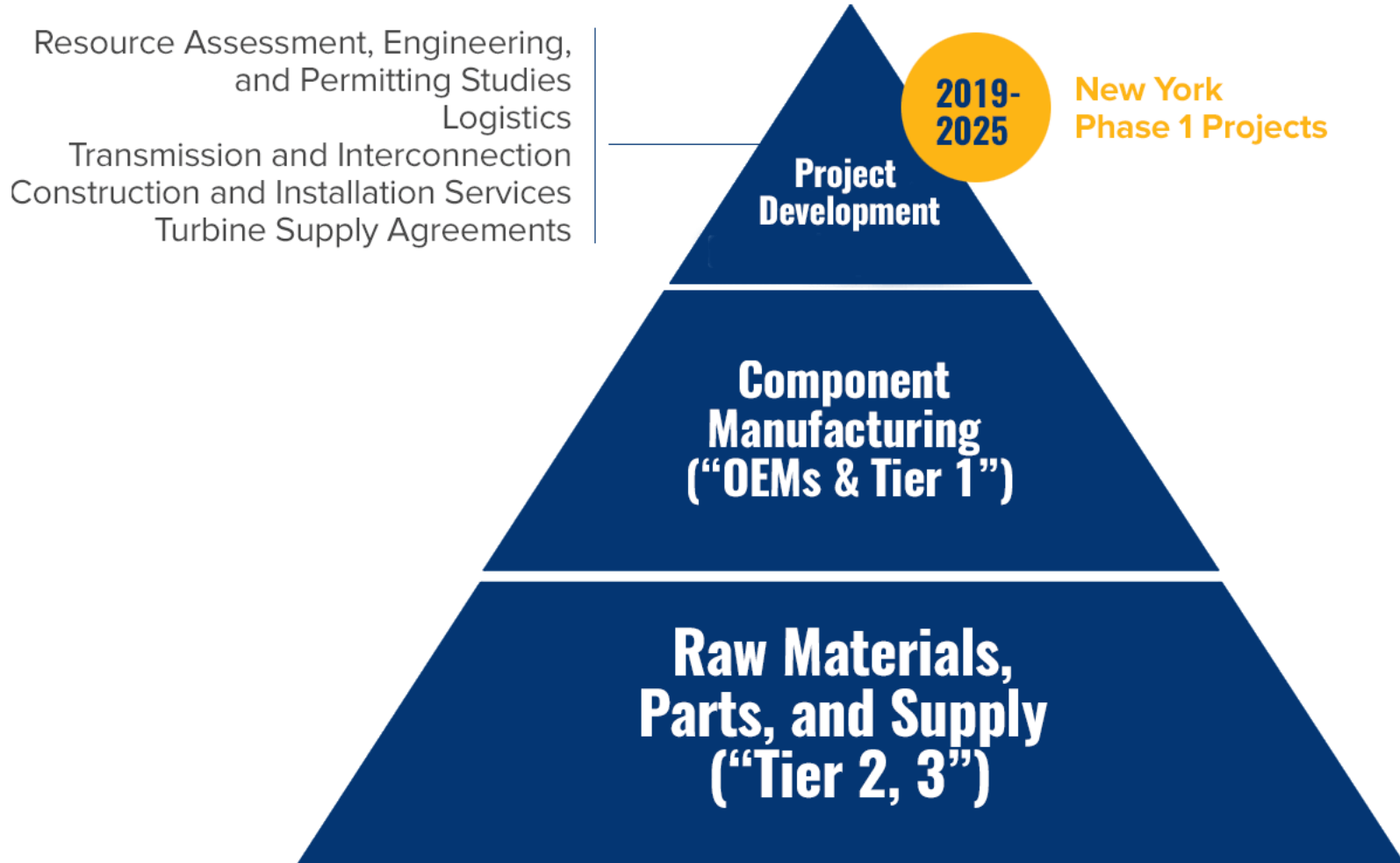


**NEW YORK**  
STATE OF  
OPPORTUNITY.

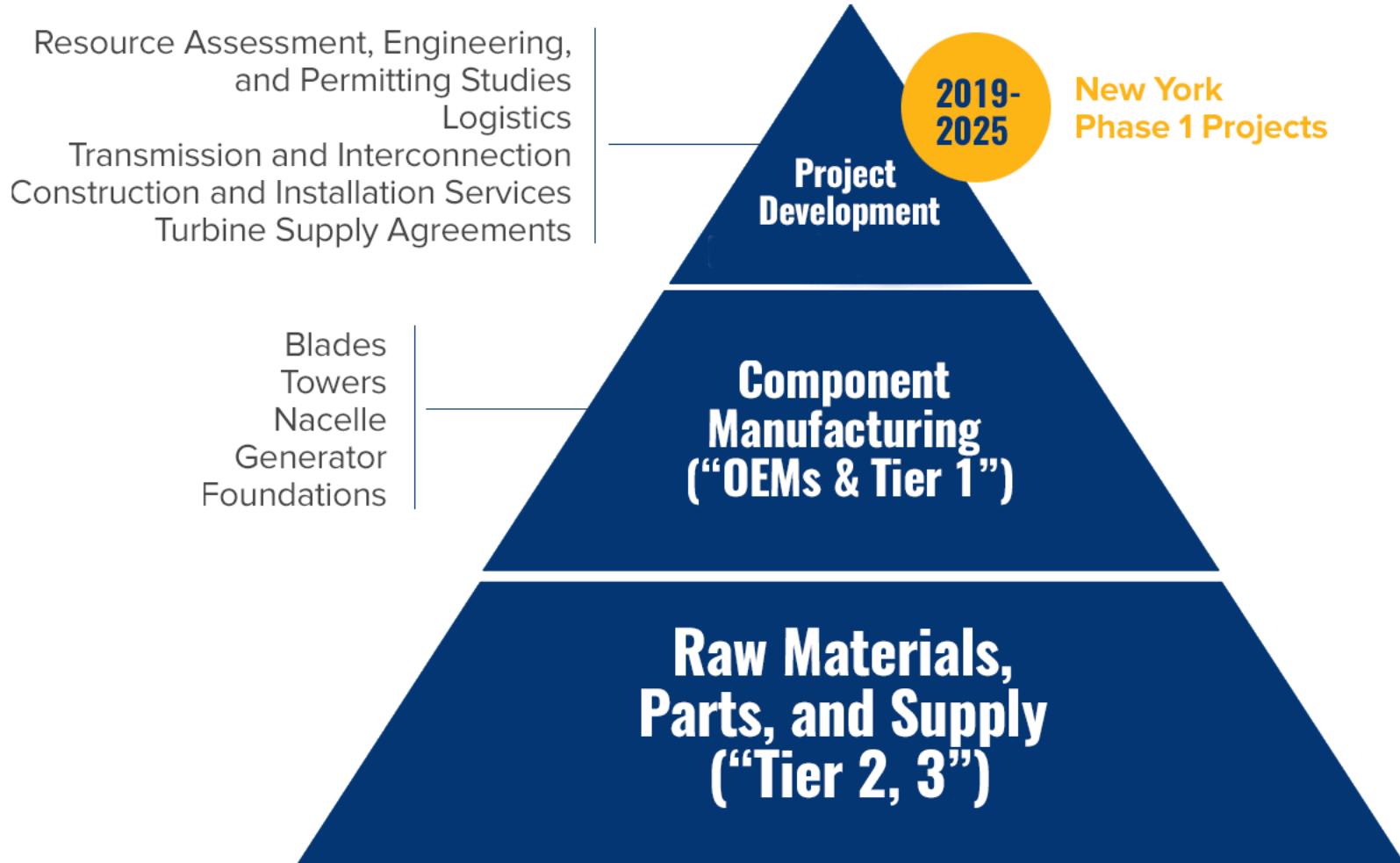
**NYSERDA**



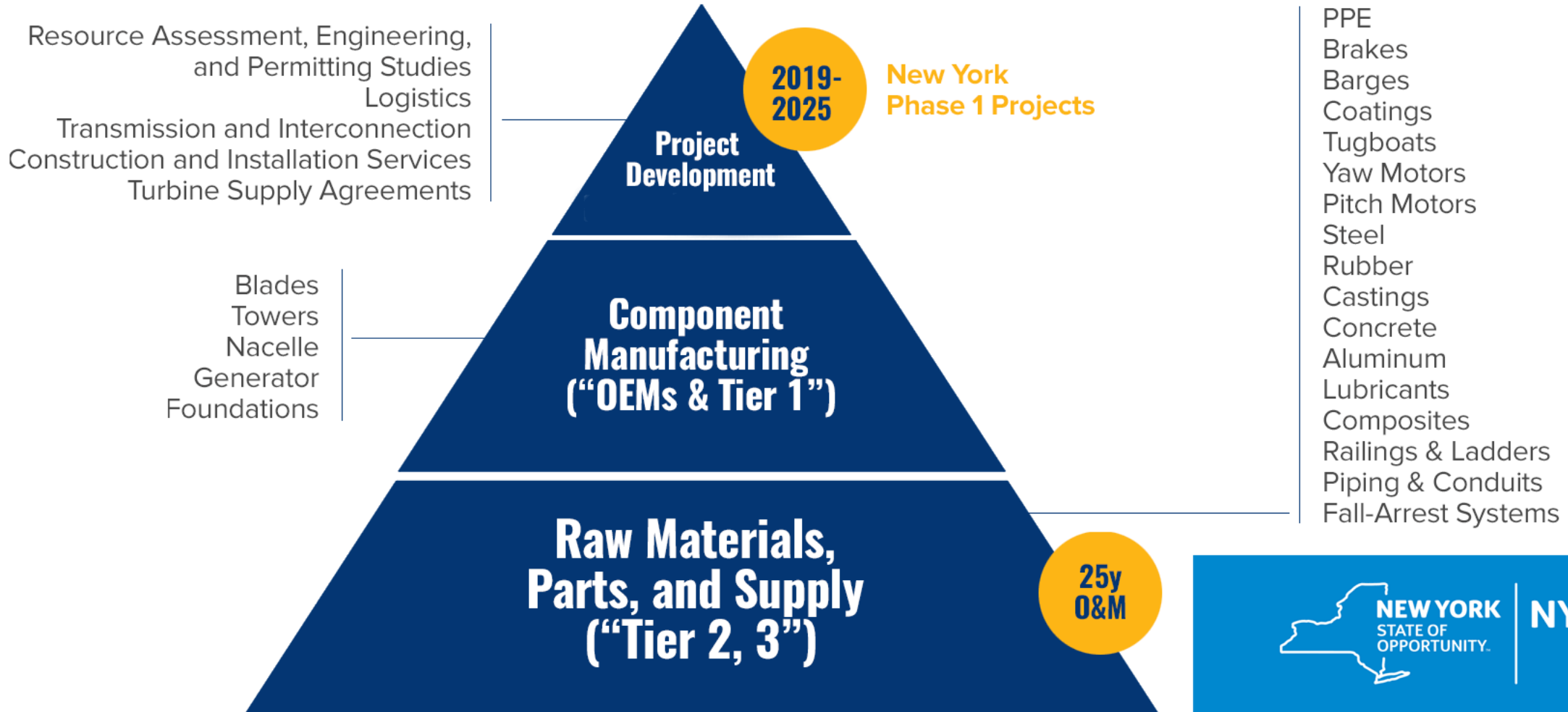
## Offshore Wind Developer



## Offshore Wind Developer



## Offshore Wind Developer



# Questions?

[nyserderda.ny.gov/offshore wind](https://nyserderda.ny.gov/offshore-wind)  
[offshorewind@nyserderda.ny.gov](mailto:offshorewind@nyserderda.ny.gov)



**NYSERDA**

NEW YORK OFFSHORE WIND SUPPLIER FORUM

**Panel 1**

# US Offshore Wind: A 2030 Forecast

**Moderator: Doug Pfeister**

*Managing Director, North America Renewables Consulting Group (RCG)*

**Panelists**

*Bill White, EnBW*

*Christer af Geijerstam, Equinor*

*Sunny Gupta, Ørsted*

*Lars Thaaning Pedersen, Vineyard Wind*

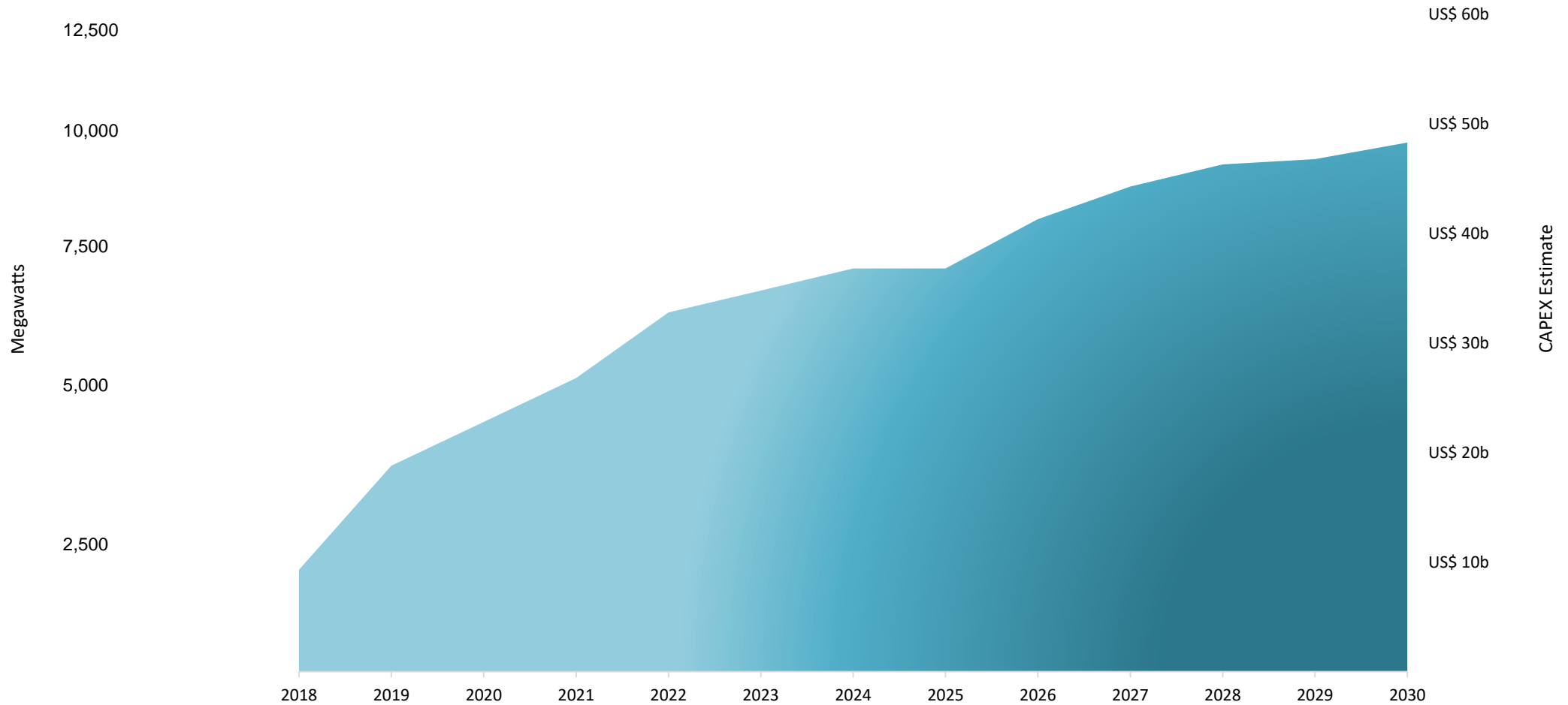


**NYSERDA**



# Cumulative Offshore Wind Power Contracts Forecast

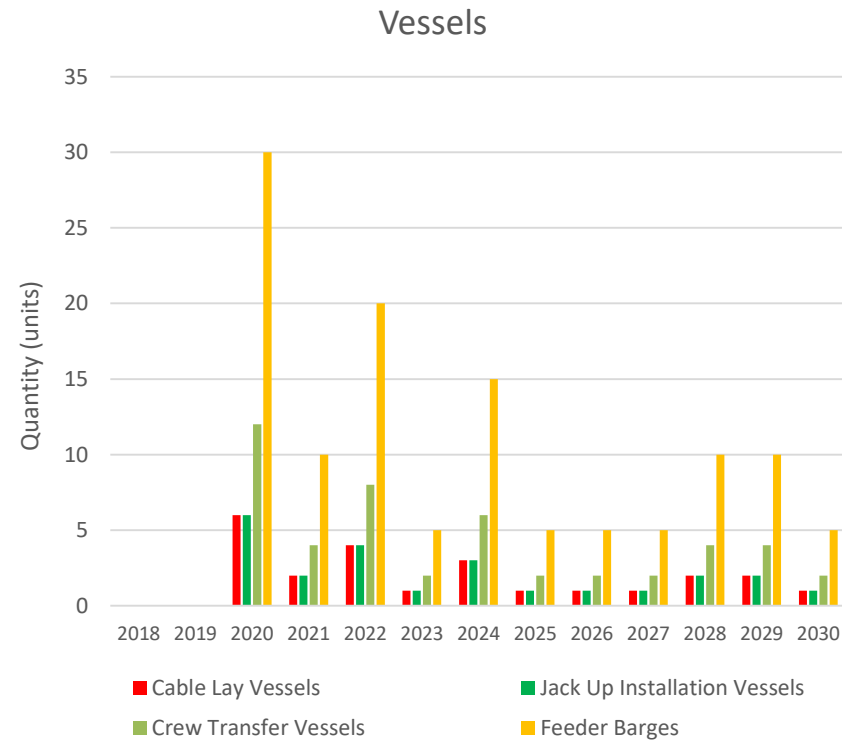
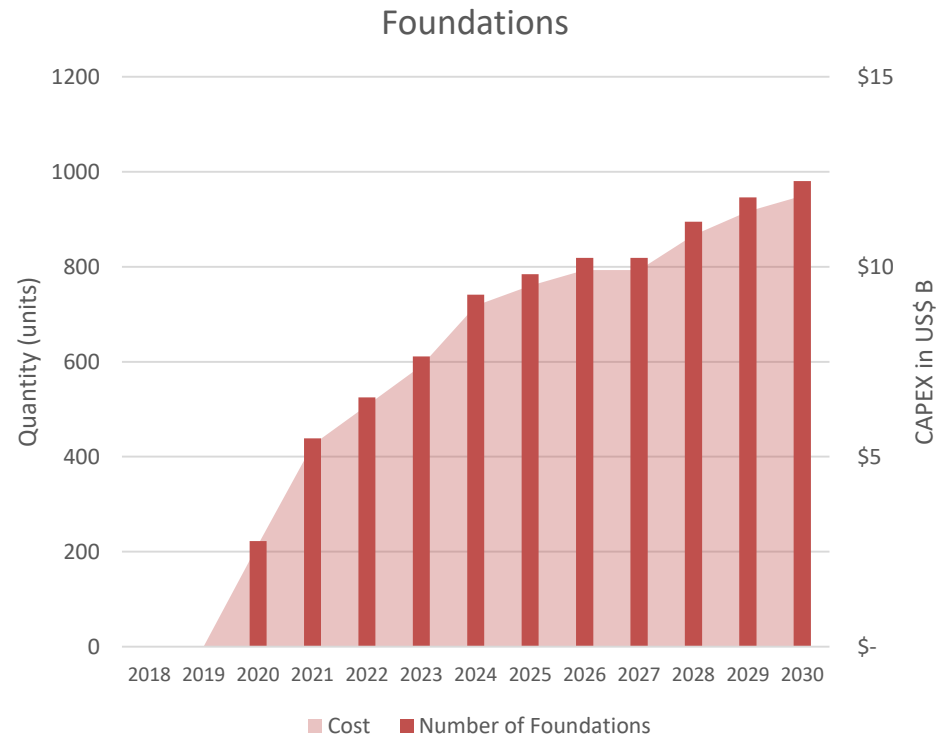
*For six northeastern states through 2030*



Source: RCG analysis

# Cumulative Offshore Wind Power Contracts Forecast

## *Example – foundations and vessels*

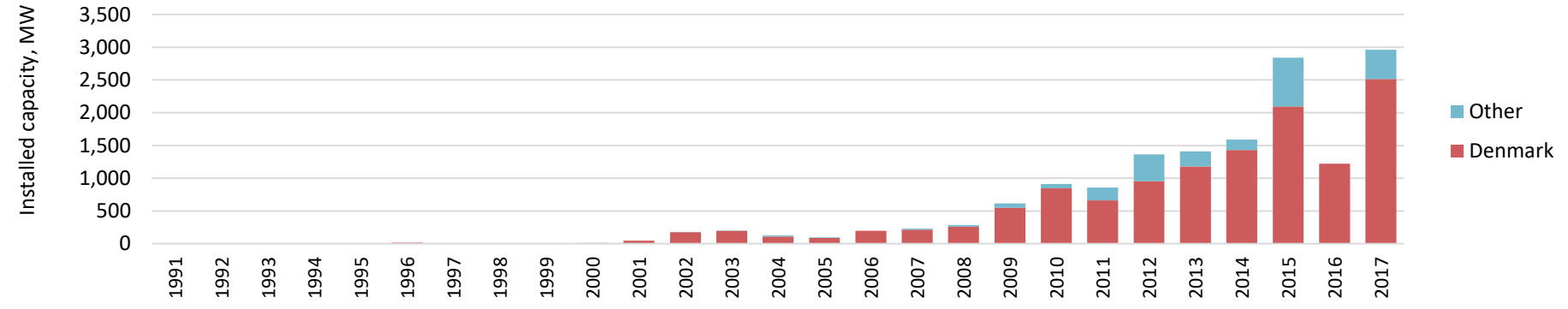


Source: RCG analysis

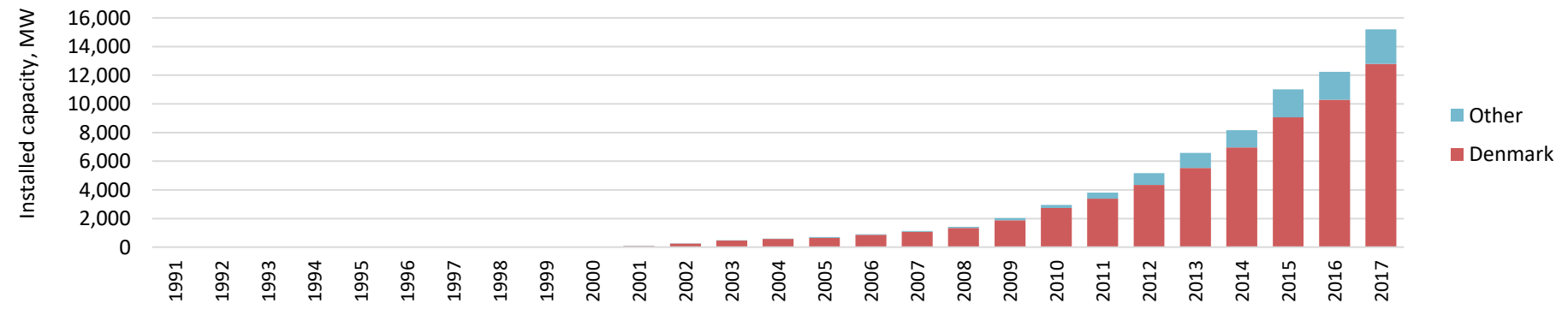
# Cumulative Offshore Wind Power Contracts Forecast

*Denmark is a dominant force in European offshore wind turbine manufacturing*

Annual European offshore wind commissioning activity by country of turbine manufacture



Cumulative European offshore wind commissioning activity by country of turbine manufacture



Source: RCG analysis





# EnBW

# North America

## Projects On Line:

- EnBW Baltic 1 – Baltic Sea (48 MW)
- EnBW Baltic 2 – Baltic Sea (288 MW)

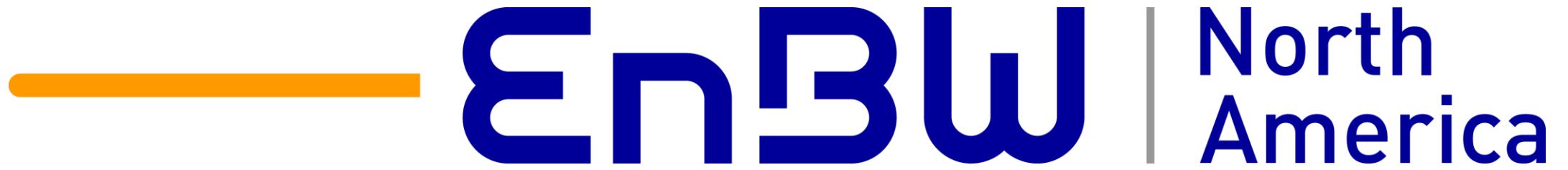
## Projects Under Development:

- Hohe See – North Sea (497 MW)
- Albatros – North Sea (112 MW)
- He Dreiht – North Sea (900 MW)

## Future Areas for Development:

- Formosa 3 – Taiwan
- Castle Wind – CA
- East Wind – MA, NY, NJ





### **U.S. Market Entry Priorities:**

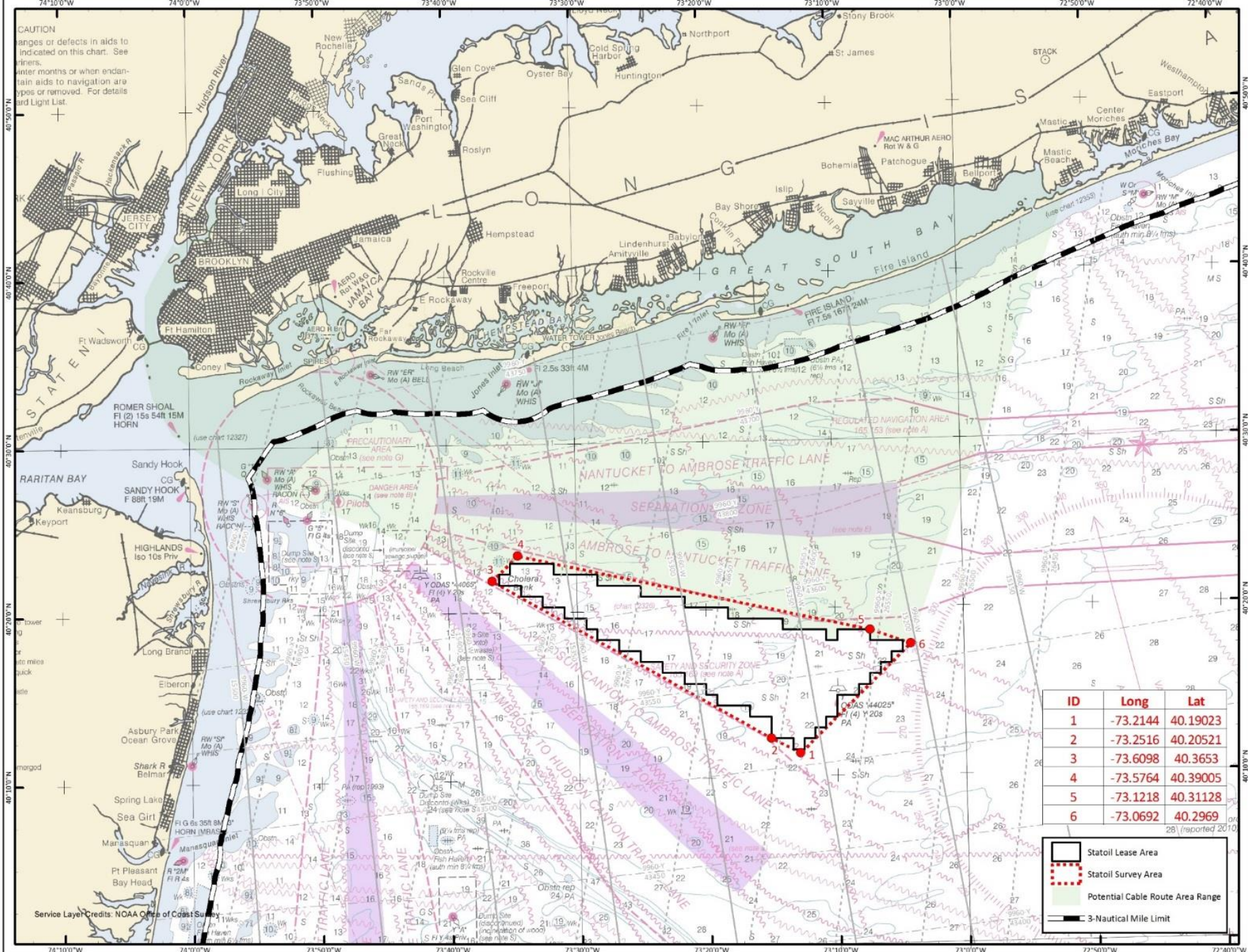
- Offices in NJ, MA, and CA
- Focus on market opportunities in:
  - New England
  - New York
  - New Jersey
  - California

### **Goal:**

- Develop cost-effective clean energy while maximizing local content, close collaboration with communities and stakeholders



# Empire Wind



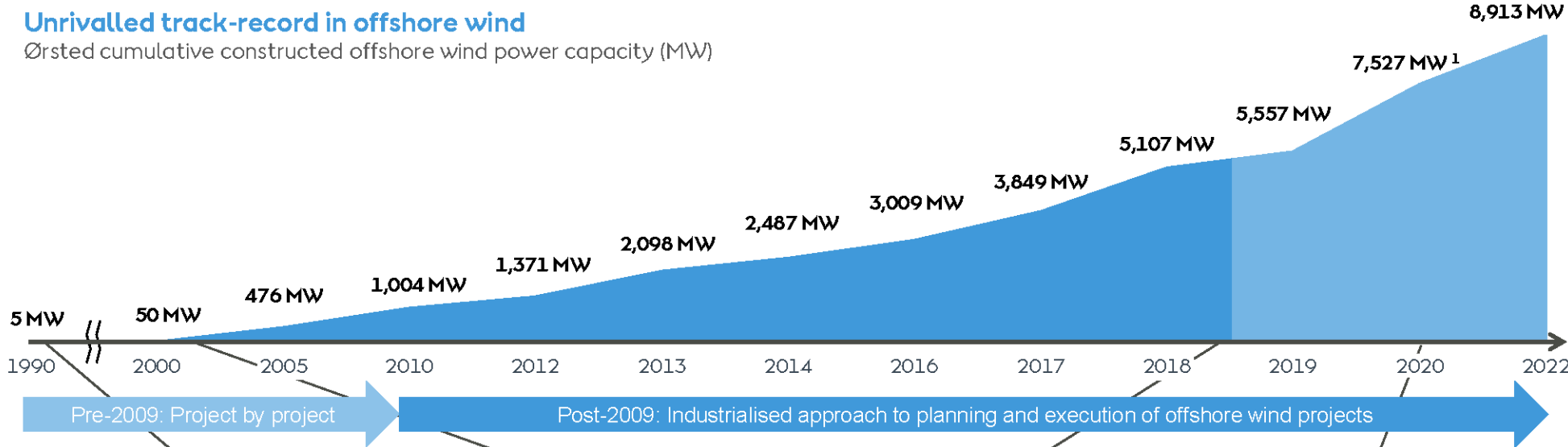
Site Key Data	
Area	79,350 acres (124 sqm)
Water Depth	65-130 ft
Distance to shore	From 14 miles
Capacity	Up to 2 GW

ID	Long	Lat
1	-73.2144	40.19023
2	-73.2516	40.20521
3	-73.6098	40.3653
4	-73.5764	40.39005
5	-73.1218	40.31128
6	-73.0692	40.2969

# Ørsted pioneered the offshore wind industry and is the global leader with a footprint across Europe, Asia, and the US.

## Unrivalled track-record in offshore wind

Ørsted cumulative constructed offshore wind power capacity (MW)



Selected projects

**Vindeby**

**First offshore wind farm in the world**

**5 MW**

Turbine capacity	0.45 MW
Nr. of turbines	11
Rotor diameter	35 m
Distance to shore	1.8 km

**Horns Rev 1**

**First large scale offshore wind farm in the world**

**160 MW**

Turbine capacity	2 MW
Nr. of turbines	80
Rotor diameter	80 m
Distance to shore	18 km

**Walney Extension**

**The largest operational offshore wind farm in the world**

**659 MW**

Turbine capacity	7-8.25 MW
Nr. of turbines	87
Rotor diameter	154-164 m
Distance to shore	19 km

**Hornsea 1**

**The world's largest offshore wind farm once constructed**

**1,218 MW**

Turbine capacity	7 MW
Nr. of turbines	174
Rotor diameter	154 m
Distance to shore	120 km

Note 1: Ørsted will, in accordance with the Dutch tender regulation, build Borssele 1 and 2 within four years from November 2016 with a flexibility of 1 year



# Ørsted US Offshore Wind's Portfolio

Robust and geographically diverse portfolio of offshore wind assets: potential for 10GW



# Offshore Wind Installation Harbors

## The Harbor Case Studies

### Port of Esbjerg, Denmark



Characteristics	Port Specifics
Harbour Investments	USD 150m (phase 2)
Area Size for Wind	600K sqm / 150 acres
Local Jobs (project*)	150

### Port of Belfast, United Kingdom



Characteristics	Port Specifics
Harbour Investments	USD 90m (phase 1)
Area Size for Wind	200K sqm / 50 acres
Local Jobs (project*)	200

### Port of Taichung, Taiwan



Characteristics	Port Specifics
Harbour Investments	70 (phase 1)
Area Size for Wind	200K sqm / 50 acres
Local Jobs (project*)	250

#### Supporting Supply-chain Categories:

- Terminal Operations
- Stevedoring
- Marine Services
- Tugboat Services
- Transport & Logistics
- Hospitality Services
- Ship Chandler Services
- Secondary Steel
- Coating Services
- Equipment Repairs
- Crane Services
- Construction
- Engineering
- Professional Services

#### Supporting Vocational Categories:

- Electricians
- Carpenters
- Mechanics
- Welders
- Painters
- Longshoremen
- Mariners
- Linesmen
- Crane drivers
- Truck drivers
- Engineers
- Office admin

(\*) = estimated per installation project excl. port construction and primary component manufacturing related jobs

# 50/50 PARTNERSHIP: UNIQUE BLEND OF LOCAL AND GLOBAL EXPERTISE



- **Leading provider** of renewable power in the United States with more than **6,500 MW** of owned and operated facilities in 22 states.
- Part of Iberdrola, the **world leader** in the renewable energy industry (30+ GW in operation), and 10 GW of offshore wind under development, construction, or operations.

# CIP

COPENHAGEN INFRASTRUCTURE PARTNERS

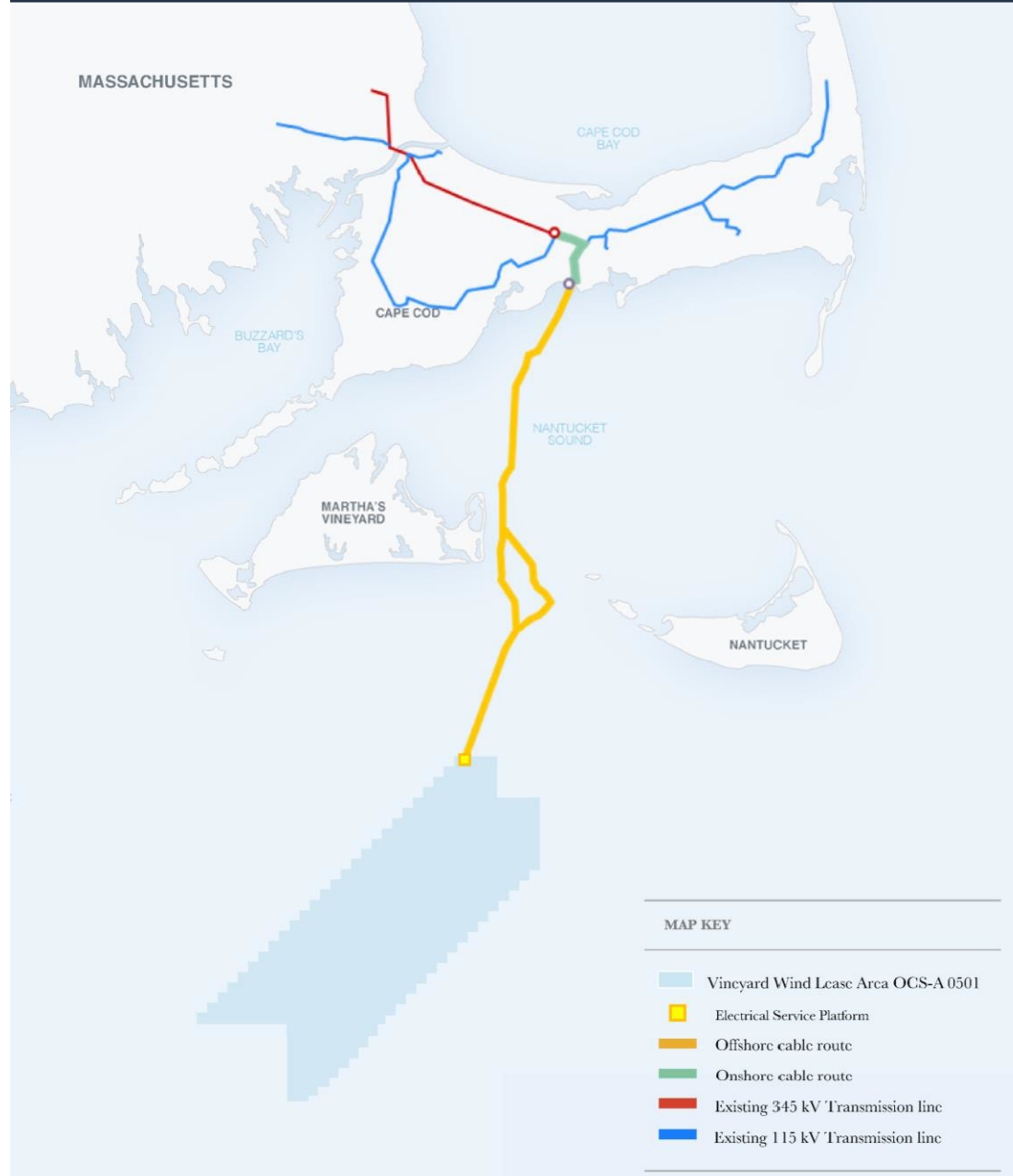
- **One of the world's leading Renewable Infrastructure fund management** companies with over \$7 billion under management
- **Long-term, clean energy infrastructure focus** with 6,000+ MW offshore development portfolio in North America, Europe, Asia and Australia



MASS  
USA

## VINEYARD WIND

- **JV Team lead from and focused only on Massachusetts**
  - Offices in New Bedford and Boston
  - World-class technical team with experience building some of the earliest and largest offshore wind farms in the world matched with local staff with first-hand knowledge of the waters, shores, and communities where the project is located



## PROJECT OVERVIEW

### COMPETITIVE PRICING

- ✓ 800MW project for MA includes a fixed, low cost for generation and transmission.

### FIRST IN THE WATER

- ✓ December 2017: Submitted state and federal permits with MEPA, EFSB, and BOEM. Most mature large-scale offshore project in US.
- ✓ PPA submitted for regulatory approval.
- ✓ EFSB hearing and SDEIR conducted.
- ✓ Construction to begin 2019. In service 2021.

### ECONOMIC BENEFITS

- ✓ Project will generate \$1.87 billion of direct economic benefits to Massachusetts.
- ✓ Project will create 3,600 new jobs, beginning in 2018, over 80% of which will be located in Southeastern MA.
- ✓ Host Community Agreement with Barnstable providing town revenue during project lifetime.



**Panel 2**

# Translating European Supply Chain Experience to New York

**Moderator: Liz Burdock**

*CEO and President, Business Network for Offshore Wind*

**Panelists**

*Joshua Weinstein, DNV-GL*

*Ketil Arvesen, Fred Olsen*

*David Nemetz, JDR Cables*

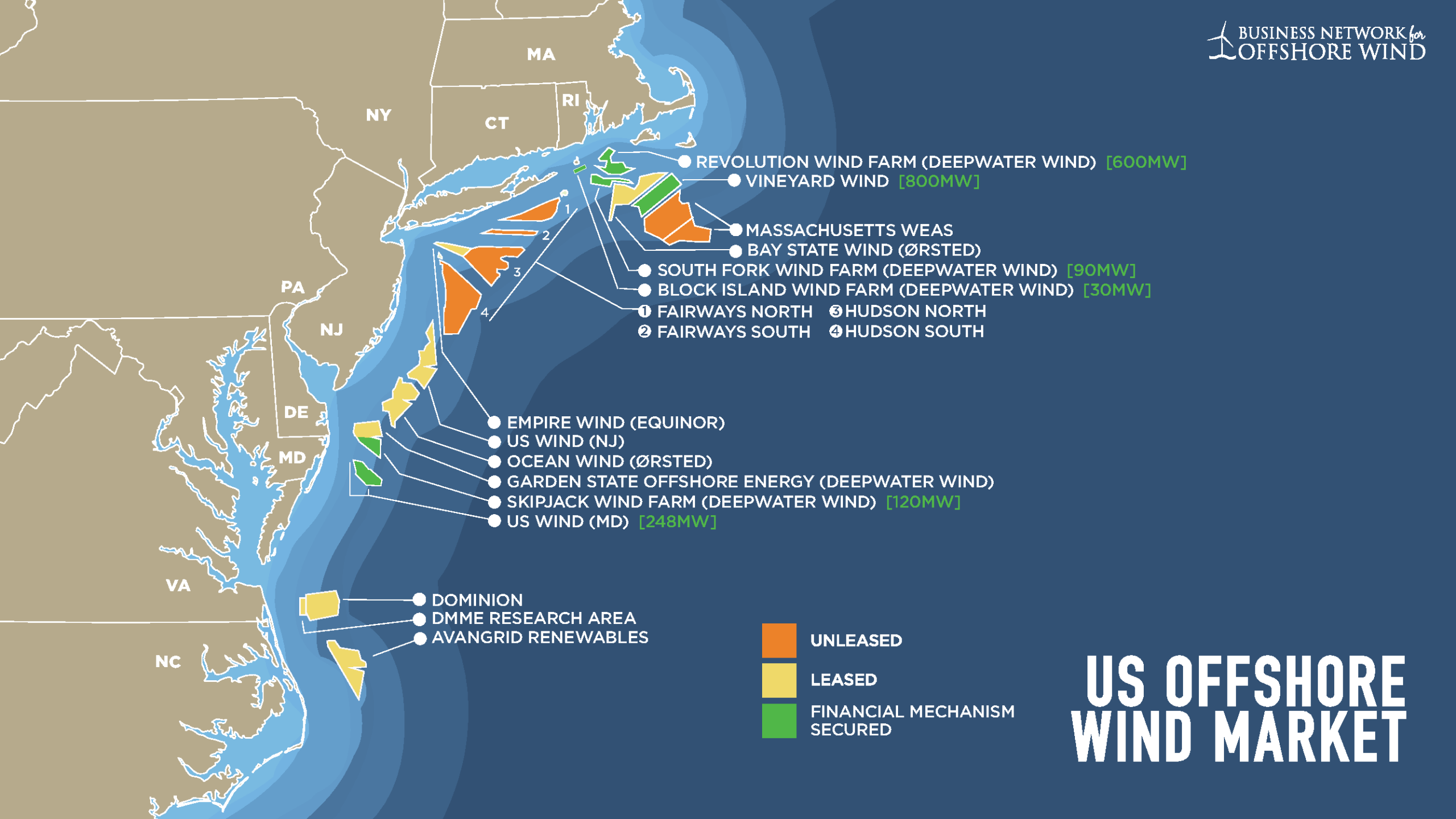
*Jason Folsom, Siemens Gamesa*

*Dirk Kassen, Smulders*



**NYSERDA**

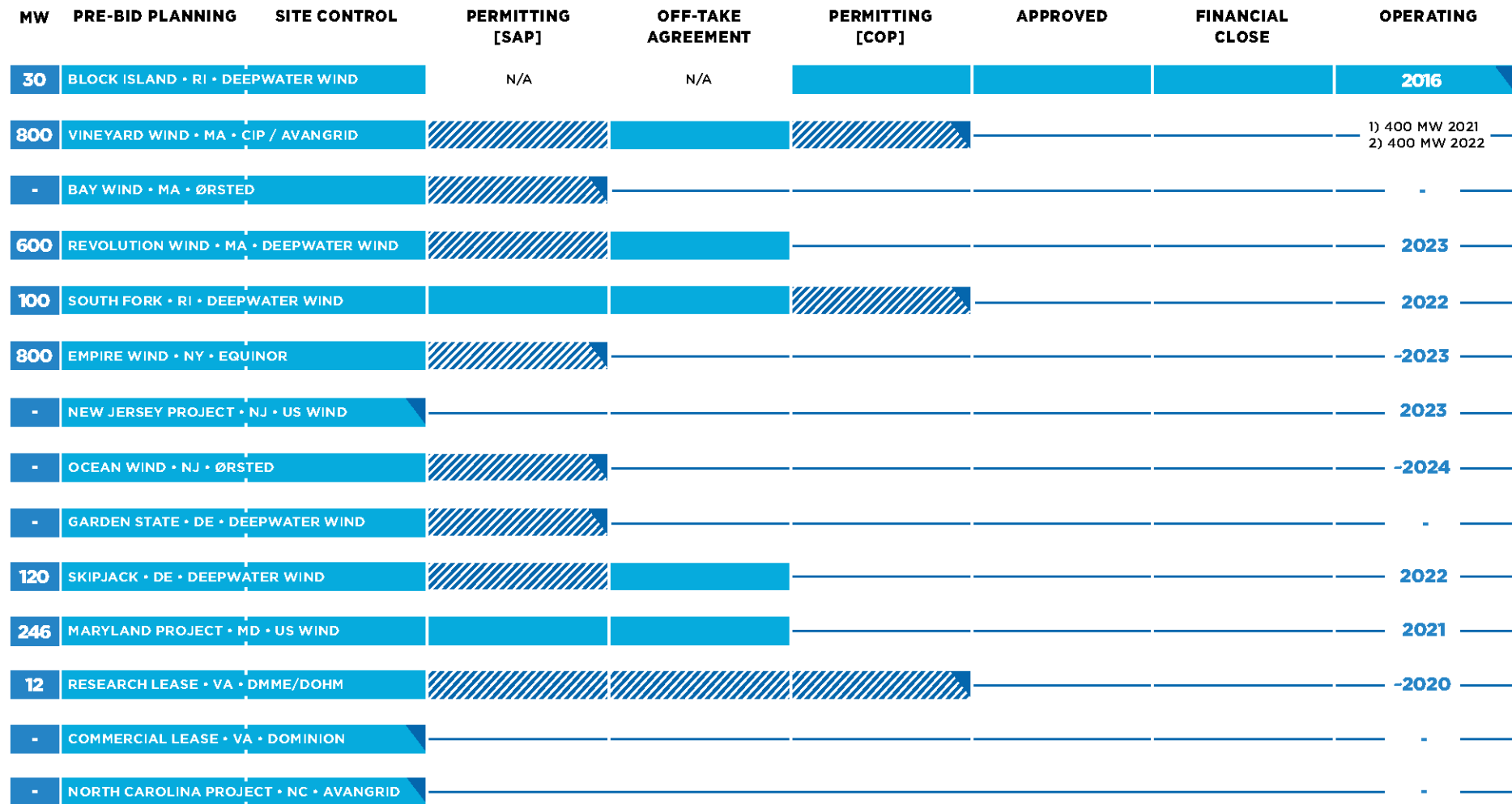




- UNLEASED
- LEASED
- FINANCIAL MECHANISM SECURED

# US OFFSHORE WIND MARKET

# PROJECT TIMELINE



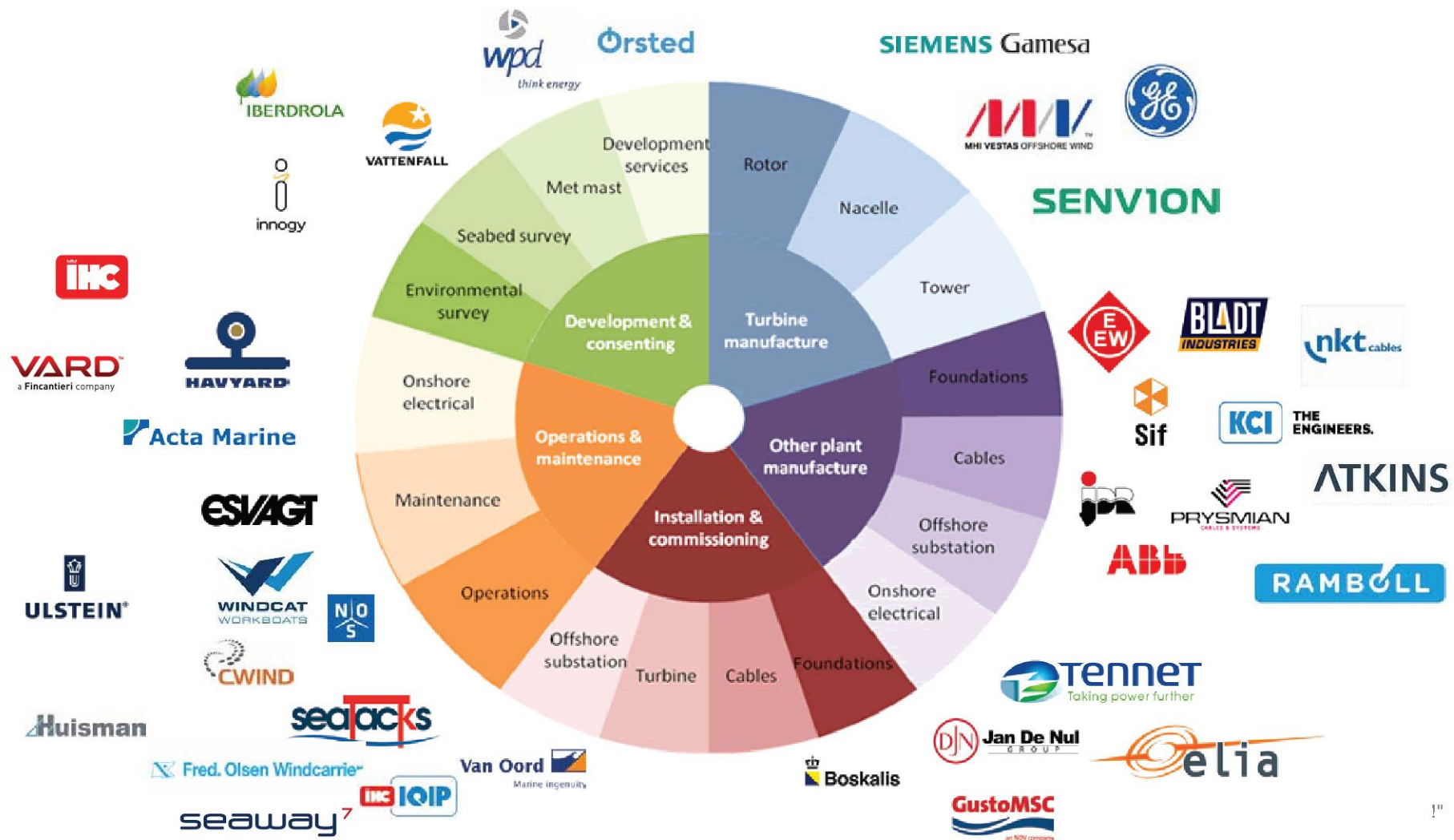
## US OFFSHORE WIND PROJECT TIMELINE

BUSINESS NETWORK FOR OFFSHORE WIND



Data has been taken by U.S. BOEM and validated by developers. It is based on the best information available at the time of publication. However, it is subject to change. The purpose of the information is to provide insights into the timelines of the US Offshore Wind Industry out to 2030. Terminology and definitions are consistent with US DOE's 2017 Offshore Wind Technologies Market Update.







**OFFSHORE WIND  
MARKET INSIGHT.  
CONNECTIONS.  
KNOWLEDGE.**

**IPF 19**

BUSINESS NETWORK  
FOR OFFSHORE WIND

**NYC**

**APRIL 8-11, 2019 NEW YORK CITY**



# LIZ BURDOCK

CEO & PRESIDENT  
BUSINESS NETWORK FOR OFFSHORE WIND  
liz@offshorewindus.org / 443.652.3242

👉 [offshorewindus.org](http://offshorewindus.org)

📘 [offshorewindus](https://www.facebook.com/offshorewindus)

🐦 [@offshorewindus](https://twitter.com/offshorewindus)

📌 [business network for offshore wind](https://www.linkedin.com/company/business-network-for-offshore-wind)