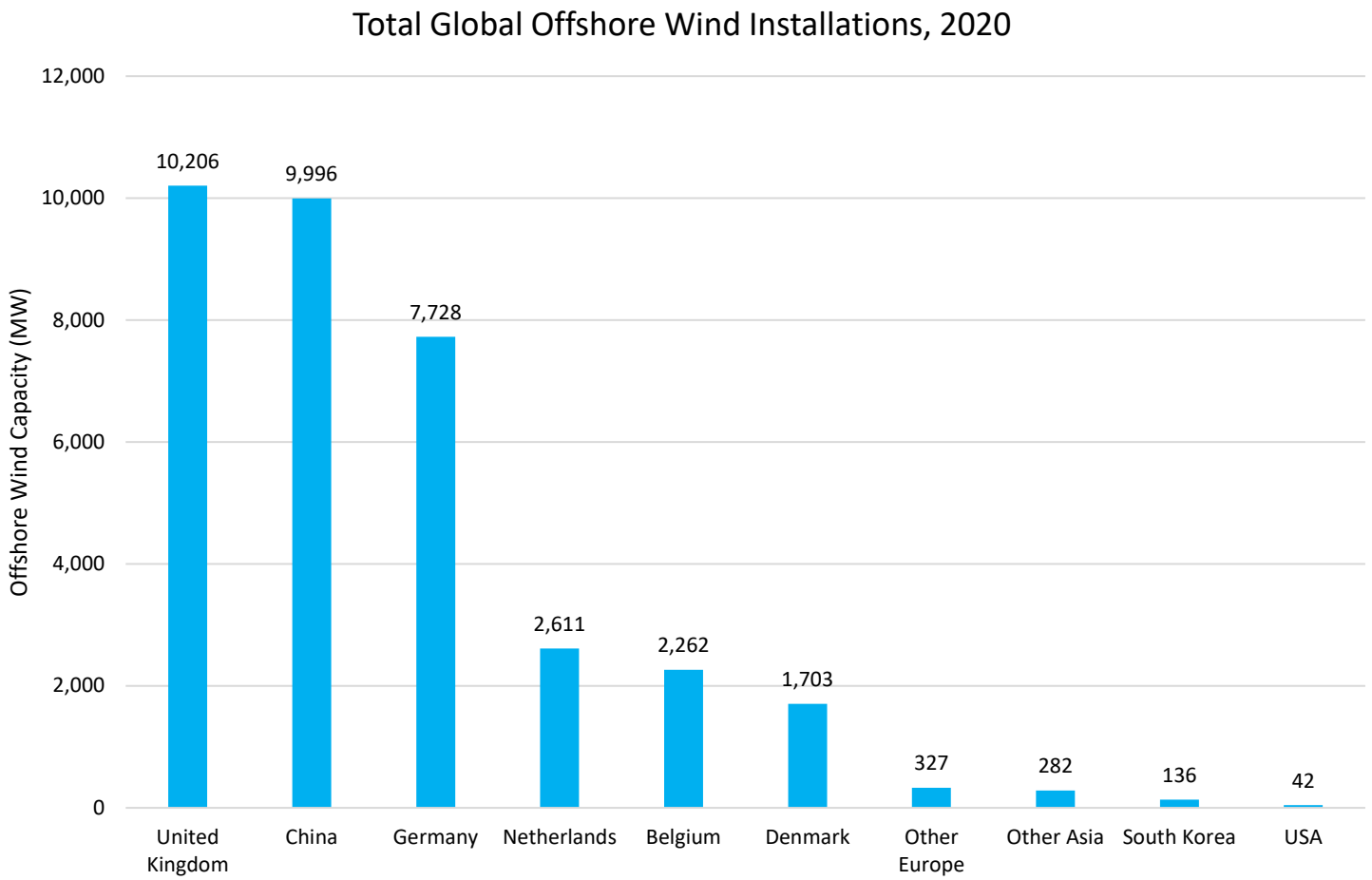
State of the American Offshore Wind Industry

AMERICAN CLEAN POWER

Global Offshore Wind Installations

U.S. lags the rest of the world in offshore wind

- **35,293 MW of global installations at end of 2020**
  - 24,837 MW in Europe
  - 10,414 MW in Asia-Pacific
  - **42 MW in U.S.**
- **2020 Additions**
  - 3,060 MW in China
  - 1,493 MW in Netherlands
  - 706 MW in Belgium
  - **12 MW installed in U.S.**

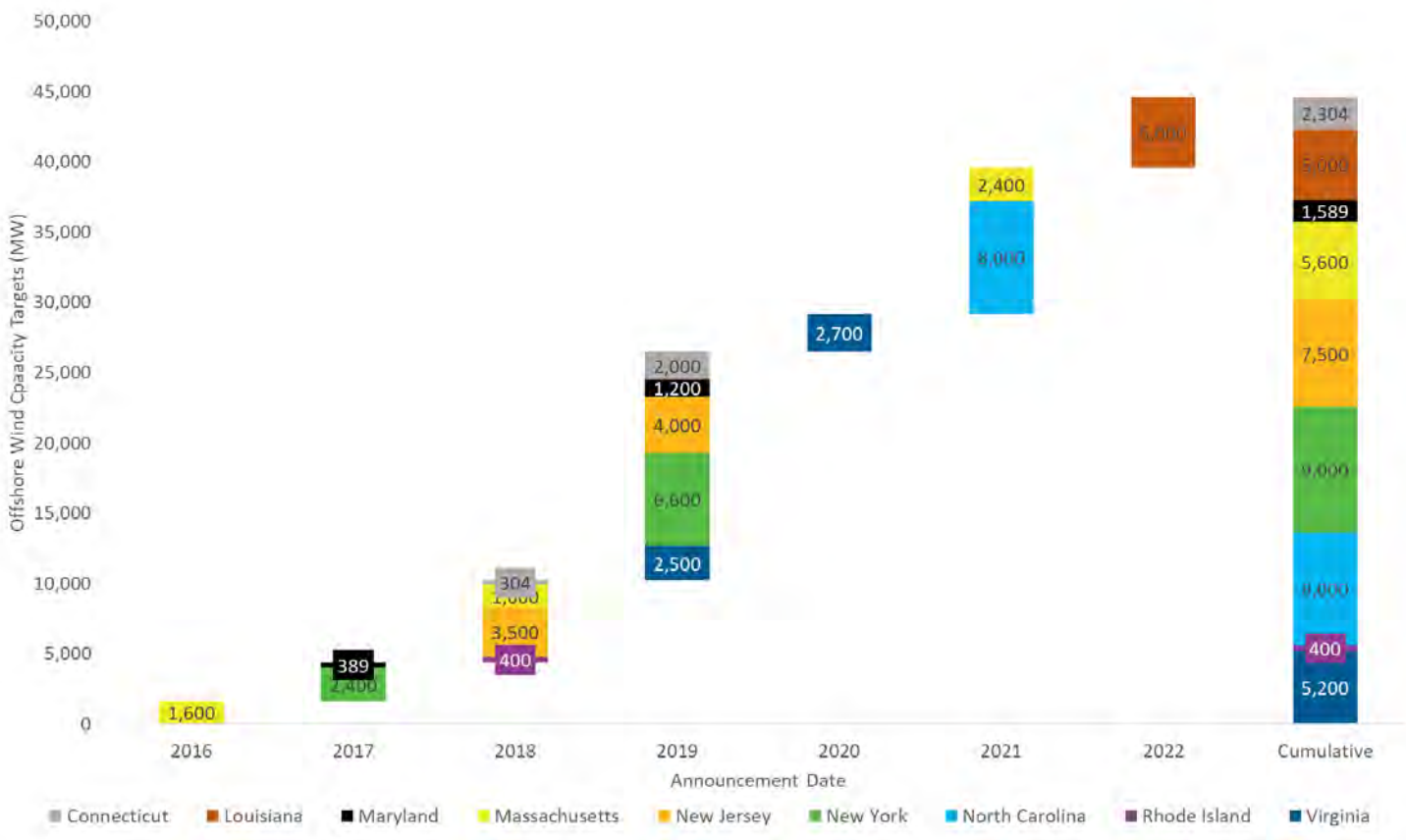


Source: GWEC Global Wind Report 2021

States are Driving Demand

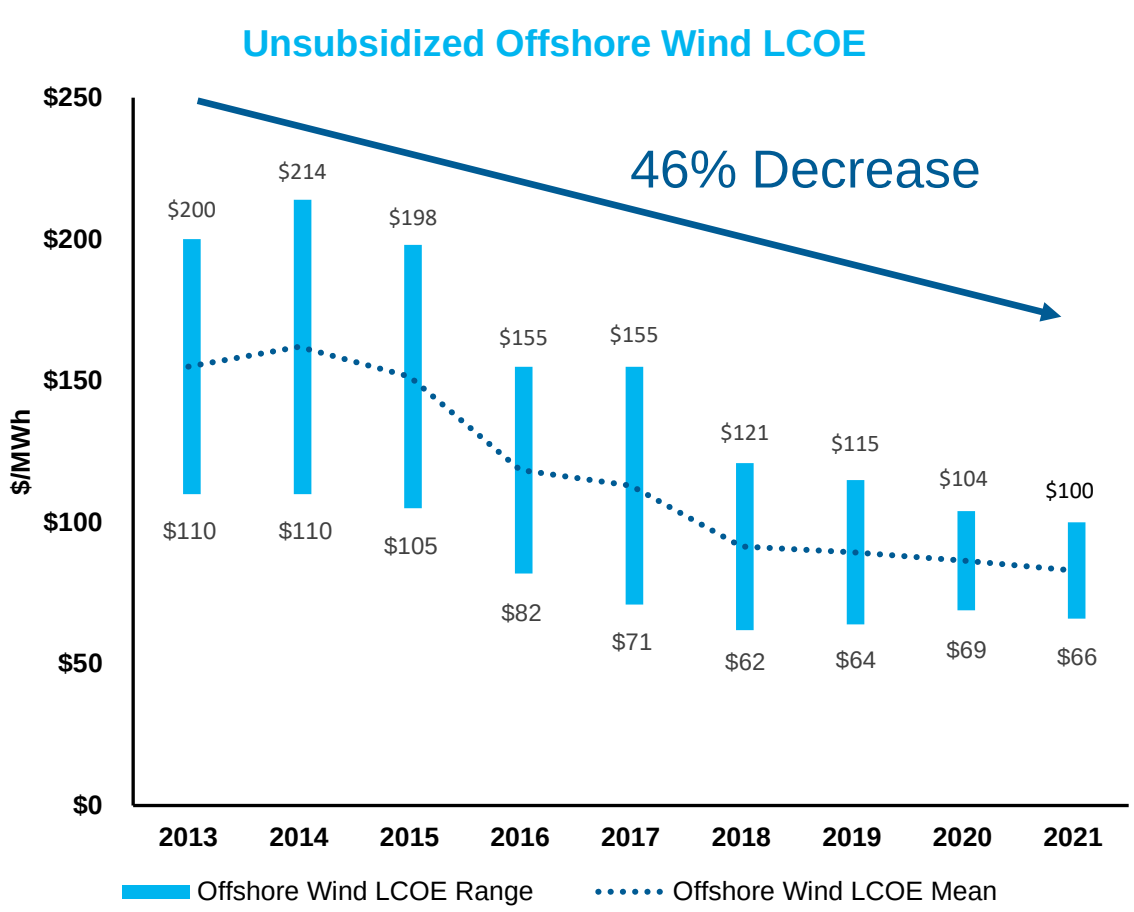
States have established nearly 45 GW of offshore wind procurement targets through legislation, conditional targets, or executive orders

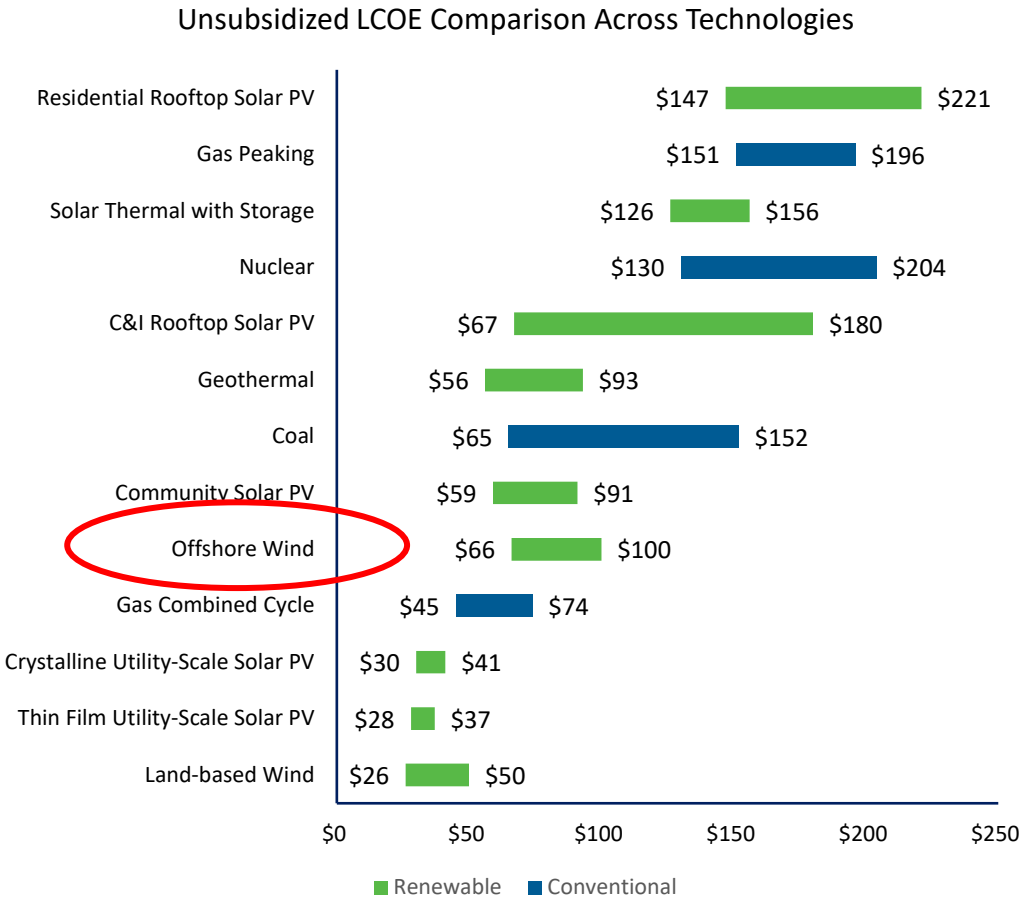
- New York: 9,000 MW by 2035
- New Jersey: 7,500 MW by 2035
- Virginia: 5,200 MW by 2034
- Massachusetts: 1,600 MW by 2027
  - Authorized additional 4,000 MW by 2035
- Connecticut: 2,000 MW by 2030, plus 304 MW purchased in 2018
- Maryland: 1,200 MW by 2030, plus 389 MW purchased in 2017
- Rhode Island: 400 MW purchased in 2018
- North Carolina: 8,000 MW by 2040 (2,800 MW by 2030)
- Louisiana: 5,000 MW by 2035



Source: ACP

Market Forces: Increasingly Cost-Competitive

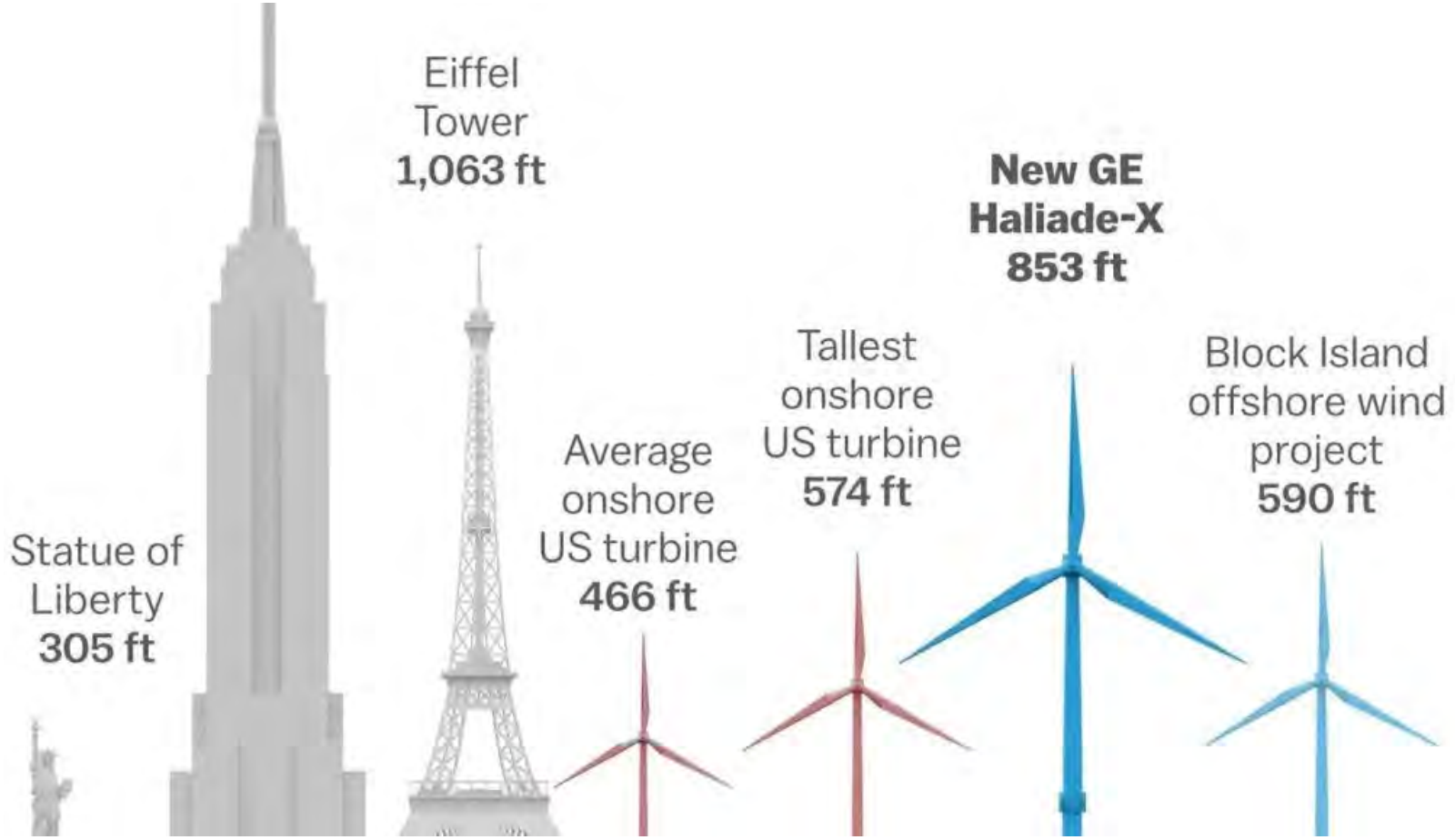




Source: Lazard, *Levelized Cost of Energy Analysis Version 15.0*, 2021

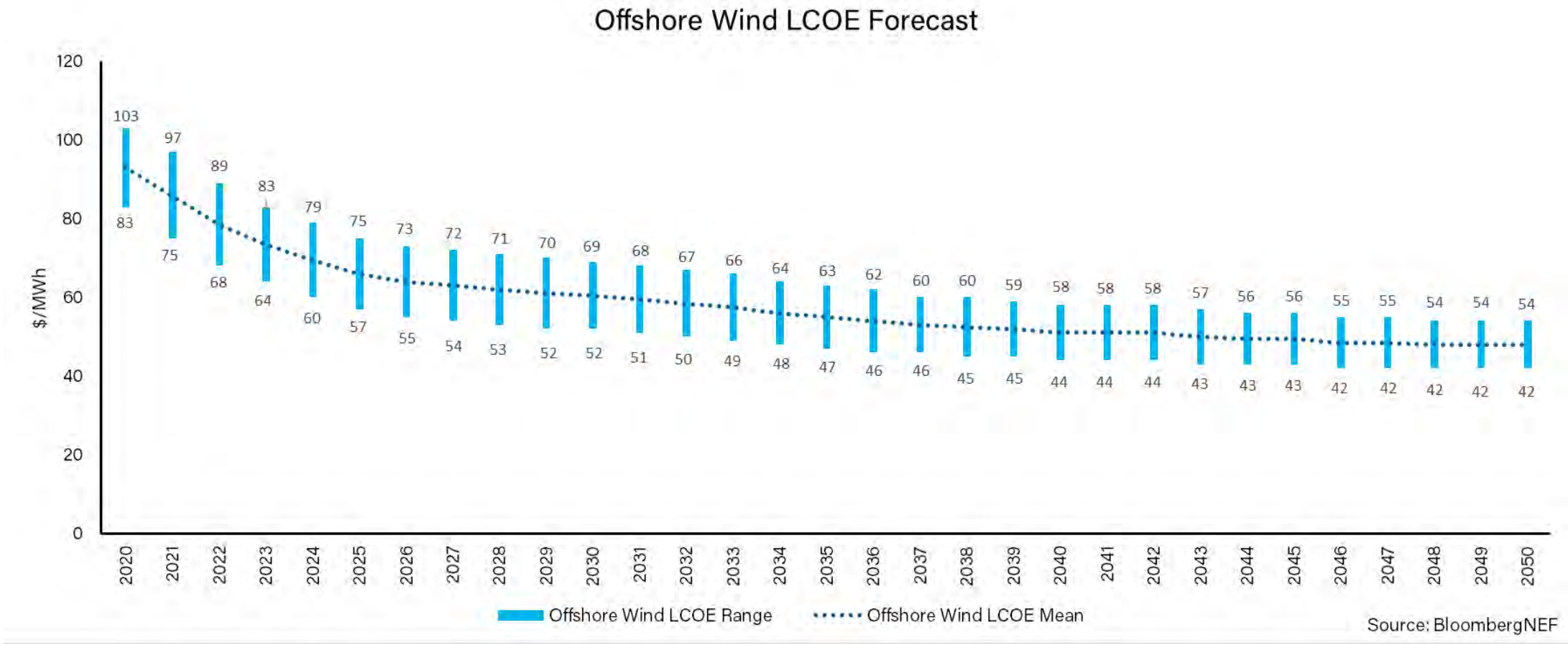
Offshore Wind Technology

Offshore Wind turbine technology keeps improving, creating larger turbines

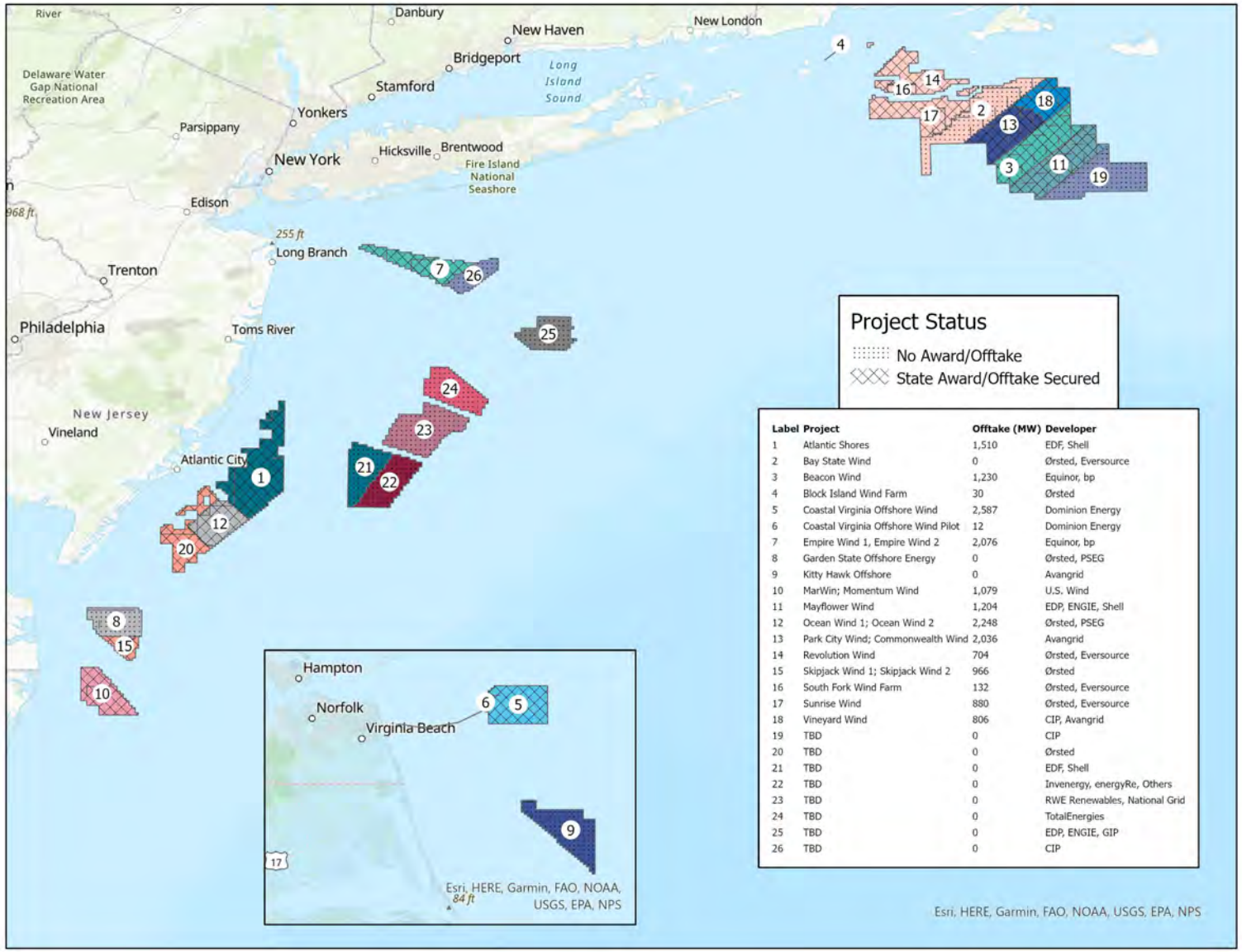


Costs Expected to Decline

Offshore Wind LCOE Forecasted to Fall Nearly 50% by 2050



U.S. Pipeline



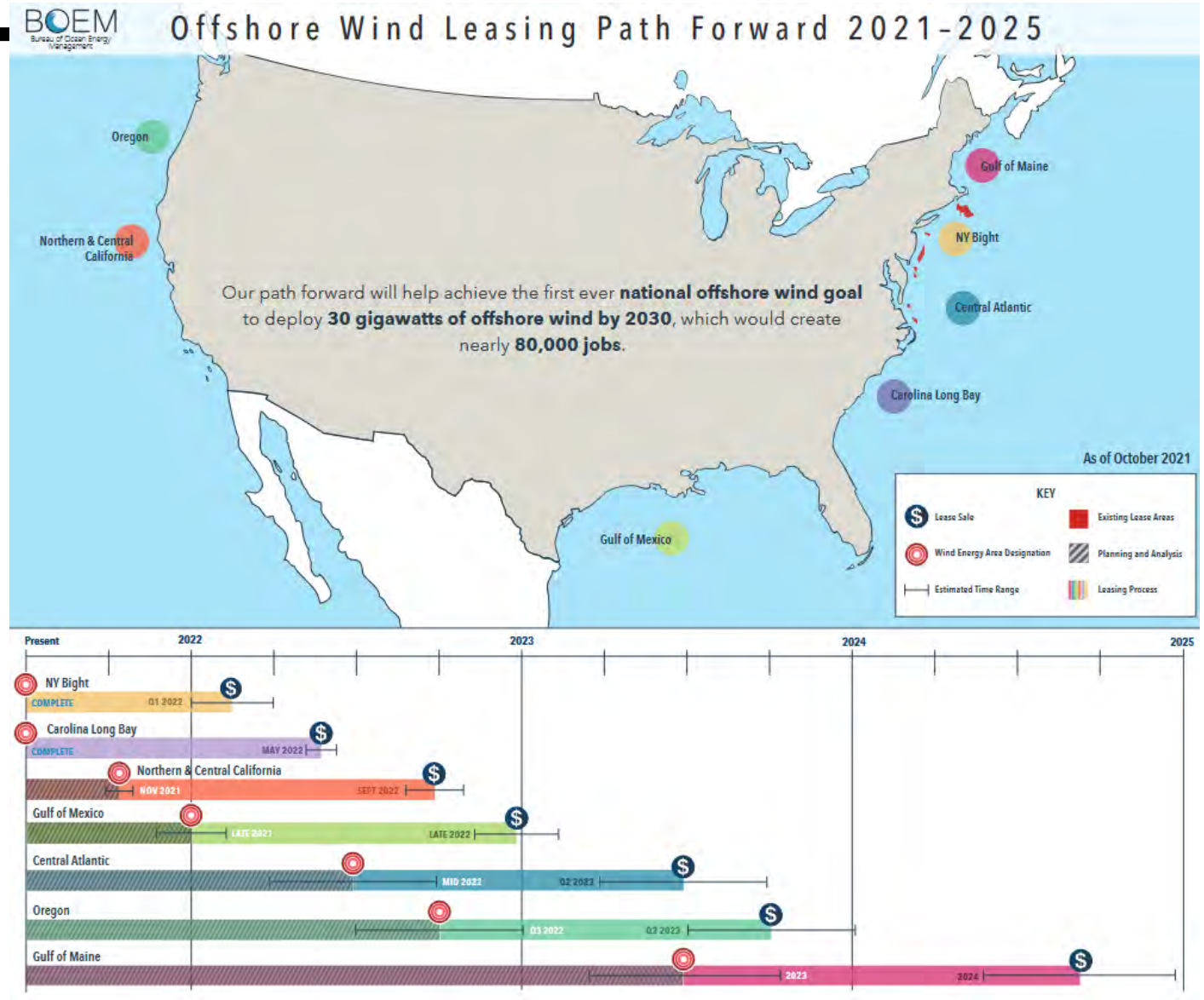
Label	Project	Offtake (MW)	Developer
1	Atlantic Shores	1,510	EDF, Shell
2	Bay State Wind	0	Ørsted, Eversource
3	Beacon Wind	1,230	Equinor, bp
4	Block Island Wind Farm	30	Ørsted
5	Coastal Virginia Offshore Wind	2,587	Dominion Energy
6	Coastal Virginia Offshore Wind Pilot	12	Dominion Energy
7	Empire Wind 1, Empire Wind 2	2,076	Equinor, bp
8	Garden State Offshore Energy	0	Ørsted, PSEG
9	Kitty Hawk Offshore	0	Avangrid
10	MarWin; Momentum Wind	1,079	U.S. Wind
11	Mayflower Wind	1,204	EDP, ENGIE, Shell
12	Ocean Wind 1; Ocean Wind 2	2,248	Ørsted, PSEG
13	Park City Wind; Commonwealth Wind	2,036	Avangrid
14	Revolution Wind	704	Ørsted, Eversource
15	Skipjack Wind 1; Skipjack Wind 2	966	Ørsted
16	South Fork Wind Farm	132	Ørsted, Eversource
17	Sunrise Wind	880	Ørsted, Eversource
18	Vineyard Wind	806	CIP, Avangrid
19	TBD	0	CIP
20	TBD	0	Ørsted
21	TBD	0	EDF, Shell
22	TBD	0	Invenergy, energyRe, Others
23	TBD	0	RWE Renewables, National Grid
24	TBD	0	TotalEnergies
25	TBD	0	EDP, ENGIE, GIP
26	TBD	0	CIP

Federal leases and projects currently in development

- Two operating projects in the U.S.
  - Block Island Wind Farm (30 MW)
  - Coastal Virginia Offshore Wind Pilot Project (12 MW)
- 18 additional projects totaling over 17.5 GW have secured a buyer, primarily through state solicitations
- February 2022 lease sales in the NY Bight have over 7 GW of potential

Source: ACP

Lease Sales



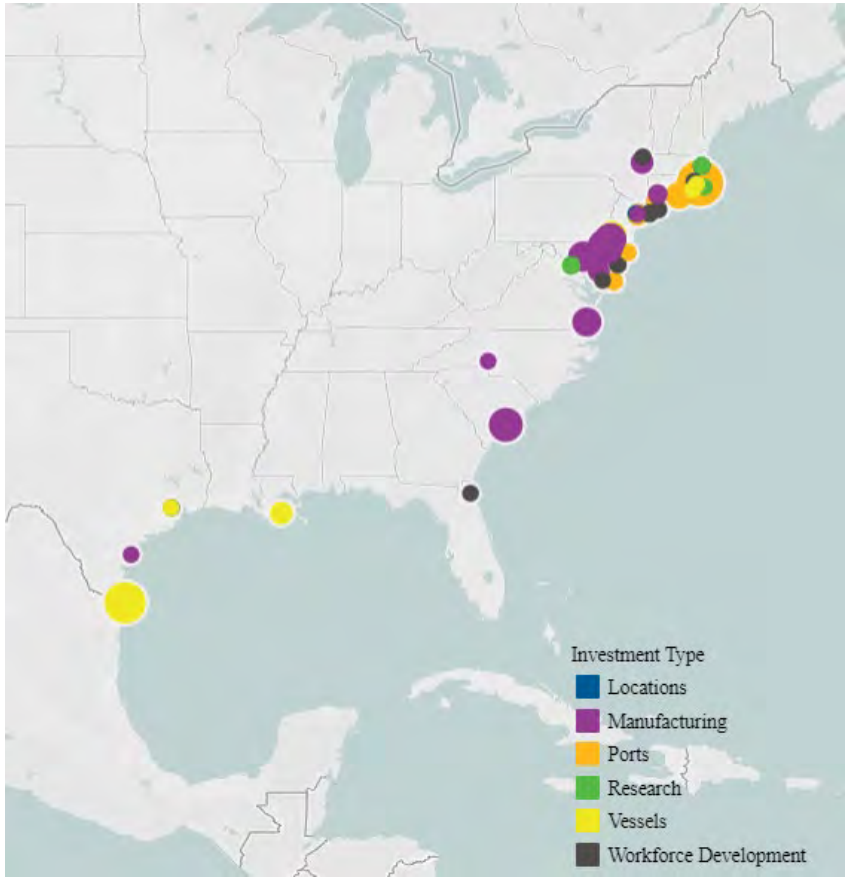
Source: BOEM

BOEM's Path Forward outlines plans to hold lease sales in 7 regions by 2025

- NY Bight FSN took place on February 23, 2022 and generated $4.37 billion in Federal revenue
  - Six leases were offered, the most areas ever offered in a single auction
- Final Sale Notice was released for Wilmington East lease area in Carolina Long Bay and will be held on May 11, 2022
- Additional lease sales in Northern and Central California, Gulf of Mexico, Central Atlantic, Oregon, and Gulf of Maine expected in the coming years

Infrastructure and Investment

U.S. offshore wind means U.S. jobs, manufacturing, and infrastructure



Industry committing billions of dollars to U.S. jobs, manufacturing, and infrastructure. For example:

- Ørsted standalone investments and commitments made jointly with its utility partners total over $215 million in ports in VA, MD, NJ, NY, CT and RI.
- Equinor and NY state investing a total of $644 million in port upgrades for three NY ports.
- EEW to build turbine tower manufacturing facility in South Jersey.
- Vineyard Wind partnering with Marmon Utility to establish capabilities at CT facility for manufacturing Kerite cables for inter-array cable cores and investing $10 million toward MA supply chain development.
- One U.S- flagged crew transfer vessel in service; two additional U.S.-built CTVs under construction and two more under contract.
- Consortium led by Dominion investing up to $500 million to build the first U.S. offshore wind installation vessel in a Texas shipyard to be used in several offshore wind projects. Keel laying announced December 16, 2020.
- Nexans to manufacture the first U.S. subsea high voltage export cables in Goose Creek, S.C. to be used at several East Coast projects. Nexans is investing $310 million in this project.
- Ørsted and Eversource signed Charter Agreement with Edison Chouest Offshore for U.S. flagged Jones Act-compliant service operation vessel.
- US Wind facilitating the investment of an incremental $150 million in a new monopile fabrication factory at Sparrows Point, MD.

Offshore Wind Vessel Needs

- **Offshore Wind Projects will rely on at least 27 different vessels per project**

U.S. Offshore Wind Creates U.S. Jobs

Deploying 30 GW of offshore wind by 2030 will support 83,000 jobs

U.S. Offshore Wind Power Economic Impact Assessment. AWEA, March 2020

- **Offshore wind developers have already invested in training programs for welders, divers, and electricians, among others.**
- **Offshore wind provides diversified job opportunities for experienced Gulf Coast builders and mariners.**
  - LA-based Falcon Global used its **experienced crews and feeder vessels** to serve the Block Island project.
    - **Foundations** for this project were made in LA by Gulf Island Fabrication.
    - The crew transfer vessel this project is owned and operated by a RI-based wind farm support company that has a long-term contract to provide services for operations and maintenance.
  - **Houma, LA-based Offshore Survey Vessels** currently at work conducting geophysical surveys for a 2,640 MW project to be built in 2024
  - An April 2020 BOEM study on **offshore wind in the Gulf of Mexico** has found that a single 600 MW offshore wind project in **Port Arthur, LA** could support **approximately 4,470 jobs and $445 million in U.S. GDP during construction, plus an ongoing 150 jobs and $14 million in U.S. GDP annually from O&M labor, materials, and services.**

M/V Sarah Bordelon survey vessel

Heavy lift installation vessel

Industry Dedicated to Providing Good Jobs

“This is an opportunity to develop good union jobs in an emerging industry. With the announcement of finalized contracts, we have taken another historic step on the journey to creating good union jobs, growing our economy, and continuing the necessary fight against climate change.”

- John R. Durso, President of the Long Island Federation of Labor, AFL-CIO

Offshore Industry has committed to partner with labor unions. Agreements have already been signed with (sampling):

- North America’s Building Trades Unions
- Rhode Island Building and Construction Trades Council
- New London Building and Construction Trades Council
- Southeastern Massachusetts, Cape Cod and Islands Building Trades Council
- Nassau Suffolk Building and Construction Trades Council
- South Jersey Building and Construction Trades Council
- Massachusetts Building Trades Council
- Virginia State Building and Construction Trades Council
- Fairfield Building Trades Council
- Utility Workers of America
- International Association of Bridge, Structural, Ornamental and Reinforcing Iron Workers
- International Brotherhood of Electrical Workers
- Laborer’s International Union of North America (LiUNA!) Mid-Atlantic Region
- Eastern Atlantic States Regional Council of Carpenters
- International Union of Operating Engineers Local 825,
- Ironworkers International
- Baltimore-D.C. Building Trades (BDCBT)
- United Steelworkers

In the construction of the Block Island Wind Farm in 2016 (5 turbines), 300 unionized construction and electrical workers were used.

- There are **2,000 turbines in the current pipeline** of projects

Challenges Lie Ahead

- **Supply chain and vessels**
  - Need regulatory certainty and long-term pipeline of leases and project approvals to incentivize investments
  - Maritime crewing legislation threatens viability of the industry
- **Permitting coordination**
  - BOEM is lead federal agency, but other federal permits and competing priorities (plus state/local approvals)
- **Agency resources**
  - Workload has gone from zero to 60, and funding hasn’t kept up.
- **Grid interconnection**
  - Transition from radial to regional mesh/backbone, onshore upgrades
- **Lawsuits from industry opponents**
  - Some commercial fishing interests
  - Wealthy coastal landowners
  - Dark money

Thank you

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