

Overview - Wind Energy in Maryland

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October 29, 2019





Maryland Land Based Wind:

The U.S. wind industry is a major economic development driver in Maryland. In addition to job creation and billions of dollars in project investment, the wind industry invests heavily in local communities, providing significant revenue in the form of property, state, and local taxes.

- Capital investment in wind projects through 2018*: \$408 million
- Annual state and local tax payments by wind projects: \$2.5 million
- Annual land lease payments*: \$500k - \$1 million
- 3 manufacturing facilities serving the land-based wind industry (offshore wind expected to greatly expand this manufacturing base)

*Source: Based on state and national averages from LBNL, NREL

- The first utility scale wind turbine was installed in Maryland in 2010 and there are now 4 major utility scale projects and 2 community projects across the state.



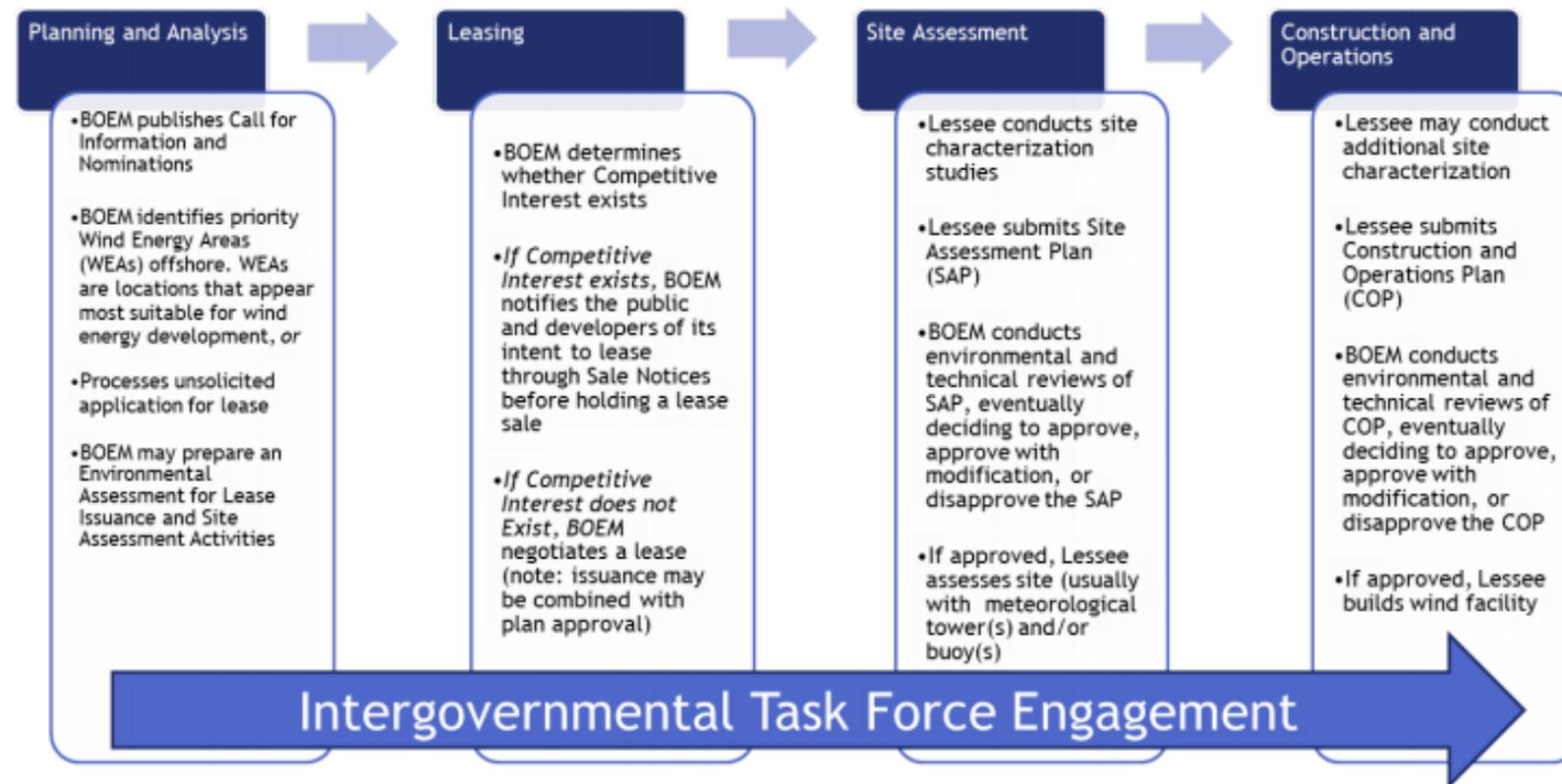
Wind energy projects currently operating in Maryland

Project Name	Total Capacity	Turbine #	Year Online	Developers	Owners	Turbine Mfr	Turbine Model	Power Purchasers
Criterion	70	28	2010	Constellation	Constellation Unknown	Clipper Windpower Inc.	C93	Old Dominion Electric Cooperative (70)
Fourmile Ridge	40	16	2014	Exelon Wind	ExGen John Hancock	Nordex USA Inc.	N100/2500	PJM Interconnection (40)
Roth Rock	40	16	2011	Synergics Wind Energy	Elawan Wind	Nordex USA Inc.	N90/2500	Delmarva Power & Light (40)
Fair Wind	30	12	2015	Exelon Wind	Exelon Generation Co.	Nordex USA Inc.	N100/2500	Exelon Corporation (30)
Roth Rock North	10	4	2011	Synergics Wind Energy LLC	Elawan Wind	Nordex USA Inc.	N90/2500	WGES(10)
Crisfield WWTP	0.75	1	2017	Crisfield WWTP	Crisfield WWTP	Aeronautica Windpower	54-750	Crisfield WWTP (0.75)
Talbot County DPW	0.3	3	2010	Tieder Controls	Talbot County DPW	Northern Power Systems	NPS 100	Talbot County DPW



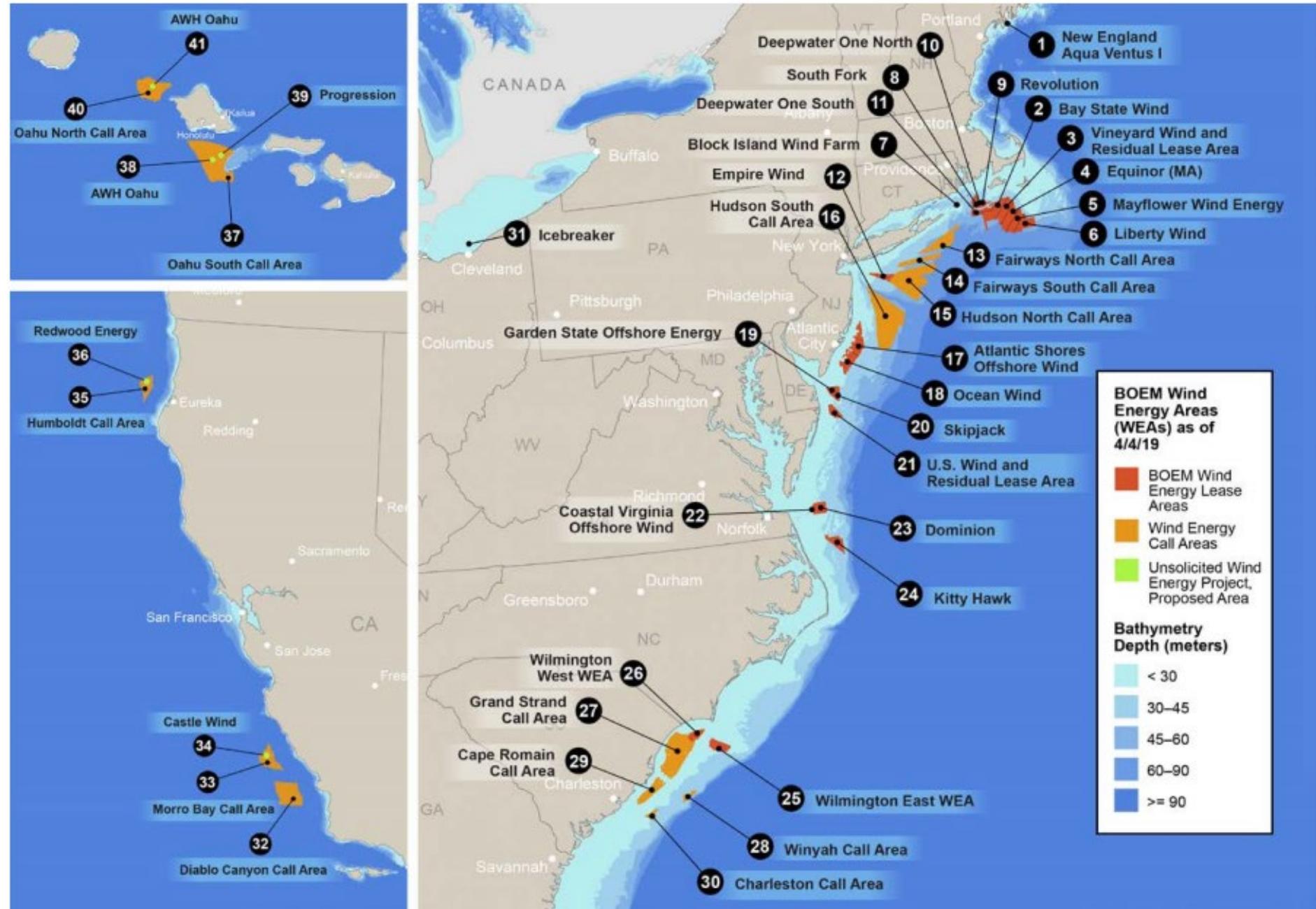
BOEM Offshore Wind Permitting

- BOEM seeks public engagement throughout the multi-stage permitting process.
 - Intergovernmental Renewable Energy Task Force meetings
 - Call for information on the proposed lease area
 - Proposed sale notice on the lease area
 - NEPA public comment periods
 - NEPA public meetings
 - Regional Fisheries Council Meetings
- BOEM has already held over 100 public meetings and accepted public comment and other public input regarding offshore wind development in federal waters.



15 leases issued for US waters; more planned for future auctions.

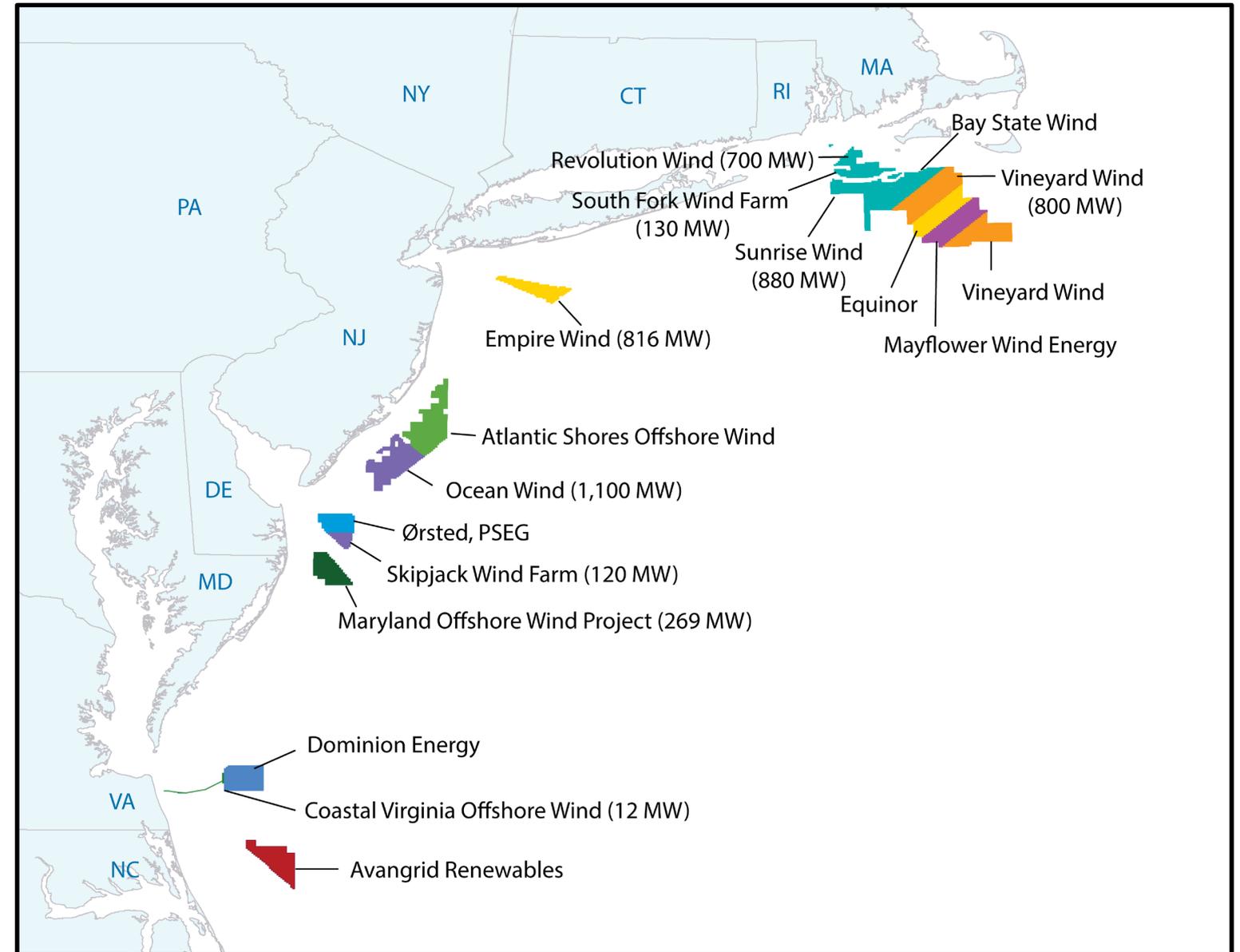
In a December 2018 offshore wind lease auction, three separate parcels in New England each went for \$135 million.



Source: DOE, NREL, 2018 Offshore Wind Technologies Market Report

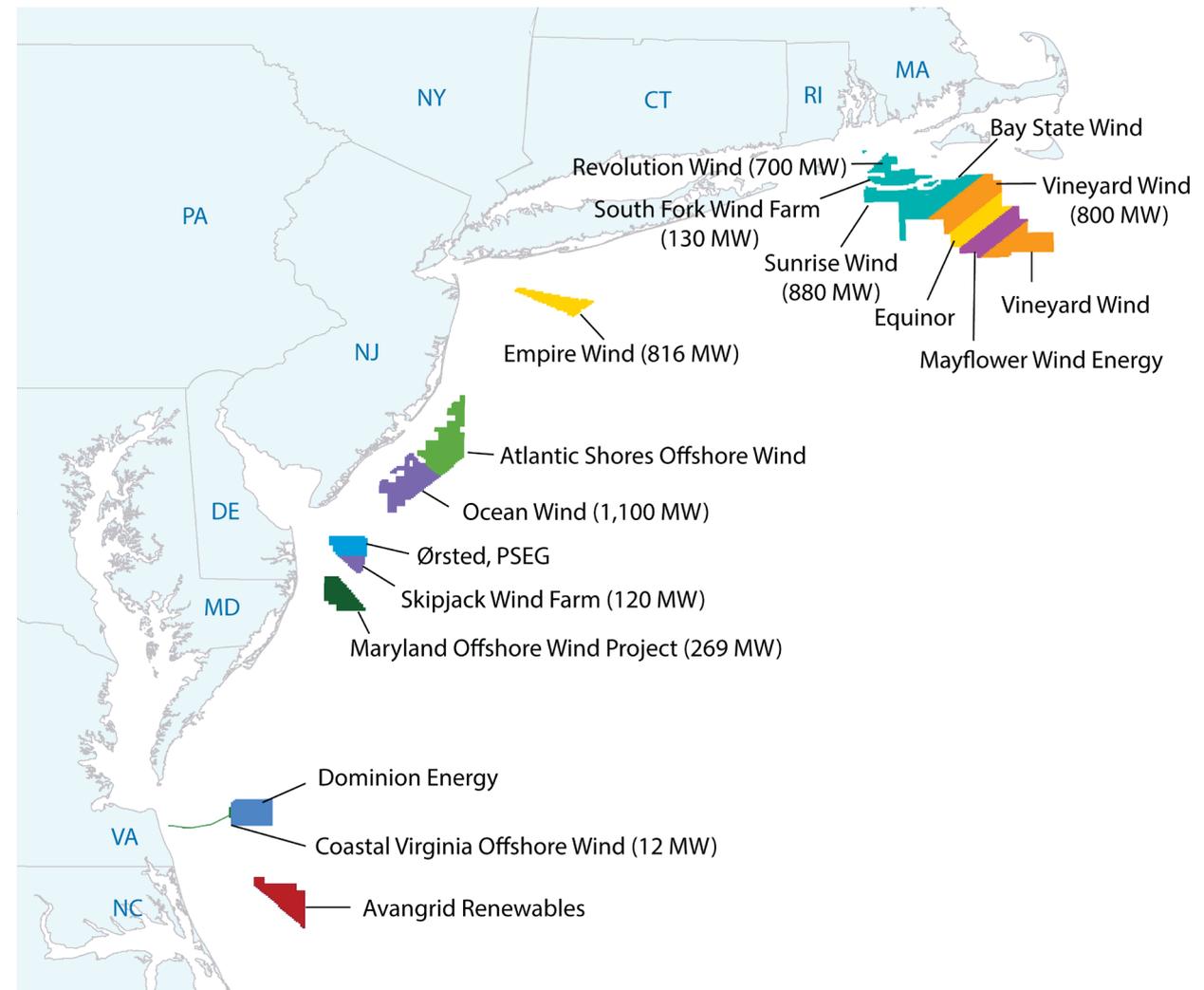
Offshore Wind Activity

- U.S. total offshore wind pipeline currently sits at 26,000 MW
- Project developers aiming to have 12 projects totaling 7,470 MW operational by 2026.



State Offshore Wind Activity

- Maryland awarded ORECs to two projects (368 MW) in 2017
- Massachusetts issued first large-scale solicitation in 2017; selected 800 MW Vineyard Wind project in May 2018
- Rhode Island selected 400 MW from Revolution Wind in May 2018
- Connecticut selected 300 MW from Revolution Wind in June & Dec 2018
- New Jersey issued 1,100 MW solicitation in Sept 2018; Selected 1,100 MW Ocean Wind Project in June 2019
- New York issued 800 MW solicitation in Nov 2018; Selected 880 MW Sunrise Wind and 816 MW Empire Wind in July 2019



Offshore Wind Project Timelines

Project Name	Project Capacity (MW)	Project Owner(s)	Project Location (BOEM Lease Area)	Offtake	Estimated Start of Construction	Estimated Year Online
Skipjack Wind Farm	120	Ørsted US Offshore Wind	Delaware	Maryland OREC award	2021	2022
Maryland Offshore Wind Project	269	U.S. Wind Inc	Maryland	Maryland OREC award	2021-2022	2022
Vineyard Wind	800	Copenhagen Infrastructure Partners; Avangrid Renewables	Massachusetts	Eversource Energy, National Grid, and Unital Corp	2019-2020	2022-2023
Ocean Wind	1,100	Ørsted US Offshore Wind	New Jersey	New Jersey OREC award	2020-2021	2024
Empire Wind	816	Equinor	New York	NYSERDA	2022	2024
South Fork Wind Farm	130	Ørsted US Offshore Wind; Eversource Energy	Rhode Island/ Massachusetts	Long Island Power Authority	2021	2022
Revolution Wind	704	Ørsted US Offshore Wind; Eversource Energy	Rhode Island/ Massachusetts	National Grid (400 MW); Eversource Energy & United Illuminating Co (304 MW)	2020-2021	2023
Sunrise Wind	880	Ørsted US Offshore Wind; Eversource Energy	Rhode Island/ Massachusetts	NYSERDA	2022	2024
Coastal Virginia Offshore Wind	12	Dominion Energy; Ørsted US Offshore Wind	Virginia	Dominion Energy	2019	2020
Unnamed Dominion Energy Project	2,640	Dominion Energy	Virginia	Dominion Energy	2022	2024-2026



U.S. offshore wind = infrastructure, investment in the U.S.

Among other commitments, offshore wind developers have announced the following investments:

- **\$472 million** paid to the U.S. taxpayers for existing offshore federal leases
- **\$10 million** to accelerate an offshore wind supply chain in Massachusetts;
- **\$40 million** for investments in Rhode Island ports, supply chain development and workforce development;
- **\$100 million** to improve the marine terminal in New Bedford, Massachusetts;
- **\$22.5 million** to upgrade the Port of New London in Connecticut;
- **\$76 million** for steel fabrication and **\$40 million** for port upgrades in Maryland;
- **\$35 million** for an offshore wind gearbox testing facility at Clemson University;



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