14. OFFSHORE WIND PORT COMMERCIAL ANALYSIS

14.1 Introduction

The US East Coast is expected to experience a rapid increase of activity in the OSW industry over the coming decade, with the operating capacity of installations increasing from the 30 MW today (Block Island and Coastal Virginia) to roughly 29,000 MW (29.0 GW) by 2035 (as presented in Figure 14-1). This would suggest there could be approximately 2,500 turbines[1] in operation by 2035, depending on the per unit capacity of the turbines brought to the installations. In order to accommodate projected growth, the development of dedicated port infrastructure will be necessary to support the staging, manufacturing, and operations and maintenance associated with the newly constructed installations. Both the timing and scale of to-be-developed installations indicates that there is an opportunity for multiple "regional" port hubs to operate simultaneously on the US East Coast to meet the demand of the industry.

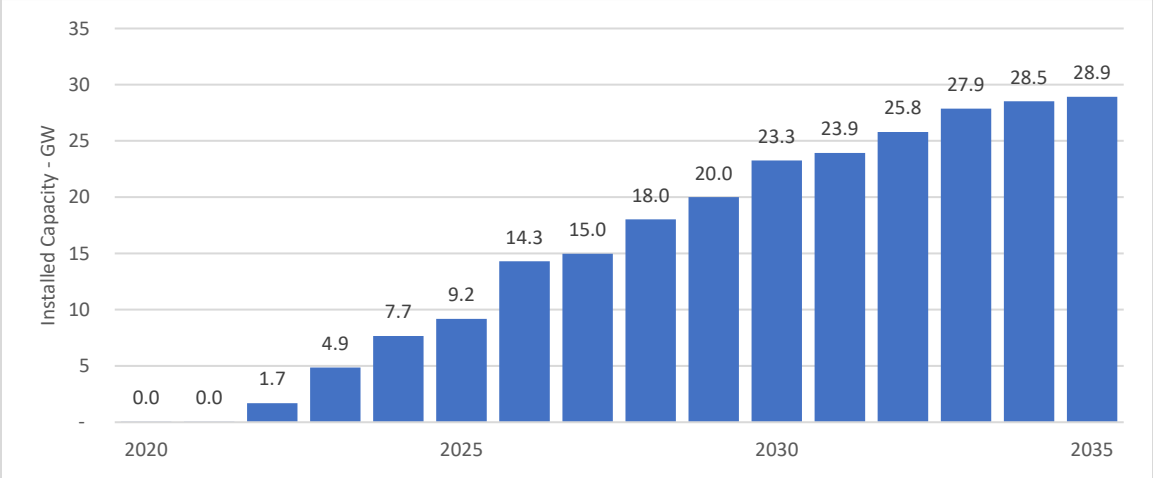

Figure 14-1: Projected Cumulative Installed OSW Capacity on the US East Coast[2] (Source: M&N)

The commercial assessment presented in this section addresses the following:

- The existing pipeline of installations and long-term state-level targets for OSW
- The relative cost competitiveness of floating-base vs. fixed-base turbines
- The lease terms emerging on the US East Coast at other OSW ports and potential operating models

Based on the analysis, the opportunity for Maine, and more specifically the port-hub at Searsport, will emerge in the late 2020s/early 2030s.

[1] Assuming roughly 12 MW per turbine
[2] Includes assumptions around the build up of undefined installations/solicitations that are required to meet the respective state-level 2035 targets

- By this time, many of the identified installations and planned solicitations will have either began operating, be under construction, or be in permitting. These installations will have been established in the shallow-water BOEM areas, which will utilize fixed-foundations.
- Advancement in technology and supply chains of the floating-base turbines will allow them to have become financially competitive with the fixed-base foundations.
- BOEM's official schedule shows the first lease sale in Maine to occur in Q2 – Q4 2024. It can take up to seven- years to complete the permitting and receive approval of the construction operations plan, so even on an accelerated timeline the late 2020's appears likely as the earliest a commercial installation would begin operations.
- The US OSW industry will have matured and will have likely attracted interest from additional private terminal operators and financial investors that could support the development of Maine's OSW industry.
- BOEM may have designated additional deep-water call sites and/or lease areas, presumably both within and outside the Gulf of Maine. This would give the Searsport-hub the potential to serve not just a local Gulf of Maine market but also a more extensive US Northeast floating OSW market.

14.2 Project Pipeline and Implication on Port Infrastructure

The largest clusters of BOEM call areas (by area and potential capacity) available for OSW development in the US Northeast include the Massachusetts cluster (located off the south coast of Martha's Vineyard), the NY Bight cluster (south of Long Island and east of New Jersey) and the South Jersey/Delaware cluster (off the coast of southern New Jersey and Delaware). These clusters are all located in shallow water (<45 meters), as presented in Figure 14-2 and, therefore, will utilize fixed-base installations.

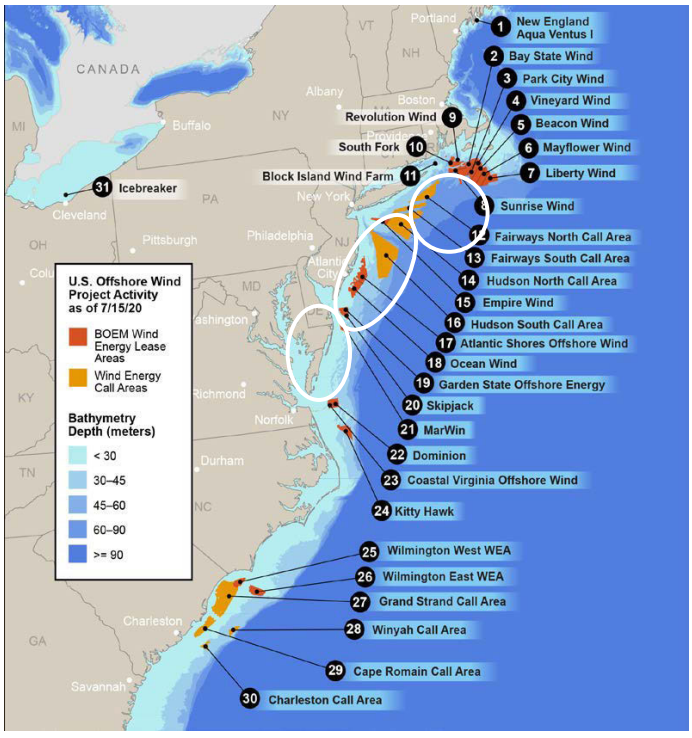

Figure 14-2: BOEM Lease and Call Sites on US East Coast (Source: BOEM)

Additionally, BOEM has designated other call areas off the coasts of Virginia and North and South Carolina.

In the Gulf of Maine there are currently no designated call areas, though the installation of the single Aqua Ventas pilot turbine (12 MW) was approved by Maine's Public Utility Commission and is scheduled to begin operations in 2023. There is limited shallow water available to support a fixed-base installation and, therefore, the Aqua Ventas and future installations in the Gulf of Maine will deploy the floating-bases.

In terms of leased areas, the most advanced are the Massachusetts and South Jersey/Delaware clusters. Within the Massachusetts cluster, as presented in Table 14-1, there are currently six projects in the permitting stage and an additional three under exclusive site control. The Block Island installation, which is operating, is also located in this cluster. Of the projects in permitting, all have Commence Operation Dates (COD) between 2023 and 2025. Of those in site control, it would be expected that COD occur sometime between 2025 and 2035. Generally, site control precedes permitting by one to three years, with COD expected to occur within five years following completion of permitting. It would, therefore, appear that by 2035, all Massachusetts cluster areas available for lease will likely be accounted for and in operation.

Table 14-1: Installation Status & Details

Cluster	Location	Project Name	Status	COD	Announced (MW)	Pipeline (MW)	Offtake	Developers
	ME	New England Aqua Ventus I	Permitting	2023	12	12	ME	Aqua Ventus
MA	MA	Bay State Wind	Site Control	-	-	2,277	-	Ørsted/Eversource
	MA	Park City Wind	Permitting	2025	804	804	CT	Avangrid/CIP
	MA	Vineyard Wind + Residual	Permitting	2023	800	1,221	MA	Avangrid/CIP
	MA	Beacon Wind	Permitting	-	1,230	1,564	NY	Equinor/BP
	MA	Mayflower Wind + Residual	Permitting	2025	804	1,551	MA	EDPR/Shell
	MA	Liberty Wind	Site Control	-	-	1,607	-	Avangrid/CIP
	MA	Sunrise Wind	Permitting	2024	880	880	NY	Ørsted/Eversource
	RI	Revolution Wind	Permitting	2023	704	704	RI & CT	Ørsted/Eversource
	RI	South Fork	Permitting	2023	130	130	NY	Ørsted/Eversource
	RI	Block Island Wind Farm	Operating	2016	30	30	RI	Ørsted/Eversource
NY Bight	NY	Fairways North Call Area	Planning	-	-	-	-	-
	NY	Fairways South Call Area	Planning	-	-	-	-	-
	NY	Hudson North Call Area	Planning	-	-	-	-	-
	NY	Empire Wind 1&2	Permitting	2025 / 2028	2,076	2,400	NY	Equinor/BP
	NY	Hudson South Call Area	Planning	-	-	-	-	-
South NJ	NJ	Atlantic Shores OSW	Permitting	-	1,510	2,500	-	EDF/Shell
	NJ	Ocean Wind + Residual	Permitting	2024	1,100	1,947	NJ	Ørsted/PSEG
	DE	Garden State Energy	Site Control	-	-	1,050	-	Ørsted
	DE	Skipjack	Permitting	2023	120	120	MD	Ørsted
	MD	MarWin + Residual	Permitting	2023	248	966	MD	US Wind
	VA	Dominion	Site Control	-	-	2,640	-	Dominion
	VA	Coastal Virginia OSW	Constructed	2020	12	12	VA	Dominion/Ørsted

Shading indicates projects which are in Permitting or more advanced phases
Source: NREL

Within the Southern NJ cluster, four projects are in permitting and two under exclusive site control. Those in permitting have CODs of 2023 and 2024 (respectively), which indicate that operations should begin in the "near-term." Those under site control would be expected to begin operation between 2025 and 2035. Therefore, it would indicate that all designated BOEM areas would be accounted for and in operation.

The NY Bight cluster has two projects, Empire Wind 1 & 2, in permitting with a COD of 2025 and 2028. There are an additional four areas in planning, which is the first stage of the development pipeline. This implies that installations in these areas may commence operations later in the forecast horizon (2030 – 2035+).

It should be noted that NY and NJ have the largest targets for OSW procurement, 9,000 MW and 7,5000 MW, respectively, by 2035 (as presented in Table 14-2). This indicates that there will need to be a strong procurement effort in order to meet the long-term targets as NY currently has just 3,306 MW under permitting and NJ has just 2,610 MW. Much of the generating capacity needed to reach the long-term goals could be developed in the NY Bight and Southern NJ Cluster.

MA has already reached its 2027 target of 1,600 MW with the projects currently in permitting but will have double this level if it is to reach its 2035 target of 3,200 MW. CT will have to secure additional installation(s) to meet its 2030 target of 2,000 MW. These levels could potentially be sourced by the three projects under site control, namely Bay State Wind (2,227 MW area capacity), Beacon Wind (1,564 MW), and Liberty Wind (1,607 MW)[3].

Within the permitted and site-controlled sites, there is a total 22,415 MW[4] of pipeline capacity (which is greater than the announced capacity of the individual installations) and doesn't include the potential of the large NY Bight areas in the planning stage. Therefore, much, if not all, of the existing 2035 target MW can accommodated in the existing shallow-water call areas.

Table 14-2: State-Level Procurement Targets (Offtake)

Offtake	Permitted (MW)	2030 Target (MW)	2035 Target (MW)
ME	12	NA	NA
MA	1,604	1,600*	3,200
RI	430	NA	NA
CT	1,108	2,000	NA
NY	946	2,400	9,000
NJ	1,100	3,500	7,500
MD	368	1,568	NA
VA	12	2,500*	5,200*
Total	5,568	13,998	28,900

*Source: NREL; M&N. *MA Target 2027, VA Target 2026, 2034*
ME has 80% renewables target for 2030, but does not stipulate a target for OSW

[3] https://www.nrel.gov/wind/offshore-wind.html - October 2020
[4] Pipeline capacity is the total implied capacity of the lease area (based on acreage) vs announced capacity which is project specific (phase)

To prepare for the imminent activity associated with component delivery, staging and installation of the turbines, cables, and substations, the public and private sectors have been actively engaging one another to secure and fund waterfront access and port development. To date, some of the early port developments/administrations in the US Northeast/Mid-Atlantic targeting the OSW industry (staging and manufacturing) include:

- The New Bedford Terminal, MA
- Brayton Point, MA
- State Pier, CT
- Port of Albany & Coeymans, NY
- Port of NYNJ & South Brooklyn Marine Terminal
- Hope Creek & Paulsboro, NJ
- Tradepoint Atlantic, MD
- Portsmouth, VA

While not all sites will be able to offer the same service complement, the intense level of installation activity (between 2022 and 2035) will necessitate that multiple staging facilities operate simultaneously to meet demand.

It is advantageous from a cost perspective for the installation developers (Equinor, Ørsted, Dominion, etc.) to have staging locations that are close to the installation sites (Figure 14-3). This reduces the distance, time, and ultimately, cost of delivering components to the installation site. Therefore, it is not surprising that sites such as New Bedford and State Pier will be utilized for the Vineyard Wind and Mayflower Wind projects (Massachusetts cluster, roughly 53 nm between port and installation areas), Hope Creek for Ocean Wind (South Jersey), and Portsmouth for Dominion. These ports offer the closest option to serve the respective installations.

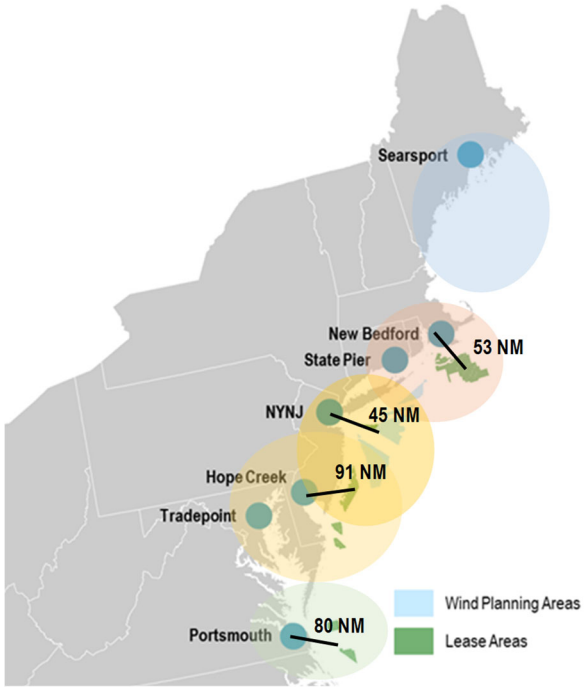

Figure 14-3: Illustrative Port Regions & Installation Areas (Source: M&N)

The implication for the Searsport, ME development is that it would be at a great competitive advantage to serve the needs of installations in the Gulf of Maine but would be at a competitive disadvantage to serve the installation sites to the south (for the existing shallow-water fixed foundation call sites). This competitive disadvantage could be erased, however, should BOEM open deep-water call sites and there are no other floating-base hubs to serve them (in the US Northeast).

In summary, the following can be inferred with respect to the prospect of the port-hub development in Searsport, ME:

1) Installations in the Gulf of Maine will become the primary source of the "Market" for this hub. With an 80% renewables target by 2030 and 100% by 2050, OSW is likely to be required.

    a. The long-standing goal in Maine is to have 5,000 MW of installed capacity by 2030[5].

        i. Note the prospect of having 5,000 MW of capacity in the Gulf of Maine by 2030 is a significant challenge. This would imply that anywhere from 500 to 333 turbines will have been installed by that time, depending on per unit capacity (assuming 10 MW to 15 MW per turbine). In order to reach that target, a single floating-base manufacturer would have to operate continuously for years and/or receive additional bases from alternate locations simultaneously. There are currently no commercial producers of floating-bases in the US. M&N believes a more realistic goal would be to have a single large commercial installation (400 – 1,000 MW e.g.), in operation by 2030.

    b. BOEM will need to designate call areas within the Gulf of Maine and a formal solicitation/procurement process will need take place to secure a developer(s).

2) The ability to serve locations outside of the Gulf of Maine will remain contingent on two market events:

    a. The states need to expand on their respective long-term targets, thereby extending the demand horizon beyond 2035 - all of which will likely have been met by fixed-base installations in existing call areas.

    b. BOEM needs to designate new lease areas in deep water, which necessitates the use of the floating-bases.

Momentum is clearly building behind the floating-base industry. In August of 2020, the Aqua Ventus, RWE Renewables and Diamond Offshore Wind (A Mitsubishi subsidiary), formed the New England Aqua Ventas JV, which will fabricate, develop, and operate the single turbine. Total costs are estimated at $100 million, underscoring the interest by major renewable energy developers to invest in floating wind technology in the US. Other major global developers such as Equinor, Cobra Group, and PPI (EDP and Repsol [major partners]) continue to develop and install floating-base installations in Europe and Asia.

14.3 Competitiveness of Floating Installations

The use of floating bases represents one of the frontiers[6] of the global OSW wind industry, and today remains in its formative stages. There is currently less than 100 MW of installed floating capacity around the world, compared to roughly 29,800 MW of total installed capacity (or just

[5] https://composites.umaine.edu/offshorewind/ - this has been a stated goal since 2009 but has not been formally recognized in executive order or legislation

[6] The scale/capacity of the turbines being developed for fixed-base installations is equally impressive

0.3% of the total). The prospect of floating bases gaining market share, however, is well supported and, just as the fixed-base installations have steadily improved their competitive position relative to conventional forms of energy over the past ten years, floating-bases too will leverage improvements in technology and reductions in production costs to improve its competitive offering over the coming decade, bringing its offering closer to both fixed-base and conventional energy sources.

The Levelized Cost of Electricity (LCOE) from the OSW industry has improved dramatically over the last 10-years and is projected to continue to do so through the coming decades (see Figure 14-4). Globally, the median cost supplied by OSW has fallen by almost 20-30% since 2012 to about $100/MWh in 2019/2020, bringing it in the range of conventional fossil fuels.

The consensus projections[7] indicate that LCOE from OSW will continue to fall through the 2020s and 2030s, reaching roughly $50/MWh by 2030. This would bring the cost of energy roughly in line with the low-end of the fossil fuel range. Indeed, in some markets around the world, particularly in Europe/UK, the cost of power from OSW has fallen below that of conventional fuels.

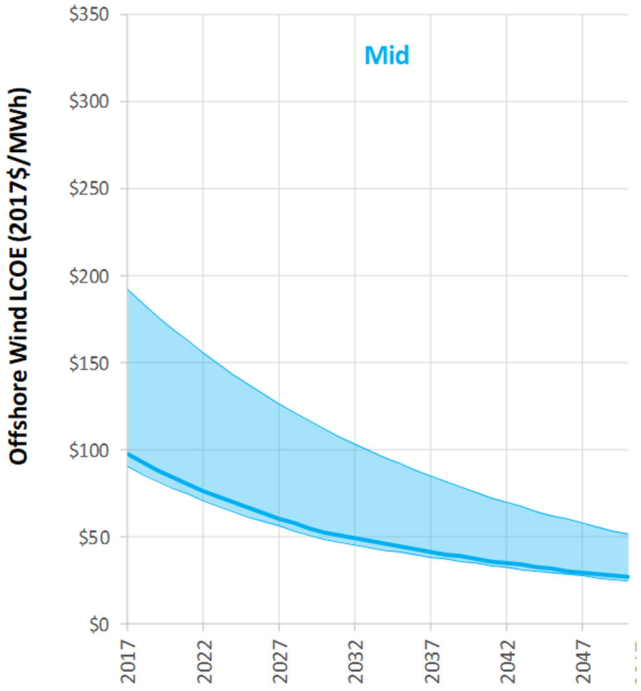

Figure 14-4: LCOE Projections for OSW (Source: NREL)

This decline in LCOE offered by OSW reflects both a reduction in the supply chain costs of the turbines and their installation, as well as the substantial increase in electricity production generated by the larger turbines. As illustrated in Figure 14-5, in 2010 the average capacity per turbine being installed was 3 MW, by 2018 this had increased to 5.5 MW. Ten (10) and 12 MW turbines are now being sourced/manufactured for the installations being permitted today. These, along with the even larger (15 MW+ turbines), will continue to bring the efficiencies of scale to the market in the future.

[7] https://atb.nrel.gov/electricity/2019/index.html?t=inlwowsusdsrscgthpcgcccncb&m=1

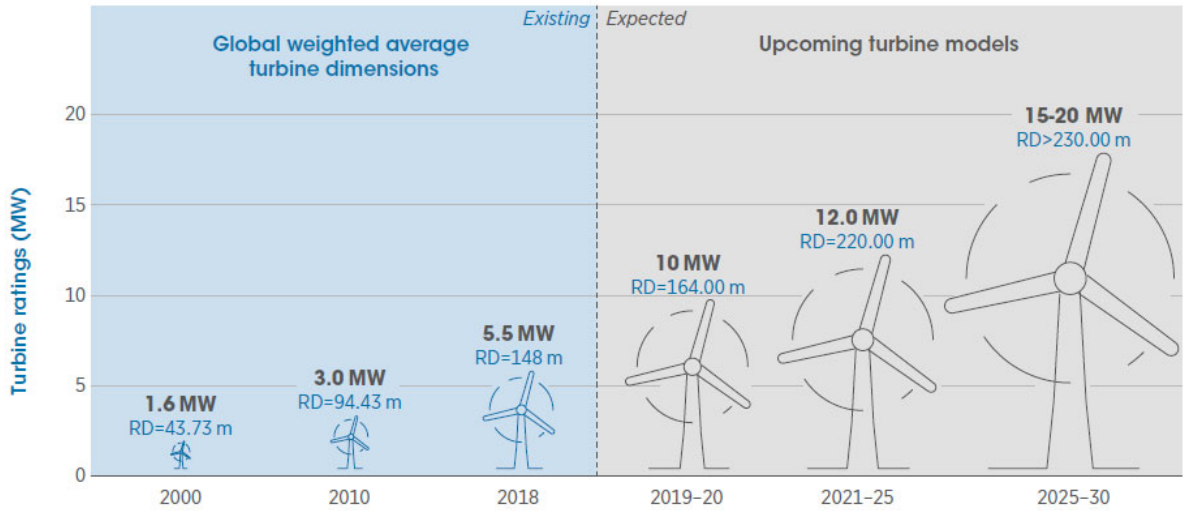

Figure 14-5: Average Size of OSW Turbines (Source: IRENA "Future of Wind – Development, Investment, Technology, Grid Integration and Socio-economic Aspects" 2019)

Being the younger technology, floating-base turbines are currently costlier than the fixed monopile turbines due to more expensive technologies and a lack of the economies of scale that has benefited monopile turbines. The largest operating floating-base installation is Equinor's Hywind Scotland 30 MW installation (5 X 6 MW [Siemens Gamesa]) with COD in 2017. More recent projects, like the Hywind Tampen installation in the Norwegian North Sea (COD 2022) and the upcoming floating wind auctions in France and Japan, will set precedents for the LCOE of floating wind in larger arrays. France's floating wind auction consists of two 250 MW with LCOEs of $142 and $130 per MW hour, which is significantly lower than other ongoing projects.

Equinor is already on record saying that it will seek to reduce the development cost (per MW) of the Hywind Tampen by more than 40% compared to the Hywind Scotland project. Tampen will be a significantly larger installation, delivering 88 MW capacity and utilizing 11 X 8 MW (Siemens Gamesa) turbines.

It is efforts such this, as well as the precedent set by the fixed-base segment of the industry, that gives credence to the assumption that the floating-base option will also be able to bring more competitive LCOE to the market. The Aqua Ventus project is a key example of a technological advancement that could rapidly lower the expected LCOE for floating wind structures. While the current Aqua Ventus plan includes only a single floating turbine, the NREL predicts that the LCOE of a 1,000 MW system, using current Aqua Ventus technology and supply chains, could be $107/MWh[8]. Table 14-3 shows that the NREL study predicts an LCOE decline to $74/MWh in 2027 and $57/MWh in 2032. The reductions in price follow similar patterns to those experienced by fixed bottom turbine technology. With the industry moving towards larger turbines, there is a possibility that the cost of floating turbines will fall faster as they are able be deployed in deeper and more productive areas of the ocean.

[8] https://www.nrel.gov/docs/fy20osti/75618.pdf

Table 14-3: Expected LCOE and Costs of 1,000-MW Aqua Ventus Array

Model Year	2019	2022	2027	2032
LCOE ($MW/H)	107	88	74	57
CapEx ($/kW)	4,789	4,129	3,686	2,998
OpEx ($/kW/yr)	84	62	53	38
Net Capacity Factor (%)	46	47	49	51

Source: NREL

Government policy can also play a pivotal role in the adoption of floating wind. The current presidential administration has announced policy that will be far more favorable to renewable energy as well as US-based manufacturing. A government backed emphasis on both could lower the costs of manufacturing in the US and accelerate the rate at which floating wind turbines are deployed. In the coming years, if existing monopile arrays prove to be successful, it could mean BOEM would open deep-water sites off the US East Coast sooner than expected.

As the floating-base option matures through the 2020s and into the 2030s, this could provide the window of opportunity for the Searsport development to enter competitive market, particularly for the deep-water lease areas within the Gulf of Maine which BOEM seeks to auction in 2024.

14.4 Lease Agreements & Operating Model

The analysis presented in this section is meant to identify the terms and key stakeholders of lease agreements being accepted within the new market of designated ports servicing the OSW industry. To date there have been four announced and which are described below and shown in Figure 14-6:

- The New Bedford Terminal with Vineyard Wind and the State of MA
- State Pier with Ørsted/Eversource JV and the CT Port Authority
- Orsted with the Port of Virginia
- Dominion Energy with the Port of Virginia
- Tradepoint Atlantic (private entity) with Ørsted

They show varying terms and must be considered in the context of the infrastructure requirements and funding sources for construction and procurement of equipment.

A fifth agreement (undisclosed lease terms) was made in December 2020:

- $250 million agreement between EEW / Ørsted and State of NJ to build a monopile factory at the Paulsboro site

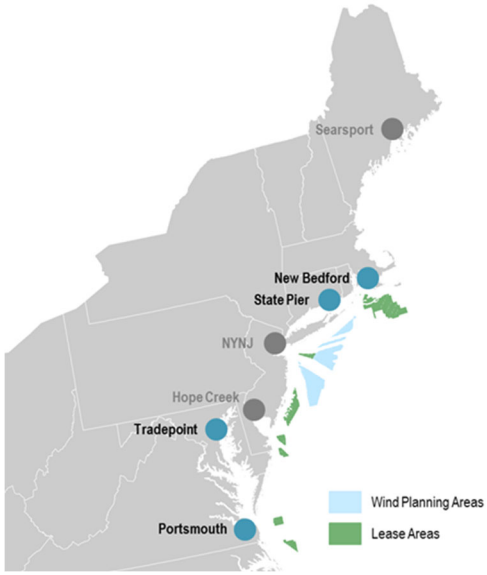

Figure 14-6: Existing Lease Agreements (Source: M&N)

Other commitments include:

- NJ's plan to develop the Hope Creek site's 200 total acres (in two phases) at an estimated total of $300 - $400 million
- NY's $200 million in grants and lending assistance in order to develop port infrastructure in support of the OSW industry (Port of Albany and South Brooklyn Marine Terminal e.g.)

A summary of the OSE Port Lease Agreements and Key Projects is presented at the end of Section 12.4 in Table 14-4.

14.4.1 The New Bedford Terminal, MA

The New Bedford Marine Commerce Terminal is a 29-acre heavy-lift facility constructed and operated by the Massachusetts Clean Energy Center (MassCEC). Complete in 2015, it was funded primarily through state bonds for $113 million, subsequent expenditures have brought the total to $139 million.

In August 2020, Vineyard Wind and Mayflower Wind signed lease agreements worth $32.5 million, committing the facility to OSW work from 2023 to 2027. The Terminal will be used as a staging site for their respective projects in the Massachusetts cluster.

- Vineyard Wind and Mayflower Wind were selected in May 2018 and October 2019, respectively, to provide a total of 1.6 GW of offshore wind power to Massachusetts

The Vineyard Wind agreement is an amended version of an original lease agreement made in August 2019. In December 2019, final approval for the Vineyard Wind project was delayed by BOEM ,which has led to the adjustment of the previous lease agreement.

- The original agreement was an 18-month lease to exclusively use the terminal starting in December 2020 at a cost of $9 million.

Mayflower Wind is a 50/50 joint venture of Shell New Energies US LLC and EDPR Offshore North America LLC, while Vineyard Wind is a joint venture of subsidiary of Avangrid Inc. and Copenhagen Infrastructure Partners (CIP).

14.4.2 State Pier, CT

The proposed State Pier development in New London, CT, shown in Figure 14-7 represents a $150 million (plus) redevelopment agreement between the State of Connecticut and joint venture partners Ørsted and Eversource.

The State Pier Terminal is currently under a lease agreement between the CT Port Authority and Gateway Terminals, a private terminal operator. The standing lease is a 20-year concession granted in May 2019.

The agreement made between Connecticut (via the Port Authority) and the Ørsted/Eversource JV would represent a sublease to the existing agreement, and would redevelop State Pier, into a dedicated OSW terminal[9]. Gateway would remain the terminal operator.

Under the agreement, the Port Authority is guaranteed $20 million from the lease payments (over a ten-year period) and is also receiving $55 million from the JV to help facilitate construction at the port. The state will contribute $80 million in public funds, making it the largest public private partnership (agreed to to-date) for dedicated OSW port infrastructure on the US East Coast.

Construction began in 2021, with anticipated completion in 2023. This facility will support the Revolution, Sunrise, and South Fork Wind installations.

Ørsted, based out of Fredericia, Denmark is one of the world's largest OSW operators. The majority of Ørsted's shares are owned by the Danish Government.

Eversource is a public utility provider in the US Northeast serving roughly 4.3 million customers throughout CT, MA, and NH.

[9] There is flexibility/process stipulated in the sublease agreement that will allow Gateway to handle other commodities/ products during periods when the terminal is not being used for OSW.

Together, Ørsted and Eversource have agreed to jointly develop three installations in the region, namely South Fork, Sunrise, and Revolution Wind.

Figure 14-7: Rendering of the State Pier Development (Source: CT.gov)

14.4.3 Portsmouth Marine Terminal, VA & Dominion Energy

The agreement was announced in January 2020 between Ørsted and the Port of Virginia.

The lease agreement will go through 2026 and will start with an initial lease of 1.7 acres with the option to expand to 40 acres. The lease guarantees $2.2 million for up to six years ($13 million in total). Additionally, Ørsted is contributing $20 million to fund the upgrading of the terminal (for heavy lift capacity) and equipment.

Ørsted will use the terminal to stage components for the Coastal Virginia Offshore Wind project, which consists of two, 6 MW Siemens Gamesa turbines. This is the test program for Dominion's larger 220-turbine project being planned for COD in 2026.

In August 2021, Dominion Energy entered a 10-year lease agreement with the Port of Virginia for a 72-acre site in the Portsmouth Marine Terminal. The lease is valued at $4.4 million annually.

Dominion is one of the US's largest utilities companies. It is based out of Richmond, VA and supplies electricity to customers throughout Virginia, North Carolina, and South Carolina. The company's gas distribution regions include Utah, West Virginia, Ohio, Pennsylvania, North Carolina, South Carolina, and Georgia.

14.4.4 Tradepoint Atlantic, MD

The agreement between Ørsted and Tradepoint Atlantic was announced in July 2019. There are limited, publicly available details of the financial terms. What has been disclosed includes:

- Ørsted is contributing $13.2 million to the construction effort
- The staging areas will encompass 50 acres in total: 5 adjacent to the waterfront for loadout and 45 for laydown and assembly
- Ørsted's intended use of the area is to support the development of the Skipjack installation (15 turbines; 120 MW)

Tradepoint Atlantic is a 3,300-acre multimodal logistics center in Baltimore, MD. It is being developed on the former Bethlehem Steel's Sparrows Point mill site, which sits outside of the Port of Baltimore's major container, auto, and dry bulk terminals. Existing tenants of Tradepoint Atlantic include big box retailers and ecommerce distribution facilities, logistics companies, auto processors, and industrial users.

14.4.5 Paulsboro, NJ

An agreement between Ørsted / EEW and the State of NJ to invest $250 million in the construction of a monopile factory at the Port of Paulsboro, NJ was announced in December 2020. Figure 14-8 shows a rendering of the facility. The new EEW facility is scheduled to open in 2023 and will take up 70 of the port's total 190 acres. The agreement will allow Paulsboro to serve as EEW's manufacturing hub in the US. Holt Logistics will remain the terminal operator, with South Jersey Port Corporation (SJPC) as the landlord.

The monopiles produced will be destined first to Ørsted's 1,100 MW Ocean Wind project (COD 2024) but will eventually be utilized at Ørsted's multiple installation locations throughout the US East Coast. The Paulsboro factory will complement the Hope Creek development, which is being developed as a staging and manufacturing hub.

Figure 14-8: Rendering of EEW Paulsboro Factory (Source: Insidernj.com)

EEW is a German based manufacturer and one of the world's leading producers of monopiles. The company maintains production locations throughout Europe and Asia and the Paulsboro would represent the companies first manufacturing plant in the US.

Table 14-4: Summary of OSW Port Lease Agreements & Key Projects

Port	Port Attributes	Developer / Lessee	Projects	Lease Term	Fixed Annual Payment	Other Contributions – Private Lessee	Other Contributions – Public
New Bedford	29 Acres 1,200' Quayside 30' Dredge	Vineyard Wind	Vineyard, Mayflower	4 years	$8.1 mil	NA	$139.0 mil
State Pier	32 Acres 1,400' Quayside 38' Dredge	Ørsted/ Eversource	Revolution, Sunrise, South Fork	10 years	$2.0 mil	$55.0 mil	$80.0 mil
Portsmouth	Up to 40 Acres N/A Quayside 41' Dredge	Ørsted	CVOW	6 years	$2.2 mil	$20.0 mil	$40.0
Portsmouth	72 Acres	Dominion	CVOW	10 years	$4.4 mil	NA	NA
Tradepoint Atlantic	50 Acres 2,000' Quayside 41' Dredge	Ørsted	Skipjack	NA	NA	$13.2 mil	NA
Paulsboro Port & (Factory)	Up to 200 acres 3 Berths (850') 40' Depth 70-acre (Factory)	State of NJ EEW & Ørsted (Factory)	NA	NA	NA	$15 mil (terminal operator) $250 mil (Factory)	$175 mil
NJ Wind Port	Ph1 = 50 acres (two parcels) Ph2 = 100+ acres	State of NJ	Ocean Wind	NA	NA	NA	$300 - $400 mil at total build out

Source: M&N. NA = Not Available, mil = million

14.4.6 Operating Model

In consideration of potential future operations at the wind port, it could be in the best interest of the state to continue to partner with a private terminal operator to manage and operate the waterfront facilities. This is known as the landlord model, where the state is the owner of the property, leasing it to a tenant operator on a long-term basis (generally 10-years or more). This is currently the model used at the state-owned dry bulk terminal at Searsport with Sprague.

There are several advantages to having a dedicated terminal operator at the site:

- Long-term lease agreement between terminal operator and state would guarantee fixed annual rental payments to the state
- Burden of training and accessing specialized labor force falls on the operator
- The operator will have a long-standing, proven record of dependable service, which will give confidence to potential customers of the terminal
    - Operator will have best-practice experience for specialized cargoes
- The operator may bring in specialized equipment (from existing operations elsewhere) as part of the lease agreement, potentially removing some of the cost burden from the state
- The state will retain ownership of the site at the end of the lease – allowing for it to be repurposed for alternate uses if supported by future market conditions

It should be noted that there is a fundamental difference in the term lengths between the OSW port facilities that are developed/leased for staging and those developed/leased for manufacturing.

The staging sites are generally utilized for short durations (two years or less), the construction timeline it takes to have a single installation ready to begin operations (such as Vineyard and Mayflower Wind in New Bedford). The exception to this would be if a developer has multiple installations it intends to have ready on a sequential basis in generally the same region, then the developer may seek a longer term (such as Ørsted / Eversource in State Pier).

Manufacturing site agreements generally garner longer terms that could cover 15 to 25 years. This is because the manufacturer will be committing a significant amount of fixed capital to develop a factory/manufacturing location (building, equipment, staff relocation). In order to realize a return on this investment, the manufacturer will have to have confidence in both the ability to carve out a distinct segment of market share and a future pipeline of projects that can support demand.

The attractiveness of a new floating-base wind port operation in Searsport in the 2030s could gain traction with private terminal operators, particularly if these companies find success with the fixed-base operations in the 2020s. This would allow for the state to bring a competitive bid process to the market in order to find an operator offering the best value proposition.

Additionally, outside financial investors including private equity, pension funds, and project finance banks for example, and will likely become familiarized with and invested in the US OSW space. In August 2020, Apollo Global Management, one of the world's largest private equity firms, announced a $265 million investment in US Wind, the Maryland based OSW developer that is in the permitting phase for the MarWin installation (COD 2023). This acquisition, along with the RWE/Diamond investment in Agua Ventas, signals that the US OSW industry is already attracting outside interest.

Following the trend in Europe, as the industry matures in the US, access to capital will become easier, as evidenced by the reduction in lending interest rates over the past decade, as presented in Figure 14-9.

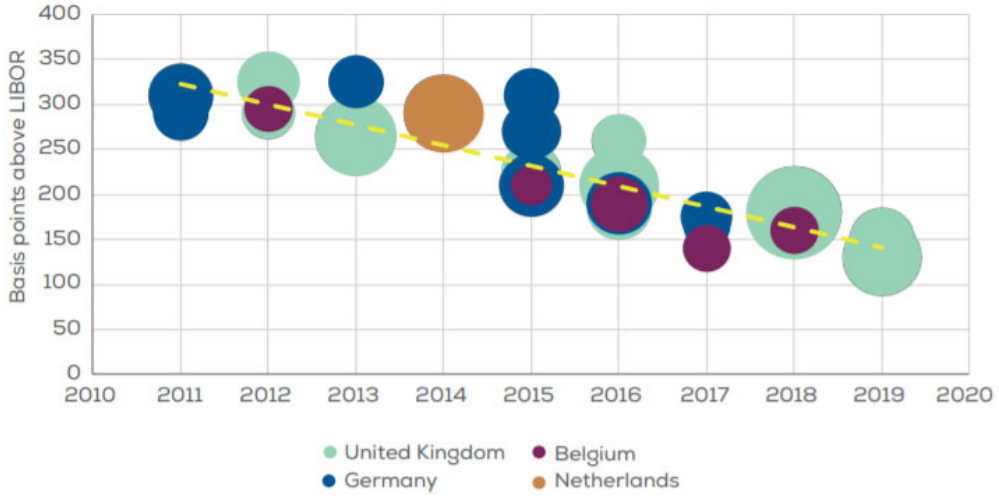

Figure 14-9: Interest Rates for Offshore Projects: Basis Points above LIBOR per MW Finance 2010-2019 (Source: Wind Europe: "Financing and investment Trends: The European Wind Industry in 2019")

As interest builds in larger installations (to be developed), alternative financing options could be leveraged to develop/procure the unique infrastructure and equipment that will be needed to support the OSW wind industry in Maine.

The emergence of the OSW industry on the US East Coast offers a substantial opportunity for all stakeholders.