

NEWS ANALYSIS: US OFFSHORE WIND'S PATH TO BECOMING MAINSTREAM

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Large-scale projects off the East Coast could transform US offshore into a national industry, with a little help from European partners and banks. But risks are buried in deeper waters, as Andrew Vitelli reports

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Around 13GW of offshore wind is being developed off the coast of the US, but only one project – the 30MW Block Island Wind farm – is currently generating power. Large-scale projects, nearly all planned off the East Coast, will not be online until the 2020s, yet developers, bankers and others in the renewables space are already viewing the sector as a safe bet, if not a sure thing.

Growing pains are expected, but industry participants are counting on experience gained from project development across the pond around Europe and the UK. But there is also political skepticism and policy uncertainty to consider, coupled with the more obvious technical challenges of logistics, site assessment and deeper-water development on the West Coast.

“The US will certainly take advantage of the path already travelled by the EU offshore market and will be in a position to catch up in just a few years,” Alejandro de Hoz, the vice president of US offshore for Avangrid Renewables, tells *Inframation*.

Avangrid is one of the owners of [Vineyard Wind](#), an 800MW project between Nantucket and Martha's Vineyard off Massachusetts. Vineyard Wind may end up as the first large-scale offshore wind project to enter operations in the US, with the site going online as soon as 2021. Several projects in the Northeast are set to follow.

The concentration of projects in the Northeast is not due to the wind speeds; some of the strongest wind can be found off northern California. It is the shallow ocean floor that has made the region viable, a stark contrast to the deep water off the West Coast.

Already, some investors are looking at how to tap this market through still-nascent floating turbine technology.

“Floating offshore wind is the future of offshore wind, period,” says Alla Weinstein, the CEO of Trident Winds, which is looking to develop the first commercial floating wind farm in the US.

Like in Europe, government policy – both at federal and state level – will play a key role in how offshore wind develops. Massachusetts, New York, New Jersey and Rhode Island are among the states that have set ambitious renewable targets, while the Bureau of Ocean Energy Management (BOEM) has put out several calls for site leases.

Costs are dropping rapidly; from USD 244/MWh when Block Island went operational in 2016 to USD 132/MWh on long-term contracts procured in 2017 on Maryland's Skipjack and Ocean City projects. Prices are expected to drop to around USD 80/MWh in some regions, according to a recent Moody's report.

European roots

The offshore wind industry was born and raised in Europe. The first project – the 4.95MW Vindeby wind farm – was launched in Denmark in 1991. With the first commercial-scale offshore wind farms, investors tread carefully.

Projects required 50% equity, according to a report by the Business Network for Offshore Wind.

“Not many banks were willing to look at offshore wind when it first started in Europe, which I think largely explains why leverage was low,” Ranjan Moulik, the global head of power and renewables at Natixis, tells *Inframation*. “The first few projects in Europe were done by utilities, and they were done on balance-sheet.”

Banks in Europe have grown more comfortable since the start of the decade, with roughly 16GW of total offshore wind installed across the continent. Some of these projects have been financed with 80% debt, according to the same report. And today, finding European banks willing to finance these projects is no longer a challenge.

While it may take the capital markets some time to reach that level of comfort, the US has a head-start with the lessons from Europe. First of all, offshore wind is now a proven technology, and one that is rapidly advancing. But bankers point also to the knowledge base built over the decade in managing the supply-chain and bringing projects to fruition.

“As a bank, when we look at offshore wind projects, we actually look at the CV of the key people in the team,” says Moulik. He recommends developers find teams and individuals who have successfully developed projects in Europe and “get these people on a flight to the US.”

The US market is seeing this approach, with American firms teaming up with European companies to bid on projects. On Vineyard Wind, Connecticut-based Avangrid is working with Denmark’s Copenhagen Infrastructure Partners. Eversource, a New England-based utility, is teaming up with Ørsted, another Danish firm, to develop the 200MW Constitution Wind project in Connecticut.

Yet even with European players involved investors will be cautious on the first round of projects. Projects will likely be leveraged with roughly a 2:1 debt-to-equity ratio, industry observers say – a better starting point than Europe but less leveraged than current European projects.

“The test will be if they get one of these big ones off the ground, and that is a big ‘if,’” Skip Rankin, chair of Baker McKenzie’s global renewable energy practice, tells *Inframation*. “That will really get people pouring into it.”

Going big?

Differences between the US and Europe present fresh challenges and add some degree of risk. The centrality of tax equity in the US renewable space means financing these projects requires more than copying the European approach. Government incentives in Europe come in forms such as Feed-in tariffs or Contracts for Difference – subsidy schemes which limit investor exposure to pure market risk – but these have been recently reduced, either by government or through increasingly competitive auctions.

David Burton, the head of Mayer Brown’s renewable energy practice in New York, notes that tax equity is “much less liquid and much more difficult to monetize” than anything lenders encounter in Europe.

“These projects need a lot of tax equity. The numbers are staggering,” Burton tells *Inframation*. “No one tax equity investor is going to be able to finance any one of these, because the numbers are too big.”

Instead, they will require club deals with multiple tax equity investors. These deals could be “cumbersome,” Burton says, since each investor has unique demands and criteria.

“But the industry has got the depth and experience to handle it,” Burton concludes. “It will get done.”

While European banks new to renewable energy in the US may be willing to take on more complex tax equity structures than they have in the past, it may lead them to charge more for their capital, according to Jonathan Kim, head of infrastructure for Natixis.

“Having said that, they are sophisticated so I don't think it is a big leap in terms of understanding the construction undertaking and operations of offshore,” Kim adds.

Another challenge frequently mentioned is the Jones Act, which requires goods traveling between US ports to be shipped by US-owned and operated vessels. Since few US ships are outfitted for offshore wind construction, this

presents additional complications for developers. While not seen as an insurmountable obstacle, it is a consideration that does not exist in Europe or Asia.

On the other hand, there are aspects in which the US poses less risk. In Europe, projects have been held up by the discovery of unexploded ordnance from two world wars.

"It is really hard to imagine why they would find unexploded munitions off the US East Coast," Clifford Kim, a vice president and senior analyst at Moody's, notes.

Within the US context, offshore wind is riskier than onshore but is better positioned to power key markets in the Northeast.

"Offshore wind has materially more risk than onshore wind because it is offshore, it is difficult to get to, and weather becomes a much more important component," Clifford Kim says. "That is the type of risk you would not have to consider for onshore wind."

The advantage is a strong wind resource, close to population centers.

"In the Northeast market, you are competing with onshore renewables that must be imported given insufficient permittable land in and near the load centers," Laura Beane, CEO of Avangrid Renewables, tells *Inframation*. "You are avoiding much of the transmission congestion that the onshore renewables are going to face as they are trying to get to the load."

Though most of the impetus on the policy front has come from state level, President Donald Trump's coolness towards renewables has not hurt federal support for offshore wind, those in the industry say. BOEM has 12 active leases and plans to open additional areas off Massachusetts towards the end of this year, according to Jim Bennett, the chief of BOEM's renewable energy programs.

"The industry needs a pretty steady stream of leasing opportunities, and that is what we are trying to provide," Bennett tells *Inframation*. "I think we will see a lot of activity over the next few years."

Many in the industry would like to see BOEM go further. The National Ocean Industries Association (NOIA), which represents 250 firms engaged in the offshore energy sector, recently sent a letter urging BOEM to play a more proactive role in spurring these projects. Tim Charters, NOIA's vice president of governmental and political affairs, said BOEM should enact a multi-sale leasing program in which much of the environmental work is completed up front.

"We believe that by doing that they will actually receive higher bid prices and bonus bids for the lease purchase," Charters tells *Inframation*. "The operator coming in will know that they have an opportunity to go and get their project developed in the market faster, and start getting a return on their investment faster."

A more frequent wish from the industry is simply that the approval process, which can take years, move more quickly. Bennett says BOEM is looking at more improvements to speed the process up, but that any changes are likely to be incremental.

Public opposition can also kill a project, as was the fate of the [468MW Cape Wind](#) project in the Nantucket Sound off Massachusetts.

"You cannot underestimate the importance of public support," Chris Moscardelli, the director of Societe Generale's energy group, tells *Inframation*.

Go West, Young Man?

It is in many ways natural that the Northeast is leading the country's offshore wind charge. Blue states like New York, New Jersey and Massachusetts have ambitious renewables targets but limited onshore resources.

"If they want to keep up and deliver with these [targets] they are going to have to do something on offshore wind," Lesley Ritter, an assistant vice president at Moody's, told *Inframation*.

Topography, however, plays a greater role. The continental shelf is relatively shallow, less than 30 meters, in areas like the New York Bight, allowing for the installation of proven fixed turbine technology.

That is not the case off the West Coast, where the sea floor's drop-off is much steeper. Only the wide-scale implementation of floating turbine technology will allow western shores, where the strongest winds top those off the East Coast, to be tapped. Given California's ambitious renewables portfolio standards – the state aims to generate half its power from clean sources by 2030 – the incentive to get there is huge.

Unlike fixed turbines, commercial scale floating offshore wind is not a proven technology anywhere in the world. The six-turbine, 30MW [Hywind](#) project has been operating since October off Scotland, and early reports are positive. Scaling up is the next step for this part of the industry.

Weinstein, CEO of Seattle-based Trident Winds, believes that advances in floating technology are essential to prevent the offshore wind sector from petering out.

“Look at the map of the world and see where you have water depth greater than 60 meters,” Weinstein said, referring to the depth at which fixed turbines are no longer viable. “As a matter of fact, you will be running out of [shallow offshore water] very soon.”

Weinstein aims to install the first commercial size floating turbine project in the US. In 2016, Trident applied to BOEM for a lease off Morro Bay to build a 650-1000MW wind farm. Last month, the firm formed a JV with EnBW to develop the project.

But Trident is not the only developer already looking west. The company submitted its 2016 application to BOEM as an unsolicited proposal and hoped to receive a non-competitive lease. BOEM, though, received additional expressions of interest, triggering a competitive process.

Trident and EnBW also bid on 100-150MW floating [offshore procurement](#) launched by Northern California's Redwood Coast Energy Authority. Instead, a consortium led by Principle Power was picked, with six teams bidding. A JV of Copenhagen Infrastructure Partners and Magellan Wind submitted a bid and later announced a [joint platform](#) to develop future projects.

The Morro Bay project is expected to cost roughly USD 3.2-4bn, with construction launching around 2023 and operations beginning two years later. Securing financing for the first commercial-scale floating turbine projects will be a greater challenge than bringing proven technology across the pond.

“Anything new, it just scares banks,” Moscardelli of SocGen, which was the lead arranger on the USD 298m Block Island Wind Farm, explains. “And anything that is too risky is ultimately equity risk and not debt risk.”

With some of Europe's major equity players knocking on the door, however, floating wind may be one area where the North American market does not have to wait around to play catch-up.

“Maybe the US has the opportunity to take the lead,” Weinstein says.

A list of some of the US offshore wind projects in various stages of development

| Project | Owner | State | Capacity (MW) |
|-----------------------------------|---------------------|--------|---------------|
| Vineyard Wind | Avangrid, CIP | Mass. | 800 |
| Bay State Wind | Ørsted, Eversource | Mass. | 1000 |
| Revolution Wind | Deepwater Wind | Mass. | 400 |
| Garden State Offshore Energy | Deepwater Wind | N.J. | 1000 |
| New Jersey wind project | US Wind | N.J. | 1500 |
| Ocean Wind | Ørsted | N.J. | 1000 |
| Empire Wind | Statoil | N.Y. | 1000 |
| NY4 Excelsior Offshore Wind Park | PNE Wind | N.Y. | 400 |
| Rockaway project | Statoil | N.Y. | 800 |
| Long Island–New York City project | ConEd, NYPA, LIPA | N.Y. | 700 |
| South Fork Wind Farm | Deepwater Wind | R.I. | 90 |
| Fishermen's Energy | EDF Renewables* | N.J. | 24 |
| Morro Bay | EnBW, Trident Winds | Calif. | 650 |
| Eureka wind project | Principle Power | Calif. | 100 |

*EDF agreed in April to purchase Fishermen's Energy.

Source: Moody's and Inframation