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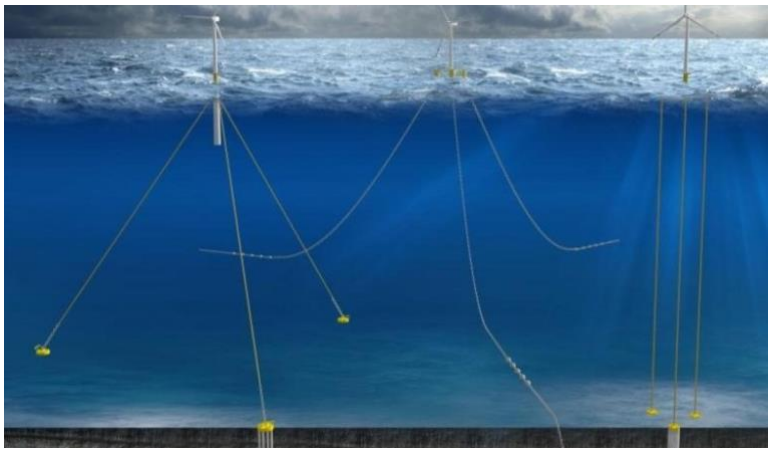
US wind industry navigates deep waters to meet ambitious offshore target



A rendering of floating wind turbine concepts from the US Department of Energy. Photo credit: Department of Energy.

By **Autumn Cafiero Giusti**, Special Correspondent

The US wind industry's next frontier will be based in very deep water — and getting there will require floating offshore wind farms, as the US Department of Energy (DOE) estimates that about two-thirds of the country's offshore wind potential lies in waters that are too deep for wind turbines secured to the sea floor.

"The future of the industry is floating. It always has [been], and always will be," Sam Salustro, director of strategic communications for the nonprofit Business Network for Offshore Wind (BNOW), told the *Journal of Commerce*.

Meeting the Biden administration's ambitious target of 30 gigawatts of offshore wind energy installed by 2030 will require floating offshore wind, and that requires building new, specialized port facilities for floating offshore wind projects. This means meeting a $10 billion infrastructure funding gap, according to a September 2023 BNOW report. The offshore wind industry needs "a ton of space and manufacturing ability on the waterfront," Salustro said.

Conventional offshore wind turbines, or fixed-bottom, sit atop foundations on massive monopiles driven into the seafloor. But fixed-bottom installation is possible only in waters shallower than 200 feet. Floating turbines offer a viable solution for deeper waters, potentially opening up vast ocean areas for wind production.

To endure the harsh conditions of the deep ocean and to deliver energy efficiently, floating turbines must be extremely large. The first full-sized floating offshore turbine in the US, to be located in the Gulf of Maine, will come in at 850 feet tall, or approximately the height of 70-story 30 Rockefeller Plaza in New York.

Storage and construction space, supplies of raw materials, and heavy-lift capacity to support construction and maintenance of these turbines will have to be proportionately large.

Solutions for large projects

The offshore wind division of Geodis Project Logistics, which provides project management and super heavy-lift services for offshore wind projects worldwide, has expanded its strategy to develop innovations that will solve some of the challenges of floating wind.

"Floating is a totally different ball game," Nicolas Bonnier, global manager offshore wind for Geodis, told the *Journal of Commerce*. "There is a lot of room for us to get heavily involved in floating, maybe even more than bottom-fixed."

According to calculations from BNOW's September 2023 offshore wind policy brief, the US is facing an infrastructure gap of 64 to 84 port-based wind-focused projects across the East Coast, West Coast and Gulf of Mexico needed to support the offshore wind industry, both fixed and floating. Estimates are that it will cost as much as $27.2 billion to fill the gap.

Up to 40% of that infrastructure funding will be necessary to build staging and integration (S&I) ports, which will be needed to deploy floating offshore wind projects. Those ports are uniquely suited to receive, store and stage floating turbine foundation components. S&I facilities are also the most expensive type of port infrastructure needed to support offshore wind.

One such project is in the works for California's Port of Long Beach, which plans to break ground in January 2027 on Pier Wind, a 400-acre, $4.7 billion floating offshore wind turbine assembly facility. The Pier Wind terminal would support the construction of 1,100-foot-tall turbines.

"California's waters are too deep for fixed-bottom foundations, so we need to use floating foundations that are anchored and moored to the seabed in waters that are around 3,000 feet deep," Suzanne Plezia, chief harbor engineer for the Port of Long Beach, told the *Journal of Commerce*. Including California, a large percentage of any offshore wind development along the Pacific Coast will have to rely on floating offshore wind because of the steep drop-off of the Outer Continental Shelf.

California has established a goal of 25 gigawatts of floating offshore wind by 2045. Reaching that goal will require the assembly of 1,300 floating offshore wind turbines.

US not far behind

Globally, commercial scale floating offshore wind is in its infancy. There are only about two dozen deep-water floating turbines operating in the world, and most of those are in Europe. But the US is making inroads.

In September 2022, the Biden administration rolled out its Floating Offshore Wind Shot initiative to reduce the cost of floating offshore wind by 70% to $45 megawatts per hour and set a target for 15 GW of floating offshore wind capacity to be installed by 2035. In December, the deep waters off the coast of California became the site of the country's first-ever sale of commercial floating offshore wind energy areas.

There are also plans for deepwater lease sales in the Gulf of Maine and the Central Atlantic. Reuters reported in September that both are set to take place in 2024, citing an emailed statement from BOEM.

Construction on commercial floating offshore wind projects will begin during the next decade, and it will take seven to eight years before there are floating turbines operating on a mass scale in the US, Sørensen said. "In order to make massive developments, you need a fairly solid and reliable pipeline," he said.

BNOW's Salustro said although the US is a few years behind Europe when it comes to floating offshore, the US has the pieces in place to become leaders in this evolution. Floating wind is still a relatively young technology, and some of the major thought leaders are coming out of the US, he said.

"If you're talking about the commercialization of a new technology, we're now only five years behind" the rest of the world, Salustro said. That differs from how the US compares with the rest of the globe when it comes to the traditional, fixed-bottom offshore wind industry, where the US is "more like 20 years behind." The smaller gap for floating wind is "really exciting," he said.