

# New California Gold Rush beckons wind developers off coast

May 20 2016, by Jennifer A. Dlouhy, Bloomberg News

---

When turbines start spinning at the first U.S. offshore wind farm near Rhode Island later this year, some energy developers will already be eyeing a bigger prize.

There's a steadier, harder [wind](#) blowing off the California coast. Those reliable Pacific gusts could yield nearly a terawatt of electricity, 13 times the capacity of all the [wind turbines](#) now installed on land in the U.S. - without consuming real estate or blocking anyone's views.

But Mother Nature isn't going to make it easy. The continental shelf plunges fast and deep off the West Coast, making it impossible to install conventional turbines into a seabed hundreds of feet under water. Some developers think they've found the solution: harnessing this renewable resource with technology borrowed from the fossil-fuel industry to keep turbines afloat.

"We can't fix turbines into the ocean floor out there," said Nancy Sopko, manager of advocacy and federal legislative affairs for the American Wind Energy Association. "To tap into that great offshore wind potential, we're going to need these floating structures."

The Department of Energy is expected to decide next month whether to award some \$40 million to as many as five floating wind projects that have already won previous funding. And the Interior Department will soon ask if there's commercial interest in leasing Pacific waters near California and Hawaii - a critical step toward future floating wind

projects there.

The technology is in its early days. Globally, there are just 15.33 megawatts of floating wind capacity, mostly coming from a handful of pilot projects involving one or two turbines, according to Bloomberg New Energy Finance. That's less than a percent of the total 11.6 gigawatts of capacity from traditional wind projects in waters around the world.

More are on the way. Seattle-based developer Trident Winds LLC is aiming to float some 100 offshore wind systems about 15 miles off the central California coast, near the city of Morro Bay. The project, which would be developed over the next decade, would link up with existing electric infrastructure, funneling power from the turbines to a decommissioned PG&E Corp. power plant.

The federal Bureau of Ocean Energy Management just completed an initial review of Trident Winds' request for a lease at the site, which would be the first wind development in federal waters off California. But permitting may take years as it would be subject to reviews by the bureau and at least two state agencies.

Meanwhile, Statoil ASA is taking advantage of its experience designing and building some of the world's biggest and most complex offshore oil facilities to erect a floating wind farm off the coast of Scotland. The project, expected to go online in 2017, involves five 6-megawatt turbines.

The company - Norway's largest oil producer - hasn't launched any floating wind ventures in the U.S., but during a recent swing through Washington and New York, a Statoil executive was unabashed in highlighting the opportunity. "We think the U.S. is ripe for offshore wind," said Irene Rummelhoff, executive vice president of new energy

solutions. "We are seeing potential in the Northeast. We love California."

For wind developers, California has special appeal not just because of the strong gusts buffeting its coast, but also a new law that requires state utilities to derive half of their electricity from wind, solar and other renewable sources by 2030 - up from about 20 percent now.

Trident Winds Co-Founder Alla Weinstein, a former Honeywell engineer who ran another wind company, Principle Power Inc., until February 2015, said floating projects also can capitalize on lower installation costs than their conventional cousins, which are installed with steel pilings into the sea floor.

Traditional offshore turbines must be customized to account for varying water depth and soil conditions. Installing them is a time-consuming task that requires specialized vessels. It took roughly 200 workers four months to install five jacket foundations at a 30-megawatt wind farm near Block Island, R.I. Turbines still need to be put in place before that project can go online as expected later this year.

By contrast, floating wind systems can generally be assembled on shore and then towed to sea where mooring lines are all that's needed to tether them to the ocean floor.

"I don't need the boats. I don't need the cranes. I don't need the equipment that's going to cost a lot of money," Weinstein said. "You just need a simple anchor handling vessel to do all the installation, because everything's done onshore."

Statoil's Rummelhoff envisions cost-effective, mass fabrication of the wind production systems. "Eventually, when this is industrialized, you can imagine just having a factory popping these out, and they'll all be the

same," she said.

Floating [turbine](#) foundations cost about eight times more than seafloor-based supports for their conventional counterparts, according to BNEF. But they can be reused to support replacement turbines when old ones reach the end of their quarter-century lifespan.

"Every 20 or 25 years, no matter what you do, you have to replace the turbine," said Habib Dagher, executive director of the University of Maine's Advanced Structures and Composites Center. Since the biggest expenses of offshore wind projects are foundations and associated infrastructure - not the turbines - floating designs that allow reuse of those expensive structures are more cost-effective.

One of floating wind's other benefits just can't be seen. Literally. The projects disappear when installed a dozen or more miles from shore, appeasing residents who fret about spinning blades spoiling their ocean views. Such opposition helped topple the Cape Wind project off Massachusetts, and presumed Republican presidential nominee Donald Trump fought the construction of a wind farm near his luxury golf resort in Scotland.

Offshore wind projects aren't free from environmental criticism. Fishermen and conservationists have warned that some projects could disturb seabirds, marine mammals and fish spawning grounds.

But the major challenge is cost. Floating wind could cost around \$8.95 million per megawatt by 2020 - more than double the \$4.03 million per megawatt projected for conventional offshore, bottom-fixed [wind projects](#) - said BNEF analyst Tom Harries.

Those price projections are pegged to small-scale demonstration projects with sometimes a single turbine in the water - even though they shoulder

many of the same costs as large wind farms in terms of permitting and infrastructure. A recent Statoil floating project got costs lower - to \$7.8 million per megawatt - by using more than one turbine and drawing on lessons learned from an earlier venture, Harries said.

Cost concerns may be throwing off Seattle-based Principle Power Inc.'s plan to install up to five 6-megawatt floating turbines off Coos Bay, Ore. The so-called WindFloat Pacific project received Energy Department funding but so far hasn't found willing buyers for the power it would generate after utilities in Oregon said it would be too expensive.

"If floating wind wants to seriously join the offshore party it needs to scale up with more megawatts," Harries said. "More importantly, it needs to reduce the size and weight of the foundations in order to bring down costs. Otherwise it will remain an expensive experiment."

©2016 Bloomberg News

Distributed by Tribune Content Agency, LLC.

Citation: New California Gold Rush beckons wind developers off coast (2016, May 20) retrieved 23 June 2024 from <https://phys.org/news/2016-05-california-gold-beckons-coast.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.