Offshore wind still looks to get a foothold in California

December 10 2019, by Rob Nikolewski

Credit: CC0 Public Domain

There may be a literal energy windfall off the coast of California but it is still unclear whether the federal government will give approval to specific sites and how long it will take before tall turbines are bobbing on the Pacific, sending electricity to customers across the Golden State.

Wind energy's boosters are eager to see proposed projects get the go-ahead.

"Let's get a couple of these rolling, get some floating offshore turbines out there and build this over time, which is exactly what you're seeing on the East Coast," said Tom Kiernan, CEO of the American Wind Energy Association.

For now, the state, local and federal governments are working with military brass to negotiate a possible agreement that could see a way clear for a pair of sites off the coast of Central California but a compromise thus far has proved elusive.

By contrast, one offshore wind farm off the coast of Rhode Island is already up and running and 15 other potential sites off the East Coast are in the pipeline.

"They did a whole series of early leases, those early leases built momentum and now we're seeing the subsequent ones," said Kiernan during an interview with the Union-Tribune at his organization's Clean Energy Executive Summit at La Costa last month.

Wind blows up

In recent years, wind turbines have become a familiar sight, delivering renewable power in blustery areas across the country.

In the San Diego area, the Tule Wind Farm along the ridge lines of the McCain Valley in East County opened last year. Farther east off Interstate 8, the Ocotillo Wind project covers 12,500 acres in the Imperial Valley.

Nationally, Texas is the No. 1 state in terms of installed wind capacity,

followed by Iowa and Oklahoma. California finishes fourth.

But another bonanza figures to be blowing offshore.

Ocean winds blow steadier and stronger and European countries such as Denmark and Scotland have taken the global lead, erecting massive turbines that harvest larger quantities of energy.

An analysis conducted in late 2016 by the National Renewable Energy Laboratory looked at the coastline of California and estimated the potential for offshore wind energy is enough to produce about 1.5 times of the state's energy consumption, based on 2014 numbers.

But offshore wind along the Pacific Coast is trickier than the East Coast.

That's because offshore wind turbines off the Atlantic can be bolted into the seabed in relatively shallow water. But the continental shelf off the coast of the Pacific plunges steeply. According to the National Renewable Energy Lab, 96% of California's offshore resource is located in water deeper than 60 meters, or nearly 200 feet.

That means the wind farms must float on the water's surface, tethered or moored by cables to the ocean floor. Electricity generated by the turbines is transmitted to a floating substation and carried to a power plant onshore via buried cables.

The technology is still in the nascent stage but wind-energy supporters are confident the turbines can be built economically. The first operational floating wind farm launched in 2017 off the coast of Scotland, with turbines extending 574 feet above the water.

Training and exercises

A bigger obstacle for California centers on concerns from the military, which is concerned wind turbines would interfere with training missions.

The U.S. Navy considers vast portions of California as "wind exclusion" areas, including the entirety of Southern California.

The Point Mugu Sea Range north of Los Angeles and the sprawling Southern California Range Complex situated off the coast between Dana Point and San Diego take up more than 120,000 square miles of sea space for training, equipping and maintaining combat-ready forces.

The area is also used by the Marine Corps, the Air Force (at Vandenberg Air Force Base near Lompoc) and, to a lesser extent, the Army.

"I don't see any realistic, conceivable manner where we can find offshore wind to co-exist with the degree and complexity of operations that are occurring in Southern California," Navy Region Southwest Encroachment Program Director Steve Chung told the Union-Tribune last year.

But wind developers are really setting their sights farther north, to the coasts of Central and Northern California where the wind blows harder and more consistently.

The military has been more open to considering potential wind farms north of Mendocino.

But efforts have focused on getting the Navy and the U.S. Department of Defense to be amenable to a pair of proposed offshore sites off the coast of San Luis Obispo County—one off Morro Bay that will begin 24 miles offshore and another off the Diablo Canyon nuclear power plant that begins 22 miles from the shore.

Rep. Salud Carbajal, D-Santa Barbara, whose congressional district includes San Luis Obispo, helped create a working group of federal, state, environmental and defense officials to try to pave a way to build offshore wind farms on the Central Coast while satisfying the military's concerns. The parties include the California Energy Commission and the Bureau of Ocean Energy Management, the federal agency in charge of reviewing offshore wind projects in California.

"In communities like the Central Coast, offshore wind is a viable, sustainable energy source," Carbajal said in an email. "We are presented with the chance to be leaders in renewable energy, and we should take it."

The Department of Defense has not yet filed its final assessment to the bureau, known as BOEM, which has the final say on any construction and operation plans. BOEM officials expect to conduct offshore wind lease sales for all of California sometime next year.

"As long as we are all committed to have a genuine dialogue towards finding a solution, I think we'll get there," said John Romero, spokesman for the Pacific region at BOEM.

Progress has been slow but that hasn't deterred some companies.

In April, BOEM announced 14 entities expressed "indications of interest" to obtain commercial leases.

Among the companies filing paperwork is a group called Castle Wind that proposes erecting about 100 floating offshore wind systems that would be moored to the ocean floor with anchors at the Morro Bay site. Castle Wind this summer signed a non-binding memorandum of understanding with a community choice aggregation program in Monterey for 1,000 megawatts of electricity. The company hopes the

wind farm will be up and running between 2025 and 2027, provided it gets the green light.

Farther north, another community choice aggregation program, the Redwood Coast Energy Authority, plans to work with a consortium of private companies to put up 5 to 15 turbines for a floating wind farm of up to 150 megawatts in Humboldt Bay, about 25 miles off the coast of Eureka.

Other issues

While environmental groups champion the development of more renewable energy, support for offshore wind in California is not unanimous.

Joey Racano, director of the San Luis Obispo-based Ocean Outfall Group, has come out against the offshore projects in Central California. He worries the blades from the turbines will kill migratory birds and the wind farm's mooring lines and electrical cables could injure or disrupt corridors for whales.

"They're trying to force this thing in like it's a good idea," Racano said. "It's a dangerous pushing forward of a mass industrialization of our coastal waters ... We're trying to bring the oceans back along the whole coast of California. This is a step in the wrong direction."

Wind energy supporters say floating turbines can be sited properly to ensure birds, animals and marine life can be protected. In July, the Natural Resources Defense Council released an outline in conjunction with conservation groups such as the Audubon Society.

The NRDC called offshore wind "a critical component of U.S. efforts to reduce dangerous greenhouse gas emissions, and prevent the worst

impacts of climate change" and the outline said proper siting, construction and operations "can ensure that the offshore wind we need advances in harmony with the protection of our treasured ocean wildlife."

California's aggressive renewable energy goals figure to give offshore wind a boost.

State policymakers have set a target of the state deriving 60% of its electricity from renewable energy sources by 2030 and 100% by 2045.

Solar production in California has grown rapidly but has a problem with intermittency—when the sun does not shine, solar generation disappears and puts the state's electric grid under strain.

But offshore wind could help fill in the gaps because it blows fairly steadily at night, when solar production evaporates.

However, offshore wind blows fairly steadily at night, when production from solar evaporates.

In addition, if energy storage technology does not develop as quickly as anticipated, the state may rely more on offshore wind production when other emissions-free resources are not available.

"I think it will reduce the amount of (natural) gas generation that we're using in the evening hours because of that complementary profile," said Danielle Mills, the California policy director for the American Wind Energy Association.

Offshore wind—even including systems anchored on the East Coast—is still more expensive than onshore wind. According to Bloomberg New Energy Finance, the rates for unsubsidized offshore wind is $89 a

megawatt hour, about twice the wholesale power price seen in New England last year. But the price has fallen 64% between 2012 and 2018.