

2021 Offshore Wind – West Coast, Turbines and Other Developments

By John Benson

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1. Introduction

This is the second post for this paper. The first post on U.S. East Coast projects was on 1/19, and is linked below.

<https://energycentral.com/c/cp/2021-offshore-wind-%E2%80%93-east-coast-projects>

The last posts with the same subject as this was over a year ago. This is described and linked below.

California Offshore Wind: There is quite a bit of early-stage activity on the California coast. This post reviews that activity, and possible barriers to future development.

<https://www.energycentral.com/c/cp/california-offshore-wind>

This post will cover West Coast activity, a new Mid-Atlantic leadership organization, and recent developments for off-shore turbines.

2. West Coast

On the West Coast there has been little significant progress. The Humboldt Project has identified the proposed lease area, but there does not appear to be an auction date scheduled yet. The Morro Bay project developer has not identified a lease area yet. There is a pilot project near Vandenberg AFB with at least two potential (contending) developers.

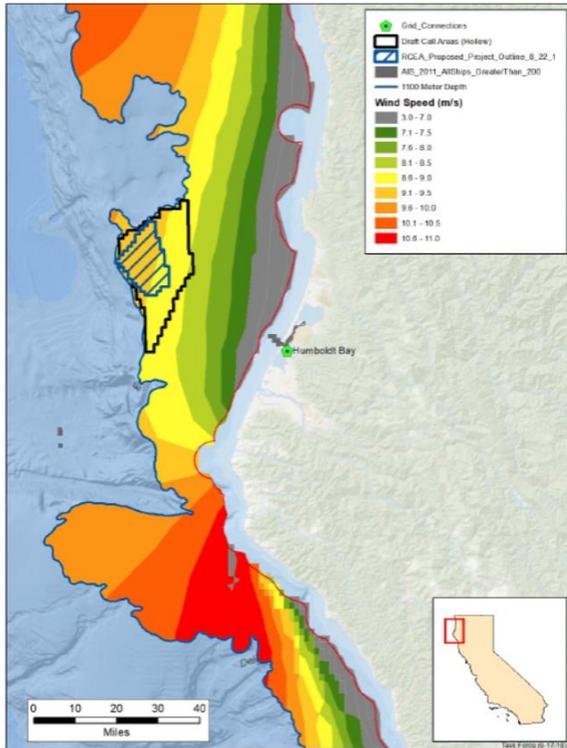
The potential projects (all in California) are listed below with links to each. There have been no major developments since the post in September, 2019 (linked in the Intro). The main characteristic that differs in California is that the offshore waters are much deeper here, requiring floating turbine supports.

Also, since the developments on the East Coast (reviewed in Part 1) are much more advanced and have much easier logistics, I would guess that these will need to start winding down (say around 2025) before much development moves to the West Coast.

2.1. Redwood Coast Offshore Wind Project

The Redwood Coast Energy Authority is the main supporter of this project, and there is a link to their offshore wind page below. The Map below that shows the proposed project location. They are in the pre-lease stage.

<https://redwoodenergy.org/community-choice-energy/about-community-choice/power-sources/offshore-wind-energy/>



2.2. Castle Wind Offshore, Morro Bay

Morro Bay is about half way between the San Francisco Bay and Los Angeles. The link to the web site is below. Castle Wind is also in the pre-lease stage, and seems to have some issues identifying a lease site due to DOD restrictions.

<http://castlewind.com/morro-bay-project/>

2.3. Pilot Projects

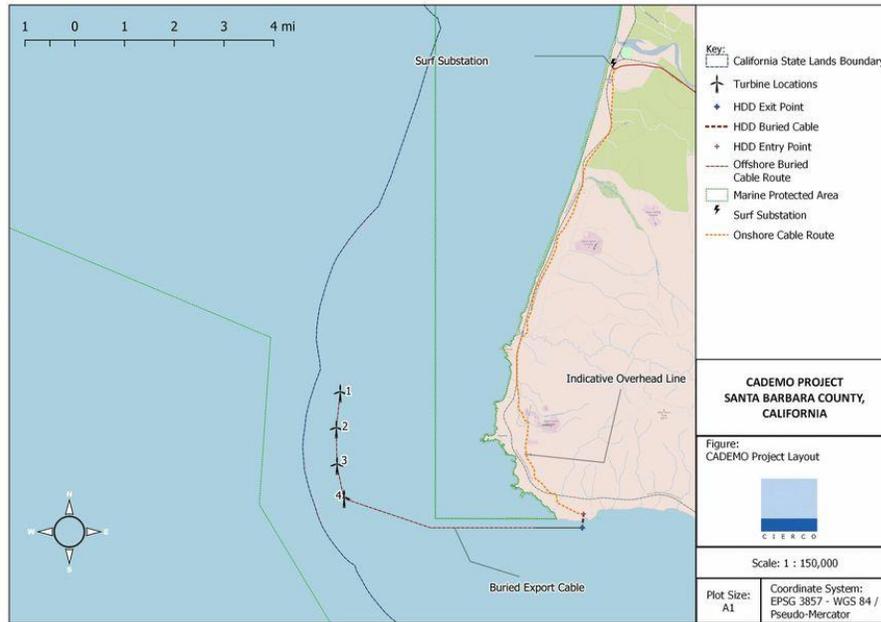
There are at least two pilot projects that are each intended to deploy four floating wind turbines to evaluate these designs. These are each south of Morro Bay and West of Solvang & Vandenberg AFB (see maps below), thus I'm assuming that these are alternative projects. Information on these are on the site linked below, and in the following subsections.

<https://www.slc.ca.gov/renewable-energy/offshore-wind-applications/>

2.3.1. CADEMO Project

This appears to be further along. See the maps below and additional descriptive text and a link to the developer's site.

Situated off the Santa Barbara County coast in California, the CADEMO Floating Offshore Wind Project is a renewable energy technology demonstration project aimed at kick starting the emergent marine renewable energy sector off the west coast of the United States. The project developer, CIERCO Projects Corporation, aims to have the project operational by 2024/25, providing a new source of renewable energy for the Californian consumer and contributing to the State efforts in reducing its carbon emissions.



<https://cademo.net/>

The turbines they have specified (below) seem to be consistent with the largest (14 MW) turbines offered by both GE and Siemens.

The CADEMO project will use the latest design of offshore wind turbine technology. The turbines will visually be similar to 'conventional' wind turbines, but technically will be different with larger blades and high generation capacities.

The cutting edge technology presents new challenges in the integration of larger turbines to a floating foundation and the CADEMO project will be the first project to install these turbines at this scale. The indicative turbine parameters include:

- Rotor Diameter - 225 meters / 738 feet
- Hub Height - 137.5 meters / 451 feet

- Height from sea to turbine tip - 250 meters / 820 feet
- Blade clearance distance to sea - 25 meters / 82 feet

2.3.2. Ideol USA Vandenberg Air Force Pilot Project

The following is from the above linked [slc.ca.gov/...](http://slc.ca.gov/) site.

Ideol USA Inc. is a renewable energy development company specializing in floating offshore wind technology and based in San Francisco, California. Since 2010, IDEOL has been involved in engineering floating foundations in France for offshore wind and, in July 2019, IDEOL applied for a lease to develop an offshore wind pilot project in California state waters near the Lompoc coast and Vandenberg Air Force Base. The project would involve construction, operation, maintenance, and decommissioning of a floating offshore wind electrical generation pilot project consisting of up to four 10 megawatt (MW) floating wind turbines capable of generating up to 40 MW of renewable energy. This energy will be available to serve the Vandenberg Air Force Base and other California customers. The total lease area IDEOL is requesting for the floating turbines is approximately 6.2 square miles.

2.3.3. Additional Information on the Vandenberg Project

I saw the article excerpted below on several sites, including the one linked below. These articles were from the August 2019.

<http://sierra2thesea.net/energy/first-offshore-wind-project-could-feed-vandenberg>

Prospects for California floating offshore wind projects have been stalled for several years largely because the US Navy has yet to find any place off the West Coast that does not pose a conflict with their seagoing operations.

Guarding the gate for the Navy is Steve Chung, Encroachment Program Director for the Navy, based in San Diego who offered a few days ago that despite the delay “discussion is underway at the highest level of the Department of Defense (DOD) leadership to see if something is possible.”

A second federal agency, the Bureau of Ocean Energy Management (BOEM) has announced they would like to offer leases offshore potentially in three areas including in federal waters (3 miles out) offshore of Diablo Canyon, Morro Bay/Cambria and off Humboldt in Northern California. But like the rest of us, they are waiting for word from Steve Chung.

Now there is a surprise development. A French company Ideol has applied for a permit to do some wind speed testing in state waters – less than 3 miles out – off the Vandenberg Air Force base coast. That area on the Santa Barbara coast is not on the current BOEM list, at least not yet. Jurisdiction for state waters falls to the California State Lands Commission who will hear the new request at their August 23 meeting in LA.

Endorsing the pilot idea is Vandenberg AFB who is looking to diversify its power sources including more marine renewables. Already the base gets about 35% of their electricity from their new 22MW solar plant on the base, built by SunPower and in operation for about a year now.

“Vandenberg Air Force Base is supportive of the Ideol offshore wind energy project as an option to consider in its efforts to increase its overall energy resiliency. These types of projects are assessed to ensure they have no adverse mission impacts and are also subject to U.S. Air Force and U.S. Department of Defense considerations and approvals,” said Col. Michael Hunsberger, 30th Mission Support commander.

Ideol is not the only company who has expressed interest in supplying offshore wind power to Vandenberg. Well aware of the new initiative is Steve Chung who says his office has received interest from several other companies. “in both wind and wave power” at the Vandenberg location.

Chung, after all represents all branches of the military as a DOD official and will be involved because of the likelihood energy operations could extend into federal waters as well as state waters.

“I will be there at the Lands Commission meeting” and will likely be part of the discussion, he says.

Ideol on their website says they have installed a 2 MW floating wind turbine off the Atlantic Coast of France. The company has yet to respond for comment regards Vandenberg. During the first half of 2019 France’s first offshore wind turbine produced a total of 2.2 GWh and faced significant wave heights up to 38 feet, they reported...

3. SMART-POWER

The governors of Maryland, North Carolina, and Virginia have announced the Southeast and Mid-Atlantic Regional Transformative Partnership for Offshore Wind Energy Resources (SMART-POWER): a multi-state collaboration aimed at advancing offshore wind projects in the region and promoting the Southeast and Mid-Atlantic U.S. as a hub for offshore wind energy and its supply chain and workforce.¹

The SMART-POWER framework calls for the three states to form a leadership team comprising representatives from each signatory jurisdiction that will work to streamline the development of regional offshore wind resources...

According to the U.S. Department of Energy, the Atlantic Coast offshore wind project pipeline is estimated to support up to 86,000 jobs, drive \$57 billion in investments, and provide up to \$25 billion in economic output by 2030. In turn, the three states have committed to work together to increase regulatory certainty, encourage manufacturing of component parts, reduce project costs through supply chain development, share information and best practices, and promote synergy between industry and the signatory jurisdictions.

4. Offshore Turbine Update

The bottom line for primary offshore turbine suppliers GE Renewable Energy and Siemens Gamesa Renewable Energy (SGRE) is that the largest turbines offered by both companies is now 14 MW. SGRE states that the first deliveries of these will be in 2024. I

¹ Michael Bates, North American Windpower, “Mid-Atlantic States Announce Major Offshore Wind Initiative”, Oct 29, 2020, <https://nawindpower.com/mid-atlantic-states-announce-major-offshore-wind-initiative#:~:text=The%20governors%20of%20Maryland%2C%20North%20Carolina%2C%20and%20Virginia.wind%20energy%20and%20its%20supply%20chain%20and%20workforce.>

could not find any statement as to when the first delivery of the GE 14 MW turbine would be, but the first major project to use these turbines (Dogger Bank, Phase 3) is scheduled to be completed in 2026, and one report said that *installation of the 14-MW turbines (would be) in 2025.*²

Also there is some late breaking news regarding GE Turbines in the first subsection below.

4.1. New York Haliade-X Turbine Plant?

*The following information was released by New York Senator Charles Schumer:*³

GE Is poised to be a key supplier for eastern seaboard's offshore wind installations.

After learning that General Electric (GE) is pursuing a site to manufacture their next-generation wind turbines to support the growing offshore wind industry in the United States, U.S. Senator Charles E. Schumer reached out directly to GE CEO, H. Lawrence Culp Jr., to express his support for GE to locate these manufacturing jobs for the new Haliade-X right here in New York. With GE poised to be a key supplier for the nation's major offshore wind installations along the Eastern Seaboard, "a GE investment in New York to build the next generation wind turbines would be a win-win-wind," said Schumer.

"GE's long history in the state, its investments here, and its thousands of existing workers make New York an ideal place for the company to build its wind turbines and continue to grow its leadership in green wind power development and manufacturing, which I relayed to GE CEO Larry Culp Jr.," said Senator Schumer. "Our world-class New York workforce is eager to get to build the future, and with New York's considerable capabilities for clean-energy manufacturing and its transportation infrastructure and deep water inland ports, like the Port of Albany, and other critical port infrastructure, it is tailor-made to help drive GE's goal of expanding its role in the green economy. GE will always be a New York company at heart, and I will do everything in my power to support their recommitment to that home with a new investment in wind turbine manufacturing in the state."

Schumer, during his personal call to CEO Culp yesterday, plugged New York and conveyed his support of the company's potential interest in doubling down on their existing New York workforce, infrastructure, and investments by manufacturing their state-of-the-art Haliade-X wind turbines in the Empire State. The senator said choosing New York to manufacture GE's new wind turbines would be a win-win-win by creating hundreds of new green energy manufacturing jobs for the Upstate economy and helping the state achieve it's 9,000 megawatts from offshore wind by 2035 commitment, all while spinning GE's manufacturing capacity to new heights by tapping into New York's world-class workforce and port infrastructure. Additionally, with GE's 130-year history in New York, the senator argued that the company can leverage its existing New York facilities

² Sonal Patel, Power, "POWER Offshore Wind Notebook: GE Boosts Haliade-X to 14 MW; Dominion Kicks Off 2.6-GW Virginia Project; Vestas Absorbs MHI Vestas", Dec 22, 2020, <https://www.powermag.com/power-offshore-wind-notebook-ge-boosts-haliade-x-to-14-gw-dominion-kicks-off-2-6-gw-virginia-project-vestas-absorbs-mhi-vestas/>

³ States News Service via Energy Central, "Last Week, in Personal Call To General Electric CEO, Schumer Pushes For GE to Manufacture Next-Generation Wind Turbine in New York and Create Hundreds of New Jobs", Jan 13, 2020, https://energycentral.com/news/last-week-personal-call-general-electric-ceo-schumer-pushes-ge-manufacture-next-generation-wind?utm_medium=eNL&utm_campaign=DAILY_NEWS&utm_content=416684&utm_source=2021_01_14

and knowledge of the state to provide a unique opportunity for long-term growth in the clean energy industry.

Schumer successfully pushed to include a provision to expand the Investment Tax Credit (ITC) to qualifying offshore wind projects in the 2020 end-of-year omnibus package. Offshore wind projects will now be able to benefit from the ITC at the full 30% rate for projects that start construction from January 1, 2017 through the end of 2025. Establishing this long-term offshore wind tax incentive and providing greater certainty to the industry will help spur this important renewable energy technology and create good-paying manufacturing jobs in New York, including at companies like GE. The Investment Tax Credit allows companies to reduce their income taxes by 30 percent of their investment in a product, which helps defray the cost of switching over to the new technology.

4.2. Regarding Vestas

On Dec. 14, Danish wind turbine giant Vestas announced it acquired Japanese technology firm Mitsubishi Heavy Industries' (MHI's) shares in the MHI Vestas Offshore Wind (MVOW) joint venture, paving its re-entry into offshore wind.⁴

Vestas Wind Systems, a Danish company that held the top spot in the wind turbine market in 2019, on Dec. 14 announced it closed an agreement initiated in late October to acquire MHI's 50% share in MVOW. As part of the agreement, which the European Commission approved on Nov. 27, MHI acquired 2.5% in Vestas and will be nominated to a seat in Vestas' Board of Directors.

The deal means that starting in February 2021, Vestas will effectively re-enter the offshore wind business. While Vestas divested its offshore assets in 2013 as part of a two-year-long restructuring effort to cut costs and capital expenditure, that year, it established MHI Vestas as a joint venture with MHI to preserve long-term opportunities in the offshore wind turbine market.

Since Vestas seems to be skipping the U.S. East Coast offshore boom, they may be well-positioned to start investing in the West Coast market, especially if MHI did the turbine-component manufacturing in Japan, and assembly in Central California. However, they need to develop a competitive large direct-drive turbine (like GE and Siemens have) quickly.

⁴ Sonal Patel, Power, "Vestas Absorbs MHI Vestas", Dec 22, 2020, <https://www.powermag.com/power-offshore-wind-notebook-ge-boosts-haliade-x-to-14-gw-dominion-kicks-off-2-6-gw-virginia-project-vestas-absorbs-mhi-vestas/>