

RECHARGE

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'The forces propelling California toward global floating wind leadership are strong'

Jonah Margulis of Aker Offshore Wind. Photo: Aker Offshore Wind



After years of unfulfilled potential, the stars appear to at last be aligning for the Golden State's floating wind ambitions – but only a first wave of giga-scale investment will turn vision into reality, writes Jonah Margulis

By Jonah Margulis

Off the west coast of the US lies a great untapped energy potential that could transform the state of California into a global leader in floating wind power.

Extreme weather events – from heat domes to droughts – are increasingly battering the Golden State, highlighting the need for the reliable, clean energy to replace the climate-changing fossil-fuelled power that has dominated California's energy mix until now.

The steep drop-off of the continental shelf in the Pacific means the West Coast has had to look beyond the conventional bottom-fixed offshore wind technology that has grown in use rapidly around the world in the past decade to deepwater arrays, where turbines are mated to floating platforms moored to the ocean floor.

Despite lagging behind the US east coast where some 30GW of bottom-fixed turbines are in the frame to be installed by 2030, California is now gaining momentum in securing a place among the first movers in floating wind.

Aker Offshore Wind's collaboration with key community, commercial and legislative partners in California have shown us that the resources and desire to push the envelope on floating wind are strong. The 150MW Redwood Coast Offshore Wind (RCOW) floating wind development, where we are partnering with developer Ocean Winds, has the potential to be a flagship for California.

But for the state to become a global leader will require financial backing and the supporting infrastructure, for RCOW and the other projects ahead.

In May, the Biden administration and California governor Gavin Newsom announced the planned development of up to 4.6GW of floating wind in the Humboldt and Morro Bay call areas. Once developed, the Humboldt call area in the north, where RCOW is located, could produce up to 1.6GW of energy, while Morro Bay, off central California, could produce about 3GW. Combined, floating wind power in the swaths of the Pacific could generate enough electricity to power 1.6 million homes.

It is a level of ambition typical for California – home to Silicon Valley and some of the world's most successfully scaled start-ups. For perspective, the UK, the leading offshore wind market currently plans to develop 1GW of floating wind by 2030 – as part of a larger 30GW target, a goal California has the potential to surpass.

There are three big challenges ahead for California. First, the development of floating wind on the US west coast will require significant port upgrades to build and tow-out these massive platform structures.

The Humboldt Bay Harbor, Recreation and Conservation District has outlined a multi-phase plan to completely replace the existing six acre Redwood Marine Terminal 1, with future expansion that would transform the port into a floating wind manufacturing hub.

The price tag is hefty: preliminary estimates point to almost \$125m. Governor Newsom has allocated \$11m to port upgrades in Humboldt Bay, which the district hopes to top up with \$44m in federal funds. That leaves a \$69m shortfall.

A port that would service wind farms near Morro Bay remains undecided, but the one that is selected is likely to also need substantial upgrades.

Second, grid infrastructure remains an issue, at least in Humboldt Bay, where the wind resource is best. The current grid delivers roughly 150MW of electricity to the community, which sits in a sparsely populated area of the state. Major upgrades are needed to unlock the planned 1.6GW and supply electricity to a broader area and feed the California electric backbone.

And third, there is the final hurdle of creating a reliable offshore wind supply chain to build and service this highly prospective market, which DNV expects to explode to over 250GW by mid-century

Total offshore wind turning around the world has now passed 35GW, just under 5% of total cumulative capacity, according to the Global Wind Energy Council. But the level of annual installations is likely to quadruple by 2025 from 6.1GW in 2020, bringing offshore's market share of total installation to 21% by 2025 as more than 70GW offshore is added worldwide.

Until the necessary manufacturing capabilities are built out on the US west coast, developers will be sourcing materials from Europe or Asia, and they will be shopping in a crowded and competitive market.

The good news is that the manufacturing capabilities and know-how exist in the US. The expertise currently lies in the Gulf of Mexico where the offshore oil & gas sector has thrived for the past 50 years. Those capabilities can be equally built on the west coast, providing well-paying jobs and a sustainable supply chain.

The political will to develop a floating wind industry is there too. By the end of 2019, about 36% of the state's electricity came from renewable resources, according to the [California Energy Commission](#). Wind power, especially floating wind, is seen as a valuable part of the overall energy mix. It also serves as a strong complement to solar power, the state's top source of renewable energy.

Ambitious offshore wind legislation is working its way through the California legislature. Assembly Bill 525 requires a roadmap to large-scale offshore wind by 2045 and calls for significant infrastructure upgrades that would support the development of the floating wind industry.

California also has world-class offshore wind conditions. The areas of Morro and Humboldt Bay both produce wind speeds of over 10 meters per second – more than enough to support commercially viable, reliable floating wind power production.

The reliability aspect of floating wind is not lost to policy makers in a state that experienced rolling blackouts last summer, and where regulators are warning of potential blackouts again this summer if extreme heat conditions take hold. Floating wind complements energy production from solar and other sources, with somewhat of an energy baseload characteristic.

Until recently, California's move from laggard to leader in floating wind was far from certain. Proponents were stuck at an impasse with the Department of Defense, which had hesitation towards the development in Morro Bay. That's all changing now with much-needed clarity around the size and scope of the projects, lease timing and funding instruments.

We are excited to witness the evolution of a new energy market in California, and as a pure-play offshore wind developer, stand ready to invest, given a clear roadmap for development in ports, grids and supply chains. Ultimately, it will be the responsibility of the federal and state governments, as well as industry, to tackle these challenges. The forces propelling California into a global floating wind leader are strong, but only proper investments will solidify its status.

Jonah Margulis is senior vice president of US operations at Aker Offshore Wind