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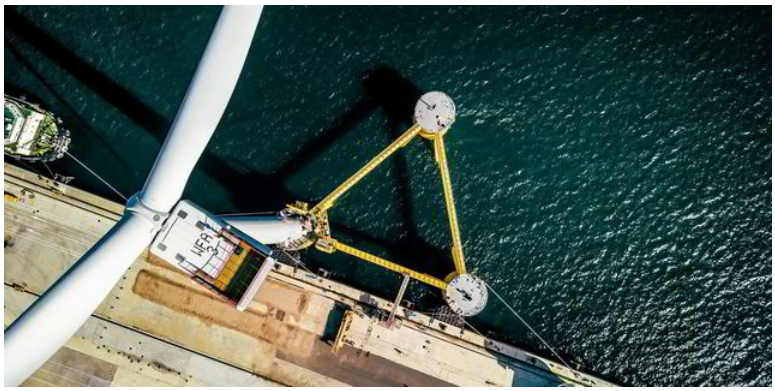
'Coexistence is key': California looks to far horizons as big time beckons for floating wind



A Principle Power floating wind unit for the WindFloat Atlantic project off Portugal Photo: PPI

Floating wind power's potential off California has never been question. But will the Golden State finally get both oars in on this multi-gigawatt play in the US Pacific, asks Richard A Kessler

By Richard Kessler

California must overcome a range of challenges that have historically dogged its floating wind sector if it is to uncork development of the 10GW-plus of generation capacity that policymakers estimate the state will need to achieve a carbon-free electric grid by 2045. An array of stumbling blocks continue to face the sector in the US Pacific, including grid constraints, lack of clear and defined interim development targets and timelines, and little port infrastructure, as well as issues around siting, stakeholder engagement and supply chain.

Yet such is the resource potential of the play off the Golden State – in the view of analyst Aeigir Insights, floating projects account for as much as 25% of the total offshore wind plant capacity installed off US shores by 2035, over 11GW – that the enthusiasm for California's floating wind industry is undimmed.

"It's really an exciting time for floating wind now. The opportunity is right, but first there has got to be commercialisation. The route to market is essential," Una Brosnan, offshore new markets manager at Mainstream Renewable Power (MRP), underlined in a recent industry webinar. She said her company and the broader emerging sector are encouraged by commitments so far from President Joe Biden's administration to drive 30GW of offshore wind development along both the US east and west coasts by 2030, which opens avenues for California to "get on board with the race and to build an industry".

At least 14 developers are prospecting in California's floating wind market: Algonquin Power and Utilities, Avangrid Renewables, Castle Wind (EnBW and Trident Winds), Cierco, Copenhagen Infrastructure Partners, EDF Renewables, EDP Renewables, Equinor, MRP, Northland Power, Redwood Coast Energy Authority, RWE Renewables and Wpd. Despite this interest from developers, California has been slower than the US Atlantic states to embrace offshore wind. This is for several reasons. First and foremost, the US Navy which has concerns that development of deepwater projects off central California would interfere with training and weapons-testing in an era of heightened tensions in the Pacific region with China and North Korea.

But there are also entanglements for the sector including legislature and energy planners that have historically given priority to more accessible geothermal, onshore wind, and commercial-scale and residential solar development to achieve renewables mandates. And there are worries that marine ecosystems and ocean health, and with it key state industries, including tourism, would be damaged by development of large floating wind arrays off its coastline.

Beyond this, there is an ongoing public debate over grid integration with other western states and the level of reliance on them for renewable energy as partial replacement for fossil fuels. Wyoming, for example, could supply 3-5GW of wind energy by 2025 and much more later, but some California lawmakers reject doing business with the nation's top coal producing state.

Before leaving power in January, former President Donald Trump made a last-minute attempt to further delay an already slow-rolling process for launching California's first offshore wind tender, announcing an "historic milestone" to begin environmental reviews for the Humboldt area off the remote far northern coast which has drawn little industry interest and for a much more attractive one called Morro Bay facing the central coast.

A closer look revealed Morro Bay had been slashed in size to prevent large-scale developments that would keep costs affordable and help the state meet its ambitious renewable energy mandates. The nearby and equally attractive Diablo Canyon area was eliminated. Days later, Joe Biden's White House issued a directive not to publish Trump's communique in the *Federal Register*, the officials US government journal.

An industry official, who spoke on condition of confidentiality, told *Recharge* at the time: "I think the plan was to put something out that looked like it was a good advance but when you get into the details, significant parts of it were only going to make things difficult for making progress – I think it is fair to say this is like a wolf in sheep's clothing."

Critics also contend that California should further develop its own renewable resources rather than help finance the billions of dollars to upgrade the long-haul, interstate transmission system necessary for ramping imports. Or be reliant on merchant developers who have struggled for years to advance major projects through opaque federal permitting processes.

With Biden and native daughter Vice President Kamala Harris in the White House, California and industry officials are confident that the Department of Defense and Bureau of Ocean Energy Management (BOEM), the federal offshore wind regulatory agency, will reach agreement on where commercial-scale arrays can be responsibly sited at sea.

A big advantage of floating wind technology is that there is a lot more flexibility with siting, according to Antoine Peiffer, vice president of engineering at Principle Power, whose WindFloat semisubmersible floating foundation has been vetted in Europe. The company is based in Oakland, California. "Whether you have 80, 120 or 200 metres [or more] of water depth, it really doesn't matter from a technology standpoint. What that means is you have so much more room to place your units in a very de-conflicting matter with all other users of the ocean. That is a key benefit and something we need to leverage as we move forward to site projects," he said. A good thing too. California's outer continental shelf abruptly drops off, with water depths quickly reaching 800-1,000 metres (2,625-3,280 feet), exceeding those in the North Sea where several demonstration and pre-commercial projects are located, as Dan Kyle Spearman, global lead for floating wind at the Renewables Consulting Group, noted.

Policy updraft on the horizon

On the political front, offshore wind is moving up the priority list in the California legislature where supportive Democrats have a three-quarters "supermajority" in both houses and is drawing more attention from pro-renewables Governor Gavin Newsom. A bill gaining traction would require state agencies to develop a strategic plan to spur development and leave it to them to set capacity targets. Spearman said setting targets would benefit California as it would define its floating wind ambitions and signal to the industry "this is what we have in terms of an opportunity".

The sensitive issue of ocean impacts are being addressed in various ways by the sector, as a matter of urgency. These include data gathering, equipment testing, experimentation with "safe zones" for fishing within wind farms, transfer knowledge gained from fixed-bottom offshore projects and widespread stakeholder outreach. There are also collaborations with non-governmental organisations and local colleges and universities.

"You really need to start early. The co-existence issue is key to succeed as an industry," said Sebastian Bringsvaerd, head of floating wind at Equinor. "I know there are a lot of activities ongoing in California. If you come too late then you have missed an opportunity." Bringsvaerd, who was responsible for bringing online the world's first floating wind array, the 30MW Hywind Scotland in the North Sea, said Equinor has been especially sensitive to the concerns of the commercial fishing industry. It is conducting R&D projects in areas such as entanglement of anchors, cables and moorings, electromagnetic fields, and sounds from projects in the marine environment. "We need to make sure we work with our governments, stakeholders, wider supply chains and communities as well so that everyone is brought along the journey. To understand the technology and how the projects will work. Offshore wind is going to be new to California," added Brosnan.

Infrastructure and supply chain are also critical issues for the industry and supportive policymakers in California. They are hopeful that Congress will fund a large part of Biden's proposed $2.25bn infrastructure plan that includes $100bn in federal money for upgrades to ports and the electric grid, and a new investment tax credit for construction of high-voltage offshore and onshore transmission lines able to deliver at least 20GW of renewable power from new sources. "The main barrier for launch of a fully grown industry in California is not so much on the floating technology itself but more on the infrastructure that is going to be required to deploy those large-scale wind farms," said Peiffer.

Grid infrastructure repurposing

He favours proposals for floating wind projects to link with existing grid infrastructure at near-shore natural gas and nuclear power plants that have been decommissioned in recent years or are scheduled for closure later this decade. That arrangement would benefit projects off central California but not those facing the thinly populated north coast where there is less grid development.

Spearman said identifying drivers is a key supply chain consideration for both the industry and policymakers. "Are you purely driven by costs or are you looking more for local content?" he said, noting that timescales and understanding potential opportunities for manufacturing components and materials are factors too.

Also important is that supply chain companies have confidence that the floating wind industry will take off in California to make necessary investments but equally, that policymakers understand that not every US state is going to get a factory for large turbine components, according to Brosnan. "There is something for everyone. Make sure we can diversify the opportunity. It's not all in the blades and nacelles. There are wider opportunities," she said. "We need the states to collaborate to make sure we're not over-competing for the same thing."

The global offshore wind market is set to mushroom toward 250GW by the end of the decade driven by over $800bn in new projects, many being spurred by the growing shift in capital spending by international oil & gas operators, according to latest numbers from Norway's Rystad Energy.