RECHARGE

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California pulls key floating wind action plan at last minute to weigh up '50GW by 2045'

Palm trees and Pier at Manhattan Beach, California, looking out onto the Pacific Ocean Photo: Shutterstock

California Energy Commission delays submitting key sector scoping document after new studies claim US' largest state could more than double its long-term offshore targets

By **Tim Ferry**

The California Energy Commission (CEC) has delayed handing in a lead-off strategic plan for offshore wind energy development in its coastal waters to afford itself more time to factor in feedback that points to the potential to more than double long-term goals for clean power projects off its coastline.

The last-minute decision – expectations were that the CEC would submit the first of three scoping documents yesterday (1 June) to state natural resources agency the CNRA – was prompted by new information from recent sector workshops and two new studies that concluded some 50GW of floating wind arrays could be turning off California by 2045, rather than the 20GW currently envisioned.

“In light of new information submitted during the workshop and in writing through the docket — including studies released after the draft report posted — the CEC will conduct an additional public workshop to further examine this new information to consider possible changes to maximum feasible capacity and planning goals recommendations,” CEC spokesperson Sandy Louey told *Recharge*.

The strategic plan follows sign-off last year of **the law AB525 by governor Gavin Newsom**, requires the CEC to scope out four plans targeting different aspects of offshore wind development, which because of California’s extreme water depths will all be floating plant.

A **draft of the lead-off plan was released last month** and focused on the “evaluation and quantification of the maximum feasible capacity of offshore wind… to achieve reliability, ratepayer, employment, and decarbonisation benefits.” The CEC estimates that California could develop 3GW of plant by 2030 and 10-15GW by 2045, while leaving room for the development the highest capacity scenario by 2050.

“These preliminary megawatt planning goals are established at levels that can contribute significantly to achieving California’s climate goals,” the CEC stated.

A study submitted to the CEC by a team of energy system scientists at the University of California (UC) at Berkeley, however, suggested that the CEC “consider a significantly higher preliminary planning goal of offshore wind (OSW) deployment (50 GW by 2045)”.

“Current OSW planning goals for 2045 are unlikely to add much to resource diversity and understate OSW’s potential to meet California’s electrification load growth,” the study states, adding that “maximum feasible capacity of OSW is likely to be an order of magnitude higher than the technical reference point considered by CEC”. Another report issued renewable energy think tank GridLab raised the CEC’s 2030 target from 3GW to 4GW.

“It’s constructive that the CEC is taking time to closely study the new reports from UC Berkeley and GridLab and is considering going even bigger on offshore wind for the Golden State,” Adam Stern, executive director for Offshore Wind California, told *Recharge*.

The CEC will issue a follow-on study on sector infrastructure and workforce development investments, and will also provide a permitting roadmap for the industry. All reports are due by the end of this year in anticipation of a finalised plan by 31 June 2023. Today’s expected step follows last week’s release by the **US government of its draft notification for lease sales** of up to 4.6GW of offshore wind acreage in federal waters off the coasts of California, initiating a 60-day comment period, with an auction expected by next autumn.

California has two federal wind energy areas (WEAs), **Morro Bay off its central coast** with nearly 3GW of potential capacity, and **Humboldt off its northern coast** with 1.6GW of capacity.

The Bureau of Ocean Energy Management (BOEM), the federal agency charged with regulating energy development on the outer continental shelf (OCS), announced 6 May that it had completed its environmental assessment of the Humboldt WEA and found "no significant impacts", clearing the way for lease sales.

BOEM head Amanda Lefton promised at the Pacific Offshore Wind Summit in March **to hold lease auctions "this year"** for one or both WEAs. As the OCS drops off steeply along the US' west coast, all of California's offshore wind energy will be floating in waters over 1000 metres deep, a still nascent technology.

Varner Seaman, California representative for industry advocacy group American Clean Power Association, said: "California [is] on the path to becoming a global leader in floating offshore wind—with all of the environmental, economic, and energy benefits that go with it.

"The CEC's draft goals align closely with the targets outlined last year in AB 525. They are ambitious, achievable targets that show the state is serious about going big on offshore wind."

Beyond Humboldt and Morro Bay, the National Renewable Energy Laboratory (NREL) has identified another three areas with large potential, including Diablo Canyon off the central coast and Cape Mendocino and Del Norte off its northern coasts, with a total of more than 21GW of potential capacity based on NREL's conservative 3MW per km2.

NREL estimates California's technical offshore wind potential at 200GW, and forecasts that developing 10GW of offshore wind in California would support thousands of jobs while supplying 15% of the state's current electricity needs and $20bn in economic growth by 2050.

State targeting 100% renewable energy

California has already made substantial progress on renewable energy development, and on at least three separate occasions in recent weeks, the California independent systems operator (Caiso), the non-profit that oversees the state's bulk electric power system, reported that renewables had powered virtually all the state's power needs, the latest on 8 May.

Solar provides the bulk of California's renewable power off its nation-leading 18GW of utility-scale solar capacity plus another 8-9GW of behind-the-meter residential solar, supplying as much as two-thirds of the state's power needs on sunny afternoons. But this much solar poses grid balancing challenges to Caiso, as demand tends to increase in the early evening just as solar is waning, forcing Caiso to keep a substantial amount of natural gas fired power operating to quickly step in as replacement.

"That's where offshore wind can play a role. It is the perfect complement to solar to generate clean, reliable baseload power," Jonah Margulis, vice president for offshore wind at Aker Offshore, told *Recharge*. Aker is part of a consortium proposing to develop the **Redwood Coast offshore wind project near Humboldt** in northern California with an initial 150MW capacity by 2025.

Senate Bill 100 (100 Percent Clean Energy Act of 2018) mandates that renewable energy and zero-carbon resources supply 60% of all retail electricity sold and state agency electricity needs by 2030, and 100% by 2045. California has the second largest state power market after Texas, but studies indicate that meeting its renewable and greenhouse gas emissions targets will require tripling its current power production.

Big industrial hurdles to overcome

A draft report issued by the CEC and Caiso forecasts that meeting state renewable energy targets would require 53.2GW of utility solar; 37GW of battery storage and 12GW of wind from other states as distant as Wyoming, along with 10GW of floating wind from projects along California's central and northern coasts, 4GW of long-duration energy storage, 2.3GW of geothermal and 2.2GW of in-state onshore wind.

While offshore wind is making strides, California would need to overcome significant hurdles to realise its dreams. Port capacity is highly constrained, with few deepwater ports available besides the **Port of Humboldt**, which has already received $10.5m from the CEC for what it hopes will be a $56m upgrade to ready it for the offshore wind boom.

Transmission is another potential logjam. While Morro Bay WEA can leverage the transmission infrastructure of the soon-to-be shuttered Diablo Canyon Nuclear Station, Humboldt lies off its lightly-populated northern coastlines, which would require substantial grid upgrades to receive offshore wind power.