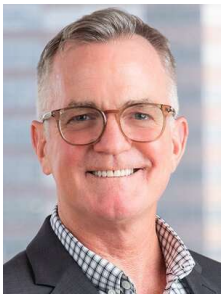
California's Offshore Turbine Plans Face Stiff Headwinds

By **David Smith and David McGrath** (November 1, 2023)



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California's tallest building — actually, the tallest building west of the Mississippi River — is downtown Los Angeles' Wilshire Grand Center. At 1,100 feet, it's slightly taller than the Eiffel Tower.

If all goes as planned in the near future, California's offshore wind turbines reaching that height will generate power from floating platforms 20 miles off the coast, above the Pacific Ocean's deep seafloor.

California is betting big on a win. Its blueprint for cutting emissions, the Scoping Plan, requires 20 gigawatts of offshore wind energy production by 2045. This sounds daunting, because it is: No large-scale offshore wind projects like those planned for California are operational anywhere in the world.

While the East Coast has deployed wind turbines with fixed-bottom foundations in its shallower ocean waters, California will need to connect floating turbine platforms to its deep offshore seabed via cable. This has never been done. Undersea transmission cables will then send energy to coastal substations, and eventually to power lines.

California is pursuing its ambitions to become a leader and jump-start the commercialization of this technology, but it faces serious headwinds. The necessary critical infrastructure — e.g., factories, ports and transmission lines — still needs to be built. Then there are regulatory processes, capital fundraising and workforces to address.

For California to meet its offshore wind targets, developers will need strong assurances that the state is committed to achieving its aspirational goals. The state is effectively launching a new industry that has no existing supply chain in a complicated technological, regulatory and political environment.

The products are not on the shelf. The plan will require significant research and development, along with attendant public subsidies from state and federal sources.

As evidenced by offshore wind developments elsewhere, issues like inflation, interest rates and supply chain difficulties will continue to affect the timing and viability of these projects. But California has the opportunity to learn from other jurisdictions' challenges, and incorporate those lessons into its efforts.

On top of heightened initial costs, companies investing in the industry will look for clear pathways to success — with robust permitting transparency, predictable timelines, and meaningful coordination between jurisdictions, agencies, and stakeholders.

Ambitious Targets

In 2018, California established a landmark policy that renewable energy and zero-carbon resources supply 100% of the state's electricity by 2045. Offshore wind is a key piece to

that puzzle. It is also key to grid reliability — because, unlike solar, offshore wind tends to peak during the evening hours, so it keeps generating power in the dark.

The wind is out there: In 2020, the National Renewable Energy Laboratory estimated that California has the potential to produce 201 GW of offshore wind power.[1] Currently, the U.S. generates approximately 0.42 GW of total offshore wind power annually.

In 2021, California legislation, A.B. 525, required the California Energy Commission to establish offshore wind planning goals for 2030 and 2045, as well as strategic planning documentation for offshore wind. In August 2022, the commission set bold targets of 2 GW to 5 GW by 2030, and 25 GW by 2045 — or enough to eventually power 25 million homes. A.B. 525 forms the backbone of California's planning efforts.

The National Renewable Energy Laboratory estimates that a capital investment of $4 million is required for every 1 megawatt of installed floating offshore wind energy.[2] Thus, 25 GW of floating offshore wind will require approximately $100 billion. This does not account for ancillary port facility developments and upgrades, transmission grids, or specialized ocean fleets.

Initial Auctions Complete

In December 2022, the U.S. Department of the Interior's Bureau of Ocean Energy Management auctioned five federal offshore wind lease sites on the outer continental shelf 20 miles off California's Morro Bay and Humboldt County.

The five sites, spanning 583 square miles, or 373,268 total acres, with an estimated potential to produce 4.6 GW of wind energy, resulted in total bids of $757.1 million. Average water depths for the lease sites range from 2,300 feet to nearly 4,000 feet.

This was the first ever U.S. auction for sea space planned for commercial-scale floating offshore wind projects. While indicative of the emerging technology's untested promise, the auction yielded far less than the $4.37 billion generated from six offshore wind leases in New York and New Jersey in February 2022.

The California Energy Commission estimates it will take roughly eight years to permit these initial projects. While the commission has proposed potential permitting road maps for offshore wind, the road ahead remains murky and uncertain.

Streamlining State Processes

To maximize long-term success and efficiencies for its offshore wind industry, California must factor in lessons from other jurisdictions.

California needs to formulate coordinated and streamlined contracting and permitting processes. While the platforms themselves are more than three miles offshore, placing them outside waters under state jurisdiction, the transmission lines and onshore infrastructure will be subject to the review and permitting authority of state and local entities.

Regulators should focus not only on initial projects, but also on future procurement scheduling, future leasing plans and programs that incentivize early developments of supportive infrastructure — before initial projects commence construction.

If projects and associated timelines are clear, infrastructure like port facilities can succeed.

But those types of supportive facilities — particularly for initial projects — will not be viable on their own, and will require significant public support.

Developers and investors will likely insist on having a clear understanding of application requirements and agencies' roles with respect to offshore wind projects. Project developers and permitting authorities must proactively engage one another to find common ground, and to coordinate with interested parties in an organized manner.

Rushing these processes through piecemeal efforts will not set up the industry for long-term success — and will likely result in significant delays and difficulties securing financing.

Several companies that won initial bids for offshore wind projects on the East Coast have recently terminated their contracts, paying tens of millions of dollars in penalties, due to inflation, the sudden rise in interest rates and supply chain troubles taking a toll on their bottom lines.

For example, power purchase agreements previously signed simply no longer make economic sense given ballooning project costs, including for raw materials like steel. As a result, these projects will have to be rebid, resulting in uncertainty for reliant facilities, such as the factories manufacturing the components.

Recognizing the need to expedite economies of scale, East Coast states are rethinking how they bid projects. For example, on Oct. 4, the governors of Massachusetts, Rhode Island and Connecticut announced a coordinated effort to solicit multistate, cost-effective proposals for offshore wind projects.

This effort is meant to maximize efficiencies by promoting regional industries to allow each state to benefit from one another's manufacturing strengths and workforces. California should take notice.

The state should consider bolstering these types of regional partnerships among its various counties — and potentially with other West Coast states — to support the development of a coordinated and sustainable supply chain, and help achieve economies of scale.

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[1] https://www.nrel.gov/docs/fy21osti/77642.pdf.

[2] https://www.nrel.gov/docs/fy23osti/86864.pdf.