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California main grid bolsters transmission plan to enable 4.7GW of floating wind

California Governor Gavin Newsom. Photo: Gage Skidmore/Flickr

Golden State needs $6bn in grid investment to add 85GW of new renewable power capacity by 2035

By **Tim Ferry**

California independent systems operator (Caiso) offered its ***draft 2023-2024 transmission plan*** to state regulators that includes new power lines and other infrastructure to handle some 4.7GW of floating wind slated for deployment off its central and northern coasts.

The investments are part of a wider package of proposed system upgrades as the Golden State looks to expand its clean power sector and delivery infrastructure and make it more resilient amid an ambitious climate agenda and ramped demand.

"The need for additional generation of electricity over the next 10 years has escalated rapidly in California as it continues transitioning to the carbon-free electrical grid required by the state's clean-energy policies," noted Caiso, which manages flow of electricity to about 80% of the state.

California is looking to add 85GW of new renewable power capacity to the grid by 2035, which is "driving a dramatically accelerated pace for new transmission development in current and future planning cycles," Caiso said. The upgrades come with a total price tag of some $6bn and lead times of eight to 10 years.

Floating wind forms a key component of the Golden State's sweeping effort to transform how it generates and uses power. California leads the nation with lofty sector ambitions of 5GW by 2030 and 25GW by 2045.

Federal offshore energy regulator **Bureau of Ocean Energy Management (BOEM) auctioned five leases** off California's coast at the end of 2022. Three were in the Morro Bay wind energy area (WEA) facing the Central Coast with 3.1GW of capacity, and two off Humboldt in the north with 1.6GW. The auction attracted heavyweight developers including Copenhagen Infrastructure Partners, Equinor, and RWE, which have already begun development activities.

Along with floating wind, Caiso's plan incorporates 2035 energy transition targets including 38GW of new solar, 21GW of geothermal, 5.6GW of imported wind, and 3GW of in-state onshore wind.

Floating wind along the North Coast receives particular focus from the system operator as the lightly populated Humboldt region has scant transmission infrastructure but excellent wind resources.

New infrastructure planned for the region includes a new Humboldt 500kV substation complete with a 500/115kV transformer; a 260-mile (418 km) high voltage direct current (HVDC) line to interconnect the new Humboldt substation to the Collinsville 500kV substation; and a new, 140-mile 500kV AC line to interconnect new Humboldt substation to the Fern Road 500kV substation, with other smaller upgrades also likely be needed, Caiso noted.

Morro Bay receives far less attention in the draft report due to its proximity to significant transmission infrastructure related to gas-fired plants slated for retirement this decade.

Transmission assets linked to the 2.25GW Diablo Canyon nuclear power station near Morro Bay had likewise been slated for floating wind, but now are less certain following **governor Gavin Newsom's support for keeping the plant operating** through 2030 at least.

Caiso's plan will be the subject of meetings with state regulators, especially the state Public Utilities Commission and the California Energy Commission, and open for public comment.

Transmission is not the only hurdle floating wind development in California will have to overcome. Water depths off the coastline average some 1,000-metres, unprecedented for the nascent floating wind sector. The state also lacks **industrial ports** and trained workers.