

Capitalizing on Existing Transmission Assets for West Coast Offshore Wind Power

By Derek Cedars

New offshore wind power projects along the West Coast create demands for upgrading the electric grid. Investor-owned utilities (IOUs), public utility commissions (PUCs), independent system operators (ISOs) and regional coordinating authorities can support enhancing the reliability and safety of transmission infrastructure while reducing impacts on the environment, customers and ratepayers.



For years, utilities have bought, developed and maintained transmission corridors to distribute energy to customers and end users. When it comes to enabling offshore wind transmission, now is the time to identify how existing corridors can be upgraded. Improvements can help position utilities as viable partners for offshore wind development projects. With new funding opportunities from the federal government and venture capital, as well as renewable tax credits, the market is ripe for offshore wind generation, giving utilities the green light to upgrade existing transmission corridors.

The New Gold Rush

The development pipeline for West Coast offshore wind generation is primed. In late 2022, the Bureau of Ocean Energy Management (BOEM) awarded the first five lease areas for offshore wind development, covering more than 370,000 acres off the California coast. These leases have yielded more than \$750 million. BOEM is also assessing commercial interest in offshore wind energy leasing for waters off Oregon and the

state of Washington has received unsolicited requests to develop offshore wind projects.

Hydrogen production and the development of federally backed hydrogen hubs are additional drivers of demand for offshore wind. Energy storage is critical during the energy transition. This is well understood; however, the development of hydrogen hubs creates a new and unique storage opportunity. Seen as the green complement to hydrogen production, offshore wind is poised to provide the requisite energy to support potential West Coast hydrogen hubs, thus facilitating lower-carbon transportation. Demand for offshore wind on the West Coast is ready to spike in the coming years.

Factors fueling the offshore wind industry include the sale of leases for offshore wind areas; federal and consortium funding; loan guarantees; renewable tax credits; and venture capital investment. To deliver offshore wind success, however, the industry needs to go ashore.

Righting the Way

No matter where electricity is generated, connecting high-voltage power to the grid requires physical pathways to reach the end users on land. As with any energy generation project, it is essential to understand, plan for and implement the right transmission infrastructure.

With the Pacific Northwest National Laboratory currently conducting a West Coast offshore wind transmission study that aims to outline transmission options, the time is now for West Coast utilities to explore their own strategies for transmission development.

The responsibility for evaluating and identifying how existing transmission architecture and corridors can be modified and upgraded to help offshore wind rests with utilities and transmission operators in California, Oregon and Washington. Improving existing transmission infrastructure increases the reliability and safety of transmission, lowers environmental and customer impact, and can boost operators' financial performance. Utilities can also identify congestion within the transmission system and, where possible, upsize the transmission capacity to reduce it.

Upgrading Transmission Corridors

Improving Existing Infrastructure

Instead of using maintenance dollars — largely residing in expense budgets — on aging equipment, utilities can leverage new capital spending to upgrade existing transmission assets. Existing transmission rights-of-way already serve current population centers. Identifying the right asset strategy using new capital dollars to upgrade this infrastructure is a clear winner for ratepayers, transmission customers and investors. West Coast utilities should begin outlining improvements — such as new towers, poles and upsizing of conductors — as investment opportunities. Deploying composite conductors, using transmission topology tools and dynamic substation controls, and upgrading to high-temperature power lines are additional possibilities to improve the operations of existing infrastructure. Expanding transmission capabilities while repurposing assets is financially beneficial, enhances the reliability of service and increases safety while not burdening ratepayers.

Leveraging Transmission Interconnections

From the San Onofre Nuclear Generation Station in Southern California to the Centralia coal-fired power plant in the state of Washington, various older facilities are being reevaluated or retired. Such shuttered facilities can still play a role in the energy future, however, as their substations, switchyards and land can be leveraged for offshore wind interconnection.

Using new capital spending to redesign and renew these facilities provides new interconnection opportunities for offshore wind. Utilities and regulators should evaluate how aging and retired assets and infrastructure can be utilized and improved with new investments. Once these key locations are identified, both the utilities and regulating agencies should push to use these existing assets and locations for onshoring the offshore projects.

Recapitalizing Existing Rights of Way

Vegetation management and facilities maintenance in rights-of-way and easements is critical for improving safety, significantly reducing the threat of fire. New technologies, procedures and requirements have been developed to help reduce hazards, but they require investment. By leveraging existing rights-of-way, new capital investment can help utilities meet safety and environmental standards and mitigate risk.

New capital spend made available as part of new transmission projects in existing rights of way can also be deployed to upgrade infrastructure, replace towers, upsize assets for greater transmission capacity and lower the risk of aging assets. Recapitalizing along existing rights-of-way does not require additional land purchases, leases or new easements, reducing long-term costs while facilitating reinvestment. Improvements increase reliability, minimize environmental impacts and reduce safety risks.

Achieving the Vast Potential of Offshore Wind

Currently, most power generation from offshore wind in the U.S. is located along the East Coast, where an expansive continental shelf allows for fixed-bottom wind farms. Without a sufficient continental crust margin along the West Coast, deep-water floating wind farms are a more suitable option, similar to offshore wind projects in European markets, specifically the North Sea.

The National Renewable Energy Laboratory (NREL) Wind Resource Assessment estimates that the U.S. could produce 1.5 terawatts of energy from fixed-bottom ocean wind farms and another 2.8 terawatts from floating offshore wind. This amount of clean energy would be more than three times the current annual electricity consumption in the U.S.

Additionally, as part of a federal zero-carbon emissions initiative, a national goal has been set that the U.S. deploy 30 gigawatts of new offshore wind by 2030. Currently, about 42 megawatts of offshore wind capacity is online, while almost 52 gigawatts is in development. The West Coast has just begun to contribute to offshore wind project development, which will be essential to achieve zero-emissions goals.

Strategic Transmission Partnerships

Along the West Coast, offshore wind developers seek to secure interconnection rights with utilities and providers offering a strategic and flexible transmission strategy. Utilities can attract developers looking to access transmission connection points by evaluating existing assets, developing plans and securing capital investment for improvements.

For West Coast utilities, PUCs, ISOs and regional coordinating authorities, leveraging existing infrastructure and upgrading existing transmission corridors can help deliver greater reliability, reduced risk, reduced environmental impact and increased safety in transmission corridors while also generating greater financial return.

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