

Hold On to Your Hats

Offshore wind has the potential to blow away other forms of energy.

On its face, the idea of harvesting energy from wind farms constructed at sea looks like an answer to the U.S. power industry's prayers.

Offshore wind offers an abundant supply of renewable and frequently available energy — as much as 2,000 gigawatts (GW) a year, or nearly double current electricity

use in the U.S. Going offshore also mollifies communities that don't want wind farms or other generation facilities in their backyards. If Europe's 15 years of experience in the market is any indication, offshore wind can be economical as well, with costs expected to fall below those of onshore wind before 2030, according to research by Cornwall Insight.



For offshore wind to work for the U.S., offshore wind transmission needs a master plan.

And yet, the U.S. offshore wind market remains in its infancy with just 30 megawatts (MW) of offshore wind-power capacity now in operation off the coast of Rhode Island. Europe, in contrast, welcomed installation of 2,649 MW of offshore wind power in 2018 alone, boosting its offshore wind capacity to 18,499 MW across 11 countries. That is roughly 10% of Europe's total installed wind energy capacity, with much more to come.

There are many reasons the U.S. market is lagging.

One of the most immediate challenges is the Jones Act, a U.S. law enacted in the wake of World War I that prevents foreign-owned ships from carrying cargo between U.S. ports. Add to that state mandates for locally sourced labor and materials, and a wrench is thrown into offshore development efforts.

"The problem is offshore wind turbine design and construction take unique skills," explains Tony Appleton, offshore wind director at Burns & McDonnell. "Most of this know-how currently resides in European companies that employ non-U.S. citizens and operate specially equipped foreign vessels."

An even greater challenge is the lack of a comprehensive strategy for expanding the transmission grid to support offshore wind, says Kent Herzog, a regional practice manager at Burns & McDonnell.

"Individual states have their own energy policies and renewable energy goals," Herzog says. "To realize offshore wind's enormous potential, states are going to need to work with regional and federal stakeholders to decide the best ways to build offshore transmission and connect it to the onshore grid."

That includes choosing connecting points and determining who will be responsible for transmission development; who

will manage the design, construction and interconnection process; and who will regulate the entire system.

Groups likely to comprise states, regional energy consortiums, regulators, financiers and other stakeholders will need to determine how offshore wind and energy storage might work together. Others must iron out questions regarding financing and regulation, as well as figure out how competing state and regional groups can learn to collaborate.

Finding answers to these questions will be critical because once systems are in place, changing course could be cumbersome later.

Fortunately, the offshore wind industry is keenly aware of the transmission grid expansion challenges and is starting to take steps to address them. The Business Network for Offshore Wind, the leading offshore wind industry group in the U.S., recently kicked off a new Grid and Transmission Working Group, chaired by Herzog, to address these grid issues.

LESSONS FROM EUROPE

The good news is, the challenges U.S. states face with collaboration are similar to those European countries experienced when competing with each another to attract development. That includes significant growing pains as they grappled with technological and regulatory challenges.

"Europe has learned many lessons, and the U.S. should not have to learn those again," says Jason Cabral, a regional practice manager at Burns & McDonnell. "We need to apply the best practices, where applicable. But we must also be cautious that best practices in Europe are not necessarily best practices here."

While sharing similarities, the U.S. offshore wind market differs from Europe's in significant ways. In Europe,



for example, gaining access to inexpensive renewable energy is a developer's highest priority, with economic development a secondary consideration. In the U.S., those priorities are flipped. Economic development comes first because it means several things to U.S. developers, including the prospect of financial incentives and different rules for evaluating and rewarding projects.

Wind conditions off the U.S. Eastern Seaboard — where these projects are planned — are different from those in Europe, which can impact everything from foundation design to equipment installation. In the U.S., wind farms also are likely to be located within 50 miles of shore, compared to the newest projects under consideration in Europe, which are likely to be located hundreds of miles from coastal lands.

A cookie-cutter approach to development, in other words, won't work. Neither will it work for individual states to each embark on its own approach.

According to Appleton, "One current European development that potentially could be tailored for the U.S. market is the U.K. Offshore Wind Sector Deal."

This deal, which marks a significant deepening of the partnership between the British government and the sector, makes offshore wind an integral part of a low-cost, low-carbon, flexible grid system. The partnership is not only expected to drive the transformation of offshore wind generation but also reinforce the aims of the government's industrial strategy for future growth. It also is expected to boost the productivity and competitiveness of the supply chain, which could be a key factor in kick-starting the U.S. market.

For offshore wind to work for the U.S., offshore wind transmission needs a master plan, Herzog maintains. With smart planning and cooperation, the U.S. has the potential to learn from Europe's experience and leapfrog the obstacles standing in the way of a viable offshore generation and transmission system. ●



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