Will advances in offshore wind development result in onshore wind graveyards?

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Just over a decade ago, the mention of a "wind farm" in western Oklahoma would have raised more than a few eyebrows. Today, a number of these "farms" have sprung up across open spaces where buffalo once roamed, and more are on the horizon. Similar scenarios have played out across the U.S. since the onset of the modern wind era beginning in the 1980s. Fueled by economic incentives and a growing desire for cheaper and cleaner energy, the U.S. is the leader in land-based wind energy capacity. However, more than 50 percent of the population of the U.S. lives in coastal areas, a reality that has been one of the primary catalysts for recent efforts by the U.S. Department of Energy to develop an offshore wind industry in the U.S. If these efforts are successful, will the land-based wind farms become a thing of the past?

Having stood mostly on the sidelines during the last decade, the U.S. is getting serious about adding wind to its energy portfolio. Renewables currently make up about 5 percent of the electricity generated in the U.S., with natural gas and coal leading in overall generation. While land-based wind farms will provide a good template, the offshore turbines will operate in a much different environment and be subject to elements not found on land. This will require modifications to the subsystems of the turbine, port upgrades, transmission planning and the maneuvering through an infant regulatory system. These challenges will likely result in higher costs and difficulty securing financing. However, once the mold is created, achieving economies of scale should be a matter of time.

Many of the land-based wind farms in the U.S. are located in the heart of the wind corridor of the central plains, but the wind resources available offshore are more abundant. The U.S.

coastlines are extensive, and the wind blows stronger and more consistently offshore. Projections indicate that offshore generating capacity is four times what is currently coming on the U.S. grid, and many of the cities that require large amounts of electricity are located near coastal regions so transmission issues will be reduced considerably. Offshore development could inject billions of dollars in economic activity into the U.S. through professional manufacturing, construction and engineering jobs.

The offshore wind industry is still in the early stages of development, which makes the government's goal of having 54 GW of offshore capacity by 2030 seem pretty lofty. Currently, there are about 20 offshore projects and approximately 2,000 MW in the planning and permitting stages. The Bureau of Ocean Energy Management, Regulation and Enforcement is overseeing developments in federal waters and has recently conducted two wind lease auctions – one off the coast of Massachusetts and Rhode Island and one off the coast of Virginia. Together, these lease areas are projected to produce enough power to provide electricity to more than one million homes. Lease auctions are expected in the near future for areas off the coasts of Maryland and New Jersey.

The turbines planned for these areas will not be operational for another five to 10 years, largely due to the permitting process, which will take between seven and 10 years. This delay is why some argue that development in state waters will take off at a much quicker pace, and it already has in some areas. While offshore developments within state nautical boundaries might progress at a faster pace, their close proximity to shoreline will limit their size and capacity, and the state and federal governments will have to collaborate if the U.S. is going to succeed in its renewable energy efforts via offshore wind energy.

Even with its paramount benefit of being green and clean, offshore wind development is not without its critics. Most

objections stem from its high cost and the likelihood that much of the expertise needed to develop the essential technology would come from overseas. Additional objections focus on concern for the marine habitat, visual effects and noise pollution. Similar concerns existed when land-based wind projects were being developed, which gave way to certain diligence and mitigation requirements related to animal life that will certainly be applied in similar fashion to the offshore developments.

The development of offshore wind projects will no doubt be directly impacted by the advances, or lack thereof, of the coal and natural gas industries. When compared to these “established” forms of energy, wind can look much less attractive. Wind is inherently intermittent and lacks consistency in generation, partly due to the difficulty in efficiently storing the energy generated. However, development of offshore wind energy as an affordable and viable energy source will be necessary if the U.S. is going to expand and diversify its energy portfolio.