

More transmission lines needed to realize wind-power visions

April 6 2010, By Julie Wernau

As regulators pave the way for wind-farm development with tax credits and loosened regulations, the key challenge facing developers is that existing transmission lines, substations and transformers are inadequate to handle the amount of energy expected to come from wind farms in various stages of development across the country. There's already a waiting list for wind-farm developers who want to hook into the existing grid.

"It's easy to be green and say let's build wind but we have to think about -- how are we going to deliver that?" said Thomas O'Neill, chief operating officer at Chicago-based Exelon Transmission Co., a unit of Exelon Corp.

In the near term, companies are opting to harness wind power closer to existing transmission lines, usually near urban areas, to avoid the lengthy and costly process of building new lines. Aside from pockets of strong winds in the midsection of Illinois, however, some of the most powerful wind in the U.S. stretches from the upper Midwest, south, into Texas.

In order to integrate and move that alternative power east through Illinois, the grid would have to be expanded and upgraded, say transmission experts and utility companies.

The estimated cost to move that wind power east could range from \$64 billion to \$93 billion in 2009 dollars and would require 17,000 to 22,000 miles of transmission lines to be built in the eastern half of the country

alone, according to the Eastern Wind Integration and Transmission Study (EWITS) published in January and prepared for the National Renewable Energy Laboratory.

While [electricity demand](#) has increased by about 25 percent since 1990, according to the U.S. Department of Energy, transmission line construction has decreased by 30 percent because of the lag time created as developers justify costs and lay out the impact of new transmission to regulators at the local, state, regional and federal levels. According to the American Wind Energy Association, a typical transmission line takes five years or more to be planned and built, while a renewable power plant can be constructed in less than a year.

Exelon Corp. is part of the Strategic Midwest Area Transmission (SMART) Study, sponsored by several Midwestern utilities, which is among dozens of similar groups studying how a significant increase in the nation's wind power would impact transmission and how and where new transmission lines would need to be built to make such a build-out feasible.

These studies say it isn't feasible for businesses to pay costs associated with the transmission upgrades required to hook into a congested grid. Many withdraw their requests to hook in once they realize the significant upgrades that would be needed, according to Midwest ISO, the organization that coordinates the movement of wholesale electricity in several states, including much of Illinois. Of more than 70,000 megawatts of generation waiting for permission to hook in to the grid, 60,000 of that is generated by wind turbines, according to Midwest ISO.

"You have a lot of projects fighting over the same capacity. How do you delineate who gets to be first in line?" said Eric Laverty, director at Midwest ISO.

Under Midwest ISO's auspices in Illinois, more than 30 wind projects are seeking approval in roughly a dozen counties. Two more wind projects are waiting in line with Illinois' other regional transmission operator, the PJM Interconnection, which coordinates movement in all or parts of 13 states, including the ComEd area of Illinois, where Chicago lies.

"In many instances, interconnection studies indicate that adding a new power plant would overload transformers and transmission lines hundreds of miles away," the American Wind Energy Association and the Solar Energy Industries Association concluded in a white paper published last year. "Its owners must pay to upgrade all of the transmission equipment, often at a cost approaching or exceeding the cost of the power plant itself."

The groups compared the situation to asking the next car on the on-ramp of a crowded highway to pay to build an extra lane.

For that reason, several consortiums of stakeholders are pushing for federal regulators to allow utilities to spread the costs of transmission beyond the regions where those utilities are located. As it works today, a wind developer would pay to upgrade transmission lines, pass those costs along when it sells that power, and those costs in turn are passed along to customers in their bills. Transmission charges in the ComEd region currently account for about 5 percent of a customer's electricity bill, according to Exelon. These stakeholders say it would make more sense to spread that cost out among a larger region that benefits from the high-capacity transmission lines that have been proposed.

According to Exelon, the nation's extra-high voltage transmission system stops at Illinois' doorstep, and significant upgrades are needed for high wind development.

"There's an existing extra-high voltage system to the east that essentially stops at the Illinois/Indiana border as you move east to west," O'Neill said.

LS Power Group, which wants to build a 160-mile transmission line that would connect three 345-kilovolt substations in Illinois and Indiana, announced recently that it has begun the lengthy process of convincing state, federal and regional authorities that its transmission project is worthwhile enough to pass the costs along to the customers throughout the mid-Atlantic region.

"It is difficult to develop transmission, and there's a lot of state, local and federal permits that we have to apply for in order to move forward with transmission," said Sharon Segner, director at LS Power.

The company said it expects it will take until at least 2014 to gain the necessary permissions and financing, moves they say would open up wind development in an area where development has been stymied because of a lack of transmission lines.

"There is a definite need for new transmission in northern Illinois and Indiana, with a significant backlog of interconnection requests in these states," said Lawrence Willick, senior vice president with LS Power Group.

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