

4. RENEWABLE ENERGY: Big boost in wind power doable but complicated in eastern U.S. -- study (01/20/2010)

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The eastern United States could get 20 or even 30 percent of its electricity from wind by 2024, but it would cost up to \$175 billion and wouldn't take a big bite out of greenhouse gas emissions without a price on carbon, according to a study by released today by the National Renewable Energy Laboratory.

The Energy Department lab examined four scenarios for wind development and concluded all would need significant new transmission capacity and the transformation of electric grid's operation and market.

Boosting wind power without putting a price on carbon would reduce greenhouse gas emissions only 5 percent from 2008 levels of 1.9 billion metric tons, the report says. But price carbon at \$100 a ton and emission reductions hit nearly 33 percent, it says.

The study is the most comprehensive addressing what is needed to reach 20 percent wind for the grid east of the Rocky Mountains. The report was prepared by Knoxville, Tenn.-based EnerNex Corp.

There have been several other recent studies of regional transmission needs and wind integration, including one released yesterday by the Southwest Power Pool ([Greenwire](#), Jan. 19). And six Eastern grid operators released their "Joint Coordinated System Plan" early last year concluding it would cost \$1.2 trillion to reach 20 percent wind ([Greenwire](#), Feb. 9, 2009).

While the costs of the three 20-percent scenarios in the NREL report are close, the scenario of "high quality" on-shore wind, mainly in the Midwest, has the lowest cost, \$140 billion. But this scenario also has the highest transmission costs, \$93 billion, mainly due to 22,697 miles of extra high-voltage lines.

The report finds that capital costs for building offshore wind farms push up the price for those scenarios. A hybrid of offshore and onshore projects costs about \$143 billion, and one that relies more on projects in the East as opposed to including a Midwest mix would cost about \$155 billion. Many New England and mid-Atlantic states have been unhappy that Midwestern wind generation has been emphasized over local offshore wind generation and economic benefits, and about the difficulty in siting transmission lines.

"Transmission is always one of those hard subjects," said David Corbus, who managed the project for NREL. "Looking up and seeing wires is not always what people like to see. It's not an easy thing to do, but that is required."

Corbus said he hoped the study would not emphasize regional differences but rather would highlight what can be done on transmission and to transform grid operations and markets. "The take-home is that it is going to be hard to do all of it, so let's not argue about specific regional agendas," Corbus said. "There is a lot of common transmission among the different scenarios that would benefit all the regions," he said.

New transmission is necessary for all scenarios and the reference case and -- despite a large price tag -- is still less than 20 percent of the total cost, the report notes. "Without increased transmission capacity, it will be impossible to run new and existing wind plants at full capacity," the report says.

Need for regional cooperation

Another significant change the study relies upon is the need to consolidate dozens of local "balancing authorities" into seven central ones -- one for each of the current independent systems operator in the region. A balancing authority makes sure there is enough current generation to meet demand by calling other generation to come online or to shutoff.

A centralized balancing authority and consolidation of available generation would enable a more efficient use of available generation and transmission capacity, the report says. The Midwest Independent Transmission System Operator has currently adopted a model similar to this, and it should not be too technically difficult to achieve, Corbus said.

"I hope this study brings the different regional groups together so they can dialogue more on how they can all get their needs met and integrate more wind," Corbus said. "There are a lot of common elements in the different groups, and there is a lot they can work on together. This is a first step in what should be a multi-step process," he said.

[Click here](#) to view the executive summary.