Nuclear Industry Withers in U.S. as Wind Pummels Prices

By Julie Johnsson and Naureen S. Malik - Mar 11, 2013

A glut of government-subsidized wind power may help accomplish a goal some environmentalists have sought for decades: kill off U.S. nuclear power plants while reducing reliance on electricity from burning coal.

That’s the assessment of executives and utility experts after the U.S. wind-energy industry went on a $25 billion growth binge in 2012, racing to qualify for a federal tax credit that was set to expire at year’s end.

The surge added a record 13,124 megawatts of wind turbines to the nation’s power grid, up 28 percent from 2011. The new wind farms increased financial pressure on traditional generators such as Dominion Resources (D) Inc. and Exelon Corp. (EXC) in their operating regions. That’s because wind energy undercut power prices already driven to 10-year-lows by an abundance of natural gas.

“Right now, natural gas and wind power are more economic than nuclear power in the Midwestern electricity market,” Howard Learner, executive director of the Environmental Law and Policy Center, a Chicago-based advocate of cleaner energy, said in a phone interview. “It’s a matter of economic competitiveness.”

Wind-generated electricity supplied about 3.4 percent of U.S. demand in 2012 and the share is projected to jump to 4.2 percent in 2014, according to the U.S. Energy Information Administration.

The wind power boom has benefited consumers in regions where wind development is fastest, contributing to a 40 percent wholesale power-price plunge since 2008 in the Midwest, for example. Yet the surplus is creating havoc for nuclear power and coal generators that sell their output into short-term markets.

‘Perfect Storm’

The impact is greatest in the capacity-glutted Midwest. There, Richmond, Virginia-based Dominion is closing a money-losing reactor and selling coal plants, Exelon warns of shrinking nuclear margins and an Edison International (EIX) merchant coal-plant unit has gone into bankruptcy.
“It’s a perfect storm,” said Charley Parnell, a Chicago-based spokesman for Edison’s Midwest Generation unit, in a phone interview. Pricing, already under pressure from cheap natural gas and the lingering effects of recession, now has a wind factor. “Wind absolutely plays a part in that,” he said, “especially in the off-peak hours.”

Atomic-power providers complain that the upheaval is an example of government subsidies distorting the market -- to the particular detriment of nuclear which provides 19 percent of the nation’s electricity, is clean and has proved safe despite perennial concern by activists that it poses a danger to public safety.

**Prices Below Zero**

Wind power has two advantages. Green energy laws in many states require utilities to buy wind energy under long-term contracts as part of their clean-energy goals and take that power even when they don’t need it. Wind farms also receive a federal tax credit of $22 for every megawatt-hour generated.

Thus, even when there is no demand for the power they produce, operators keep turbines spinning, sending their surplus to the grid because the tax credit assures them a profit.

On gusty days in the five states with the most wind power -- Texas, California, Iowa, Illinois and Oregon -- this can flood power grids, causing prices to drop below zero during times when demand is light. Wholesale electricity during off-peak hours in Illinois has sold for an average price of $23.39 per megawatt hour since Jan. 1, after hitting a record low of -$41.08 on Oct. 11, the least since the Midwest Independent Transmission System Operator Inc. began sharing real-time pricing in 2005.

**‘Negative Prices’**

Meanwhile, nuclear and coal plants must continue running even as this “negative pricing” dynamic forces them to pay grid operators to take the power they produce.

“It is becoming more pronounced as more wind is coming on,” Christopher Crane, chief executive officer of Chicago-based Exelon Corp., said in a phone interview.

If the push to “over-develop” subsidized wind continues, “there is a very high probability that existing safe, reliable nuclear plants will no longer be competitive and will have to be retired early,” according to Crane.

More development seems a certainty. Wind power got another boost when Congress, as part of January’s deficit deal, extended the production tax credit through Dec. 31, amending current law so that projects begun this year will receive the 10-year tax break regardless of when they come online.
Defending Wind

While few new projects are expected to be built out this year due to developers’ mad dash at the end of 2012, “we think 2014 will pick up again,” said Rob Gramlich, interim CEO of the American Wind Energy Association, a trade group.

Gramlich doubts wind power is the chief reason that spot- market power producers like Exelon are suffering a profit drain. “Low prices are due to a lot of things, mostly shale gas,” he said. “But to some extent wind does reduce power prices and that’s a good thing for homes and businesses.”

Natural gas is fuel for a growing number of U.S. power plants because of its cost advantage and new environmental rules for coal. Wind is gaining as turbine costs plummet -- they are down one-third since 2010 -- and technology gains make windmills economical in states with lower average wind speeds.

Google Inc. (GOOG) is investing $1 billion in wind and solar projects and Warren Buffett’s MidAmerican Energy Holdings, Iowa’s largest utility owner, owns 6 percent of U.S. wind-energy capacity and has invested about $13 billion in renewable energy.

Tenfold Rise

U.S. wind installations have risen 10-fold since 2003 to 60,007 megawatts, attracting $120 billion investment that has produced new capacity equivalent to 14 nuclear power plants and enough to power 14.7 million homes, the AWEA, the industry group based in Washington, D.C., said in a Jan. 30 report.

Wind’s rapid gains have created headaches for grid operators since winds often blow strongest when homes and businesses use the least amount of power: at night and during the spring and fall seasons, said Paul Patterson, a New York–based analyst with Glenrock Associates LLC.

“I think this model’s got problems with it,” Patterson said in a phone interview. “There are not many examples where the product you produce actually has negative value.”

Before 2006, when wind power began its latest growth spurt, negative prices were extremely rare. The phenomenon is now prevalent in parts of the Midwest, Texas and the West Coast where turbine installations are growing fastest, data compiled by Bloomberg show.

“We can’t find enough demand for the amount of energy created by Mother Nature,” said Doug Johnson, spokesman for the Bonneville Power Administration, which manages the grid in the Pacific Northwest. The transmission operator, based in Portland, Oregon, paid wind operators $2.7 million last year to stay off line so it could make room for the power from hydroelectric generators handling
the runoff from melting mountain snows.

Wind vs Fossil Fuels

The surge in wind generation is also squeezing the number of hours that fossil-fuel plants are needed to supply some wind-heavy markets, said Michael Blaha, the principal analyst of North American power research for Wood Mackenzie Ltd. in Houston. “It makes it economically harder for fossil units because when the wind’s up, it’s going to start depressing prices,” he added.

Negative prices are starting to seep into a Southern California power hub and may become more frequent as state regulations mandate that 20 percent of its power come from renewable sources by 2020, Blaha said. “That extra amount is going to knock out about 15 percent” of energy filled by fossil fuels.

Exelon in Illinois

Exelon, the largest U.S. nuclear operator, says a surplus of wind power is making negative pricing a problem in Illinois, where it owns six nuclear plants and a wind project. Prices for markets served by Exelon’s Clinton and Quad Cities reactors trade below zero between 8 percent and 14 percent of off-peak hours, said Joseph Dominguez, Exelon’s senior vice-president for governmental and regulatory affairs and public policy.

Exelon cut its quarterly dividend for the first time Feb. 7, after reporting a 38 percent decline in fourth-quarter profit on lower power prices and higher nuclear fuel costs.

“Wind generators ignore that price signal in order to chase the federal tax credit,” Exelon’s Dominguez said in a telephone interview. “Everyone else that is producing electricity during that time period pays that negative $30 per megawatt-hour back to the system in the form of congestion charges.”

The market should remain “open and fair” even in the “very rare instances” when demand can’t support two low-cost sources like wind and nuclear, Gramlich of the wind trade group said. “Just because one was there first doesn’t mean they automatically get the right of way to operate 24-7.”

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