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Is Texas Writing the Book on Wind Power?

By **PETER BEHR** of [ClimateWire](#)

AUSTIN, Texas -- Feb. 28, 2010, was a banner day for Texas wind to set the clouds -- and electrons -- flying.

In the Panhandle, gusts reached 47 miles per hour and wind generators delivered a record 6,242 megawatts of power to Dallas, Austin and other population centers. At 1 p.m., 22 percent of all the electricity consumed in the Texas grid was coming from wind.

To proud Texans like Public Utility Commission Chairman Barry Smitherman, such records document the state's position as the "epicenter of land-based wind production" in the United States, if not the world, as the chairman put it.

At the end of 2009, the capacity of Texas wind turbines, reaching to the horizons of farm and prairie land, totaled 9,410 megawatts, well more than the combined total of the next three largest wind-power states, Iowa, California and Washington. Over the course of a year, wind power is providing 5 percent of Texas' demand, and that would more than double if the state's grid goals are achieved.

Is Texas the model for how expanding renewable generation and smart grid technologies could transform the nation's utility sector? Or is the ornery independence of the Texas grid a telling example of how regional differences confront the search for national policies on energy? Evidence for both cases jumps out from the Lone Star State.

It clearly is center stage displaying the engineering, industry and political challenges of a large-scale build-out of wind, as called for by President Obama and his party's leaders in Congress. "It is a laboratory, if you like, a pilot, a test case," says Gürcan Gülen, senior energy economist at the University of Texas, Austin.

The state's pioneering electricity deregulation statute in 1999 included, almost as an afterthought, a requirement that Texas develop 2,000 megawatts of wind power by 2009.

To prime the market, it created an energy trading program requiring power retailers to acquire -- and then retire -- renewable energy credits. Texas raced past that first renewable energy milestone in 2005, four years ahead of schedule, and is closing in on the new goal of 10,000 megawatts of renewable energy by 2025.

More than half the states now have renewable energy mandates or goals, but Texas was at the front of the pack.

Looking to Texas for answers

Deregulation in Texas has created competitive electricity markets at wholesale and retail levels that, while suffering some "tortuous" growing pains, as one expert put it, have invited innovation and experimentation. Millions of smart electric meters are being installed throughout the state. Austin is the site of the one of the nation's primary federal smart grid experiments, the Pecan Street Project, testing whether utilities can profitably switch from selling kilowatts to conserving them.

"We can bring new technologies very quickly into the market," said Warren Lasher, manager of system

assessment for ERCOT -- the Electric Reliability Council of Texas, the state's grid operator. "If all these things come together, we could see significant changes" in the state's electricity system, Lasher said.

"You can't cut and paste from Texas to California or Pennsylvania. But Texas stakeholders have spent a lot of time learning how to evolve our markets," said Texas energy consultant Mark Bruce.

Perhaps the state's most striking advance was the approval by the Public Utility Commission of Texas in 2005 of a plan to build a matrix of new transmission lines across west and central Texas to tap the full potential of its wind power. The commission is overseeing the \$5 billion construction of 2,300 miles of high-voltage lines into the wind zones. While some projects have been delayed by siting issues and court disputes, and the regulatory timetable is tight, the expansion is still headed for substantial completion by 2013 to 2015, experts say. Then the network will be able to handle up to 18,000 megawatts of wind power at peak output.

By contrast, federal policy on transmission is hogtied by regional conflicts over who pays for long-distance transmission lines for renewable energy, and local opposition to new lines and their skyscraping towers. In Texas, all customers bear a proportional share of the lines.

Grid operators who want to know how much wind or solar power the grid can handle look first to Texas for answers.

'The sons of bitches are trying to steal my lignite'

"I'm amazed," said Roger Duncan, until recently the general manager of Austin Energy, the municipal utility in Texas' capital. "I remember the discussion 10 years ago, when we first started talking about this. At our utility, the engineers were saying someday you might theoretically reach a point where you could get 20 percent of the grid powered by wind. But it would be very difficult to do; it would be decades away, and beyond 20 percent, you'd crash the whole grid. I don't want to say there aren't any problems, but they aren't nearly as intractable as they looked 10 years ago."

Blending wind energy, which literally changes with the fickle weather, is requiring steady advances in forecasting, control systems and wind turbine technology. ERCOT's consultant, GE Energy, concluded that up to 15,000 megawatts of wind power could be handled by the grid's current architecture, assuming power demand at 2008 levels. "At some point, you can't take any more wind," Lasher said, without significant changes in the grid. "We think there are off-the-shelf technologies that can solve all of the issues we face," Lasher added.

Whatever surprises lie ahead may show up first in Texas. "It's safe to say we have the most wind to deal with," said John Dumas, ERCOT's manager of operations planning. "We've dealt with things other people haven't seen yet."

Arguably, none of the Texas wind story would have been written, however, if the state had not essentially walled itself off from the rest of the nation's electricity networks in the New Deal. While electricity lines west and east of the Rockies are tied together as two synchronized generation systems, their power plants humming in close unison, two-thirds of Texas stands by itself. Today, that grid is managed by ERCOT.

When Congress put the Federal Power Commission in charge of all wholesale interstate electricity sales in 1935, Texas opted out and stayed out. In a storied pre-dawn episode one day in 1976, a Texas power company secretly rewired its lines near Wichita Falls, Texas, to a sister plant in Oklahoma in order to protect its status as an interstate holding company. But since it was connected to other Texas utilities, its action appeared to subject the entire industry suddenly to federal control. Texas might have to share its cheap coal-fired electricity with other states.

"The sons of bitches are trying to steal my lignite!" then-Texas Utilities Chairman Louis Austin bellowed,

as a former Texas Public Utility commissioner later recalled. After lengthy battles in courts, legislatures and regulatory councils, Texas' independence was preserved.

Wind has arrived: Just ask its opponents

Gülen and his colleagues were planning for an electric power policy conference in Washington earlier this year and were considering offering Texas as an example to the rest of the country.

"What people were telling us in Washington was, they didn't want to hear about it. They see Texas as an exception," he said.

A confluence of economic and political interests unique to Texas gave birth to the initial wind power mandate in 1999, Duncan said. "The western ranchers and farmers saw revenue opportunities. They are a strong power in the Legislature." Meanwhile, environmental organizations wanted wind power, and some urban lawmakers saw the hope of cheaper power, he said.

"There was strong leadership for it [in the Legislature]," said Texas state Sen. Kirk Watson (D-Austin). But many Texas lawmakers assumed the small renewable energy mandate wouldn't amount to anything.

In 2000, soon after the law took effect, wind power generators began offering long-term fixed-price contracts. That summer, the California energy crisis erupted, causing natural gas prices to triple -- along with electricity made with gas.

"Suddenly, all the big commercial customers said, 'Man, we can buy 10-year fixed price; we don't care where the hell it comes from,'" said Brewster McCracken, a former Austin City Council member who now heads the Pecan Street Project.

There is another way to measure the rising impact of wind power in Texas -- by tuning in to the opposition.

The state's powerful natural gas producers have mounted a campaign inside ERCOT to compel wind generators to share the costs of meeting reserve requirements -- the generation that has to be on hand to serve demand when wind isn't blowing -- and of maintaining a stable transmission network.

Lowering prices, but at a cost

Older wind turbines typically have not been equipped or designed to support voltage levels on power lines, a critical stability factor, and weren't required to provide that service. (New turbine designs can help keep frequency in line.)

A requirement that all wind generators retrofit their turbines to cover this issue would impose a heavy cost, wind developers say. So would a new requirement that assesses costs to wind generators when they can't run. The issues are being fought over now by industry factions on ERCOT's policy committees. Last month, the PUC tabled a measure on the issue, seeking further staff analysis.

The state's largest power generators say it's simple fairness: The wind industry should play by the same rules everyone else faces.

But wind is not currently playing by the same rules.

Wind generators can offer their electricity for bid into the Texas wholesale market at a zero price because they pay no fuel costs. At times, they even pay \$10 per megawatt-hour or more for buyers to take their power because they receive a \$20 per megawatt-hour federal production credit -- if they are running.

This lowers the wholesale price of electricity that all generators receive, in the way that the Texas market works, said Judy Chang, a principal at the Brattle Group consulting firm. (The capital costs of building the

wind farms get passed on through retail rates, Chang noted.)

With their lower prices, wind producers are pushing gas generators out of the market, Gülen said. "That's why gas plants are complaining," Chang said. "All the traditional resources are complaining."

Wind could not compete if it were not for the subsidies and tax credits wind generators receive, said University of Texas professor Ross Baldick. These transfers from taxpayers bring the cost of wind power down from about \$80 per megawatt-hour to \$50 or \$60, he said.

To the \$80 cost without subsidies he would add \$20 to \$30 more per megawatt-hour for the cost of additional transmission to the wind zones and for backup services required when wind isn't blowing. That takes the real price of wind power to more than \$100 a megawatt-hour.

"That is expensive compared to alternative approaches to reducing emissions," he said.

Texas law professor Drew Thornley made the same point in a 2008 paper for the conservative Texas Public Policy Foundation. "I am not anti-wind. I am anti-subsidy. We're throwing a ton of money at wind, but we're not getting the return from it," he said.

Baldick estimated that the United States would have to adopt a national climate policy imposing a price of \$30 per ton of greenhouse gas emissions before wind power can stand on its own economically -- a target that appears out of reach politically, at least for now.

"It's been great that we've developed so many gigawatts of wind in Texas. Now it's important for us to take a deep breath and reevaluate the policy goals we're trying to achieve," he said.

The next fight: generation growth

Bruce, the consultant who works for wind producers, said real fairness requires the calculation of all of wind power's benefits. These include its impact on reducing smog and acid rain components and mercury emissions, with their threat to wildlife and the food chain. Wind power reduces demand for water -- heavily used by conventional generators -- and that protects a resource particularly threatened in the Southwest.

The lessons learned from the Texas wind power story are also writing the first chapters for new energy policies that will be required when the climate threat becomes a political reality to Americans, wind proponents say.

"You can say, we have to buy more [grid] services because of wind, so OK, stick wind with the cost. You could also argue -- correctly -- that wind power provides benefits far above those costs," Bruce said.

"I don't think we know yet where to find consensus on this issue," said Bruce, who has represented wind producers on the issue. The majority on the ERCOT board "is taking a deep, hard look at this issue. There are more votes to come."

To Duncan, the struggle between gas and wind at the regulator's table has one simple message. "When they start fighting over the technical rules, you know wind has arrived, by golly."

"We're in the battle now between wind and natural gas for generation growth probably for at least the next decade" in Texas. "Both have pros and cons, and it will vary by region as to who wins," Duncan said.

It's another reason to keep an eye on Texas.

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