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LOCAL NEWS AND CULTURE

BLOW HARD

NEW MEXICO HAS PLENTY OF WIND TO SELL, BUT HOW WILL IT GET THERE FROM HERE?

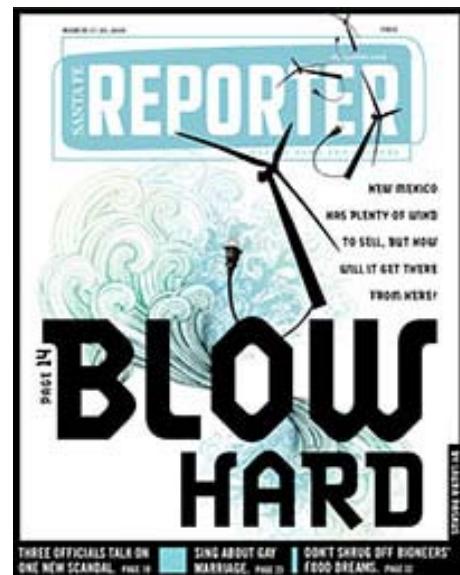
By: [Laura Paskus](#) 03/17/2010

Slicing across the eastern Plains, Interstate 40 runs just north of two of New Mexico's large wind farms. As dramatic as those stands of spinning turbines might seem, the view from the highway offers little in the way of true perspective.

Gaining an appreciation of their girth—and that quiet rush of physical power—takes pulling off the highway, winding down back roads. Only when standing close beneath a turbine is it possible to understand the immensity of those swinging blades.

A modern turbine's tower is enormous—big enough to house computer equipment and for technicians to climb inside to the nacelle, the square component at the top that houses the gear box, generator and control panels. There at the hub, the three 110-foot-long blades meet. There's also a door for technicians to exit toward the electrical components outside—outside at approximately 265 feet up in the air. And at the very top is an anemometer collecting the data that guides the hub to turn so the blades can best catch the wind.

“It's like a big robot,” John Hail Jr. says. Hail got his start in the wind industry at the 80-turbine wind farm in San Jon, NM, east of Tucumcari.



With a background in heavy equipment operations, Hail was working as the director of maintenance at a nursing home when he received a callback from San Jon's wind farm supervisor.



"I'd applied for the job because it was good money—I didn't have a clue about turbines," he says, laughing: "But I guess it was God's direction for me."

Now the director of the Wind Energy Technology Program at Mesalands Community College in Tucumcari, Hail doesn't romanticize the life of a wind farm technician: The work is physically demanding, but "we love our jobs, and they pay good money." Work in renewable energy and on wind farms, in particular, he says, is the "next gold rush, the next oil boom."

Hail isn't alone in believing clean energy like wind power could, even should, be New Mexico's biggest economic development opportunity.

Gov. Bill Richardson for many years has declared New Mexico the "clean energy state" and called for the export of electricity generated from renewable sources to large markets such as California.

Sounds good. But behind the hype, talk to any expert about future wind development in the state and it becomes clear there is one major problem:

Transmission lines are already at capacity.

It's easy to imagine that electricity from different sources flows through the lines, humming along to different tunes, depending on whether it's from a coal-fired or natural gas power plant or say, a wind farm or solar array.

Too bad that's not actually the case.

When thinking about how electricity from different sources travels through the grid, it's helpful to compare the system to a lake, Michael McDiarmid, a 20-plus-year veteran of the New Mexico Energy, Minerals and Natural Resources Department who initiated the state's wind power program 13 years ago, says. Ask anyone what is happening with wind development in New Mexico, and most defer to McDiarmid.

Imagine different streams feeding and draining a lake, and campers all around dipping their cups into the water.

"The electrical grid is like that," McDiarmid says. "It's fed by different streams—lines—and there are electrical feeders from different generators."

From any type of generating plant, the electricity needs a way to get to customers. Transmission lines run from the plant to larger lines—those humongous towers you might have compared with alien monsters as a kid—that deliver electricity to substations. Located closer to cities and large factories, substations distribute power toward individual customers and areas. The interconnected transmission lines that deliver electricity from multiple sources are typically referred to as the “grid.”

- **Owned by NextEra Energy Resources (formerly Florida Power and Light), the New Mexico Wind Energy Center near House, NM, was the third largest in the world when built. In recent years, New Mexico ranked within the top 10 for the number of installed megawatts from wind. Now, it stands at 16.**
- **Under the enacting legislation, three of New Mexico Renewable Energy Transmission Authority’s board members (nmreta.org) are appointed by the governor, one by the speaker of the House of Representatives and one by the president pro tempore of the Senate. The remaining three members include the state investment officer (or designee), the state treasurer (or designee) and the cabinet secretary for the Department of Energy, Minerals and Natural Resources.**
- **In addition to financing projects through bonds, RETA can offer a letter of support showing that the board has reviewed the project and believes its completion would benefit the state or the region as a whole. The developer can then use that letter of support to solicit input from other investors. The authority also can enter into what’s called a “memorandum of understanding” that pledges additional support to the project.**
- **There are environmental concerns when it comes to wind farms as well as transmission lines: The huge Altamont Pass Wind Farm near Livermore, Calif., was built in the 1970s along a bird migration route and atop a ridge—causing a regular slaughter of birds.**
- **The video, “New Mexico Catches the Wind,” can be viewed at the New Mexico Energy Conservation and Management Division [website](#)**

The challenge for wind farms is getting the electricity from those rural, out-of-the-way, windy-as-hell spots to the existing grid.

“Once in the grid, wind energy is just like electricity from other generators,” McDiarmid says.

Boosters of coal power point to how inexpensive that electricity is—approximately 4.8 to 5.5 cents per kilowatt hour—but McDiarmid counters that those older plants are already paid for, and they don’t meet many modern pollution-control requirements.

If new coal plants were built today, he says, they wouldn’t be as cheap. Construction costs would be much higher and developers would have to install equipment to control pollutants.

Wind power is “clean, domestic and inexhaustible,” and, McDiarmid says, economical. The cost of building a wind farm is comparable to building a coal-fired power plant. But, he adds, a wind farm can be built more quickly, and built of any size to suit the market and its electricity needs. Not only that, but there aren’t any concerns about fuel costs or how they might fluctuate in the coming years.

As for the issue of intermittency—the wind doesn't blow at a constant rate, and it doesn't always blow when demands for electricity are greatest, such as on hot summer afternoons—McDiarmid says it's not that big of a deal.

“We're not contemplating getting 100 percent of our electricity from wind—the electricity supply already includes a diverse portfolio,” he says. “When the wind doesn't blow, there is [generation from] natural gas, biomass, solar—and coal and nuclear will be in the mix for a while.”

Right now, McDiarmid says, the issue is transmission. The electrical grid has been neglected for some two decades—and was never designed for today's demands.

“People have been transmitting large volumes of electricity—and that's risky because the grid was not designed to do that,” he says. “It's the same kind of issue with renewables: There are a lot of resources, both wind and solar, but they are not necessarily close to where the load is.”

As far as load goes, New Mexico's small population doesn't use that much electricity. Even use in Albuquerque and Santa Fe pales in comparison with out-of-state markets. When New Mexicans talk about cultivating new sources of electricity, they're thinking about the maw to the west: Almost half of the electricity used in the entire western United States goes to California.

“The big wind resources run through the middle of the country—it's a huge resource—but not a lot of people live there, probably because it's too damn windy,” Ron Lehr, Western representative for the American Wind Energy Association, says. “So then you have to ask yourself: How do you get it to where the population is?”

There are a number of regional transmission projects in the planning stages. The proposed Tres Amigas superconductor project near Clovis would connect three power grids: the Eastern, Western and Texas grids. Likewise, the SunZia Southwest Transmission Project would create a new regional electric transmission line between southern New Mexico and southern Arizona, and the High Plains Express Transmission Project would tie grids together in Wyoming, Colorado, Arizona and New Mexico.

Regional grids allow variability to spread across a larger area, Lehr says. And a new study from the National Renewable Energy Laboratory shows that such an integration would benefit consumers:

“The lesson was that if you mix solar and wind across the territory, it becomes a more stable resource,” he says. “But that requires changes in how you operate.”

The real challenge is changing how markets operate in the West. Each utility supplies its own customers from its own resources, he says. Trading is not the focus.

He cites the example of moving electricity generated from a New Mexico wind farm to a market in Los Angeles, comparing it to moving wheat during feudal times: The seller stops at every

castle, pays a toll, faces off against robber barons.

In the case of electricity today, providers must pay a transmission fee to every utility they cross on the way to market.

“By the time it reaches California, there’s nothing left of it—the value has been taken out,” he says. “But you don’t have to have the market structured like that.”

Enron’s abuses of the market in California scared people off further discussions of trading on electrical markets, but there are plenty of examples of investor-owned utilities nationwide that operate their grids centrally, taking bids on power production.

Utilities are not particularly adaptable. Nor are they good at dealing with change—which is usually a good thing, Lehr says. Customers want utilities to be reliable and stable. But change is inevitable, he says. The fossil fuel resources that built the modern infrastructure—and cemented markets and mind-sets—aren’t going to last forever.

Innovation rarely occurs within institutions such as electrical utilities without government incentives. As the wind industry began to mature nationwide—wind farms were proving to be reliable, productive and economical—the state studied and monitored New Mexico’s wind potential, then made those maps and data available to developers.

Then in 2002, the state created a renewable energy production tax credit for wind and solar—offering developers a 1 cent per kilowatt hour tax credit. And in 2004, the Legislature passed the renewable portfolio standard, which created the requirement that utilities use alternative energy. (That law was also amended in 2007.)

But while nearby Colorado—whose wind farms are also concentrated east of the Rockies—has doubled its wind capacity in the past five years, New Mexico’s growth hasn’t been as dramatic, according to Craig Cox, executive director of the trade association Interwest Energy Alliance.

Again, the problem of transmission arises. And it’s a “chicken or the egg” problem: It’s difficult to build new wind farms without existing transmission lines, but it’s also hard to fund new transmission lines without new generating plants in the works.

“The most important issue is making sure stakeholders understand the importance of proactively developing new transmission capacity so we can build these resources for the future,” Cox says. “Once the economy revives, demand is going to grow again [for electricity] and we need to be ready.”

Cox notes that during a recession, demand for electricity tends to slack off; there’s simply not as much growth and demand, particularly in Sunbelt cities.

“With a strengthened economy and population growth, as well as international obligations [to cut carbon emissions], we’re going to need a lot more clean energy,” he says. “Wind energy is ready: We just need the proper infrastructure.”

That's where the New Mexico Renewable Energy Transmission Authority comes in. Created by the Legislature in 2007 at the urging of Gov. Bill Richardson, RETA is tasked with helping to finance and plan electrical transmission and storage projects in the state.

With three staff members and a volunteer board of directors, the authority can issue revenue bonds that finance renewable energy transmission projects—though only 30 percent of the electricity being transmitted must be from renewable sources.

RETA is one of seven transmission authorities in the United States, and it's the only one with a renewable mandate, Jeremy Turner, the authority's executive director, says.

Before being named the authority's second executive director, Turner spent almost nine years at the New Mexico Finance Authority, the only other state entity structured similarly to RETA.

Although RETA is held accountable by the Legislature's Financial Oversight Committee, both authorities were established by statute and, rather than reporting directly to the executive branch, they answer to—and have their budgets and bonds approved by—a board of directors.

“I do think New Mexico is well-poised, with our resources, to become an exporter of renewable power—we have probably 15 times the capacity in the state than we would ever use,” Turner says. “What that does is create an export market for us and, if we can do that, we can help stimulate development and help improve the economy in the state.”

But almost three years after its creation, RETA is still working on its first bond issue. With big green eyes that blink to punctuate a slow Wyoming drawl, Turner knocks softly on the conference table as he talks about the High Lonesome Mesa Wind Ranch.

That's a 100-megawatt wind development in the central part of the state. The 40-turbine wind farm came online last summer, and the project's parent company, Edison Mission Energy, is upgrading an existing transmission line from Willard to Belen. It already has a contract—or “power purchase agreement”—with Arizona Public Service to provide wind energy that will help that utility meet Arizona's own renewable portfolio standard.

“The plant is already in operation, and it's already generating electricity; upgrades on the line are already taking place and are expected to be finished by April,” Turner says. “Some future upgrades won't be completed until 2013—but this is different from other projects in that it's already there, and they're already using an existing line that just needs to be upgraded.”

And if all goes according to plan, RETA will be financing the project with a \$60 million bond.

RETA's bonds are different from municipal bonds, Turner explains, because they are not funded by state or municipal taxpayers. Instead, the authority uses the project's power purchase agreement—the legal and financial document between the wind farm and the buyer—to evaluate the plant's planned revenues. Then RETA issues a bond on the public trading market. Turner admits that while support for RETA was widespread, most people are watching this first bond issue closely—to see if the authority can actually pull it off.

“And we think we can, we’re getting close to that,” he says. Turner had hoped the final terms of the bond would be approved at the March 24 board meeting, but that’s not going to happen. However, he says, it will be wrapped up soon.

And once that first bond closes, he says, the authority will have a better idea of what kind of impact it can have on development in the state. It also won’t have to rely on cash from the general fund. If the High Lonesome Mesa bond goes through, RETA will stay afloat through June 2012.

Again, Turner taps the table. Softly. “Knock on wood.”

Even without the question of transmission, it can take a long time to develop a wind farm, from conception to actually building one can last five to 10 years, according to Jeremy Lewis, a clean energy specialist with the New Mexico Energy, Minerals and Natural Resources Department’s Energy Conservation and Management Division, who also coordinates the state’s Wind Working Group.

Tall and thin, with a commuter’s bike propped up against his office wall, Lewis is a former Peace Corps and AmeriCorps worker who focuses on everything from solar tax credits to clean fuels.

“It’s tricky,” he says. “It’s one thing to say, ‘It would be great to put a wind farm here,’ but it’s another thing to actually do it. It’s very complicated and there are a lot of policy and legal issues.”

The role of the working group is to bring together various stakeholders, ranging from lawyers, government representatives and large-scale developers to local business owners, regional planning organizations and concerned community members.

Phillip Box is one such community member: He’s a rancher and the board chairman of the Hudson/Revuelta Land Association. Using the successful model established by landowner associations in Wyoming, Box and others are working together to negotiate with developers and investors working on wind farms. All told, there are more than 20 landowner associations in the state focused on wind development. They have 2,000 members, he says, and represent approximately 2 million acres of private land in New Mexico.

As far as Box is concerned, farmers and ranchers should be on board with wind. Leasing land to wind farm developers, he says, offers farmers and ranchers additional income—something that can’t be taken for granted as farming and ranching communities struggle to stay afloat. Some landowners may even become co-owners of projects, he says, receiving royalties off the wind produced by turbines on their lands.

“Once they’re built, the cattle can graze underneath and there’s very little loss of usage of the land as far as ranging,” he says. “It’s just another revenue stream—and a lot of people are then able to hold onto their land and continue that lifestyle.”

Indeed, despite the limitations, the wind industry is already helping New Mexico's economy, Robb Hirsch, who owns the Santa Fe-based company Windforce, says. Wind farms create short-term construction jobs as well as long-term maintenance and operation positions. Revenue from the electricity generated helps rural counties develop their local economies, he says, and projects located on state trust lands create revenue for schools and hospitals.

Wind can still grow exponentially, Hirsch says—but only if the public collaborates and cooperates with the private sector.

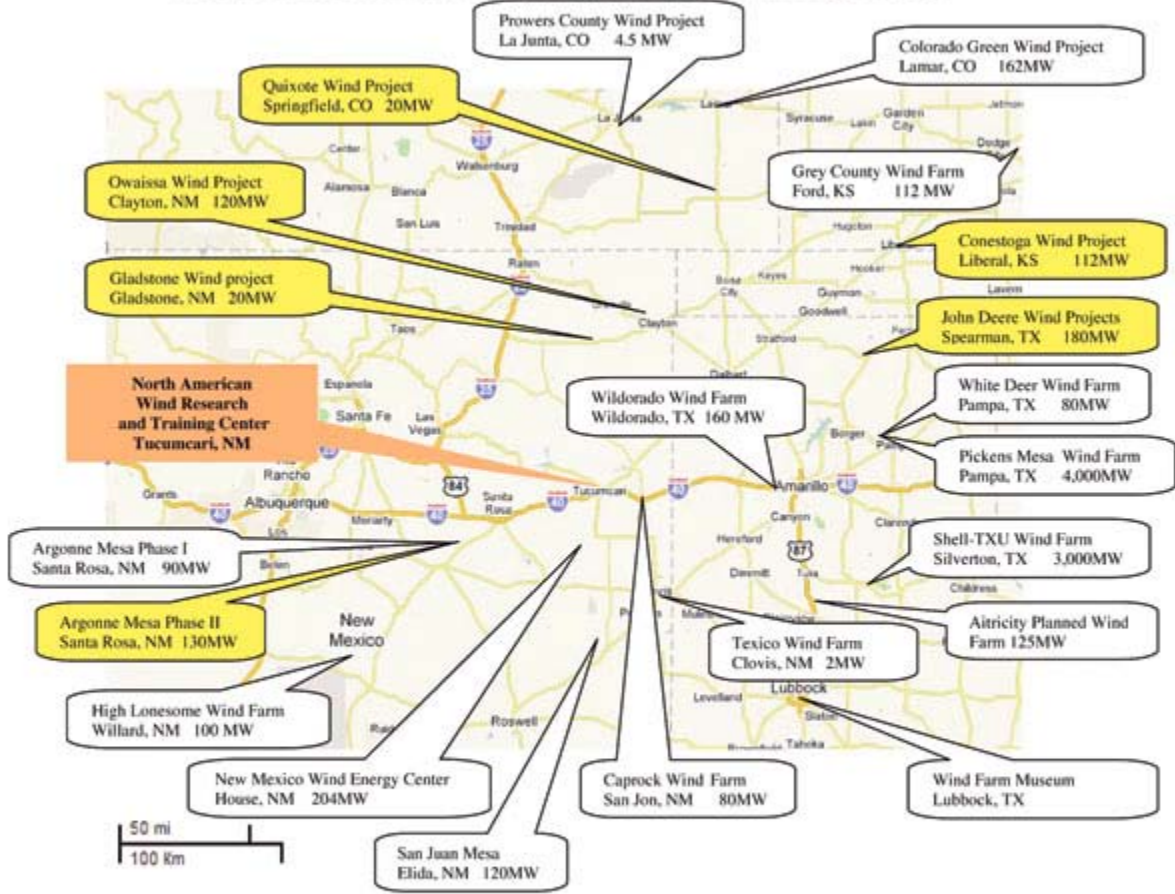
“If we continue to embrace conventional industry, the damage to the environment will be much more than from the renewable sources we're talking about,” Hirsch, who is also executive director of the nonprofit Climate Change Leadership Institute, says. “The bottom line is we have to do a lot of things differently.”

While national leadership flails, failing to rein in greenhouse gas emissions from the fossil fuel industry, set taxes or limits on carbon emissions, or even set up a cap-and-trade program, states must again take the lead on renewables—just as they did by setting statewide renewable portfolio standards.

“If we're going to sit and wait for an energy policy that's robust and responsible, we're going to be waiting a long time, and we'll be leaving the consequences on the backs of future generations,” Hirsch says.

“We as a state need to lead because we can take it to a whole other level,” he says. “There are opportunities right here in front of us, we just need to take advantage of them.” **SFR**

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