

Rural COOPERATIVES

USDA / Rural Development

November/December 2007

Wind Power Windfall for Rural America?

Page 4



Advanced technology enables Illinois electric co-op to tap into wind power

By Anne Mayberry
USDA Rural Development
Rural Utilities Programs

Driving across rural Illinois in December, the landscape is one of pale gold crop residue set against rich brown soil. But in one part of rural Pike County, Illinois, the landscape has changed dramatically. Now, towering 365 feet above the fields is a wind turbine erected by Illinois Rural Electric Cooperative (IREC).

Since it was installed in May, 2005, the turbine — Illinois' first — has been producing power at full capacity 30 percent of the time, depending on wind speed and frequency. This is in keeping with projections in the project feasibility study.

Many parts of the nation, including much of Illinois, were previously thought to lack the wind resources necessary for wind power. But wind turbine technology has improved greatly in recent years, with utility-scale turbines generating electricity at wind



Many parts of the nation previously thought to lack wind resources can now generate wind power, thanks to advances in turbine technology. This turbine was recently erected by the Illinois Rural Electric Cooperative (IREC). Photo courtesy IREC

speeds as low as six miles per hour.

“The new technology allows the turbines to operate at a lower wind speed, and that changes the equation of where they can be located,” says Sean Middleton, the co-op’s manager of engineering.

States such as North and South Dakota still have an advantage because the wind blows so much more there. “In the Dakotas, the 30 percent full capacity we see in Illinois would likely be closer to 40, 50 or even 60 percent capacity,” Middleton says.

But variability of wind can pose problems. Wind power is not classified as base-load power because it cannot be relied upon 24/7 to provide enough electric power to meet member needs.

USDA loan aids project

Wind power is among the fastest growing forms of renewable energy in the United States. It is also one of the lowest-cost, non-hydro sources of renewable power. Once a turbine is paid for, wind is essentially free fuel that produces no greenhouse gas emissions. With the increasing cost of fossil fuels and the low environmental impact of wind turbines, wind power is “the right thing to do,” Middleton says.

Illinois REC’s wind project was boosted by a \$1.3 million loan from USDA Rural Development’s Utilities Program. The wind project earned the co-op the Wind Cooperative of the Year honor from the U.S. Department of Energy in 2006.

The initial thrust for the wind project began with the co-op’s members. “We do annual surveys of our members, and one question asked whether we should explore involvement in alternative sources of energy,” Middleton says. “The answer was an overwhelming ‘Yes!’”

“Our next step was to see how we could make alternative energy sources work for us,” Middleton continues. “Cooperatives are good at managing



USDA provided a \$1.3 million loan for this Illinois turbine.

debt and have good relations with their communities and their members; these relations were assets that helped.”

As part of its feasibility study of wind power, co-op representatives attended a conference sponsored by the National Renewable Energy Laboratory, part of the U.S. Department of Energy. “We discovered that we had utility-grade wind right in our back yard,” Middleton recalls.

The next steps seemed to happen simultaneously. “All of this — member reaction to the survey, the wind conference and available funding resources — converged, and the result was the Pike County Wind Turbine Project.”

Reducing purchased power costs

“Wind power accomplishes two goals,” Middleton says. “First, integrating it into the power grid means Illinois Rural Electric Cooperative has to buy less power. It is also causing the co-op to look at the feasibility of power storage, which ultimately could result in another renewable energy project.”

Currently, the turbine generates 1.65 megawatts of power, enough to provide electricity to 500 homes. Wind levels in central Illinois could support as many as 100 turbines, Middleton says, which could add as much as \$7 million to the local tax base.

The co-op is looking at adding a few more turbines, but Middleton says any

large project would require contracts to sell the wind-generated power. Can it happen? Yes, he says, but there are no current plans to expand the co-op’s wind project.

The lack of transmission capacity is a major obstacle to increasing wind power. Utilities in the surrounding parts of the state are “not excited about wind farms, in part, because of the cost of moving this new power load around,” Middleton explains. Nonetheless, about 150 electric cooperative utilities across the country own wind facilities or have agreements in place to purchase wind power.

Another constraint to wind power is that some of the best wind sites are found in mountains and coastal areas, where turbine placement can cause scenic-impact concerns.

In Pike County, the overall community has always been supportive of the wind project, Middleton says. For the most part, the co-op managed to avoid the negative issues that sometimes arise from constituencies with conflicting goals. However, initially there were some critics, Middleton says. “The concerns focused on possible harm to birds and the noise issues. But those concerns did not materialize.”

The co-op’s wind turbine produces less sound than does an average household, in large part because new-model rotors now turn much more slowly than did rotors on older model turbines. The slower rotational speeds also reduce the risk to birds.

Since the turbine was installed, community support has been overwhelming. “People see the turbine up close, and that makes a difference,” Middleton says. “They love it. We’ve put in a small community park by it. We don’t have picnic tables yet, but we get families coming out to play, take pictures — just to visit. That might be the difference between people in cities and rural areas.” ■