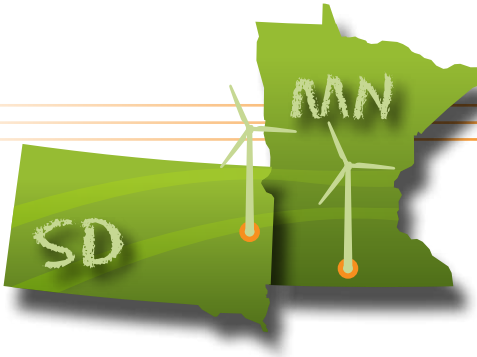
LANDOWNER news

IBERDROLA® RENEWABLES

Summer 2011 | Issue VIII

INSIDE THIS ISSUE:

New Midwest Projects Join Iberdrola Renewables Lineup



Iberdrola Renewables completed two wind projects in Minnesota and South Dakota that provided jobs and big economic boosts during the construction phase, and sent renewable energy to Midwest homes and businesses. Here's a closer look at these latest developments in the company's growing lineup of wind project locations:

ELM CREEK II

Elm Creek II wind project in southwestern Minnesota was completed in December 2010. The project, with 62 turbines and a 148.8 megawatt (MW) capacity, is the third developed (Trimont, 101 MW and Elm Creek I, 99 MW) in the immediate area under a unique partnership between Iberdrola Renewables and a group of area landowners who took responsibility to complete certain project development tasks.

During the peak of the construction process, more than 340 workers were on site. Elm Creek II provides direct, local benefits in the form of more than $1.5 million in annual taxes and direct payments to landowners.

"Minnesota has a great wind energy business climate and a strong wind resource," said Adam Sokolski, Iberdrola Renewables' Elm Creek II project developer. "Landowners are supportive of wind development, and the state's policies support a 25 percent by 2025 renewable electricity standard, a common-sense wind production tax and a rigorous, yet straight-forward site, permitting process."

BUFFALO RIDGE II

With its 210 MW capacity, Buffalo Ridge II, located in Brookings and Deuel Counties in eastern South Dakota, is the largest wind project built so far in the state. Buffalo Ridge II features 105 Gamesa 2 MW turbines and joins two other Iberdrola Renewables projects in the area (MinnDakota, 150 MW, and Buffalo Ridge I, 50 MW).

During the peak of construction, the project had more than 360 workers on-site, including electricians, heavy equipment operators, engineers, concrete technicians and steelworkers. The project provides a host of benefits to the neighboring communities, including in excess of $1.5 million annually in taxes and direct payments to participating landowners.

Iberdrola Renewables received tremendous support at the state and local government levels in South Dakota and credits the wind-friendly legislative environment with making the Buffalo Ridge II project a great success.

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Landowner Shows His Passion for Alternative Energy

They might live in different climates and time zones, but the Iberdrola Renewables family of landowners—nearly 5,000 strong reaching from California to Maine—have at least one thing in common: a high level of interest in renewable energy. For a few of these landowners, that interest has morphed into a way of life that includes undertaking several alternative energy projects on their own. Below is a story about one Iberdrola Renewables landowner and his own renewable energy project.

A TURN TOWARD SOLAR AND GEOTHERMAL

When Providence Heights (Bureau County, Illinois) landowner Farrell Lord was planning for his retirement, he set out some specific goals related to how he wanted to address energy use in the future: he wanted to minimize consumption as much as reasonably possible, explore all options for creating renewable energy, and maximize the benefits of the various programs available.

So began his journey into alternative energy. As he started building his new home near Metamora, Illinois, his first major decision was to install a geothermal HVAC system. In 2008, he was hosting two turbines on his family farm as part of the Providence Heights wind farm. The next year, as a result of tax benefits and incentives available at the time, he installed a 5 kilowatt (kW) solar photovoltaic, grid tie system at his home.

"Each of my energy-producing or energy-saving goals has had very large learning curves," Lord said. "Decisions made now will have to be lived with for years to come. Sometimes the information to make those decisions is not readily available. In most situations the people you are working with are key to making that decision and determining what the outcome will be."

For example, the geothermal system was installed by an established, reputable local family business and went smoothly. His experience with a larger company like Iberdrola Renewables was also positive. However, the solar vendor was new to the community, made many promises and commitments that were not fulfilled, and later closed its doors and fled the area. This left Lord to tinker with the system on his own to get it up and running. Currently, the solar project supplies approximately one-third of his annual electricity usage.

Have you undertaken a project of your own? If so, we would love to hear about it. Please write to Landowner News (see contact information on back page).

Understanding the Physics of Wind Power

On a technical level, wind power derives its benefits from a simple equation. Here's a more detailed look at how this equation works.

Power = $\frac{1}{2} * \rho * A * V^3$ is the equation that defines how much kinetic power (in watts) there is to extract from the wind blowing through the rotor area of a wind turbine.

(Continued...page 3)

Five Questions with Kevin Lynch

In the past two years, wind energy policy has moved substantially from offense to defense, according to Kevin Lynch, head of public policy and regulation for Iberdrola Renewables. While federal and state wind energy laws are well established, the alternative energy source needs its growth managed and promoted going forward. With 20 years of experience in the power business, Lynch works on the front lines of wind power policy across the country. Landowner News recently caught up with him to find out more about his job and how landowners can help promote future wind energy adoption.

LN: What's the view of wind energy from states and regulators?

Lynch: In general, policy makers from several standpoints view wind energy positively. One, it presents an opportunity for economic development and all the community benefits that come with it, including but not limited to jobs. Second, wind energy is a benign energy source: no emissions, no use of water and a small footprint on the ground. It is very often welcomed by policy makers in a local community. Third, it provides a diversification benefit in a utility's portfolio of energy supplies. Wind is viewed as predictably priced energy, free of the market volatility that fossil fuels face.

LN: How can landowners help in the public policy process?

Lynch: Landowners are an integral part of any project. Wind development is a collaborative endeavor. The stakes for a project are not just ours, but a shared interest. When legislators hear from the

landowners—who are voters—about policies that lead to new wind development, they often react more favorably than when they hear about them from the company's policy guy—me. The economic development story is told much more effectively from the person who is hosting the project.

LN: Do attitudes about wind power differ by region?

Lynch: It's difficult to broadly categorize one region against another, because the politics are more local than that. Generally speaking, we haven't found too many places where there is broad and deep resistance to developing wind. Landowners can help their own cause by being an advocate for the policies that promote renewable energy at the state and federal levels.

LN: What should potential wind farm landowners understand about policy work?

Lynch: The enthusiasm for hosting new wind energy development is high. A successful development is going to be helped by thoughtful siting, public outreach and a decision-making process that considers the interests of the local community. We find a lot of enthusiasm among elected officials for our projects when we have done a good job on the ground.

LN: What's a typical day like for you?

Lynch: No such thing as a typical day. My work changes quickly and is focused across a lot of different jurisdictions. I love my job. It's a great opportunity to work on policies that will grow an emerging set of technologies and modernize a very fundamental infrastructure that every American relies on.

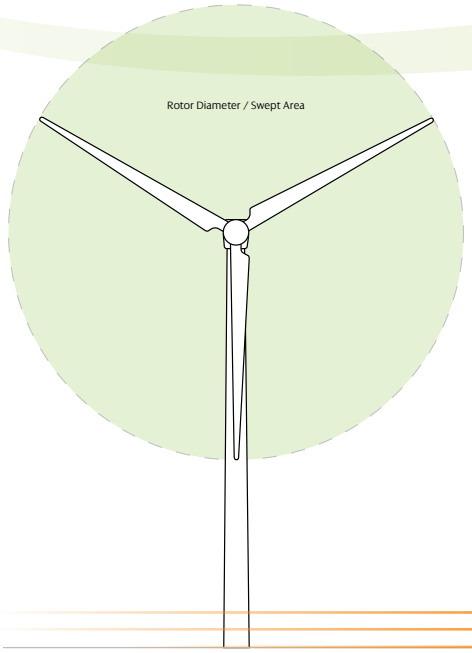
(Physics of Wind Power...continued)

To further define the variables for the power equation:
ρ = **air density**
A = the area of the circle made by the turbine rotor. Also known as πr^2 or $\pi d^2/4$
v = velocity of the wind

AIR DENSITY
A key point here is that what seems like empty space is actually full of air, and it has a certain mass. The movement of this mass can be captured to generate wind power. Air density is largely determined by elevation above sea level, though temperature has an effect too. 1.225 kg/m³ (kilograms per cubic meter) is the standard density found at sea level. This is equivalent to 2.1 pounds per cubic yard. As you move up in elevation, the density will drop and that can have an impact on how much energy is available for a wind farm to capture.

AREA is the size of the rotor disk or the swept area of the turbine. For an example, a 90-meter diameter rotor has an area equal to the following: (as a reminder: π=3.14)
$A = \pi * 45^2 = 6{,}358$ square meters = 68,000 square feet = 1.6 acres
This is a big "basket" that can capture the energy of a lot of moving air.

The square factor of the diameter of the wind turbine rotor explains the major technological trend in wind turbine design: longer blades. Gamesa now makes 2.0 MW wind turbines that come with 83, 87 or 90-meter rotor diameters. A 97-meter diameter should be available starting next year. The increase from 90 to 97 meters will increase the length of each blade by about 11.5 feet—a distance that may be hard to see from ground level. But the 97-meter rotor represents a basket that is 16 percent larger, with the potential to capture 16 percent more energy. This evolution of ever-longer blades is opening up more areas to wind development. Ten years ago, it was thought that Illinois did not have enough of a wind resource to support a wind energy industry. Today, there is more than 2,000 MW of wind power capacity installed.



VELOCITY is simply the speed at which the wind is blowing. Meteorologists usually use meters per second or knots, as the unit to describe wind speed. 1m/s is equal to about 2.24 miles per hour. In this equation, velocity is raised to the third power.

Now with the math on paper, you can see how wind velocity has an enormous impact on how much energy is available for a wind turbine to capture. Because the kinetic energy in the wind is a function of the cube of its velocity (velocity * velocity * velocity), a relatively small increase in velocity will have a dramatic impact on energy production.

Let's just look at a simple example:
4 * 4 * 4 = 64 8 * 8 * 8 = 512 512/64 = 8

Just by doubling the wind speed from 4 m/s (about 9 mph) to 8 m/s (about 18 mph), the wind will have eight times as much kinetic energy for a wind turbine to work with.

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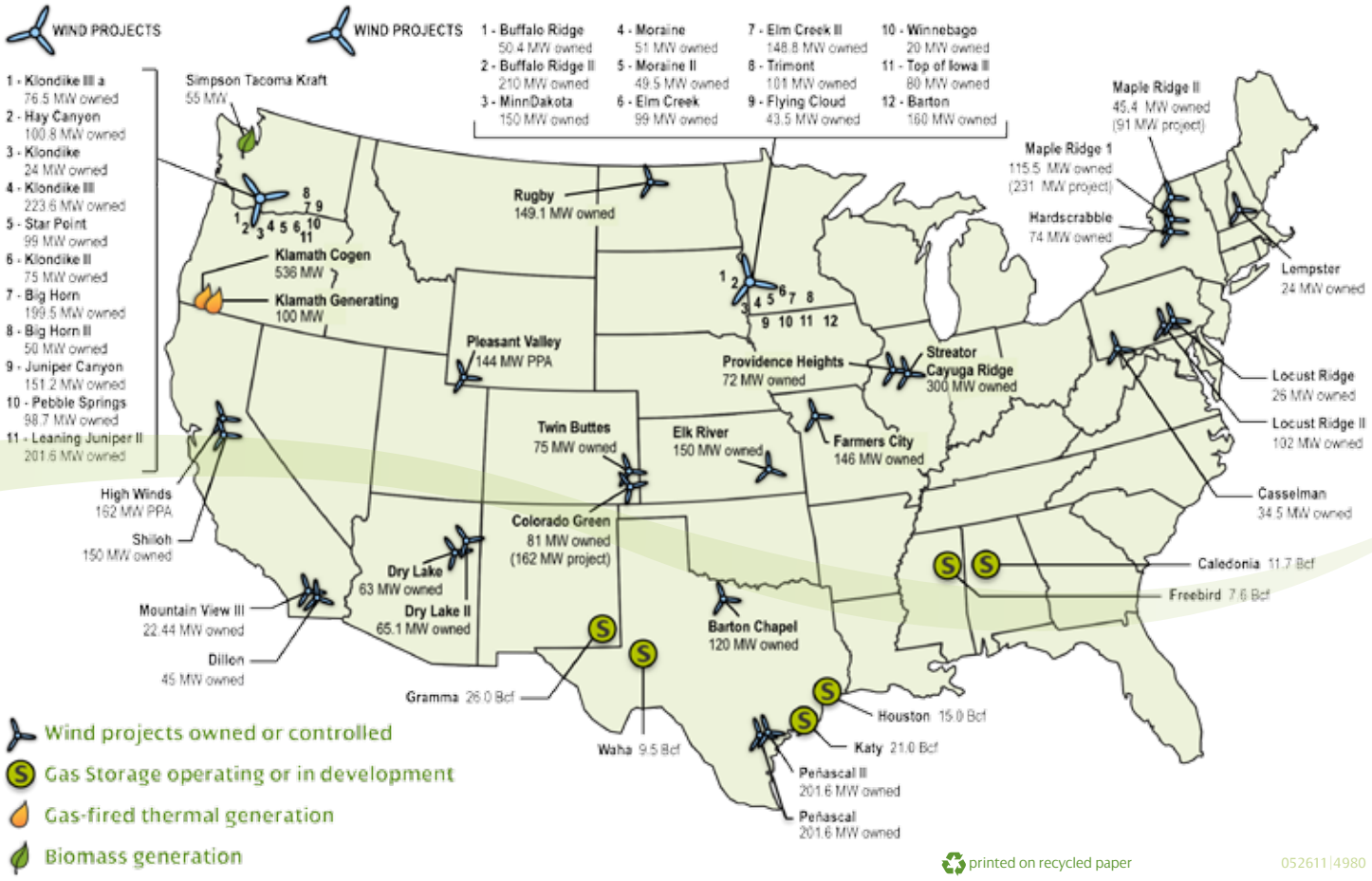

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Iberdrola Renewables develops and manages wind, gas storage, thermal and soon biomass and solar projects from coast to coast. Here's an inside look at our facilities and footprint in the country's renewable energy initiative.

Questions? Have a story to tell?

Questions or comments relating to Landowner News? Have a story to tell? Would you rather receive an electronic copy to save paper? We'd like to hear from you !

Contact Landowner News via email: dlitchfield@iberdrolaren.com or via regular mail: Landowner News, 110 N. Brockway St., Suite 340, Palatine, IL 60067

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