

## Understanding the Transmission Process

Of the many steps that go into developing a wind farm, connecting to the electrical grid is by far the most complex.

Understanding this process is key to grasping not only how Dakota Wind Energy is developed, but the development of any wind project. Timelines for building wind farms are often dictated by how long transmission interconnection will take. Dakota Wind Energy is well on its way along this process, however, as with anything, it takes time.

In fact, in today's current development climate, anywhere from three to seven years is an accurate estimate to procure interconnection. The question remains: why is this? The short answer is today's current power grid wasn't designed to effectively handle large injections of renewable energy, so we must make upgrades to ensure the system can work properly before moving forward to construct our projects.

The more involved perspective requires a closer look at who owns the transmission lines. We soon find out that no one company owns all of the lines; various utilities across the country own lines and for a wind project to transmit its electricity, it must submit a request to gain access.

The wind project doesn't submit this request to the utility but instead to an Independent System Operator (ISO) or a Regional Transmission Operator (RTO). These operators coordinate, control and monitor the operation of the electrical power system.

There are 8 existing ISO's in the US and 4 RTO's. Despite the 'ISO' in its name, the Midwest Independent System Operator was recently named

the nation's largest Regional Transmission Operator. The MISO is responsible for the constant availability of electricity to 13 Midwestern U.S. states and the Canadian Province of Manitoba.

Another RTO is the Western Area Power Administration (WAPA), whose area of responsibility includes a 15 state region in the Western half of the United States.

Dakota Wind Energy currently has two interconnection requests — one with MISO and one with WAPA.

The next step in the transmission process is a series of lengthy studies conducted by the transmission operator. Once the request is made, the wind project is placed in a queue that ultimately determines the order in which the project is studied.

Recent changes to study procedures have allowed projects that have reached certain development milestones to be studied first. These milestones include having all the landed needed for the project under lease and having a Power Purchase Agreement in place with a utility.

Four studies are carried out to establish in totality what impact the wind project's proposed injection of electricity will have on the grid's ability to work properly. The first analysis is a feasibility report to see if the project is economical or physically possible. Once this is verified, a system impact study analyzes what problems might occur if the wind project's electricity were infused into the power grid today, without any system improvements. The current electrical grid wasn't originally designed to have the capacity to carry large infusions of renewable energy and often needs to be

upgraded. Once these issues are identified, the next analysis, the facility study, outlines mitigation procedures and necessary "fixes" that must be made, interconnection timelines, along with their cost detail. This often includes building new lines or upgrading old ones. The final step is the signing of the Interconnection Agreement, which outlines who pays for what and ultimately bestows the "green light" for the wind farm's grid interconnection and proceeding construction.

Again, this transmission process is one of the most crucial parts of wind farm development and also, one of the most time-consuming. Without transmission, a wind project's electricity will have no place to go.

Dakota Wind Energy is currently waiting for its System Impact Study in both MISO & WAPA.

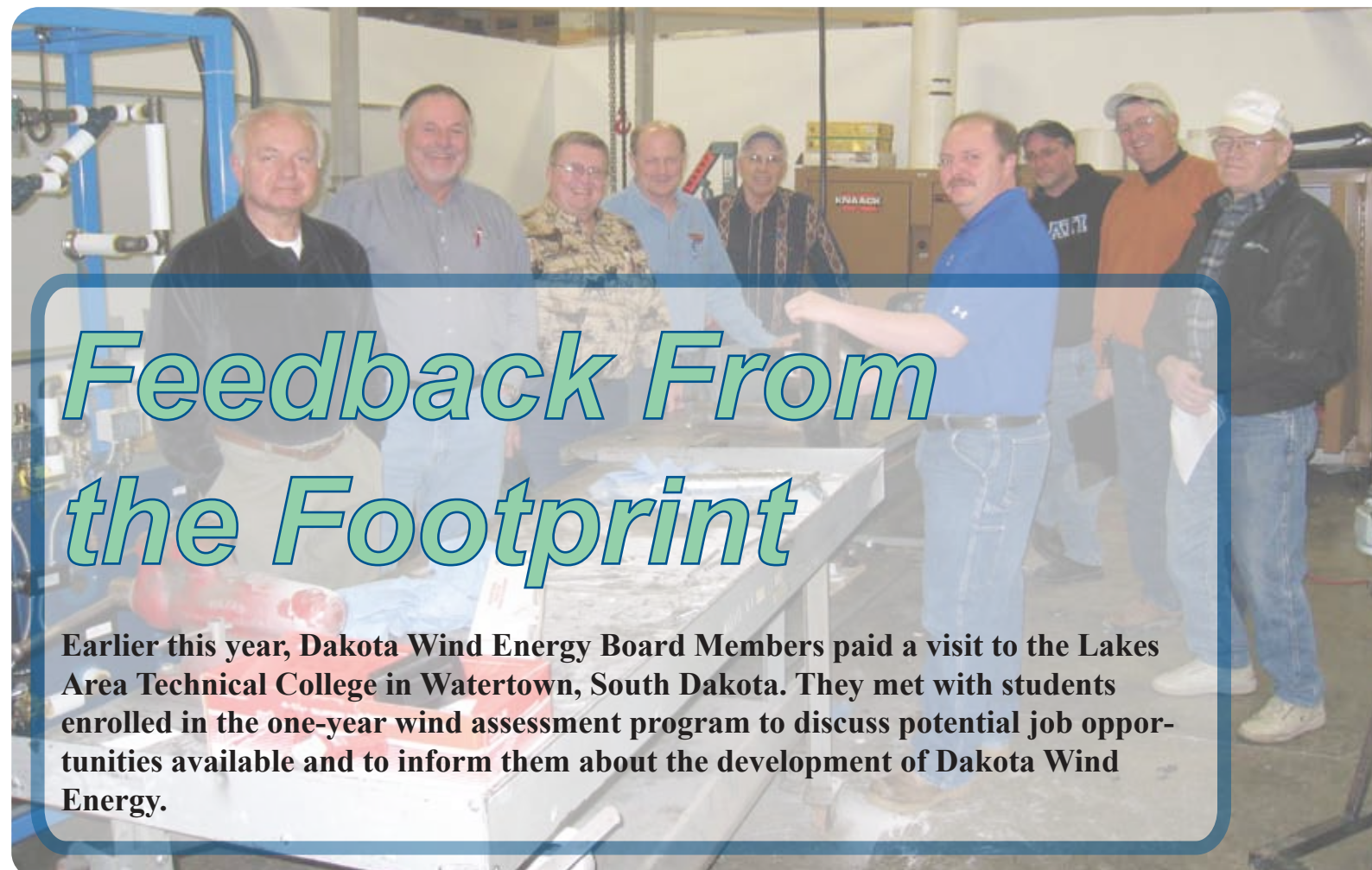
The key to wind industry growth obviously lies in constructing more interconnected high-voltage transmission lines across the country, similar to how the interstate highway system got its start. There are many regional and private initiatives to build more lines and identify transmission solutions: CapX2020, ITC's 3000 mile Green Power Express, the Upper Midwest Transmission Development Initiative, and the strong advocacy work being done by Wind on the Wires.

However, it will take a government-aided approach to oversee placement and cost allocation of such a large undertaking. Current stimulus act legislation will assist the Federal Energy Regulatory Commission (FERC), is analyzing the best ways to tackle developing such an infrastructure.



## DAKOTA WIND ENERGY UPDATE

FALL 2009 NEWSLETTER



## Feedback From the Footprint

Earlier this year, Dakota Wind Energy Board Members paid a visit to the Lakes Area Technical College in Watertown, South Dakota. They met with students enrolled in the one-year wind assessment program to discuss potential job opportunities available and to inform them about the development of Dakota Wind Energy.

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### Greetings From Your Board of Advisors and National Wind!

On behalf of Dakota Wind Energy's Board of Advisors and National Wind, we are proud to provide this exciting news and project update. 2009 has proved a challenging year for the wind industry, however, the signing of Obama's stimulus package has facilitated the usage of many grants and loans to finance wind projects. Also, the potential for a National Renewable Portfolio Standard of 25% by 2025 will help provide long-term incentive for renewable energy production and

installation. The most compelling news of 2009 for Dakota Wind Energy is that as of July 2009, the project now has complete site-control for its first 2 planned phases. The project also has completed a one-year on-site wind speed assessment, revealing some of the best wind speeds in the country. Having wrapped up both of these critical milestones, we now have excellent marketing potential for working with utilities and financiers.

The South Dakota Wind Energy Association and the South Dakota

Public Utilities Commission are working to help increase the state's wind energy production capacity over the next several years. They are reporting that wind energy production in South Dakota could easily double over the next year. The groups are also advocating for policies that support more state-wide transmission construction.

Read on to find out more details about Dakota Wind Energy's efforts and wind energy efforts statewide and across the country.



### Dakota Wind Energy, A 2009 Progress Update By Ben Kerl, Senior Wind Developer, National Wind

The month of January 2008 commenced the development of South Dakota's largest community-owned wind farm project, Dakota Wind Energy.

As development activities continue nearly two years on, we want to make sure the community is aware of our progress and our continued dedication and commitment to wind energy in Day, Roberts and Marshall Counties.

The process started with 21 local South Dakota community members, partnering with the nation's largest community developer, National Wind, to build a 750 megawatt wind facility in the three-county area. Eight of these 21 founders sit on a local advisory board, namely, Blair Healy, Donald Erickson, Walt Johnson, Dennis Fagerland, Curtis Samson, Don Ogren, Bob Metz and Gerry Fisher.

The primary goal of this board is to assure development activities are in alignment with landowners interests, making the advisory board a key component of our community wind model. Regular meetings between National Wind and the board have taken place since January 2008 to transparently discuss project progress and address board concerns in a timely manner.

Along with the advisory board, two local field specialists, Charlie Kraemer and Pete Karlsson helped sign landowners to participate in Dakota Wind Energy. To develop a 750 megawatt project, nearly 75,000 acres of land is needed. To date, we have signed just over 60,000 acres, enough land to develop at least 500 megawatts.

Reaching this milestone not only speaks to the dedication of our field team, but to the strong local support and interest in community wind energy. Completing this crucial landmark makes our project a very viable option for area utilities. Utilities like to work with community

projects because they know significant local support is important to getting a project permitted and completed. Dakota Wind Energy is exploring several options in this regard.

In July 2009 we accomplished another key development objective: obtaining one year's worth of wind energy data from the three meteorological towers in the field. This data revealed some of the best wind speeds in the country. Please see the adjacent article for more information on what this means for Dakota Wind Energy.

Of course, the greatest benefit of our community model is that a large portion of the wind farm's profit's will be kept in the community. A 2006 study by the University of Minnesota Morris compared the benefits of corporate-owned (developer or utility-owned) wind energy with that of community wind. It found that community-owned wind projects have 5 times the local economic impact when compared to traditional corporate owned wind farm development.

Community wind is also known to create more local jobs than corporate-owned projects. A 2009 study conducted by the National Renewable Energy Laboratory, found that community wind's construction-period employment impacts are 1.1 to 1.3 times higher and operations-period impacts are 1.1 to 2.8 times higher than corporate-owned projects. This is generally because we try and utilize as many local firms as we can during the construction process and operations period.

Dakota Wind Energy, therefore, has a very bright future in regards to local economic benefits and job creation. With completion of site control and its 1-year wind study, the project proves it has the local support and wind speeds necessary to move forward efficiently. Current development activities include working through transmission interconnection timelines, which involve a complex process of studies.

Obtaining an interconnection agreement to transmit wind energy on the power grid is one of the last development objectives. Current projections for this set the first wind facility installation to occur in the next 3-5 years. Our development team has a lot work ahead of them, but we are on track and dedicated to making a viable economic and clean energy contribution to the three-county area.

### SD Wind Facts

- 187 megawatts installed by end of 2008, up from 91 megawatts in 2007

- Currently 288 megawatts installed, up over a 100 megawatts from last year already

- SD Public Utilities Commission predicts that the state could easily double wind installations in 2010, with a billion dollar investment possible over the next two and a half years

- More than 550 million dollars has already been invested in wind energy in SD

- More than 1,000 people are currently employed in the wind power industry in SD

Source: SD PUC and the South Dakota Wind Energy Association.

### What Wind Assessments Mean for Dakota Wind Energy's Development by Kevin Romuld, President National Wind Assessments

Dakota Wind Met Tower Installation, 2008



Wind assessment is one of the most fundamental components of wind farm development. It is essential to determining overall wind facility profitability and providing an accurate estimation of energy production.

The industry recommends collecting at least one year of on-site wind data for commercial development in order to accurately predict the potential benefits of a wind power installation. Dakota Wind Energy has recently reached this crucial milestone, opening the door for further progress.

Financing sources and utilities require validated energy production and revenue estimates before they even consider participating in a wind project, so having this information readily available is important for Dakota Wind Energy. In fact, it has been documented that a 10% difference in wind speed makes about a 33% change in power outputs. Accuracy, therefore, is essential. Already the one-year analysis indicates that Dakota Wind Energy's wind regime is one of the best in the country.

Collecting on-site data requires the installation of measuring equipment designed to amass wind data at a height of at least 40-60 meters, in what is referred to as a wind data acquisition program. National Wind Assessments, a well-recognized and experi-

enced wind resource analysis firm, is conducting the wind acquisition program for Dakota Wind Energy and many other projects across the country.

This equipment, known as meteorological towers, are temporary, monopole towers supported by guy wires sited and installed near the spots of the proposed turbines. Multiple towers are usually needed for larger projects in order to design the optimal wind turbine layout.

Dakota Wind Energy has three meteorological towers installed, two in Marshall County and one in Roberts County. The National Wind Assessment team installed all three meteorological towers in 2008.

The met towers are equipped with high-tech measurement instruments, including anemometers and direction vanes which measure wind speed and wind direction, respectively. It is recommended to have anemometers at three different heights on the tower. Two anemometers located at the same height document a good cross section of the wind and provide redundancy in case one anemometer stops working.

The instruments report this wind information to a data logger, located at the base of the tower. This data is sent via a low-voltage electrical signal that records to memory

ten-minute averages of speed and direction. In the case of the National Wind Assessment met towers, the loggers are equipped with the most advanced transmitting capabilities. This means that the towers have internal cell phones that send this data to a computer modem, making the information available instantly to the National Wind Assessment team.

One year of data is a healthy representation of the on-site wind speeds and direction across seasonal changes. Now, a comparison with long-term weather over the course of ten years is needed. This comparison helps determine whether the short-term data represents a low, medium, or high wind year, and allows for the appropriate energy production adjustments.

Our overall goal is to not only utilize the wind data to ensure the financial productivity of the wind farm, but to use it appropriately to design a wind farm that meets the needs of landowners. We want to be as honest and open and possible to help everybody better understand this process.

After all, this is your community-owned wind farm development and we want to do it right.

### Federal Government Distributes Over One Billion Dollars to Help Finance Wind Projects

Signed into law February 2009, Obama's American Reinvestment and Recovery Act (ARRA) provides additional resources to help fund renewable energy projects. This funding hopes to double U.S. renewable energy production over the next three years, creating countless jobs.

The application process for one funding method, cash grants, began August 1st, 2009 and by Sept 1st, the U.S. Department of Treasury delivered over \$500 million to 12 renewable energy projects across the country. Ten of the 12 were wind

energy developments. On September 22nd a second round of grants distributed \$550 million to renewable projects, \$464 million going to 5 wind projects. Nearly \$3 billion is expected to be distributed to support \$10-14 billion in projects.

Qualified projects are eligible for a cash grant equal to 30% of the project's property costs. To qualify for the funds, the renewable energy facility in question must begin construction before 2010 and be placed in service before the year 2013. Payment of the grants will be made within 60 days of receiving a completed

application or the date the project is completed. Hundreds of wind projects are expected to apply for and benefit from the grants.

The grants are designed to temporarily replace the production tax credit (PTC) that has been a major factor in the continued growth in wind and other renewable energy projects. The recession and the freeze in the credit markets of the last couple years rendered the PTC much less useful as an investment incentive.