Wind Development in South Dakota:

A Status Update for Legislators

By the South Dakota Public Utilities Commission
December 18, 2009

Wind development has come a long way in South Dakota since the first major wind farm was built in 2003. That project went up as a result of a property tax break for wind turbines passed by the state Legislature the same year. In 2008, the Legislature again changed the tax structure for wind turbines, keeping the state's tax structure competitive with our neighbors to assure continued development. Although the Legislature has been friendly to developers, it has not been at the expense of South Dakotans. In 1996, the Legislature kept wind rights tied to the land and stopped speculators from tying up land for long periods of time. All in all, the Legislature has been a driving force in creating South Dakota's current development landscape and will continue to be. With that in mind, this document is intended to update legislators on what that landscape currently looks like.

Brief History

Wind power has been used to grind grain and pump water for thousands of years but didn't begin generating electricity until the 20th century. Once fossil fuels became the cheap, reliable alternative, wind power was used only in remote locations. From 1850 to 1970, millions of small wind turbines, mainly used for pumping water, were installed in rural America. It wasn't until the Arab Oil Embargo of the 1970s and resulting oil crisis that wind power's domestic benefits were realized. The research and development that resulted from that event essentially brought the technology to where it is today. As costs continued to drop, wind's environmental and sustainable benefits pushed its continuing popularity in the 1990s, and the plight of climate change in the 21st century made it the most developed renewable energy source.

Wind Development in South Dakota

The state's first large-scale wind farm was constructed in 2003 near Highmore. The 27-turbine, 40.5 megawatt (MW) project was built by FPL Energy (now NextEra Energy) with the power sold to Basin Electric Power Cooperative and East River Electric Power Cooperative. Following that development, there was a long dry spell. Finally, in 2006, PPM (now Iberdrola) began developing the southern tip of the Buffalo Ridge area in South Dakota, just east of Brookings. The company built the Minn-Dakota Wind Farm (54 MW) in 2007, followed by Buffalo Ridge I (50.4 MW) in 2009 and recently started construction on Buffalo Ridge II (210 MW). In Day County, NextEra Energy has also begun construction on a 99 MW project. The Coteau des Prairies land formation, which runs from northwestern Iowa, through southwestern Minnesota (known there as the Buffalo Ridge), eastern South Dakota and up into North Dakota, sits in a great wind resource and, more importantly in South Dakota, close to transmission and a market for power. Most of this 200-mile ridge has been leased by developers and will likely be developed in the near term, granted there is enough transmission to export the power.

The Coteau des Prairies/Buffalo Ridge has not been the only location in South Dakota developed for wind energy production; other developers have found niche areas in the state. Spanish developer Acciona built Tatanka I in 2008 near Long Lake on a ridge that dips down from North

Dakota. This 180 MW project straddles the North Dakota-South Dakota border, with 88.5 MW on the South Dakota side along with a maintenance facility and a transmission substation. The ridges west of the James River Valley have also seen some development including the previously mentioned South Dakota Wind Energy Center near Highmore as well as the newer Wessington Springs Wind Farm (51 MW), built by Babcock & Brown in 2009, and Titan I (25 MW) near Ree Heights, developed by BP Alternative Energy and launched in December of 2009.

Large-scale wind farms, although typically the most economical, have not been the only wind development in South Dakota. Both small residential and older, rebuilt larger turbines have been installed recently in South Dakota. As some of this country's original wind farms are updated, many of the older turbines are being rebuilt and sold, some destined for South Dakota. With federal tax incentives increasing during the last two years, residential turbines have become very popular. Resalers are popping up throughout South Dakota. The number of 2 to 10 kW turbines installed have been too numerous for the PUC to accurately track. The Wind for Schools program is an excellent example of small-scale wind development. You can find more information about that program at wac.sdwind.org.

The following is a comprehensive list chronicling large-scale wind projects in South Dakota:

Year	Name	Location	Size	Developer	Purchaser
2001	Howard Turbines	Near Howard	216 kW	MCCR & City of Howard	City of Howard
2001	Chamberlain Wind Project	Near Chamberlain	2.6 MW	Crown Butte Wind Power	Basin Electric/East River Electric
2002	Gary Wind Energy Project	Gary	90 kW	EMS	EMS
2002	Canova Turbine	Near Canova	108 kW	MCCR & City of Canova	City of Canova
2003	Alex Little Soldier Wind Turbine	Near Rosebud Casino	750 kW	Native Energy & DISGEN	East River Electric
2003	Carthage Turbine	Near Carthage	108 kW	MCCR & City of Carthage	City of Carthage
2003	South Dakota Wind Energy Center	Near Highmore	40.5 MW	FPL Energy	Basin Electric
2006	Oaklane Colony	Near Alexandria	160 kW	Oaklane Colony	Oaklane Colony
2007	Minn-Dakota Wind Farm	Brookings County	54 MW	PPM Energy	Xcel Energy
2008	Tatanka I	Near Long Lake	88.5 MW	Acciona Energy	Merchant
2008	Sisseton Wahpeton Community College	SWCC	130 kW	SWCC and USDA	SWCC
2009	Wessington Springs Wind Project	Wessington Springs	51 MW	Babcock & Brown	Heartland Consumers Power District
2009	Buffalo Ridge I	Brookings County	50.4 MW	Iberdrola Renewables	Northern Indiana Public Service Company
2009	Titan I	Near Ree Heights	25 MW	Clipper Wind & BP Alternative Energy	NorthWestern Energy

Future Development

The last two years have been very exciting for wind development in South Dakota, with the state moving from 40 MW to over 300 MW during that time. Next year looks to be even more promising. At this point, it looks like our development will double next year to 600 MW. Beyond these projects, however, development is likely to get more difficult. With 600 MW of wind

generation, we are nearing 30 percent of our peak load of just more than 2000 MW. At this level of wind integration, we are nearing the limits of what the transmission system can handle without extensive upgrades.

The following is a comprehensive list of wind projects at late stages of development:

Year	Name	Location	Size	Developer	Status
2010?	Buffalo Ridge II	Brookings & Deuel counties	210 MW	Iberdrola Renewables	Under Construction
2010?	Day County Project	Day County	99 MW	NextEra Energy	Under Construction
2011?	Crow Lake Wind	Near Crow Lake	151.5 MW	Basin Electric	Permitting

Issues Affecting Development

There has been much speculation about what is needed to drive more development in the state. A successful wind project has three basic requirements that make everything else fall in place: wind resource, a buyer for the electricity and transmission to get it from the wind turbines to the load. South Dakota really has only one of those three to offer: the wind resource. Most of the exporting transmission is filling to capacity and electric load in South Dakota is not large enough to take on very much more wind. As such, large wind's future in South Dakota is dependent on the ability to export it to larger markets.

That ability to export electricity lies solely on the expansion of high voltage transmission lines, mostly to eastern markets such as Minneapolis and Chicago. As utilities serving states to the east of South Dakota are required to buy more renewable energy to meet their states' requirements, the lowest cost power is likely to come from wind projects in the Dakotas. The two main barriers to developing those transmission lines are cost allocation and siting. Traditional cost allocation formulas recover transmission costs from customers within the geographic area that transmission is built. Without any changes, South Dakotans would end up paying for the transmission moving wind power to eastern customers. Everyone agrees the cost allocation formulas need to change; it's simply a question of what method is the most equitable. Although siting has not been as much of a concern in South Dakota, it's nearly impossible to build transmission lines through Minnesota, especially if there are no benefits attached for the landowner (e.g. wind turbine payments that will go to landowners in South Dakota). Siting new, high voltage transmission lines is a process that will take years but cannot start until the cost allocation formulas have been decided. South Dakota will not come anywhere near its real wind development potential until states in the region solve these two issues.