Net Metering

Net metering is a policy in which a utility must purchase power generated by its customer at the same retail price it sells electricity to the customer. It is typically used as an incentive for customers who install renewable energy systems, such as wind turbines. Net metering was first considered as a result of the Public Utility Regulatory Policies Act of 1978. South Dakota's policymakers debated it and chose not to implement net metering at that time. The South Dakota Legislature has considered this issue a number of times and concluded mandatory net metering is not in the public interest.

The reason net metering has not been adopted is the utility would be forced to pay the generator far above the market cost of generation. Further, the utility would not be able to schedule the generation of the electricity and it would be worth even less than the electricity they are already buying for a lower price.

Retail electricity rates are based on the cost of generation as well as the cost of distribution and transmission facilities. Thus, if utilities must pay above market rates for substandard power, rates will eventually have to go up to cover their increased expenses. The increased rates will have the largest effect on low income customers, who would not be able to afford the upfront costs of renewable energy systems in the first place.

Small generators do have an opportunity to sell power to their utility without net metering. The purchase price the utility pays must reflect the value of the generation and is regulated by the Federal Energy Regulatory Commission. It does not include the costs of transmission, distribution, overhead and other costs of providing electrical service that are included in net-metered rates. All electric utilities regulated by the PUC are obligated to interconnect with and purchase power from small wind facilities if the generator desires and agrees to the terms.

Rates paid to small generators by investor-owned electric utilities must be filed with the PUC. This transparency allows the producer to easily review and compare rates to make an informed decision regarding the economics of a small renewable power facility.

7/2011

SouthDakota

Wind Energy

South Dakota
Public Utilities Commission

500 E. Capitol Ave.
Pierre, SD 57501

(605) 773-3201
www.PUC.SD.gov
wind@state.sd.us

www.SDWind.com

The South Dakota Public Utilities Commission produced this booklet to help you become more informed about wind energy and what it means to our state's economy, environment and energy mix.

The PUC's role in wind energy development is regulation and education. The PUC has siting authority for wind farms with a capacity of 100 megawatts or more. Smaller wind projects are not regulated by the commission. The PUC provides information on its Web sites, www.PUC.SD.gov and www.SDWind.com, and through other sources to help South Dakotans understand the opportunities and obstacles regarding wind energy use and development. It is necessary to have accurate information to make responsible and wise economic and environmental decisions.

The Resource

South Dakota ranks in the top five states for wind energy potential. In a recent study, South Dakota was estimated to have the potential to produce more than 3 million gigawatt-hours of energy on annual basis. If this entire wind energy potential of South Dakota was harnessed, it would be nearly enough to provide power for the entire United States. While it is not feasible to harness every breeze, wind farms in the state have reported higher than industry standard capacity factors, which means the quality of South Dakota wind is high. A wind resource map at www.SDWind.com shows how the wind is classified throughout South Dakota.

South Dakota's Wind Resource Assessment Network, a series of instrument stations across South Dakota, is a tool for analyzing wind. The WRAN collects data about wind speed and variability at sites near Belle Fourche, Faith, Martin, Murdo, Gettysburg, Fort Thompson, Medicine Butte, Leola, Crow Lake, Crandall and Summit. Researchers from South Dakota State University analyze the information to predict maximum capacity factors for potential wind turbines. This information is especially valuable to researchers, residents and developers interested in selecting sites for wind energy facilities.

Neighboring States

South Dakotans often ask why our state does not develop wind energy at the same pace as other states. Folks may see wind farms next door in Minnesota or hear news reports of California's rebate programs for renewable energy systems. When making comparisons to other states, an important consideration is the differences between South Dakota and its counterparts. For example, both Minnesota and California have larger populations, more energy use and new energy needs, and more state government-collected taxes and funds than South Dakota. The population and growth drives the demand for new energy in those states and the taxes fund incentives to companies and individuals with renewable energy systems.

Small Wind Systems

South Dakotans who want to install a small wind system to provide power to their home or other facility should consider these points:

Need – Determine the practicality of having a wind system. It may be worth investigating if your property has a good wind resource, is located on at least one acre of land, if your local zoning codes or covenants allow wind turbines, if your average electricity bills are $150 per month or more, and if you are comfortable with long-term investments.

Cost – A residential turbine costs about $3,000 to $5,000 for every kilowatt of generating capacity, according to the American Wind Energy Association. AWEA estimates that a typical home wind system (10kW) costs $40,000 to build. Other factors affecting cost are maintenance, connection and payments to a utility provider for when the wind doesn't blow, insurance, etc. AWEA advises that after 10 years, blades or bearings may need to be replaced, but with proper care, a machine should last up to 20 years.

Incentives

There are several incentives that favor wind development. See a complete listing of incentives at www.dsireusa.org.

Federal Incentive

- The Federal Production Tax Credit, enacted in 1994, provides a 2-cent per kilowatt credit, adjusted periodically for inflation, for electricity produced from a wind farm during the first 10 years of operation. For example, if a wind energy project can produce electricity at 6.5 cents per kilowatt before the PTC, the PTC of 2 cents reduces the cost to 4.5 cents – which is about a 30 percent reduction. The PTC expires at the end of 2012. The American Recovery and Reinvestment Act of 2009 allows for the substitution of a Renewable Energy Grant of 30 percent rather than the PTC. This expires at the end of 2011.

State Incentives (year enacted)

- 2003: Wind turbines or blades not included in property taxes, thereby reducing the property tax burden by 70 percent.
- 2005: Simplified and expedited the process to approve wind farm sites. Siting a traditional energy conversion facility can take up to 18 months; the process was shortened to six months for wind farms.
- 2006: The Midwest Renewable Energy Tracking System was established to track the trade/sale of renewable energy credits.
- 2006: Utilities allowed to recover construction costs as transmission lines are being constructed or improved, rather than after the next rate case.
- 2008: Developers allowed to receive rebates which can be applied toward half of the cost of new transmission systems.
- 2010: The first $50,000 of the assessed value of a small to medium renewable energy property, or 70 percent of the assessed value if that figure is greater, exempt from real property tax.

South Dakota Wind Projects

South Dakota has operating wind farms capable of producing more than 780 MW of wind.

In Production

Project	Developer	Power Purchaser	Size	Operation
South Dakota Wind Energy Center, Hyde County	NextEra Energy Resources	Basin Electric Power Cooperative	40.5 MW 27 turbines	2003
MinnDakota Wind Farm, Brookings County	Iberdrola Renewables	Xcel Energy	54 MW 36 turbines	January 2008
Tatanka Wind Farm, McPherson County	Acciona Energy	Midwest ISO power market	88.5 MW 60 turbines	March 2008
Wessington Springs Wind Project, Jerauld County	Babcock & Brown	Heartland Consumers Power District	51 MW 34 turbines	February 2009
Buffalo Ridge I, Brookings County	Iberdrola Renewables	Northern Indiana Public Service Co.	50.4 MW 24 turbines	April 2009
Titan Wind Project, Hand County	BP Alternative Energy	NorthWestern Energy	25 MW 10 turbines	November 2009
Day County Wind Farm	NextEra Energy Resources	Basin Electric Power Co-op	99 MW 66 turbines	April 2010
Buffalo Ridge II, Brookings and Deuel counties	Iberdrola Renewables	Midwest ISO customers	210 MW 100 turbines	December 2010
PrairieWinds SD1, Jerauld, Aurora and Brule counties	Basin Electric Power Cooperative		151.5 MW 101 turbines	February 2011
South Dakota Wind Partners Jerauld County	Basin Electric Power Cooperative		10.5 MW 7 turbines	February 2011

Smaller projects are in operation around Chamberlain, Howard, Gary, Canova, Carthage, Oaklane Colony and Rosebud.

Wind Energy Benefits

Sustainable – Though supplies of fossil-fuel resources like natural gas and coal are finite, as far as we know, the wind will always blow.

Environmentally-friendly – Wind power does not emit carbon dioxide, sulfur dioxide, nitrous oxides or mercury.

Economic – Although wind projects do not create many jobs, wind-related businesses, such as turbine manufacturers and maintenance companies, often can and are more likely to be located in areas with significant existing or possible wind development.

Wind Energy Limitations

Cost – Many of the utilities in our region, particularly rural electrics and municipal providers, have low-cost power, primarily generated from a combination of coal and hydropower, in their portfolio. Wind power is often more expensive. However, wind power is often considered cost competitive with existing natural gas generation and new coal or new nuclear.

Intermittency – Almost nothing is more important in the electric industry than reliability. When we flip the switch, we want the lights to come on. Unfortunately, it is difficult to predict how hard the wind will blow at a given time during a week, day, or even an hour. This creates some integration and reliability challenges for load-serving entities.

Generation profile vs. load needs – The wind often blows the most when we least need the electricity. The highest wind speeds are often recorded in the nighttime and early morning when energy needs are relatively low. In July, August and September, when electricity is most needed to cool our homes and businesses, the wind blows less than it does other times.

Lack of (cost-effective) storage mechanism – Electricity must be used when it is produced. No cost-effective large-scale storage or battery technology currently exists, although research is being conducted.

Successful Development

A successful wind farm needs three basic ingredients:

1. **An excellent wind resource** – South Dakota's wind resource ranks from fair to excellent, depending upon the area.

2. **Transmission** – Capacity on high voltage lines is needed to get the energy to the end user.

3. **A buyer for the electricity** – Wind farm developers typically do not deliver the electricity to consumers. Electric utility companies buy the electricity from the developer. It is preferred the wind farm have a signed, long-term contract with a buyer before making an investment in a wind project.

Transmission

Transmission is a key element of a successful wind project. It is also one of the biggest obstacles. The current transmission system in South Dakota is mostly full. The utility companies that own the lines are using the capacity to transmit electricity that's already being produced to customers. The leftover capacity is limited. Further, that leftover capacity fluctuates depending on energy use. During times of extreme heat or cold, the capacity of the lines may be in complete use. Considering wind energy is not produced at a constant level – it fluctuates based on when and how hard the wind blows – that leftover transmission capacity may not be adequate to carry newly-produced wind energy.

Major transmission lines are generally estimated to cost about $1 million per mile to construct. That's a huge investment for a wind developer. South Dakota is far away from large energy-use markets like Minneapolis, Chicago and Denver so the distance and cost to export wind energy is great.

The good news is that in recent years the PUC has approved several new major transmission line projects in eastern South Dakota, each with the stated purpose of assisting the development of wind power.