



Green Power in Wisconsin

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The state of Wisconsin has abundant renewable energy resources that can provide electricity, heat and transportation fuels. In 2011, Wisconsin was rated at 15th in the nation for its renewable energy leadership by Clean Edge, a clean-tech research and advisory firm. This factsheet explores the development of renewable energy for electricity generation (green power) in Wisconsin, describing the rich resource potential, and outlining the legislation, regulation and incentive programs in place to encourage expansion of green power on the Wisconsin grid.

Wisconsin has a number of reasons to encourage green power development within its borders. The state currently depends heavily on imported coal for electricity and oil and propane for heating because Wisconsin possesses no fossil fuel or uranium resources. Also, because renewable energy generation is generally small-scale and local, green power, particularly wind power and anaerobic digestion, can provide economic opportunities in many rural areas. Relying more on clean, renewable energy generation will reduce air and water pollution from coal-fired plants and help maintain the high quality of Wisconsin's natural environment for recreation and tourism.

Bioenergy Resources (biomass and biogas)

Wisconsin's primary biomass resources include logging residue, waste wood and urban forestry waste, energy crops such as switch grass and fast growing tree species, and corn cobs, stover and other crop residue. Much of Wisconsin's biomass fuel is used for facility and industrial process heat, although utilities are experimenting with co-firing biomass with coal or natural gas, or using it to generate heat and power in combination. Xcel Energy's Bayfront Power Plant in Ashland is primarily fired with biomass feedstock but also uses a mix of other fuels. We Energies is building a

biomass plant in Rothschild that will provide both heat and power for the Domtar Corporation paper mill. DTE Energy Services built a biomass-fired plant in Cassville that will serve 28,000 homes for the Dairyland Power Cooperative of La Crosse.

Wisconsin's biogas (methane) is extracted from animal manure, sewage, food waste and other organic process waste in anaerobic digesters. Anaerobic digestion is a series of processes that naturally break down organic matter in the absence of oxygen. Digesters are considered to be an economical way of processing organic waste to reduce odor and other pollution. They essentially separate the chemical components of the waste stream for reuse. For most systems, electricity generation is seen as a byproduct rather than the primary purpose of building the digester. For many years, wastewater treatment facilities have used digestion to pretreat municipal waste. More recently, anaerobic digestion is being used to treat livestock waste. Currently, 26 dairy farms in Wisconsin manage their manure using an anaerobic digester, although not all generate electricity from the resulting methane. Alliant Energy has partnered with five dairy farms in its territory, installing its own generation equipment and offering a buy-back rate to the farm owner for the power generated. A number of Wisconsin food processing companies including cheese makers, breweries and meat packers also use anaerobic digestion, producing process heat from the methane.

Wind

Wisconsin has a fair wind resource with the most productive areas for utility scale development lying along the Niagara Escarpment in the eastern part of the state from Fond du Lac north through Door County. Other productive areas stretch along the east-southeast, and several smaller areas in the west central section of the



The Brazos Wind Farm, also known as the Green Mountain Energy Wind Farm, near Fluvanna, Texas.

state. As of 2011, there were 11 utility wind farms in Wisconsin comprising a total of 404 turbines with the generating capacity of 631 megawatts.

Wind farm installations in Wisconsin have been controversial, primarily in more densely populated eastern areas. To establish greater consistency in siting requirements for new wind farms, the Wind Siting Law (2009 Act 40) was passed and the Public Service Commission of Wisconsin adopted administrative rules. There was legislative effort to restrict the new law and essentially create a moratorium on wind development throughout the state but this effort failed and the new wind siting law went into effect in March 2012.

Solar

Wisconsin receives 20 percent more sunlight than Germany, Europe's leading solar nation, and currently generates 6.5 megawatts of solar electricity. According to the National Renewable Energy Laboratory, Wisconsin has installed 1,074 solar electric systems and is ranked number 13 in the nation. Most systems are 20 kilowatts or less but utility scale systems are appearing as well. Epic Systems Corporation of Verona, Wis., started with a 363 kilowatt solar canopy over their parking lot and will expand their total to 2.2 megawatts of capacity with a ground mounted system to be operational in June 2012. Kohl's Department Stores, with headquarters in Menomonee Falls, Wis., has installed large solar electric arrays on 100 of its locations, including three in Wisconsin.

Regulation in WI

Wisconsin has set its Renewable Energy Portfolio Standard (RPS) at 10% by 2015. Utilities must either

generate or purchase that percentage of green power in their generation mix by that date. Solar, wind, biomass, hydroelectric, landfill gas, ocean energy and fuel cells using renewable fuels are among the eligible technologies. Utilities are also able to purchase Renewable Resource Credits (RRCs) from other utilities to meet their quota.

Wisconsin's net metering law requires investor-owned and municipal utilities to allow customers who own grid connected generation systems up to 20 kilowatts in size to both pay and receive the same retail rate for electricity, essentially running their meters forward or backward as the electricity flows. In addition, for We Energy customers, the net metering limit is 100 kilowatts for wind power.

Wisconsin Administrative Code Chapter PSC 119, Rules for Interconnecting Distributed Generation Facilities, went into effect in early 2004. These rules guide interconnection of renewable energy generating systems up to 15 megawatts among Wisconsin's investor-owned and municipal utilities, and set out the responsibilities of both system owners and their utilities. Cooperative utilities are encouraged to adopt the rule as well. The rules cover the application process and include all forms and agreements, along with technical requirements for safety, power quality and compliance with local and national electric codes. There are agreements that apply to different system sizes, with the simplest process being for those 20 kilowatts or smaller.

Incentives Available in Wisconsin

Since 2001, Focus on Energy - Wisconsin's public benefits program - has been the primary source for renewable energy incentives in Wisconsin, offering cash back rewards of up to one third of system costs for the residential, commercial and institutional sector customers of participating utilities. Each calendar year, \$10 million is allocated for renewable energy incentives. In 2011, incentives for renewable energy projects for businesses and homes were temporarily suspended. In 2012, \$7.9 million of the annual distribution has been allocated to cover a backlog of renewables projects. The remaining \$2.1 million will be available by July 2, 2012 for projects to be completed by the end of the year. Because wind and bioenergy projects typically require a longer planning and development time frame, it is likely that the remaining allocation for 2012 will go

to solar projects. In 2013-14, 75% of the \$10 million for renewable energy incentives will be dedicated to bioenergy, biogas, and geothermal projects, with the remainder to be allocated to solar and wind projects. A new set of renewable program cost-effectiveness criteria were developed to evaluate renewable energy technologies to help the Public Service Commission (PSC) determine which technologies should continue to receive Focus on Energy incentives and how much of the annual budget should be allocated to each. New programs and criteria are now available on the [Focus on Energy website](#).

Setbacks

Despite Wisconsin's progressive path, significant setbacks for renewable energy development have recently been created by changing political winds and the slow economy. Until the political climate changed in 2011, Wisconsin was steadily working toward building a strong renewable energy industry. The market was growing through incentives and education provided by the Focus on Energy program, regulatory hurdles such as inconsistent interconnection standards were being addressed, and new manufacturing and installation businesses were being established.

The new political climate slowed the previous rate of progress. The Legislature suspended the new wind siting rule developed by the PSC on March 1, 2011. This was rescinded in March of 2012 when the moratorium did not produce more restrictive law and the new rule went into effect as originally developed. However, during the year of suspension, new wind project development ceased.

The Legislature also adopted SB 81, a bill that allows utilities to count hydropower purchases from other states and Canada toward meeting their Renewable Portfolio Standard. This bill, due to go into effect in 2013, short-circuits development of local resources and continues to encourage the drain of energy dollars out of state.

The loss of non-residential financial incentives for renewable energy systems through the Focus on Energy program is a blow to municipalities and non-profit organizations, in particular, which have contributed to promoting renewable energy to the general public through demonstration projects and educational programs. Small businesses and corporations are also less likely or able to install a system without incentives, setting these markets back as well. Efforts within the industry are underway to re-establish the value of incentive programs in building a strong renewable energy business climate.

Resources for Wisconsin

1. DSIRE (Database of State Incentives for Renewables & Efficiency), funded by U.S. DOE and managed by the University of North Carolina Solar Center, offering a comprehensive listing of incentives and regulatory policies for each state along with summary maps and a useful glossary:
<http://www.dsireusa.org/>
2. National renewable Energy Laboratory (NREL), National Wind Map for Wisconsin
http://www.windpoweringamerica.gov/images/wind-maps/wi_80m.jpg
3. Web site for RENEW Wisconsin, a statewide nonprofit organization that promotes economically and environmentally sustainable energy policies and practices. A good source for the latest information about political and regulatory issues
<http://www.renewwisconsin.org/>
4. Focus on Energy, Wisconsin's public benefits program
<http://www.focusonenergy.com/>
5. U.S EPA AgSTAR Program, providing information about methane production and use from animal manure
<http://www.epa.gov/agstar/>
6. Public Service Commission of Wisconsin, offering information about regulatory issues:
<http://psc.wi.gov/>



This publication is available electronically at

http://fyi.uwex.edu/biotrainingcenter/files/2012/06/EB_Renewable-Energy-Grid.pdf

On-line training programs on bioenergy and sustainability, on-farm energy conservation and efficiency, and anaerobic digestion are available electronically at

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