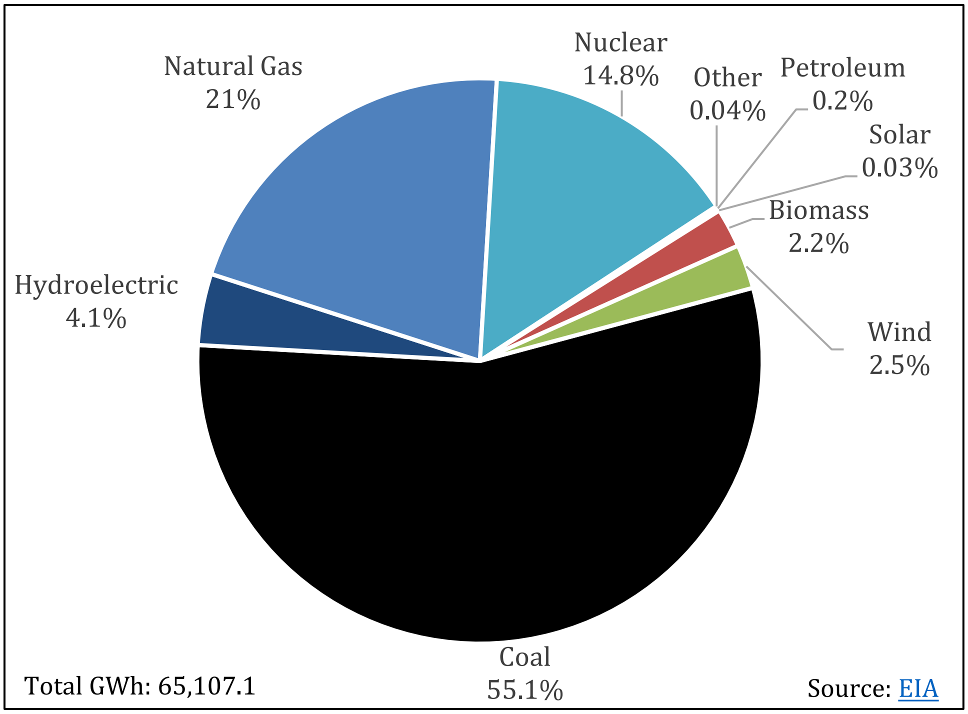
State Brief: Wisconsin

BACKGROUND

Wisconsin's Net Electric Generation, 2017



In 2017, approximately 55% of Wisconsin's net electric generation was fueled by coal. According to U.S. Energy Information Administration (EIA) estimates, this number dropped to 49% in 2018. The state, lacking fossil fuel resources of its own, imports most of its coal from Wyoming. A 2019 report by the National Association of State Energy Officials and the Energy Futures Initiative found that Wisconsin has 39,177 traditional energy workers (1.3% of total state employment) and an additional 63,141 workers employed in energy efficiency. A separate report found that more than 75,000 jobs in the state are provided by clean energy industries.

The Badger State has ample biomass resources, supplied in large part, by the state's forests and agricultural sector. The state is one of the top 10 ethanol producing states in the nation. Wisconsin's hydroelectric and on- and offshore wind resources are also notable. Nearly two-thirds of the state's solar generation is from customer-sited systems. Between 2016 and 2018, the number of utility-scale solar facilities in operation climbed from two to 15.

The Public Service Commission of Wisconsin (PSC) regulates investor- and municipally-owned electric and gas utilities in the state. It does not regulate most of the activities of cooperative utilities. The PSC has three appointed commissioners; Rebecca Cameron Valcq is Chair. Republican majorities control both chambers of the state legislature; Democratic Governor Tony Evers was elected in 2018.

POLICY STRENGTHS AND OPPORTUNITIES[1]

The National Renewable Energy Laboratory (NREL) developed the notion of "policy stacking,"[2] an important framework for policymakers to consider. The basic idea behind policy stacking is that there is an interdependency and sequencing of state policy that, when done effectively, can yield greater market certainty, private sector investment, and likelihood of achieving stated public policy objectives.

In theory, but not always in practice, clean energy policies can be categorized into one of three tiers of the policy stack. Tier 1, market preparation policies, remove technical, legal, regulatory, and infrastructure-related barriers to clean energy technology adoption. Tier 2, market creation policies, create a market and/or signal state support for clean energy technologies. Tier 3, market expansion policies, create incentives and other programs in order to expand an existing clean energy market by encouraging or facilitating technology uptake by additional market participants.

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[1] For more information on policy opportunities, please visit the SPOT for Clean Energy. For more information on specific policy actions related to these opportunities, please review the *Clean Energy Policy Guide for State Legislatures*.

[2] V.A. Krasko and E. Doris, *National Renewable Energy Laboratory*, 2012. Strategic Sequencing for State Distributed PV Policies: A Quantitative Analysis of Policy Impacts and Interactions. http://www.nrel.gov/docs/fy13osti/56428.pdf.

For example, before financial incentives for combined heat and power (CHP) will be successful, two key considerations for deployment are having clear interconnection standards and favorable stand-by rates for customers who opt to add CHP. In this example, states should adopt policies to address interconnection and stand-by rates before adopting financial incentive programs.

GRID MODERNIZATION

The transition to a digital economy requires affordable, sustainable, and reliable electricity and presents challenges and opportunities to the grid. Emerging physical and cyber security threats, along with increased demand for faster outage response times, require, at minimum, real-time incident tracking and response capabilities. Increased grid penetration of renewable energy coupled with the adoption of advanced metering, energy storage, microgrids, electric vehicles, and other technologies to modernize our electric system will provide economic benefits, increase security, and ensure more reliable, resilient, and clean electricity. These innovations will require substantial planning and investment in grid technologies.

Grid modernization will require a suite of state and federal policy changes to support advancements in grid technologies, grid management, and utility regulation. Grid modernization strategies, while recognizing regional and inter-state diversity and avoiding one-size-fits-all plans, should take a holistic view of the electric system.

The GridWise Alliance's latest Grid Modernization Index ranks Wisconsin 39th overall for grid modernization efforts. The state is in a good position to act. The state's utilities have taken the lead in installing advanced metering infrastructure (AMI) – 78% of the electric meters in Wisconsin are AMI. The PSC completed a survey of utilities, energy providers, and other stakeholders in 2017. The survey found that the top five priorities of these stakeholders were interconnection of distributed energy resources (DERs); a better ability to identify customers' changing expectations, preferences, and behaviors; uses and benefits of AMI; distribution system safety and reliability; and increased electrification of transportation and buildings. The PSC noted in 2018 that it would continue to work with stakeholders to develop plans to address these issues.

There are policies that Wisconsin's policymakers could adopt to support in-state modernization efforts.

1. Using the PSC's survey as a foundation, develop a grid modernization strategy through a stakeholder process. Alternatively, states might decide to require that utilities develop and propose a ten-year grid modernization plan to the utilities commission within a specified timeframe. Utilities would then be required to implement that plan within another specified timeframe. Strategies and/or plans should outline a clear set of grid modernization goals and describe methods to measure, report, verify, and enforce progress towards those goals. Utility goals might include such things as enhancing cybersecurity, integrating DERs (including electric vehicles and energy storage), and increasing demand response and/or demand-side management (DSM) programs.

2. States might also provide incentives or cost recovery mechanisms for utilities that meet grid modernization goals. Policymakers could consider directing the PSC to evaluate alternative ratemaking mechanisms, performance-based regulation, and/or new utility business models that support grid modernization.

3. Wisconsin does not have clear state policies governing customer data access and privacy protections. To address this, policymakers could develop legislation or rules that, at minimum, do the following: clarify who owns the energy data associated with consumer energy usage; protect customer privacy; outline the process for allowing direct access to data by third parties; and promote access to the highest resolution of data possible. The state could establish customer access to energy data through a program like Green Button.

ENERGY STORAGE

Energy storage offers a unique opportunity to dynamically manage supply and demand while maximizing the value of grid resources. By deploying storage in strategic locations, utilities can more effectively manage their energy portfolios. First, storage provides management of intermittent demand – helping to flatten peak demand requirements for the utility. Second, the responsiveness of energy storage can allow the utility to implement voltage regulation and other ancillary services, which are useful for improving system efficiency. Third, storage can dispatch power to better integrate intermittent resources like renewable energy.

The flexibility of battery storage, combined with advanced metering infrastructure, allows customers to control, for instance, how and when they use energy from the grid or from solar panels installed on their home or business. In most cases, this can provide greater cost savings than standalone solar systems. Combined with time-varying rates or real-time pricing programs, state policy can further support customer choice and open a new market for energy services. Prices that better reflect the time-varying and location-dependent costs of producing and delivering electricity can lead to a number of economic and environmental gains.

Two major trends have enabled increased deployment of energy storage: declining costs and technological advances. State policy can help maximize these benefits through a combination of establishing a framework for easy integration of energy storage into the grid and establishing a marketplace that monetizes the benefits of energy storage for cost-effective investment.

Wisconsin is positioned to grow its energy storage capacity. The University of Wisconsin-Madison researches and develops energy storage technologies. Invenergy is developing a 100 megawatt (MW) solar farm that might include a 50 MW battery storage system. A handful of firms in the state manufacture storage technologies.

There are several opportunities for developing supportive state policies:

1. Amend existing interconnection policy to ensure that storage can connect to the grid through a transparent and simple process. The Interstate Renewable Energy Council (IREC) has produced a series of interconnection protocols that states can easily adopt. The state could establish best practices for interconnecting storage in statute, or legislation could provide an instruction to the PSC to adopt new rules.

2. Instruct utilities to evaluate the value of energy storage in multiple strategic locations across the utility system and consider a requirement to deploy storage where it will be cost effective, or identify the price point at which it will become cost effective.

3. Require the inclusion of energy storage as a critical piece of the energy system as both a demand and supply management resource. Some states have required that utilities evaluate the cost effectiveness of non-wires alternatives (NWAs) to large transmission and generation investments. Alternatively, states might want to require utilities to develop a distribution investment plan that identifies the locations on the distribution system where energy storage or other distributed resources would offer the greatest value.

4. Consider creating a mandatory energy storage procurement target or requirement for energy storage with a documented process for periodic review of progress towards that goal. Procurement targets can limit the amount of utility owned storage; require that a certain amount of storage be targeted to low-income customers; and create carve-outs for storage at the transmission, distribution, and customer levels. Procurement targets can jump-start market creation, spur fast learning, and guide the development of a regulatory framework.

5. Finance and incentivize energy storage for customers and utilities. Incentives could enable customers to use storage to manage their electric load and store locally produced renewable energy. Incentives in the form of rebates, grants, and tax credits can provide a bridge to scalable deployment for storage. Incentives can be designed to decline as storage values become more readily monetized and/or as the cost of storage decreases. Financing energy storage installations for commercial customers could help reduce their demand charges. Policymakers might want to start first with a policy that provides grants to pilot projects. Policy might also target solar system owners. Financial incentives should be designed to ensure that the state will meet other goals including emissions and peak demand reductions, and equitable access to clean energy.

6. Clear data access policies that allow third parties to provide energy management services based on signals from the utility can greatly increase the value of efforts to monetize the value stream offered by energy storage. (See discussion above, under Grid Modernization.)

MAINSTREAMING RENEWABLES

As the renewable energy industry has matured, technology has improved, and global production of generating equipment has increased, renewable energy is increasingly seen as the least cost and lowest risk form of energy (excluding energy efficiency). A 2019 Bloomberg New Energy Finance report predicts that renewable resources will generate at least 60% of total global electricity and 43% of U.S. electricity by 2050. With increased deployment, utilities are learning more about how to integrate renewables effectively, investors are becoming more comfortable with the technologies, and building code officials are recognizing common standards and best practices. For these reasons, it is in the interest of policymakers to ensure that their states are well positioned to benefit from the transition to clean energy resources.

To reduce barriers to customer and utility participation in the renewable energy market, policymakers in Wisconsin might consider several options.

Customer-Oriented Policies

1. Interconnection, net metering, and streamlined permitting – In general, customers want a clear, streamlined, affordable, and predictable system for connecting renewable energy systems to the grid. To ensure this, Wisconsin's policymakers could consider adopting IREC's model interconnection procedures, removing net metering system size limitations, and crediting net excess generation at the customer's retail rate. Allowing aggregated net metering would be especially beneficial to the state's agricultural operations. Other applications for aggregated net metering include commercial properties and public entities like state and local governments, universities, and schools. The state might also consider establishing either statewide standards for streamlined permitting processes, or resources to support local governments that voluntarily implement a streamlined program, as Wisconsin Rapids has done. State incentives, such as tax credits, financial incentives, or loans can be tied to systems that are established within a designated streamlined permitting jurisdiction.

2. Shared Renewables – Due to building and property attributes and ownership issues, many customers are unable to install renewable energy technologies where they live or work. Allowing shared, or community, renewable energy projects addresses these barriers. These projects have multiple owners or subscribers who pay for a portion of the project or the generation provided by the system. Wisconsin might consider adopting a virtual net metering policy. Virtual net metering allows a customer to receive credits from a shared system as if the generation were on site. Virtual net metering is different from a power purchase agreement (PPA), which pays the customer for the proportion of power they produce. Because it is treated as a credit on the customer's bill, the customer can avoid the tax implications of a PPA payment - which can adversely affect the economics of the system (and may come as a surprise to the participant).

   Several Utilities in Wisconsin offer community solar programs. In 2015, the PSC approved programs for Northern States Power Company – Wisconsin (NSPW), New Richmond Municipal Utility, and River Falls Municipal Utility. A year later, the Commission approved Madison Gas and Electric's (MGE) program. MGE's and River Falls' programs are fully subscribed, as of 2018, NSPW was at an 88% subscription rate. In June this year, the PSC approved new shared solar programs for MGE and Alliant Energy.

   Low credit ratings often deter participation in renewable energy markets; this can affect low- and moderate-income (LMI) households' adoption of renewable energy solutions. Supportive policies for shared renewables can be designed to encourage participation by LMI households; this can increase adoption of renewable technologies and reduce energy costs. Low-income participation can be ensured either through a percentage mandate for the overall annual contracted capacity, or by offering a higher rate of payment for the portion of shared solar capacity attributed to LMI customers. States that have a shared renewable program may want to coordinate this program with implementation of the federal Weatherization Assistance Program or the Low Income Home Energy Assistance Program to provide recipients of assistance with participation in a shared renewable system.

   A number of financial incentives and financing options are available to Wisconsin's citizens, businesses, and public entities. There are additional policy options that policymakers might consider to promote renewable energy uptake by low- and moderate-income consumers. Generally, successful state policies should be tailored to these customers, be cost-effective and financially sustainable, have measurable performance indicators, and be flexible enough to allow later changes in design.

3. Corporate Procurement – Many Fortune 100 and 500 companies have established either climate goals or commitments to purchase renewable energy. Over the last five years, over 16 gigawatts (GW) of renewable contracts have been announced by corporate entities. In 2019, Ashley Furniture announced a $29 million investment in renewable energy to offset 35% of their energy use. Organic Valley, Dr. Bronner's, and Clif Bar are joining other companies and the city of Madison to purchase the energy credits associated with the Butter Solar Project. Over 60 other companies with operations in Wisconsin have also made commitments to purchase renewable energy. Wisconsin's policy allows companies to purchase renewable energy credits (RECs), purchase renewable energy through the wholesale market, and develop or lease onsite renewable energy projects. MGE, NSPW, and We Energies provide green power pricing programs, and Alliant Energy is seeking approval for a similar program. The products available in Wisconsin meet all six of the Corporate Renewable Energy Buyers' Principles. It is prudent to incorporate corporate renewable purchase commitments into utilities' long-term plans for resource needs over multiple decades. By integrating these renewable purchase commitments into the planning process, utilities can avoid over-building resources and stranding generation assets.

Utility-Oriented Policies
Some states have created programs that aim to reduce greenhouse gas (GHG) emissions and increase utility investments in clean energy resources. Wisconsin's renewable portfolio standard (RPS) set a target of 10% renewable energy by 2015. Utilities met the target early, in 2013. Governor Evers joined the U.S. Climate Alliance in February. As part of his budget proposal, Governor Evers proposed a plan to require the state's utilities to be carbon-free by 2050. After the proposal failed, the Governor issued an executive order in August creating the Office of Sustainability and Clean Energy. The Office will be tasked with developing a plan to meet the 100% carbon-free by 2050 goal. Cities and utilities have also announced climate goals. In June 2019, Milwaukee officials announced the creation of a task force to develop a plan to reduce GHG emissions 45% by 2030 and to be GHG-free by 2050. The cities of Eau Claire, La Crosse, Madison, Green Bay, Monona, and Middleton have adopted similar goals. MGE is targeting zero-carbon electricity by 2050, as is Xcel Energy. WEC Energy Group has set a goal to reduce total CO_2 emissions by 40% below 2005 levels by 2030 and 80% below 2005 levels by 2050. Alliant Energy has a target to reduce CO2 emissions from fossil-fueled generation by 80% by 2050. The utility says that renewable resources will supply over 30% of its portfolio by 2030.

To support utility adoption of clean energy technologies, Wisconsin's policymakers might consider the following:

1. Emission standards are designed to drive emission reductions through either 1) a carbon portfolio standard or 2) a market-based approach. Both types of approaches can take a technology neutral stance that drives emissions down with a combination of renewables, traditional fuels, efficiency, and technological advances. These policies can also address other concerns such as pollution, asthma risk, environmental justice, and water use.

   A portfolio emissions standard sets emissions reduction targets to be achieved over time. This can be implemented through the utility planning process or by establishing a maximum allowable rate of emissions per unit.

   Market-based approaches can take the form of an emissions trading regime or a tax. Under a market-based approach, a state or a group of states might set a certain emissions reduction target, for example, 40% below 1990 levels by 2030. This reduction is achieved by the distribution of annual emission allowances that decrease over time until the goal is met. Allowances can be bought and sold on a market that allows utilities and other emitting firms flexibility in reaching total emissions goals. Revenue generated by these markets can be used to support the development of renewable energy, energy storage, and energy efficiency programs. There are emissions trading markets in operation today that states can join. The other pathway to reaching emissions targets is through a tax on fossil fuel use that can be used to generate revenue to fund emissions reductions policies and technologies and to incentivize the reduction of emissions over time. One of the advantages of a market-based program is that these are designed to reduce emissions in the most economically efficient manner possible.

2. Clean Peak Standards aim to increase the share of clean energy resources used to meet peak demand and decrease energy bills over the long-term by reducing peak demand in the hours when energy costs are highest. These objectives can be met through different policy options including: planning and procurement requirements that focus on peak demand; a moratorium on the construction of new peaking units or a phase out of existing

units; incentives for clean energy resources delivered during peak times; and/or adopting a new clean peak standard that sets a target for clean energy deliveries during peak times.

ELECTRIFICATION OF THE TRANSPORTATION SECTOR

Bloomberg New Energy Finance estimates that 57% of all new passenger vehicle sales will be electric by 2040 and that price parity with conventional vehicles will be met for most segments in the mid-2020s. Designing infrastructure that will facilitate easy connection of EVs to the grid is a key part of building a modernized grid. The relationship between the increased adoption of EVs and the availability of EV charging stations is complicated. On the one hand, consumer range anxiety creates a barrier to increased adoption. On the other hand, while greater availability of charging stations would ease this anxiety, the relatively low numbers of vehicles on the road provides little incentive to install and make these stations available to the public. The good news is that both supportive policies for developing charging infrastructure and advancements in technology have eased range anxiety.

A few incentives for alternatively fueled vehicles are currently available in Wisconsin. MGE offers a handful of programs. Alliant Energy offers a rebate to commercial and industrial customers that install workplace charging stations. We Energies recently proposed offering rebates and time-of-use rates to customers that install EVSE at their homes. Legislation introduced this year would incentivize the installation of charging infrastructure across the state and the PSC opened an investigation in January 2019 to consider policies related to EVs and EV supply equipment (EVSE).

There are several policy opportunities to further encourage and prepare for increased market penetration of EVs in the state, including:

1. EV and EVSE Financing and Financial Incentives – Providing financial incentives and innovative financing options can help spur greater market penetration of EVs. Sales, property, and income tax credits are some of the simplest methods for addressing high up-front costs of EVs and EVSE. While sales tax credits are typically applied at the time of purchase, property and income tax credits may do less to address upfront cost barriers as the credit is not applied at the time of purchase.[3] States have adopted other financial incentives including low-interest loans, grants, vouchers and rebates. A handful of states qualify EVSE under their property assessed clean energy (PACE) programs. A simple solution is to increase and expand existing tax credits to incentivize commercial, publicly available charging stations.

2. Charging Infrastructure Plan – Locating charging infrastructure is different from locating conventional fueling stations. For the most part, EVs are cars used for commuting and local trips. Furthermore, while a driver of a conventional vehicle stops only briefly at a gas station for the specific purpose of filling up, a driver of an EV is generally looking to refuel when they are parked for a longer period of time, for example when going shopping, going to a restaurant, or going to work. Charging infrastructure plans should attempt to pair the appropriate level of charging with a reasonable amount of time a person will be at that location. Legislation could direct a state agency to develop an infrastructure plan through a stakeholder process. Wisconsin's newly adopted EV registration fee could help fund these efforts. For example, in Washington a portion of each EV registration fee is used to fund charging infrastructure development across the state.

3. Parking Infrastructure Requirements – In tandem with the development of a statewide plan, legislation could set requirements for EV parking infrastructure. Some states have adopted permitting standards for parking lots, requiring, for instance, that for every 100 parking spaces, there must be at least one EV charging space. Legislation could also incentivize utilities to develop make-ready locations. These locations supply power to the point where a utility or third party developer might install an EV charging station. Wisconsin's building energy code could also be updated to include requirements for EV charging infrastructure.

[3] A study by the Congressional Budget Office however suggests that tax credits are important tools for ensuring increased adoption of alternative-fueled vehicles.

NEWS

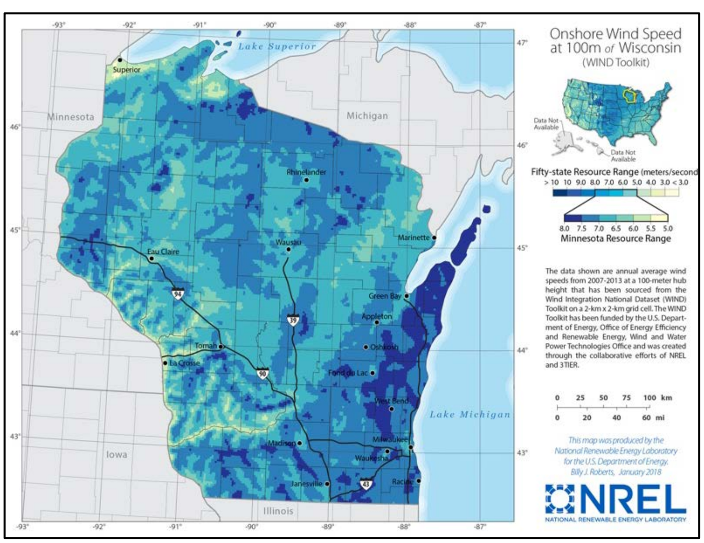
- August 17, 2019: [Wisconsin Native Americans Granted Funds for Green Projects]
- August 8, 2019: [Crossed Wires: Wisconsin Transmission Proposal Sparks Debate over Best Path to 100% Clean Energy]
- August 5, 2019: [Under the Lens: Energy Storage is a Key to Wisconsin's Renewable Energy Transition]
- August 2, 2019: [MGE, We Energies, Apply to Own Remaining Solar Power from Wisconsin's First Large-Scale Solar Farm]
- July 23, 2019: [Renew Wisconsin, We Energies Announce Solar Settlement]
- July 5, 2019: [Great Lakes Ports Seek to Improve Tracking of Greenhouse Gas Emissions]
- June 18, 2019: [Dem Bill Would Create Public Funding for Renewable Energy Startups]
- June 12, 2019: [Report: Wisconsin Energy Efficiency Program Generates Millions in Savings]
- April 15, 2019: [PSC Approves 5-Fold Solar Expansion in Wisconsin]
- April 11, 2019: [What Role for Utilities in Deploying Public EV Chargers, Wisconsin PSC Asks]
- April 10, 2019: [Renewable Energy, Energy Efficiency Companies Continue to Add Jobs in Wisconsin]
- February 9, 2019: [Study: Transition to Renewable Energy Could Create 162,000 Jobs in Wisconsin]

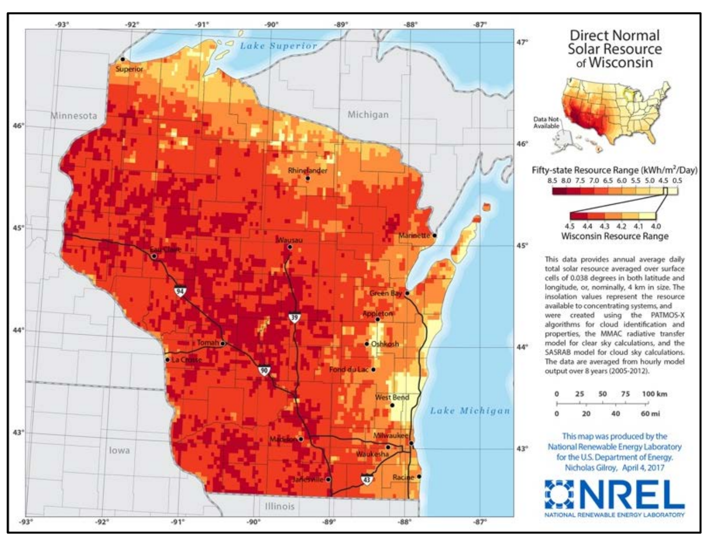
OTHER RESOURCES

- Wisconsin Office of Energy Innovation: https://psc.wi.gov/Pages/Programs/OEI.aspx
- RENEW Wisconsin: https://www.renewwisconsin.org/
- The American Council for an Energy-Efficient Economy State and Local Policy Database, Wisconsin: https://database.aceee.org/state/wisconsin
- The Database of State Incentives for Renewables and Efficiency, Wisconsin: http://programs.dsireusa.org/system/program?fromSir=0&state=WI
- U.S. Energy Information Administration, Wisconsin: https://www.eia.gov/state/?sid=WI
- American Wind Energy Association (AWEA): https://www.awea.org/resources/fact-sheets/state-facts-sheets
- National Renewable Energy Laboratory Biomass Maps: https://www.nrel.gov/gis/biomass.html
- U.S. Department of Energy's Alternative Fuels Data Center, Wisconsin: https://www.afdc.energy.gov/states/wi
- SPOT for Clean Energy, Wisconsin: https://spotforcleanenergy.org/state/wisconsin/
- The Rocky Mountain Institute: [From Gas to Grid – Building Charging Infrastructure to Power Electric Vehicle Demand]
- The GridWise Alliance: [EVs - Driving Adoption, Capturing Benefits]
- The Regulatory Assistance Project: [Performance-Based Regulation]

WISCONSIN'S WIND AND SOLAR RESOURCES

WIND https://windexchange.energy.gov/states/wi
SOLAR https://www.nrel.gov/gis/solar.html





Our Resources

CNEE Homepage: http://cnee.colostate.edu/

The SPOT for Clean Energy: https://spotforcleanenergy.org/

The Advanced Energy Legislation (AEL) Tracker: https://www.aeltracker.org/

Clean Energy Policy Guide for State Legislatures: http://cnee.colostate.edu/cleanenergypolicyguide/

The Energy Policy Podcast: http://energypodcast.colostate.edu/

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