

BACKGROUND

Michigan generates most of its electric power from coal and nuclear and has the [most underground natural gas storage capacity](#) of any state in the country. While coal-fired generation dominates Michigan’s net electric generation, the U.S. Energy Information Administration [reports](#) that about a dozen coal-fired power plants have retired during the past decade and no new coal-fired facilities have been added.

A 2019 [report](#) by the National Association of State Energy Officials and the Energy Futures Initiative found that Michigan has 84,528 traditional energy workers (1.9% of total state employment) and an additional 85,061 workers employed in energy efficiency. Renewables make up about 8% of the state’s [electricity generation](#). The Great Lakes State has more [shoreline](#) than any other state except Alaska making offshore wind a highly viable option for energy production. Michigan is also among the top 15 states in the nation for wind capacity and generation.

The three member bi-partisan [Michigan Public Service Commission \(MPSC\)](#) regulates the state’s eight investor-owned utilities (IOUs) and eleven electric cooperatives. Democratic [Governor](#), Gretchen Whitmer took office in January 2019 and Republican majorities control both chambers of the [state legislature](#).

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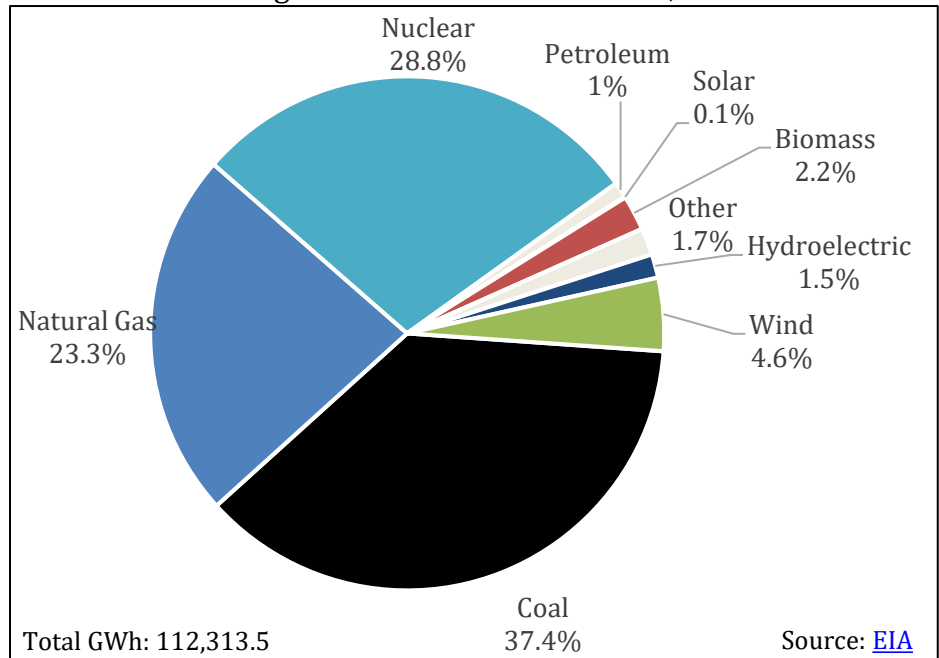
POLICY STRENGTHS AND OPPORTUNITIES¹

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.

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.

Michigan’s Net Electric Generation, 2017



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>.



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.

Last year, the MPSC took significant steps toward modernization. According to the latest [Grid Modernization Index](#) from GridWise Alliance, Michigan improved their grid modernization efforts between 2017 and 2018. Michigan is now in the top 15 states for efforts to modernize the electric grid. The MPSC [required](#) Consumers and DTE to file a five-year distribution plan to address modernization, including integrating new technologies such as solar, storage, and electric vehicles. Currently, the MPSC is hosting [workshops](#) for distribution planning systems and is conducting stakeholder engagement.

States might wish to provide incentives or cost recovery mechanisms for utilities that meet grid modernization goals. As required by [Senate Bill 16-437](#), The MPSC recently evaluated performance-based regulations and submitted a [report](#) to the Governor in April 2018. States may also benefit from having clear rules for customer data access. Current [MPSC rules](#) require utilities to make customer data available to customers and third parties with customer approval and to “provide clear instructions regarding the method by which a customer and a third party, authorized by the customer, may obtain customer usage data in a timely manner and a readily accessible format from the utility.”

While Michigan shows strength in this area, there are policies that Michigan’s policymakers could adopt to support in-state modernization efforts. The state could require that all utilities’ integrated resource plans (IRPs) include plans to enhance cybersecurity, integrate distributed energy resources (including electric vehicles and energy storage), increase smart meter deployment and demand response and/or demand-side management (DSM) programs, and measure and report on the results of grid modernization efforts. The legislature could also develop a formal 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.



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.

Michigan is taking steps to understand and support energy storage deployment in the state. In March of this year, The Michigan Agency for Energy hosted an [Energy Storage Symposium](#) that submitted its [findings](#) to the Michigan Legislature. The state's renewable portfolio standard provides [a credit multiplier](#) for energy storage technologies. In January, NEC Energy Solutions completed an [energy storage pilot system](#) for Consumers Energy to enable the utility to study how storage can be deployed throughout its territory.

In addition to evaluating energy storage's benefits to the grid, there are several additional opportunities for developing supportive state policies:

1. Amend [existing interconnection policies](#) 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 MPSC to update existing policy.
2. Instruct utilities and the MPSC 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](#) (NWA) 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. Policymakers could allow utilities that provide incentives to customers to recover the costs of installing smart meters. This would enable dynamic and time-varying energy management from multiple distributed battery systems. This should signal to customers the value of leveraging storage while better aligning customer costs with system costs. 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.



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 Michigan 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, Michigan’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. This year, the Michigan PSC approved a phase out the state’s net metering policy in favor of an [inflow/outflow credit mechanism](#). Allowing [aggregated net metering](#) would be especially beneficial to the state’s 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 [Ypsilanti](#) 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. Michigan 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). Currently, Consumers Energy offers a [solar garden program](#).

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.

There are [several additional policy options](#) that Michigan 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. This is leading policymakers to provide additional avenues for businesses to procure renewable energy. In October of 2018, the Michigan PSC [approved](#) Consumers’ Large Customer Renewable Energy Program (LC-REP) and [Senate Bill 16-438](#) directs electric providers to offer voluntary green pricing programs to customers. Michigan’s [Electric Customer Choice Program](#) allows retail customers to choose their electric provider based on their needs. With Michigan’s substantial wind capacity and Consumers’ [LC-REP](#), the state is becoming an attractive environment for corporate procurement of renewable energy. [Michigan’s policy](#) also allows companies to purchase renewable energy credits, develop or lease onsite renewable energy projects, and enter into onsite third-party PPAs. The products available in [Michigan](#) meet all six of the [Corporate Renewable Energy Buyers’ Principles](#). It is prudent to incorporate corporate renewable purchase commitments into the IRPs that utilities submit to regulators to plan for resource needs over multiple decades. By integrating these renewable purchase commitments into the IRP process, regulators can avoid overbuilding resources and stranding generation assets.

Utility-Oriented Policies

Some states have created programs that aim to reduce greenhouse gas (GHG) emissions and increase investments in clean energy resources. Consumers Energy has a goal to reduce carbon emissions more than 90% by 2040. In 2016, the [Clean, Renewable and Efficient Energy Act](#) was enacted. The Act increased the state's Renewable Energy Standard to 10% by 2015 and 15% by 2021. There is an interim compliance standard of 12.5% from 2019 to 2020. Governor Whitmer's [Executive Order 2019-02](#), creates the Office of Climate and Energy, the Office of Environmental Justice Public Advocate, and the Interagency Environmental Justice Response Team.

After the threat of a [ballot initiative](#) in November 2018 that would have required 30% of all electric sales to be renewable by 2030, Michigan's two largest IOUs, DTE and Consumers, announced a 50% [clean energy goal](#). By 2030, the utilities plan to achieve half of this goal through renewable energy and the other half through energy efficiency. Consumers Energy has a [renewable energy target](#) of 42% by 2030 and 56% by 2040. Both Consumers Energy and DTE plan to be [coal-free](#) by 2040. States with aging coal plants may want to develop policies that address coal plant closure and support the transition toward renewable energy. One common policy tool is [securitization](#), which restructures utilities' unpaid debt on non-competitive coal plants, allowing them to pay reduced interest rates with ratepayer-backed bonds to minimize the economic effects of closures for coal communities. A portion of bond proceeds could go toward funding jobs-focused transition assistance programs and renewable energy initiatives.

To increase utility adoption of clean energy technologies, Michigan'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.

[Executive Order 2019-012](#) commits the state to join the [U.S. Climate Alliance](#).

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.

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

1. EV and EV Supply Equipment (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. In addition to the [Federal tax incentives](#), various utilities throughout Michigan offer discounted rates for [residential vehicle charging](#) during off-peak hours. Furthermore, battery EVs are [exempt from emissions tests](#). This year, an [EV charging infrastructure package](#) was introduced in the state legislature. If enacted, the legislation will promote greater EV usage within the state.
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.

This year, Consumers Energy announced the launch of the multi-year [PowerMIDrive program](#) that includes rebates for residential, public, and fast chargers throughout Michigan. The MPSC recently approved DTE Energy’s plan to invest \$13 million in its “[Charging Forward](#)” program, a three-year electric school bus charging pilot project.

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. Michigan’s [building energy code](#) could also be updated to include requirements for EV charging infrastructure.

NEWS

- August 13, 2019: [Climate Change Brings Urgency to Debate over Detroit’s Grid Resilience](#)
- August 13, 2019: [Consumers Energy Proposes Settlement for Solar Developers in Michigan](#)
- August 12, 2019: [Upper Peninsula Power to Purchase Energy from New Solar Plant in Michigan](#)
- August 7, 2019: [Energy Report Outlines Weaknesses in Michigan Supply as Public Comment Period Nears End](#)
- July 31, 2019: [In Michigan, Consumers Sees Strong Interest in Charging Station Rebates](#)
- July 22, 2019: [Michigan Approves 455 MW DTE Wind Power Purchase](#)
- July 1, 2019: [Michigan Bills Aim to Open State Parks to Electric Vehicles](#)
- June 10, 2019: [Michigan Approves Consumers’ IRP Eliminating Coal, Reducing Emissions 90% by 2040](#)
- June 4, 2019: [Michigan Opens 3.3M Farmland Acres to Bee-Friendly Solar Projects](#)

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

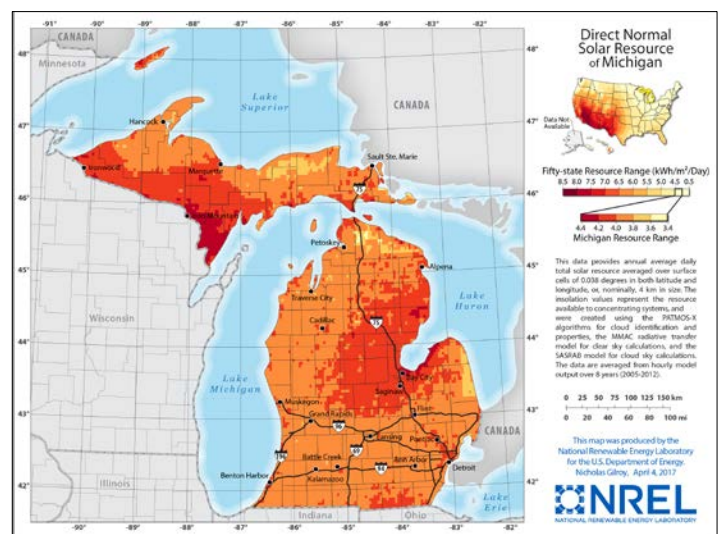
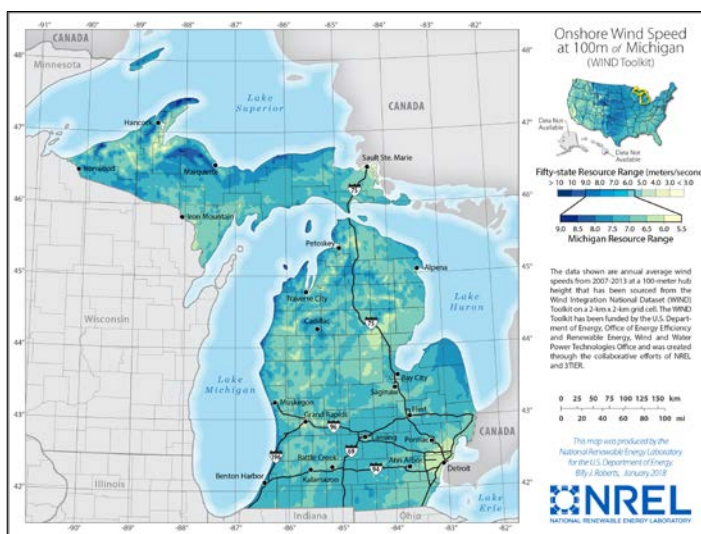
OTHER RESOURCES

- The Michigan Agency for Energy: <https://www.michigan.gov/energy>
- The American Council for an Energy-Efficient Economy State and Local Policy Database, Michigan: <https://database.aceee.org/state/michigan>
- The Database of State Incentives for Renewables and Efficiency, Michigan: <http://programs.dsireusa.org/system/program?fromSir=0&state=MI>
- U.S. Energy Information Administration, Michigan: <https://www.eia.gov/state/?sid=MI>
- 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, Michigan: <https://afdc.energy.gov/states/mi>
- SPOT for Clean Energy, Michigan: <https://spotforcleanenergy.org/state/michigan/>
- 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](#)

MICHIGAN'S WIND AND SOLAR RESOURCES

WIND <https://windexchange.energy.gov/states/mi>

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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