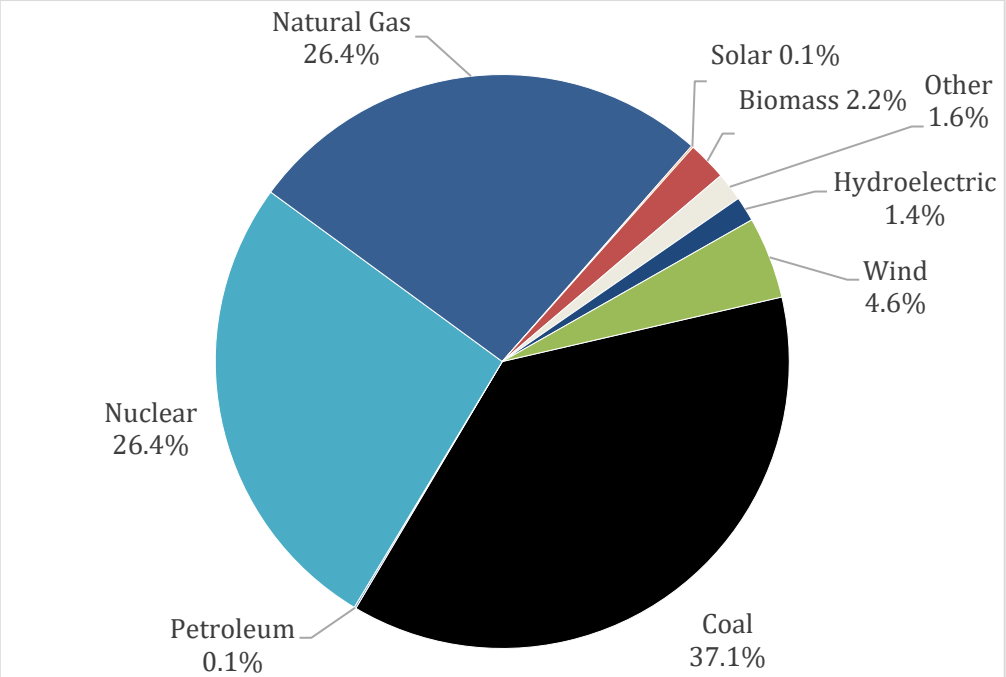
State Brief: Michigan

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.

Michigan's Net Annual Electric Generation, 2018



% 2018 GWh (115, 568 total) Source: EIA

A 2020 report by the National Association of State Energy Officials and the Energy Futures Initiative found that Michigan has 84,764 traditional energy workers (1.9% of total state employment) and an additional 85,323 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.

POLICY STRENGTHS AND OPPORTUNITIES

The National Renewable Energy Laboratory (NREL) developed the notion of "policy stacking,"[1] 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.

[1] 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

New digital technologies have enabled utilities to better manage the grid and provide opportunities for consumers to customize their services to fit their priorities. These technologies allow a two-way flow of information between the electric grid and grid operators and between utilities and their customers.

Emerging technologies improve system reliability and resiliency by enabling better tracking and management of resources. These technologies allow grid operators to incorporate central and distributed energy resources, energy storage technologies, electric vehicles, and assist in addressing the challenges associated with planning, congestion, asset utilization, and energy and system efficiency.

Grid modernization will require a suite of state and federal policy changes to support advancements in grid technologies, grid management, and utility regulation.

Last year, the MPSC took significant steps toward modernization. In the most recent (2018) 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. Originally implemented in 2018, in August 2020, the MPSC updated requirements on Consumers Energy and DTE Energy's five-year distribution plans to address modernization, including integrating new technologies such as solar, storage, and electric vehicles. In October 2019, the governor's office, in coordination with the MPSC launched MI Power Grid, a program specifically focused on increasing customer engagement with the grid, integrating emerging technologies, and optimizing grid performance. This year, Consumers Energy gave away 100,000 smart thermostats to its customers to allow easier control/reduction of energy use during peak times.

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 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 manage supply and demand dynamically while also maximizing the value of grid resources. By deploying storage to strategic locations, utilities can more effectively manage their energy portfolios. First, storage allows utilities to manage intermittent demand – helping to flatten peak demand requirements. Second, the responsiveness of energy storage can allow utilities to implement voltage regulation and other ancillary services, which are useful for improving system efficiency. Third, storage can dispatch power to better integrate intermittent power generation resources like renewable energy to the grid. Finally, energy storage can help the commercial sector avoid costly demand charges. As utilities around the country consider implementing or extending demand charges to other sectors, energy storage will become more relevant as a customer cost-saving investment.

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.

Storage provides multiple benefits to both the customer and the utility. State planning and regulatory policies can help maximize these benefits by 1) establishing a framework for easy integration of energy storage into the grid and 2) establishing a marketplace that monetizes the benefits of energy storage for cost effective investment.

Michigan is taking steps to support the deployment of energy storage. In March 2019, 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 2019, 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 (NWAs) to large transmission and generation investments. Alternatively, states might want to require that utilities 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. These incentives can also be designed to decline as the value of storage becomes more readily monetized, and/or as the cost of storage decreases. Policymakers could allow utilities that provide storage incentives to customers to also 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 start first with a policy that provides grants to pilot projects, and/or that targets existing solar system owners. Financial incentives should be designed to ensure that the state meets other goals including emissions and peak demand reductions, and equitable access to clean energy.

MAINSTREAMING RENEWABLES

As the renewable energy industry matured, technology improved, and global production of generating equipment 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. In 2019, 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 20 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 2018, the MPSC 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 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 investments in clean energy resources. Consumers Energy has a goal to reduce carbon emissions more that 90% by 2040. In 2016, Public Act 341 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 adopting a Clean Peak Standard. These 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.

PATHWAYS TO A LOW CARBON FUTURE

The international scientific community has determined that steep and rapid reductions in global greenhouse gas (GHG) emissions are needed to avoid the worst impacts of global warming and climate change. Federal and state policy interventions are necessary to transform our energy systems and rapidly reduce GHG emissions in the U.S. In general, effective policies will:

1) Establish performance standards and place enforceable limits on carbon pollution;
2) Provide financial incentives for individuals, businesses, and industry to choose clean energy and greatly improve energy efficiency;
3) Spur public and private investment in clean energy infrastructure, including investment in advanced transportation systems for the movement of people and goods; and
4) Provide funding for research, development, and demonstration of technologies that will underpin the de-carbonization of the U.S. economy.

Michigan's governor signed Executive Directive 2019-12 committing the state to joining the U.S. Climate Alliance and to reduce emissions 26-28% from 2005 levels by 2025. To help reach this goal, policymakers might consider the following:

1. GHG Emissions Monitoring and Reporting – To effectively implement policies that reduce emissions, a mandatory system for monitoring, reporting, and verifying GHG emissions must be put in place. While the U.S. EPA has GHG reporting requirements, the federal reporting requirements focus on major industrial sources, leaving significant gaps in the information states need to fully understand their emissions profile. Policymakers

might consider legislation similar to Colorado's SB19-096, which requires annual GHG reporting and establishes emissions baselines from which to measure progress.

2. Cap-and-Trade / Cap-and-Invest – These policies place enforceable limits on carbon emissions that cannot be exceeded by regulated entities without penalty. Emissions allowances are allocated or sold to companies by the state and sources must hold an allowance for each ton of carbon they emit in a given year. Emissions caps and available allowances are reduced every year, requiring that industries reduce their emissions or pay higher market prices for available allowances. States might choose to invest the revenue associated with emissions allowances in renewable energy, public transportation, zero-emission vehicles, environmental restoration, sustainable agriculture, recycling, and other actions.

   States might consider joining an existing program like the Western Climate Initiative (WCI) or the Regional Greenhouse Gas Initiative (RGGI), as joining an established network can remove administrative barriers to entry.

3. Carbon Tax – Carbon taxes impose a price on each ton of carbon emitted and are levied on the purchase and use of fossil fuels by business and industry. That cost is subsequently reflected in consumer prices. If carbon taxes are levied at a high rate, they will discourage the use of GHG emitting resources and technologies, encouraging a market switch to new technology. Alternatively, carbon taxes can be set at a lower rate, which will have a limited impact on market behavior, but the revenue can be substantial and that revenue can be invested in energy efficiency and emission reduction technologies, which will result in lower emissions. States considering this option might examine British Columbia's existing tax structure or the federal proposals from the Citizen's Climate Lobby and the Climate Leadership Council.

4. Emissions Performance Standards – Transportation sources now emit more GHGs than any other sector, and rapid reductions from all types of vehicles, engines, and equipment is critical to achieving carbon reduction goals. The Low Carbon Fuel Standard (LCFS) implemented by both Oregon and California is another example of a flexible, market-based approach to regulating carbon emissions at the state level. LCFSs regulate the carbon intensity of transportation fuel in order to reduce the use of petroleum-based fuels and promote investment in low-carbon options (electrification, biofuels, hydrogen, etc.). The market mechanism LCFSs use is a crediting system where each fuel type is assigned a carbon intensity (CI) score. The allowable CI score is decreased yearly, requiring a switch to lower CI fuels. Entities who provide fuel below the regulated CI score earn credits. These credits can be sold to providers who operate at a deficit (above the mandated CI score), creating a market incentive for investment in cleaner fuels

ELECTRIFICATION OF THE TRANSPORTATION SECTOR

Bloomberg New Energy Finance estimates that 58% 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. Therefore, a key part of building a modernized grid involves designing infrastructure that will facilitate easy connection of electric vehicles (EVs) to the grid. One of the most important barriers to increased adoption of EVs is the consumer's awareness of the availability of EV charging stations. Ultimately, drivers want to be sure that their car will get them where they need to go. Another important barrier to increased adoption of EVs is their higher up-front cost as compared to similar conventionally fueled vehicles. The good news is that both supportive policies for developing charging infrastructure and technological advancements 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 EVSE Financing and Financial Incentives – Providing financial incentives and innovative financing options can help increase market penetration of EVs. Sales, property, and income tax credits are some of the simplest methods for addressing the 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 receipt

of the credit is typically removed in time from the purchase.[2] Some 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. While some drivers will need to charge more quickly, others will refuel when they are parked for longer periods of time, for example when shopping, eating at a restaurant, or going to work. Charging infrastructure plans should attempt to pair the appropriate level of charging (level 2 or direct current fast 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. States with existing registration fees for EVs could use a portion of this revenue to fund charging infrastructure development efforts, as Washington has done.

   In 2019, 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. Hawaii, for instance, requires that for every 100 parking spaces, there must be at least one EV charging space. States and local governments are also updating building standards and codes to require that new buildings are EV ready, meaning that all conduit and wiring are able to accommodate EVSE. States can also implement programs to provide parking incentives for owners of EVs. Typically, these programs provide access to carpool parking, preferential spaces, reduced fees, and/or access to charging stations.

4. Utility Investment in "Make-Ready" Infrastructure – "Make-ready" means building and upgrading the infrastructure necessary for the installation of a charging station. The Rocky Mountain Institute (RMI) recommends that policies providing incentives for utilities to invest in make-ready infrastructure or charging infrastructure itself should be performance-based and encourage investments in locations that are unlikely to be targeted by the private sector, such as low-income and multi-unit dwellings.

NEWS

- July 31, 2020: High Bills, Energy Demand During Pandemic Revive Call for Renewables
- June 15, 2020: Commentary: Michigan Green Tariff Expansion Could Define Future of Renewable Procurement
- May 29, 2020: Michigan Program – The Largest of Its Kind – Offers Free Smart Thermostats
- April 4, 2020: General Motors and DTE Energy are Making Michigan a Clean Energy Powerhouse
- March 10, 2020: Michigan's Electricity Resource Planning Law is Pushing Utilities on Clean Energy
- March 6, 2020: With Wave of Solar on the Horizon, Most Michigan Communities Lack Policies
- March 2, 2020: Michigan Lawmakers Weigh Renewable Energy Expansion
- February 5, 2020: Michigan's Renewable Energy Law Levels off Next Year. What's Next?
- December 3, 2019: Michigan Utilities See Role for Renewable Natural Gas, But Cost Barrier Remains

OTHER RESOURCES

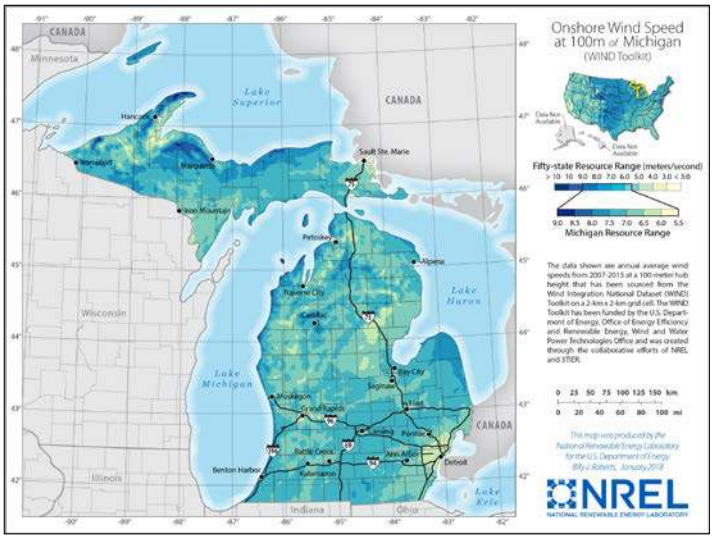
- The Michigan Agency for Energy: https://www.michigan.gov/energy
- The American Council for an Energy-Efficient Economy State and Local Policy Database, Michigan: https://database.aceee.org/state/michigan
- The Database of State Incentives for Renewables and Efficiency, Michigan: http://programs.dsireusa.org/system/program?fromSir=0&state=MI
- 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

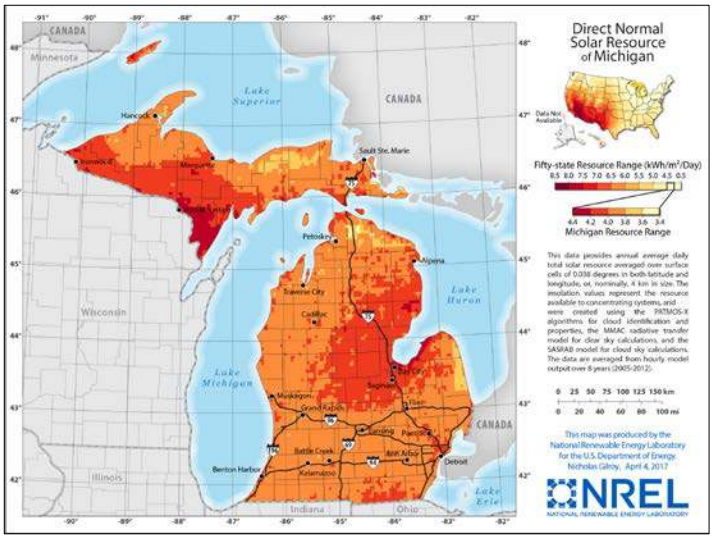
[2] A study by the Congressional Budget Office however suggests that tax credits are important tools for ensuring increased adoption of alternative-fueled vehicles.

- 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: https://rmi.org/wp-content/uploads/2017/10/RMI-From-Gas-To-Grid.pdf
- The GridWise Alliance, EVs - Driving Adoption, Capturing Benefits: http://gridwise.org/evs-driving-adoption-capturing-benefits/
- The Regulatory Assistance Project, Performance-Based Regulation: https://www.raponline.org/event/performance-based-regulation-the-power-of-outcomes-part-1/
- The Interstate Renewable Energy Council, A Playbook for Modernizing the Distribution Grid, Volume 1: https://irecusa.org/publications/a-playbook-for-modernizing-the-distribution-grid-volume-1/

MICHIGAN'S WIND AND SOLAR RESOURCES

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





Our Resources

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

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

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

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