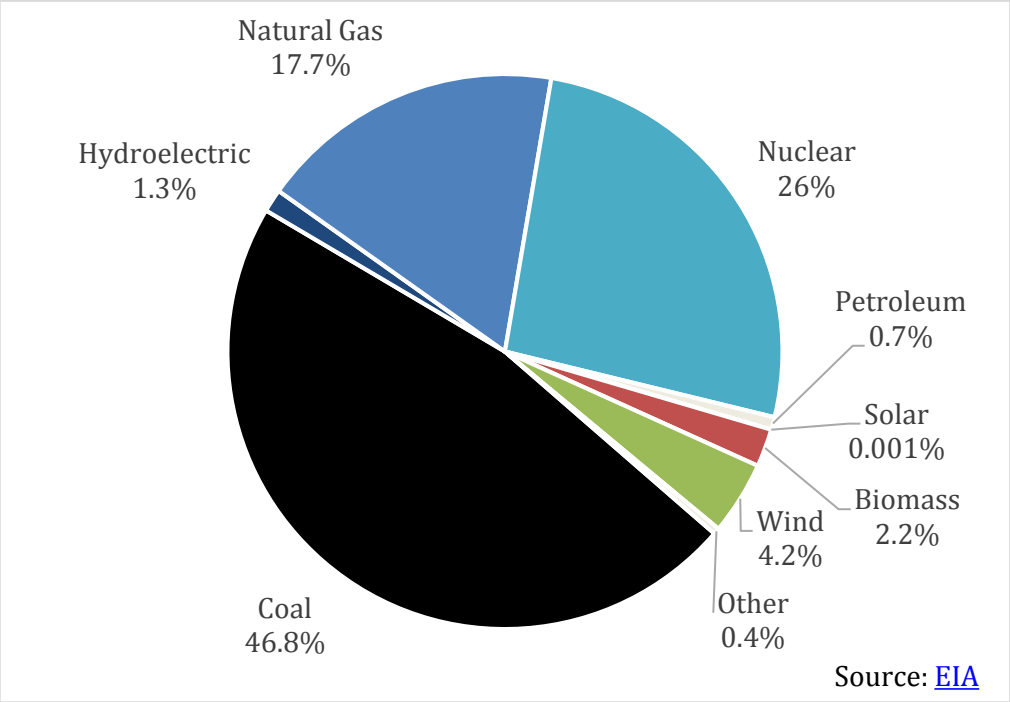
State Brief: Michigan

Background

Michigan's energy mix is dominated by coal and nuclear. In 2015, Michigan had the most underground natural gas storage capacity of any state in the country.

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% by 2019. As of March 2015, Michigan was one of only 18 states to have a state-run program providing grants for renewable energy education, outreach, feasibility studies, and technology development.

Michigan's Energy Mix



Source: EIA

The three members of the bi-partisan Michigan Public Service Commission (MPSC) are appointed by the Governor. The state has a Republican Governor, Rick Snyder, and both the House and the Senate have Republican majorities.

In May of 2017, the state's two largest utilities announced plans to incorporate more clean energy. DTE Energy unveiled a proposal to reduce carbon emissions by 80% and shut down all coal-fired power plants by 2050. The utility plans to provide customers with 40% of their energy from natural gas plants, 40% from renewable sources, and 20% from nuclear. Additionally, Consumers Energy submitted a "Voluntary Large Customer Renewable Energy Pilot Program" to the MPSC as a response to the growing corporate desire for renewable energy in Michigan. MPSC's review is expected to take six months.

Policy Strengths and Opportunities[1]

An important framework for policymakers to consider, the notion of "policy stacking", [2] was developed at the National Renewable Energy Laboratory (NREL). The basic idea behind policy stacking is that there is an interdependency and a 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.

A simple 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, policies to address interconnection and stand-by rates should be adopted before financial incentive programs are implemented.

Grid Modernization

In the last two decades, digital technologies have been developed that enable utilities to better manage the grid and also 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. This can make the operational side of the utility more efficient. On the customer's side of the meter, advanced metering infrastructure, dynamic pricing, and other emerging technologies allow an exchange of information and electricity between a consumer and their electric provider. Grid modernization will be associated with greater consumer choice, allowing customers to meet their energy priorities by producing their own energy or to selecting to receive innovative energy efficient or clean energy services from different providers.

Grid modernization efforts compliment other policies such as demand response policies, customer data management, smart metering infrastructure, electric vehicles, and others. Policy approaches around grid modernization should be seen as an umbrella to put in place a structure that supports and ties together these other individual policy initiatives.

In terms of state efforts to modernize the grid, Michigan ranks in the top 30%. In the latest Grid Modernization Index, Michigan moved down one spot from 2014, earning the ranking of fifteenth overall for state support, customer engagement, and grid operations. While Michigan shows strength in this area, and in line with the notion of policy stacking, discussed above, there are supportive policies that could advance in-state modernization efforts.

1. Michigan does not have clear state policies governing customer data access and privacy protections. Important aspects of legislation or rules addressing this include the following: clarification of who owns the energy data associated with consumer energy usage, protections for customer privacy, an outline of the process for allowing third parties direct access to data, and policy to promote access to the highest resolution of data by third parties. The state could establish statewide customer data access to energy data through the Green Button Connect program, for example. Only one utility, Northern States Power Company, is a participating Green Button utility provider. Allowing customers to access their data and authorizing third parties to use their energy data for services opens a market for IT based energy management companies to expand and offer services directly to customers in Michigan.

2. Michigan could require that utilities' integrated resource plans (IRPs) include plans to integrate distributed energy resources (including electric vehicles and energy storage), and measure and report on the results of grid modernization efforts.

3. Improvements to the state's energy storage policies, discussed below, will enhance efforts to modernize Michigan's grid. Enhancing clean energy financing and electric vehicle policies, also discussed below, would likewise improve the chances of successful grid modernization.

Clean Energy Financing

Distributed generation (DG) provides localized generation that serves a specific part of the grid. It may include generation serving a specific residence or business, a neighborhood, or a region served by a substation. DG has the benefit of reducing stress on large transmission infrastructure by providing distribution level power (as opposed to central generation). Because small-scale renewable energy systems require large upfront investments, overcoming the upfront cost barrier is arguably the biggest challenge to clean energy deployment at the consumer level. Financing is key and many states provide financing and financial incentives to spur adoption of these technologies.

To promote wide-spread deployment of DG, there are a handful of policy opportunities in Michigan.

1. Combined Heat and Power Incentives – Combined Heat and Power (CHP) is a suite of policies that enable large industrial customers to install systems that boil water to produce steam (heat) and use that steam to drive a turbine generator (power), where excess steam can be used for district heating or cooling. Sometimes referred to as cogeneration, the primary benefit of CHP is very high system efficiency. A key consideration in CHP deployment is identifying the right application – a constant electric and heating/cooling load. Breweries, universities, hospital complexes, are all suitable applications. CHP is a technology that thrives in heavy industry states and Michigan fits the bill. There are many things a state can do to take advantage of CHP, and here are a few of the top policy opportunities in Michigan.
    a. Standby Rates – A key consideration to deployment is having a clear utility tariff for utility customers who opt to add CHP. Legislation directing a utilities commission to design and approve a clear standby charge for CHP is often going to be the best place to focus in this policy area. Rates for these services are generally composed of two elements: energy charges, in dollars/kilowatt-hour (kWh), which reflect actual energy provided to the customer; and demand charges, in dollars/kilowatt (kW), which attempt to recover the utility's costs of providing capacity to meet the peak demand of the facility using the CHP system. Rates that recover the majority of the cost of standby service in fixed customer charges or ratcheted demand charges significantly reduce the financial viability of a CHP project.
    b. Encouraging CHP as a Resource – State policies can encourage utilities to evaluate customer-sited CHP as a supply-side asset within their IRP, which has the potential to expand investments in cost-effective CHP projects that would not otherwise be built. States can encourage CHP deployment through revenue streams that are directly linked to acquisition of electricity generated by the systems. These can include production incentives, feed-in tariffs, standard offer programs, or other revenue streams.
    c. Deployment Incentives – Net metering can be extended to CHP. Furthermore, tax credits, incentives, and exemptions for CHP can be offered at the state level. State loans and grants may also support CHP deployment by providing funding for capital or other costs.

2. On-Bill Repayment or On-Bill Financing – On-Bill Repayment (OBR) and On-Bill Financing (OBF) are mechanisms for financing residential and small commercial clean energy technologies in buildings. The source of financing is the main design component separating OBR from OBF. Financing can come from the utility (OBF), or through a private entity (OBR). In either case, the customer's costs of retrofits or equipment are amortized and combined with savings from the measures on the utility bill. Legislation to promote OBR or OBF should include, at minimum, the following: whether "bill neutrality" – an equal or lower monthly bill post-retrofit – is required; and language authorizing the utilities commission to implement the program. Legislation may include a credit enhancement fund that encourages lending to customers that would otherwise not qualify for a loan due to a low credit score. Reducing the risk to lenders can keep interest rates lower. Legislation can tie loans together with weatherization upgrades for low-income customers. Even though OBR and OBF are offered by individual utilities and other entities in the state, there is an opportunity to make the offering mandatory statewide, and to enact changes to specify such things as loan terms, program size, and customer eligibility.

3. Property Assessed Clean Energy (PACE) – PACE is a financing mechanism used by local governments that allows property owners to finance energy efficiency and renewable energy improvements through their property tax payment. The repayment of qualified energy improvements is done via a voluntary property tax assessment collected by local governments, just as other public infrastructure investments are financed. While PACE programs can be designed for both the residential and the commercial markets, residential PACE takes a much more committed and engaged approach on the part of the state. Commercial PACE programs have been

expanding rapidly in recent years with a robust market evolving around these programs. State legislative authority must be in place to allow local governments to establish energy financing districts.

Michigan has authorized municipalities to establish both commercial and residential PACE programs. Counties and cities must opt in to the program for property owners in their jurisdictions to participate. There are however only two commercial PACE programs at this stage.[3] There is thus an opportunity to extend this program to residential properties.

Electrification of the Transportation Sector

One of the most important barriers to increased adoption of electric vehicles (EVs) is their higher up-front cost as compared to a similar conventionally-fueled vehicle. In addition, there has been a complicated relationship between increased adoption of EVs and the availability of EV charging stations. Put simply, consumers want to be sure their car will get them where they need to go. The good news is that both supportive policies for developing charging infrastructure and technological advancements have eased "range anxiety." For instance, the most recent GM Bolt has an estimated range of 240 miles.

In addition to the Federal incentive, various utilities throughout Michigan offer discounted rates for residential vehicle charging during off-peak hours. Furthermore, battery EVs are exempt from emissions tests. The state has 330 public charging stations to serve an estimated 9,500 plug-in EVs.

There are policy opportunities to further encourage and prepare for increased market penetration of EVs.

1. Charging Infrastructure Plan - Create a charging infrastructure plan for the state, which can serve as a model plan for local governments. Locating charging infrastructure is different than locating conventional fueling stations. For the most part, EVs are cars used for commuting and local trips. Furthermore, while one fuels a conventional vehicle when they are going somewhere, stopping at a gas station for the specific purpose of filling up, a driver of an EV is generally looking to refuel when they are stopping somewhere: when going shopping, going into a restaurant, or going to work. Charging infrastructure plans should target these types of locations and attempt to pair the appropriate level of charging infrastructure with a reasonable amount of time a person may be stopped at that location. Legislation could direct a state agency to develop such a plan through a stakeholder process. Consumers Energy announced a plan for a statewide electric vehicle charging network in 2016. However, the plan was withdrawn in 2017 after pushback from a range of entities, including a Silicon Valley electric charging station vendor and the Michigan Attorney General's Office. MPSC plans to host a technical conference this August to study the impact of alternative fuel vehicles on the state's utility infrastructure. Generating a model plan is one of the expected goals of this conference.

2. Parking Infrastructure Requirements – In tandem with the development of a state-wide 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, one EV charging spot must be provided.

3. EV Supply Equipment (EVSE) Financing and Financial Incentives – The provision of financial incentives and innovative financing options can increase installations of charging stations. States have adopted a number of financial incentives including income and property tax credits, sales tax credits, low-interest loans, grants, and rebates. A handful of states qualify EVSE under their property assessed clean energy (PACE) programs. The state could offer tax incentives for companies to install charging at their workplace and provide grants to local governments to put charging infrastructure in accordance with a state plan. In addition, the state could offer tax credits or other incentives for residents to install charging infrastructure in their homes.

4. EV Financing and Financial Incentives – The provision of financial incentives and innovative financing options can help spur greater market penetration of EVs. Sales and income tax credits are one of the simplest methods for addressing higher up-front costs. While sales tax credits are typically applied at the time of purchase,

[3] For the 'Lean and Green MI' program, only properties that meet the following criteria qualify for PACE financing: 1) properties with a utility cost of $5,000 or more per month, 2) properties with a proposed energy improvement project greater than $100,000, and 3) properties valued at $,1000,000 or more.

income tax credits may do less to address the upfront cost barrier as receipt of the credit is typically removed in time from the purchase. However, a study by the Congressional Budget Office suggests that tax credits are important tools for ensuring increased adoption of alternative-fueled vehicles. To increase the value of the incentive, some states offer transferrable tax credits, allowing the savings to be applied by the dealership at the time of sale. States have adopted several other financial incentives including low-interest loans, grants, vouchers, and rebates.

Energy Storage

Energy storage offers a unique opportunity to dynamically manage supply and demand to maximize the value of grid resources. By deploying storage in strategic locations, utilities can more effectively manage their energy portfolios. First, storage can dispatch power to better integrate intermittent resources like renewable energy. Second, it provides management of intermittent demand – helping to flatten peak demand requirements for the utility. Third, the responsiveness of energy storage can allow the utility with to implement voltage regulation and other ancillary services, useful for improving system efficiency. Finally, energy storage can help the commercial sector avoid costly "demand charges." As utilities around the country consider extending demand charges to the residential sector, this will become an even more important issue.

Storage provides multiple benefits to both the customer and the utility. State planning and regulatory policies can help maximize these benefits through a combination of 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 has a strong set of policies for rooftop solar and wind with a move toward time of use rates, which creates a good foundation for storage as a distributed energy technology. Combined with smart meters, distributed battery storage offers benefits for both the customer and the utility.

A University of Michigan team of sustainability experts and engineers has developed a guide, called "12 Principles for Green Energy Storage in Grid Applications," to assist developers and operators of energy storage systems. The principles offer a concise picture of the most important criteria to consider when designing and operating sustainable energy storage devices and systems. Furthermore, Consumers Energy, one of the largest utilities in Michigan, partnered with researchers at Michigan State University on a two-year energy storage pilot project, with the goal of determining the extent to which storage can be deployed through its territory and how batteries could be installed on its distribution system. Additionally, a Chinese battery company, Camel Energy, is opening its North American research and development headquarters in just outside of Ann Arbor. The company manufactures batteries, and its new center will focus on electric vehicle batteries.

There are additional opportunities for developing supportive state policies:

1. Instruct 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.

2. Amend interconnection policies to ensure that storage can connect to the grid through a transparent and simple process. IREC has produced a series of interconnection protocols that states may easily adopt.
    a. In the latest Freeing The Grid report, Michigan received a "C" for interconnection rules. The best practices for interconnection could be established in statute, or legislation could provide an instruction to the MPSC to implement these best practices.

3. Instruct the MPSC to develop a strategy toward broad-scale implementation of energy storage both at the home and business level as well as the micro-grid level through the establishment of an energy storage standard.

4. 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 utilities to evaluate the cost effectiveness of "non-wires" alternatives (NWAs) to large generation investments that are more traditional utility avenues for meeting demand. Or, states may 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 system the greatest value.

5. Adopt clear data access policies that allow third parties to provide energy management services based on signals from the utility to greatly increase the value of efforts to monetize the value stream offered by energy storage.

6. Provide financing for commercial businesses to install energy storage to reduce their demand charges.

7. Incentivize energy storage. Policymakers may want to start first with a policy to incentivize those who have solar systems, along with a utility incentive that will allow the utility to maximize the benefit of solar by aligning solar resources with peak load.

8. Provide an option for utility customers (targeted at commercial users) to pay an additional charge to be included in a "high reliability zone" created through a combination of distributed generation and energy storage – forming a utility integrated "microgrid".

9. Provide incentives for customers to purchase storage to both manage load and store locally produced renewable energy. This will bolster the rooftop solar and wind energy industries as well as the distributed energy storage. Allow utilities that provide incentives to customers to install smart meters that enable dynamic energy management from multiple distributed battery systems.

2017 Energy-Related Legislation Introduced by Attendee

Bill Number	Bill Summary	Bill Status	Sponsor
HR 17-09	A concurrent resolution to urge the Governor to add Michigan to the growing number of states pledging to fulfill the goals of the Paris Climate Accord.	Introduced	Elder
HB 17-4200	Environmental protection; air pollution; air pollution control commission; establish.	Introduced	Elder
HB 17-4202	Natural resources; gas and oil; oil and gas commission; established to oversee issuance of permits and promulgation of rules.	Introduced	Elder
HB 17-4776	Natural resources; gas and oil; use of flowback water from hydraulic fracturing process on dirt roads as a dust suppression tool; prohibition.	Introduced	Elder
HB 17-4777	Natural resources; gas and oil; hydraulic fracturing; require notice and an opportunity for a public hearing prior to authorizing.	Introduced	Elder
HB 17-4778	Natural resources; gas and oil; methane from wells; require control or capture of.	Introduced	Elder

Other Energy-Related 2017 Legislative Activity

Only bills that have passed both chambers are set out below. For all 2017 energy-related legislation, visit aeltracker.org.

Bill Number	Bill Summary	Bill Status
HB 17-4080	Amend the Revised School Code to do the following: Include energy conservation and operational improvements to school facilities or infrastructure among permitted conservation improvement projects in local school districts and intermediate school districts; Allow such projects to be financed from an installment contract or lease-purchase agreement; Provide that payments under a lease-purchase agreement would be a current operating expense; Allow a school board to make payments under a lease-purchase agreement from any legally available funds or from a combination of energy or operational savings, capital contributions, future replacement costs avoided, or billable revenue enhancements that resulted from energy conservation and operational improvements; Provide that a lease-purchase agreement would terminate immediately and absolutely at the close of the fiscal year in which it was	Enacted

	executed or renewed, or when appropriated and otherwise unobligated funds were no longer available to satisfy the obligations of the board under the agreement; Add to the list of permitted energy conservation improvements: ventilating upgrades; information technology improvements associated with an energy conservation and operational improvement to school facilities; and municipal utility improvements associated with an energy conservation and operational improvement to school facilities; and Revise the information that a school board must report to the State Treasurer if energy conservation improvements are made.	
SB 17-159	Traffic control; traffic regulation; gross vehicle weight limits; provide exemption for certain natural gas vehicles.	Enacted

Media

- September 3rd, 2017: Industrial-strength Savings: Michigan Companies Take Steps to Reduce Energy Used in Industrial, Office Facilities.
- September 1st, 2017: Harvey Prompts Gov. Snyder to Declare State Energy Emergency.
- August 30th, 2017: Michigan Communities Take Slightly Different Approach to Clean Energy Financing Tool.
- August 25th, 2017: Changes Coming to the Michigan Energy Code.
- August 23rd, 2017: Michigan Utility Agrees to Retire Coal Plants, Add Wind and Solar.
- August 18th, 2017: As Coal Plants Close, Groups Scrutinize Plans for More Gas-fired Generation in Michigan.
- August 17th, 2017: MSU Taps Parking Lots for Renewable Energy and Big Savings.
- August 17th, 2017: Michigan Energy Agency Offers to Match Utility Rebates to Convert Commercial Buildings to LED Lighting.
- August 4th, 2017: Michigan Developer Looks to Combine Clean Energy with Affordable Housing.
- July 23rd, 2017: Renewable Energy Contract Case in Michigan Could Set Precedent.
- July 21st, 2017: Michigan Program Finances First Megawatt of Solar, with Ambitious Goals Ahead.
- July 19th, 2017: Michigan Utility Embarks on 'Next Generation Infrastructure' for Clean Energy.
- July 5th, 2017: Construction Starts on Consumers Energy Wind Turbine Project.

Other Resources

- Michigan Conservative Energy Forum: http://www.micef.org/
- Michigan Public Service Commission: http://www.michigan.gov/mpsc/
- U.S. Energy Information Administration, Michigan: https://www.eia.gov/state/?sid=MI
- The Database of State Incentives for Renewables & Efficiency (DSIRE), Michigan: http://programs.dsireusa.org/system/program?fromSir=0&state=MI
- The American Council for an Energy-Efficient Economy State and Local Policy Database, Michigan: http://database.aceee.org/state/michigan
- SPOT for Clean Energy, Michigan: https://spotforcleanenergy.org/state/michigan/