

# Michigan EV Policy Landscape

## Electrifying Transportation in the Auto State



December 2020

### Overview

As Michigan continues to drive toward an electrified transportation future, which policies, strategies, and partners can help it succeed? The Michigan EV Policy Landscape outlines how the state can move forward to achieve a more robust EV future. The Electrification Coalition (EC) developed this document to guide the work of the EC State EV Policy Accelerator over the next year, and it features our assessment of the policy opportunities, pathways, messaging, and key players that will be most effective in achieving progress in the near term. It reflects input from a wide range of on-the-ground stakeholders and builds upon the insights of previous roadmaps and guidance documents, including those developed by the EC. It accounts for transportation’s current impacts to public health, safety, and the economy. From the collection of policy opportunities we examine here, the EC has identified a set of high-impact areas of engagement where we will dedicate our resources in partnership with other players. Our goal: Electrify the Auto State.

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## EV Policy Context

Michigan has already taken important steps toward an electrified transportation future, with actions by the state government, local governments, non-governmental organizations, and the private sector, including utilities and EV companies. Michigan's future prosperity will be shaped by its ability to keep pace in adopting and guiding this transformation.

**State leadership:** Governor Whitmer has taken several actions to support transportation electrification. In September 2020, she announced [Executive Order 2020-182](#), which set a goal of economic decarbonization in Michigan by 2050, and [Executive Directive 2020-10](#) to create a Michigan Healthy Climate Plan, which will provide strategies and recommendations for achieving and tracking progress toward the statewide goals, including efforts to electrify transportation.

Earlier in 2020, under [Executive Directive 2020-1](#), Gov. Whitmer established the Office of Future Mobility and Electrification (OFME) to guide policy recommendations to ensure Michigan remains a world leader in autonomous vehicles and vehicle electrification. Powertrain electrification is one of six trends at the core of this transformation, alongside vehicle connectivity, shared mobility, autonomous driving, intelligent automation, and global supply chain. The OFME will be guided by an appointed Council on Future Mobility and Electrification (CFME), which is anticipated to develop policy recommendations by September 2021.

On the legislative front, important steps are underway. A bipartisan group of legislators has been active in previous sessions, and we expect similar engagement, in coordination with CFME.

**Vehicles:** Michigan is the birthplace and home of the American automobile industry, with more than 70% of North America's automotive research and development, 60% of the largest auto suppliers and 25% of all U.S. assembly plants<sup>1</sup>. America's "Big 3" automobile companies (FiatChrysler, Ford, and GM) have been increasing the pace and intensity of their electrification efforts in the last few years. Of these manufacturers, GM's Chevy Volt and Bolt lead, while Ford and FiatChrysler are following up with the Ford Mustang Mach-E, Ford F-150 Lightning, Chrysler Pacifica PHEV, Jeep Wrangler PHEV,

### About the State EV Policy Accelerator and the Electrification Coalition

The Electrification Coalition (EC) launched the State EV Policy Accelerator in early 2020, with the goal of advancing state policy levers to drive transportation electrification at scale. Working with leaders across the government, private-sector and advocacy community, the EC will lead deep-dive policy action focused on high-impact policy measures in the five priority states of Michigan, Nevada, North Carolina, Pennsylvania, and Virginia from 2020-2022. This work will include detailed market assessments, policy blueprints, resource toolkits, and customized bootcamps, alongside targeted implementation programs for bus electrification, fleet transitions, and other local programs to prove out electrification on the ground. In addition, the EC provides rapid response support for states across the country, in the form of targeted analysis, media and communications support, testimony, and policy comments.

The EC is a nonpartisan, nonprofit organization that promotes policies and actions to facilitate the deployment of plug-in electric vehicles (EVs) on a mass scale to overcome the national security and economic challenges caused by America's dependence on oil. EC supporters and partners represent the entire electrified transportation value chain, positioning the organization as a dedicated rallying point for a new transportation future.

### Michigan Office of Future Mobility and Electrification

Source: [OFME](#)

The OFME will focus on six objectives:

1. **Accelerate Electric Vehicle Adoption in Michigan:** Support the transition from internal combustion engine vehicles to electric vehicles and expand access to charging infrastructure.
2. **Bolster Michigan's Mobility Manufacturing Core:** Protect the state's competitiveness in electric and autonomous vehicle manufacturing and ability to move technologies into industrial scale manufacturing.
3. **Increase Mobility Investment in Michigan:** Generate new investment and job creation from tech companies focused on future mobility, including autonomous and electric vehicle innovation.
4. **Expand Michigan's Smart Infrastructure:** Further develop systems for deploying autonomous and shared transportation.
5. **Engage More Mobility Startups:** Establish Michigan as a premier location for young companies to start, scale, commercialize and grow technologies redefining the movement of people and goods.
6. **Further Enable Michigan's Mobility Workforce:** Develop and attract the skills and talent necessary to meet the changing demands of the mobility sector.

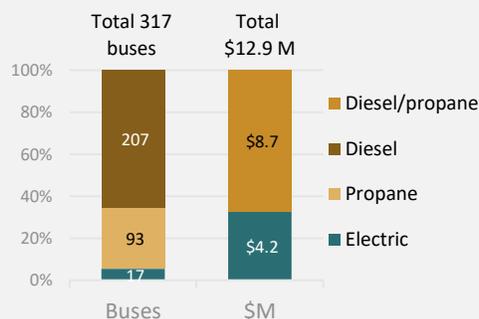
<sup>1</sup> <http://www.detroitchamber.com/wp-content/uploads/2013/05/Michigan-is-Auto-2015.pdf>

and Fiat 500e. Meanwhile, Michigan-based EV startup Rivian has gained strong financial support from Ford and Amazon, which placed an order for 100,000 electric delivery trucks to be on the road by 2024. Ford is also funding Rivian's efforts to build an electric pickup and SUV. Bollinger, another Michigan-based EV startup, is developing e-trucks, focusing on the Class 3, medium-duty truck market. In September 2020, GM invested in Nikola Motors to build a fuel cell or battery pickup truck.

Michigan was awarded \$64.8 million through the VW settlement fund to address diesel emissions. However, Phase 1 distributions for school buses (about \$13 million) did not prioritize zero emission or electric buses (Figure 1).

**Figure 1. Michigan's VW settlement school bus allocations have not prioritized electric vehicles**

Percent of school buses, Phase 1 [VW funds](#)



## The Case for EVs in Michigan

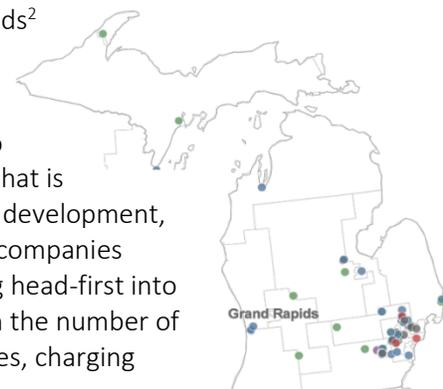
Drivers for EV action in Michigan include the economic development benefits of transportation electrification; the need to reduce greenhouse gas emissions and air pollutants, such as particulate matter (from diesel vehicles) and nitrogen oxides, which adversely impact public health, especially for communities of color; and concerns over the adverse energy security risks associated with oil dependency.

### Jobs and Economic Development

Vehicles are a big deal in Michigan, with nearly 400,000 people employed in related fields<sup>2</sup> (including automotive manufacturing, sales, repairs, renting, and maintenance), representing 7% of the state's workforce.

The future of the auto industry is electric, and if Michigan seeks to remain the U.S. auto leader and be competitive in global markets, the state must spearhead the innovation that is driving this transition. Electric vehicles already provide significant benefits to economic development, and Michigan is poised to grow its EV industry. Globally, automakers and other private companies have committed \$460 billion to electrification.<sup>3</sup> Michigan-based companies are jumping head-first into transportation electrification. Already, Michigan ranks very high among all U.S. states in the number of companies involved in the [EV supply chain](#), including companies building electric vehicles, charging stations, batteries, electronic controls, and electronic devices used in motors and charging (Figure 2. See also Table 1, Key Players, EV and EVSE supply chain).

The Big 3 are adjusting their traditional fossil-based vehicle portfolios to build electric models, and they are investing in electric-only companies (battery electric and hydrogel fuel cell). Rivian's order from Amazon to build 100,000 delivery trucks is worth \$700 million. Ford is supporting Rivian with a \$500 million investment to build an electric pickup truck, and it invested \$700 million in Ford's own Dearborn Complex to build the electric F-150. The company has committed to becoming [carbon neutral](#) by 2050. In September 2020, [GM announced a \\$3 billion investment](#) to produce all-electric trucks and SUVs at its Hamtramck plant in addition to a self-driving vehicle through its subsidiary Cruise. GM invested \$2 billion in Nikola Motors to build a fuel cell or battery pickup. For the state of Michigan, these investments mean renewed economic development opportunities.



**Figure 2. Facilities supporting EV supply chain in Michigan**

<sup>2</sup> Auto Alliance, <https://autoalliaMle.org/in-your-state/>

<sup>3</sup> Atlas Public Policy. <https://www.atlasevhub.com/materials/private-investment/>

Economic benefits beyond the supply chain extend into growth in electricity generation and distribution, grid and infrastructure investments, sales of vehicles, and associated advertising and marketing services. Cost savings that result from EVs' lower fuel costs can be re-invested in the community. Spending on oil in Michigan totals about \$11-\$12 billion per year.

### Reduce dependency & \$ on oil



165 million barrels per year imported



\$11-12 billion/year on oil

### Pandemic-Related Uncertainties

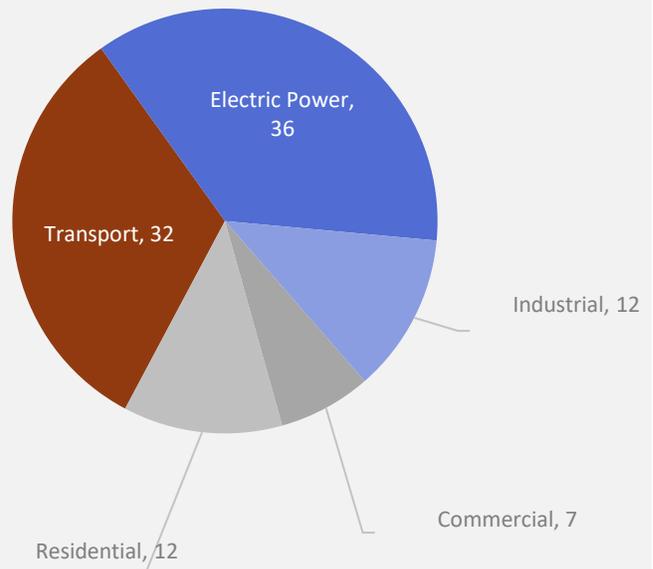
The novel coronavirus pandemic introduced a significant degree of uncertainty in coming months, even as health conditions improve and the economy begins to rebound. Challenges include reduced travel, which lowers economic activity and state revenues; extended timelines for the introduction of new EV models, including in the much-anticipated light-duty pickup segment; lower demand for public transit and new social distancing protocols that persist for public transportation, constraining budgets; and broader employment impacts that have reduced economic activity. As a result, local and state governments are facing continued financial struggles. Meanwhile, as cities see lower emissions and improved public health conditions that result from reduced travel, there is a greater awareness of the positive impacts that increased use of EVs could have communities.

### Greenhouse Gas Emission Reductions

Transportation emissions are the second largest contributor to Michigan's greenhouse gas profile (Figure 3), at about 50 Mt CO<sub>2</sub> per year (Figure 4). There is a substantial opportunity to reduce greenhouse gas emissions by electrifying the transportation sector. The estimated potential GHG emissions reductions that would result from a switch to electric light-duty vehicles, freight trucks, and buses is illustrated in Figure 4. Cumulative CO<sub>2</sub> saved from 2020-2060 is an estimated 750-845 Mt.

**Figure 3. Transportation is Michigan's second-largest source of GHG emissions**

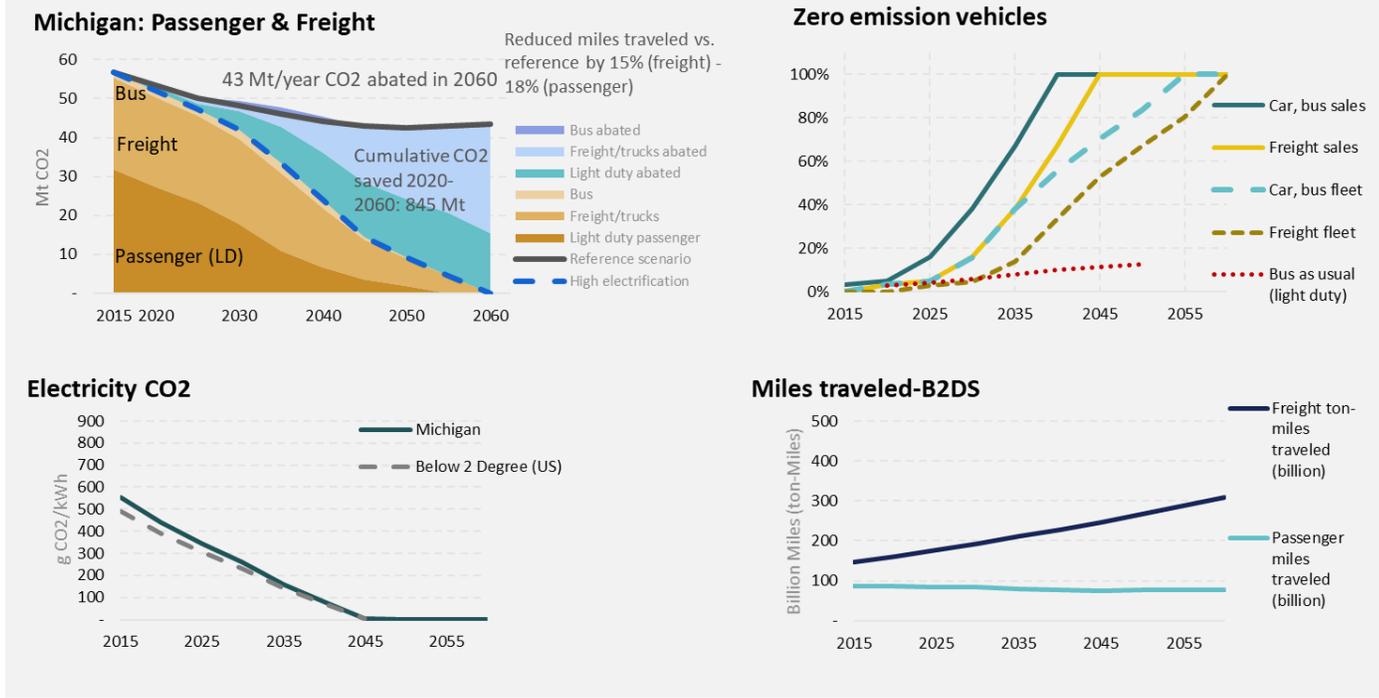
Percent of GHG emissions by sector. Source: Energy Information Administration, [Table 4](#)



### Figure 4. GHG reductions possible with aggressive electrification

Mt CO<sub>2</sub> reductions: About 45 Mt/year avoided in 2060; cumulative CO<sub>2</sub> saved from 2020-2060 is 750-845 Mt. Low-range reflects reference travel patterns (flat passenger travel, increasing freight travel); higher range reflects 15-18% reduction in miles traveled consistent with a Below 2 Degree Scenario (B2DS) (bottom right). Electricity CO<sub>2</sub> intensity specific to Michigan, following an assumed decarbonization pathway to 0 g CO<sub>2</sub>/kWh in 2045 (bottom left).

Source: Hovland Consulting estimate (2020), with inputs from [IEA Energy Technology Pathways \(2017\)](#) & other sources.



### Air Quality, Public Health, and Social Equity

Public health improvements are another benefit of transportation electrification. The transportation sector is a significant source of harmful air pollutants, particularly in areas of high population density, which are often home to disadvantaged communities. These emissions can be lowered substantially through a move to EVs. Traditional internal combustion engine vehicles (ICEVs) are leading emitters of criteria pollutants considered by the U.S. Environmental Protection Agency (EPA) to be harmful to public health. These include particulate pollution (PM<sub>2.5</sub> and PM<sub>10</sub>), carbon monoxide, volatile organic compounds, and nitrogen oxides (NOx). Globally, PM<sub>2.5</sub> from fossil fuel emissions is responsible for nearly [9 million premature deaths per year](#), amounting to nearly one in five deaths worldwide. Transportation emissions are linked to asthma, heart attacks, reduced lung capacity, chronic pulmonary disease, heart disease, and cancer.

Of additional concern, pollutant exposure disproportionately affects Black, Latinx, Indigenous, and low-income communities, and the COVID-19 pandemic has brought these inequities into stark relief. In Michigan, these populations are significant: 25% of residents are people of color, and 30% have incomes below 185% of the

federal poverty line.<sup>4</sup> Recent studies suggest that higher exposure to PM<sub>2.5</sub> increases the COVID-19 mortality rate: An increase of only 1 µg/m<sup>3</sup> in PM<sub>2.5</sub> is associated with an 8% increase in the COVID-19 death rate.<sup>5</sup>

In Michigan, 5 million people live in EPA-designated nonattainment areas for criteria pollutants (or high criteria emissions).<sup>6</sup> Child or adult asthma is estimated to affect about 12% of the population, or roughly 1 million people.<sup>7</sup> Asthma rates increased by 5% between 2003 and 2017 to levels significantly higher than the national rate. The Detroit area is especially concerning, with 165 deaths every year due to on-road air pollution.<sup>8</sup>

## Improve health



5 million people in air quality non-attainment areas



With EVs in 2050, avoid 145 premature deaths, \$1.7 trillion health costs, 1,840 asthma attacks, 8,250 lost work days per year

Battery electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs) in electric drive mode have zero tailpipe emissions and thus drastically improve ambient air quality and health outcomes. Across Michigan, the benefits of vehicle electrification would be substantial: Annually, the state could avoid 145 premature deaths, \$1.7 trillion in health costs, 1,840 asthma attacks, and 8,250 lost work days.<sup>9</sup>

## National and Energy Security

The importance of a transportation-sector transition from petroleum to electricity extends beyond emissions reductions. About 90% of transportation in the United States is currently powered by oil, and this dependence has bound the United States' national, economic, and energy security to a highly volatile, cartel-influenced global oil market.<sup>10</sup> Every year, the [U.S. military spends roughly \\$81 billion](#) to safeguard global oil supplies. Ninety percent of conventional crude oil reserves are held by OPEC member states or state oil companies that do not share U.S. strategic values or interests. Some economists have estimated that the financial resources spent by the military equate to a U.S. taxpayer [subsidy of up to \\$0.70 per gallon](#) of gasoline. The U.S. has gone to great lengths to secure oil supply and reduce volatility globally, but not all supply disruptions can be predicted or prevented. And no matter where oil supply is disrupted in the world, prices everywhere are affected. If the

<sup>4</sup> U.S. Census Michigan Quick Facts. <https://www.census.gov/quickfacts/MI> and GIS analysis using Census data. <https://www.census.gov/geographies/mapping-files/time-series/geo/tiger-line-file.html>

<sup>5</sup> Harvard (2020), *COVID-19 PM<sub>2.5</sub>: A national study on long-term exposure to air pollution and COVID-19 mortality in the United States*. <https://projects.iq.harvard.edu/covid-pm/home>. See also *Can exposure to PM<sub>2.5</sub> particles increase the incidence of coronavirus disease 2019 (COVID-19)?* Elsevier Public Health Emergency Collection (Nov 2020). <https://www.Mlbi.nlm.nih.gov/pmc/articles/PMC7308784/>.

<sup>6</sup> GIS analysis using EPA non-attainment data and census for population

<sup>7</sup> [https://www.cdc.gov/asthma/most\\_recent\\_data\\_states.htm#source](https://www.cdc.gov/asthma/most_recent_data_states.htm#source). National Center for Environmental Health 2018.

<sup>8</sup> Anenberg, S.C., J. Miller, D. Henze, R. Minjares, P. Achakulwisut (2019) The global burden of transportation tailpipe emissions on air pollution-related mortality.

<sup>9</sup> American Lung Association (2020), *The Road to Clean Air: Benefits of a Nationwide Transition to Electric Vehicles*. <https://www.lung.org/getmedia/99cc945c-47f2-4ba9-ba59-14c311ca332a/electric-vehicle-report.pdf>

<sup>10</sup> U.S. Energy Information Agency: Use of energy explained - Energy use for transportation.

<https://www.eia.gov/energyexplained/use-of-energy/transportation.php#:~:text=Petroleum%20is%20the%20main%20source,distillates%2C%20contributed%20about%205%25.>

United States is to ever attain true energy security, we must accelerate the transition away from petroleum-dependent transportation to electric vehicles.

The direct financial impact can be significant: Michigan imports 165 million barrels of oil per year, at an annual cost of roughly \$11-12 billion.<sup>11</sup>

## Key Players

The electrification policy opportunities in Michigan include a variety of potential actions by many players, as described in Table 1. These players must work together in combination to advance the transition to EVs.

**Table 1. Key Players**

Player	Description
<b>Governor</b>	With strong high-level leadership by Governor Gretchen Whitmer and local reinvestment by the Big 3 auto companies in EV assembly plants, Michigan is poised to emerge as a leader in transportation electrification. Gov. Whitmer established the Office of Future Mobility and Electrification (OFME) by executive directive to maintain Michigan’s place as a world leader in transportation electrification.
<b>State Agencies and Organizations</b>	The OFME was established by the Governor’s Office in July 2020 to reaffirm Michigan’s position as the global leader in producing next-generation transportation technologies. It will also engage in electrification policies and startup support of emerging technologies. The Department of Environment, Great Lakes, and Energy (EGLE) handles the VW settlement fund. The state has prioritized VW fund distribution to update diesel buses to cleaner diesel and propane buses and the purchase of a small number of electric buses. A second RFP was released in mid-2020 to replace eligible diesel transit buses, shuttle buses, medium trucks, large trucks, and port drayage trucks. A third RFP is anticipated, depending upon funding availability, to replace eligible freight switchers, tugboats, ferry boats, port cargo handling equipment, forklifts, and airport ground support equipment.
<b>State Legislature</b>	Michigan’s governor is a signatory to the U.S. Climate Alliance, committing the state to meet carbon emissions reductions equivalent to those outlined in the Paris Climate Accord. But the state legislature has been slow to embrace transportation electrification policies. However, lawmakers could find appeal in free-market arguments to support start-up business models and significant job-creation opportunities that stem from the EV supply chain.
<b>Auto Companies</b>	Michigan is home to the Big 3 of the automobile industry and to new entrants that have demonstrated support for EV policy across a variety of policy areas and strategies: Ford Motor Co., Stellantis, General Motors (autonomous and EV research), GM Subsystems Manufacturing (batteries), Rivian, and Bollinger Motors.
<b>EV and EVSE Supply Chain</b>	The supply chain in Michigan is very robust, with a host of players that can benefit from EV growth: 3M (battery components), A123 (battery components), AKASOL (batteries), Auria Solutions (auto insulation), AVL Powertrain Engineering (battery and e-motor development), BASF Catalysts (battery components), BASF Toda (battery components), Black & Veatch (EVSE), Robert Bosch (battery systems), Dana Incorporated (motor thermal management), Engineered Machined Products (thermal management), Federal-Mogul Corp (supplier), Rawsonville Components (batteries), GaN Systems (semiconductors), Gentherm (thermal management), Hella Electronics (auto supplier), Hemlock (semiconductors), Hitachi Automotive (e-motors), Inmatech (supercapacitors), Johnson Controls (batteries), Lear Corporation (EVSE), LG Chem Power (batteries), Magna Electronics (motors), Mitsubishi Engineering, Navitas (batteries), Nitto Automotive (battery components), Nexteer (power steering), New Eagle (electronics), Panasonic (batteries), Paraclete Energy (battery components), Ricardo (batteries), Roush Industries (auto suppliers), Sakti3 (solid state batteries), Soulbrain (battery components), Thermo Analytics (thermal management), Tremec (auto suppliers), Valeo (EV tech), Volta Power Systems (batteries), XALT Energy (EVSE), XG Sciences (batteries), ZF industries (axle drive), ZF North America (auto components).
<b>Businesses and Trade Associations</b>	There are several associations that play an important role in helping shape EV policy in the state and provide thought leadership: Clean Fuels Michigan* (30 leading Michigan companies focused on clean transportation industry in Michigan), Michigan Energy Innovation Business Council* (trade association focused on Michigan’s advanced energy economy), MICHauto (an initiative dedicated to promoting, retaining, and growing the automotive and next-generation mobility industry in Michigan), May Mobility (autonomous EV shuttles).
<b>Utilities</b>	Electric utilities are a natural ally in the transition to electric vehicles. So far, utility pilot programs have been focused on EVs and EVSE. Utilities have offered rebates or discounts for installing EVSE and have offered time-of-use rates or special rates for EV owners. Utilities include Consumers Energy, DTE Energy (Detroit-based power company), Indiana Michigan Power, Lansing Board of Water & Light.

<sup>11</sup> US Energy Information Administration State Energy Data System (SEDS) - Petroleum consumption, <https://www.eia.gov/state/seds/seds-data-complete.php?sid=US> and \$2.01/gallon average (<https://michiganprices.com>)

## Policy Opportunities

Michigan has a rich set of policy opportunities to pursue, with some groundwork already laid. The existing foundation will ensure Michigan's ongoing role as a hub of transportation innovation and manufacturing and jumpstart deployment of EVs and the charging network necessary to support them.

Key policy levers include those that advance the electrification of the medium- and heavy-duty sectors; sales of EVs directly from manufacturers to consumers; future allocation of VW settlement funds; decisions in utility rate cases (with the opportunity to devote funding to EVs and charging infrastructure); EV-ready building codes; and monetary and non-monetary incentives to support electric vehicles and charging infrastructure.

Based on our assessment to date, the top policy priorities for EC's work accelerating electrification of transportation in Michigan in the near term are as follows:

1. Support cleaner freight and buses by signing onto the Multi-State Medium- and Heavy-Duty Zero Emission Vehicle MOU and support follow-up policies
2. Support EV manufacturer direct sales to consumers
3. Reform annual EV fees to improve access
4. Electrify the state fleet
5. Begin the process to establish a Clean Fuels Standard
6. Concentrate VW settlement fund disbursements on EV uptake.

The EC will seek opportunities to support education and outreach on the transition to electric vehicles and pursue additional policy strategies and venues as opportunities arise.

## Acknowledgements

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