

August 2020

Siting Utility-Scale Solar and Wind in Michigan A Guide for Local Governments

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Photo from Great Plains Institute by Katharine Chute

SUMMARY

Wind and solar energy are among the least expensive forms of electric generation in the country. Solar and wind resources are abundant throughout Michigan. Costs of both solar and wind energy systems are forecast to continue declining. Increased market activity in renewable energy development will therefore continue well into the future.

This guide provides Michigan communities with a long-range perspective on utility- and community-scale solar — systems sized 1 megawatt (MW) or greater — and wind energy markets and development trends. Understanding the long-term context helps communities make informed decisions in evaluating renewable energy proposals and creating plans about how future development should happen.

The Great Plains Institute is engaging local governments across the Upper Midwest on long-term planning for renewable energy. Additional guides are available on the Great Plains Institute website: www.betterenergy.org.



SUMMARY OF RENEWABLE ENERGY SITING AUTHORITY

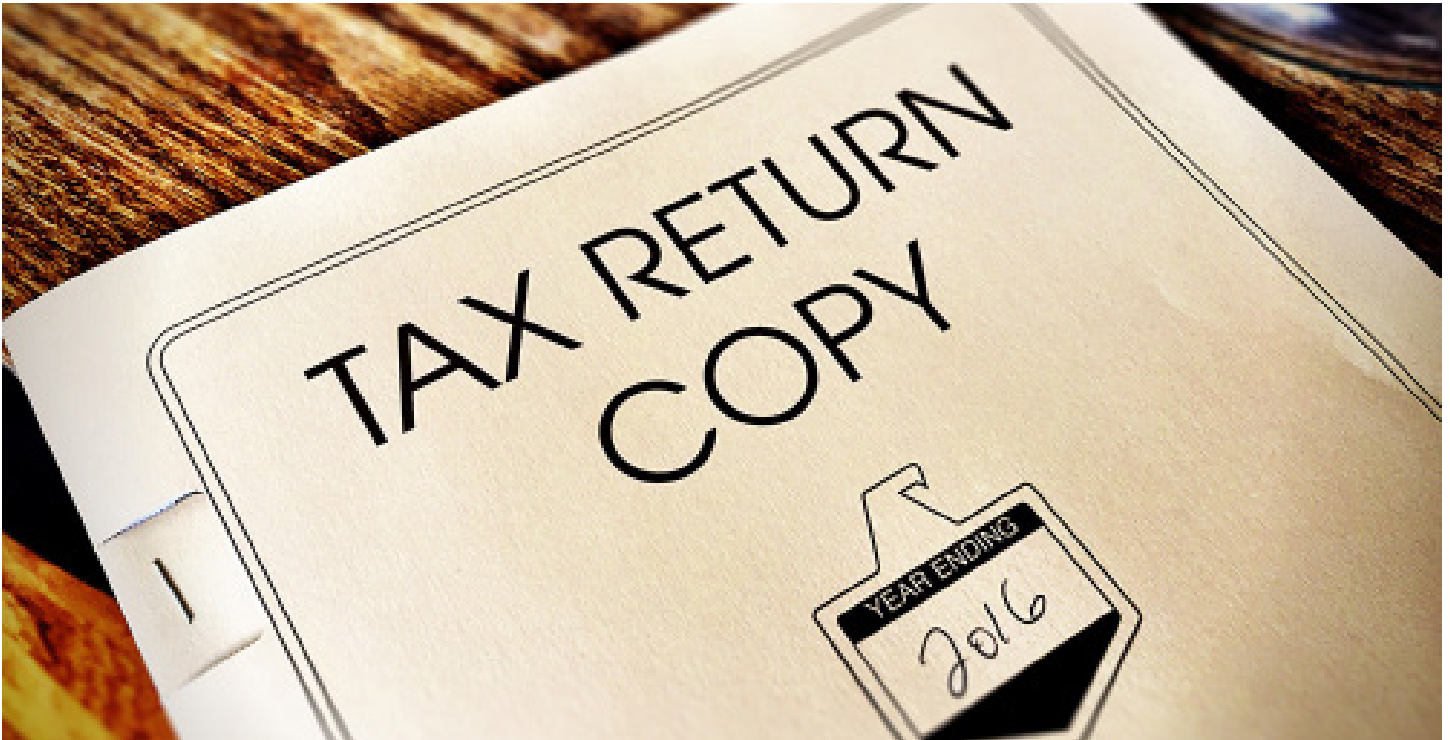
Siting authority for solar and wind systems in Michigan resides at the local level.¹ Additional permits are granted by state bodies, but these projects are still subject to local land use controls. For example, the Michigan Public Service Commission issues a Certificate of Public Convenience and Necessity for some large wind and solar projects, but neither solar nor wind energy systems require a state-level siting permit.² Zoning and land use standards vary widely across local governments. Table 1 provides an overview of siting authority by project type and size.

Table 1. Michigan Siting Authority

ROLES	STATE	LOCAL
Wind energy systems		X

Solar energy systems		X
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SUMMARY OF TAXATION AND LOCAL REVENUE



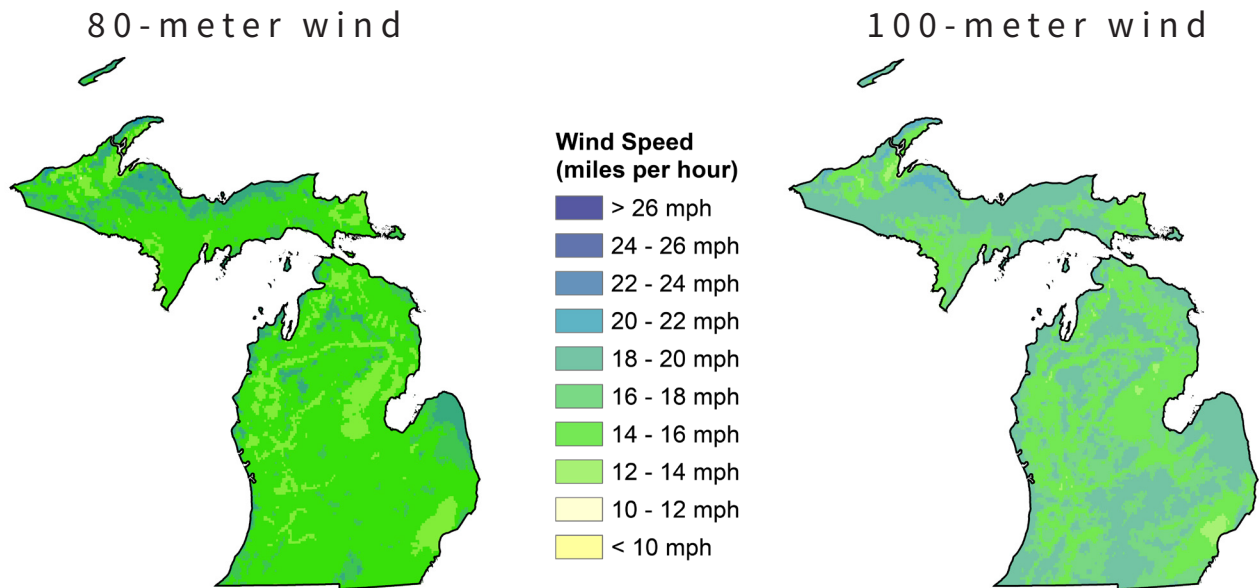
Utility-scale solar and wind development provides direct economic benefits to the community where they are located through property tax revenue. More details about the taxation of solar and wind energy systems are described on page 10 of this guide.

Local governments benefit from solar and wind systems through tax revenue.

WIND AND SOLAR RESOURCES

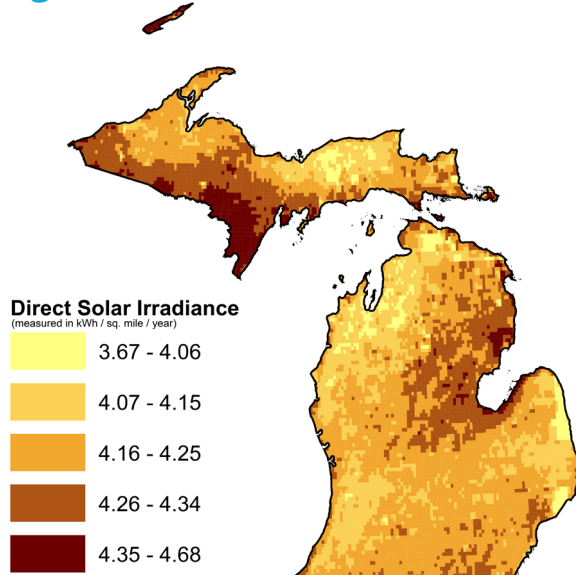
Michigan has abundant solar and wind resources. Figures 1 and 2 are a useful guide to identify regions with the best resource potential for renewable energy development. Local governments will need to consider a more granular view of the data for assessing renewable energy development potential.

Figure 1. Wind Resource



Data Source: National Renewable Energy Lab (NREL) national wind speed data, 2006-2013. NREL incorporates surface wind data, upper-air data, topography, and other factors to estimate the wind resource potential over many square miles. The data is most accurate for large spatial scales.

Figure 2. Solar Resource



Data Source: NREL Multi-Year PSM Direct Normal Irradiance data available through National Solar Radiation Dataset, 2019.

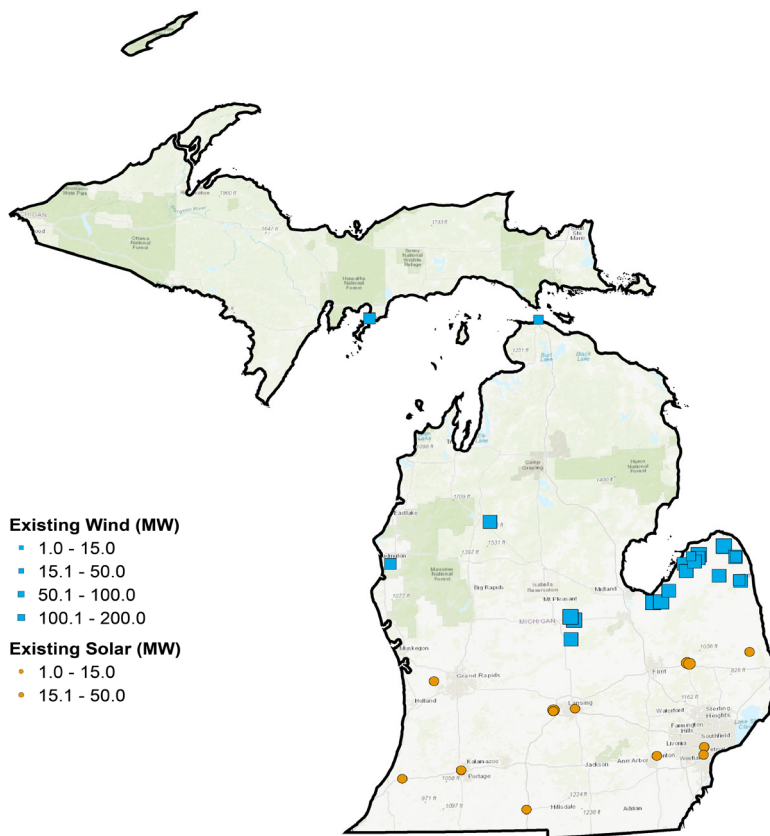
Figure 1 shows the wind potential (in miles per hour) across Michigan for both 80 meters and 100 meters above the ground. Blue and green areas represent the best wind resource and yellow areas represent marginal or poor resources. The elevation shows the resource at the wind turbine tower height. Most new wind farms will have turbines at 100-meter hub height or greater. The data is most accurate at large spatial scales.³

Figure 2 shows the solar potential across Michigan. Dark orange areas represent the highest solar resource and light yellow areas represent the lowest solar resource. Scientists collect solar resource data with LiDAR technology to measure the amount of solar resource available for a given area.⁴

EXISTING WIND AND SOLAR PROJECTS

A small but growing portion of Michigan's energy production comes from renewable energy. Wind energy makes up about 5 percent of electricity generation in Michigan.⁵ Solar energy makes up less than half of one percent in the state.⁶

Figure 3. Existing Wind and Solar



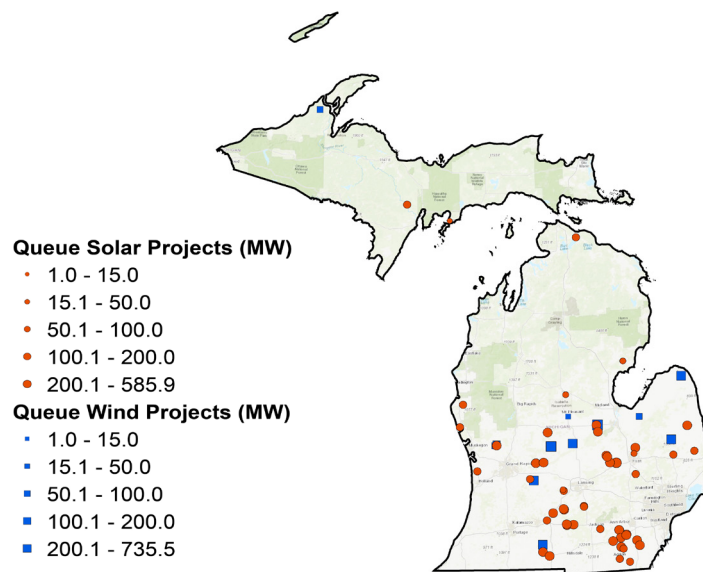
Source: Adapted from US Energy Information Administration Generation Data (via Form 860) for wind and solar energy systems, updated through 2018. Map created January 2020.

Figure 3 shows existing utility- and community-scale solar and wind projects in Michigan. The state had about 176.5 MW of solar installed as of February 2020 and approximately 2,190 MW of wind installed through February 2020.^{7,8}

MARKET TRENDS IN WIND AND SOLAR

Public utilities in Michigan file an integrated resource plan (IRP) with the Michigan Public Service Commission that details their long-term plan for energy resource additions and retirements. Investor-owned utilities in Michigan included substantial renewable energy resources in their most recent IRPs. Figure 4 shows proposed solar and wind energy projects that have filed an application for interconnection with the Midcontinent Independent System Operator (MISO) as of February 2020, which serves as an indicator of market activity and development interest.

Figure 4. MISO Queue Projects



Adapted from Midcontinent Independent System Operator (MISO) public interconnection queue dataset, accessed February 2020.

Wind: There has been an upsurge of wind energy development in recent years, including several projects in the planning and investigation phase that amount to about 1 gigawatt of capacity.

Solar: The Midwest is an increasingly attractive location for wholesale (larger than 10 MW) solar market developments, which could significantly increase Michigan's total solar deployment over the next five to seven years. There are several large-scale solar energy projects that amount to several gigawatts currently in the planning and investigation phase.

Figure 4 displays proposed solar and wind energy projects that have filed an application for interconnection with MISO as of February 2020. Eight wind projects, comprising 1,215 MW of capacity, were in the MISO queue as of February 25, 2020.⁹ As of February 25, 2020, developers are pursuing 49 large-scale solar projects, with a generation capacity of over 6,000 MW.¹⁰

SOLAR ENERGY SITING AND POLICY

RESOURCES FOR SITING AND DESIGN BEST PRACTICES



Photo from Great Plains Institute by Katharine Chute

State Solar Policy Summary

In 2008, the Michigan legislature passed Public Act 295 that required all regulated utilities to meet a renewable portfolio standard of 10 percent by 2015.¹¹ In 2016, the state legislature passed the Public Act 342 including a requirement that 12.5 percent of electricity be generated with renewable energy sources by 2019 and 15 percent by the end of 2021.¹²

In addition to the renewable portfolio standard, Michigan's Public Service Commission regulates utility practices related to distributed generation or small-scale solar development, such as net metering and interconnection.

Solar and Farmland

The Farmland and Open Space Preservation Program provides tax incentives to landowners who enroll in the program and agree to keep land in agricultural use for a minimum of ten years. Prior to an administrative change in 2019, solar development could not be sited on any portion

of land enrolled in this program. The administrative rule change allows for commercial solar development to be sited on land enrolled in the program.¹³ While solar energy systems are sited on land in the Farmland and Open Space Preservation Program, the land is not eligible for tax incentives, but the land can still stay within the program while solar development is sited on the land.

Solar energy systems that are sited on farmland within the program must meet the state's pollinator habitat guidelines, as described by the Michigan Department of Agriculture and Rural Development.¹⁴ The solar energy systems also must maintain field tile and ensure a decommissioning plan to remain within the program.



Photo from Great Plains Institute by Katharine Chute

Local Government Policy, Programs, and Impact

Several Michigan communities are participating in a national best practice program, the SolSmart solar-ready certification program for local governments. The SolSmart program offers models and guidance on land use and solar development, as well as free technical assistance to participating communities through 2020.¹⁵

Local government policies and goals across the state also impact the solar and wind market as individual communities set renewable energy, electricity, and solar development goals. Several communities in Michigan have adopted such goals, including Ann Arbor, Dearborn, Detroit, Grand Rapids, Hazel Park, Kalamazoo, Petoskey, Southgate, Traverse City, Ypsilanti, Meridian Township, and Northpoint Village.¹⁶

SITING AUTHORITY

In Michigan, land use and siting permits for solar energy systems are granted by local governments, including cities, counties, and townships. Townships may choose to regulate solar energy systems if the township has assumed siting authority through a local ordinance. If the township has not assumed siting authority and the county in which the township is located has assumed siting authority, the county may choose to regulate solar energy systems. If a solar energy system is proposed in a township or county that has assumed zoning authority, that solar energy project is subject to local land use controls and must acquire zoning or development permits from the local government in which the project is located. Residents of jurisdictions within which solar energy systems are proposed can provide comments through local zoning hearings.

If neither the township nor the county in which the solar system is located has assumed zoning authority, a land use permit is not required. The University of Michigan's Graham Sustainability Institute and the State of Michigan Department of Environment, Great Lakes, and Energy have compiled a [database of municipal ordinances](#) in Michigan relating to renewable energy.¹⁷

WIND ENERGY SITING AND POLICY

State Wind Policy Summary

Communities across Michigan have developed local ordinances regulating wind energy development, with some differences in standards, restrictions, and requirements. Wind energy has increased in Michigan and makes up about 5 percent of electricity generation in the state. The renewable portfolio standard requires public utilities to generate 12.5 percent of electricity with renewable energy sources by 2019 and 15 percent by the end of 2021.

The Farmland and Open Space Preservation Program provides tax incentives to landowners who enroll in the program and agree to keep land in agricultural use for a minimum of ten years. Land that includes wind energy development may be enrolled in the program so long as the development does not hinder farming operation.¹⁸

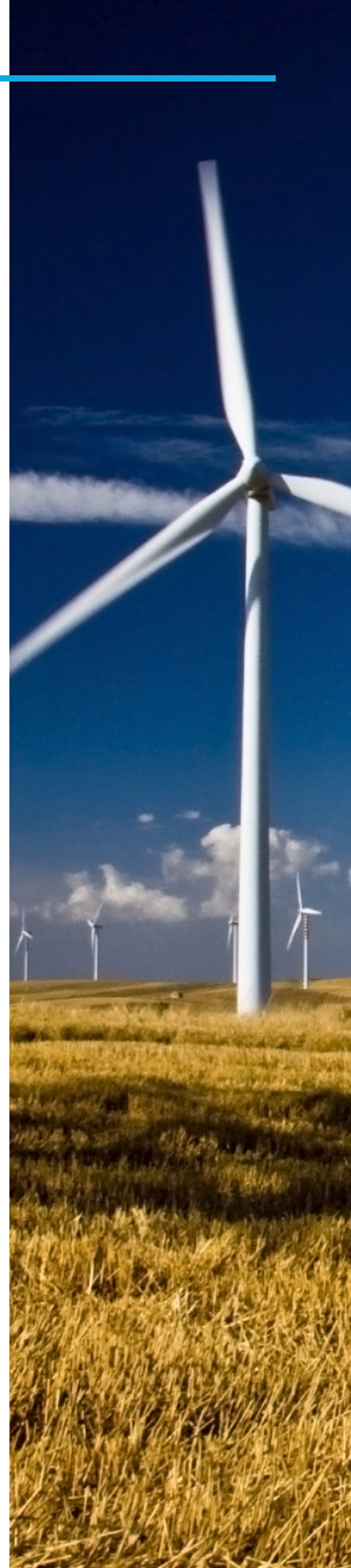
SITING AUTHORITY

In Michigan, the siting regulation and land use permitting for wind energy development falls under the jurisdiction of local governments through local zoning. Townships may regulate wind turbines through the adoption of a zoning ordinance or amendment of a current ordinance.

State agencies do not have authority to issue siting permits for wind energy systems in Michigan. However, state agencies can provide siting guidelines. Since 2002, there have been efforts from many groups to develop wind siting guidelines. In 2007, the Michigan Department of Labor and Economic Growth put forth recommended zoning language for local government zoning amendments with input from members of the Michigan Wind Working Group.¹⁹ In 2017, Michigan State University Extension built upon this guidance with updated recommendations in a sample wind energy system zoning guide. The guidance includes recommendations related to noise, shadow flicker, and recommended zoning ordinance language.²⁰

Michigan Community Wind Ordinances

Many cities and counties in Michigan have developed ordinances regulating small-scale and utility-scale wind energy development. Over 700 townships in Michigan include utility-scale wind development in local ordinances. The University of Michigan's Graham Sustainability Institute and the State of Michigan Department of Environment, Great Lakes, and Energy have compiled a [database of municipal ordinances](#) in Michigan relating to renewable energy.²¹



TAXATION AND INCENTIVES

Property Tax

Wind: In Michigan, wind energy systems are designated as industrial personal property, meaning they are subject to property taxation.²² The true cash value of personal property affects its taxation. Taxation of personal property changes annually based on depreciation value of the property. Depreciation values are detailed in multiplier tables.

The State Tax Commission developed a multiplier table that tax assessors are encouraged to follow, but many tax assessors throughout the state follow a different multiplier table that affects taxation and local revenue. The Michigan Tax Tribunal has heard many cases related to the assessment of wind energy system components and the State Tax Commission is considering revisions to the recommended multiplier table.²³

Solar: In 2013, the Michigan State Tax Commission affirmed that solar panels are classified as industrial personal property.²⁴ Tax assessors making different decisions about the taxation of different solar energy system components throughout the state. The State of Michigan will be updating guidance on property taxation for solar energy systems in the coming year.²⁵

Endnotes

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- 4 Sengupta, M., Y. Xie, A. Lopez, A. Habte, G. Maclaurin, and J. Shelby, “The National Solar Radiation Data Base (NSRDB),” *Renewable and Sustainable Energy Reviews*, 89 (June 2018): 51-60.
- 5 “Wind Energy in Michigan,” U.S. Department of Energy Office of Energy Efficiency and Renewable Energy, accessed February 2020, <https://windexchange.energy.gov/states/mi>.
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- 8 “Wind Energy in Michigan,” U.S. Department of Energy Office of Energy Efficiency and Renewable Energy, accessed February 2020, <https://windexchange.energy.gov/states/mi>.
- 9 MISO Generation Interconnection Queue, Midcontinent Independent System Operator (MISO), accessed February 26, 2020, https://www.misoenergy.org/planning/generator-interconnection/GI_Queue/.
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- 16 “Michigan Cities Taking Action on Climate.” Michigan Climate Action Network, accessed May 2020, https://www.miclimataction.org/michigan_cities_taking_action_on_climate.
- 17 “Wind and Solar Energy Zoning Ordinance Database,” University of Michigan Graham Sustainability Institute and State of Michigan Department of Environment, Great Lakes, and Energy, last modified December 18, 2019, https://docs.google.com/spreadsheets/d/1jsDcA_H1gjk7gHJjF6kwW2v0whUeHrIs4ZWLdFPe2WQ/edit#gid=872368601.
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Endnotes

22 State Tax Commission to Assessors and Equalization Directors, May 13, 2008, State of Michigan Department of Treasury, 3500 (Rev. 1-03).

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ABOUT THE GREAT PLAINS INSTITUTE



GREAT PLAINS INSTITUTE

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If you would like more information on resources available (and relevant) to your specific community, please reach out to:

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