







## Michigan's Clean Energy Economy: Key Facts and Resources

*Home to the Big Three auto manufacturers, Michigan's economy has benefitted from gains in vehicle efficiency and hybrid electric technology. There is a growing wind sector and increased public investment in building efficiency.*

*E2's state profile demonstrates how energy efficiency, renewable electricity and clean fuels are creating jobs and spurring economic growth. We also provide a list of local government resources and contacts working to grow the state's clean economy.*

### EMPLOYMENT

In 2013, businesses in Michigan announced over 1,700 clean energy jobs, including:

-  910 in Energy Efficiency
-  277 in Wind Energy
-  205 in Solar Energy
-  380 in Clean Vehicle Manufacturing

### OTHER CLEAN JOB RESOURCES

- Brookings provides a two page fact sheet detailing clean job growth and wages in Michigan: [Sizing the Clean Economy in Michigan](#)
- The State of Michigan offers a database of job opportunities in clean energy sectors: [Finding Employment and Employees in the Green Economy](#)

## GENERATION

### **The Cheapest, Cleanest Form of Energy: None at All**

The American Council for an Energy-Efficient Economy (ACEEE) estimates Michigan' investments in energy efficiency in 2011 saved the state 1,000,437 megawatt hours (MWh) – the equivalent of meeting the annual electricity needs of more than 120,000 Michigan households.<sup>1</sup> At the average price of electricity \$110 per MWh, Michigan saved more than 110,448,245 through energy efficiency programs.<sup>2</sup>

### **Existing Renewable Generation: What does Michigan have today?**

U.S. Department of Energy: Annual Renewable Generation (MWh)<sup>3</sup>

	<b>2010</b>	<b>2011</b>	<b>2012</b>
Wind	360,000	456,000	1,108,000
Solar	N/A	N/A	N/A
Geothermal	N/A	N/A	N/A
Biomass	802,000	827,000	913,000
Total:	1,162,000	1,283,000	<b>2,021,000</b>
<i>All Energy Sectors:</i>	111,551,000	109,170,000	108,166,000

*\*In 2012, Michigan generated enough renewable energy to power over 246,000 homes.*

### **Planned Renewable Generation: What projects are in development in Michigan?**

SNL Financial: Current Renewable Energy Projects in Place (MW)<sup>4</sup>

	Announced	Under Development	Under Construction	Total Projects in Place
Wind	209.4	865.5	112	209.4
Solar	8			8
Biomass				
Total Renewables		48.9		

<sup>1</sup>American Council for an Energy-Efficiency Economy "The 2013 State Energy Efficiency Scorecard" November 2013. Online. Accessible: <http://aceee.org/research-report/e13k>

<sup>2</sup> Energy Information Administration "How Much Electricity Does an American Home Use?" March 2013. Online. Accessible: <http://www.eia.gov/tools/faqs/faq.cfm?id=97&t=3>

<sup>3</sup> Energy Information Administration "Electricity Data Browser" August 2013. Online. Accessible: <http://www.eia.gov/electricity/data/browser/>

<sup>4</sup> SNL Financial provides business intelligence services such as data, analysis, and news. This information was sourced from a private subscription to SNL's Energy Unlimited Package.

## Technical Potential: What could Michigan generate in the future?

The National Renewable Energy Laboratory (NREL) examined each state's geographic and agricultural resources to determine the maximum amount of renewable energy each state could feasibly produce.

NREL: Technical Renewable Potential in Michigan (MWh)<sup>5</sup>

Onshore Wind	143,908,000
Offshore Wind	1,739,801,000
Utility Scale Photovoltaic	5,266,485,000
Rooftop Photovoltaic	23,528,000
Concentrated Solar Power	0
Geothermal	457,850,000
Biopower (Solid and Gas)	11,897,000
<b>Total</b>	<b>7,643,469,000</b>

\*The net technical potential of clean, renewable energy can meet **70 times** Michigan' current electricity needs.

For more information on existing and planned renewable energy projects, visit NRDC's [renewable energy map](#), which shows specific developments and resource potential in each state.

For a full assessment of the energy sector in Michigan, including a map of resource potential, and energy projects and infrastructure, categorized by county and congressional district, please visit the Energy Information Administration: [Michigan State Profile](#)



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<sup>5</sup> National Renewable Energy Laboratory, "U.S. Renewable Energy Technical Potentials: A GIS-Based Analysis" July 2012. Online. Accessible: <http://www.nrel.gov/docs/fy12osti/51946.pdf>

## ECONOMY

### CLEAN MANUFACTURING CAPACITY

- ELPC issued a report on the potential of the [Midwest High-Speed Rail Supply Chain](#), which included key contributions from Michigan.
- GLWN, a network of industry manufactures, provides a national map of suppliers in the wind industry: [Wind Industry Supply Chain Map](#)

### STATE POLICY AND INVESTMENT

<a href="#">CleanEdge Ranking</a>	12 <sup>th</sup>	<a href="#">ACEEE: Energy Efficiency Scorecard Ranking</a>	12 <sup>th</sup>
<a href="#">Ernst and Young: State Energy Attractiveness</a>	17 <sup>th</sup>	<a href="#">Freeing the Grid</a>	B (Net Metering) B (Interconnection Standards)
<a href="#">Energy Efficiency Resource Standard</a>	Yes	<a href="#">Renewable Energy Standard</a>	10% + 1,100 MW by 2015

- The Database of State Renewable Incentives for Renewable Energy, DSIRE, details all state and municipal renewable energy policies for all fifty states: [DSIRE: Renewable Electricity and Energy Efficiency Incentives and Policies](#)
- The U.S. Department of Energy lists state policy supporting alternative fuels and energy efficient transportation: [DOE: Clean Fuel Incentives and Regulatory Policy](#)
- The Advanced Energy Economy Institute's [Public Utility Commission Portal](#) provides a helpful overview and links to the key regional and state energy and utility policymaking institutions in Michigan.

### FEDERAL POLICY AND INVESTMENT

Energy Type	2009 Federal Stimulus [Sec.1603]	USDA Grants	Loan Guarantees	Federal R&D Funding	Small Business Innovation Research
Wind	\$255,766,621	\$132,695	-	\$745,189	-
Solar	\$10,427,872	\$756,787	-	\$19,814,926	-
Geothermal	\$228,983	\$126,895	-	\$2,738,100	-
Biomass	-	\$12,891,793	-	-	-
Fuels	\$1,741,148	-	-	-	-
Energy Efficiency	-	\$3,848,198	-	-	-

Section 1603 of the 2009 American Recovery and Reinvestment Act (ARRA- commonly known as the Stimulus) offered payments in lieu of tax credits for the installation or construction of renewable energy systems. For the full list of projects awarded payments, click [here](#).

With the goal of effectively using agricultural resources to generate energy, the U.S. Department of Agriculture issues grants to American farmers to install renewable energy systems and efficient technology. For a list of grants, ranging from anaerobic digester facilities to photovoltaic systems, please click [here](#).

The Department of Energy's Loan Programs Office provides loan guarantees to select businesses to accelerate the deployment of advanced clean energy technology. For a detailed list of loan guarantees recipients, please click [here](#).

To learn more about the federal government funds clean energy research, please visit of the [Office of Energy Efficiency and Renewable Technology](#)

For further information on Small Business Innovation Research Grant awardees, please visit the [Department of Energy's Office of Science](#).



## **RESOURCES AND ADVOCACY**

### **State Organizations**

#### [Clean Energy Coalition](#)

*Clean Energy Coalition is a Michigan nonprofit, nonpartisan organization dedicated to promoting clean energy technologies as a way to create healthier, energy independent communities.*

#### [Eco-USA: List of Michigan's Environmental Organizations](#)

*Eco-USA is a database of state environmental organizations.*

#### [Great Lakes Renewable Energy Association](#)

*The Great Lakes Renewable Energy Association is a statewide nonprofit organization that educates, advocates, and promotes renewable energy.*

#### [Michigan Energy, Michigan Jobs](#)

*Michigan Energy, Michigan Jobs is a broad and bipartisan coalition of more than 300 Michigan businesses, labor organizations, health care advocates, faith leaders, environmental and conservation groups and many more. The coalition supports increasing Michigan's renewable energy and energy*

*efficiency use because it will create jobs, help rein in rising energy costs and improve public health by giving us cleaner air and water.*

## **National and Federal Organizations**

### [EERE – Clean Energy in My State](#)

*Users can explore the Department of Energy's statistics and policy information related to renewables and energy efficiency.*

### [National Governor's Association: Profile of Your State's Green Economy](#)

*NGA seeks to provide a detailed, empirical account of each state's existing assets across multiple green sectors and serve as a foundation for identifying future growth areas and related needs.*

### [Advanced Energy by State \(AEE\)](#)

*AEE is a national association of businesses and business leaders who are making the global energy system more secure, clean, and affordable.*

### [American Council on Renewable Energy: Michigan Fact Sheet](#)

*ACORE summarizes Michigan's solar and wind irradiance, as well as its current policies in place to promote renewable energy.*

### [American Wind Energy Association: Wind Energy in Your State](#)

*The American Wind Energy Association's summary of jobs directly supported by the wind industry in Michigan.*

### [Solar Energy Industry Association: Policy in Your State](#)

*SEIA compares Michigan's solar capacity and potential to other states, and details the impact of solar energy throughout the state.*