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MIDWEST MANUFACTURING SNAPSHOT: MICHIGAN

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This state handout is an excerpt from the WRI working paper entitled “Midwest Manufacturing Snapshot: Energy Use and Efficiency Policies”. The working paper presents comprehensive manufacturing energy-use and economic-activity data along with state-by-state policy summaries for the 10 member states of the Midwestern Governors Association (MGA).¹ For more information on Midwest region manufacturing, the methods used to derive the data, and policy background, please see the full working paper at: <http://www.wri.org/publication/midwest-manufacturing-snapshot>.

1. Member states of the MGA are Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Ohio, South Dakota, and Wisconsin.

MICHIGAN



In 2006 Michigan consumed 3.0 Quads of energy—making it the third-highest energy using state in the Midwest. Figure KS-1 shows the breakdown of statewide energy used for fuel and feedstock in 2006, roughly equal to the total energy consumed by the transportation and residential sectors. In 2006, Manufacturing accounted for 65% of Michigan’s industry energy use.

Petroleum and coal products and primary metals manufacturing accounted for the largest share of Michigan manufacturing energy use in 2006, followed by transportation equipment and nonmetallic minerals.

Michigan has 3.1 GW of total installed CHP capacity^{MI-1}, which is equivalent to 10% of total installed electricity generation capacity, versus the national average of 8%. Within total CHP, the remaining technical potential for industry CHP in Michigan is estimated to be equivalent to 82% of currently installed industrial capacity (Hedman, 2010).

MI-1 This number is higher than the installed CHP capacity number in Figure 9 because it includes all CHP installations (i.e., industrial, commercial, and institutional).

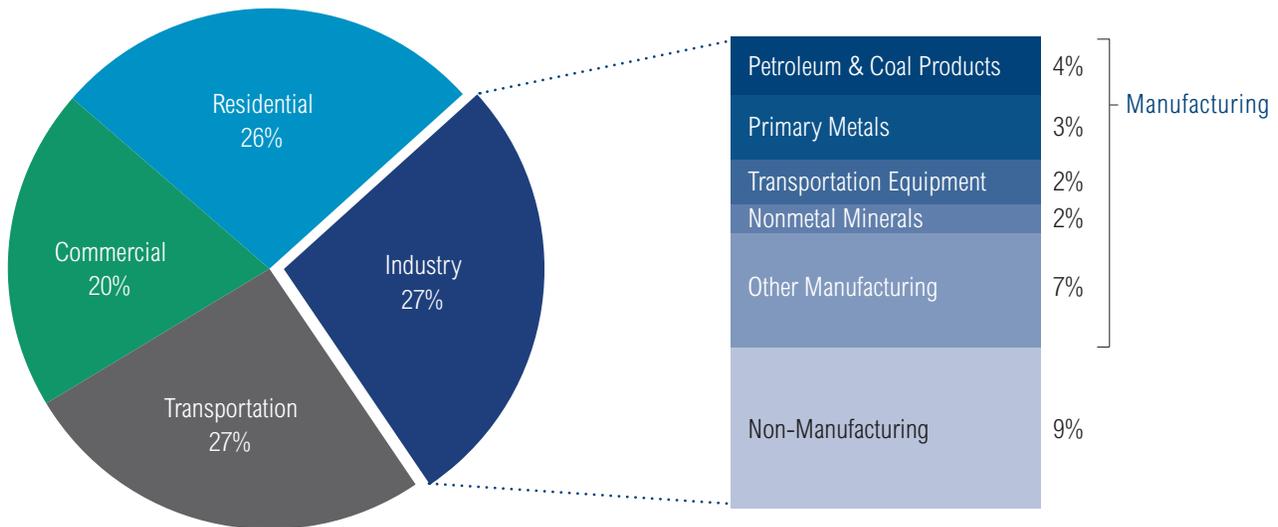
Manufacturing energy expenditures (shown by “cost of fuels & electricity” in Figure MI-2) have followed a national trend of peaking in 2008. Between 2000 and 2010, the index of manufacturing energy costs rose while the value of shipments index declined (Figure MI-2). The average difference between these two series over the period is 16%. By 2010 Michigan manufacturing energy expenditures had increased by 8%, while the total value of shipments dropped by 15%, relative to year 2000 levels. Over the same 10-year period, Michigan manufacturing employment dropped by 45%—from 910,000 to 501,000,

Table MI-1 | **Michigan Industry Delivered Energy Annual Average Prices (2010)**

	ELECTRICITY (cents/kWh)	NATURAL GAS (\$/1,000 ft³)	COAL (\$/short ton)
Michigan	7.08	9.25	95.50
Midwest average	6.19	6.66	50.68
U.S. average	6.77	5.49	59.28

SOURCE: U.S. Energy Information Administration; for details see Appendix.

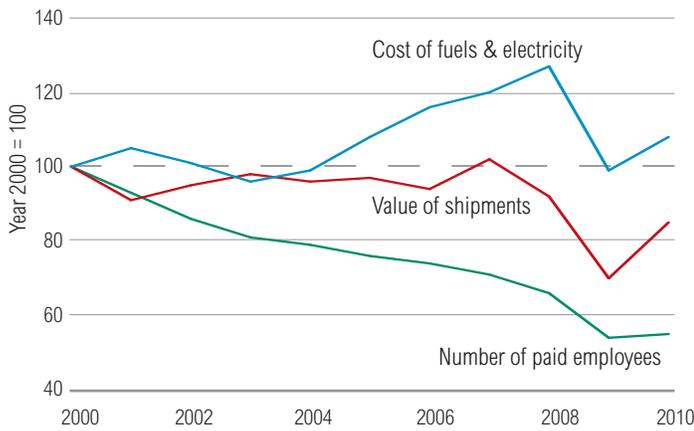
Figure MI-1 | **Michigan Total Energy Use, 2006**



Total Energy Use: 3.0 Quads

SOURCES: MECS; ASM; SEDS.

Figure MI-2 | **Index of Michigan Manufacturing Energy Cost, Value of Shipments, and Employment (2000-2010)**



SOURCE: ASM; BEA (employment)
NOTE: 2002 ASM values were linearly interpolated due to a gap in the published data.

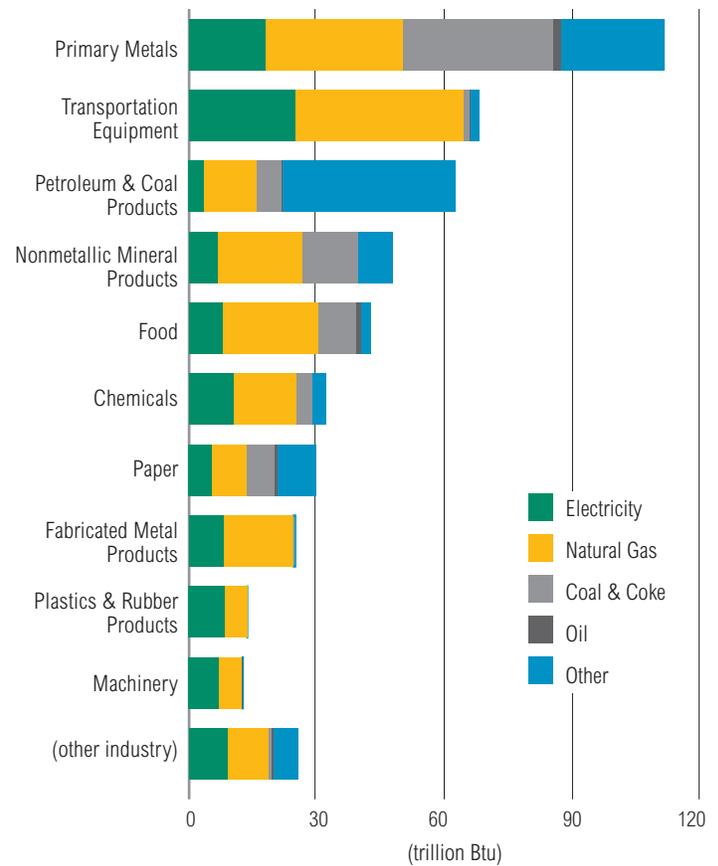
compared to the national manufacturing employment decline of 37% over the same period (Figure 1). Michigan experienced the largest manufacturing employment decline in the Midwest region, in both relative and absolute terms.

Energy prices (Table MI-1) influence demand and end-use efficiency. Michigan industrial energy prices were generally higher than national average prices in 2010. Electricity was slightly more expensive while coal prices were 61% higher and natural gas was 68% more expensive. Prices vary by end user and time of use, but this snapshot of 2010 prices suggests that Michigan industry faces electricity and fuel prices that are higher than the national and regional average.

In 2006 Michigan manufacturing consumed 480 trillion Btu^{MI-2} of fuel. Figure MI-3 shows the breakdown of Michigan manufacturing fuel use by subsector (not including energy used as feedstocks). Natural gas was the most-consumed fuel by Michigan manufacturing. Primary metals, transportation equipment, and petroleum and coal product manufacturing accounted for 51% of Michigan manufacturing fuel use in 2006.

In 2008 Michigan enacted Public Act 295, which established an energy efficiency resource standard and a

Figure MI-3 | **Michigan Manufacturing Fuel Use by Sector, 2006**



SOURCES: MECS; ASM.

renewable energy standard. Advanced clean energy, which includes CHP, can meet up to 10% of the renewable energy standard, and efficiency programs include incentives for industrial efficiency measures.

MI-2 For energy unit conversion, 1,000 trillion Btu is equivalent to 1 Quad of energy.

Table MI-2 | **Michigan Key Energy and Environmental Policies**

MICHIGAN	
REGULATORY ENVIRONMENT	
Renewable energy standard	Michigan's renewable energy standard requires utilities to generate 10% of retail electric sales with renewable energy by 2015. Up to 10% of the requirement can be met with energy efficiency and advanced clean energy credits—the latter includes industrial CHP (ACEEE; DSIRE).
Energy efficiency resource standard	Public Act 295 of 2008 established energy optimization standards that ramp up to annual savings of 1% for electric utilities and 0.75% for gas utilities in 2012 and every year thereafter. Some utilities offer incentives for industrial energy efficiency measures (DSIRE).
Emissions control programs	Michigan does not have output-based emission standards (ACEEE).
Alternative business models	Act 295 authorizes decoupling and the MPSC has approved decoupling for two electric utilities and three gas utilities (ACEEE).
Grid access	In 2008, the Public Service Commission updated interconnection standards based on five tiers of generator capacity up to 2 MW and higher. The rules adopt IEEE 1547.1 and UL 1741 as technical standards (ACEEE; DSIRE).
FINANCIAL AND TECHNICAL ASSISTANCE	
Grants, loans, or tax incentives	Michigan's Department of Environmental Quality offers a low interest pollution prevention loan program for qualifying small businesses. Energy conservation measures are eligible. ^a The Michigan Emerging Technologies Fund provides matching grants for federal SBIR/STTR (Small Business Innovation Research/ Small Business Technology Transfer) funding opportunities in four technology sectors, including CHP systems. ^b Michigan also provides property tax exemptions for alternative energy systems including CHP that are located within the NextEnergy Zone (ACEEE).
Technical assistance	The Department of Environmental Quality administers the Retired Engineer Technical Assistance Program (RETAP) program, through which retired engineers provide free pollution prevention and energy efficiency assistance to businesses and institutions. ^c The University of Michigan houses the MI Industrial Energy Center and an Industrial Assessment Center, which provide free assessments, recommendations, and other resources to help industrial plants improve their energy efficiency. ^d
UTILITY PROGRAMS	
Customer EE programs, with cost-recovery	Efficiency program costs are recovered on utility bills via a volumetric residential charge and "per meter" commercial and industrial charge. Efficiency spending is limited to 2% of total sales revenues. Large electric customers may seek exemption from most of the utility program charges. To do so, they must develop and implement multi-year, on-going self-directed plans that meet or exceed the state's EERS goals and report results annually to their utility (ACEEE, DSIRE).
EE as a resource	MCL 460.1071 states that the goal of the energy optimization plan is to reduce future costs to consumers, in part through EE measures that delay the need for the construction of new electric generators. Additionally, MCL 460.6s incorporates energy efficiency into utility integrated resource planning (ACEEE).

SOURCE: "ACEEE" refers to the American Council for an Energy Efficient Economy website: <http://www.aceee.org/sector/state-policy>. (February, 2012); "DSIRE" refers to the Database of State Incentives for Renewables and Energy Efficiency website: <http://www.dsireusa.org>. (February, 2012).

a http://www.michigan.gov/deq/0,1607,7-135-3307_3515_4144--,00.html (February, 2012).

b <http://www.mietf.org/Default.aspx>. (February, 2012).

c http://www.michigan.gov/deq/0,4561,7-135-3585_4848--,00.html. (February, 2012).

d <http://www.miec.engin.umich.edu/> (February, 2012).