

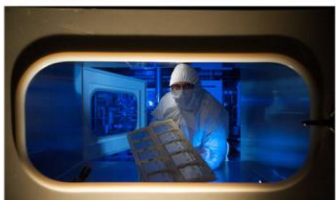


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Energy In Michigan: A Discussion of the State's Energy Impacts -- Now and in the Future

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A Few Basics on Energy Cost

- When you buy gas they charge you by the gallon. When you buy electricity they charge you by the *kilowatt-hour (kWh)*. When you use 1000 watts for 1 hour, that's a kilowatt-hour.
- 100 watt light bulb runs for 730 hours (i.e. all month) = 73 kWh

Michigan Energy Prices: Regional Comparison (December 2011)

State	Residential (c/kWh)	Commercial (c/kWh)	Industrial (c/kWh)
Illinois	11.17	8.13	6.27
Indiana	9.85	8.74	6.18
Michigan	13.17	10.18	7.37
Ohio	10.96	9.22	6.27
Wisconsin	12.82	10.2	7.18

Source: U.S. Energy Information Administration

What Those Costs Mean

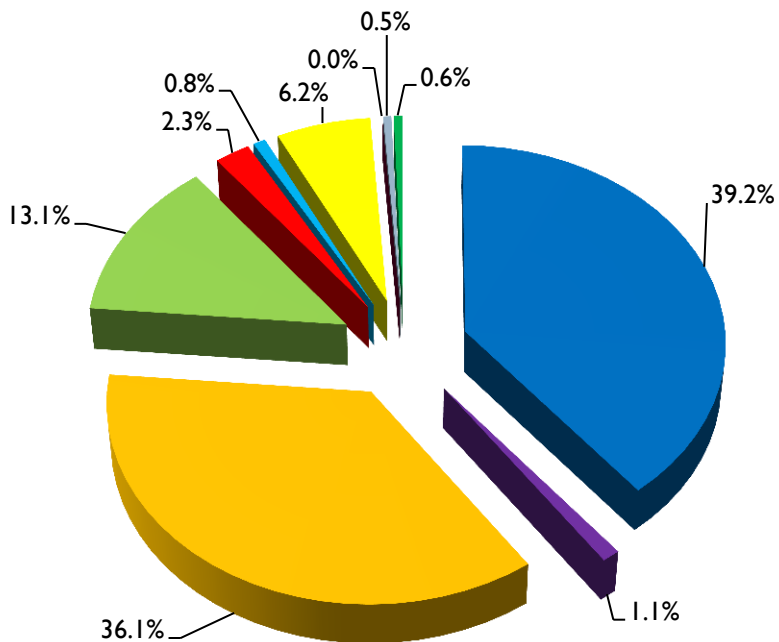
- So... it costs MI residents about \$9.61 to run a 100W light bulb all month, commercial businesses about \$7.40 and a factory about \$5.24.
- This hits business because their base operating costs are higher than competitors (assuming reliability is similar)
- This hits the poor most of all... they spend a higher percentage of their income on energy (25% for families below FGP)

But Will Costs **Stay** That Way??

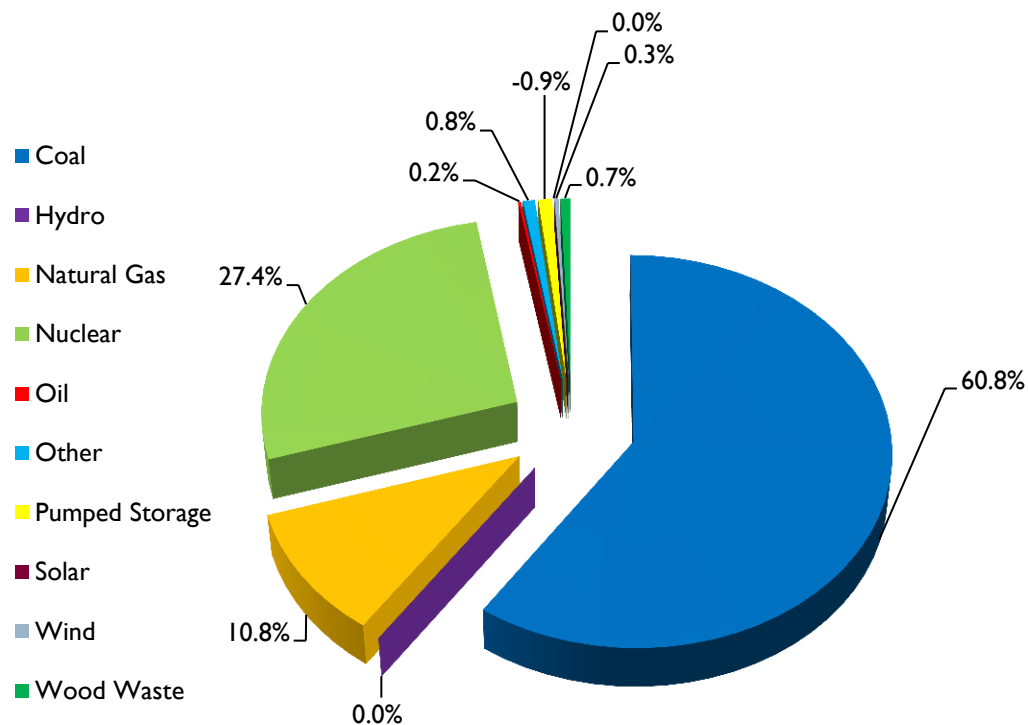
- Simple answer: It's unlikely.
- Major driver of power cost is fuel cost.
 - Other issues (infrastructure cost, etc.) are also important, but as a general rule, fuel cost is the biggest single rate impact.
- Michigan's natural advantages position us better for the future than they did in the past.

What Fuels MI's Power Now?

2010 Generation Capacity
Expressed as % by Type



2010 Actual Generation
Expressed as % by Type



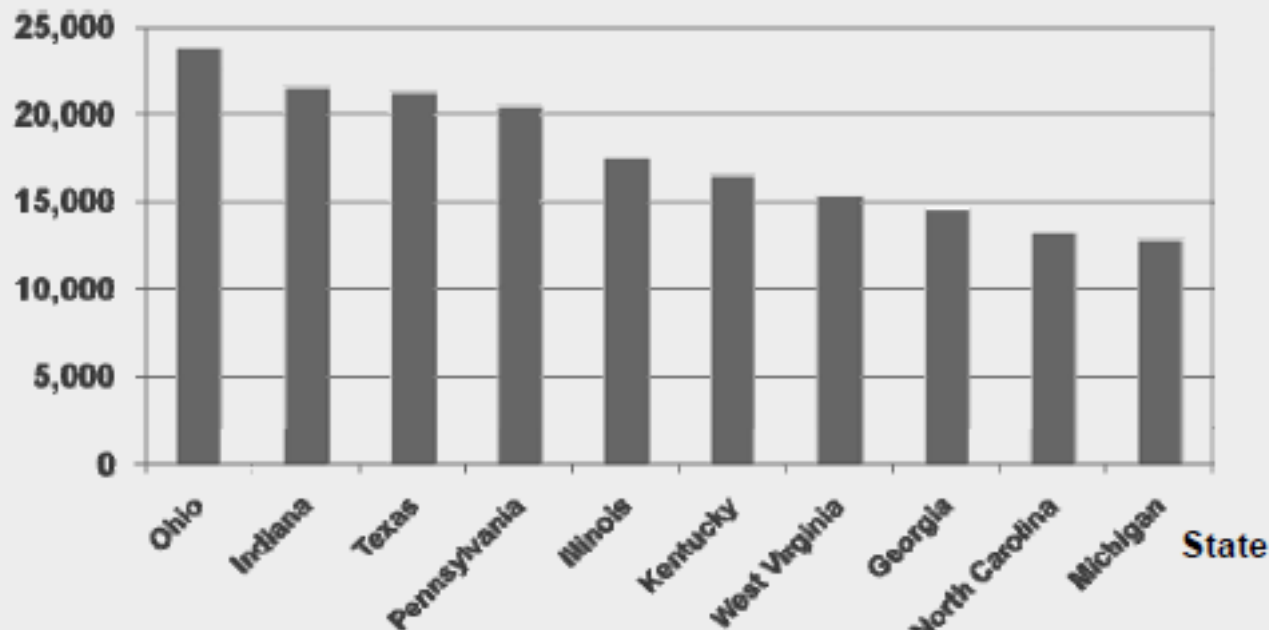
Source: Ventyx

Michigan's Coal Use vs. Others' Use

Existing U.S. Coal-Fired Power Plants by Top Capacity States

Top 5 states account for 33% of total U.S. coal capacity

Total Capacity (MW) Top 10 states account for 50% of total U.S. coal capacity



Source: SFA Pacific Inc. generated graphics from U.S. EIA data

Average Cost of Coal by State

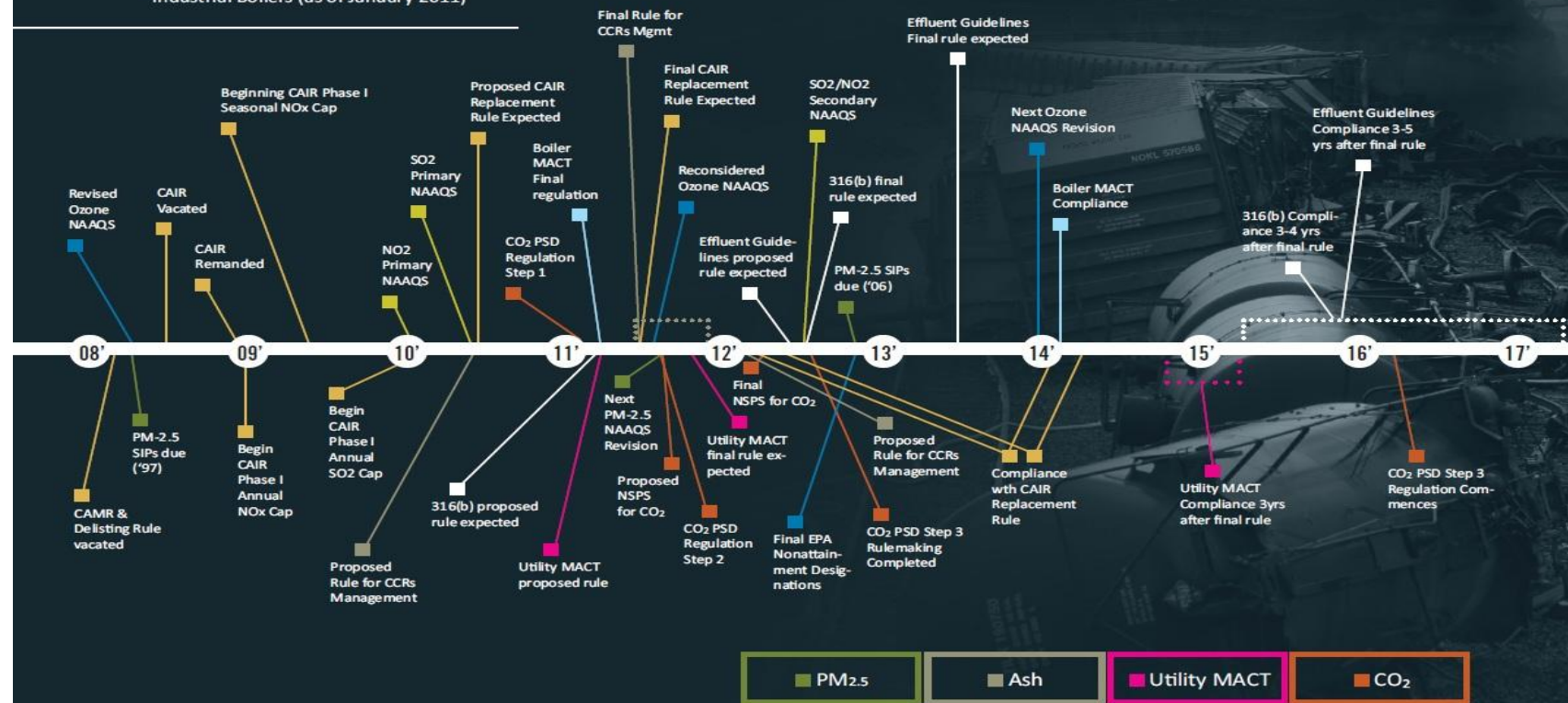
Average Cost of Coal Delivered for Electricity Generation by State, June 2011 and 2010 (Dollars per million BTU)		
Census Division/ State	Electric Utilities	
	Jun-11	Jun-10
East North Central	2.46	2.12
Illinois	2.03	1.91
Indiana	2.5	2.17
Michigan	2.63	2.07
Ohio	2.31	2.11

Source: U.S. Energy Information Administration

Coal in the Future...

EPA's Regulatory Train Wreck

Currently Estimated Regulatory Timeline for Coal-Fueled Power Plants and Commercial Industrial Boilers (as of January 2011)



EPA compliance schedule

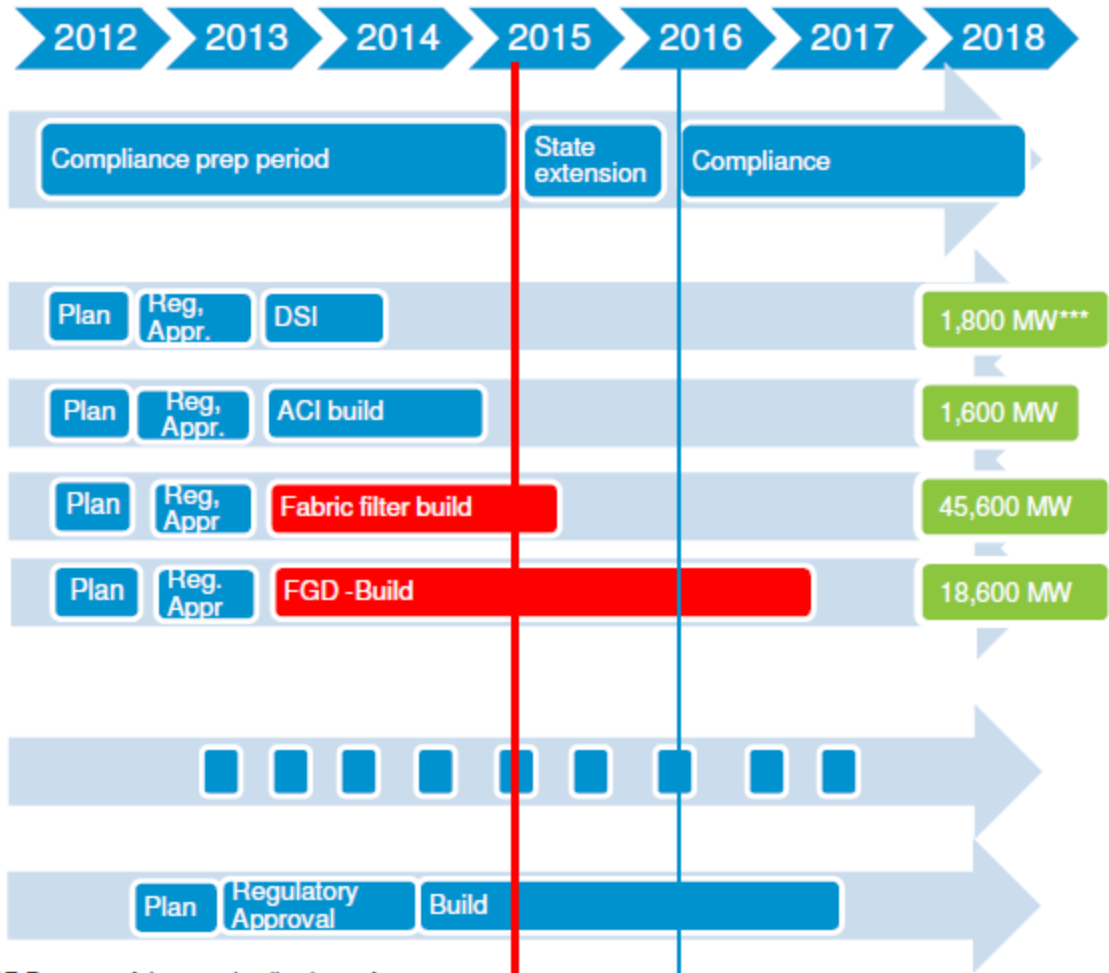
MATS Schedule
 MATS = Mercury and air toxics standards

Retrofit schedule by technology*

DSI = dry sorbent injection
 ACI = Activated carbon injection
 FGD = flue gas desulfurization

Off-peak outage windows

Gas pipeline expansion schedule**



* DOE Resource Adequacy Implications of Forthcoming EPA Air Quality Regulations, Dec 2011
 ** Gas and Electric Infrastructure Interdependency Analysis, Feb 2012
 *** MISO EPA Impact Analysis

MATS compliance deadline



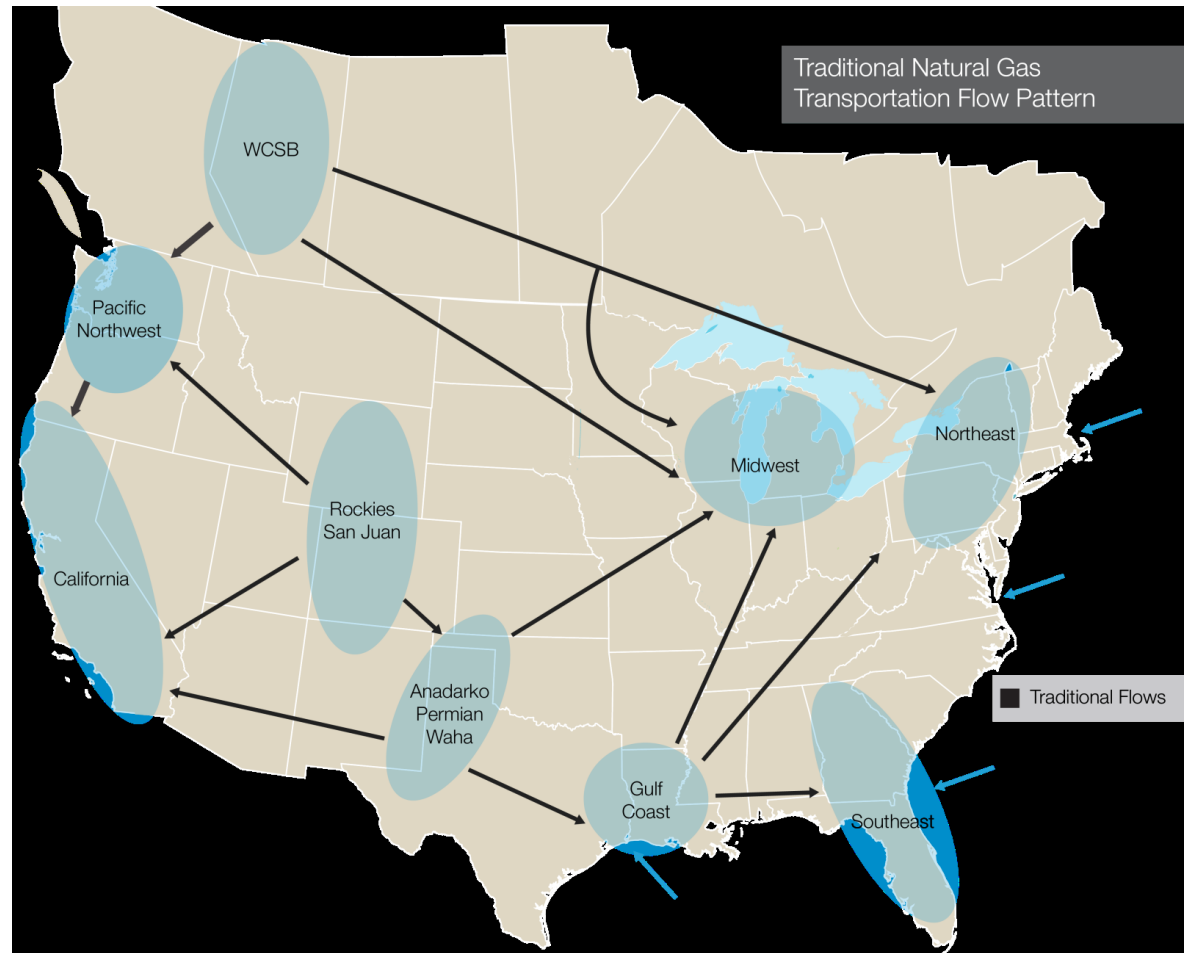
MI's Natural Advantage in Natural Gas

- Michigan has more natural gas reserves than any other state in the Great Lakes region.
- The Antrim natural gas fields, in the northern Lower Peninsula, are among the largest in the nation.
- Michigan has the most underground natural gas storage capacity of any state and supplies natural gas to neighboring states during high-demand winter months.

Storage & Usage: Michigan as Natural Gas Destination

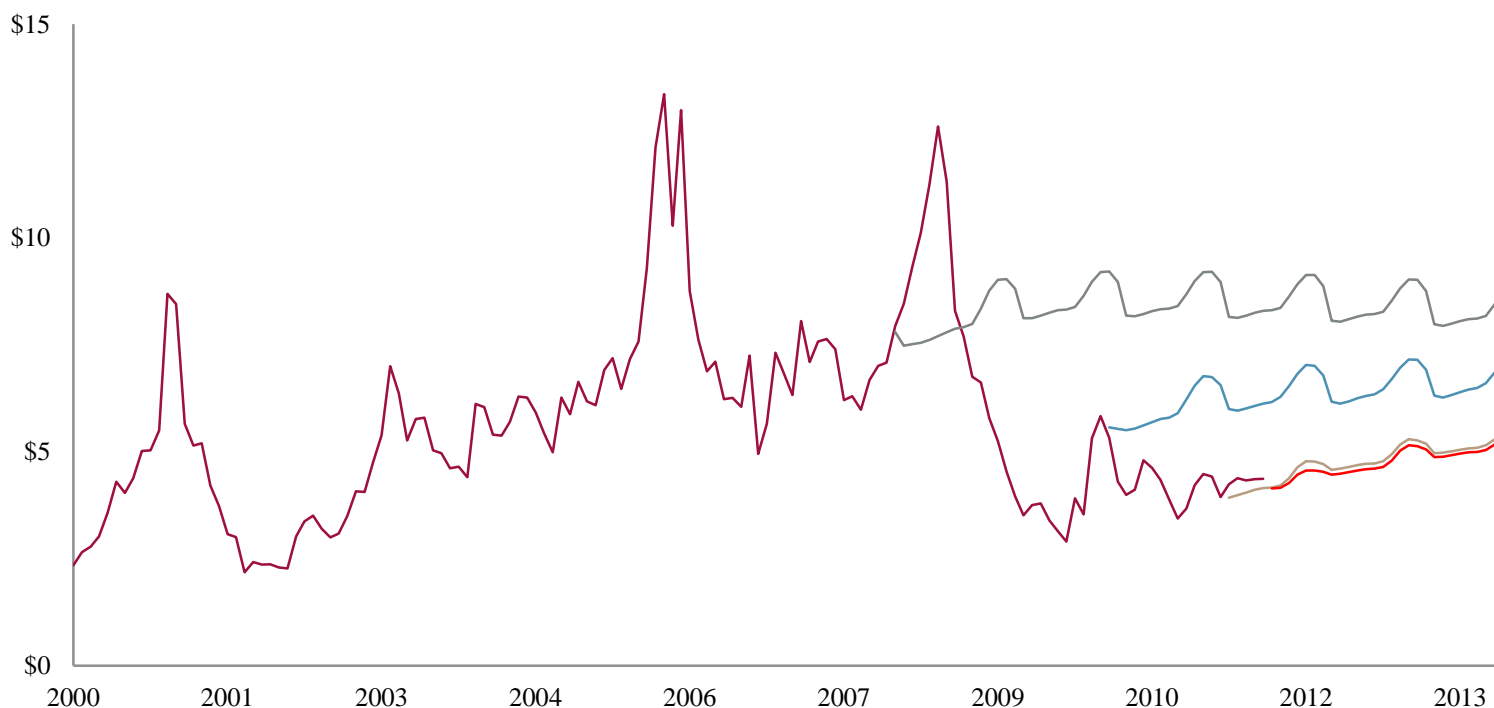
Natural Gas Flows are traditionally into Michigan, because of our usage and storage.

Source: U.S. Pipelines Central ANR / Great Lakes 2011 Shippers Meeting August 11, 2011.



Why Haven't We Used More Natural Gas in the Past?

Historic Natural Gas Spot and Forward Prices (\$/MMBtu)



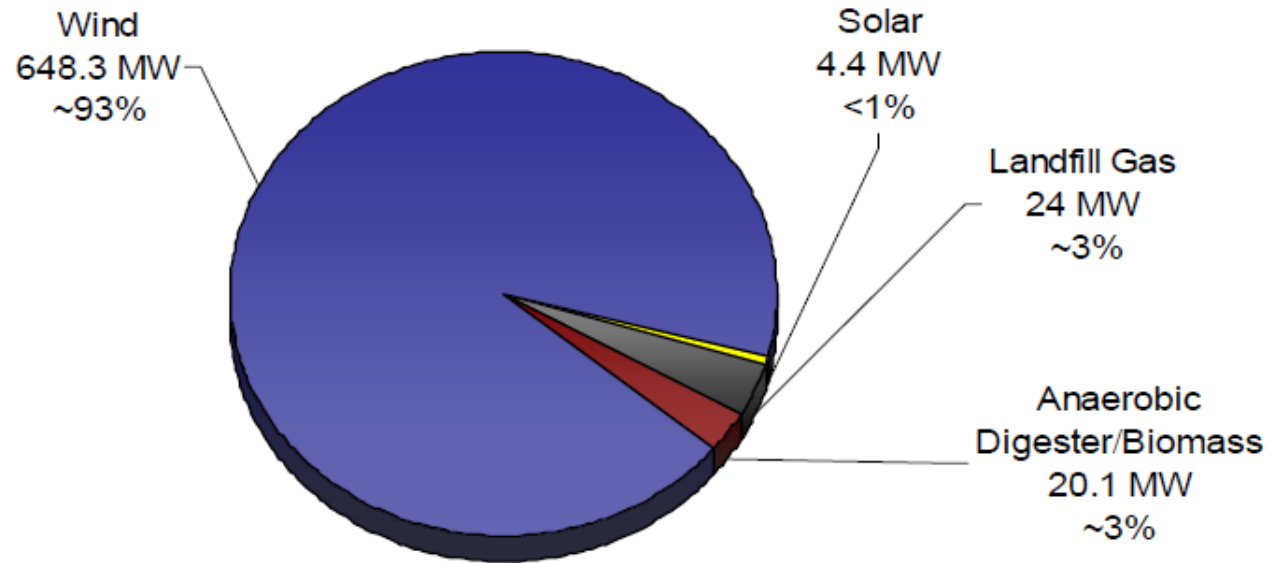
Henry Hub Nymex 12/31/07 Nymex 12/31/09 Nymex 03/07/11 Nymex 07/29/11

Renewables

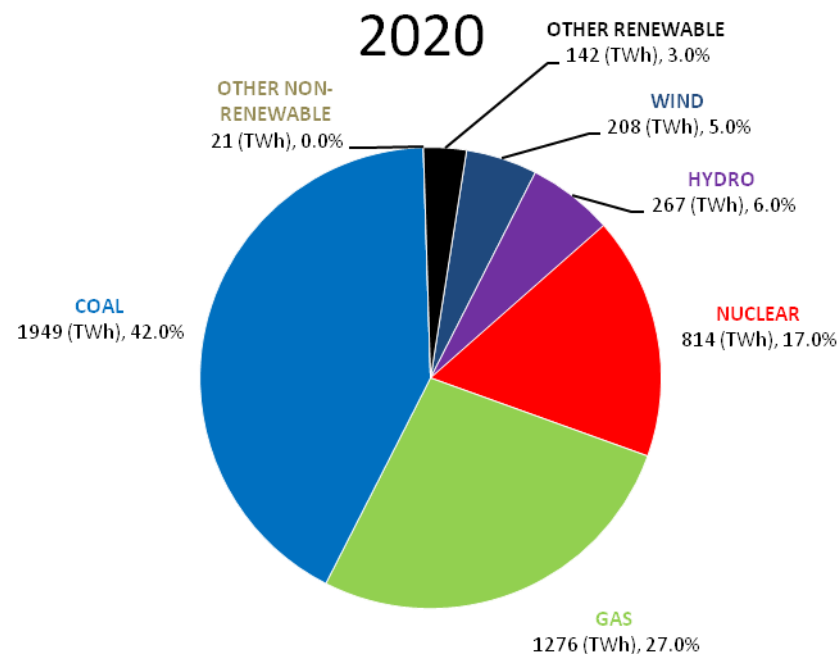
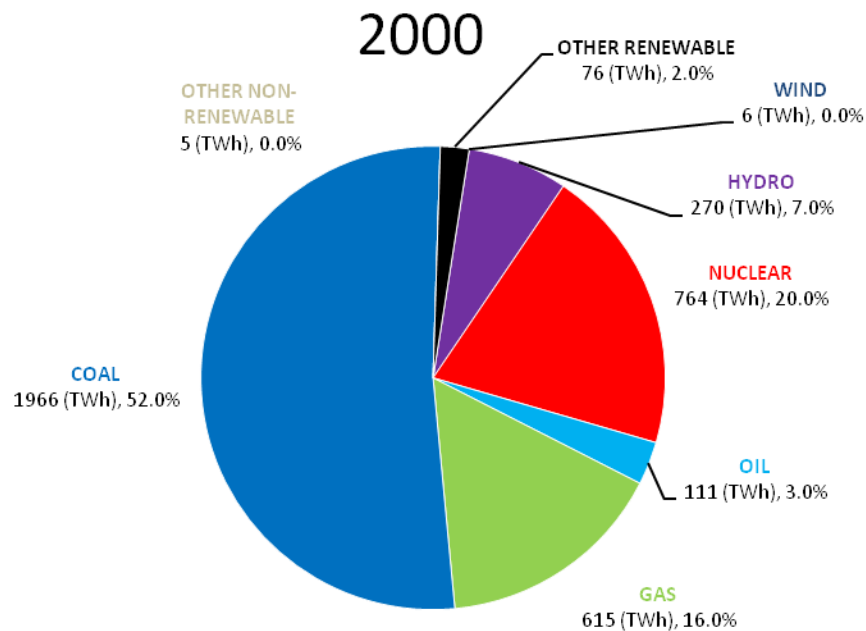
- 2008 law requires electric providers to meet a 10 percent renewable energy standard (based on retail sales) by the end of 2015.
- Michigan's 2009 estimated renewable energy percentage of 3.6% (3/4ths of which is hydro and wood) is expected to increase significantly during the next two years as approximately 700 MW of new renewable energy will become commercially operational by the end of 2012.

Michigan's Renewables

New Capacity (MW) by Technology



Nation's Predicted Energy Mix



A terawatt-hour per year is 114 megawatts

Sources: Wall Street Journal 3/7/11; EIA, Wood Mackenzie International Power Service

Energy Predictions Point to Good Things for Michigan

- Gas prices are pushing down toward competitiveness with coal
- Michigan, which has no coal, has lots of gas and better storage capability for gas than any other state.
- Michigan is well positioned to compete in the future on energy.