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The slide has a white background with a dark blue header bar containing the MPSC logo. The title "What is Energy?" is centered at the top. Below it is a bulleted list:

- In physics, energy is *the capacity for doing work*. *
- Issues of energy policy typically look at electricity (how it's made, moved, and sometimes used) and home heating focusing on the delivery system of natural gas and hazardous liquids, primarily through pipelines, and fuel delivery and availability.

A small footnote at the bottom left reads: "*<https://www.britannica.com/science/energy>". The number "2" is in the bottom right corner.

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What is Electricity?

- Electricity is a form of energy resulting from the existence of charged particles (electrons), either statically as an accumulation of *charge* or dynamically as a *current*.

A Simple Circuit

Battery

Electron flow

Lamp

Ohm's Law

Power: analogous to the size of the pipe (or the demand for the water)

Current: analogous to water flow

Voltage: analogous to water pressure

Resistance: analogous to the friction against the water's flow (i.e. tree roots in a pipe etc.)

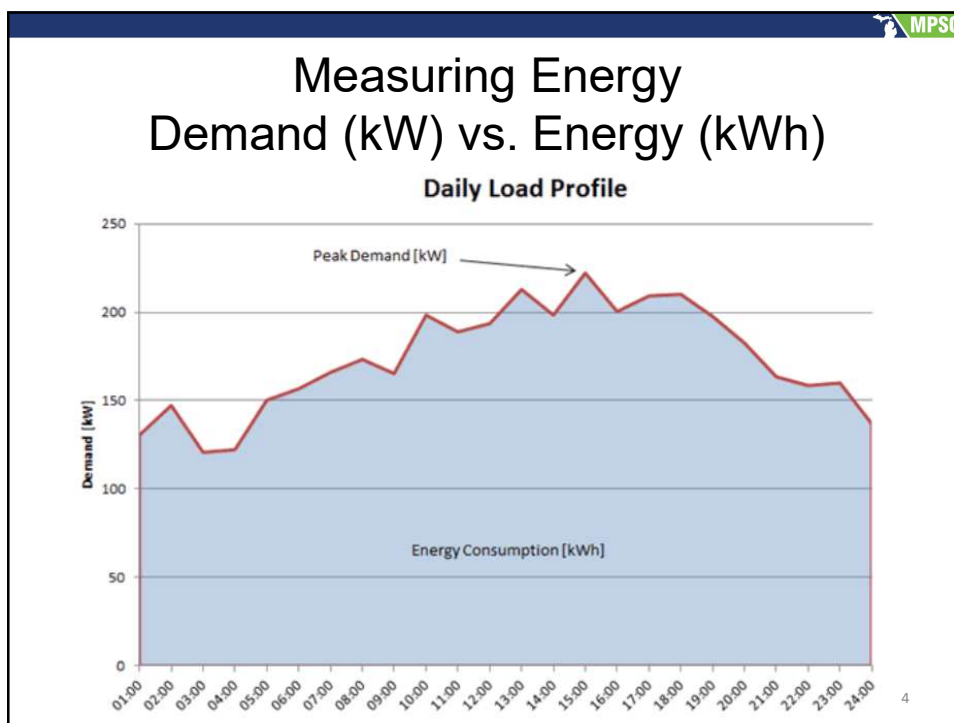
Commonly used measurements of electricity

Watts (W, kW, MW etc.): Measurement of **Demand**

Kilowatt hour (kWh): Measurement of **Use or Consumption**

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The Grid: How Electricity is Made

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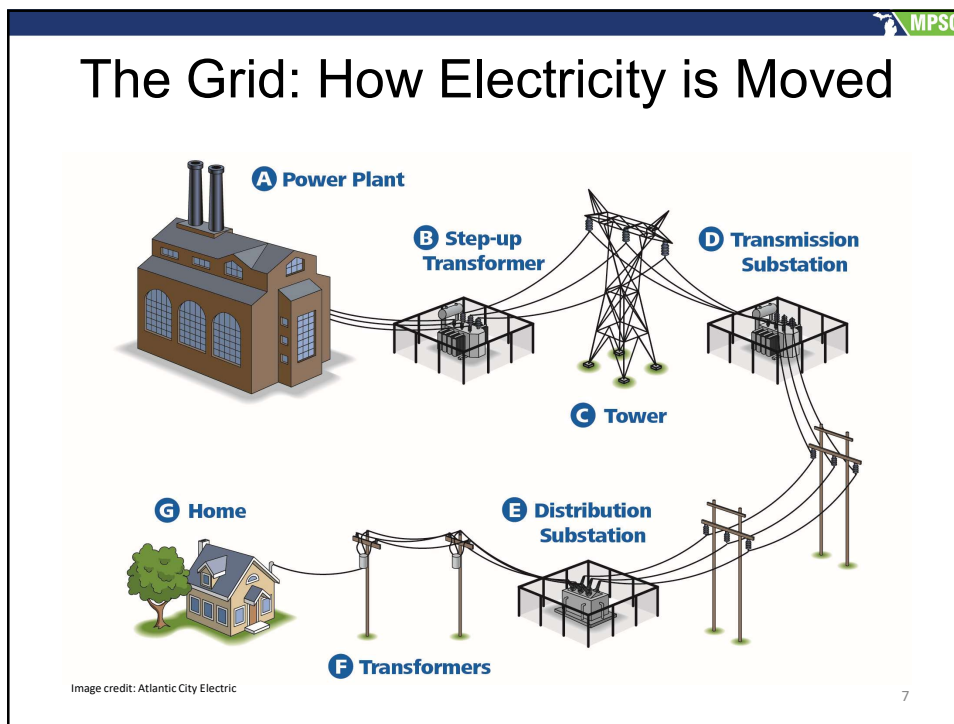
Michigan's Energy Generation Mix

Michigan Energy Mix 2019 (MWh)

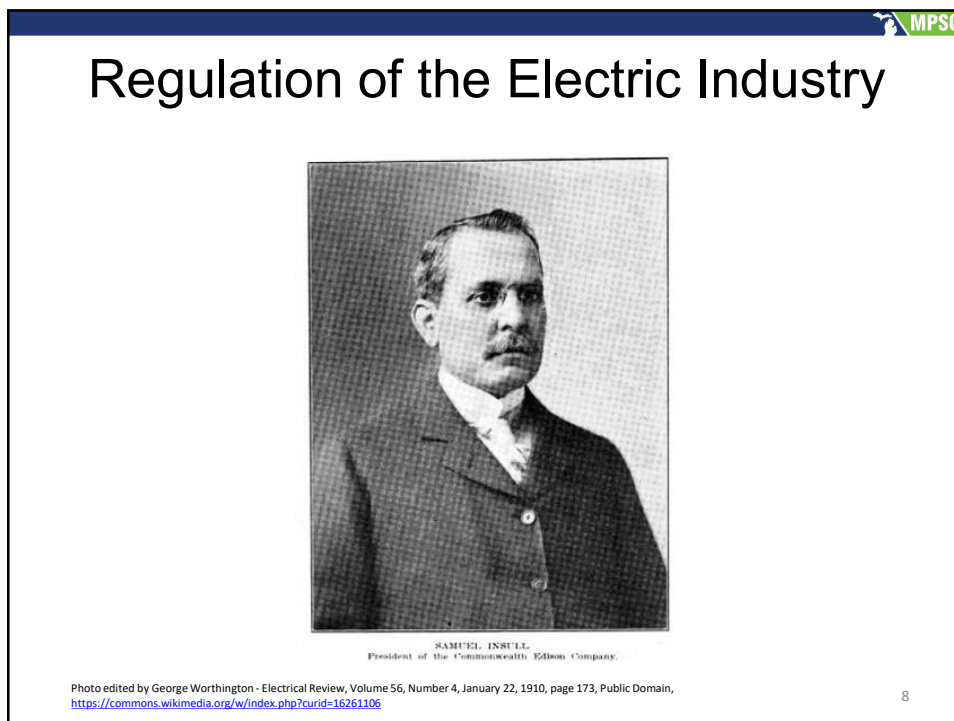
Fuel Type	MWh Generation 2019	Percentage of 2019 Generation
COAL	37,341,489	27%
NATURAL GAS	34,429,525	25%
NUCLEAR	32,909,275	24%
OTHER (Other Gases, Petroleum, etc.)	2,784,828	2%
RENEWABLE ENERGY and EWR*	28,555,185	21%
TOTAL	136,020,302	100%

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The MPSC: Who We Are



Commissioner
Tremaine Phillips



Chair
Dan Scripps



Commissioner
Katherine Peretick

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The MPSC: Who we are

Approximately 180 full-time employees focused on serving the public, with expertise in:

- Engineering
- Finance
- Auditing
- Law
- Economics



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Our Mission


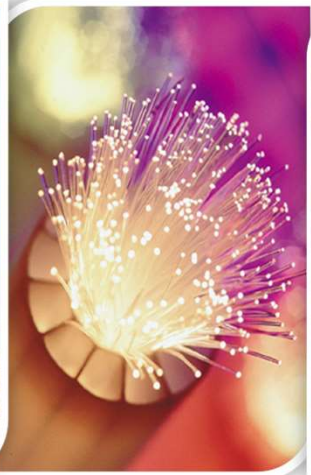

To **serve the public** by ensuring safe, reliable, and accessible energy and **telecommunications** services at reasonable rates

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MPSC Jurisdiction

Electricity	Telecommunications	Gas
		

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What is Natural Gas?

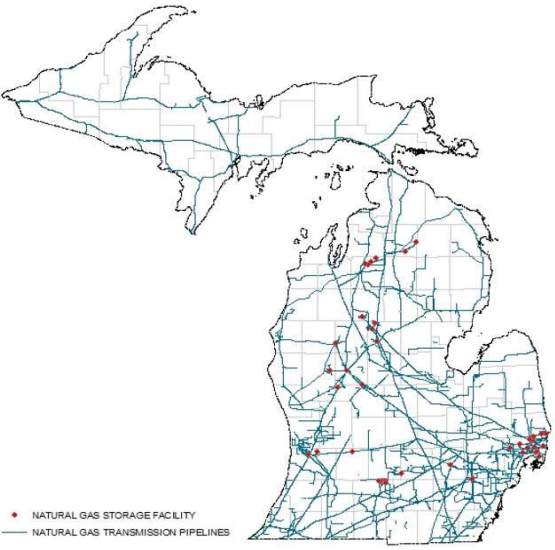
- Natural gas is a flammable gas, consisting largely of methane (CH₄), occurring naturally underground.
- It is odorless, thus an easily detectable sulfur-based mercaptan is added as a safety measure in the event of a leak.
- Natural gas is found in reservoirs (pools) trapped under impermeable rock like salt or anhydrite.
- Natural gas is found in 32 states, including Michigan (only the Lower Peninsula).
- Native Michigan natural gas produced accounts for about 8-10% of gas consumed here within our state.
- Natural gas is injected into storage facilities when it isn't needed immediately.
- Traditionally, natural gas was a seasonal fuel but the trend toward natural gas fired electric generation is increasing demand during the summer months

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Moving Natural Gas




The map displays the state of Michigan with a network of blue lines representing natural gas transmission pipelines and red dots representing natural gas storage facilities. The pipelines are most densely packed in the Lower Peninsula, particularly in the central and eastern regions. Storage facilities are scattered across the state, with a notable concentration in the western and central parts of the Lower Peninsula.

- 8,755 miles of transmission main and 3,500 miles of Hazardous Liquids
- 30 intrastate transmission operators
- 9 interstate transmission operators
- Numerous operators of gathering lines and production facilities
- 60,069 miles of distribution pipeline
- 3,319,015 miles of service lines

• NATURAL GAS STORAGE FACILITY
— NATURAL GAS TRANSMISSION PIPELINES

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Who does (and doesn't) the MPSC regulate?

- **Electric Utilities**
 - **Municipal Electric Utilities** (40): Regulated by local city council or utility board including rates and service standards; no MPSC oversight of these issues. Required by statute to make various filings at the MPSC.
 - **Cooperative Electric Utilities** (9): Rates are regulated by the co-op board. Subject to Commission regulation concerning service and safety. Required by statute to make several filings at the MPSC.
 - **Investor Owned Electric Utilities** (7): Rates are regulated by the MPSC. Subject to Commission regulation re: service and safety. Required by statute to make several filings at the MPSC.
- **Natural Gas Utilities** (6): Rates are regulated by the MPSC. Subject to Commission regulation concerning service and safety, including pipeline inspections and enforcement action where necessary.
- **Alternative Electric Suppliers & Alternative Gas Suppliers**: Licensed by the MPSC and subject to various rules. Rates for alternative suppliers are not set by the MPSC or subject to MPSC review

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State Regulation:

MPSC General Jurisdiction over Gas & Electric Utilities

- Sets rates through a contested case process. Costs approved for recovery must be “reasonable and prudent.”
- Promulgates rules under authority granted by various statutes related to system operations, safety, service quality, and customer service.
- Licenses Alternative Gas Suppliers and Alternative Electric Suppliers.
- Reviews and approves siting requests and pre-approved cost recovery for new infrastructure through contested case certificate of necessity proceedings.
 - Siting of Electric Transmission Lines longer than 5 miles and greater than 245kv (Public Act 30 of 1995)
 - Pre-approval of Costs for New Power Plants (Public Act 286 of 2008)
 - Siting of Intrastate Natural Gas Pipelines (Public Act 9 of 1929)
 - Siting of Inter- and Intra- State Liquids Pipelines (Public Act 16 of 1929)

The MPSC does not site wind farms or solar arrays.

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Pipeline Regulation: Federal & State Authority

Agency	Inter - state Natural Gas Pipeline*			Intra - state Natural Gas Pipeline			Inter - state Liquid Pipeline			Intra - state Liquid Pipeline		
	Rates	Safety	Siting	Rates	Safety	Siting	Rates	Safety	Siting	Rates	Safety	Siting
MPSC		X		X	X	X			X	X		X
PHMSA		X						X			X	
FERC	X		X				X					
MI Dept. EGLE						X					X	

*The MPSC conducts safety inspections of both interstate and intrastate Natural Gas pipelines based upon an agreement with PHMSA. However, PHMSA is the enforcing agency in the event of any safety violations on an interstate Natural Gas Pipeline

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Electricity Regulation: The MPSC

- Rate setting
- Safety and Service standards
- Licenses AESs
- Siting of Transmission Lines and Power Plants
- Review and Approval of Utility Integrated Resource Plans (Public Act 341 of 2016)
- State Reliability Mechanism and Capacity Demonstrations (Public Act 341 of 2016)
- Monitor compliance with Renewable Energy Standard and Energy Waste Reduction Standard (PA 342 of 2016)
- Approval of contracts under the Public Utility Regulatory Policies Act of 1978 (PURPA)
- Approve proposed utility mergers and acquisitions of or by Michigan utilities (PA 286 of 2008)

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Electricity Regulation: The FERC

FERC Jurisdiction

- Rates & services for electric transmission and electric wholesale power sales (Parts II and III of the Federal Power Act)
- Certification & decertification of “Qualifying Facilities” or “QFs” (Public Utility Regulatory Policies Act of 1978)
- Hydroelectric dam licensing and safety (Part I of the Federal Power Act)
- Reliability of the bulk-power system (Parts II and III of the Federal Power Act)

Issues outside of FERC’s Jurisdiction

- Local Distribution of energy, rates/terms/interconnection/conditions of distribution system
- Sale of electricity to end users
- Building of non-hydroelectric generation including choice, siting, and construction. Note wholesale rate recovery is generation is subject to FERC review.
- Building of transmission including choice, siting, and construction of facilities. Note wholesale rate recovery of transmission costs is subject to FER review.

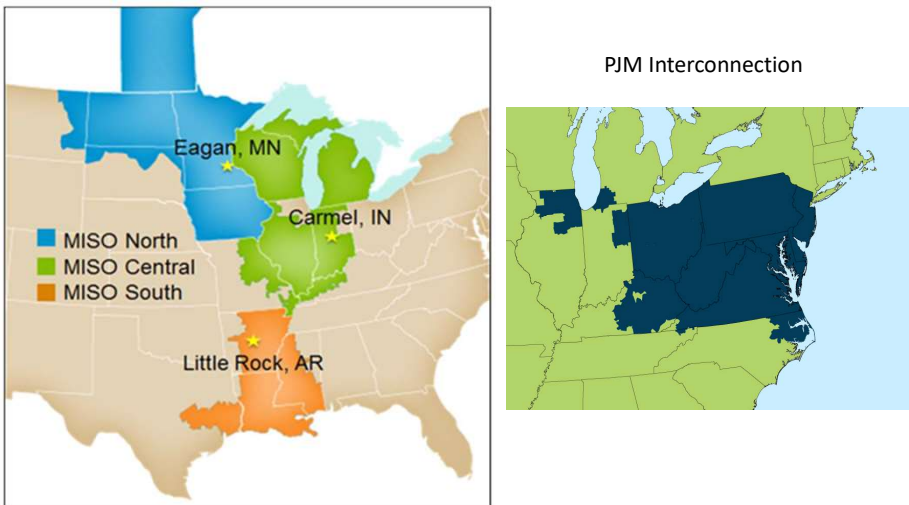
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Electricity Regulation: RTOs and ISOs

Midcontinent Independent System Operator
(MISO)



The figure consists of two maps. The left map shows the Midcontinent Independent System Operator (MISO) regions, which are divided into three sub-regions: MISO North (blue), MISO Central (green), and MISO South (orange). Key locations marked with stars are Eagan, MN (in MISO North), Carmel, IN (in MISO Central), and Little Rock, AR (in MISO South). A legend on the left side of the map identifies the colors for each region. The right map shows the PJM Interconnection, a large area in the eastern United States and southeastern Canada, shaded in dark blue.


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MISO's Key Functions

1. Keeping the Lights On – Safe & reliable operation of the electric Grid
2. Operate Open Energy Markets – Scheduling & economic dispatch of generation to support reliability and efficiencies across the system
3. Transmission Planning – Comprehensive expansion plan that meets reliability needs, policy needs, and economic needs



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Electric Jurisdictional Summary

MISO & PJM

- ✓ Transmission grid operations and bulk system reliability

FERC

- Rates for electric transmission & wholesale power sales
- Hydroelectric dam licensing & safety

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- ❖ Retail electric rates for regulated utilities
- ❖ Safety & reliability of the distribution system
- ❖ Siting
- ❖ Oversight and enforcement of State Energy Policy as enacted by statute

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Questions?

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