

Market Information:

MISO

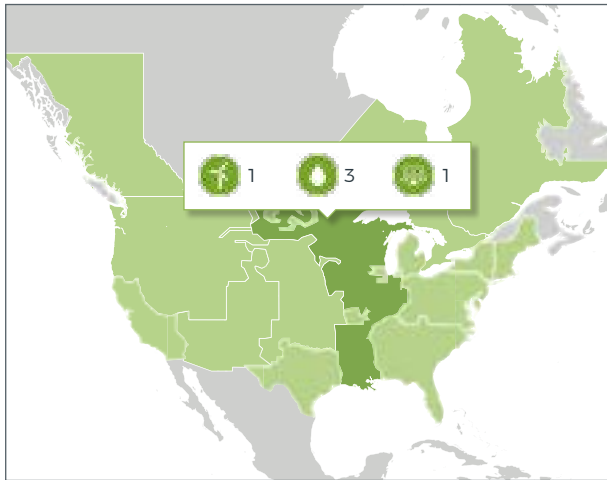


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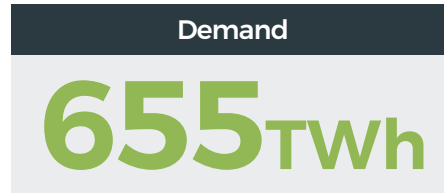
Overview

The Midcontinent Independent System Operator (MISO) operates competitive wholesale electricity markets in the Midcontinent region that encompasses all or parts of 15 U.S. states and the Canadian province of Manitoba. Thermal resources produce the bulk of MISO's electricity, with coal and gas combined accounting for nearly 75% of the generation. Due to good quality natural resources, wind represents the majority of renewable generation in the Midcontinent region.

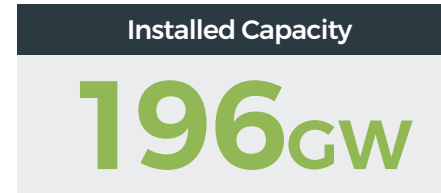
Brookfield sites



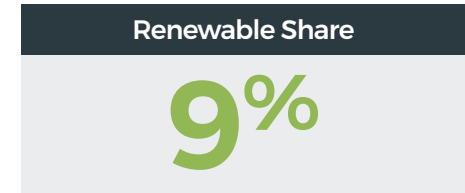
Key



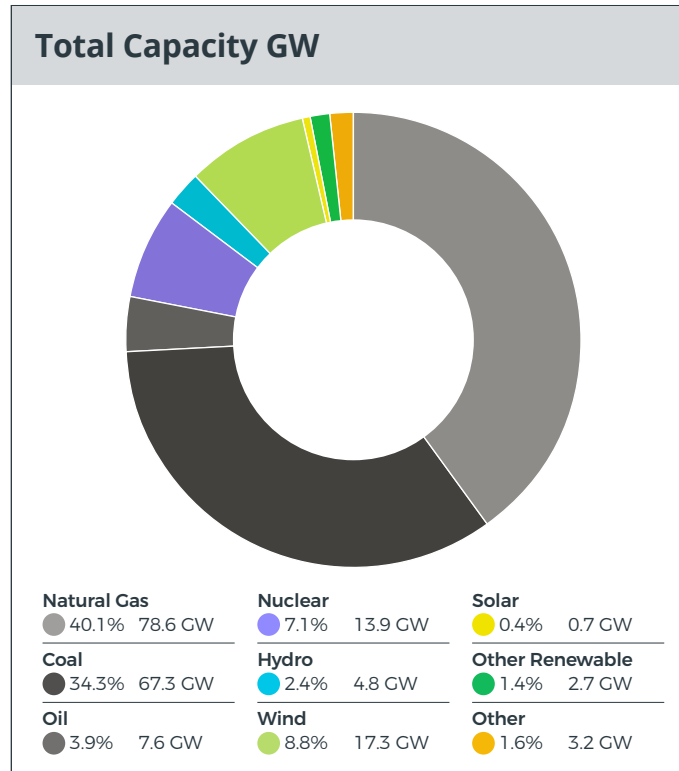
Source: MISO, 2018, US Energy Information Agency, 2017



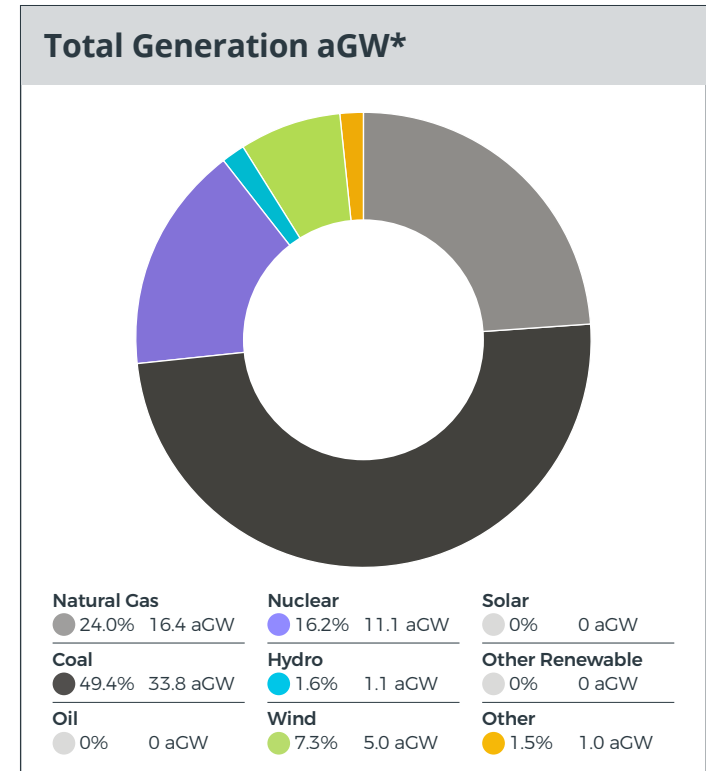
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*aGW is the average hourly electricity demand over the year

Market Design

How is the market structured?

MISO is structured as a competitive wholesale market with energy transacted on a day-ahead and real-time (5-minute) basis. MISO also operates several markets for ancillary services. Capacity requirements are addressed through bilateral transactions or through a MISO-administered voluntary annual auction.

What are the geographic boundaries of the market?

MISO covers all or a portion of 15 states (Arkansas, Illinois, Indiana, Iowa, Kentucky, Louisiana, Michigan, Minnesota, Mississippi, Missouri, Montana, North Dakota, South Dakota, Texas, and Wisconsin) as well as the Canadian province of Manitoba. MISO is interconnected with Pennsylvania-New Jersey-Maryland Interconnection (PJM) to the east and the Southwest Power Pool (SPP) to the south.

What are the relevant price and delivery zones?

The main pricing hub in MISO is the Indiana Hub. Nodal pricing exists throughout MISO, with pricing varying with local supply/demand conditions as well as transmission considerations

more generally. Nodal pricing is aggregated to calculate energy prices for eight separate energy zones, as well as the energy price at interconnection points with neighboring regions.

Can I buy long-term power in the traded markets?

Buyers and sellers can hedge their exposure in the forward market within a ~5 year window via over-the-counter (OTC) trading platforms.

Who do I need to contract with to buy power?

Many consumers receive power from their local utility (the utility covering the geographic area in which the load is located). Consumers can also opt to buy power directly from a generator, or through a retailer (in states where competitive retail markets exist) though the utility will continue to charge certain fees (i.e. transmission/distribution/other system fees).

Retail choice is available within the following MISO states: Illinois, Michigan and Texas.

How are system costs and other social charges levied?

In general, a bill can be broken into three components: generation, transmission and distribution. Generation costs are broadly correlated with wholesale energy prices. Transmission costs are socialized across all consumers, and distribution costs vary based on the local cost of each utility. Other system and social charges (such as to support energy efficiency programs) are generally socialized across consumers and are also reflected on the bill from the local utility.

How do I prove I've bought renewable power?

In the U.S., renewable generation is certified and tracked using RECs (Renewable Energy Certificates). One REC is issued for every MWh of eligible renewable energy that is delivered to the electricity grid. A REC contains unique identifying details of the energy generated, including the renewable fuel type, project name and location, the vintage of the project and the generation, and serial number.

Within MISO, the Midwest Renewable Energy Tracking System (M-RETS) is used to track generation ownership and attributes, including RECs.

How are RECs (Renewable Energy Certificates) procured? Through market transactions or long-term contracts.

Are renewable Power Purchase Agreements (PPAs) available? Yes

Are Green Tariffs available? Yes, Green Tariffs are available in Kentucky, Michigan, Minnesota, and Wisconsin.

What are the key institutions?

Regulators

- The Federal Energy Regulatory Commission (FERC) is the federal agency that regulates the transmission and wholesale of electricity in interstate commerce
- The North American Electric Reliability Corporation (NERC) is a not-for-profit international regulatory authority, whose mission is to assure the reliability and security of the bulk power system in North America

Key Government Departments

- State energy departments which oversee policy related to power markets within their state
- Public Service / Utility Commissions which regulate and oversee the electricity industry in their state

System Operator

- MISO