

MISO Markets and Market Participation Overview

MISO manages one of the largest energy markets in the world, with more than \$40 billion in annual transactions. MISO's markets are designed to deliver reliable and economically efficient outcomes across the region, managing the reliable delivery of low-cost wholesale electricity across the region. MISO's markets also play important roles in shaping the investment and operational decisions of Market Participants by providing pricing signals that indicate the value of needed resources and characteristics.

MISO Market Construct

MISO's market construct consists of three markets: Capacity, Financial Transmission Rights, and Energy and Operating Reserves.

The **Capacity Market** consists of the annual Planning Reserve Auction (PRA), providing a means for Load Serving Entities (LSEs) to meet their seasonal Planning Reserve Margin Requirement (PRMR) by procuring needed resources or selling surplus resources in an annual auction.

The **Financial Transmission Rights (FTR)** market offers a mechanism for Market Participants to procure a financial hedge to manage the risk associated with fluctuations in congestion costs in the Day Ahead market. Auction Revenue Rights (ARR) have been allocated to market participants based on firm historic use of the transmission system.

The **Energy and Operating Reserve** market provides an opportunity for LSEs to meet their load and reserve requirements in an efficient manner through buying or selling energy, operating reserves and other ancillary services.

Each day, registered Market Participants submit offers to buy or sell in the Day-Ahead and Real-Time markets. The Day-Ahead market clears energy bids for each hour of the next operating day, based on hourly energy requirements established by MISO forecasting models. The Real-Time market clears bids every five minutes during the operating day based on MISO's continuous assessment of real-time operating conditions.

In addition to energy, MISO's ancillary services market includes several Operating Reserve products - Regulating Reserve, Spinning Reserve and Supplemental Reserve - as well as Ramp Capability and 30-minute Short-Term Reserve. These ancillary services help ensure reliability and address system flexibility needs, such as the ability to change energy output quickly.

| Resource Types | Energy | Operating Reserves | | | Other Ancillary Services | | |
|------------------------------------|-------------------|--------------------|----------------------------------|-------------------------------|--------------------------|---------------------------|----------------------------|
| | Locational Energy | Regulating Reserve | Spin/Online Supplemental Reserve | Off-line Supplemental Reserve | Ramp Capability | Online Short-Term Reserve | Offline Short-Term Reserve |
| Generation | ● | ● | ● | ● | ● | ● | ● |
| Dispatchable Intermittent Resource | ● | | | | | | |
| Demand Response Resource Type I | ● | | ● | ● | | | ● |
| Demand Response Resource Type II | ● | ● | ● | ● | ● | ● | ● |
| Electric Storage Resource | ● | ● | ● | ● | ● | ● | |
| External Asynchronous Resource | ● | ● | ● | | ● | ● | |

Resource Types

A variety of resources can participate in MISO markets. Each resource type is eligible to provide one or more market products, depending on its capabilities and agreements with MISO.

- **Generation Resources** have a predictable maximum output and can be dispatched based on instructions from MISO. Examples include natural gas, coal, and nuclear generation.
- **Dispatchable Intermittent Resources** have variable maximum output, even over short durations. Examples include wind and solar generation.
- **Demand Response Resources** are registered with MISO to voluntarily reduce electricity use, typically during times of peak demand or high outages, to help support the needs of the bulk electric system. Examples include Load Serving Entities, Aggregators of Retail Customers, and End-Use Customers with market participant status.
- **Electric Storage Resources** withdraw energy and store it for later injection into the system. Examples include batteries and pumped-storage hydroelectricity.
- **External Asynchronous Resources** provide a tie between the Eastern Interconnection grid and an asynchronous grid supported by the resource. Manitoba Hydro is the only EAR resource in the MISO region.

Entities

- **MISO** administers all market services, identifies reserve zones, and calculates and posts operating reserve requirements. This includes day-ahead forecasting and clearing day-ahead bids, and assessing real-time conditions and committing additional resources, as-needed.
- **Market Participants** are qualified and registered with MISO to participate in the markets, including submitting bids to purchase energy/reserves or offers to sell energy/reserves. Market Participants may be asset owners or a third-party representative of an asset owner.
- **Transmission Operators** is a transmission owner that has transferred functional responsibility for its facilities to MISO. They provide operating information to MISO, operate within established parameters, and provide real-time operations information to MISO.
- **Generation Owners/Operators** either own or lease facilities for energy generation and must be represented by a market participant. They are responsible for submitting operational information to MISO and for responding to MISO dispatch instructions.
- **Load-Serving Entities (LSEs)** are responsible for providing or obtaining energy and/or reserves for end-use customers. They must either be a registered market participant or arrange with a market participant to be served through MISO's energy and operating reserve markets.
- **Aggregators of Retail Customers (ARCs)** represent multiple customers, typically aggregating a group of customers that individually do not meet thresholds to participate in the markets. They must submit operating information and respond to MISO dispatch instructions.
- **Local Balancing Authorities (LBAs)** provide local area load forecasts to MISO and implement MISO dispatch setpoint instructions, if applicable.
- **Independent Market Monitor (IMM)** provides independent, impartial, and effective monitoring and reporting of the MISO markets. The IMM also provides a means for MISO to mitigate the effects of any conduct that would distort the outcomes of markets.

Resources

- [MISO Markets](#) training video
- [Business Practice Manual](#) (BPM-002, Energy and Operating Reserve Markets)
- [MISO Tariff](#)
- [Market Participant Registration](#)
- MISO Demand Response Fact Sheet