

Midcontinent Independent System Operator

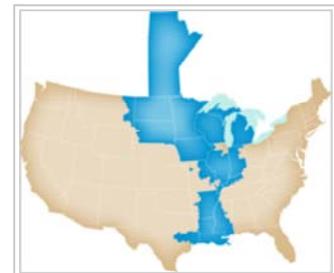
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MISO provides open-access transmission service and monitors the high voltage transmission system throughout the Midwest, and South, United States, and in Manitoba, Canada. It operates one of the world's largest real-time energy markets.

The **Midcontinent Independent System Operator, Inc.**, formerly named Midwest Independent Transmission System Operator, Inc. (MISO)^[1] is an Independent System Operator (ISO) and the Regional Transmission Organization (RTO) that provides open-access transmission service and monitors the high voltage transmission system throughout the Midwest United States, and Manitoba, Canada and more recently integrated a southern region which includes much of Arkansas, Mississippi, and Louisiana. MISO operates one of the world's largest real-time energy markets.^{[2][3]}

Midcontinent Independent System Operator (MISO)

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|---------------------|---|
| Type | Non-profit: Independent System Operator; Regional Transmission Organization |
| Headquarters | Carmel, Indiana |
| Staff | 900 |
| Website | https://www.misoenergy.org |



MISO Reliability Footprint

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Definition of ISOs and RTOs

Both ISOs and RTOs are organizations formed with the approval of the Federal Energy Regulatory Commission (FERC) to coordinate, control and monitor the use of the electric transmission system by utilities, generators and marketers. An ISO is a non-profit organization that combines the transmission facilities of several transmission owners into a single transmission system to move energy over long distances at a single lower price than the combined charges of each utility that may be located between the buyer and seller. The ISO provides non-discriminatory service, and must be independent of the transmission owners and the customers who use its system.^[4]

RTOs also provide non-discriminatory access to the transmission network; however, they are required to meet specific FERC regulations that deal with transmission planning and expansion for an entire region, the use of energy markets to deal with system congestion, of power users and owners. RTOs offer regional wholesale electric transmission services under one tariff.

^[4]

FERC first required transmission owners to provide non-discriminatory access to their lines in Order Nos. 888 and 889, building on the model it had used to require interstate natural gas pipelines to provide access to pipeline capacity. In those orders, FERC noted that ISOs could provide the additional assurance of independence from the owners, and the elimination of multiple (“pancaked”) rates to transmit electricity over long distances. Shortly thereafter, FERC Order No. 2000 encouraged the formation of RTO’s to regionally manage portions of North America’s electricity grid.^[5]

There are nine ISOs, five of which are RTOs, operating in North America. They manage the systems that serve two thirds of the customers in the U.S., and over half the population of Canada.^[5] Over time, the distinction between ISOs and RTOs in the United States has become insignificant. Both organizations provide similar transmission services under a single tariff at a single rate, and they operate energy markets within their footprints.^[5]

Incorporation under FERC

MISO was established in 1998 as an ISO and was approved as the nation's first RTO by FERC in 2001. The organization is headquartered in Carmel, Indiana with operation control centers in Carmel and Eagan, Minnesota and Little Rock, Arkansas.^[6]

Footprint/membership

MISO is an independent and member-based non-profit organization. Its members include 51 transmission owners with more than 65,800 miles of transmission lines. Members include investor-owned utilities, public power utilities, and cooperatives, such as: Entergy, Indianapolis Power & Light, International Transmission Company, Great River Energy, Xcel Energy, and City Water Light and Power.^[7]

History

MISO began its operation on “Day 1,” a development phase between 1998 and 2005. Throughout this period the company initiated and built up transmission services to increase grid reliability. MISO was established as an ISO in 1998 after voluntary discussions led to its formation. One year later, the first board of directors was elected and by the end of 2000 the organization had more than 70 employees. In 2001, FERC approved MISO as the nation's first RTO.^[8]

Northeast blackout of 2003 The following is the blackout's sequence of events on August 14, 2003 (times in EDT):
12:15 p.m. Incorrect telemetry data renders inoperative the state estimator, a power flow monitoring tool operated by the Indiana-based Midwest Independent Transmission System Operator (**MISO**). An operator corrects the telemetry problem and **forgets to restart the monitoring tool**.

In 2005 MISO announced the opening of the MISO Energy Markets. The new services ushered in MISO's “Day 2” development phase, providing a wholesale electricity market that settles \$2 billion in transactions each month. During this period, MISO grew its employee base to more than 600 staff, and moved the corporate headquarters and operations center under one roof in Carmel, Indiana.^[8]

Now, in addition to Day-Ahead and Real-Time markets, MISO operates an ancillary services market which began on January 6, 2009. This market provides both energy and operating reserves as well as regulation and response services that support reliable transmission service.^[8]

Name was changed in April 2013.

Value Proposition

The Value Proposition is a study demonstrating MISO’s major benefits as an RTO provider for the heartland region. MISO participants see \$700 million to \$900 million in annual benefits due to improvements in reliability, efficiency and development:

- *Reliability* – MISO monitors the state of the grid every 30 seconds. This allows the organization to detect potential issues and identify effective responses within minutes. Its reliability function also maintains seamless management between neighboring ISO and RTO providers and ensures that all government regulations are met.

- *Efficiency* – MISO maximizes the efficient use of the transmission system and energy under fluctuating power demands. The Security Constrained Economic Dispatch software matches energy needs with resources in terms of capability and price.
- *Development* – Regional planning efforts have resulted in almost \$8.4 billion in new infrastructure and improvements to the transmission system. The development of the transmission system supports the reliable operation of the interconnected grid and maintains a competitive energy market.^[9]

Workforce

MISO is governed by an independent nine-member Board of Directors, with eight independent directors elected by the membership, plus the president of MISO. No board member may have been a director, officer or employee of a member, user, or affiliate of a member or user for two years before or after election to the Board. Under MISO's Standards of Conduct, all MISO board members, employees and their immediate family members are required to divest themselves of any financial holdings in member or user companies.^[10]

MISO employs a staff of approximately 900 full-time employees between its three operation control centers and its transmission planning office in Metairie, LA.

Technology

MISO uses a computer model called a State Estimator that analyzes real-time conditions of the MISO power grid. The system has been in operation since December 31, 2003, and serves as the primary management tool for the reliability of transmission facilities throughout the organization's footprint. The State Estimator is one of the world's largest computer systems and provides 303,800 data points that are updated every 5 seconds.^[11]

Operations

As the primary RTO in the Midwest and South United States, MISO carries out operational responsibilities to maintain the flow of energy.

Grid management and reliability

Data is evaluated by Reliability Coordinators and Reliability Analysts, monitoring the grid 24/7. Projecting the movement of power in real-time, MISO's control room staff monitors and manages activity on the electric transmission system.

Infrastructure planning and energy alternatives

MISO performs regional planning in accordance with FERC principles. MISO infrastructure planning has four primary objectives:

- provide an efficient and reliable transmission system
- access a diverse number of energy resources, including renewable energies
- expand energy trading opportunities
- meet state and federal energy policy objectives^[12]

MISO Markets

This open market began on April 1, 2005, and provides financially binding day-ahead and real-time pricing of energy. MISO Markets include a Financial Transmission Rights Market, a Day-Ahead Market, a Real-Time Market, and a market for operating reserves and regulation. They are operated and settled separately, providing a clear look at day-to-day price changes.

^[13]

Planning efforts

10. "Careers" ([https](https://www.misoenergy.org/WhatWeDo/EPARegulations/Page)). Retrieved 2009-02-24.
11. "Improved State Estimator Gives MISO Most Comprehensive View of Power Grid" (pdf). *Midwest Independent Transmission System Operator*. 2004-01-15. Retrieved 2009-02-24.
12. [1] (<https://www.misoenergy.org/WhatWeDo/EPARegulations/Page>)
13. [2] (<https://www.misoenergy.org/WhatWeDo/MarketEnhancements>)
14. MISO Transmission Expansion Plan (<https://www.misoenergy.org/Planning/TransmissionExpansionI>)
15. "Midwest Independent Transmission System Operator, Inc. and PJM Interconnection, L.L.C., Docket Nos. ER04-375-017, ER04-375-018" (pdf). Midwest ISO. 2006-10-26. Retrieved 2009-02-24.
16. "MISO Recognized by NERC for Examples of Excellence" ([http](http://www.misoenergy.org/WhatWeDo/MarketEnhancements)). MISO. 2007-05-10. Retrieved 2009-02-24.
17. "The 2007 Computerworld Honors Program" ([http](http://www.computerworld.com)). Computerworld Honors Program. 2007-01-01. Retrieved 2009-02-24.

External links

- JCM Contour Map (<http://www.miso-pjm.com/markets/contour-map.aspx>)
- MISO (<http://www.misoenergy.org>)
- The Federal Energy Regulatory Commission (FERC) (<http://www.ferc.gov>)
- The North American Electric Reliability Corporation (NERC) (<http://www.nerc.com>)
- Midwest ISO – PJM Interconnection Joint and Common Market (JCM) (<http://www.miso-pjm.com>)
- The Organization of MISO States (<http://www.misostates.org>)
- MISO LinkedIn Profile (<http://www.linkedin.com/companies/midwest-iso>)
- *BusinessWeek* company snapshot (<http://investing.businessweek.com/research/stocks/private/snapshot.asp?privcapId=1535795>)
- Entergy aiming to join MISO end 2013, spurns SPP (<http://platts.com/RSSFeedDetailedNews/RSSFeed/ElectricPower/6023987>)
- Map of MISO transmission grid (<http://www.energy-graph.com/interactive-map.html>)

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Categories: Electric power transmission system operators in the United States | Companies based in Indiana | Electric power transmission system operators in Canada | Carmel, Indiana

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