



In its role as a regional transmission organization (RTO), PJM Interconnection works to keep the electric grid operating in balance. This means that PJM manages the available generation and transmission to provide the electricity needed by customers at any given moment.

Operating the electric system consists of a balancing act that involves three elements – generation, transmission and demand for electricity. RTOs like PJM manage the grid to ensure reliability. To do that, they must keep these three elements in balance at all times.

PJM controls the operation of about 167,326 megawatts (MW) of generating capacity in its territory. The 1,325 generating units that make up this capacity produce electricity to meet demand, supplemented when needed by purchases from other sources.

PJM operates 56,500 miles of high-voltage transmission lines across its territory. These lines move electricity from the generating units to large substations that reduce the electricity's voltage so that it can be distributed further, ultimately to local distribution points that supply homes and businesses.

To manage the electric system, PJM acts as a data clearinghouse and decision-maker. Using sophisticated computer programs, it forecasts how much electricity will be needed each hour and arranges to meet that demand from the available generation and other sources. As the actual demand changes in real time, PJM adjusts the generation and other sources to balance the demand while maintaining the transmission system at safe operating levels. This process is transparent to electricity users.

Because electricity is a speed-of-light product that cannot be stored, PJM must respond instantaneously to changes in demand and

operating conditions across its 168,500-square-mile territory.

To keep the system in balance, PJM continuously monitors the electric system, reacting to changes in demand, equipment problems, weather conditions and other factors to maintain safe and reliable service while meeting customer needs for electricity when and where it's needed.

At PJM's control centers, a staff of experts monitors the power grid 24 hours a day, seven days a week. PJM system operators react to shifts in electricity use to keep supply and demand in balance. They direct how much energy should be supplied and request adjustments to the production of generating plants to accommodate changes in demand and to make sure that no transmission lines or facilities are overloaded. The system operators also watch for unusual conditions and react to them to protect the electricity supply.

In protecting the reliability of the electric system, PJM experts study tens of thousands of "what if" scenarios, assisted by computer simulation programs that help them prepare to deal with almost any event. Each variable that conceivably could affect supply and demand for electricity is carefully considered and tested – from extreme weather conditions, emergency conditions and multiple equipment failures to the more easily anticipated impact of daily, weekly and seasonal cycles in demand.

PJM has extended this traditional power-in-balance paradigm to encompass the realities of the 21st Century electricity industry.



Competitive electricity markets also help keep power in balance. In PJM, markets and reliability work hand in hand, with the operation of competitive electricity markets sending price signals that reinforce the already strong incentives to keep the grid reliable.

The ability of demand resources to participate in many of PJM's markets also benefits reliability. Retail customers who can cut their electricity demand in response to the needs of the PJM grid can be paid for those demand reductions, just as generators are paid for increasing their output when demand is high.

PJM's Regional Transmission Expansion Planning process determines what changes and additions to the grid are needed to maintain reliability in the future. The process systematically evaluates proposed transmission and generation projects to ensure that compliance with reliability criteria is maintained.

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