

On June 24, 2004, the ISO Board of Governors approved two parallel programs, managed as one ISO initiative in order to gain economic and technical efficiencies:

- Market improvements to assure grid reliability and more efficient and cost effective use of resources.
- Technology upgrades to strengthen the entire ISO computer backbone.

Market Redesign

- Allows the ISO to conduct a Day-Ahead Market that combines three services; energy, ancillary services (operating reserves) and congestion management to better match what really happens when the electricity flows. The forward or Day-Ahead Market determines the best use of resources available, while finding the least cost method of procuring required components. With the bankruptcy of the Power Exchange in 2001, there is currently no centrally organized day-ahead energy market in California. By starting this process in the day-ahead time frame, there is less reliance on the more volatile Hour-Ahead and Real-Time Markets.
- Provides a more precise model of the grid using the latest computer technology to allow the ISO to better predict how energy scheduled a day ahead of time will flow in real-time. The ISO will be able to see ALL potential transmission line crowding a day ahead of time, rather than waiting until real-time. Once power is flowing, options for making adjustments are limited and potentially more expensive, and such adjustments present challenges to reliability.
- Introduces new market rules and penalties that prevent Enron-like gaming and manipulation. The ISO is charged with keeping the grid reliable. It does so by issuing dispatch orders to energy suppliers to increase or decrease the amount of energy they have successfully bid into the market. But the ISO had limited authority to compel suppliers to respond to dispatch instructions. The ISO has been granted new authority by the Federal Energy Regulatory Commission (FERC) to assess financial penalties on market participants that do not comply with instructions from the ISO control room. The new market design also determines the deliverability of all schedules, rejecting requests that are physically impossible.

- Produces local prices that eliminate the distinction between inter- and intra-zonal congestion. Locational Marginal Pricing (LMP) essentially shows the cost of producing power as well as the cost of delivery. This gives the ISO and market participants a clearer picture of the true cost of getting power to areas that may not have enough local generation or where transmission capacity is lacking. It will find and block infeasible day-ahead schedules—those that cannot fit on the grid.

Technology Upgrade

- Prior to the market redesign effort in 2001, the ISO began assessing its future systems and infrastructure needs as the computers originally installed at start-up began to approach the end of their useful lives. A “fence and reinvest” strategy was initiated, with the ISO seeking to minimize maintenance costs and further investment in outdated systems while developing new systems based on a more open architecture that offers greater flexibility and allows for more cost-effective changes down the line.
- Because power grids depend on the latest computer technology to help manage loads and resources, their reliability drives the reliability of the grid. New computer systems are designed to minimize downtime and the possibility for interruption, enabling grid operators to manage the transmission system more effectively and giving them a better forecasting tool to spot potential bottlenecks on power lines before electricity actually flows in real-time.

Just as home computers become outdated over time, the ISO computers are in need of updating after seven years of operation. New computer systems will replace the existing systems that have been “patched” more than 400 times over the years. Replacing the aging infrastructure also takes advantage of technological advancements in the past five years.