Midwest ISO: Benefits of a Centralized RTO

The Midwest Independent System Operator (ISO) engaged ICF to estimate potential and actual economic benefits of its market operations for the period June 2005 through August 2006. On April 1, 2005, the Midwest ISO began operation of Midwest Markets—an hourly locational marginal price (LMP) energy market that includes centralized unit commitment and dispatch, a day-ahead energy market, a real-time energy market, and a financial transmission rights market. The Midwest ISO is the first greenfield regional transmission organization (RTO) with an LMP and centralized dispatch market structure in North America. The results of ICF's study were released in February 2007, followed by an addendum in May 2007.

Results Show Midwest ISO Energy Markets Bring Tangible Benefits to Nation's Largest Power Grid

Our Approach

Generally, the benefits from RTO operation come from three major sources: investment efficiency, operational efficiency, and savings (or costs) associated with market participant operation within the new RTO.

Not all of these major sources of benefits can be easily quantified. Some are best treated qualitatively because the industry as a whole has not accepted any one particular approach to quantifying these benefits. The area that lends itself easily to quantitative analysis is operational efficiency.

ICF's study captured and quantified the potential benefits from the functional and structural changes of the market, primarily through production costs savings from improved generation dispatch. ICF assessed the maximum potential benefits of the Midwest ISO's transition to a centralized unit commitment and dispatch operation. The centralized market optimizes the use of generation and transmission assets. In a variation of the centralized market analysis, ICF also assessed the potential benefits actually achievable by the Midwest ISO given its current market structure. This was necessary because the current Midwest ISO market structure lacks a centrally coordinated regulation and operating reserves market.

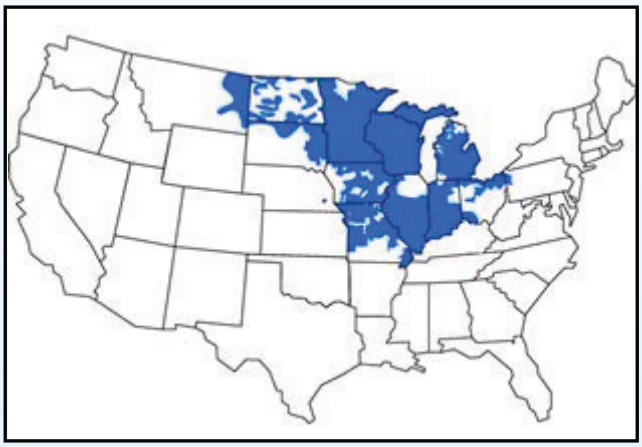
Further, ICF estimated the benefits achieved during actual operation of the Midwest ISO market over the study period, which was a complex undertaking given the size, scope, and nuances of the Midwest ISO market. This aspect of the study has apparently never been addressed in previous studies of major electric power marketplaces. It required cooperation with Midwest ISO stakeholders, access to Midwest ISO operators, processing of massive amounts of historical data, and development of an extremely detailed generation and transmission model of the Midwest ISO footprint.

Capabilities

Our team of experts possesses recognized qualifications and proven experience in areas including:

- Operation of interconnected electric power systems and power markets
- Production costing and fundamental modeling of power markets
- Power flow modeling and contingency analysis
- Load forecasting and demand growth projections
- National, regional, and local air regulatory policy, pollution control technologies, and optimal unit compliance strategies
- Generation resource cost and thermal data
- Fuel supply, fuel price forecasting, and fuel delivery
- Regulatory issues

MISO Market Footprint



Source: Midwest ISO

Our Analytics

Analytically, a detailed transmission system model is required to accurately illustrate the dynamics of the network. ICF uses GE Energy's MAPS™ model as the main tool for this study. MAPS software uniquely models transmission topology and distribution of loads to accurately predict dispatch of generation assets throughout the system. The strength of MAPS software is in its ability to handle near-term production and simulation, especially when uncertain variables like firm capacity additions are known and there is little likelihood of unplanned capacity additions or requirements. MAPS software provides LMP output and transmission modeling, which enable MAPS software to reflect the economic penalties of redispatching generation to satisfy transmission line flow limits and security constraints. Specifically, ICF uses MAPS software in this project to perform the following:

- Security-constrained unit commitment
- Security-constrained economic dispatch
- Flows on monitored transmission lines and transmission paths under contingency conditions and/or secure dispatch
- Power plant dispatch
- Hourly nodal and zonal prices
- Fuel use, emissions, and environmental compliance

MAPS is a trademark of General Electric Company.

About ICF International

ICF International (NASDAQ: ICFI) partners with government and commercial clients to deliver consulting services and technology solutions in the energy, climate change, environment, transportation, social programs, health, defense, and emergency management markets. The firm combines passion for its work with industry expertise and innovative analytics to produce compelling results throughout the entire program life cycle, from analysis and design through implementation and improvement. Since 1969, ICF has been serving government at all levels, major corporations, and multilateral institutions. More than 2,500 employees serve these clients worldwide. ICF's Web site is www.icfi.com.

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