

Capacity Needs in Wholesale Energy Markets

*Capacity Needs Forum
Lansing
18 July 2005*



Agenda

- Introduction
- Midwest ISO – who, what, where?
- Midwest ISO – Day 2 markets
- Midwest ISO – Day 2 issues: resource adequacy
- Next steps
- Questions?

“Tackling Challenges & Forging Ahead”

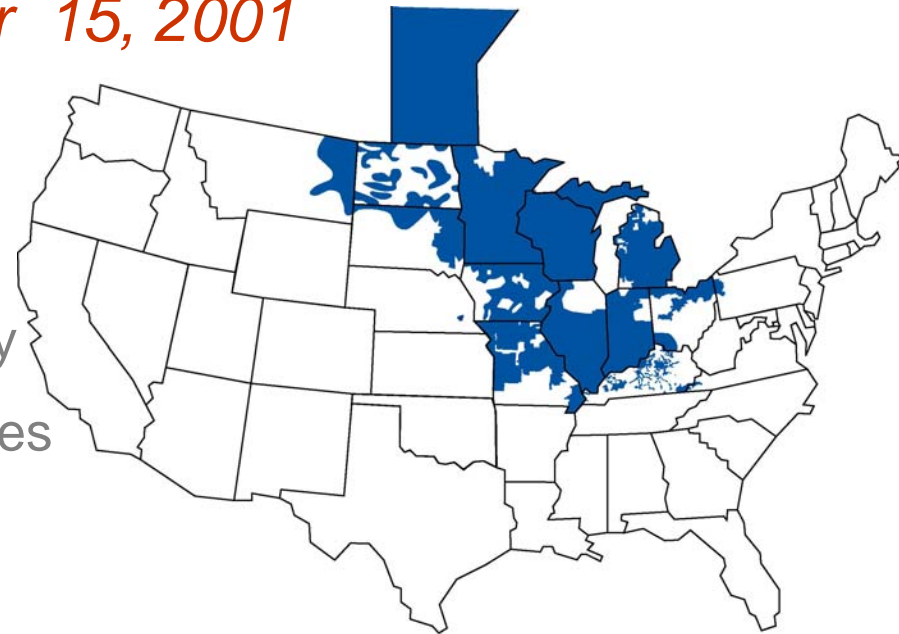


Who We Are

The Midwest ISO is an independent, non-profit entity that monitors the transmission grid of high voltage electricity across much of the Midwest.

Operational Since December 15, 2001

- 23 Transmission Owners
- 36 Control Areas
- 119,207 MW of peak load
- 137,000+ MW generating capacity
- 97,000+ miles of transmission lines
- 947,000 square miles
- 15.1 million customers
- 1,504 generating units in the reliability footprint
- Carmel and St. Paul Control Centers



■ Midwest ISO Membership



Balancing Areas within the MISO Reliability Monitoring Area

Alliant Energy – East	MidAmerican Energy Company
Alliant Energy – West	Michigan Electric Coordinated System
Ameren Transmission	Madison Gas and Electric Company
Aquila Networks – Missouri Public Service	Manitoba Hydro, Transmission Services
Aquila Networks – West Plains Kansas	Minnesota Power, Inc.
Central Illinois Light Co	Muscatine Power and Water
Cinergy Corporation	Northern Indiana Public Service Company
Columbia Water & Light	Nebraska Public Power District
City Water Light & Power	Northern States Power Company
Duke Energy – Vermillion	Omaha Public Power District
Dairyland Power Cooperative	Otter Tail Power Company
First Energy Corp	Southern Indiana Gas & Electric Co
Great River Energy	Southern Illinois Power Cooperative
Hoosier Energy	Southern Minnesota Municipal Power Agency
Illinois Power Co	Upper Peninsula Power Co
Indianapolis Power & Light	Western Area Power Administration UGPR
Lincoln Electric System	Wisconsin Energy Corporation
LG&E Energy Transmission Services	Wisconsin Public Service Corporation

“Tackling Challenges & Forging Ahead”



The Role of RTOs

- Monitor flow of power over the grid
- Schedule transmission service
- Perform transmission security analysis for the Reliability Area footprint
- Manage power congestion through LMPs
- Approve transmission & coordinate generation maintenance outages
- Perform long term planning & analysis for region
- Operate Real-Time & Day-Ahead Markets

“Tackling Challenges & Forging Ahead”



Roles & Responsibilities Day 1 -- markets

Bilateral transactions facilitated by “physical” transmission service provided under regional OATT

MISO’s primary responsibilities related to the market include:

- **Acceptance and analysis of requests to reserve transmission capacity for future scheduling of transactions**
- **Acceptance of schedules for approved reservations**
- **Monitoring transmission usage**
- **Providing reliability coordination**
- **Invoicing participants monthly for use of transmission lines as well as other associated services**

“Tackling Challenges & Forging Ahead”



Why markets? Why a Midwest ISO administered market?

- *Create a framework for robust, transparent and competitive electric markets.*
 - *Markets work better when there are many buyers and sellers*
 - *Competition yields lower prices*
 - *Sellers will build if there's an opportunity to earn a return commensurate with the risks.*
- *Competitive markets are efficient!*
 - *Maximizing consumer welfare*
 - *'Correct' allocation of scarce resources*
 - *Production at lowest cost*
- *Enhance system reliability*



Real-Time Centralized Dispatch

- MISO uses the Security Constrained Economic Dispatch (SCED) program every 5 minutes of each operating hour
- MISO sends control areas Net Scheduled Interchange (NSI) and basepoints for generators
 - NSI and resource basepoints sent every 5 minutes
 - Dynamic Schedules sent every 5 minutes
 - Ramped Balancing Area NSI sent every 4 seconds
 - Ramped Dynamic Schedule values sent every 4 seconds
- Balancing Areas are responsible for regulation between dispatch interval and for operating reserves
- MISO calculates ex-post Real-Time LMPs based on actual system activity



Other Market Design Elements

The Real Time market operator and the market participants want some certainty that enough resources are available every five minutes to meet the load demands, or to keep the lights on.



Midwest ISO Energy Markets

- The critical design elements included in these Markets are:
 - Real-Time Centralized Dispatch
 - Integrated Energy and Congestion Management Day-Ahead Market
 - Locational Marginal Pricing (LMP)
 - Financial Transmission Rights
 - Reliability Assessment Commitment (RAC)
 - Self-Schedules and Bilateral Schedules
 - Use Limited and Demand Response Resources
 - Accommodate Retail Access Programs
 - Load Aggregation and Trading Hubs
 - Market Timeline
 - Market Power Mitigation

 - Security Constrained Unit Commitment (SCUC)
 - Resource Adequacy
 - Pre-OATT Contracts (grand fathered agreements)
 - Ancillary Service Procurement
 - Control Area Activities

 - Market Settlements



Day 2 Market Issues: resource adequacy

Does the Midwest ISO need a Capacity
Market?



Day 2 Market Issues

Reliability Assessment Commitment (RAC) process: replacement reserves

Issues: commitment process

CT/GT commitment

The following principles have guided development of this RAC process:

- The RAC process should allow the Midwest ISO to commit the capacity it deems necessary to reliably operate the grid at the least commitment cost;
- The RAC process should have a transparent and equitable implementation process;
- The RAC process is not intended to create any 'new' markets outside of the existing proposed energy markets; and
- The RAC process should be incentive compatible with the Midwest ISO's proposed Day-Ahead and Real-Time Energy Markets;



Day 2 Market Issues

Issue: reserve treatment-- Balancing Area/Midwest ISO coordination

The Reliability Charter

Midwest ISO & Balancing Area roles and responsibilities:

NERC Functional Model

- Reliability authority
- Balancing authority
- Interchange authority
- Real-Time security constrained economic dispatch



The Reliability Charter

Midwest ISO & Balancing Area roles and responsibilities: Real-Time Energy Market

- Multi-Balancing Area Implementation
- The Midwest ISO will not directly control generation
- 5-minute LMP Base-points produced by the Midwest ISO and sent to Market Participants using 5-minute Load Forecast at Balancing Area granularity
- Net Scheduled Interchange calculated by the Midwest ISO and sent to each Balancing Area continuously
- Balancing Area performs regulation between 5 minute LMP base-points
- Generation limits sent by market participants has generation set aside for regulation and operating reserves “blocked off” from LMP dispatch



Day 2 Market Issues

Resource Adequacy:

06 August FERC order on Midwest ISO EMT

- Docket ER04-691-000
- Section IV. H, pa. 388 – pa. 422

08 November FERC order on Rehearing

- Docket ER04-691-003
- Section IV. H, pa. 307 – pa. 358

20 December FERC order on Compliance

- Docket ER04-691-004
- Section IV. H, pa. 279 – pa. 336



Day 2 Market Issues

Resource Adequacy:

Some History(1):

25 July 2003 Midwest ISO tariff filing

- did not specifically address resource adequacy, in part because the stakeholder group (SAWG/OMS RAWG) was still in the process of developing it.
- FERC received numerous comments and protests from market participants and other stakeholders that the MISO EMT had critical gaps or missing design elements, one of which was resource adequacy.
- Consistent with the Advisory Committee action, MISO pulled the filed EMT.
- In granting the withdrawal of the filed tariff, FERC offered some guidance, suggesting the Midwest ISO work closely with the OMS to develop a long term resource adequacy plan.



Day 2 Market Issues

Resource Adequacy:

Some History(2):

31 March 2004 Midwest ISO tariff filing

- Resource adequacy requirement filed as part of the tariff, Module E.
- Result of numerous stakeholders meetings prior to the filing.
- Essentially a codification of resource adequacy requirements placed on market participants by their states of regional reliability organizations (RROs).



Day 2 Market Issues

Resource Adequacy:

The following principles have guided development of the Midwest ISO's resource adequacy proposal:

- The resource adequacy proposal should enhance system reliability and security;
- The resource adequacy proposal should not impose any additional costs for the Midwest ISO's market participants without a commensurate increase in system reliability;
- The resource adequacy proposal should not promote the abuse of market power.



Day 2 Market Issues

Resource Adequacy:

Interim Approach:

- Comply with existing RRO or state reliability requirements
- Standard setting responsibility
- Midwest ISO Designated Network Resources (DNRs)
- Must Offer requirements
- Midwest ISO role in RRO process
- Midwest ISO supply adequacy working group (SAWG)
- Organization of Midwest ISO States (OMS) resource adequacy working group
- OMS/SAWG principles & work plan

- **Expectation: MISO filing on permanent resource adequacy: late-2005**



Day 2 Market Issues

At Market Start:

- Resource Adequacy --- Module E: codification of existing RRO requirements
- Ancillary Services (regulation & operating reserves) --- Schedules 3,5,6: part of the roles and responsibilities of the BAs, through parsing out of NERC Functional Model
- *Each of these critical design elements being addressed in parallel tracks in Midwest ISO stakeholder processes.*



Day 2 Market Issues

Resource Adequacy:

06 August FERC order on Midwest ISO EMT : The Midwest ISO's proposal

- Pa.396: “We view Module E as a transition mechanism to bridge the gap between market startup and the implementation of a permanent RAR plan.”
- Pa.397: “we expect that the final RAR plan will give due consideration to stakeholder views, but we also recognize that achieving uniform agreement on all aspects of such a plan may be impossible. We also expect that any permanent resource adequacy plan will provide a consistent platform to support the region’s short-term reliability needs and encourage long-term planning and investment in infrastructure.”
- Pa.398: “We agree with some of the intervenors’ comments that certain areas in Module E lack sufficient detail and clarity.”



Day 2 Market Issues

Resource Adequacy:

08 November FERC order on Rehearing: The Interim Plan

➤ Pa.319 & 324: “We grant the Coalition MTC request for clarification that the Commission is not mandating a particular model of long-term RAR for the Midwest ISO. ... The Midwest ISO is composed of multiple NERC Reliability Regions, time zones, control areas, and states and thus there are multiple stakeholder views that undoubtedly will factor into the long-term RAR plan that will be filed with the Commission. The Commission does not want to cut off the stakeholder process that is underway and making significant progress in the Midwest. While stakeholder consensus is not essential for the Commission to approve a long-term RAR plan, due consideration of stakeholder views is appropriate, as stated in the TEMT II Order.... However, at a minimum, the long-term RAR plan that the Midwest ISO files cannot directly conflict with the PJM RAR plan.”



Day 2 Market Issues

Resource Adequacy:

20 December FERC order on Compliance: The Interim Plan

- The Commission directs the Midwest ISO to state in Module E that its requirements will sunset upon the adoption of a long-term resource adequacy plan in the Midwest ISO. (pa.313)
- Pa. 314/315: “We find that section 68.2.3 is sufficiently clear to determine that the 12 percent reserve margin requirement does not apply in states where a reserve margin presently exists and that the Midwest ISO will not require any reserve margin that is in excess of a state’s reserve margin. ... As noted elsewhere in this order, the 12 percent requirement is very limited in scope and it will sunset upon the adoption of a permanent resource adequacy plan for the Midwest ISO.We find that it is appropriate to allow the Midwest ISO to rely on the pre-existing reliability standards in the interim period until a permanent plan that enjoys stakeholder input is adopted. However, we clarify that we interpret section 68.2.3, where it states that the Midwest ISO will not require any reserves in excess of such requirements established by any state, to mean that the Midwest ISO will not change preexisting reserve standards regardless of whether they are higher or lower than 12 percent.”



Day 2 Market Issues

Resource Adequacy:

20 December FERC order on Compliance: Commission Directives

➤ Pa. 335: “We accept the Midwest ISO’s statement that it intends to file a long-term resource adequacy plan on or about June 1, 2006. We find that this is a reasonable time frame to develop a long-term resource adequacy plan that can satisfy both stakeholders’ concerns and the region’s reliability needs. The Commission clarified the requirements of any long-term resource adequacy plan in the TEMT II Rehearing Order, stating that the long-term plan could not directly conflict with the PJM resource adequacy plan”



Day 2 Market Issues

Resource Adequacy:

SAWG/OMS RAWG stakeholder process:

- Regular meetings for 18 months on
- Charter developed, work plan with Gantt chart filed as an attachment to the MISO transmittal letter on filed tariff.
- OMS RAWG produced 'Resource Adequacy and Capacity Markets Principles'
- Numerous resource adequacy constructs proposed by various stakeholders, including PJM, MAPP, NYISO, ISO_NE, RAM, CMTC, Reliant, LG&E, Strategic Energy,
- OMS design elements matrix



Day 2 Market Issues

Resource Adequacy:

SAWG/OMS RAWG stakeholder process:

➤ **Result: 'a three-legged stool'**

- i. PJM approach – (towards a joint & common market)
- ii. MAPP approach – (if it ain't broke, don't fix it)
- iii. 'laissez faire' – (let the energy market decide)



Day 2 Market Issues

Does an electricity market need a resource adequacy or capacity (ICAP/UCAP/ACAP/RPM) market? ISSUES

- What's the objective?
- ISO/RTO is the buyer in the capacity market (on behalf of LSEs)
 - Shifting risk from investors to consumers?
- Demand curve incorporation – administratively set?
- Adders provided to capacity resources with operational flexibility?
- Mandatory participation?
- RTO/ISO incentive?
- Others?



Day 2 Market Issues

Lessons learned from the past years' efforts in the SAWG/RAWG

- Energy markets, as currently designed, have issues.
- Some of these issues have been addressed with the institution of capacity markets.
- Capacity markets, as currently designed or proposed, have the same issues.

- What have we accomplished?
 - At best, simply a transfer of the problem.
 - At worse, you have to live with the consequences if reality does not match the assumptions.



Moving forward (1)

Energy plus (forward?) operating reserve markets

- **Offer/price caps? relaxed**
- **Market monitoring and scarcity pricing? of a different type**

- **Successful wholesale markets around the world focus competition on forward markets with limited purchases in spot market.**
 - **Energy-only markets – no explicit capacity payments**
 - **Spot markets primarily run to maintain system balance**
- **Spot price volatility leads to contracts that protect loads and suppliers from risk**



Moving forward (2)

Long-term energy contracts and long-term FTRs

- **Long-term energy contracts**
 - **Bilateral market?**
 - **Nymex?**
 - **ISO-administered market?**
 - **What type? financial & physical**
- **Long-term FTRs commensurate with long-term energy contract positions?**
 - **ISO-administered? probably**
 - **Allocation or auction?**
 - **How many tranches?**



Moving forward (3)

- **Reserve requirements**
 - **MAPP**
 - **Reliability First**

- **Demand Response**

- **Political support & regulatory commitment**



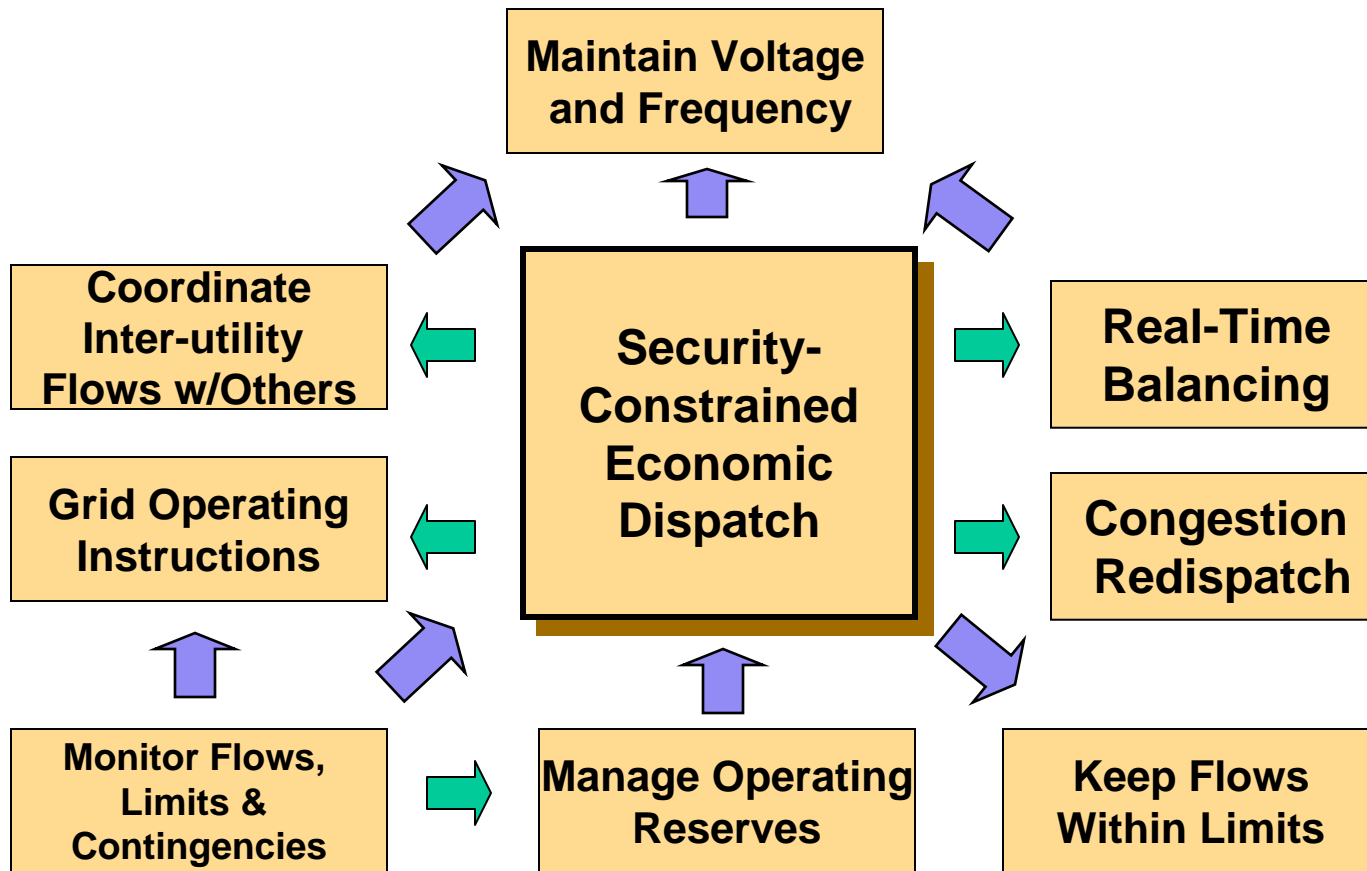
Moving forward (4)

- Capacity markets: a solution to a problem or a solution looking for a problem?, or
- How to intervene in a market when it may not be failing.
 - What's the nature and size of the risk?
 - Can the resource adequacy construct work like a market should?
 - Can the construct fade away if it's no longer needed?
- "We must remember that the same price signals that are so critical for balancing energy supply and demand in the short run also signal profit opportunities for long-term supply expansion."

--- comments delivered 6 April 2005



Improved Reliability Functions Center Around System Operations Dispatch



“Tackling Challenges & Forging Ahead”



Benefits for participants

- **Reduced barriers to trade**
 - Elimination of pancaked transmission rates
 - Uniform access -- one stop shopping for transmission service and interconnection
 - TLR replaced with market-based redispatch
- **Coordinated markets**
 - Liquidity/transparency
 - Expanded choices
 - Self-scheduled generation or load
 - Bilateral transactions
 - Spot purchases or sales
 - Forward hedging
 - Virtual transactions



Questions/comments?

Contact:

Michael Robinson

mrobinson@midwestiso.org

317.249.5741

For more information

– www.midwestiso.org