

Market Design 2002

Comments by
Market Surveillance Committee
of the California ISO
at
June 6, 2003 ISO Board Meeting

Outline of Talk

- Goals of Market Re-design process
- Six features of MD02
 - Local market power mitigation (LMPM)
 - Locational marginal pricing (LMP) and load aggregation
 - Residual Unit Commitment (RUC) process
 - Congestion Revenue Rights (CRRs) and Scheduling Priority
 - Capacity Adequacy—How to obtain it
 - Existing Transmission Capacity (ETCs)—Integrating them into ISO market
- Answer two questions for each feature
 - Why is ISO implementing this feature now?
 - How does this feature enhance overall market efficiency?

Goals of Market Re-design

- No ISO market design can prevent a future market meltdown
- Determinants of market meltdown are outside of ISO's control
 - California Public Utilities Commission (CPUC) determines
 - Extent of forward contracting between loads and suppliers
 - Amount of final demand that responds to hourly prices
 - Amount of competition-enhancing transmission upgrades
 - Effective local market power mitigation authority obtained from Federal Energy Regulatory Commission (FERC)
- What market re-design can accomplish
 - Make market operation consistent with all aspects system operation
 - Use network model with all constraints internal to ISO control area to price transmission congestion in all day-ahead, hour-ahead and real-time markets
 - Provide ISO operators with tools to operate system efficiently
 - System operation dominates market operation after close of day-ahead market
 - Obtain effective local market power mitigation mechanism from FERC

General Comments on MD02

- MD02 is not revolutionary market design
 - Locational Marginal Pricing exists in PJM, NYISO, ISO-NE
 - Certain aspects of market design are new because of unique features of California electricity supply industry
 - Substantial import dependence
 - Large hydroelectric presence
- Delay entails higher risks to California than moving forward with MD02
 - Mexican generation problem under current zonal market design
 - FERC did not approve ISO's proposed remedy to problem
 - Thin adjustment bid markets because of balanced schedule and market separation requirements
 - Current mitigation measures on ISO markets could be removed
- California parties should emphasize to FERC that LMP market will work best if its is accompanied by effective LMPM mechanism

Local Market Power Mitigation

- California ISO currently lacks effective local market power mitigation (LMPM) mechanism
 - Reliability must-run (RMR) contracts provide coverage for portions of ISO control area
 - RMR contracts are unit-specific rather than location-specific
 - Allows AES/Williams problem to arise
- Lack of effective LMPM is most glaring deficiency in current ISO market design (see MSC LMPM Opinion)
- Current market design pays non-RMR contract generators with local market power as-bid
- Other ISOs have LMPM mechanisms that mitigate bids of suppliers with local market power to
 - Variable costs plus a 10% adder, or proxy bid

LMPM Mechanism

- LMPM mechanism needed to
 - Limit market power exercised by unit with local market power
 - Limit market power that portfolio generation owner can leverage from unit with local market power
 - Similar to problem with original Contract A RMR contracts
- MD02 mechanism generally consistent with MSC Opinion on LMPM
- Currently, all ISOs have far more effective LMPM mechanisms than California
 - If take unit out-of-sequence and bid is \$50/MWh or 200% above zonal price can mitigate bid to reference level
 - Delaying implementation of MD02 allows this deficiency in California market to continue

LMP and Pricing of Loads

- ISO will pay all units for electricity produced at respective LMP
 - In day-ahead, hour-ahead, and real-time markets
- Loads pay weighted average of LMPs for one of three investor-owned utility (IOU) service areas in all markets
 - PG&E, SCE, and SDG&E
- Only loads able to respond to ISO's real-time dispatch instruction will be paid LMP at their location in all markets

LMP and Pricing of Loads

- Averaging LMPs limits exposure of loads to price differences within IOU service territories
 - Transmission grid was designed to serve each IOU's customers
- Can serve as a transition period to LMP pricing for loads
 - Show load LMPs before exposing load to LMPs
- Loads with ability to respond to real-time ISO dispatch instructions have strong incentive to be price-responsive
 - They are required to buy and sell power at LMP
- Remaining loads still pay according to IOU-average hourly price
 - Preserves incentive for these loads to respond to hourly prices
 - Does not provide most efficient price signal
 - 1 MW load reduction anywhere in IOU service area is paid the same price despite the fact that system benefits much more or less at some locations in IOU service area than other

RUC Mechanism

- Residual Unit Commitment (RUC) mechanism allows the ISO
 - To commit more units in ISO control area and purchase more imports if operators do not believe market has yielded enough energy and capacity to meet expected real-time energy and capacity demands
- Some mechanism is needed to guarantee that at close of day-ahead market, ISO operators have final schedules that reflect all
 - Transmission network constraints
 - Grid reliability constraints
 - Capacity and reserve constraints
- Market operation must reflect all network and reliability constraints imposed by system operators
 - Failure to do so leaves arbitrage opportunities that may harm system reliability and market efficiency
 - “DEC Game” in zonal market design
 - Enron Strategies

CRRs and Scheduling Priority

- Current market design gives scheduling priority to both load and generation sides of schedule for FTRs
 - Limits ability of ISO operators to manage congestion
 - Fewer generation options to manage congestion
 - Increases thinness of adjustment bid markets
 - Increases cost of real-time system operation
 - Increases opportunities for suppliers to exercise market power
 - Only schedules without FTRs can be moved
- Current ISO proposal gives priority to loads with CRR protection
 - Operators can only move generation units that submit adjustment bids
 - Increased operator flexibility over current market design
 - Increased incentives for the supply side of the CRR-protected balanced preferred schedules to submit decremental energy bids.
- Scheduling priority for loads may be necessary to allow loads to protect their bilateral schedules with price caps on ISO's electricity markets

Capacity Adequacy

- ISO alone cannot guarantee resource adequacy
- Load-serving entities and California Public Utilities Commission jointly determine resource adequacy
- As period of June 2000 to June 2001 demonstrated having adequate generation resources is not enough to prevent a market meltdown if there is insufficient competition among resource owners
- Resource adequacy is having sufficient forward market hedges for spot price risk
 - Forward contracts for supply of energy into future
 - Hedging instruments to manage spot price risk
 - One-sided options to provide price spike insurance

Existing Transmission Capacity

- Current market design reserves entire ETC capacity
 - Operate ISO day-market assuming all ETC utilized
 - ETC capacity can be released for real-time markets, which provides a limited opportunity for utilization
- Current method for managing ETCs increases
 - Costs of managing congestion
 - Opportunities for phantom congestion
 - Opportunities “Enron-like Strategies”
- Under MD02, ISO will not reserve any more capacity for ETC holder than their day-ahead schedule
 - ETC owner schedule changes are given priority over all hour-ahead schedule changes
 - Any schedule change not accepted in hour-ahead will be accepted in ISO’s real-time market
- ETC-holder bears no financial consequences associated with obtaining full ETC capacity in real-time

Existing Transmission Capacity

- Preference to ETC schedules reduces efficiency of ISO markets
- Reserving only capacity scheduled on day-ahead basis rather than full ETC capacity on day-ahead basis should increase market efficiency
 - Preference to ETC schedules in hour-ahead and real-time markets should provide service equivalent to what ETC holder previously had
- ETCs create inefficiencies regardless of what ISO market design is implemented
 - LMP market in MD02
 - Current zonal-market
- LMP market will provide greater transparency concerning costs of ETCs to other market participants

Summary

- MD02, although not revolutionary, is necessary
- Delay is higher risk than adopting MD02
- Message to FERC
 - LMP market for effective LMPM mechanism
- LMP averaging—Allows gradual transition to full LMP
- RUC-mechanism—Guarantees that operators have day-schedules that reflect best estimate of real-time operation
- CRRs—No scheduling priority to generation gives operators greatest flexibility to manage congestion
- Capacity Adequacy—ISO alone cannot solve this problem
 - CPUC and LSEs must determine capacity adequacy
- ETCs—Efficiency enhanced by integrating ETCs into operation of ISO market
 - ETC holders have right to ETC capacity in real-time