Standard Market Design: FERC Process and Issues

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The views presented here do not necessarily reflect those of other FERC staff nor the Commission.
Overview of FERC Process

- Staff concept paper for discussion (Dec. 17, 2001)
- Meetings with ISOs, other regional entities, market participants (Jan. 22-23, Feb. 5-7, 10-11, 2002)
- Rule-making to take place in 2002

For updates: www.ferc.gov/Electric/RTO/mrkt-struct-comments/rm01-12-comments.htm
SMD Principles

- Promote economic efficiency and maintain system reliability
- Voluntary participation
- Customer Choice/Flexibility
- Transparency of design
- Ease of participation (should not create biases toward certain market participants)
- Adaptability
- Mitigate market power
Some Basic SMD Issues

(1) More than one SMD (to allow significant regional differentiation)

or

One national, robust SMD with provisions for regional adaptation, innovation.

(2) Establish basic market functions in SMD rule-making, leaving details for regional implementation

or

Very specific SMD rules and procedures.
SMD Concept Paper Reflects Many Lessons Learned, Including:

- Failure of various attempts at zonal congestion management (PJM preliminary design, California, New England)
- Problems in energy markets associated with single settlement (i.e., real-time only), incremental energy-only (one-part) bidding, and other market rules.
- Pricing problems in some ancillary service and capacity markets
Many of these Lessons Already Becoming Industry Standard

Basic framework adopted by SMD concept paper similar to:

✓ PJM
✓ New York
✓ New England re-design
✓ proposed MISO

Also has core features that appear in

✓ draft California ISO market re-design
✓ RTO West proposal
Day-Ahead Energy Market: Concept Paper Proposal

- Types of transactions: self-schedule, bilateral schedule or bid into market; no requirement for balanced schedules; supply and demand
- Bid protocol: three-part financial bid (start-up, no load and incremental energy) with physical parameters (e.g., low and high operating levels, minimum run times, ramp rates)
- Price determination and settlement: locational marginal prices (LMP) that reflect congestion and losses
Day-Ahead Energy Markets: Some Design Issues

- Differences in unit commitment procedures
- Variations in rules for scheduling/ bidding and price determination to reflect regional differences in transmission and generation
- Restrictions on bids (daily vs. hourly incremental energy bids; limits on changes in start-up bids; flexibility of physical parameters)
- Financial only (virtual) bids
Real-Time Energy Markets: Concept Paper Proposal

- **Types of transactions:** self-schedule, bilateral schedule or bid into market
- **Bid protocol:** incremental energy with physical parameters (e.g., low and high operating levels, minimum run times, ramp rates)
- **Price determination and settlement:** locational marginal prices (LMP) that reflect congestion and losses
Real-Time Energy Markets: Some Design Issues

- Scheduling flexibility in the hour
- Rules for uninstructed deviations from system operator instructions
- Scheduling of external transactions
- Differences in how software calculates real-time LMPs (ex ante vs. ex post, length of look-ahead period in the dispatch, etc.)
Reserve and Capacity Markets: Concept Paper Proposal

- Reserve markets should include at least regulation (AGC) and 10-minute spinning reserve
- Types of transactions: self-schedule, bilateral contract or bid into market; both generators and demand-side can offer reserves
- Reserve bid protocol: energy bid plus availability bid
- SMD for longer-term forward reserves or capacity market left as open question
Reserve Markets: Some Design Issues

- Whether reserve markets are both day-ahead and real-time
- Procedures for co-optimization of reserves and energy
- Option of bid-based, non-spinning reserve markets
- Locational reserves (that require transmission reservations)
- Demand curves for reserves
Transmission Markets: Concept Paper Proposal

- Congestion management based on LMP, both day-ahead and real-time
- No socialization of congestion costs
- Financial transmission rights offered both as point(s)-to-point(s) rights (FTRs, TCCs) and flowgate rights
- Options and obligations
- All transmission customers willing to pay congestion costs get firm physical service
Point-to-Point Transmission Rights

Advantages and Disadvantages:

+ Fully hedge congestion costs
+ Defined independently of system topology and effects of network interactions
+ Can be specified between nodal aggregations, such as zones or hubs
- Point to point rights not easy to trade in secondary markets (require exact or close match of POI and POW)
- Can only be reconfigured in centralized auction (monthly in PJM)

? Effect on transmission investment
Flow-Based Transmission Rights

Advantages and Disadvantages:

+ May support more liquid secondary market in regions where there are few commercially significant flowgates
- Number of active (binding) flowgates could be larger than anticipated
- Active flowgates will change over time
- Buyers/advocates may want uplift (subsidy) from market operator to improve (i.e., reduce imperfection of) flowgate rights hedge

? Effect on transmission investment
Concept Paper: “Do Both”

- Both types of rights sold simultaneously in forward auctions and settled at day-ahead or real-time locational prices
  - Adopt current auction rules for point-to-point rights (e.g., PJM, New York)
  - Sell *user-specified* flow-based rights on all transmission elements (may need some restrictions); i.e., users decide which are commercially significant
  - No subsidy for flow-based rights
Transmission Markets: Some Other Design Issues

- Point(s)-to-point(s) rights as options
- “Up-to” congestion bidding (PJM)
- Capacity reservations at seams (physical, financial?)
- Priority in event of curtailment
Market Monitoring and Market Power Mitigation: Concept Paper Proposal

- Relationship of SMD and market monitoring/mitigation not explicit in concept paper
- Market monitor required to report common performance standards
- Mitigation triggers and measures may also be standardized