



California ISO
Your Link to Power

California Independent
System Operator Corporation

Convergence Bidding Design

Focus on Three Elements

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Design Framework

- **Convergence Bidding Design Framework**
 - Work Group formed – September 6 and 8 conference calls with three eastern ISOs
 - Focus on three key elements that will underpin the design:
 - Spatial granularity
 - Choice of Distribution Factors
 - Provisions for market power mitigation and monitoring

Key Design Elements

- **Spatial granularity of virtual bids**
 - Under MRTU, loads bid only at the LAPs, while generation bids can be submitted only at their respective nodes.
 - **Should all virtual bids be limited to the aggregated (LAP and/or Hub) level, or should virtual bids be allowed at all pricing nodes?**
 - **Would a staged implementation make sense where virtual bids would start at the LAP/Hub and then extend to nodes after some experience is gained?**

Key Design Elements (Cont'd)

- **Choice of virtual bid distribution factors**
 - Under MRTU, the network model will utilize LAP load distribution factors (LDFs) to distribute non-dispatchable load bids to the nodes for optimal power flow and market clearing computations. LDFs are based on historical data in the day-ahead market, but they are based on State Estimator results in real-time. The question is for virtual bids at the LAPs, should the design:
 - Use the same distribution factors for virtual load that are used for actual load (i.e., different LDFs in day-ahead and real-time?)

Market Power Mitigation

- **Bid Price Mitigation**
 - Virtual bids only limited by price caps in others ISOs
- **Bid Quantity Restrictions**
 - Collateral requirements (all ISOs)
 - Position limits (none)
- **Settlement Rules for CRR Owners**
 - PJM and NE-ISO have automatic settlement adjustments if participant's virtual positions may have increased CRR payments
- **Sanctions**
 - Referrals to FERC
 - Ability to suspend trading (NYISO?)

Market Monitoring System & Analyses

■ **Monitoring Systems (all ISOs)**

- Automated tracking of profits and losses
- Flagging of sustained losses as indicator of potential gaming
- Model to re-simulate market with and without virtual bids to assess impacts

■ **Analyses**

- Periodic analysis of impact on convergence of IFM and Real-Time prices (all ISOs)
- Periodic ad hoc analysis of impact of participants virtual bidding on overall settlement portfolio (NYISO)
- Analysis of actual impact on CRRs?