

Catherine Tyler Mooney

REVENUE ADEQUACY ANALYSIS

Revenue Adequacy Analysis : Process

1. Clean Day Ahead case

- MCE v1.6 solved a defect that impacted congestion
- Bid in load increased to realistic levels

2. Day Ahead model assumptions applied to TCR

- Outages, Flowgates, Parallel Flow, Topology, Contingencies

3. “Perfect Hedges” from one on-peak hour Day Ahead injections and withdrawals as TCR inputs

- Generation to load for all load-serving entities
- EIS schedules for independent power producers
- Left-over North to South gen to load

Revenue Adequacy Analysis : 3 Hedge Runs

1. ARR Allocation

- “Perfect Hedges” as Candidate ARRs
- Objective function maximizes awards

2. TCR Auction with Bids at Congestion Values

- “Perfect Hedges” priced economically
- Objective function maximizes auction revenue

3. TCR Auction with equal bids

- Same as ARR Allocation

Revenue Adequacy Analysis : Allocation Results

1. ARR Allocation

- “Perfect Hedges” as Candidate ARRs
- Objective function maximizes awards
- **Total Awards : 33,025 MW**
- **% of DA Injections/Withdrawals Awarded : 99.6%**
- **Curtailments : small loads**
- **TCR Payments : \$60,898**
- **103% Funded by Day Ahead Market**

Revenue Adequacy Analysis : Auction Results

2. TCR Auction with Bids at Congestion Values
 - “Perfect Hedges” priced economically
 - Objective function maximizes auction revenue
- Total Awards : 19,550 MW
- % of DA Injections/Withdrawals Awarded : 59.0%
- Curtailments : Negative Bids
 - The auction doesn’t want negative bids that do not provide valuable counter-flow.
- TCR Payments : \$63,853
- 98.5% Funded by Day Ahead Market

Revenue Adequacy Analysis : Auction Results

3. TCR Auction with equal bids

– Same as ARR Allocation

- **Total Awards : 33,092 MW**
- **% of DA Injections/Withdrawals Awarded : 99.8%**
- **Curtailments : small loads**
- **TCR Payments : \$61,244**
- **102.7% Funded by Day Ahead Market**

Revenue Adequacy Analysis : Summary

- The TCR Hedge and Day Ahead Market models are practically identical.
- Small Differences due to
 - Bus-Branch (TCR) vs. Breaker-to-Breaker (DA) Models
 - Load distribution not perfectly matched
 - Parallel Flow as Injections/Withdrawals (DA) vs. Flowgate Derates (TCR)
- The TCR Auction is designed to maximize revenue, not to accept all bids.
- Nothing in this analysis reveals concerns with the TCR market software.

Revenue Adequacy : Conclusions

- **What causes revenue adequacy concerns?**
 - Updates in model assumptions (like parallel flow, topology, contingencies)
 - Outages reported late, forced outages
 - Changes in flowgate designations and/or ratings
 - Bidding Behavior
- **Ongoing dialogue with stakeholders**
 - Congestion Hedging
 - Market Monitoring (Quarterly and Annual Reporting, MWG)