FRM STF: CAISO Case Study

July 17th, 2019
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Changes to market structure should have the goal of improving liquidity and transparency

- **PJM has presented a study on reducing eligible path types in the FTR market to “physical delivery” paths**
  - FTR path types and biddable nodes were not a recommendation of the independent report
  - Changes to market structure should have the goal of improving liquidity and transparency

- **CAISO restricted bids to “supply delivery” paths in 2019. This provides a good case study for PJM members to evaluate when considering biddable nodes**
  - CAISO defines “supply delivery” paths as generator bus to either a load aggregation point, trading hub or intertie
  - Counterflow on these supply delivery paths is no longer allowed
After CAISO restricted biddable paths in 2019, volume cleared in monthly auctions dropped by over 50%. The annual auction saw a 66% drop in volume cleared.

Mean Monthly Volume 2019: **33.4 GW**
Mean Monthly Volume Pre-2019: **68.8 GW**

50%+ drop in volume cleared
The drop in volume was not isolated to financial participants. Physical participants saw a drop in the volume they could clear sourcing from supply points.
Counterflow was significantly reduced in the market. This was made worse by CAISO preventing participants from providing counterflow directly on delivery paths.
Removal of counterflow can create pricing anomalies that are not justified from settlement outcomes

**CAISO Delivery Path Example**
– Altwind → Riverside Load, OnPeak, Prompt Month CP vs DA Settlement –

*This path is currently only biddable in one direction. Without the ability to bid on the opposite direction (provide counterflow), this path is less accurately priced in CRR auctions.*

**Avg Inaccuracy**
- Before Jan19: ~$0.8k/MW
- After Jan19: ~$4.4k/MW

*Pricing Inaccuracy is measured by the absolute error between the monthly auction price and actual settlement*
On average, prices on the delivery paths that hedgers must now use more than doubled as competition was forced onto these paths and direct counterflow was not allowed.
While pricing rose across delivery paths, the prices did not become more accurate.

**CAISO Monthly Auction CRR Pricing Inaccuracy**

Pricing Inaccuracy is measured by the absolute error between the monthly auction price and actual settlement.

Price inaccuracy is normalized by settlement levels as 2019 has been a low congestion environment.
While delivery prices rose, overall auction revenue actually declined. This is driven by the inability of participants to pay for various congestion elements due to path restrictions.

Drop in revenue is due to a large decline in auction binding constraints. These constraints can no longer be purchased in the auction due to path restrictions.

CAISO Auction Revenue
– Jan 2018 to Present –

Monthly Auction

$0 $2 $4 $6

No Gen Sinks

Avg. Revenue
2018: $4.2MM
2019: $3.1MM

Annual Auction

$0 $10 $20 $30 $40
2018 2019

Restriction to delivery paths has led to lower liquidity and less pricing transparency in CAISO

- **CAISO market liquidity has declined**
  - Overall market volume in CAISO dropped by over half
  - Liquidity for physical participants sourcing from supply sources has decreased
  - Counterflow was largely eliminated from the market

- **Price Transparency has been impaired**
  - Abnormally high prices have resulted on a number of delivery paths due to the inability of counterflow to converge pricing
  - Overall price accuracy has declined. This is of greater importance for PJM as these prices are utilized to determine appropriate collateral for portfolios via mark to auction

- **Costs for hedgers have increased while payments to load have declined**