Convergence Bidding in the CAISO market

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High level Pros & Cons of Virtual Bidding (Utility Perspective)

Pros

- Virtual supply adds additional supply and competition to the market
  - Helps mitigate potential market power (during unforeseen events)
- Provides some additional hedging tools
  - Allows physical supply and demand to schedule in the day-ahead market but settle on real-time prices
- In theory it should "converge" day-ahead and real-time prices and remove incentive to "lean on" or "avoid" the more efficient day-ahead market
- FERC approved tool, eliminates the need for "implicit virtual bidding" that some characterize as market manipulation

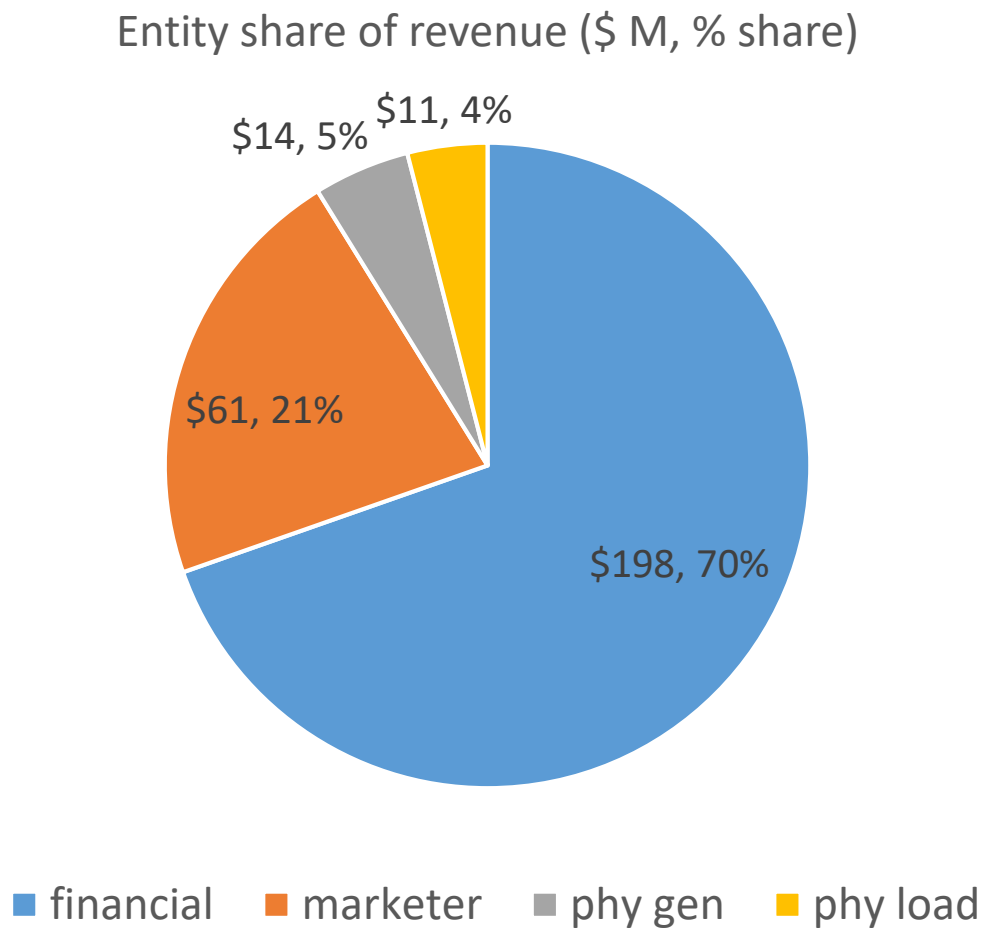
High level Pros & Cons of Virtual Bidding (Utility Perspective)

Cons

- Load becomes an unwilling counter party and is forced to fund certain payments without receiving commensurate benefits
  - Virtual bidders frequently "bet" against the CAISO, and when the CAISO loses, load is force to pay on behalf of the CAISO
- Uplift must be properly allocated to virtual transactions
- Provides a tool for market manipulation and requires additional rules to prevent (e.g., CRR congestion manipulation) abuse
- Allows participants to exploit and profit from systematic differences and systematic CAISO interventions
- Significant dollars have been extracted from the CAISO market by financial players
  - Unclear if physical players have received commensurate benefits

Revenues Associated with Virtual Bidding

- Total profits (net costs) from February 2011 → end 2019 = $247 M
- Total revenues 2012 through 2019 = $284 M



Utilities will likely require Regulatory Authority to submit Virtual Bids

- SCE requested CPUC approval, and granted in Decision 10-12-034 December 16, 2010

SCE ask:

1. Locational volume limited bidding at nodes that:
   - Have SCE's physical load or resources
   - Are identified in SCE's CRRs
   - Are price correlated with nodes where SCE has physical load or resources
   - Have prices that can impact SCE's demand costs and supply revenues
2. Convene PRG meeting when loss reaches $10 M/qtr with max loss at $40 M/yr

CPUC allowed convergence bidding only to hedge risk from:

1. Generation outage & load uncertainty
2. Uncertainty from VER scheduling
3. Market manipulation
4. Stop loss set at $20 M/yr (SCE, PG&E), $5 M/yr (SDG&E)

Key drivers that increase Day-ahead/Realtime price divergence

- Load and VER forecast accuracy
- *CAISO operator adjustments*
- Convergence bids
- *Manual intertie dispatches (used for ED) settled at negotiated prices*
- Meeting Flexi Ramp Product (FRP) requirements from resources outside an EIM entity's BAA
- Early release of unneeded FRP capacity during:
- Proxy Demand Response awarded FRP unable to follow 5-minute dispatch
- *Stranded FRP due to non-locational procurement*
- Pacific DC interchange losses
- Congestion arising in HASP
- VERs that do not participate in IFM are not considered in RUC
- VER IFM bidding beyond their capabilities
- Intertie deviations

Criticisms of Convergence bidding

- Incorrect uplift allocation
- Convergence betting against:
  - CAISO changing its model and load pays
  - CAISO model structural deficiencies
- CAISO Market Monitor (DMM) specifically cites an external report in its own 2018 annual report. Report findings:
  - DA-RT spreads unavoidable due to algorithmic differences – convergence bids cannot resolve these differences
  - Convergence bids can:
    - Profit from such structural differences thereby being "**a purely parasitic drain on the system, adding to the costs paid by load**"
    - Add system costs

Sources

- Slide 4 – http://www.caiso.com/market/Pages/MarketMonitoring/AnnualQuarterlyReports/Default.aspx
- Slide 5 – https://docs.cpuc.ca.gov/PUBLISHED/FINAL_DECISION/128621.htm
- Slide 6 – http://www.caiso.com/Documents/FinalReport-PricePerformanceAnalysis.pdf
- Slide 7 – Footnote 132 of http://www.caiso.com/Documents/2018AnnualReportonMarketIssuesandPerformance.pdf citing to https://www.mit.edu/%7Ejparsons/publications/20150300_Financial_Arbitrage_and_Efficient_Dispatch.pdf