Policy Discussion:
Virtual Bids at Ties & Hubs
Information Release about Virtual Bids

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Benefits of having nodal CB at the ties

- Allowing convergence bidding at the inter-ties makes legitimate those transactions that would occur implicitly otherwise.
  - Currently, participants engage in implicit CB at the ties by scheduling in the DA and not delivering in the HA which has reliability implications.
- Convergence bids on the ties would settle as the difference between the IFM price and the HASP price.
  - In the same way as convergence bidding at nodes or LAPs will drive the IFM and RTM prices together, CB at the ties will drive the IFM and HASP prices together.
Concerns with having nodal CB at the ties

- Infeasibility and/or inefficiency of Energy and Ancillary Services scheduling
- Masking of deviations between IFM and HASP prices
  - modeling errors
  - differences between those two markets
- Manipulation of prices
  - Virtual counter-flows
  - Existing Transmission Contracts (ETCs)
    - Virtual bidding of ETC holders can be monitored
    - Non-holders of ETCs should be prepared to report control of ETCs not scheduled under their own SC id
Example of virtual congestion over the ties

- An important concern with CB at the ties is the potential for virtual congestion.
  - This could hinder our ability to import Energy and A/S in the Day Ahead Market
- If the transmission constraint is binding, DA virtual bids that exacerbate congestion prove to be losing transactions when virtual bids are settled out in the HASP.
- An example…
Case 1: Net Inbound Energy (Imports > Exports)

- **Case 1a: Imports + Virtual Imports (VSup) > Exports**
  - Transmission constraint is binding → Congestion
  - Importer is paid a low price in the IFM
  - Congestion is relieved as virtual imports are settled out in HASP
  - HASP price for imports is higher as a result, and the virtual importer has to buy back his position at that higher price.
  - This was a losing transaction.

- **Case 1b: Imports > Exports + Virtual Exports (VDmd)**
  - Transmission constraint is binding → Congestion
  - Exporter pays a low price in the IFM
  - In the HASP, congestion is relieved as virtual exports are settled out.
  - HASP price for exports is higher as a result, and the virtual exporter is paid back at the higher price.
  - This was a winning transaction.
**Case 2: Net Outbound Energy (Imports < Exports)**

- **Case 2a: Imports + Virtual Imports (VSup) < Exports**
  - Transmission constraint is binding $\rightarrow$ Congestion
  - Importer is paid a **high** price to relieve congestion in the IFM
  - Congestion is relieved as virtual imports are settled out in the HASP
  - HASP price for imports is now **lower**, and importers buy back at that lower price.
  - This is a **winning** transaction

- **Case 2b: Imports < Exports + Virtual Exports (VDmd)**
  - Transmission constraint is binding $\rightarrow$ Congestion
  - Exporter pays a **high** price in the IFM.
  - In the HASP, the congestion is relieved as virtual bids settle out
  - The HASP price for exports is now **lower**, and exporters are paid back at that lower price.
  - This is a **losing** transaction.
Questions and Comments to:
ConvergenceBidding@caiso.com

- What further benefits or concerns should be examined regarding virtual bidding at interties?

- What special considerations should be given to virtual bidding at interties that might not apply to virtual bidding at other locations.

- For what unique business reasons might there be for virtual bidding at interties?
And now for something completely different…
Can CBids be submitted at Trading Hubs?

- Trading Hubs *are not* part of the MRTU optimization.
  - Trading Hub prices are part of a settlement service for bi-lateral transactions that occur outside the CAISO Markets.
  - Trading Hub prices are not outputs of the optimization, but rather are calculated ex post as a weighted average of Nodal prices.
  - Therefore, there is no mechanism by which to submit physical bids at Trading Hubs.

- Convergence Bids *are* part of the MRTU Optimization.
  - Though CB granularity has yet to be finalized, the options for granularity are only those geographical levels at which physical bids can be submitted.
  - This is because Convergence Bids will be included in the optimization alongside those physical bids.
  - Inclusion of CBids in the Market optimization will increase market efficiency through greater liquidity of bids and potentially more information brought to the market.
How can CBids be used to hedge ISTs?

- In the case of nodal Convergence Bidding, known weights can be used to submit bids at all the nodes within a Trading Hub to approximate a hedge.
  - The reason it is an approximate hedge is that there can be no guarantee that the nodal bids would be all accepted or declined together.

- In the case of LAP-level Convergence Bidding, a Market Participant wishing to hedge IST price risk would have to rely on the correlation of the LAP price and the Trading Hub price.
  - The correlation between these two prices is not perfect despite the closely aligned geography. This is because LAP prices are derived from the market optimization while Trading Hub prices are ex post calculations based on fixed weights.
Using nodel CB to Hedge ISTs at the Hub

- If a virtual bidder wanted to hedge an IST for 33 MWh at $40/MWh to be delivered at the Hub...
  - It is possible that a bid for 33 MWh at the Hub could be parsed down to the three (equally weighted) nodes.
  - It is very unlikely that it will ever be possible to force all the 11 MWh bids to clear – or not clear – together.
  - In this example, only 22 MWh will clear at $40/MWh so the hedge is imperfect.
How do Eastern ISOs do CBids at Hubs?

- In Eastern ISOs, Convergence Bidding is allowed at Trading Hubs though the Hubs are not part of the market optimization.

- If the Trading Hub is defined so that it is comprised of pricing nodes in an uncongested portion of the grid (as in ISO-NE) then hedge is very close
  - Traders can use equally weighted virtual bids at each node in the Trading Hub, or simply pick a “representative node” at which to bid.
  - In the previous example, note that $P_1 = P_2 = P_3$ in ISO-NE by design due to no congestion between nodes 1, 2 and 3.
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- What special considerations should be given to virtual bidding at Hubs that might not apply to virtual bidding at other locations.

- For what unique business reasons might there be for virtual bidding at Trading Hubs?
For further discussion ...

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Information Release about Cleared Virtual Bids

- Under MRTU, OASIS will post Day Ahead prices at 1:00 pm.
  - Hourly LMPs – identifying energy, congestion and losses at each Pnode and APnode.

- OASIS does not immediately post MW amounts clearing each location.

- OASIS does post the MW amounts of clean bids at each location 180 days following the trade date.
  - Certain fields are omitted to mask the obvious identity of the Scheduling Coordinator.
Should the CAISO consider publishing the amount of virtual bids that cleared the IFM each day at each location?

- Some stakeholders said no. Financial bidding information should be released on the same time frame as physical bidding information.
- Other stakeholders said yes. The full details (in coded form) of cleared virtual bids should be released immediately.

Are there good reasons to release information about virtual bids (such as MW amounts of virtual supply/demand that cleared each node) on a daily basis?

- Would such information facilitate or diminish virtual bidding activity?