

DC ENERGY

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Memorandum to: Chairman Mason Willrich and Governors Linda Capuano, Laura Doll, Kristine Hafner and Thomas Page

From: Chris Carpenter, DC Energy

Date: October 28, 2009

Subject: CAISO Convergence Bidding Implementation

We thank you for the opportunity to present our perspective before the CAISO Board of Governors. DC Energy has been involved in the CAISO Convergence Bidding stakeholder process since 2006 and we appreciate CAISO staff's efforts in this regard. Overall we believe the staff proposal is very well designed, and merits your approval. In particular we commend (a) the nodal aspect of CAISO's proposal and (b) the CAISO's approach to market monitoring. We offer the following perspective based on our seven years of experience in the Eastern ISO/RTO markets.

Zonal vs. Nodal Implementation – Of the eastern ISO/RTOs, ISO-New England, Midwest ISO and PJM all have nodal virtual (convergence) bidding. NYISO has had only zonal virtual bidding -- however because of its Independent Market Monitor's recommendations and identified infirmities in the zonal approach, it too has committed to moving to nodal granularity. While a couple of CAISO market participants have suggested first implementing zonal convergence bidding, DC Energy (similar to CAISO staff recommendation) favors nodal implementation so that market participants and the consumers of California can, at the outset, see the full benefits realized in the Eastern nodal markets. During the CAISO stakeholder process DC Energy has provided considerable information on the superiority of a nodal approach, however for this brief summary we present two illustrations.

- Slide 1 (attached) illustrates the superiority of nodal convergence bidding as it pertains to price convergence. It shows that, because only zonal virtual bidding is allowed in NYISO, convergence at individual nodes is much worse on a relative basis than at other ISOs that do allow nodal virtual bidding). Price convergence is an important metric in determining the benefits realized by California electricity customers. When prices converge: (a) the risk premium inherent in the market is reduced, sometimes considerably¹; and (b) generators have the appropriate incentive to bid efficiently --

¹ NYISO and ISO-NE studies showed virtual bidding improved price convergence and lowered the market price of risk. Specifically, (i) from *Celeste Saravia - University of California Energy Institute Nov 2003: Speculative Trading and Market Performance: The Effect of Arbitrageurs on Efficiency and Market Power in the New York Electricity Market* -- "I begin by demonstrating that since the implementation of the virtual bidding policy, the absolute value of the forward premium (difference between the forward and expected spot prices) in the New York market has decreased significantly."; (ii) from *2004 Impact of Virtual Transactions on New England's Energy Market by ISO New England Inc. - Market Monitoring Department* "Once participants learned the price dynamics in the market and the divergence pattern became stable, financial virtual trades systematically decreased the market price of risk." "Virtual transactions helped to decrease the divergence between real-time and day-ahead prices."

meaning the ISO is able to perform a more efficient dispatch of the system, thereby reducing the need for last-minute RT dispatch, and benefiting everyone through the improved reliability of the grid.

- Slide 2 (attached) illustrates, from a case study that we did in NY, that consumers overpaid in the Astoria pocket due to the lack of nodal granularity of virtual bids and offers. In this case a generator was providing power in the real time market but not in the day-ahead market for several months – which meant prices in that local area were higher in the day-ahead market than they should have been for an extended period of time. Load (and by extension consumers) purchase the majority of their power in the day-ahead market, so the impact was significant. Had virtual bidding been allowed at a granular level, then virtual supply would have lowered prices in the day-ahead market in this local area.

Market Monitoring

While not sufficient by itself, the greatest market monitoring leverage comes from simply having a well-designed market (because participants have the right incentives to drive efficient outcomes). The CAISO has appropriately recognized that (by the very nature of convergence bidding) there is no intrinsic incentive for participants to conduct inappropriate transactions – as those that would diverge the day-ahead and real-time markets will lose money. Moreover, even if one participant attempted to, the incentives of dozens of other participants would drive them to converge any potential divergence, rendering that first participant's actions ineffective. Because the basic market design is sound, this means that CAISO has an extremely robust foundation on which to apply any market monitoring capabilities it develops.

In fact, Eastern ISOs view convergence/virtual bidding as part of the market monitoring solution. As described in a Megawatt Daily article last November,

“Joe Bowring, PJM’s market monitor, said he agreed with Ott that the role of financial participants in the regional transmission organization markets ‘is critical.’ That role is ‘by and large positive. It clearly adds liquidity. It clearly adds competitive forces and it would be very difficult to imagine’ day-ahead markets operating effectively without participation by financial players.”

David Patton, Independent Market Monitor for MISO, NYISO, and ISO-NE agrees:

"Liquid virtual supply and demand is an important component of the Midwest ISO market because it: (a) Facilitates convergence between the day-ahead and real-time markets; (b) Mitigates market power in the day-ahead market; and (c) Reduces day-ahead price volatility." *Report of the Midwest ISO Independent Market Monitor: July 2007, Presented 08/15/07 to the Markets Committee of the Board of Directors, Slide 11.*

For these reasons, it is critical that the end state of convergence bidding not include position limits – as position limits preclude the ability of virtual participants to provide this market power mitigation function on physical supply. CAISO recognizes this, and as such has proposed that position limits be removed on a strict schedule.

Despite the self-disciplining nature of the market, it is of course still prudent to maintain some market monitoring checks on convergence bids themselves – in particular to ensure that participants cannot gain inappropriate external leverage. To this end, the CAISO has crafted a well-designed CRR settlement rule – that is both more comprehensive and targeted than any of the Eastern ISOs (some of which do not have formal rules at all). In addition, CAISO has elected (at least for the time being) to ignore convergence bids in its local market power mitigation run (and simply maintain the current solution) until it is 100% confident that no potential issues may exist there. Further, while not strictly market monitoring tools, the credit checks and bid fees proposed (both in line with the practices of Eastern ISOs) will further limit the potential of any one virtual participant to capture an unfair or outsized share of the market. Finally, CAISO is proposing that it have unambiguous authority to limit or suspend virtual trading, to a degree that is at least as strong or stronger than the authority the Eastern ISOs have.

While a couple CAISO market participants have voiced concern about unintended consequences and the potential for abuse with the advent of convergence bidding (and DC Energy understands how “the unknown” could cause some concern), we strongly believe the concerns are unfounded because of the years of successful experience in Eastern ISOs and the specific market protocols in place or proposed by CAISO.

To summarize, nodal convergence (or virtual) energy trading is well established in the Eastern ISO/RTO markets, provides critical market efficiency and market power mitigation benefits, and can be easily and rigorously monitored. DC Energy would again like to highlight that the CAISO staff has taken a very deliberate approach in their proposal – thoroughly considering Eastern market designs, and improving upon them where possible. We strongly encourage you to both endorse their proposal and urge them to implement convergence bidding as soon as possible.

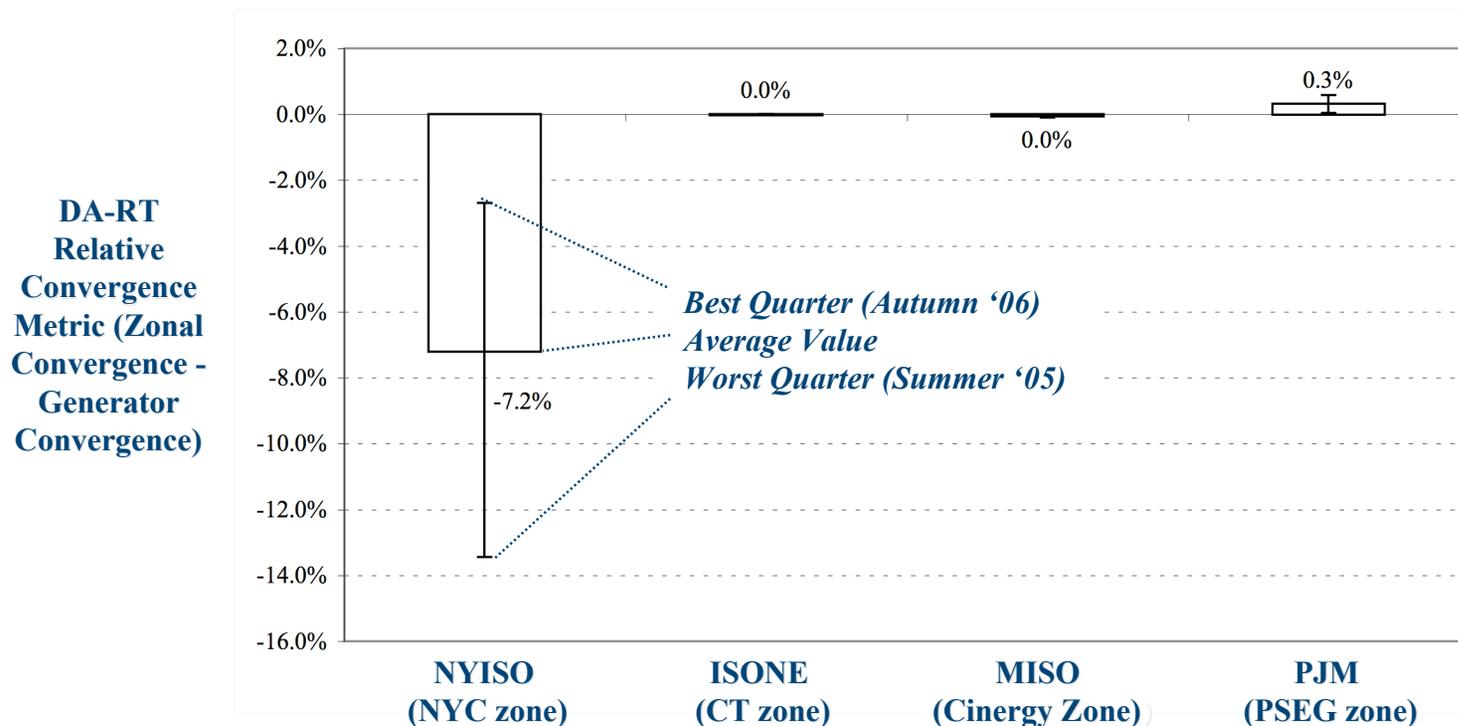
Sincerely,



Christopher C. Carpenter
Director
DC Energy, LLC

Allowing virtual bidding at a granular level has a major impact on price convergence as evidenced by comparing NYISO to others

Difference Between Zonal and Nodal Price Convergence Among ISOs¹ – 7 Quarters, 6/1/05 to 2/28/07 –



Granular convergence has been much worse in NYISO than other ISOs in each of the last several quarters, likely because virtual bidding is only allowed at the zonal level in NYISO

¹ Convergence metric is the average absolute hourly DA-RT LMP difference, computed over 90-day intervals, normalized by DA prices. In each case, the convergence metric for a zone is compared with the average convergence metric for the generators in that zone.
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Because virtual energy is not allowed at the generator level, DA prices remained significantly above RT prices at NYPA Astoria during the months when it was testing (and only providing output in RT)

Comparison of NYPA Astoria vs. NYC DA Premium
– September 15 to December 31, 2005 –

	<u>NYC Zone</u>	<u>NYPA Astoria</u>
DA	\$110.81	\$112.97
RT	\$109.34	\$106.96
Premium	\$1.47	\$6.01

The DA price premium at NYPA Astoria was \$6/mwh, which is unnaturally high -- particularly when compared to the NYC premium of \$1.47/mwh for the same period