

Memorandum

To: ISO Board of Governors

From: Charles A. King, P.E., Vice President, Market Development & Program Management

Date: December 4, 2007

Re: Briefing on Convergence Bidding

This memorandum does not require Board action.

EXECUTIVE SUMMARY

Convergence bidding is a feature used in other ISOs by which “virtual” bids (which are not backed by physical energy) can be submitted in the Day Ahead Market and, if cleared, are then automatically liquidated in the Real Time Market at the Real Time prices so that bidders receive or pay the hourly price differences (*i.e.* Day Ahead minus Real Time) at that location. When the virtual bidding is robust, such activity pushes prices in the two markets toward convergence, which provides strong incentives for accurate scheduling in the Day Ahead Market, among other benefits.

The CAISO did not include convergence bidding in MRTU Release 1 because of schedule constraints, the complexity of additional design and software features and the concerns among some stakeholders about the potential risk of increased gaming opportunities until more experience was gained with the new market design. FERC ordered the CAISO to implement convergence bidding within one year after MRTU’s startup and required the CAISO to establish interim measures to address potential under-scheduling in the Day Ahead Market until convergence bidding is in place. The CAISO filed its proposed interim measures for day one MRTU on September 28, 2007 at FERC.

The CAISO has engaged in an on-going stakeholder process that began with a Market Issue Forum on June 13, 2006, to develop design features for convergence bidding. Based on the progress so far in this stakeholder process, the CAISO is proceeding to define the software requirements for implementing convergence bidding within the timeframe ordered by FERC. This design will include configurable features for convergence bids at each node or at an aggregation of nodes. This flexibility allows more time and analysis to resolve a fundamental policy issue, specifically the granularity of convergence bids; that has sharply divided stakeholders involved in this process. Suppliers have advocated strongly for nodal convergence bidding, so that these “virtual” bids could be submitted and settled at the Locational Marginal Prices (LMPs) of the 3000 or more nodes consistent with physical supply. Other entities have advocated as strongly that “virtual” bids should be submitted and settled only at the three Load Aggregation Points (LAPs), consistent with the way most physical demand will be settled under MRTU.

While consensus among stakeholders on this granularity issue may be difficult to achieve, the CAISO will continue this public discussion in 2008 with particular focus on actual MRTU market outcomes that might bear upon virtual bidding. After start-up of MRTU, the pros and cons of nodal *versus* LAP-level virtual bidding can be directly related to the daily experience with financially binding hourly bids in the Day Ahead Market and a comparison of actual prices between the Day Ahead and Real Time Markets. Furthermore, while being informed by actual market results, CAISO and market participants can evaluate different scenarios that might have occurred if convergence bidding had been in place.

By developing configurable software features, the granularity at which the CAISO introduces convergence bidding can be determined with greater confidence and stakeholder support after MRTU's launch, while still allowing several months for testing and other preparations of the virtual bidding features. In this regard, the CAISO reiterates its commitment to comply with FERC's order to implement convergence bidding within a year after the start of MRTU.

Management anticipates presenting to the Board of Governors, soon after the summer of 2008, the final policy proposal for the implementation of convergence bidding. The introduction of this market enhancement will be strongly guided by the recommendations of the Department of Market Monitoring, and the Board of Governors will be provided an opinion from the Market Surveillance Committee (MSC) which has been participating in this public stakeholder process.

Background on Convergence Bidding

One of the fundamental purposes of MRTU is the creation of a formal Day Ahead Market process that encourages market participants to transact and establish commitments for delivery of electricity in advance of actual operation. Importantly, unlike the current market design, the MRTU Day Ahead Market will utilize a full network model when clearing bid-in supply against bid-in demand. Overall grid reliability will be improved when bids are cleared and feasible schedules are established in the Day Ahead or "forward" timeframe, with the Real Time "spot" market in place for the residual balancing of supply and demand in response to real-time conditions.

Commodities like electricity that are bought and sold in both forward and spot markets may, at times, offer opportunities to profit by trading on the prices in the different markets. If market participants observe that the price for MWhs of energy at a certain hour and location in the Day Ahead Market is for some reason persistently different than the Real Time Market, then market participants will want to submit virtual Bids by which they can financially benefit from that lack of price convergence. For example, a market participant may want to submit a virtual demand bid to buy in the Day Ahead market, with the expectation that the Real Time price will be higher when that position is reversed. As more virtual bidders compete for that opportunity to buy low and sell high, market liquidity increases and the inter-temporal price differences diminish. Over time, this should minimize the potential for gains or losses from engaging in virtual bidding and the risk of exposure to the differential between Day Ahead and Real-Time prices, even for market participants that do not engage in virtual bidding.

Because virtual bidding activity is expected to move the Day Ahead and Real time prices closer together, the introduction of virtual bidding should minimize incentives for under or over-scheduling physical demand in the Day Ahead. This is why the terms "virtual" and "convergence" are interchangeable; one emphasizes the non-physical nature of these types of bids and the other their expected market impact.

All of the other ISOs, with the exception of Southwest Power Pool, permit virtual bidding in one form or another. The general experience with convergence bidding at these ISOs is quite positive. The benefits include additional liquidity which helps discipline the market power of physical suppliers, as well as converging prices within their markets.

These benefits occur both where the granularity for virtual bidding is limited to load zones, as practiced at the New York ISO, and where virtual bidding is permitted at the nodal level such as the PJM, ISO-New England and MISO markets.

Virtual bidding programs in other ISOs have not had any adverse effects on reliability. By explicitly differentiating these financial bids from physical bids, these other ISOs remain fully aware of the resources and amounts of energy from those resources that are expected in real time operations. Without these explicit processes or other measures, entities could have incentives to schedule more or less of their expected power flows for the next day, thus diminishing the value of the Day Ahead process.

Developing the Structure for Convergence Bidding in the CAISO Markets

It is important to emphasize that virtual bidding will not adversely affect the tools the CAISO will be using under MRTU to ensure reliability. Virtual bids would not be included in the Residual Unit Commitment (RUC) process that commits additional capacity, if necessary, to meet the next day's demand forecast, nor would virtual bids be included in any dispatch or Real Time Market processes (except for financial settlement at the Real Time LMPs.)

Some stakeholders, especially load-serving entities, favor limiting virtual bids to the large Default LAPs that are settled in the same way that demand bids will be settled under MRTU. Stakeholders favoring this approach are typically concerned with any ability of nodal virtual bidding to raise market prices. Other stakeholders support virtual bidding that would settle at nodal prices just like physical supply bids will settle under MRTU. This would allow suppliers to hedge the possibility of generator outage between Day Ahead and Real Time, a risk management tool which may be particularly useful in peak conditions.

The CAISO anticipates implementing convergence bidding with appropriate market monitoring and mitigation safeguards to preclude any opportunity for market manipulation or gaming. In and of itself, virtual bidding discourages the exercise of local market powers and thus in that respect, compliments CAISO's ability to assure competitive market outcomes.

Next Steps

To allow extended discussion on a definitive policy decision on the granularity for virtual bids, the CAISO will build system and software capability for virtual bidding at both the nodal level and the aggregated level (such as the three Default LAPs). Such a configurable platform also could allow convergence bidding to begin at one level of granularity, and then evolve toward a different level over time.

While developing this all-encompassing capability, the CAISO will continue to work with stakeholders to consider the pros and cons of different levels of granularity and strive for increased consensus for the initial implementation of convergence bidding, which is one of the key market enhancements to be included as "Market Release 1A." This parallel process of developing the software while simultaneously continuing the stakeholder discussions will in no way delay implementation of convergence bidding.

The final policy proposal design for a tariff filing on convergence bidding, as well as further details on the timing for implementation, will be presented to the Board of Governors in the third quarter of 2008.