

**Pacific Gas and Electric Company
Comments on the CAISO
Convergence Bidding Fundamentals
Whitepaper (June 13, 2006)**

Introduction

PG&E appreciates this opportunity to provide its comments on the CAISO's convergence bidding whitepaper, entitled "Convergence Bidding Fundamentals." The CAISO's evaluation of the implementation of convergence bidding in markets in which it already exists (i.e. PJM, ISONE, NYISO and MISO) is very helpful, and should enable CAISO to better ensure that the adoption of convergence bidding in the California market achieves its goals without untoward results. PG&E has been generally supportive of convergence bidding, provided that it is implemented with necessary safeguards. PG&E believes prudent and rigorous design, appropriate market monitoring, and a cautious rollout are key to a successful virtual market. That cautious rollout would include initially limiting convergence bidding to trading hubs or LAPs and limiting trading positions by MW and projected market value initially, subject to further review and relaxation of limits as the market progressed. Below are some initial concerns of PG&E; we will continue to work with the CAISO and other market participants to identify and resolve concerns as the virtual bidding design process progresses.

Background:

Convergence bidding would enable any market participant to expose themselves to the Real Time Market (RTM) prices through a Virtual Bid in the Day Ahead Market (DAM). Virtual supply and virtual demand bids are similar in their effect on the financial market, but differ in their effect on the physical grid. Virtual supply bids will never produce physical delivery of energy; such bids are strictly a financial construct. The supplier of the virtual bid will be paid the day-ahead price and, when its supply doesn't materialize in real-time, that supplier will be charged the real-time price for the same amount of supply, thus, price arbitrage occurs. If a virtual supply bid is used in the day-ahead market to meet the expected needs of load without the support of a physical unit, the CAISO's residual unit commitment process (RUC) should ensure that sufficient necessary units are on line to meet real demand. In contrast, a virtual demand bid would cause a physical unit to be dispatched in the day-ahead market to meet its level of "demand." In analogous fashion to virtual supply bids, virtual demand bids would be charged the day-ahead price but, when the demand doesn't show up in real-time, would be paid the real-time price.

Expected Benefits:

The expected benefits noted by virtual bidding include:

- ❖ Expose load and resources to real-time prices. Convergence bidding allows RTM prices to be explicitly available to market participants in a systematic way.
- ❖ Price Convergence. Convergence bidding is a speculative tool that allows financial institutions, and other market participants, to expose themselves to the risks and rewards of the energy markets without holding physical assets. This use of convergence bidding is expected to cause convergence between the day-ahead and real-time market prices to the extent differences exist that are not inherent in the structure of the market (i.e., structural differences that cause differences between the day-ahead and real-time market prices should remain after convergence bidding).
- ❖ Liquidity. Additional players and bids in the market should bring greater liquidity.
- ❖ Reduced implicit convergence bidding. Explicit convergence bidding may result in less implicit convergence bidding in the market.

Concerns and Necessary Safeguards:

Mixing physical and financial markets may result in benefits, but certainly contains risks since the physical dispatch is affected and an additional opportunity for gaming may be introduced in the market. Attention to the following concerns in the design and implementation of convergence bidding will help ensure that the market functions as anticipated.

- ❖ Negative impact on reliability. As stated above, the dispatch of physical units dispatch can be affected by convergence bidding. The CAISO's primary responsibility is to ensure the physical reliability of the system. To the extent convergence bidding results in the dispatch of use-limited resources (ULRs), those resources may not be available later when needed. The convergence bidding construct needs to include provisions that prevent dispatch of use-limited resources, which must be budgeted across a season for reliability, in response to price arbitrage. So long as ULRs are not required to submit bids in every hour, this would not be a problem. However, PG&E notes that some capacity market proposal are attempting to force bids in all hours from ULRs.

Under-commitment of physical resources in response to virtual bids should be corrected by RUC, and should not be a problem. However, the CAISO should assess whether convergence bidding's potential for increasing the use of RUC in response may inappropriately shift costs, and whether RUC cost assessment should be revisited in this context.

- ❖ Cost shifting – Convergence bidding should be implemented in a way that does not result in unintended cost subsidies. The market design should ensure that all costs associated with convergence bidding are fairly and appropriately assessed to those bids. For example, if convergence bidding

results in too much generation being online, negative dec prices may occur and convergence bids should carry their fair share of this uplift.

- ❖ Gaming due to market design flaws. A reliable, predictable, and functioning LMP market design is necessary before convergence bidding can be implemented, to avoid the misuse of convergence bidding to arbitrage design flaws rather than price differentials between day-ahead and real-time markets. If convergence bidding is used to exploit market flaws, severe damage could result in a short period of time. The performance of the LMP market and its robustness should be fully evaluated prior to implementation of convergence bidding.
- ❖ Gaming due to other causes. The Department of Market Monitoring (DMM) or other independent market monitoring mechanisms must play a strong role in assessing the proper application of convergence bidding, particularly at the onset. The CAISO should have the ability to intervene in the market if objective evidence demonstrates misuse of convergence bidding that is causing substantial market malfunction. The monitor should ensure prices converge to extent predictable; lack of convergence might indicate a serious design flaw that could, in exceptional circumstances, merit placing convergence bidding on hold to allow investigation. CAISO should continue looking to the experience of other markets in monitoring, gaming, and gaming responses as it designs its own program. Safeguards at implementation might also include limits on the volume of total convergence biddings at each hub and limits on the volume that any one player could trade. Some initial market monitoring tools for consideration are:
 - Monitor price dispersion and net position in convergence biddings of any single player;
 - Monitor generator bidding, including under-scheduling and virtual purchase bidding, that inflates price at a delivery point or price divergence between nodes;
 - Spot-checking unusual activity based on samples of statistical significance to identify surprise gaming behaviors;
 - Monitoring bids impact on holders of CRRs (CRR holders in PJM are not paid for taking virtual positions that provide congestion revenue to avoid inappropriate conduct that should be addressed in the CAISO design and implementation).
- ❖ Discriminatory Participation. An even playing field for all market participants is a necessary prerequisite to implementing convergence bidding, to avoid unexpected and unwanted market results. If, for example, CPUC rules limit participation in market for CPUC-jurisdictional entities, those entities may be unable to protect their loads from the potential impacts of convergence bidding behavior, and the market could experience severe distortions. The CAISO should work with

all stakeholders, including the CPUC, to identify any limitations that may arise early in the process and to consider such limitations in the design and implementation of the program.

Next Steps

- ❖ Re-assessment of benefits. The benefits of convergence bidding should be evaluated, using the latest practicable CAISO market data and up-to-date data from other markets in which convergence bidding has been adopted, to better determine if those benefits merit the risks. Identification of structural factors that would not be expected to converge is necessary as part of that effort, as well as to take into consideration in evaluating the ultimate performance of convergence bidding. The analyses should identify any likely differences northern and southern California.

The assessment of benefits should also consider the potential for convergence bidding to result in sub-optimal dispatch and its costs. Use of convergence bids in the day-ahead market can result in the use of RUC. The DA market optimizes based on start-up, minimum load and energy bids whereas RUC optimizes based on start-up, minimum load and RUC capacity bids – a different optimization. The CAISO should evaluate the potential cost of this potential sub-optimal dispatch.

- ❖ Review and consideration of stakeholder comments. The CAISO's practice of posting stakeholder concerns and CAISO's responses to those concerns are particularly well-suited to this controversial and difficult area.