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Raising the Level of the Bid Cap on the Real-Time Energy Market in California

by

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1. Introduction

We have been asked by the ISO management whether recent trends in natural gas prices justify raising the level of the bid cap on the real-time energy market in California. The present level of the bid cap was initially established in 1998 when the price of natural gas in California was between \$2.00 per million BTU (MMBTU) and \$3.00/MMBTU. Spot natural gas prices are currently fluctuating between \$10/MMBTU and \$12/MMBTU, which implies that reconsideration of the \$250/MWh bid cap is necessary.

This opinion provides our recommendation for re-setting the level of the bid cap. In the process of preparing it we received written comments from the City of Anaheim, Southern California Edison, Duke Energy, and RTO Advisors (on behalf of APS Energy Services, Constellation NewEnergy and Strategic Energy). We have also discussed issues relating to re-setting the level of the bid cap at the September 22 Market Surveillance Committee meeting and received public comment from stakeholders. We are extremely grateful to stakeholders for their written comments and participation at the MSC meetings. Their perspectives on this very important issue were extremely helpful to us in formulating this opinion.

We conclude that the primary concern at the present time is the risk of generation unit-level variable costs approaching or rising above the cap level.¹ If gas prices rise further beyond their current range, there is a risk that the bid-cap will restrict electricity supplies to California. Rather than wait for natural gas prices to exceed some pre-specified value before increasing the bid cap, we believe that the likelihood of substantially higher natural gas prices during the winter of 2005 is sufficiently high to justify raising the bid cap at the present time. Given the relatively small amount of power now purchased at short-term market prices, we view the risk of supply shortfall to be a much more serious threat to California consumers than the potential cost consequences of increasing the bid cap. Raising the bid cap only in response to evidence of supply shortfalls at the current bid cap has significant reliability consequences. We do not believe that the “soft” nature of the current bid cap adequately addresses these risks.² The new level of the bid cap should be high enough to make it very unlikely that the ISO will need to increase the cap again before February of 2007, when the locational marginal pricing (LMP) market is scheduled to be implemented. If the current \$250/MWh bid cap was appropriate for the natural gas prices that prevailed during 1998 and

¹ The degree to which energy revenues are to be relied upon for the recovery of fixed and capital costs of generation is the subject of ongoing resource adequacy proceedings. The final level of the bid cap beyond 2007 obviously should be influenced by the results of this proceeding.

² If market conditions are such that generation units in the California ISO control area can credibly justify variable costs above the current bid cap, under the “soft” cap those units are allowed to bid a price above \$250/Mwh if they can demonstrate that their costs make such a bid necessary. This creates a situation in which heavy use of the soft cap contributes to market opaqueness and encourages generators to inflate their variable cost estimates.

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1999, the bid cap should be increased to at least \$400/MWh, considering the likely trajectory of natural gas prices this winter. Although our main concern is the reliability of the market if gas prices rise further above current levels, we feel that this possibility is likely enough that it would be advisable to raise the bid-cap now, rather than wait for conditions that may prove disruptive to the market.

2. Factors Determining Level of Bid Cap

Although economic theory provides limited guidance for setting the level of the bid cap, the trade-off in setting the level of cap is the ability to limit the unilateral market power exercised by suppliers against the risk that the cap will be set too low and artificially limit the supply of energy. Low bid caps also risk limiting the role of demand response in the short-term market and dull the incentive retailers have to enter into long-term fixed price contracts for energy and ancillary services. The risk of supply shortfalls has three dimensions. First, the cap may be set below the incremental costs of some generation units and be inadequate to attract supply into California in the short-term market. Second, the cap may be set above the incremental costs of all units but still too low to allow suppliers to recover fixed costs and therefore attract new investment to the California market. When genuine shortage conditions occur, prices should be allowed to reflect that scarcity in order to attract investment. Third, a cap that is effectively lower than neighboring regions could draw needed supply away from the local market when it is needed most.

It is very difficult to assess whether any hourly price-cap is set high enough to recover fixed costs and attract new investment. This is because investment decisions are based upon forecast average prices over long periods of time, and the ability of a given bid cap level to provide sufficient revenues depends largely upon how often market prices reach that price-cap. Because of the time lags in construction, we note that current cap levels will almost certainly not impact the level of *installed* capacity over the next summer, although too low of a bid cap may cause some existing high cost units to retire if they are unable to sign a long-term contract for their energy. Nevertheless, because California is in the process of developing a resource adequacy regime to take effect by June 2006, we conclude that policies about the current level of the bid cap should focus on the risks of near-term disruption--in other words, current policy should focus on the risk that the operating costs could rise close to or above the cap level.

From the perspective of short-term reliability, it is crucial that the west-wide bid cap exceed the variable cost of the higher cost units needed to meet the demand peaks in California. Because California is a net importer of electricity in virtually all hours of the year, setting the bid cap below this level runs the risk that a supplier needed to meet demand in California will be unable to cover the variable cost of producing the necessary electricity at a price equal to the bid cap. Consequently, this unit owner may decide not to supply the needed electricity to the California market. This inability to recover the variable cost of production is less of a concern under the current "soft" bid cap on the real-time market which allows a supplier to cost-justify bids in excess of the current \$250/MWh bid cap. Yet we note that the more frequently such exemptions are made to the cap, the less credible the \$250/MWh level becomes. Specifically, the more exemptions that are made, the more likely it will be that other firms will seek them. More importantly, extensive reliance on the soft-cap creates a two-tier payment structure, with expensive units paid as-bid above \$250/MWh and less expensive units consigned to earning no more than \$250. If these units are denied the ability to earn a legitimate market-clearing price above \$250 in California, they will likely try to earn that price outside of California. Thus the application of the soft cap to some generation does not

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adequately ensure that enough suppliers, both inside and outside of California, will choose to sell into the California market.³

California's experience with the \$150/MWh soft bid cap, implemented on January 1, 2001, demonstrates what can happen when the bid cap is set low enough for suppliers to credibly justify variable costs above the bid cap. It must be noted that implementation of this soft-cap ushered in the months with the highest wholesale electricity costs of the entire crisis period. A substantial amount of generation was impacted by the soft-cap, and the regulatory and bureaucratic machinations involved in enforcing it created very strong incentives to inflate costs. The disruptive effects spilled over from the electricity market to markets for natural gas and emissions credits.

For this reason, the bid cap should be set far enough above the incremental costs of the vast majority of generation units in the California ISO control area so that few, if any, unit owners can credibly justify bids in excess of this level. If the bid cap is set too low, suppliers may find it profitable to take actions to increase their apparent regulated variable costs so that their bid can exceed the bid cap. The ISO will have a difficult time preventing suppliers from taking these actions, because it is very difficult, if not impossible, for the ISO to determine a supplier's actual variable cost. Avoiding this incentive to inflate variable costs above \$250/MWh in all hours by allowing a higher market-clearing price during some hours could result in lower wholesale energy costs under a higher bid cap.

The level of the bid cap is closely related to the extent of fixed-price forward contracting in a market. Higher levels of forward contracts reduce the exposure of load serving entities to price spikes in the short-term market. Thus, high levels of forward contracts are necessary under a high bid cap. On the other hand, forward contracts also help to ensure reliability under a low cap. If electricity demand outside of California is high enough to cause the spot price of electricity outside of California to rise above the bid cap, all suppliers in Western Electricity Coordinating Council (WECC) that do not have forward contract commitments to California LSEs can be expected to sell their electricity outside of California through multi-hour bilateral transactions that effectively pay prices higher than the current bid cap during some hours. These actions create significant reliability problems for the California ISO operators and increase the likelihood of supply shortfalls in California. Lower levels of forward contracting by California LSEs and direct access (DA) customers imply a greater risk that high spot prices outside of California result in insufficient energy being offered into the spot market in California at or below the bid cap.

Experience from other wholesale electricity markets does not provide clear recommendations for adjusting the bid cap as the level of forward contracting is reduced from 100% coverage. In addition, answering this question with any confidence requires knowledge of the fixed-price forward contract position of the major suppliers to the California market. The three major LSEs in California argue that a substantial fraction of the demand they expect to serve over the coming two to three years is covered by fixed-priced forward contracts for energy. For this reason, there is less of a concern that California consumers might be harmed by an increase in the bid cap.

Raising the bid cap significantly increases the incentive for final demand to become an active participant in the wholesale market. The potential for higher short-term prices under a higher bid

³ Even if a \$250 cap continued to be applied to the entire western market, there is concern that neighboring control areas could easily acquire energy at prices above that level through bilateral arrangements that effectively sell power above capped levels.

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cap increases the benefits that consumers can realize from paying the hourly wholesale price for some fraction of their consumption each hour of the day. Increasing the amount of final demand able to respond to short-term price movements increases system reliability. It reduces the risk of a real-time supply shortfall, because higher short-term prices will not only increase the supply of electricity to California, but they will also reduce the real-time demand for electricity in California.

Therefore, it is very important for the California Public Utilities Commission (CPUC) to encourage more active demand-side participation. As we have previously noted, unless the CPUC encourages more active demand-side participation in the wholesale market by a substantial fraction of final demand, the net benefits, in terms of spot market efficiency and demand-side participation, of higher bid caps are likely to be limited.⁴ There are substantial reliability and market efficiency benefits that can be realized by raising the bid cap if the CPUC allows more active demand-side participation in the wholesale market. A higher bid cap increases the incentive that retailers have to sign fixed-price long-term contracts. This higher bid cap also increases the incentive that these suppliers have to make their generation units available to the short-term market. If they do not supply their forward contract commitment in energy from their generation units, then they must purchase the remainder of the forward commitment from the short-term market at a price that can be as high as the bid cap. A higher bid cap also makes it more likely that suppliers located outside of California will be willing to keep their units available to sell energy into California.

There are also potential environmental benefits associated with a higher bid cap on the short-term energy market. To meet the demand peaks it is often necessary to operate high cost combustion turbine units located near California's major load centers. These units also have very high NOx emissions rates. Allowing a larger fraction of final demand to respond to short-term prices reduces the need to operate these units, thereby reducing peak NOx emissions near major load centers, assuming that emissions by distributed generation do not ramp up and erase that reduction.

3. Recommended Procedure for Revising Bid Cap

Assuming that the \$250/MWh Bid Cap was appropriate when natural gas prices were \$2.50/MMBTU to \$3/MMBTU, it is possible to derive a procedure for adjusting the bid cap to reflect current natural gas prices using information on the heat rate of the least efficient class of natural gas-fired units in California and an estimate of the variable operating and maintenance costs of these units. Because of the thinness of the short-term natural gas market in California and the state's experience with misreporting of natural gas transactions prices during the winter and spring of 2001, we do not recommend a trigger for raising bid cap based on California natural gas prices. Instead, we base our analysis on average values of Henry Hub futures prices for the winter of 2006, which are currently in the range of \$12/MWh.

The least-efficient natural gas-fired units in California have heat rates in the range of 17 MMBTU/MWh. Multiplying this heat rate by a \$12/MMBTU gas price and adding a \$6/MWh variable operating and maintenance cost (that has been approved by FERC in setting a number of cost-based rates) yields a variable cost estimate of \$210/MWh. Multiplying this same heat rate by \$3/MMBTU yields a variable cost estimate of approximately \$60/MWh. Subtracting this \$60/MWh

⁴ California ISO Market Surveillance Committee, "Opinion on the California ISO's Market Redesign and Technology Upgrade (MRTU) Conceptual Filing," April 26, 2005. (At <http://www.caiso.com/docs/2005/04/26/2005042611125729395.pdf>)

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variable cost estimate from \$250/MWh yields a \$190/MWh difference that could be applied to going-forward fixed costs at a natural gas price of \$3/MMBTU. Applying this same \$190/MWh value to the \$210/MWh variable cost estimate yields a bid cap of \$400/MWh. This bid cap provides the same headroom at a \$12/MMBTU natural gas price that a \$250/MWh bid cap provided at a \$3/MMBTU natural gas price. From this perspective, a \$400/MWh bid cap today could therefore be seen as consistent with the \$250/MWh bid cap in 1998.

Because natural gas prices are not likely to return to \$3/MMBTU level and may even rise beyond \$12/MMBTU during the winter of 2006, a \$400 bid cap should be sufficient to ensure that further increases in natural gas prices will not cause the variable costs to approach the bid cap and create the distortions and reliability concerns outlined above. This higher bid cap makes it even more imperative that the CPUC continue to work toward increasing the degree of participation of final consumers in the wholesale market. As noted above, this bid cap increases the potential benefits that final consumers can realize from managing short-term wholesale price risk for some or all of their consumption.

4. Concluding Comments

The levels that natural gas prices may reach during the winter of 2006 could make the variable cost of some generation units in the WECC higher than the current \$250/MWh bid cap. This opinion has suggested an approach to raising the bid cap based on expected natural gas prices during the winter of 2006 and the return to fixed costs that was implicit in the \$250/MWh bid cap at \$3/MMBTU natural gas prices.

It is important to emphasize that many of the arguments against raising the bid cap during the period from June 2000 to June 2001 are no longer relevant. Virtually all of California load is covered by fixed-price forward contracts or tolling arrangements between generation unit owners and LSEs, so suppliers to the California market have significantly less incentives to raise the short-term price of electricity because they typically earn this price on only a small fraction of the output they produce. Moreover, bidding to increase the short-term price also reduces the likelihood that their units will not be dispatched to serve load, which increases the risk that these suppliers will sell less than their forward commitments in the short-term market.

If LSEs are adequately hedged with fixed-price forward contracts for energy, then there are limited costs to raising the bid cap that should be outweighed by the significant potential reliability benefits to consumers of a higher bid cap. With the right conditions in the retail market, the ultimate goal should be to raise the bid cap on the short-term market to a level that limits the reliability risks of a bid cap. Clearly, the higher the bid cap, the less likely there is to be a supply shortfall, because final consumers will reduce their demand in response to higher short-term electricity prices. All market participants will then benefit from greater grid reliability and lower capital costs because the same number of consumers can be served with less total generation capacity.

For these reasons, we support raising the bid cap to \$400/MWh before the winter of 2006, rather than wait until the price of natural gas rises above some level. We believe this is preferable to raising the bid cap in response to evidence of either reduced supply to the real-time market or bids above the \$250/MWh cap. As noted earlier, the bid cap is scheduled to increase to \$500/MWh in 2007. Some experience with a higher bid cap with current market design

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appears to us a lower risk strategy for transitioning to the eventual \$500/MWh bid cap. We also do not support lowering the bid cap in the event that natural gas prices subsequently fall. Instead, we view this bid cap increase as an opportunity to realize the system reliability improvements and average wholesale energy cost reductions that can result from a wholesale market with active participation by a significant fraction of final demand. We hope that CPUC will support this by implementing tariffs for all customers with hourly meters that allow them to benefit from more active demand-side participation in the wholesale market.