

MEMORANDUM ON MAXIMUM PURCHASE PRICES IN ENERGY AND ANCILLARY SERVICES MARKETS IN CALIFORNIA

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The Federal Energy Regulatory Commission's ("FERC") May 26, 1999 Redondo Beach (Docket No. ER98-2843-005 et al.) Order ("the Order") allows the California Independent System Operator ("ISO") to retain its current authority to set maximum prices at which it will purchase ancillary services and imbalance energy but only until November 15, 1999. After that date, the ISO's authority to set maximum purchase prices, which the Order refers to as "price caps," will be removed.

The Market Surveillance Committee ("MSC") of the ISO and the Market Monitoring Committee ("MMC") of the California Power Exchange ("PX") concur with the FERC that the current \$250 purchase-price limits on ancillary services and imbalance energy should be raised as soon as possible consistent with the maintenance of competitive markets for electricity in California. The Committees, however, strongly believe that the price caps should not be raised until the ISO's redesign of its ancillary services markets and the reform of the Reliability Must-Run ("RMR") contracts are fully implemented. By setting a date certain for the removal of the price caps that is independent of the completion of these necessary redesign and reform efforts, the FERC's May 26th Order leaves the California markets unprotected from massive unanticipated price movements that could arise from market-design flaws or the exercise of market power.

Furthermore, the specific choice of November 15, 1999 as the termination date is especially problematic because, as the FERC notes, the second stage of the RMR

reform cannot be completed before December 1st, even if the ISO files the necessary changes on the earliest date it can, October 1st, and the Commission approves the reforms. As both Committees urged in their March 1999 reports, the current price caps should stay in place until the ISO's ancillary-services market redesign and RMR contract reform (including adoption of the RMR "netting out" requirement) are complete. The Committees also note that if any ISO request to retain the authority to limit the prices at which it purchases energy and ancillary services must await the two Committees' filing of their October 15th reports, there is little practical possibility that the ISO could file and the FERC could approve a modification of the May 26th Order before that authority would end on November 15th.

The MSC and MMC have been extremely reluctant to recommend imposing purchase-price caps on the energy and ancillary-services markets in California. But the Committees continue to have concerns about the competitiveness of the California energy and ancillary-services markets, as articulated in their August 1998 and March 1999 reports to the FERC. Therefore, the MSC and MMC have advocated that until the market-design problems identified in their reports are remedied, the current damage-control purchase-price caps should be imposed on the imbalance-energy and ancillary-services markets. The Committees also believe that until there is sufficient confidence that the structure of the California electricity market allows unrestricted market forces to yield efficient results, there will still be a need for some mechanism by which the ISO and the PX can facilitate the smooth functioning of the market and protect California consumers from inefficiently high prices for energy and ancillary services.

As both the MSC and the MMC have emphasized in their August 1998 and March 1999 reports to the FERC, the California markets for energy and ancillary services are highly interdependent. In particular, given the sequential structure of the California electricity markets, expectations about prices in the ancillary-services

markets have a major impact on prices in the PX day-ahead market, and the expected price for imbalance energy has strong effects on the energy prices in both the PX day-ahead and day-of markets. Consequently, the PX is heavily dependent on the ISO's authority to establish maximum prices that it will pay and on the ISO's exercise of any such authority. Since a price limit in the ISO imbalance-energy market will effectively supersede any price constraint the PX might impose in its day-ahead and day-of energy markets, the MMC shares the MSC's concerns about the ISO's authority to establish maximum purchase prices for ancillary services and imbalance energy.

Finally, although the California electricity market is unique in some respects, the MSC and the MMC believe that the issues of market-supporting interventions that now face the ISO and the PX in California will arise in other new deregulated electricity markets that are emerging in other parts of the U.S. The equity implications of establishing damage-control price restraints are at least as important as their effects on economic efficiency. Hence, policy makers, such as the FERC, should be centrally involved in deliberations about such measures. The Committees urge the ISO and the PX to emphasize to the FERC the importance of its grappling with these questions now in a way that will have general application and the wisdom of its not waiting to have to address these issues in the context of emergency situations that are very likely to arise in different jurisdictions.

In the remainder of this memorandum we discuss salient aspects of the issue of market-protecting interventions and, in particular, the basis of our recommendations about retaining the maximum purchase prices for ancillary services and imbalance energy now in place in the California electricity market.

The Role of Purchase-Price Caps

With a strong consensus among market participants that all the flaws in the design of the markets for energy and ancillary service had been eliminated, with a large

number of consumers purchasing energy or ancillary services at the hourly spot price, and with a fairly full and robust set of forward and financial contracts available to market participants, there would be very little reason to consider price-intervention mechanisms in the California electricity market. But the California market presently falls far short of this ideal. In the near term, until the market-design problems that have already been identified are remedied, there is a continuing need for the kind of damage-control price caps that are currently in place. In the medium term, when those design flaws are corrected but price-responsive demand and robust markets for forward and financial contracts are not yet fully developed, there will still be a need for some mechanism, perhaps a more creative one, that ensures orderly and efficient markets for energy and ancillary services. That is, once the current price caps are lifted, the ISO must retain some residual authority to intervene during market emergencies to limit the prices it will pay for energy and ancillary services.

Market Flaws May Remain

The California market for electricity has been in operation for only a little over a year. Although both the MSC and the MMC hope that most of the market-design flaws have been identified, only experience with the new market design when all the necessary changes have been implemented will enable us to determine whether more problems remain. Some flaws create opportunities that can produce extremely high prices, and without a damage-control purchase-price cap, there is no limit to how high these prices could go. Although it can be argued that vigilant market participants should be rewarded with high prices for finding flaws in the market design – otherwise there will be little incentive for anyone to identify them and thereby facilitate eradicating the problems – such rewards should be limited or else they may destroy the market itself. A damage-control purchase-price cap should be sufficiently high to provide a reward for

finding a market-design flaw, but not so high as to disrupt, and perhaps even totally undermine, the market.

If the ISO lacks the authority to limit the prices at which it purchases energy or ancillary services, it will be forced as it was in July 1998 to accept bids of \$5,000 or \$9,999 per MWH for ancillary services, even in times of moderate demand and ample supply. A market perturbation in thin ancillary services markets—such as the one that occurred on May 30, 1999—could have extraordinary impacts on prices and costs. In that case, the unavailability of one large hydroelectric facility drove regulation prices to \$250 for 10 hours. If the ISO had not had authority to limit the price at which it purchased regulation, and the market had cleared at \$5000 as it did on July 9, 1998, California consumers would have had to pay 20 times more than they did for the service. This would come to more than \$50 million for one day. Had the market cleared at \$9,999 (as it did on July 13, 1998), the cost to consumers would have been almost 40 times more than it was, and a market-clearing price of \$50,000 would have cost consumers 200 times more than they paid, more than \$500 million.

The Commission's May 26th Order leaves the ISO with no residual authority to cope immediately and directly with severe market perturbations that may occur after November 15th. Unless the Order is modified, it effectively requires the ISO to return to the FERC to seek remedial authority after any problem occurs. By the time the Commission acts on such a request, California consumers may have incurred many hundreds of millions of dollars in higher energy costs.

The Committees recommend that the ISO and PX seek authority for the ISO to establish a mechanism for responding to severe price disturbances in ISO markets when those disturbances are attributable to market-design problems and not to underlying conditions of demand and supply. Finally, the Committees recommend that

the ISO exercise its existing authority, under the May 26th Order, to retain the current price caps in place through the summer and until November 15, 1999.

The Importance of Price-Responsive Final Demand

An essential element of a smoothly functioning competitive market for electricity is a price-responsive demand side of the market. When final customers – residential, commercial, and industrial – can respond in real time to spot prices for energy and ancillary services, the market itself provides an appropriate and effective check on the ability of supply-side participants to raise prices to inefficient levels. As a consequence, the need for market interventions of the price-cap or similar form is diminished.

To reduce the ability of generators to set extremely high prices in the energy and ancillary-services markets, and thereby to diminish the need for market interventions, final consumers must have both strong financial incentives and the ability to reduce their consumption in hours with high prices. But under the set of retail-rate structures for electricity that currently prevail in California, few customers have much, if any, financial incentive to shift their consumption of electricity from hours when wholesale prices are high to hours when those prices are low. The present retail-rate structures reflect to very few customers the path of the hourly PX prices. Furthermore, most final customers in California currently do not have hourly electricity meters, and unless a final consumer's usage during each hour can be measured, it is impossible to bill that customer based on hourly spot electricity prices. Without such billing, what is to induce customers to shift their consumption from hours with high prices to those with low prices? Currently, the California Public Utilities Commission (CPUC) does not require customers who elect an alternative retail electricity supplier to install hourly meters on their premises. Consequently, even residential customers electing to switch suppliers are no more responsive to hourly prices than are those served by their incumbent utility.

The lack of significant final load that faces the hourly day-ahead or real-time price in a given hour yields an aggregate hourly demand for electricity in California that is nearly insensitive to the hourly spot price. Consequently, during extremely high-demand hours when all generators know that their capacity will be required for either energy or ancillary services, there is very little to limit the prices they can bid. Producers are thereby able to sell their output at prices far beyond what many customers would be willing to pay for electricity during those hours if they actually faced those prices. Until the demand side of the market becomes much more price responsive, there need to be other checks on the exploitation of market-design flaws and the exercise of market power; market-intervention measures by the ISO are a prime candidate.

The Role of Forward Contracts

In all electricity markets around the world generators and loads buy and sell physical and financial forward contracts for electricity. Such contracting schemes allow loads to mitigate some of the market power that generators may possess and exercise when all electricity consumed must be traded in a day-ahead or real-time spot market. The most prevalent form of financial forward contracts are two-sided contracts-for-differences, or simply contracts-for-differences (CFDs). Under a CFD, a generator and a load agree to a specific contract price, PC , and a contract quantity, QC , for a given hour during a day in the future. If the spot price of electricity in that hour is PS , then the generator pays the load $(PS - PC) * QC$. If this quantity is negative, then the load makes the payment to the generator. The payment is independent of both how much electricity the generator produces and how much electricity the load purchases in that hour.

CFDs provide two benefits to market participants. First, they hedge all price risk associated with buying or selling the contract quantity of electricity. Second, they provide strong financial incentives for the generator selling the CFD to bid more

aggressively into the electricity market that determines the spot price against which the CFD clears. In particular, such contracts mitigate the incentives that generators may have to bid excessively high prices in periods of forced outages or in the face of other unexpected events. Despite the fact that CFDs can function as *de facto* purchase-price caps, the California Public Utilities Commission has not permitted the three investor-owned utilities to enter into such contracts to hedge any of the retail load they serve as Utility Distribution Companies.

The PX, however, has recently introduced a market in block-forward contracts for energy, an innovation in the direction of providing a more complete set of market options for market participants. The PX is hopeful that on July 8, 1999, the CPUC will give formal approval for the three investor-owned utilities to receive full cost recovery for all purchases in the Block-Forward Market. This new market should improve the ability of loads to hedge day-ahead energy-price risk in the California market. But, for now, the Block-Forward Market applies only to energy purchased during the 16 peak hours of the day, and not to ancillary services, which were the sources of the very high prices during the summer of 1998. The opportunity to enter such forward contracts for ancillary services would provide further opportunities for loads to hedge spot-price risk in these markets as well.

In sum, the current California electricity-market rules present various impediments to consumers who might try to set an implicit purchase-price cap in the energy and ancillary-services markets through creative financial forward-contracting schemes, just as those rules diminish the effects of actions by those who might financially benefit from shifting their consumption in response to hourly electricity prices. Consequently, without some changes in these market rules and some period of time to adjust to such changes, it would be inadvisable to remove the ISO's ability to invoke some damage-control market intervention in its energy and ancillary-services markets.

An Intervention Mechanism to Control Damage to the Market

Progress toward implementing the rules changes needed to allow loads to be more active participants in the California electricity market have been remarkably slow relative to the speed at which modifications to the ancillary-services markets and the RMR contracts have been made. Whatever the explanation of this difference in the pace of progress toward market efficiency, removal of the purchase-price caps in accordance with the FERC's May 26th Order is likely to stimulate development of demand-side price responsiveness and forward contracting because with the caps removed, it is very likely that at some point extremely high prices will occur in the ISO's energy and ancillary-services markets. Such prices would provide the evidence necessary for those who advocate giving consumers more opportunities to protect themselves from high prices to justify the cost of implementing hourly metering and more flexible forms of financial contracting for energy and ancillary services. Because the market changes necessary to allow final demand to protect itself from extremely high prices require up-front investments in the form of the purchase and installation of hourly metering technology and the design and implementation of an array of financial hedge contracts for energy and ancillary services, a few extremely high spot prices in these markets may provide just the financial incentives necessary for market participants to make these up-front investments. On the other hand, the continued imposition of a purchase-price cap that is too low will diminish the incentive to undertake these important market improvements.

The MSC and MMC advocate the introduction of a mechanism that balances two market-supporting goals. The first of these is the objective of protecting the markets and, in particular, California electricity consumers from the possibility that an excessive, inefficiently high bid will be accepted and set the market-clearing price. The second

goal is to stimulate the up-front investments necessary for demand-side developments that will enable consumers to protect themselves from high prices.

One mechanism for balancing these two goals is to set for the real-time energy market and for each ancillary-services market an individualized maximum daily purchase-price limit that can adapt to market conditions and protect against very high price spikes that may occur because of market flaws or short-term speculation in any of these markets. Variations of these mechanisms can be found in many commodity markets in the U.S. and around the world. Rather than imposing a fixed, one-size-fits-all purchase-price cap for all of the markets, under this scheme each market would have a separate baseline daily purchase-price limit and a market-specific maximum movement of that price limit from one day to the next. For each market the choice of the baseline daily purchase-price limit and the maximum upward movement would depend on the importance of providing incentives for the investments necessary to allow loads to protect themselves against extremely high prices relative to the need to prevent the detrimental effects of price spikes. Under this scheme, the absolute level of prices in all markets would be unlimited; only the *rate* at which maximum prices can increase within a day would be constrained. Different versions of this approach would specify that different events trigger changes in the maximum daily price limit from one day to the next, and alternative forms of the mechanism might allow one-day maximum price increments to differ from one-day decrements.

The specifics of such an approach require careful consideration, and the two Committees intend to proceed with further study of such moving purchase-price limits. Other intervention mechanisms that will support the successful functioning of electricity markets deserve consideration as well. The MSC and the MMC recommend that the ISO and the PX themselves pursue, and that they urge the FERC to pursue, careful study of these possible market-facilitating instruments.