

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

San Diego Gas & Electric Company,)	Docket No. EL00-95-000
Complainant,)	
)	
v.)	
)	
All Sellers of Ancillary Services into)	
Markets Operated by the)	
California Independent System)	
Operator Corporation and the)	
California Power Exchange,)	
Respondents.)	
)	
Investigation of Practices of the)	Docket No. EL00-98-000
California Independent System)	
Operator Corporation and the)	
California Power Exchange)	

DECLARATION OF ERIC HILDEBRANDT

1. My name is Eric Hildebrandt. My address is 151 Blue Ravine Road, Folsom, California 95630. I am employed by the California Independent System Operator Corporation (“the ISO”) as Manager of Market Monitoring in the Department of Market Analysis (DMA).

I have specialized in economic analysis and market research relating to energy issues for over ten years, with emphasis on research, planning and evaluation studies for the electric utility industry. Since joining the ISO over two years ago, I have worked extensively on analysis of the overall performance and competitiveness of California’s energy and Ancillary Services markets, analysis

and mitigation of local market power through Reliability Must-Run (RMR) Contracts, and, most recently, on developing and analyzing system market power mitigation options. I am a primary author of a recent DMA report on California's market performance (*California Energy Market Issues and Performance: May-June, 2000*, Special Report by ISO DMA, August 10, 2000).

2. I began my career in energy research at the Center for Energy and Environment at the University of Pennsylvania, and then worked for over six years as an economic consultant to the electric utility industry. Prior to joining the ISO, I worked for over three years at the Sacramento Municipal Utility District as Supervisor of Monitoring and Evaluation. I have published numerous articles on energy issues in professional journals and have frequently presented my research in academic and industry forums. I hold a B.S. degree in Economics from the Colorado College, and an M.S. and a Ph.D. in Energy Management and Policy from the University of Pennsylvania.
3. I provide this declaration in support of the proposed Offer of Settlement being submitted by the California ISO in the above captioned proceedings.
4. The performance of the ISO markets over the past two years has shown that during most hours of the year supply conditions has been sufficient to ensure workable competition among suppliers and that such competition leads to prices closely aligned with the costs of supply required to meet demand. Analysis by the DMA shows that when significant supply exists (e.g., when total available supply reaches or exceeds 120% of system demand for energy and ancillary

services), prices tend to be close to the variable operating cost of the highest-cost generating unit required to meet demand. However, during high load hours and hours of limited supply, the combination of tight supply conditions and the limited ability of consumers to reduce consumption in response to prices creates the situation in which the markets are less than workably competitive.

5. The persistently high prices observed in California's wholesale energy markets since late May during periods when no absolute scarcity of supply exists provide a strong indication of lack of competitiveness over this period. While only a few peaking units have had estimated operating costs of \$100/MWh, the combined hourly average wholesale cost of energy in the PX/ISO markets has exceeded \$100/MWh of load served more than 1,200 hours or over 14% of total hours over this period on an annualized basis. In contrast, the average wholesale cost of energy in the PX/ISO markets exceeded \$100/MWh during only 1% to 2% of hours during both the ISO's first two years of operation.

6. The DMA has also performed more systematic, quantitative analyses of market competitiveness and any potential scarcity of supply within the ISO system over the ISO's first two and one half years by comparing the difference between the actual wholesale price of energy in the ISO system and an estimate of baseline costs that would be incurred under competitive market conditions. The competitive baseline price used in this analysis represents the estimated variable operating cost of the marginal thermal generation unit within the ISO system needed to meet system demand each hour, after taking into account the actual supply of imports and other supply resources within the ISO control area. The

degree to which actual wholesale energy costs (including load met in the PX Day Ahead market and the ISO real time market) exceed this competitive baseline cost (expressed as a percentage of actual whole prices) represents the *price-cost markup*.

The methodology used to determine this competitive market baseline and price-cost mark-up can be briefly described as follows. First, the operating cost major thermal units within the ISO system are estimated based on unit heat rates, spot market gas prices, and estimates of other O&M costs. Second, the availability of each of these units is determined for each operating day based on metering, scheduling and bid data. Third, a thermal supply curve is developed by ranking units based on price, and summing up the capacity available at each price level. In the base case of our analysis, we also include in this “supply curve” real time energy bids from imports (submitted as Replacement Reserve and Supplemental Energy bids). Fourth, the net demand that must be met by these sources of supply is calculated by subtracting the actual output from all other sources of energy (including upward regulation) from the total system demand for energy (plus upward regulation).

In effect, this approach “nets out” from system demand all sources of supply other than the major thermal units within ISO system and real time energy from imports, and then calculates the marginal cost of meeting the remaining net demand based on the cost of the remaining supply of major thermal units and bid price of real time energy bids. Since the actual or opportunity cost of imports cannot be easily determined, we include real time energy bids “as bid” in this

analysis in order to provide a conservative estimate of the degree to which wholesale prices exceed competitive levels.

In order to assess the degree to which high wholesale prices may be attributable to absolute scarcity of supply, we also identify the portion of the price-cost markup occurring during hours of potential resource scarcity. In this analysis, scarcity is defined based on hours when total available supply in the ISO system (including import bids and out-of-market purchases) is less than total system demand for energy plus 10% ancillary services (representing about 3% upward regulation, and 7% operating reserve). Additional details of the methodology and results of our analysis of scarcity were presented in a previous DMA report (*Report on California Energy Market Issues and Performance: May-June, 2000*, Special Report by ISO DMA, August 10, 2000).

Exhibit 1 presents result of this analysis of overall competitiveness of California's wholesale energy markets based on the markup of prices above costs. As shown in Exhibit 1, wholesale costs exceeded this competitive baseline by only 1% during the first year of operation and only 6% during the second year of operation. However, due to the very high price-cost markup since May of this year, wholesale costs have exceeded this competitive baseline by 39% on an annualized basis over this period. While a significant portion of the increase in wholesale costs above this competitive baseline have been incurred during hours of potential absolute resource scarcity, the bulk of these additional costs are attributable a lack of competition, rather than scarcity. In addition, prices continued to significantly exceed competitive levels even after the ISO's real time

Exhibit 1. Analysis of Impact of Non-Competitive Markets on Wholesale Energy Prices

Period	Avg. Wholesale Cost (\$/MW) [1]	Competitive Baseline Costs(\$/MW)	Avg. Price-cost Markup (\$/MW) (A – B)	Markup during Hours of Potential Scarcity [2]	Markup during Hours of No Potential Scarcity	Markup as Percent of Total Wholesale Cost [3]
	A	B				
Apr-98	\$23	\$27	-\$3	\$0	-\$3	-12%
May-98	\$13	\$11	\$1	\$0	\$1	14%
Jun-98	\$14	\$20	-\$6	\$0	-\$6	-37%
Jul-98	\$36	\$30	\$6	\$0	\$6	18%
Aug-98	\$43	\$34	\$10	\$0	\$10	29%
Sep-98	\$38	\$29	\$10	\$1	\$9	22%
Oct-98	\$27	\$29	-\$2	\$0	-\$2	-6%
Nov-98	\$26	\$30	-\$4	\$0	-\$4	-13%
Dec-98	\$30	\$30	-\$1	\$0	-\$1	0%
Jan-99	\$22	\$25	-\$3	\$0	-\$3	-12%
Feb-99	\$20	\$24	-\$4	\$0	-\$4	-17%
Mar-99	\$20	\$24	-\$3	\$0	-\$3	-15%
Apr-99	\$25	\$26	-\$1	\$0	-\$1	-3%
May-99	\$25	\$24	\$2	\$0	\$2	8%
Jun-99	\$27	\$27	\$0	\$0	\$0	-1%
Jul-99	\$35	\$29	\$6	\$1	\$5	17%
Aug-99	\$38	\$33	\$5	\$1	\$4	9%
Sep-99	\$36	\$33	\$3	\$0	\$3	10%
Oct-99	\$50	\$38	\$12	\$0	\$12	26%
Nov-99	\$35	\$32	\$4	\$0	\$4	12%
Dec-99	\$30	\$30	\$0	\$0	\$0	0%
Jan-00	\$32	\$30	\$2	\$0	\$2	6%
Feb-00	\$30	\$32	-\$2	\$0	-\$2	-6%
Mar-00	\$30	\$33	-\$3	\$0	-\$3	-10%
Apr-00	\$31	\$31	\$0	\$0	\$0	0%
May-00	\$58	\$46	\$12	\$1	\$11	22%
Jun-00	\$147	\$54	\$93	\$26	\$67	67%
Jul-00	\$112	\$54	\$58	\$14	\$44	56%
Aug-00	\$167	\$64	\$104	\$28	\$76	67%
Sep-00	\$119	\$70	\$49	\$9	\$39	45%
Apr 1998-Mar 1999	\$27	\$26	\$0	\$0	\$1	1%
Apr 1999-Mar 2000	\$33	\$31	\$2	\$0	\$2	6%
Oct 1999-Sep 2000	\$74	\$44	\$30	\$7	\$23	39%

[1] Avg Wholesale Cost = [Hour Ahead Schedule_{NP15} X PX MCP_{NP15}] + [Hour Ahead Schedule_{SP5} X PXMCP_{SP15}] + [(System Load Hour_{NP15} - Ahead Schedule_{NP15}) x Real Time MCP_{NP15}] + [(System Load Hour_{SP15} - Ahead Schedule_{SP15}) x Real Time MCP_{SP15}],

where zonal schedules and loads are estimated based on Utility Distribution Company (UDC) area schedules and generation (with NP15 prices applied to PG&E area and SP15 prices applied to SCE and SDG&E service areas).

[2] Hours of potential scarcity defined as hours when market supply of capacity was less than total system energy demand plus 10% ancillary services (3% upward regulation, plus 7% operating reserve).

[3] Overall Price-Cost Markup = (Actual Wholesale Costs - Baseline Costs) / Baseline Costs, with hourly costs weighted by total system loads minus generation owned or under contract to UDCs (utility-owned generation, QFs, etc.)

price cap was lowered to \$250 in August.

7. Both the methodology and results of the analysis summarized in Exhibit 1 are similar to analysis performed by the Chairman of the ISO's Market Surveillance Committee (MSC) in conjunction with researchers at the University of California Energy Institute (Borenstein, Severin; Bushnell, James; and Wolak, Frank, "Diagnosing Market Power in California's Restructured Electricity Markets", August 2000; Updated results through June 2000 presented in *An Analysis of the June 200 Price Spikes in the California ISO's Energy and Ancillary Service Markets*, MSC Report, September 6, 2000). Although conducted independently and with somewhat different assumptions, both of these studies reach essentially the same conclusion with respect to the significant increase in the degree to which the markets are not workably competitive since late May of this year.
8. The fundamental solution to increased competition is create ways for consumers to respond to increasing prices, accelerate entry to the market by new suppliers, and provide consumers the ability to avoid or hedge against the financial impacts of periods when workable competition is lacking through long term contracts. The DMA is examining the appropriate structural market changes to achieve these objectives, and will continue to present its analyses to the ISO Board to assist in the development of needed market reforms. However, needed structural market changes or developments are likely to require at least two years to be implemented to a degree that will ensure a workably competitive market. In the interim, mitigation of insufficient competition and its financial impact on consumers (and load serving entities that may be obligated to serve customers at

limited prices) is necessary to allow continued development of deregulated energy markets, rather than either a retreat to cost-based regulation.

The settlement agreement being proposed by the ISO at this time provides a framework for balancing the goal of protecting against the financial impacts of periods of insufficient competition over the short-term, with the need to accelerate the development of key structural changes necessary to ensure an efficient, equitable deregulated energy market over the longer term. Specifically, the proposed approach is designed to allow the bulk of wholesale energy costs (i.e. 80 to 90%) to be met at a lower, more reasonable and less volatile price, while allowing the remaining 10% to 20% to be met through a more robust spot market, which includes both the Day Ahead PX market and the ISO's real time imbalance market. This approach provides protection against the bulk of the financial *impacts* of a lack of competitiveness, without destroying the marginal price signals sent through higher spot market prices in periods of tight supply and demand. Preserving such price signals is essential for fostering development of demand elasticity and accelerating development of new supply.

The preferred outcome of the ISO's proposed settlement is to increase the level of forward contracting between the state's major load serving entities and non-utility generation owners to a level that would ensure that 80% to 90% of total ISO system load is covered through a combination of utility-owned generation and long term contracts with non-utility generation. In addition providing a financial hedge against the bulk of the impacts of insufficiently competitive markets, this would significantly reduce the reliability problems associated with

the current level of under-scheduling of loads and generation during periods when competition is lacking. However, in the absence of forward contracting, the proposed approach also provides for an alternative \$100/MW payment cap, representing a level that provides significant protection for buyers when competition is lacking, and exceeds the variable cost of virtually all thermal generation with the ISO system. The proposed approach allows for payment beyond the \$100 cap for the limited number of units that may demonstrate costs in excess of this level.