

**UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION**

San Diego Gas & Electric Company,)	EL00-95-075
Complainant,)	
)	
v.)	
)	
)	
Sellers of Energy and Ancillary Services)	Docket Nos.
Into Markets Operated by the California)	
Independent System Operators Corporation)	
and the California Power Exchange,)	
Respondent.)	
)	
Investigation of Practices of the California)	EL00-98-063
Independent System Operator and the)	
California Power Exchange)	

**REBUTTAL ADDENDUM ON BEHALF
OF DUKE ENERGY**

ASSESSMENT OF SUBMISSIONS BY CALIFORNIA PARTIES

DR. PETER CRAMTON

MARCH 20, 2003

Rebuttal Addendum:

Assessment of Submissions

by California Parties

Peter Cramton¹

Professor of Economics, University of Maryland

President, Market Design Inc.

March 20, 2003

Summary

- (1) In light of my report “Competitive Bidding Behavior in Uniform Price Auction Markets” (“Competitive Bidding Behavior Report”), which is being separately filed in this proceeding, I have reviewed the testimony of Drs. Fox-Penner, Stern, Berry, and Reynolds on behalf of the California parties, and Mr. Hanser on behalf of Southern California Edison. Contrary to their assertions, taken as a whole, the economists’ data and analyses do not provide economic evidence that market prices in California were fundamentally distorted by anticompetitive behavior, an abuse of market power, manipulative behavior, or collusion. The prices that prevailed in California during the time period between May 2000 and December 2001—while often higher than historical and forecast prices—were nevertheless *market* prices: they were determined by the competitive, independent, profit-maximizing decisions of many different firms, based on the market rules in place at the time. The actions of these firms are consistent with economic expectations of independent, competitive behavior in actual, “workably competitive” markets. The California Parties’ economists have used an inappropriate theoretical norm of *perfectly* competitive markets as a basis for assessing the observed outcomes, and as a basis for estimating the generators’ retroactive refund

¹ Peter Cramton is Professor of Economics at the University of Maryland and President of Market Design Inc. Over the last 19 years, he has conducted research on auction theory and practice. This research appears in the leading peer-reviewed economics journals (see www.cramton.umd.edu). During the last 10 years, Cramton has applied this research in the design and implementation of auction markets in the U.S. and abroad. He has led the design and implementation of several high-stake auction markets in telecommunications, electricity, and other industries. He has advised numerous governments on market design and has advised dozens of bidders on bidding strategy in high-stake auction markets. Since 1998, he has advised ISO New England on market design. In California, Cramton served on the Blue Ribbon Panel examining pricing rules for the California Power Exchange. He currently is advising EPRI on agent-based simulation methods to evaluate market reforms in California.

obligations. As a consequence, there is no reasonable economic basis for their conclusions, both with respect to the generators' behavior and the calculation of refunds.

CA parties use an inappropriate benchmark to assess competitive behavior

- (2) The economists for the California parties use an inappropriate norm of perfect competition to conclude that generators engaged in abusive market power. Despite their assertions that the California market was not "workably competitive,"² their only point of reference is an unrealistic standard of perfect competition. Introducing a realistic amount of imperfect competition necessarily causes independent, profit-maximizing bidding behavior to deviate from the perfectly competitive norm that they assume should prevail. Moreover, the California parties' economists ignore other important factors affecting bidding behavior, such as non-convex heterogeneous cost functions, information asymmetries, cost uncertainty, sequential clearing of related markets, forward contracts, and a myriad of market rules.
- (3) As a normative standard, "workable competition" implies that the structure of the market should not give rise to monopoly power. Economists refer to a firm's ability to exercise monopoly power in terms of its *persistent* ability to profitably increase prices above a certain level without a corresponding competitive response; it generally does not refer to a firm's occasional or episodic ability to impact price in response to events in the marketplace.³ Most importantly, however, I would emphasize that workable competition does not imply the absence of *any* market power:

The set of market structure and conduct attributes which define "perfect competition" constitute individually and collectively neither a normative ideal nor a satisfactory basis for appraising actual market conditions... In addition, it is recognized that the extremes which define atomistic and otherwise-perfect competition tells us nothing about desirable gradations in even the few dimensions to which they refer.⁴

- (4) As discussed in the body of my report, the California power market—with five new generation owners ("NGOs"), three investor owned utilities ("IOUs"), and many additional municipal generators, cogenerators, large importers, and power marketers—is far from a monopolistic market, and its structure is far more competitive than many other power markets that are considered "workably competitive." Furthermore, a standard of "workable

² Fox-Penner (2003), p. 24.

³ See for example, the U.S. "Horizontal Merger Guidelines," which explicitly consider whether a merger would allow a firm to implement a significant, *non-transitory* increase in price and whether sellers would be able to profitably maintain prices above a competitive level for a *significant period of time*.

⁴ Sosnick (1958), p. 383.

competition” does not change the behavior that is expected of market participants. *Firms in any market are expected to engage in independent profit-maximizing behavior.*

- (5) This in no way minimizes the need for market monitoring and regulatory intervention in response to observed deficiencies in market rules and undesirable market outcomes. Indeed, I have elsewhere identified flaws in the California market design, as well as other U.S. power markets, and I have long advocated that the Commission correct these flaws (Cramton and Wilson 1998; Kahn et al. 2001; Cramton 2003). However, the experts for the California Parties have presented no evidence to suggest that the California power market—even with its design flaws—was subjected to the persistent exercise of monopoly power. At bottom, all that the California Parties’ experts aver is that suppliers sometimes produce less or bid higher than would be hypothesized in a perfectly competitive market. On this I agree.

Supply withholding is to be expected in workably competitive power markets

- (6) The experts for the California parties focus extensively on “withholding,” a term fraught with political undertones that is seldom used in economics. Typically economists refer to the price-quantity decisions of suppliers, which are represented in a uniform-price auction by the supplier’s supply curve. It is generally assumed that each supplier independently determines its supply curve to maximize its profits.
- (7) As used by the California Parties’ experts, economic withholding is nothing more than bidding above marginal cost, and physical withholding is simply producing at less than full capacity when price is greater than marginal cost. Both types of price-quantity decisions are to be expected in any workably competitive market, except in the theoretical extreme of perfect competition. In my Competitive Bidding Behavior Report, I demonstrate that in any competitive market that is less than perfectly competitive, profit maximizing decisions lead firms to operate at less than their economically feasible capacity by offering supply above marginal cost. In fact, bidding prices above marginal cost *by definition* implies that firms are “withholding” capacity (as defined by the experts for the California parties), and this withholding is a consequence of independent, competitive decisions. Such withholding is evidence of profit maximizing behavior; it is not, by itself, evidence that the market is not workably competitive.
- (8) Like most real markets, electricity markets lie between the polar extremes of perfect competition and monopoly. Although there are a large number of generators that can provide power to a given market, competition is still limited, especially in high demand situations when supply is scarce and transmission constraints are more apt to bind. Competition is less

than perfect on the demand side as well. Despite the often-repeated assertions of the “uniqueness” of electricity markets, electricity markets share many features common to other “workably competitive” markets for non-storable products, including products with high fixed costs, inelastic demand, and far fewer suppliers, such as business travel and long-distance business telephone service. As a consequence, it is unrealistic to expect independent profit-maximizing firms in electricity markets to behave any differently than firms in other imperfect yet workably competitive markets.

- (9) In the body of my Competitive Bidding Behavior Report, I discussed extensively the incentives of firms to bid above marginal cost in actual competitive power markets and the long-run procompetitive consequences of independent profit-maximizing behavior. These arguments apply to physical withholding as well. In designing the California power market, there was a conscious decision not to include a must-offer rule, and this decision was based on generally sound economic logic. Must-offer rules likely are economically irrelevant in the absence of a price cap; in the presence of a price cap, must-offer rules may result in increased supply. In retrospect, it may have been beneficial for regulators to impose a must-offer rule in the California market, as FERC did in June 2001. However, at issue is not a debate over what constitutes a better market design in retrospect, but rather whether the conduct of market participants was competitive, given the market rules in place at the time. In the absence of a must-offer rule, under the market conditions and the complex market rules that prevailed in CA at the time, it was rational for firms acting independently in a “workably competitive” market not to submit bids for all of their available “economic” capacity in all hours.

Observed patterns of individual bidding behavior are consistent with competitive markets

- (10) The economists for the California parties engage in a detailed analysis of bidding behavior on a generator-by-generator basis. Dr. Berry, for example, claims that many of the observed bidding patterns—such as hockey stick bids, persistent bids at the price cap, bid spikes, physical withholding, and different bidding of units with similar costs—are “anticompetitive,” inconsistent with competition, and reflective of attempts to “manipulate” the market.⁵ Dr. Berry points to both similarities and dissimilarities in bid strategies as evidence of anticompetitive behavior, collusion, or manipulation.⁶ All of the California Parties’ economists attempt to portray the generators’ withholding and other allegedly

⁵ Berry (2003), pp. 6 -7.

⁶ Berry (2003), pp. 6 -7.

anticompetitive behavior to be so pervasive that prices must not have been the result of “workably competitive” markets.⁷

- (11) However, the economists for the California parties do not present convincing economic evidence that the observed pattern of bidding behavior was anticompetitive. While it is surely the case that California power prices were affected by the bidding decisions in aggregate made by the generators, the same is true of any workably competitive market. I agree that suppliers did not act in a way consistent with perfect competition. Especially given the conditions that prevailed in California during May 2000 – June 2001, such behavior should not be expected.
- (12) In order for the generators’ bidding pattern to provide economic evidence of anticompetitive, collusive, or “manipulative” behavior, the data must reflect something more than simply an awareness by individual firms that their price-quantity decisions could have an impact on market prices. In particular, bidding patterns that would present concern are those which demonstrate systematic anticompetitive, collusive, or manipulative behavior, inconsistent with independent, competitive decision making.
- (13) There are several analyses that an economist would need to perform to reach such a conclusion, none of which are performed by the economists for the California parties. First, an economist would need to determine whether the California power markets are conducive to anticompetitive behavior, collusion, or manipulation. As I described in my Competitive Bidding Behavior Report, power markets are generally not susceptible to collusion or manipulation, given the disparate incentives faced by the various market participants, the large number of market participants, their dissimilar cost structures, the ability of firms to cheat on any agreement without being detected, the lack of a cartel enforcement mechanism, the complexity of the market rules, the volatility of prices in response to changes in various supply and demand factors, etc. Power markets may be susceptible to the persistent abuse of market power if they are highly concentrated, either on an aggregate basis or on a local basis, due to congestion, but the California power markets did not exhibit that high a level of concentration.
- (14) Second, an economist would need to determine which patterns of bidding behavior are consistent with anticompetitive, collusive, or manipulative behavior and inconsistent with independent, competitive conduct. This determination should be based on standard economic theory, given the market rules in effect at the time of the conduct. As described above,

⁷ E.g., Fox-Penner (2003), p. 3.

economic and physical withholding are consistent with independent competitive conduct, given the rules established for the California power market. Furthermore, as I explained above, I would expect firms to independently bid their supply curves at an increasing margin above generation costs, as purchasers demand a greater quantity of their output. Similarly, bidding at the price cap is also consistent with independent competitive conduct.

- (15) As another example of anticompetitive bidding behavior, Dr. Fox-Penner claims that the generators systematically moved supply from the day-ahead market to the real-time market through a variety of strategies, since the real-time market was more susceptible to market power. However, the movement of supply and demand between the day-ahead and real-time markets is largely one of arbitrage: buyers and sellers adjust their quantity choices so that in equilibrium the day-ahead price is equal to the expected real-time price.
- (16) Third, an economist would need to determine the frequency of the pattern of alleged anticompetitive bidding behavior relative to the frequency of all transactions as a whole. This will determine whether the data show a systematic and pervasive pattern of anticompetitive bidding behavior, or whether observed instances of anticompetitive bidding behavior simply occurred episodically, reflecting not a coordinated, pervasive pattern of behavior but rather a few random, isolated instances that were unlikely to have had a significant impact on market prices.
- (17) Fourth, to demonstrate causation between the alleged behavior and market prices, an economist would need to determine whether the alleged anticompetitive behavior is correlated with periods of price spikes and uncorrelated with periods of lower prices. Otherwise, the behavior may not have had any impact on market prices, even though it was determined to be anticompetitive. In fact, many of the allegedly anticompetitive bidding strategies discussed by the economists were used by market participants long before the Summer 2000 price spikes.
- (18) Dr. Berry goes to great lengths to show that many generators alternately withheld capacity and submitted bids at the price cap during shortage periods, a pattern that she contends is anticompetitive or collusive. However, bidding at the price cap is exactly what would be expected during periods of shortages in any competitive market; only a highly myopic and poorly managed generator would ignore extreme market conditions in submitting its price-quantity bids. The increased frequency of bids at the price cap during periods of scarcity does not indicate that a particular firm's "bid spikes" had any impact on prices, only that each bidder recognized the possibility that its bid might influence the price.

- (19) Similarly, the economists for the California parties provide data showing that some generators may not have bid into the real-time market all of their uncommitted capacity at the price cap. Assuming for the sake of argument that the price cap exceeded the opportunity costs of the unbid units (including opportunity costs associated with fixed NOx limits, non-convex start-up costs, prices in markets that were not subject to price caps, credit risks, etc.), this absence of bids is neither procompetitive nor anticompetitive: under these assumptions, it would have been in the economic interest of the generators to sell their remaining capacity at the price cap. Once a generator's supply curve has reached the price cap, the failure to bid any remaining capacity at the price cap does not serve to increase the (capped) market clearing prices—it simply increases the risks that there will be insufficient power to meet demand. While this may indicate a need for future market design improvements to ensure system reliability during periods of scarcity, it does not indicate that the bids themselves (or the lack thereof) were anticompetitive.
- (20) Fifth, an economist would need to determine whether the firms that allegedly engaged in anticompetitive behavior had the ability, and knew they had such ability, to persistently and profitably increase prices without a competitive response. Dr. Fox-Penner describes the potential impact of a “pivotal firm” (i.e. a firm that by itself possesses substantial market power). However, he fails to identify any single firm that was consistently “pivotal” in the California power market. In fact, the data presented by Dr. Berry and the other economists suggest that there was no single “pivotal firm” that unilaterally set market prices in California. Many different firms—including small municipalities, cogenerators, importers, and utilities—potentially set the market clearing price throughout the period at issue. Furthermore, above marginal cost bidding was pervasive, and it is precisely the pervasiveness of this behavior that indicates independent, uncoordinated, competitive decisions. To reach the opposite conclusion—that the pervasiveness indicates widespread collusion, manipulation, or systemic anticompetitive behavior—runs contrary to fundamental results in economic theory, experimental economics, and empirical research on bidding behavior in competitive auction markets.
- (21) Finally, an economist would need to show that the generators’ individual actions are mutually reinforcing, or at a minimum, consistent with the overall goal of decreasing competition and implementing arbitrary price increases. While Dr. Fox-Penner, for example, states that the “manipulative” trading strategies and withholding strategies were mutually reinforcing and “symbiotic,” he fails to analyze how they could have been mutually reinforcing. For example, if a generator is systematically withdrawing supply from the day-ahead market in order to increase prices in the real-time market, why would it participate in a “Get Shorty”

strategy, which is only profitable if prices decline? In fact, many of the strategies were employed by different market participants with very different incentives: a power trader engaging in arbitrage strategies does not necessarily profit from a generator's decisions to reduce output, and vice-versa.

The cause of high California prices was an unanticipated imbalance between supply and demand, exacerbated by market design flaws

- (22) There are many fundamental underlying causes for the high prices observed in California over the period at issue. Ultimately, the underlying supply-demand conditions caused prices to increase, and these unexpected price increases were exacerbated by specific market rules. I have discussed in my Competitive Bidding Behavior Report the benefit of forward contracting, which was highly restricted by the California market rules; others have written about the effect of frozen retail prices (preventing a demand response) and other counterproductive market rules. Market participants responded to these market conditions, given the market rules in effect, with competitive, independent, profit-maximizing decisions. As a result, market prices likely deviated from prices than would be expected to prevail under conditions of perfect competition, but again, perfect competition is an inappropriate standard with which to judge actual market outcomes.
- (23) Market prices would likely have been considerably lower under less severe supply-demand conditions, both as a natural consequence of the greater availability of lower-cost supply, as well as the reduced incentives to bid above marginal cost. Data provided by Joskow and Kahn (2003), for example, shows that if California net imports and NOx prices had been at the same level in 2000 as in 1999, there would have been a substantial reduction in the extent to which market clearing prices would have been affected by bidding above marginal cost. Similarly, market prices would likely have been considerably lower under an alternative set of market rules allowing, and encouraging, forward contracting. All of this is important for forward-looking market mediation efforts and market rule changes, but it does not change the fact that the prices that prevailed were, in fact, competitive market prices.

There is no economic evidence of effective collusion

- (24) Evidence of explicit collusion is particularly important in assessing whether prices were the result of competitive or anticompetitive behavior, since collusion typically has no *bona fide* business intent other than to increase prices by setting aside the market process of independent decision-making. Collusion typically takes the form of an agreement to fix prices, reduce output, coordinate bids, allocate customers, or some other cooperative

agreement to reduce competition. I have already described above the reasons why the California power markets are not conducive to collusion. However, the economists for the California parties suggest that there is some evidence of coordinated behavior or collusion, including the implementation of certain trading strategies by two parties, various discussions among traders, and the sharing of outage information, and similar pricing behavior. Contrary to their assertions, none of this evidence rises to a level of economic significance.

- (25) Agreements between two parties are not necessarily collusive or anticompetitive. Two competitors can enter joint-venture arrangements, for example, as long as those joint-venture arrangements do not cause a substantial lessening of competition; one competitor may purchase a product from another competitor, without that purchase constituting a lessening of competition. From an economic perspective, however, the fact that one market participant sold a service to another market participant does not reflect a substantive agreement by both parties to raise prices, reduce output, or fix their respective bids. Furthermore, such agreements appear to have been episodic, limited to a small number of market participants, hours, and strategies. As a consequence, it is highly unlikely that their impact was significant or pervasive, and it is even more unlikely that they reflect the existence of a widespread conspiracy, as the economists for the California parties appear to suggest.
- (26) Conversations among traders are also not necessarily collusive. Indeed, such conversations are commonplace in other competitive auctions, such as U.S. Treasury auctions. The specific conversations presented in the reports do not reflect an agreement to restrict output or raise prices, nor do they reflect a broader agreement among multiple parties that would be required for effective collusion in this market. Rather, they appear to reflect on-going efforts to either collect information about market conditions and competitor actions, as well as to implement the trading strategies involving counterparties, as discussed above. Given the large number of market participants, the frequently volatile nature of the power markets, the divergent incentives of many of the market participants, and the episodic record of trader conversations, it is unlikely that the conversations documented by the economists would have had a significant or sustained impact on market prices.
- (27) The fact that three generators and many other subscribers appear to have used a third party reporting service (IIR) to obtain outage information is not an indication of collusion. Knowing which units were likely to be out of service provided an incentive for the other suppliers to increase the amount of capacity offered at that time (a procompetitive result), since they could be more certain of higher prices. The direct impact of the reporting service is to reduce uncertainty about outages. Reducing uncertainty in an auction environment

generally fosters competition. Again, as with discussions among traders, the exchange of such information does not reflect an agreement to increase prices, reduce output, or coordinate bids. Each generator still has an incentive to bid in its supply curve based on its own price-quantity tradeoff, and these incentives will be different for each generator. Since the market clearing price is set by the marginal producer, the basic competitive conditions and incentives for independent profit-maximizing behavior were unchanged by the exchange of outage information.

- (28) I also do not consider the patterns of observed bids, prices, and quantities to provide economic evidence of collusion or coordinated behavior. As discussed above, similar bidding behavior can occur for a wide variety of reasons independent of collusion, such as a similarity in underlying cost structures, similar expectations of market developments, and similar incentives, given the market rules. Antitrust economists have long recognized that a similarity among sellers' pricing decisions does not constitute evidence of collusion. Furthermore, increasing prices by a greater amount than increases in marginal costs is also consistent with independent competitive behavior, especially if such cost increases are also accompanied by changes in a firm's residual demand curve (as happened in California with the reduction in net imports). Joskow and Kahn (2003) demonstrate precisely this effect in their report.

There is no economic evidence of significant manipulation of market prices and quantities

- (29) The economists for the California parties allege that the generators and power traders engaged in market "manipulation," without clearly defining what they mean by the term. "Manipulation" is not an economic term. Market prices result from firms engaging in independent profit-maximizing behavior, subject to the market rules and applicable laws. This defines appropriate, honestly competitive behavior. Economic analysis assumes that sellers are rational, profit-maximizing firms; all of the efficiency properties of markets and their beneficial results for social welfare depend on this basic assumption of self-interested behavior, as noted by Adam Smith over 200 years ago.
- (30) Thus, if "manipulation" is a term that is to be used in economic analysis, it cannot encompass a firm's fundamental ability to make its own profit-maximizing price-quantity decisions. Similarly, it does not always encompass the exercise of monopoly power, since in some instances the exercise of monopoly power is not proscribed and may even be encouraged. A patent, for example, provides a company with a legally protected monopoly, and a company

can often freely restrict output of a patented product without being subject to charges of market “manipulation.”

- (31) The “Enron”-type strategies, often described in the reports as “manipulation,” are simply arbitrage strategies, despite their colorful names. The procompetitive effects of arbitrage are widely known: arbitrage provides liquidity, it extends the scope of markets, and it sheds risk to those most willing to bear it. A lack of liquidity and artificial restrictions on markets are generally what give rise to monopoly power. Traders who perform an arbitrage function—whether in electricity, in other commodity markets, or in financial markets—often engage in complex strategies that are designed to profit from market imperfections. If these markets were perfect, there would be no arbitrage. Hence, a judgment as to whether the impact of arbitrage is beneficial or detrimental to a market cannot be based on the inappropriate standard of perfect competition. In “workably competitive” markets, by contrast, arbitrage behavior often increases the competitiveness of markets.

Flawed market design does not invalidate market prices

- (32) As shown above, much of the critique leveled by the economists for the California Parties is ultimately a critique of the flawed design of the California power markets. As a result, this critique is largely irrelevant in assessing whether the market participants engaged in anticompetitive, collusive, manipulative, or otherwise inappropriate behavior. Economists *expect* that with market-based prices, firms will engage in independent profit-maximizing behavior, subject to the market rules. If a market design results in undesirable outcomes, this may identify the need for appropriate changes in the market design, but it in no way implies that the behavior of firms under the flawed design was anticompetitive or manipulative.
- (33) In hindsight, it is certainly easy to identify the flaws in the design of the California power market, with the restrictions on forward contracts being the most notable. In hindsight, one can also identify instances when regulatory intervention may have been desirable, such as WSCC-wide price caps. However, in restructuring power markets, it is impossible to identify the ideal market rules in advance. The best one can hope for is a concerted initial effort to establish efficient rules, followed by close observation of market behavior, and rapid response with suitable rule changes once inefficiencies are observed. Electricity markets are complex and not yet well understood, so it is perhaps not surprising that market flaws are a fact of life in all of the restructured markets. Hence, most competitive electricity markets feature market monitoring functions, which recommend changes to market rules as conditions warrant.

- (34) To the extent that there were design flaws in the California power market, the economists for the California Parties appear to take the position that market participants should have acted as price-takers instead of exploiting these design flaws. This argument is contrary to basic economic theory. It is the role of regulators and policy makers to design a market that relies on market participants engaging in rational profit-maximizing behavior. If the market design is good, this rational profit-maximizing behavior will lead to desirable outcomes (low prices and efficient investments); if the market design is bad, the behavior may lead to undesirable outcomes (volatile prices, insufficient investment, and wealth transfers). The market outcomes—and the circumstances that led to those outcomes (such as the absence of price responsiveness on the demand side)—provide a guide for improving the market rules, but they do not provide a basis for redefining what constitutes appropriate, competitive firm behavior.

Refunds

- (35) Dr. Stern has estimated that \$5.8 billion in refunds are owed to the California parties, in addition to the \$1.8 billion in refunds claimed in other proceedings. Dr. Stern derives this estimate by applying the Mitigated Market Clearing Price (“MMCP”) methodology to a broad range of energy transactions, including PX and ISO purchases during the period May 1, 2000 – October 1, 2000 (accounting for \$2.4 billion of his total).⁸ Dr. Stern’s estimation methodology is inappropriate, since it relies upon an unrealistic standard of perfect competition—based on marginal cost bidding behavior—that is inapplicable to the California power markets and inconsistent with the behavior that one would expect to observe in actual “workably competitive” markets, as I discussed in my Competitive Bidding Behavior Report.
- (36) Dr. Stern states that the purpose of his calculations is to reset the market-clearing prices during the relevant period “to the level that would have occurred had the market’s rules been obeyed and the market not been manipulated.”⁹ In fact, there is no evidence that the specific allegations by the California Parties of rule violations had a significant impact on market-clearing prices: prices in California power markets were high because of an imbalance between supply and demand, an increase in input costs, and an imperfect market design. The violations of market rules—if they were in fact violations—were episodic and did not have a substantial impact on market prices. Furthermore, I would expect the observed physical and economic withholding to have occurred even in the absence of the alleged rule violations, given the market conditions and the market rules that were established for California. Any

⁸ Stern (2003), p. 81.

⁹ Stern (2003), p. 75.

impact of the alleged rule violations on energy costs can be estimated directly from the transactions at issue (e.g. inappropriate payments for congestion, ancillary services, or OOM calls). Such episodic violations should not be used as a politically convenient excuse for the wholesale retroactive elimination of market-based rates.

- (37) From a broader perspective, Dr. Stern's use of the MMCP methodology in order to "reset" market-clearing prices is inherently arbitrary, confiscatory, and punitive, especially with respect to the period May 1, 2000 – October 2, 2000. Prior to October 2, 2000, market participants would have had no reason to expect a potential future refund obligation to be part of the market rules, and hence it was not a factor in the generators' pricing, output, and investment decisions. The refund obligation effectively constitutes a phantom price cap—a price cap that is only made known to participants long after they submit their bids. Retroactively imposing a lower price using the MMCP methodology does not recreate competitive market prices, since there is no reason to expect firms to submit marginal cost bids in the California power market, given the prevailing market rules. Rather, imposing a retroactive price cap has the same effect that it would have on any other market: it prevents the market from clearing. Sellers would offer less supply and buyers would increase demand, and short of rationing, there would be no market mechanism to bring the two in balance.
- (38) In addition, since supply would have been reduced, one cannot simply multiply the difference between the actual price and the MMCP by the actual supply in order to determine a "competitive" refund amount. One can certainly devise an alternative set of market rules that would have resulted in a greater amount of supply at a given price level, and in fact, such rules have since been imposed (e.g. the must-offer provision after April 2001 and the forward-looking MMCP market rules after June 2001). However, to the extent that Dr. Stern's analysis is an attempt to reset market-based prices, rather than retroactively impose regulated prices or change market rules (which is surely beyond the scope of an economist's role in this proceeding), he cannot simply change market prices without changing market quantities.
- (39) Finally, as I noted in the body of my Competitive Bidding Behavior Report, if the prices that prevailed in California were the result of independent decisions by market participants, a refund as proposed by Dr. Stern will impose considerable costs in the future: instead of charging market prices, firms will have an incentive to charge "political" prices—prices that firms expect regulators to find acceptable rather than prices that reflect underlying supply and demand factors. As a consequence, the major benefits of deregulation will be substantially diluted or avoided entirely, with misallocated resources, increased investor

uncertainty, permanent “refund risk” premiums, reduced investments, and ultimately a lessening of competition. Thus, it is likely that such retroactive refunds will only serve to exacerbate the fundamental supply and demand conditions in California, not solve them.

References

- Berry, Carolyn A. (2003), “Prepared Testimony of Dr. Carolyn A. Berry on Behalf of the California Parties,” Before the Federal Energy Regulatory Commission, Exhibit CA-7.
- Cramton, Peter (2003), “Electricity Market Design: The Good, the Bad, and the Ugly,” Proceedings of the Hawaii International Conference on System Sciences, January, 2003.
- Cramton, Peter and Robert Wilson (1998), “A Review of ISO New England’s Proposed Market Rules,” White Paper, Market Design Inc., September 1998.
- Fox-Penner, Peter (2003), “Prepared Testimony of Dr. Peter Fox-Penner on Behalf of the California Parties,” Before the Federal Energy Regulatory Commission, Exhibit CA-1.
- Hanser, Philip (2003), “Prepared Testimony of Philip Hanser on Behalf of Southern California Edison,” Before the Federal Energy Regulatory Commission, Exhibit CA-9.
- Joskow, Paul L. and Edward Kahn (2002), “A Quantitative Analysis of Pricing Behavior in California’s Wholesale Electricity Market During Summer 2000: The Final Word,” Working Paper, MIT.
- Kahn, Alfred E. , Peter Cramton, Robert H. Porter, and Richard D. Tabors (2001), “Pricing in the California Power Exchange Electricity Market: Should California Switch from Uniform Pricing to Pay-as-Bid Pricing?” Blue Ribbon Panel Report, California Power Exchange.
- Reynolds, Robert J. (2003), “Prepared Testimony of Robert J. Reynolds, Ph.D., on Behalf of the California Parties,” Before the Federal Energy Regulatory Commission, Exhibit CA-5.
- Sosnick, Stephen H. (1958), “A Critique of Concepts of Workable Competition,” *The Quarterly Journal of Economics*, 72:3, 380-423.
- Stern, Gary A. (2003), “Prepared Testimony of Dr. Gary A. Stern on Behalf of the California Parties,” Before the Federal Energy Regulatory Commission, Exhibit CA-3.