Energy Crisis in California:

Options for the Future

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Executive Summary

If you have opened a newspaper, listened to the radio or watched a television news broadcast in recent months you cannot have missed mention of the calamity that is California's electricity market. The 'energy crisis' has been front-page news within the state, and has attracted a great deal of national attention. The situation began to peak during the summer of 2000, and has continued to afflict the citizens of California with blackouts and power shortages well through the fall and winter months. The picture is bleak for the summer of 2001, though much depends upon the weather and the ability of the state regulators in California to institute reforms that will alleviate the stresses imposed by a fatally flawed market structure.

This paper has been initiated with a threefold purpose. Primarily, the paper will examine the origins, history, and causes of the current energy crisis in an effort to locate and examine policy alternatives available to state regulators, with a critical eye geared towards ensuring the safe, efficient, reliable and stable provision of electricity to the citizens of California. Secondly, the authors of this paper have a client, the Valley Industry and Commerce Association (VICA). As such, one of the goals of this paper is to provide VICA with policy recommendations that it can advocate at the state level to mitigate the impacts of the crisis on their membership. This paper also serves to fulfill the authors' capstone requirement for Pepperdine University's Graduate School of Public Policy.

For the purposes of clarification, it is the opinion of the authors that the process that occurred in the California's electricity markets between 1995 and 1998 is best characterized as "restructuring" rather than "deregulation". Thus, this paper consistently refers to the process as restructuring.†

Throughout recent months, it seems as though everyone has an opinion regarding the causes of the California energy crisis. The spectrum of these theories range from broad allegations of

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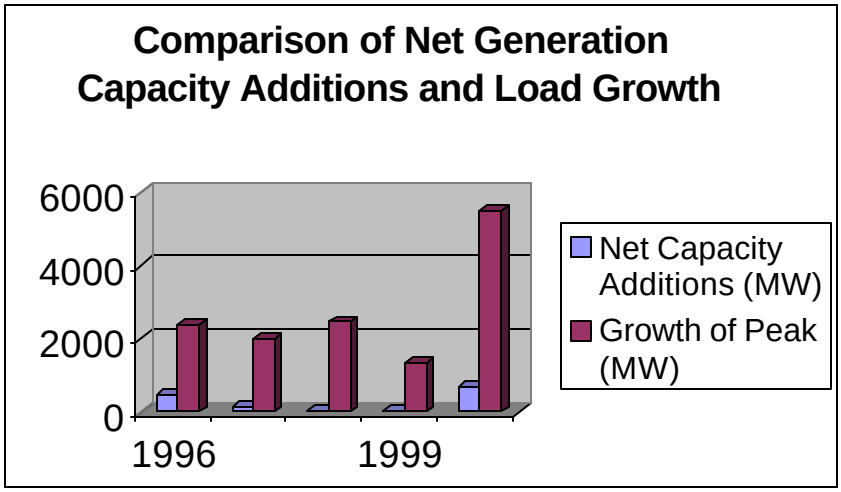
† The authors have chosen this taxonomy because of the numerous market structures imposed by the state regulators that inhibit the operation of a competitive market (including price caps, mandatory participation in the power exchange, etc.), and the depth of state participation in the operation of the market at numerous junctions.

conspiracies and backroom deals manipulating prices and supply, criticisms of market structures and incentives, to blanket avowals that restructuring of the electricity market is simply not feasible and is potentially dangerous. An accurate assessment of this situation lies somewhere in the middle of this spectrum.

Six primary difficulties have plagued the California electricity markets: the disjunction between supply and demand, market design flaws, unrealistic expectations, a lack of incentives for conservation and demand-side responsiveness, insufficient transmission capacity, and the financial dire straits of the IOUs.

The first problem is the prolonged and fundamental disconnect between the level of supply and level of demand for electricity in California (and throughout the WSCC). Supply has remained flat and relatively stagnant while demand has increased sharply. Until the yawing gap between supply and demand is addressed, it is unlikely that other solutions will have a significant effect on ameliorating the impacts of the crisis.

Demand increased 5,522 Mw, while supply or capacity has increased a mere 672 Mw. Other authors have noted that during the past decade demand has increased 14 percent while supply has increased only 2 percent during the same period. The table below illustrates the gap between supply and demand faced by California



Insufficient transmission capacity also negatively affects the operation of the electricity markets. According to the CEC's 1996 Energy Report (ER96), "transmission line citing jurisdiction is fragmented." The report states that because of this fragmentation in the oversight of licensing,

needed projects may not be built. Congestion on the grid results in significantly higher prices, because of the congestion charges tacked on to the wholesale price by CALISO. Congestion, particularly on Route 15, (the main line connecting northern and southern California) has contributed to a number of blackouts. For example, under congestion conditions surplus power generated in Southern California may not make it to Northern California where it might prevent a blackout in the San Francisco area.

Fundamental design flaws exist within the market structures created by AB1890. These flaws remained hidden while wholesale prices stayed below retail prices. Once shortage conditions arose, the market flaws were sharply exacerbated, manifesting in severe increases in the wholesale price of electricity over the summer of 2000. These market design flaws include: the exercise of market power, underscheduling in the forward markets and an over-reliance of the spot market for wholesale electricity purchases.

One of the major design flaws of the market (although intended to be a transitional structure) is the lack of demand-side responsiveness that translates into insufficient incentives for conservation. Retail customers have been insulated from the increasing cost of wholesale electricity because of the price cap. Thus, electricity end users have not faced prices that are tied to their consumption of electricity. The regulators therefore deregulated half of the electricity market while allowing the other half to remain under the old protective regulatory price caps. The retail price caps were effective in the early market, but under shortage conditions the IOUs were forced to buy electricity in the wholesale market at extremely high prices, yet were unable to pass the added cost onto their customers. Customers, because they did not feel the pinch of the increasing wholesale prices, had no incentive to conserve and cut back on their electricity consumption.

Extra-market conditions also have had a significant impact on the current energy crisis. Higher than average temperatures, below normal levels of rainfall in the West, and an increased number of unplanned maintenance outages are all conditions that further exacerbate tight supply conditions. There are no policy options that can address these conditions, and as such they introduce an element of uncertainty into the already delicate balancing act that a stable and reliable electricity grid requires.

Identifying possible solutions to the California energy crisis is a daunting task. It is clear that the crisis will not be solved by a single policy option. Any set of recommendations must include a multiplicity of options integrated to achieve the long-term goal of instituting a stable, reliable and efficient market structure that will assure reasonably priced delivery of electricity to the citizens of California.

Crucial to the reparation of the electricity markets in California is the development of a long-term vision. The authors of this report believe the long-term goal should be to implement policy actions that will repair the flawed components of the restructured electricity market, and to put California back on the road towards a competitive electricity market. The achievement of this goal must entail several steps:

- Addressing the Financial Stability of the Utilities
- Ending the State's Role as the Sole Power Purchaser in California
- Repairing Existing Market Structures
- Increasing Generation Capacity
- Instituting Demand-Side Responsiveness and Conservation Initiatives

A comprehensive plan to repair the electricity industry in California must recognize that it took a significant amount of time for the current crisis to occur, and that no short-term, painless solution is available. The choices to be made are difficult but essential to end the current crisis and to achieve a competitive electricity market.

The financial stability of the IOUs in California is critical to the successful functioning of the restructured electricity market. The IOUs must be creditworthy in order to be able to purchase power and successfully perform their function in the restructured market. Currently the IOUs have accumulated combined debts estimated at some $13 billion dollars. In order for a competitive electricity market to once again emerge in California, the IOUs must be made financially solvent. IOU participation in the CalPX is necessary for its operation and success.

At the time of the writing of this paper, the precise options open to state regulators and other influential participants are unclear. There appear to be two separate strategies being

advanced at this time: imposition of penalties against producers who illegally 'gamed' the market to raise wholesale prices; and rate hikes and bond issues.

FERC recently issued an order requiring power producers to refund nearly $70 million dollars, unless the producers can prove that they did not engage in illegally manipulative behavior. There are several other investigations underway, and several independent studies appear to indicate that there is at least some evidence of illegally collusive behavior. It is at the moment unclear what the results of these investigations will be. It is also unclear the manner in which any penalties or potentially mandated refunds will be distributed. Should the utilities or the state receive payments first? Questions abound.

CPUC issued a rate hike of 3 cents per kilowatt-hour on March 27, 2001. However, this rate hike apparently does not allow the utilities to apply any of the additional revenue against past-incurred debts. This means that the rate hike will help prevent the accumulation of further debts, but does nothing to relieve the primary question of how to pay off the IOU debt. It would have been wiser to have issued the rate hike without the restrictions on the usage of additional revenues, and allow the IOUs to apply the additional funds according to their own needs assessment.

It is the recommendation of this report that any further measures to increase rates, or to distribute penalties or refunds should allow utilities to apply these funds against the debts accumulated during the crisis.

The inability of the IOUs to recover the costs of wholesale power in the retail market has forced the utilities to finance the purchase of electricity through loans and other forms of credit. Eventually the banks simply refused to grant the utilities any further credit. The State of California was then forced to enter into the market as the sole power purchaser in the state. Thus, as a result of this crisis, the state has taken on a greater role in the electricity industry than it had under the previous regulatory regime.

It is difficult to envision the California electricity market two or five years in the future. The state simply cannot continue in its role as the sole purchaser of electricity in California. The costs of this endeavor are staggering. There are estimates that it will cost the state nearly $23 billion to

continue to supply electricity to the citizens of California for the next two years.[1] Currently, the state is purchasing electricity with money from the surplus in the general fund. These expenditures will have to be recovered through a bond issuance likely to occur in May. There is doubt as to whether the existing rate structure can withstand the pressure that will be created as a result of these increased expenditures by the state.

Therefore, it is the recommendation of this report that the state takes measures to ensure the financial solvency of the IOUs and allow them to perform their role in the restructured market. The state should endeavor to remove itself from the market as the additional recommendations of this report are implemented and the market becomes increasingly competitive and viable. As a result, it is also the recommendation of this report that any measures that would require the state to become a more active participant in the electricity market, such as purchasing the transmission lines and the use of eminent domain, should be vigorously opposed.

A third recommendation of this report is that steps should be taken by the appropriate regulatory bodies to repair the flawed market structures that have contributed to the current crisis. Naturally these recommendations are dependent upon the reopening of the CalPX auction, and the removal of the state as a power purchaser in the market.

Steps must be taken to prevent collusive behavior in the market. Instituting an open bidding process would provide the necessary information to market participants. Open bidding would also provide for an added measure of accountability as all bids, not just the market-clearing bid would be available for immediate public review.

Further steps should be taken to allow participants in the CalPX to engage in long-term contracting. A variety of hedging instruments should be made available to market participants. A variety of long-term contracting options will allow market participants to spread the risks, and will reduce reliance on the spot markets. Long-term contracting also has the benefit of introducing added measures of security to the planning and scheduling operations of the CalISO, and will allow

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[1] Ed Mendel. "Bond May Fall Short, Davis Aides Fear." Internet. *San Diego Union Tribune*, March 25, 2001. www.uniontrib.com/news/uniontrib/sun/news/news_1n25power.html.

for increased accuracy in forecasting loads, and anticipating shortages and potential congestion issues.

Therefore, it is the recommendation of this report that any measures increasing the availability and attractiveness of long-term contracting options should be advocated and supported. An open bidding process should also be advocated in order to allow for the curtailment of collusive behavior and the exercise of market power by energy producers.

Increasing generation capacity is critical to the success of the California energy market. There has been a fundamental and sustained disparity between the growth in energy demand and the growth of energy supply in California. California simply must increase its domestic generation capacity. It is no longer feasible to rely on imports of electricity from neighboring states, as demand in those states has also risen sharply in the past decade.

To achieve this goal, this paper recommends advocating and supporting measures that will allow for rapid development of new generation capacity. This recommendation should include measures to ease the burdensome bureaucratic process to obtain permits and licenses. Of course, retooling of the permitting process should not be enacted at any cost. While it might currently be necessary to reevaluate the balance between generation needs and environmental protection, policymakers must be sensitive to the potential environmental impacts of these new measures.

Critical to the success of the restructured electricity industry is the introduction of demand-side responsiveness. One of the major causes of the current energy crisis was the disconnect between wholesale and retail prices. Residential end-users have been protected from price fluctuations by retail price caps. They have no economic incentive to alter their electricity consumption during times of shortage.

This paper recommends the introduction of real-time pricing. Evidence indicates that real-time pricing will reduce overall consumption, especially during peak hours. Overall costs will decline because less electricity will be purchased during expensive peak hours.

Major publicity campaigns have been initiated by the state to encourage energy conservation. While it is extremely difficult to alter consumer behavior, absent an economic incentive, a strong public relations campaign highlighting the severity of the crisis has had an ameliorating effect on electricity consumption. Thus, it is important to continue with this campaign.

In conclusion, the restructuring of the electricity market has not turned out to be the panacea of savings and efficiency as was the intention. The causes of the crisis are numerous. While no single factor can be isolated as the definitive cause, certain contributing factors were more influential than others. Generation capacity must increase to meet demand. Sufficient generation is essential in any successful energy market. Demand-side responsiveness must be introduced into the retail sector of the market. Because of the disparity between wholesale and retail prices, utility finances plummeted. Consequently, the considerable debt accumulated by the IOUs must be addressed prior to their re-entrance into a repaired market. Once the utilities are solvent, the State must relinquish its current role as the sole power purchaser in California, again introducing competition into the market. Clearly, there are several areas in which the California electricity market structure must be amended. These include shifting much of the reliance on the spot-market to long-term contracting and opening the bidding process to public scrutiny. By instituting these recommendations, California will achieve its long-term goal of a stable, reliable, and efficient competitive market that will assure reasonably priced delivery of electricity to the citizens of California.

Introduction

If you have opened a newspaper, listened to the radio or watched a television news broadcast in recent months you cannot have missed mention of the calamity that is California's electricity market. The 'energy crisis' has been front-page news within the state, and has attracted a great deal of national attention. The situation began to peak during the summer of 2000, and has continued to afflict the citizens of California with blackouts and power shortages well through the fall and winter months. The picture is bleak for the summer of 2001, though much depends upon the weather and the ability of the state regulators in California to institute reforms that will alleviate the stresses imposed by a fatally flawed market structure.

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HISTORY

The History of Federal Electricity Legislation

The federal government's ultimate authority to regulate the electric industry has been derived from Article 1, Section 8 of the U.S. Constitution, better known as the "Commerce Clause." As transmission lines were built across state lines the need for increased planning and coordination grew. Initially, the federal government was instrumental in building generating facilities and enjoyed a natural monopoly. Energy was then sold to transmission facilities and utility holding companies.

In 1920, the Federal Power Act created the Federal Power Commission. The FPC was the chief agency to issue hydroelectric development licenses to federal, state, and local agencies. During the Great Depression of the 1930s several utility holding companies declared bankruptcy. To address this issue, Congress passed the Public Utilities Holding Company Act (PUCHA) of 1945, and granted regulatory authority to the Security Exchange Commission (SEC) to "break up the large and powerful trusts that controlled the Nation's electric and gas distribution networks."[2] PUCHA expanded the FPC's oversight, to include regulating utilities that were involved with interstate wholesale transmission and the sale of electric power.

The passage of the National Environmental Policy Act of 1965 (NEPA) had a tremendous impact on all aspects of the energy market. Environmental laws created under NEPA created strict emissions standards and regulations that increased the costs of generation, transmission and consumption of electricity. For example, Companies with smokestacks would need to install scrubbers, and other forms of waste disposal required different, more costly disposal methods. Construction of new generating facilities required not only compliance with the new standards, but also the approval of an Environmental Impact Statement (EIS) before the issuance of construction permits. This added an increased financial burden to the industry. Coal-based generating facilities were the most dramatically affected.

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[2] United States. Department of Energy, Energy Information Administration. *The Changing Structure of the Electric Power Industry: An Update.* December 1996. p. 21.

In 1977, the Federal Energy Regulation Commission (FERC) was created within the U.S. Department of Energy. Through the Department of Energy Reorganization Act, Congress replaced FPC with FERC. FERC consists of five members, appointed by the President, and "regulates the transmission of natural gas in interstate commerce, the transmission of oil by pipeline in interstate commerce, the transmission and wholesale sales of electricity in interstate commerce; licenses and inspects private, municipal and state hydroelectric projects; and oversees related environmental matters."[3] FERC's authority was expanded in the 1990s to allow the vertical integration of Investor Owned Utilities (IOUs) and to allow non-utilities access to selling their power to the grid system.

The environmental legislation of the 1970s created additional barriers of entry for the energy market, and increased capital costs leaving few incentives for new construction. As a result, there was little new construction of generating facilities during the 1980s or 1990s.

In 1978, the Public Utilities Regulatory Policies Act (PURPA) introduced some competition to the electricity market by encouraging technological innovations that made more efficient use of existing generation capacity. The goal of PURPA was to move away from the reliance on fossil fuels and towards decentralized technologies. PURPA "opened the opportunity for small generators and co-generators to enter the wholesale power business. PURPA was created to allow qualifying small generators (qualifying facilities) to sell their electrical energy to regulated utilities. Non-utility generators are privately held facilities that generate electricity primarily for their own use, and for limited to sale to others. In the 1993-94 utilities fuel and operation reports, PURPA purchases accounted for approximately 26%, 34%, and 7% of average monthly generation for PG&E, SCE, and SDG&E, respectively."[4]

The Clean Air Act Amendment of 1990 established an assortment of programs to diminish emissions even further, by utilizing emission allowances, commonly known as pollution credits. The Energy Policy Act of 1992 (EPACT) was introduced to compliment the restructuring stage set by

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[3] United States. Federal Energy Regulatory Commission. 1996.

[4] State of California. California Public Utilities Commission. *California's Electric Service Industry: Perspectives on the Past, Strategies for the Future.*

PURPA. EPACT exempted non-utilities from PURPA regulations.[5] The non-utilities became reclassified as exempt wholesale generators (EWGs), that is, they are exempt from certain environmental regulations. EWGs are not required to meet PURPA, cogeneration or renewable fuel limitations. In addition, utilities are not required to purchase electricity for transmission; EPACT simply created a market for non-utilities to sell their excess energy. Finally, EWGs are exempt from SEC regulations.[6] This encouraged non-utilities to supply gap electricity, but was enough regulation to keep non-utilities from controlling the market.

California Energy Policy Before AB 1890

The California Public Utilities Commission (CPUC) is the regulatory agency that oversees privately owned telecommunications, electric, natural gas, water, railroad, rail transit, and passenger transportation companies. The CPUC is responsible for assuring the safety and reliability of utility services to customers at reasonable rates while protecting utility customers from fraud, and promoting the health of California's economy.[7]

In pursuing these goals, the Commission establishes service standards and safety rules. Another aspect of the CPUC is to protect consumers. It is the agency responsible for prosecuting unlawful utility marketing and billing activities, governing business relationships between utilities and their affiliates, and resolving complaints by customers against utilities. It also oversees markets to inhibit anti-competitive activity. While implementing energy efficiency programs and overseeing the merger and restructure of utility corporations, the CPUC also enforces the California Environmental Quality Act for utility construction. The CPUC, along with other state and federal agencies, works

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[5] United States. Department of Energy, Energy Information Service. "The Changing Structure of the Power Industry: An Update." December 1996. p 17.

[6] United States. Department of Energy, Energy Information Service. "The Changing Structure of the Power Industry: An Update." December 1996. p 17.

[7] State of California. "California Public Utilities Commission." Internet. March 17, 2001. www.cpuc.ca.gov/static/aboutcpuc/index.htm

toward promoting water quality, environmental protection and safety. It also intervenes in federal proceedings on issues that affect California utility rates or services.[8]

Another electricity regulating agency in California is the California Electricity Commission (CEC). CEC responsibilities include "forecasting future energy needs and keeping historical data on energy, licensing thermal power plants with over 50 megawatts of generating capacity, promoting energy efficiency and conservation, developing renewable energy resources and alternative energy technologies and planning for and directing state response to energy emergencies"[9]

April 20, 1994 the CPUC proposed a study to evaluate ways to improve the electric services industry. The outcome of this investigation was the CPUC's rule and investigation number 94-04-031 and 94-04-032, otherwise known as the "Blue Paper." The Blue Paper defined the following goals for restructuring:

- California consumers should enjoy the benefits of a competitive electric industry.
- California consumers should enjoy direct access to an efficient environmentally sound industry.
- Competitive electric service should contribute significantly to growth, productivity, competitiveness and job creation for the state's economy.
- California consumers should enjoy access to a basic and affordable package of electric services.[10]

In response to CPUC's Blue paper, the California legislature passed Assembly Concurrent Resolution (ACR) 143, which stated that while it is important to study restructuring, deregulation, and any other potential ideas for the market, the discussion should be open to public input.[11] This

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[8] State of California. "California Public Utilities Commission." Internet. March 17, 2001. www.cpuc.ca.gov/static/aboutcpuc/index.htm

[9] State of California. "CEC General Information." Internet. February 1, 2001. www.energy.ca.gov/commission/index.html.

[10] State of California. California Public Utilities Commission. Order Instituting Rulemaking and Order Instituting Investigation: on the Commission's Proposed Policies Governing Restructuring California's Electric Services Industry and Reforming Regulation, R. 94-04-031 and l. 94-04-032. Issued April 20, 1994. (Referred to as the "Blue Book.")

[11] State of California. Assembly Concurrent Resolution 143. June 16, 1994.

act effectively removed any power of the CPUC to implement a restructuring plan without legislative oversight.

ACR143 identified key concerns with restructuring, including economic development, energy diversity programs and ratepayer assistance. This also included how changes could affect nonutility generators, the promotion of fair competition, rate reduction, and consumer protection. Following ACR143, CPUC issued the Preferred Policy Decision in January 1996, calling for the creation of a power exchange and an independent system operator.[12] The January decision laid out the framework for formal market restructuring, which foreshadowed Assembly Bill (AB) 1890, adopted in 1996.

Federal/State Interaction

In May of 1996 FERC Orders 888 and 889 were announced. FERC Order 888 marked a significant departure from previous federal regulatory policy, signifying the federal administration's support for massive change in the industry. FERC Order 888 guarantees "access to the monopoly owned transmission wire that control whether and to whom electricity can be transported in interstate commerce." The order also outlined that stranded costs, as a result from a systemic change in the market should be recovered. Finally, FERC Order 888 would outline the role of a California Independent Systems Operator (CalISO).

The key points from FERC Order 888 include that all generating firms should have open access to transmission. To this end, transmission tariffs and conditions of non-discriminatory service should be minimized. FERC 888 also suggested the development and maintenance of a "same-time information system that will give existing and potential transmission users the same access to transmission information that the public utility enjoys, and further requires public utilities to separate transmission from generation marketing functions and communications."[13] The order clarified that

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[12] State of California. California Public Utilities Commission. *Electric Restructuring Decision, D.95-12-063,* Issued December 20, 1995.

[13] United States. Federal Energy Regulatory Commission. "Final Rule Order No. 888." Issued April 24, 1996.

the states have the latitude to develop their own framework for changes in the existing regulatory structure.

FERC 888 also permitted "public utilities and transmitting utilities to seek recovery of legitimate, prudent and verifiable stranded costs associated with providing open access.[14]

FERC 888 included a Federal Environmental Impact Statement (FEIS) that considered, among other things, the impact a market-based system would have on the environment. The main question was how to address the issue of pollution and the attainment of NO_X permits.[15] Pollution permits are a policy device to ration pollution in a given industry. The rationing occurs in the buying and selling of these permits. Some plants, like coal, generate more pollution than natural gas plants; therefore, coal generators require more pollution permits than other generators. Should natural gas prices rise drastically, the possibility for increased use of coal-based generating facilities would reduce air quality, intensifying the need for pollution permits.

WHY RESTRUCTURE?

The primary reason for restructuring the electricity industry was an attempt to reduce the prices in California. In the early 1990s, Californians paid nearly twice as much per kilowatt-hour as did residents in neighboring regions (see Figure A). There are several reasons for this regional disparity. Much of the price differential can be attributed to different natural resource endowments in the various regions. However, the bulk of the disparities are due to investment decisions made by the utilities in the 1960s, 70s, and 80s. These decisions were heavily influenced by the assumption that the price of natural gas would be significantly higher through the year 2000. Because of the restructuring of the natural gas industry, however, natural gas prices have been far lower than forecasted 30 years ago. The erroneous investment decisions meant that a large segment of the high prices Californians were paying were a result of sunk costs incurred in the previous decades. These

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[14] United States. Federal Energy Regulatory Commission. "Final Rule Order No. 888." Issued April 24, 1996.

sunk costs (also referred to as stranded costs) still must be paid, regardless of whether or not the electricity industry is regulated by the government regulatory or a competitive market regime. As Borenstein and Bushnell (February 2000) note:

While whole trades within a regulated environment allowed the customers of high-cost utilities to reap some marginal benefits, it did not allow them to escape the more significant burden of paying for the sunk costs of past investment, known as "stranded investments" in the industry. Yet, this latter cost was the source of most of the rate disparities. The policy process has therefore largely been driven by the desire to cut costs that, being sunk, cannot be cut, only redistributed.[16]

From this quotation, there are a couple of important points to note. The first is that the repayment of stranded costs cannot be avoided, they must be paid, and consumers will pay them. The second point is that the restructuring process has been dominated by unrealistic expectations. Deregulation or restructuring, has not turned out, in the short-run, to have been the panacea of lower prices that it was expected to be.

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[15] United States. Federal Energy Regulatory Commission. "Committee Opinion Order FERC 61-208." Issued May 29, 1996.

[16] Borenstein, Severin, and Bushnell, James. "Electricity Restructuring: Deregulation or Reregulation?" *Regulation: Cato Review of Business and Government*, Vol. 23, No. 2, 2000. p.5.

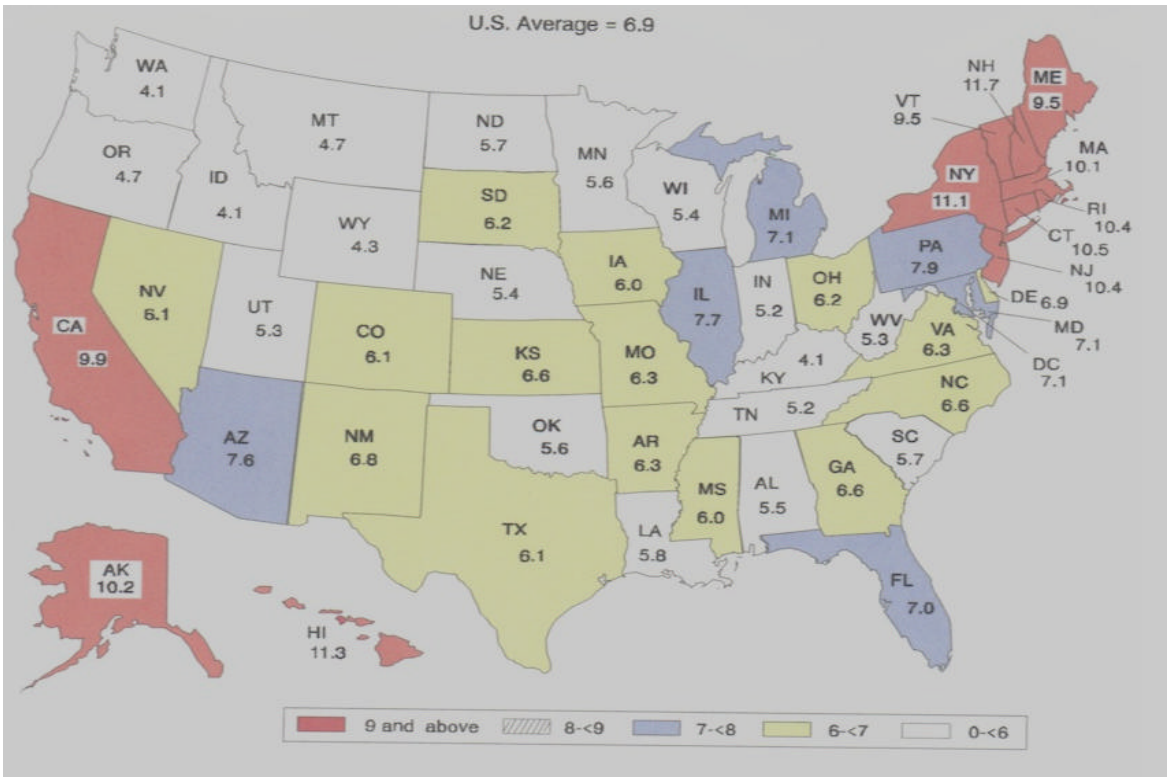

Figure A—Prices Per Mwh—National Comparison

CPUC has been the lead agency investigating market restructuring. In 1992 and 1993, CPUC published *California's Electric Service Industry: Perspectives on the Past, Strategies for the Future*. This came at a time California was experiencing some of the highest electricity prices, compared nationally. Also called the "Yellow Paper," this report discusses five main problems with the state's regulatory regime. The first, and perhaps most significant difficulty with the existing state regulatory regime was that it dulled or obscured the incentives for the utilities to operate efficiently. Under regulation, utilities charged customers prices based on a cost of service formula defined by the regulators. Thus, electricity prices did not fluctuate freely as they would have in a competitive market, and the utilities had little incentive to innovate or improve production methods. The utilities would see no return from short-term productivity gains that would not be reflected in prices.

Another difficulty with the existing regulatory compact was that regulation provided unbalanced incentives for investment. Regulators in the 1960s and 70s provided the utilities with various incentives to invest heavily in nuclear power generation. These investments turned out to be unwise. The passage of strict environmental legislation in response to concerns over safety and

potential environmental damage caused by nuclear power plants, along with technological advances changing the economies of scale of coal and gas fired plants made the construction and operation of nuclear power plants cost prohibitive. Under regulation, the utilities were insulated from the repercussions of these costs, because of the regulated prices. Thus, a goal of the CPUC was to alter the incentive structure to force more efficient investments by utilities in the future.

CPUC was also concerned with the administrative complexity and resultant costs associated with the maintenance of the regulatory compact. Tied to this concern was the feeling that the structure and procedures of the regulatory bureaucracy governing the electricity industry were prohibiting efficient management and obscuring the process from the public. Administrative decision-making was hindered, and thus so was accountability. Also the complexity of the system was such that it did not allow for significant public comment and input. This was a noteworthy problem, because the bureaucracy was so large and costly CPUC needed to find a remedy to maintain legitimacy in the eyes of the public. A fourth concern CPUC is the existing regulatory regime did not provide the utility managers and operators with sufficient incentives and flexibility to respond to the competitive pressures from the recent and successful non-utility generators. Finally, the broader national climate was one of increasing competition in the electricity industry as illustrated by the passage of PURPA and EPACT in particular. CPUC saw that the existing state regulatory regime stood in conflict with the both CPUC and national goals of increasing competition in the electricity industry.[17]

In response to these concerns, CPUC developed a strategy to introduce further competition into the electricity industry. Using the above concerns as guidelines, CPUC also outlined several other key policy concerns that were to direct them in their decision-making process. These policy concerns included consumer protection, environmental quality, resource diversity and safety and reliability. Also included was an analysis of those programs that provide solutions to other social policy objectives under regulation, such as low-income customer programs, agricultural development programs and rates intended to foster low-emission vehicle development. The CPUC

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[17] State of California. California Public Utilities Commission. *California's Electric Service Industry: Perspectives on the Past, Strategies for the Future.* p. 169.

also used a set of general principles to develop four strategic options for altering the regulatory regime covering the electricity industry. These general principles are as follows:

- Modify the regulatory compact and/or the means employed to uphold the compact when appropriate.
- Clearly define the compact's obligations and privileges under each strategy.
- Replace command-and-control regulation with market-based performance targets when appropriate.
- Create less intrusive regulation by setting clearly articulated goals and policies, providing the utility with adequate flexibility to achieve those goals and establishing utility accountability commensurate with the degree of flexibility provided.
- Ensure that the incentives facing the utility reinforce rather than frustrate the achievement of regulatory and other state goals.

The CPUC used these general principles as the minimum standard for any proposed changes. In other words, the CPUC was looking for proposals that would at the very least reduce or decrease the state regulatory regime, by creating less intrusive regulation and market incentives and structures that were appropriate to the task of improving the regulatory compact. These five general principles were used as the framework for the development of the four policy options that were then each evaluated against the criteria to arrive at a final recommendation.

The Yellow Paper concluded that significant market changes needed to be made if California intended to remain an economic powerhouse. Four different approaches were to be considered:

Limited Reform: Maintain the cost of service program. Key changes would include a new rate structure; a dismissal of the balancing accounts, examining the resource procurement process, and restructuring the performance based ratemaking mechanism for natural gas purchases related to electric generation.

Price Cap Model: Build upon the regulatory structure that is used to regulate the telecommunications industry. Focus on enhancing pricing flexibility and severing the link between utility rates and expenses.

Limited Customer Choice: Provide access to the competitive market for a limited segment of consumers, in much the same way that natural gas is regulated.

Restructure Utility Industry: Restructure the market to be competitive. This mirrors much of what we have today. This would encourage IOUs to divest their generation assets. Utilities would open up the state grid to companies that had electricity to sell. This option would include the development of a CalISO and CalPX.

In Depth: CPUC Yellow and Blue Papers

The key to any effective and efficient market is the price. Prices are especially important in a competitive market because they are a primary source of information for both producers and consumers. Prices in a competitive electricity market should at the least resemble prices in a normal competitive market. Ideally prices should be the result of the competition of many non-colluding firms in an industry with few or minimal barriers to entry.[18]

The importance of the informational content of prices cannot be understated. This information is critical to firms for their investment and production decisions. In a competitive market, there should be many firms that are 'price-takers.' This means that no firm should have the ability to arbitrarily raise the price above marginal cost. In a competitive market, each firm will offer a price set at marginal cost, in order to be sure that the firm recovers its fixed costs. The competitive price offers an incentive to firms to produce their products in the most efficient manner possible, and to constantly innovate and improve their production efficiency. Improved efficiency enables firms to take capture short-term gains by offering goods at a lower price that their competitors may not yet be able to replicate.

Using the general principles and the policy concerns outlined in the sections above, CPUC developed four alternative strategies to address the fundamental problems plaguing the regulatory compact governing the electricity industry. The four strategies outlined in the Yellow Paper by CPUC were limited reform, price caps, limited customer choice and restructured utility industry.

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[18] Wolak, Frank A., and Patrick, Robert H. *The Impact of Market Rules and Market Structure on the Price Determination Process in the England and Wales Electricity Market.* POWER Working Paper, Program on Workable Energy Regulation, University of California at Berkeley, February 1997. p. 5.

The restructuring plan outlined by CPUC included several characteristics that were later adopted and included in AB 1890. The industry structure outlined by CPUC stated that existing generation resources had to be divested to independent or non-utility generation companies, thus leaving the utilities as transmission and distribution companies. The utilities were also prohibited from owning or constructing new generating facilities.

Customers purchasing generation were divided into core and non-core customers, with the utilities obligated only to serve the core customers, thus leaving the non-core customers free to contract with independent power producers. CPUC was the agency defining the non-core class and the eligibility requirements to be included in this class. CPUC noted that eligibility in the non-core class should initially be limited, to allow participants in the new structure sufficient time to learn and adapt to the new market rules and structures. Residential customers were seen as the main customers designated as the core class, because they had no alternative to the utility electric service. The non-core class was envisioned to consist primarily of large industrial customers who, in the interests of reducing their electricity costs, might wish to have access to non-utility generation.

Simultaneously, the utilities were no longer permitted to provide generation to non-core customers except in a reserve or emergency capacity. Non-core customers then would have the option of contracting with other generators for power. Under FERC and CPUC policies the utilities would be mandated to provide open, non-discriminatory access to transmission lines for core and non-core customers alike. Since the utilities would still control the transmission and distribution aspects of the electricity industry, it would be necessary for there to be a provision or requirement that utilities continue to provide power in the retail market at least during the transition phase.

The ratemaking provisions of CPUC report are also significant. The initial plan under this restructuring option was that the CPUC would regulate the rate for core customers in all three sectors (generation, transmission and distribution). However, for the non-core customers only the transmission and distribution rates would be set by the Commission. The rates were to be set

according to a performance-based approach, for example setting a price cap according to revenue allocation that was then escalated and tied to a standard index.[19]

The main thrust of the restructuring strategy set out in CPUC's Yellow Paper was to alter the regulatory compact that had existed between the CPUC and the utilities. It was thought that the restructuring of the electricity markets would follow a path very similar to the structures and progress of the restructuring of the natural gas industry. The primary effect of the restructuring plan was to eliminate the exclusive generation franchise of the utilities. The role of the utility was changed. Its new role was to procure generation services for their core customers from independent power producers, power exchange markets or independent providers.[20] The non-core customers were to engage directly in these procurement activities, should they elect to be classified as non-core customers. This of course, also meant that the non-core customers were to be responsible for procuring transmission and distribution services from the utilities. The CPUC assessed this restructuring strategy according to:

- Administrative Costs and Burdens
- Consumer Protection
- Efficient Operations and Investment
- Safety and Reliability
- Efficient Pricing
- Environmental Concerns

The CPUC correctly notes that in the long-term, administrative costs and burdens placed upon the regulators would be reduced significantly, as the Commission and the utilities would be removed from the process of setting rates for the non-core customers. As competition intensifies and more customers opt to be classified as non-core, the choices embodied by competitive market mechanisms would set the price, and the markets would require much less oversight on the part of

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[19] State of California. California Public Utilities Commission. *California's Electric Service Industry: Perspectives on the Past, Strategies for the Future*. p. .203.

the Commission. This strategy would initially require a great deal of oversight and administrative effort on the part of CPUC, because of proposed price caps, and the necessary transition period where the market would not yet be fully competitive.[21] This restructuring process would continue to provide significant levels of consumer protection, particularly in the transmission and distribution components of the industry, as these components would continue to be owned by the monopoly utilities. CPUC noted that this option provides the most efficacious combination of incentives for cost minimization, efficient utility production, and wise investment decisions.[22] This was a significant finding because, as outlined earlier, a large proportion of the high price of electricity in the immediate pre-restructuring market was due to the sunk costs of unwise historic utility investments.

CPUC did note some concerns with the safety and reliability criteria. In particular the report stressed a concern that non-core customers would be caught short and without an alternative source of power should supply become significantly constrained. CPUC also noted a concern that distribution purchases from non-utility generators would occur either by contract or in a spot-market. These purchases may hinder the utility's ability to maintain reliability at reasonable cost levels. This is especially true for spot market purchases.[23] CPUC's paper indicated that this strategy promotes efficient utility pricing for core customers, because the natural progression and development of competitive market forces will eventually provide customers (both core and non-core alike) choice.

AB 1890

Prior to the passage of Assembly Bill 1890 (AB1890), there was a flurry of legislation proposed, each recommending a different means of accomplishing CPUC's goals. AB1890 was

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[20]State of California. California Public Utilities Commission. *California's Electric Service Industry: Perspectives on the Past, Strategies for the Future.* p. 204.

[21] State of California. California Public Utilities Commission. *California's Electric Service Industry: Perspectives on the Past, Strategies for the Future.* p. 205.

[22] State of California. California Public Utilities Commission. *California's Electric Service Industry: Perspectives on the Past, Strategies for the Future.* p. 205.

[23]State of California. California Public Utilities Commission. *California's Electric Service Industry: Perspectives on the Past, Strategies for the Future.* p. 206.

the culmination of work completed by CPUC, the legislature, and stakeholder groups. AB1890 was introduced in February of 1995, passed by a unanimous vote, and signed by Governor Wilson in September 1996. This was the legislative framework for restructuring, as a product of CPUC's Blue Paper. The restructuring of California's electricity market was the result of a significant political process that involved the input of federal, state and many other stakeholders. This process resulted in an extremely complex market design that required continued state and federal oversight at nearly every organizational level.[24]

The California Independent Systems Operator (CalISO) was tasked with managing the flow of electricity along the long-distance, high-voltage power lines that make up the bulk of California's transmission system. As part of AB1890, the state's investor-owned utilities also turned over their private transmission lines to the CalISO to manage. "The mission of the California ISO is to safeguard the reliable delivery of electricity, facilitate markets and ensure equal access to a 12,500 circuit mile 'electron highway.'"[25]

California Power Exchange (CalPX) provides "an efficient, competitive electric energy auction, open on a non-discriminatory basis to all providers, to meet the electricity loads of exchange customers."[26] CalPX provides the results of the auction to the CalISO. Then, CalISO assembles the overall transmission plan through scheduling with CalPX and other private direct access contracts. CalISO then schedules electricity flows through the transmission lines.

The newly created market entities, CalISO and CalPX were initially governed by stakeholder boards that were charged with navigating this extremely complex political environment, while primarily advocating the interests of the CalISO and the CalPX. The CalISO and the CalPX are further governed by the oversight of the Electricity Oversight Board (EOB). The five-member state Electricity Oversight Board consists of three gubernatorial appointees subject to Senate confirmation, a non-voting member of the Senate appointed by the Senate Rules Committee, and a

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[24] United States. Federal Energy Regulatory Commission. "FERC Staff Report to the FERC on Bulk Power Markets in the United States." November 1, 2000. p. 4-1.

[25] State of California. California Independent Systems Operator. "CAL-ISO." Internet. February 1, 2001. www.caiso.com/PowerCentral/

[26] State of California. California Power Exchange. "CalPX Primer: California's New Electricity Market." December 1999, version 6. p. 2.

non-voting member of the Assembly appointed by the Speaker of the Assembly.[27] In addition, the FERC and the CPUC also provide regulatory oversight. A diagrammatic exposition of the simplified operational and regulatory interaction in the California electricity market is included in attached Appendix A.

The bill was to provide immediate rate savings for residential and small commercial consumers by mandating a 10 percent rate reduction, lasting until March 31, 2002.[28] These funds have helped utilities recover stranded costs that have been associated with the market changes. This rate reduction was financed by the issuance of bonds and the imposition of a Competitive Transition Charge (CTC) to consumers.

Essentially this bill required that publicly and investor owned utilities relinquish control of the transmission facilities to CalISO. CalISO is responsible for "provid[ing] centralized control of the state-wide transmission grid, and is charged with ensuring the efficient use and reliable operation of the transmission grid."[29]

THE RESTRUCTURED MARKET

CalISO Overview

With the passed legislation, the major utilities were mandated to release control, but not ownership, of their long-distance transmission lines to CalISO. The legislation guarantees that all power marketers (non-utility companies generating or brokering electricity) who wish to do business in California will have the opportunity to generate and/or deliver power over the state's electricity

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[27] State of California. California Public Utilities Commission. *Proposed Conference Report Number 2*, August 28, 1996.

[28] AB 1890

[29] State of California. California Independent Systems Operator. "CAL-ISO." Internet. February 1, 2001. www.caiso.com

grid. These companies use scheduling coordinators to manage their deliveries of electricity over CalISO controlled power grid. Thus, CalISO acts as an "electricity traffic control center."[30]

CalISO manages the transmission of approximately seventy-five percent of the state's power grid covering 124,000 square miles. It is the second largest control area in the United States, after the Pennsylvania-New Jersey-Maryland connection, and the fifth largest in the world. CalISO portion of the grid, at full capacity delivers 164-billion kilowatt-hours of electricity annually.[31]

As stated in its mission, the main crux of CalISO is to assure safe and reliable energy to Californians. In order to attempt to assure reliable energy, CalISO is required to plan all transmission through the power grid. This is done through three different open competition markets: the real time imbalance market (also known as the spot market), the ancillary services market, and the congestion management market. Also as part of a coordinated planning process, the CalISO works with Regional Transmission Groups (RTG) and the Western Systems Coordinating Council (WSCC).[32]

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[30]State of California. California Independent Systems Operator. "CAL-ISO." Internet. February 1, 2001 www.caiso.com/aboutus/infokit/FAQ.html

[31]State of California. California Independent Systems Operator. "CAL-ISO." Internet. February 1, 2001 www.caiso.com/aboutus/infokit/PowerGrid.html

[32]State of California. California Independent Systems Operator. "CAL-ISO." Internet. February 1, 2001 www.caiso.com/aboutus/infokit/Markets.html

Figure B—Grid Associations —Regional Coordinating Councils

The CalISO through its market analysis department, is also responsible for assuring that no one company has an unfair advantage in the electricity market. The CalISO is to monitor transactions for unusual trading patterns and make recommendations that corrective action be taken against companies who unduly influence the price of electricity or constrain market access.[33] However, the agency has no enforcement power with which to impose their recommendations.

The California Power Exchange

CalPX was created to run as a single-price or uniform price auction. Under AB1890 the three largest IOUs were required to purchase all of their electricity in the CalPX. Municipalities,

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[33]State of California. California Independent Systems Operator. "CAL-ISO." Internet. February 1, 2001 www.caiso.com/surveillance/

Independent Power Producers (IPPs), and other actors may also participate in the CalPX. The auctioning process of CalPX is public, and information on prices is publicly available.[34]

CalPX is the major market for the trading of electricity in California. CalPX is operated much like any other exchange and works with CalISO and other scheduling coordinators to maintain a steady and balanced flow of electricity moving from suppliers to demanders. CalPX is a non-profit corporation that exists for the primary purpose of providing an efficient and competitive open auction for the purchase and sale of electricity.[35]

As California's electricity marketplace, CalPX operates two markets where energy is traded on an hourly basis and a Block Forwards Market (BFM) for energy trading up to six months in advance of delivery. The BFM is a uniform price auction. This means that the market-clearing price is the price of the last unit taken from the market. The auctioneer buys power from the suppliers who submit the lowest bids but every supplier whose bid is accepted is paid the amount of highest bid accepted. CalPX manages the competitive trading in the forward markets (day-ahead/hour ahead). CalPX also operates as a scheduling coordinator that submits balanced schedules to CalISO for all of its participants. CalPX accepts demand and generation bids from its participants and determines a market-clearing price based upon the aggregation of these bids. Once the market-clearing price has been determined, balanced supply and demand schedules are then submitted to CalISO. CalPX also manages schedule adjustment bids that are also balanced and sent to CalISO.

Differing Expectations

Despite any concerns the industry and consumer groups raised over AB1890, public was generally optimistic that energy restructuring would have a positive impact on the State of California. Pundits predicted that consumers would be faced with a "dizzying array of choices" of their power

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[34]State of California. California Independent Systems Operator. "CAL-ISO." Internet. February 1, 2001 www.caiso.com/surveillance/

supplier, and that the restructuring would lower rates for consumers, beyond the 10 percent rate reduction the legislature built into the bill.[36] Up to 70 percent of residential consumers were expected to have a choice in their power suppliers, and "scores of power marketers…[were] betting that consumers' demand for better deals, pent-up dissatisfaction with utilities, or desire for 'green' – albeit more expensive – energy will cause big numbers to defect to their side."[37]

Others acknowledged that competition between electricity suppliers would be of bigger benefit to "volume customers – groups that in the aggregate use more than 20 kilowatts of electricity at peak demand."[38] Analysts predicted that residential users would best benefit from restructuring by banding together into "aggregate groups" where electricity users would form buying blocks to negotiate lower prices. William Reed, vice-president of regulatory affairs at Enova Corp (SDG&E's parent company) stated that customers would be grouped by profiles rather than solicited individually, enabling city governments, business groups, or housing subdivisions to purchase electricity with negotiated volume discounts.[39] Aggregate groups were expected to be so popular that a cottage industry emerged to "herd residents and businesses into buying blocks."[40]Michael Burke, the vice-president of one such "aggregator" company stated: "I can see major home builders in the future buying electricity before they build their subdivision and then becoming partners with us in selling power to their home buyers."[41]

Other commentators did not foresee current problems with supply shortages. James Flanigan, an analyst with the *Los Angeles Times*, determined that the regulated system "produced a

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[35] State of California. California Independent Systems Operator. "CAL-ISO." Internet. February 1, 2001. www.caiso.com/surveillance/

[36] "Change, Maybe Confusion, on California Electric Rates Historic Deregulation Will Demand Consumer Savvy." *The Los Angeles Times*. September 9, 1996. p. B-4.

[37] Dickerson, Marla and Chris Kraul. "Power to the People: California's era of electricity deregulation begins Jan. 1, bringing consumers many choices, but also more than a little uncertainty." *The Los Angeles Times*. December 21, 1997. p. D-1.

[38] Flanigan, James. "How Power Deregulation Will Affect Consumers, Businesses." *The Los Angeles Times.* May 7, 1997. p. D-1.

[39] Flanigan, James. "How Power Deregulation Will Affect Consumers, Businesses." *The Los Angeles Times.* May 7, 1997. p. D-1.

[40] Dickerson, Marla and Chris Kraul. "Power to the People: California's era of electricity deregulation begins Jan. 1, bringing consumers many choices, but also more than a little uncertainty." *The Los Angeles Times*. December 21, 1997. p. D-1.

vast oversupply of power plants and electricity providers." Flanigan further stated, "many power plants are about to be mothballed – with electricity users bearing the cost of their retirement, in exchange for lower electricity prices now and in the future."[42]

Geoffrey Rothwell of Stanford University's Center for Economic Policy Research believed a supply shortage was probable. Rothwell believed that the legislature had traded "marginally lower prices" before AB1890 for supply instability, and predicted, "the cost of blackouts could overwhelm any gains we might accrue from lower electricity prices."[43] Rothwell believed that in a competitive market, generators would seek out the cheapest fuel source for producing electricity – natural gas. This would leave electricity prices vulnerable to fluctuations in natural gas prices or supply problems. At the same time, Rothwell believed that the high cost of nuclear power plants would cause many generation companies to close the plants, negatively impacting the community, stockholders, and removing a "stabilizing influence on electricity supply."[44]

Perhaps the most frequently voiced concern over restructuring was the effect the competitive market would have on municipal utility companies, (Munis) such as Los Angeles' Department of Water and Power (DWP). Munis' residential customers paid rates that were estimated to be about 25 percent lower than those charged by the IOUs. These lower rates were funded in part by slightly higher fees for commercial users, although commercial rates were still low enough for cities to use them as a magnet for new business.[45] These larger customers account for a major portion of Muni revenues, however, and many analysts predicted that Munis would be hard pressed to compete for these lucrative customers. In Los Angeles, for example, DWP's "100 largest customers account for approximately 20% of its revenues."[46]To keep costs down, many

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[41] Flanigan, James. "How Power Deregulation Will Affect Consumers, Businesses." *The Los Angeles Times.* May 7, 1997. p. D-1.

[42] Flanigan, James. "How Power Deregulation Will Affect Consumers, Businesses." *The Los Angeles Times.* May 7, 1997. p. D-1.

[43] Rothwell, Geoffrey. "Cost Isn't Only Factor in Deregulating Electricity." *The Los Angeles Times.* July 6, 1997. p. M-5.

[44] Rothwell, Geoffrey. "Cost Isn't Only Factor in Deregulating Electricity." *The Los Angeles Times.* July 6, 1997. p. M-5.

[45] Moore, Michael T. "How DWP Can Become Competitive When Deregulation Hits." *The Los Angeles Times.* September 29, 1996. p. M-6.

[46] Moore, Michael T. "How DWP Can Become Competitive When Deregulation Hits." *The Los Angeles Times.* September 29, 1996. p. M-6.

Munis implemented drastic measures such as hiring freezes, layoffs, rate hikes, and measures to pay off debts in anticipation of entering the competitive market.[47]

During legislative conferences on AB1890 a number of concerns were addressed including consumer protection, recovery of transition costs, generation and capacity. A 1996 Electricity Report by CEC identified transmission and generation concerns. The report examined the increased reliance on out-of-state import of electricity. Further, the study asserted that soon after 2000 California would lack sufficient electricity to meet fulfill demand.

The recommendation from CEC did not encourage the state to invest in new generation facilities. AB1890 was still in the hearing process. It would have been a counter-productive suggestion on the behalf of the CEC to suggest increased investment in generation facilities by the state government, while the government was a certain expectation that market forces would have encouraged the development of private construction of new generation facilities.[48]

Another critical concern of the CEC was the nature of transmission jurisdiction in California. Transmission lines in California fall under different jurisdictions depending on where the electricity originates.

Finally, concerning consumer rates in California, the goal of AB1890 was to lower rates "through reducing regulatory structure."[49] By June 1996, in committee it was found that none of the claims of a consumer rate reduction could be substantiated through any provisions of the bill.

AB1890 did nothing to remedy the issue of insufficient generation capacity. Prior AB1890, California was becoming more reliant on importing electricity from other regions. Since AB1890, the California legislature has attempted to remedy this problem by helping to streamline the regulatory process by which generating facilities are sited.

In the California Energy Commission's 1996 Electricity Report, evidence was presented showing growing inequities in the amount of energy that will be needed, and the generation capacity with in California. Prior AB1890, California was becoming increasingly dependent on out of state

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[47] Steinman, Jon. "Free Market Threatens Some Low Power Rates." *The Los Angeles Times.* November 4, 1997. p. B-1.

[48] State of California. California Energy Commission. *Electricity Report*. November 1997. p. 27-34.

[49] State of California. AB1890 Utilities and Commerce Hearing. July 13, 1995.

generators to fulfill the total demand.[50] Prior AB1890, energy reports were complied biennially analyzing the state of the electricity infrastructure, supply and demand. The reports forecasted needed supply, demand, and to ensure power plant capacity exists. In 1998 legislation was passed that no longer required the Electricity Reports, as market forces would no define the supply. The chart below was the 1996 forecast. (See Figure C)

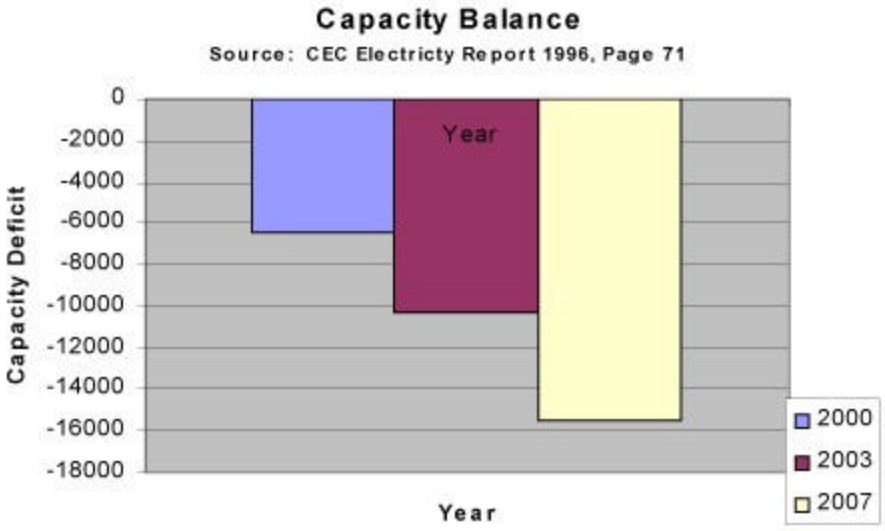

Figure C—Capacity Balance—Forecasted in 1996

The table forecasts apparent capacity deficits in the state beginning in the year 2003. Transmission ***capacity*** was not specifically addressed by AB1890. The regulating authority structure no longer matched the market structure after the passage of AB1890. For example, there are five agencies besides local government that have overlapping authority to regulate transmission wires, directly and indirectly in California. Generally the agency that regulates the power plant defines the agency that regulates the transmission lines. (See Figure D)

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[50] State of California. California Energy Commission. *Electricity Report: 1997*. November 1, 1997.

	Transmission Line Licensing Jurisdiction in California		
Project Type	<50 kV	50 to 200 kV	>200 kV
Power plant under CEC jurisdiction	CEC	CEC	CEC, plus CPUC if IOU project
IOU Power plant not under CEC jurisdiction	Regulated but Exempt	CPUC	CPUC
POU Power plant not under CEC jurisdiction	POU Board	POU Board	POU Board
Independent Power plant not under CEC jurisdiction	Local Agencies	Local Agencies	Local Agencies

Figure D—Overlapping Transmission Jurisdictions

TRANSITION TO COMPETITION

Under AB1890, the state mandated a two-pronged divestiture system. First, buyers of generation facilities had to sign a two-year agreement with the selling utility to provide operations and maintenance services to the divested power plant. Secondly, CPUC had to ensure that facilities maintain the reliability of the electric supply, remain operational and consistent with maintaining open competition, and avoiding over-concentration of market power. Divestiture of the utility companies did not occur overnight.[51]

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[51] Cissna, Tami. "Two-Phase divestiture structure frees commercial process from uncertainty." *Electric Light & Power*, May 1998. V 76 n5 p4.

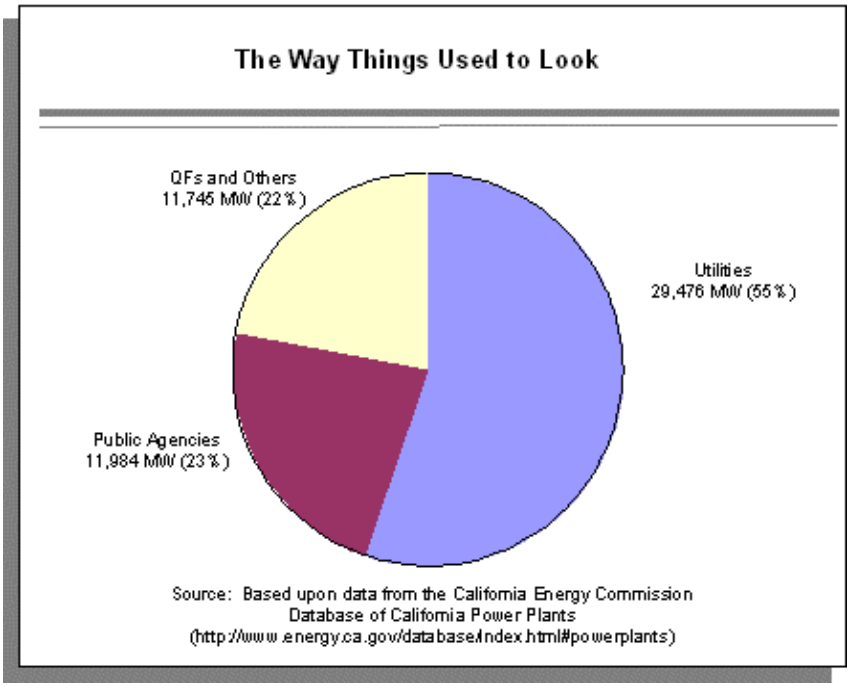

Figure E—Generation Ownership Prior to Restructuring

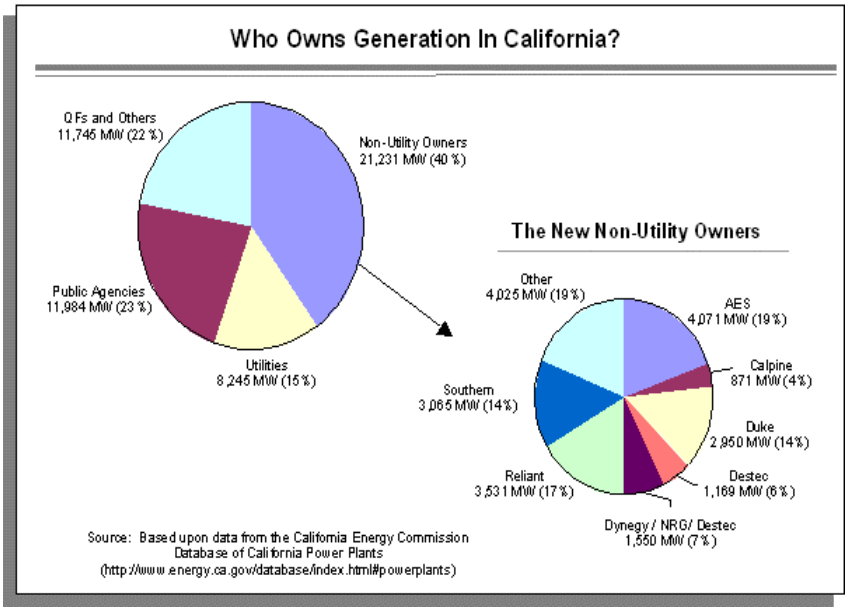

Figure F—Generation Ownership After AB 1890

The first utility to conclude generation divestiture sale under the new regulation, Edison, took 20-months to close from the time the factory first went up for sale until the deal was closed.[52]

Initially, Sempra Energy International was not doing so badly. Sempra Energy was formed after Southern California Gas Co. (owned by parent company Pacific Enterprises) merged with San Diego Gas and Electric (SDG&E) (Enova Corp.) in 1998. Interestingly, right after merger plans were announced, SDG&E was tendered a 2.1 billion stock bid from SCE Corp., the holding company for Southern California Edison. The proposed merger would have created the largest investor-owned electric utility in the United States, affecting nearly five million customers. However, SDG&E's board of directors refused the deal, and unanimously voted it down claiming the Southern California Gas co. merger was a better deal. SCE countered with a $2.5 billion bid, which SDG&E's board later accepted. This resulted in a $100 million lobbying effort to persuade the California Public Utilities Commission to approve the merger.

Supporters claimed the merger would save $3 billion in costs by eliminating 1,200 jobs and postponing power plant construction, supposedly resulting in lower rates for customers. Opponents claimed the savings would not happen, and that prices would actually rise. Eventually San Diego's mayor got involved, and persuaded area businesses to oppose the merger as well, citing the hundreds of jobs that would be lost and the "loss of another major local company." In 1991, CPUC rejected the merger.[53]

Edison International (EI) in comparison has not done so well. On March 6, 2000, the company pre-announced disappointing earnings, and its stock plunged nearly 30 percent in one day. Utilities are generally considered to be safe, low-risk investments, and for a stock to plunge that much in a few days is unprecedented. Analysts predicted that the plunge was likely due to an "overreaction" to the earnings, disappointment, and a malaise toward "old economy" stocks.[54]

EI did make an intelligent move by purchasing the eighth largest power marketer in the US, Citizens Power, in May of 2000. EI said Citizens Power would give the company the "strength it

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[52] Cissna, Tami. "Two-Phase divestiture structure frees commercial process from uncertainty." *Electric Light & Power,* May 1998. V 76 n5 p4.

[53] Toth, Simone. "1988: The Year of the Mergers That Never Were." *San Diego Business Journal.* Jan 31, 2000 v21 iS p41.

[54] "Edison International." *First Call/Thomson Financial Insiders' Chronicle.* May 8, 2000 v25 i19 p1.

needed" to best utilize the generation assets the company has purchased over the last several years. At this same time, SCE sold off the last of its fossil fuel generating interests in a sale valued at $533 million. Interestingly, the Los Angeles Department of Water and Power owns 20 percent of this plant as well. In total, SCE sold 15 generating assets between 1997 and 2000.[55]

SDG&E predicted that customers would see a refund of $390 million during summer 2000. This was due to "rate-reduction bonds" issued in December 1997, which were intended to help utilities refinance their debt related to investments made before utility restructuring. SDG&E was able to recover its costs two years ahead of schedule.[56] As late as June 2000, the President of SDG&E, Edwin A Guiles, predicted that their customers would be paying about 5 percent less on their "base" electric service than before restructuring in 1997. Base electric rates are the portion of the bill that pays for regulated delivery service of electricity to the consumer.[57]

By July 2000, however, there was talk of the CPUC conducting investigatory hearings into "outrageous profiteering" by electricity providers and a reexamination of the market structure as part of the agenda for the CPUC's August meeting. The August meeting had been called to discuss San Diego's high utility rates, which had risen from "3.25 cents per kilowatt hour in April to a peak of 13.48 cents per kilowatt hour July 15."[58] The CPUC was also planning to consider allowing SDG&E to "hedge," or purchase electricity through long-term contracts, thereby locking in rates for customers. The risk with this strategy was that it would commit customers to paying higher prices, instead of the hoped-for cheaper prices.

By August 2000, Edison's stock was still languishing, trading at around $21 per share, remaining there nearly all summer. It had traded as high as $30 a share in February.[59] Analysts blamed the poor stock prices on a "perception problem" with investors, who asked how Edison (and by extension, how all of California's IOUs) could make money when they have such huge debt, are in a rate freeze, are selling off generation facilities, and are still required to purchase

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[55] Davis, Tina. "Edison Intl. Buys Marketer, Sells Coal Generation." *Energy Daily*. May 12, 2000.

[56] Rodrigues, Tanya. "SDG&E Plans $390M Refund." *San Diego Business Journal*. June 26, 2000 v21 i26 p60.

[57] Rodrigues, Tanya. "SDG&E Plans $390M Refund." *San Diego Business Journal*. June 26, 2000 v21 i26 p60.

[58] Zign, Lee. "Profiteering Probe Possible in Electric Rate." *San Diego Business Journal*. July 24, 2000 v21 i30 p1.

[59] Hayes, Elizabeth. "Edison Can't Cash In on Increased Demand for Power." *Los Angeles Business Journal*. August 21, 2000. v22 i34 p7.

energy. Analysts also said that Edison is "undervalued" in comparison to similar firms, with stock trading at 20 percent less than its peers. It is interesting that the demand increase has been a deterrent for investors, because Edison is perceived as "a distributor in a shortage, which is a difficult time."[60] Still, Edison was optimistic with spokesperson Gil Alexander arguing the sale of generation facilities does not affect the company's ability to make a profit.[61]

In September 2000, Sempra bought a majority share of a British electric and gas company, Atlantic Electric and Gas. Sempra vice-president Todd Esse said, "The UK energy marketplace has evolved and we see a ripe opportunity to expand our European energy marketing activities and meet the high demand for competitively priced energy among consumers and small business."[62]

At the same time, Fitch's investor service lowered the ratings outlook for SDG&E, SCE, and PG&E from stable to negative, citing "political and regulatory uncertainty." This followed a similar move by Moody's Investor Service's downgrading of SDG&E and its parent company Sempra from positive to negative. Moody claimed its outlook change "reflects the somewhat unsettled state of deregulation in California."[63] Both companies blamed AB265, which set a rate cap of 6.5 cents per kilowatt-hour for SDG&E customers. This forced the company to sell energy at a loss, and left unresolved the question of who would pay the difference between the price of electricity purchased on the market and energy sold to customers. The downgrade applied to the company's outlook, not their credit rating, but is often a precursor to the credit rating downgrade.[64]

A credit rating downgrade makes it more expensive and difficult to borrow money, and according to Doug Kline, a Sempra spokesman, "it makes it difficult for the utility to invest in capital projects that it needs to go out and explore outside financing for."[65] Kline mentioned that one of the

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[60] Hayes, Elizabeth. "Edison Can't Cash In on Increased Demand for Power." *Los Angeles Business Journal.* August 21, 2000. v22 i34 p7.

[61] Hayes, Elizabeth. "Edison Can't Cash In on Increased Demand for Power." *Los Angeles Business Journal.* August 21, 2000. v22 i34 p7.

[62] "Companies & People." *Gas Connections.* September 14, 2000 v4 i17 p13.

[63] Zion, Lee. "Uncertainty Over Dereg Downgrades Utility Stocks." *San Diego Business Journal.* September 25, 2000. v21 i39 p3.

[64] Zion, Lee. "Uncertainty Over Dereg Downgrades Utility Stocks." *San Diego Business Journal.* September 25, 2000. v21 i39 p3.

[65] Zion, Lee. "Uncertainty Over Dereg Downgrades Utility Stocks." *San Diego Business Journal.* September 25, 2000. v21 i39 p3.

projects that could be affected was the construction of 25 miles of transmission lines that would connect the local utility in Riverside County to SCE's lines. This connection was intended to allow SDG&E to "import competitively priced power from other parts of the state" and would "stabilize" the local electrical supply. Also "in jeopardy" was an effort by SDG&E to install real-time meters for all of its customers, which would allow them to pay for electricity by the hour, with off-peak usage being priced more cheaply than peak.[66] This would empower users to reduce their demand-side consumption,[67] and would allow for a more accurate accounting of a consumer's usage.[68]

In November, PG&E sued in federal court to be able to pass on $3 billion in debt to its customers. The company claimed that higher wholesale power costs are regulated by the federal, rather than state government. Therefore the CPUC had no jurisdiction over the prices.[69]

By January 2001, the accumulated debt of Southern California Edison and PG&E was estimated between $10 and $12 million dollars. Talk of bankruptcy circulated, and though Governor Gray Davis blamed power generators for "hold[ing] Californians hostage," CPUC took few steps to alleviate the losses the power companies were experiencing. CPUC approved modest interim rate increases, but in amounts much lower than what the IOUs claimed they needed to avoid bankruptcy.[70] Wall Street responded to the governor's remarks with a 5-8 percent decrease in stock prices for each company.

At the same time though, other Wall Street Firms were clamoring to get involved in the crisis. The possible bankruptcies of SCE and PG&E would be a "$10 billion gold mine for Wall Street."[71] Banks inundating the state with offers and various proposals for bailing out the two companies are, according to one utility banker on Wall street "shying away from the current situation and helping the companies now, because they all want to line up to do a takeout AAA

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[66] Zion, Lee. "Uncertainty Over Dereg Downgrades Utility Stocks." *San Diego Business Journal*. September 25, 2000. v21 i39 p3.

[67] Zion, Lee. "Uncertainty Over Dereg Downgrades Utility Stocks." *San Diego Business Journal*. September 25, 2000. v21 i39 p3.

[68] Radford, Bruce W. "Meter Men." *Public Utilities Fortnightly*. October 1, 2000. v138 i18 p4.

[69] "PG&E sues to recover $3B in costs." *The Business Journal*. November 10, 2000. v18 i28 p4.

[70] Shook, Barbara. "Davis Blames Generators for Electricity Crisis." *The Oil Daily*. January 10, 2001. v51 I 7 p1.

[71] O'Leary, Christopher. "Wall Street Pans for Gold in the Detritus of California's Big Utilities." *Investment Dealers' Digest*. January 15, 2001. p1

financing instead."[72] By January 2001, Moody's Investors Service and Standard & Poor's Ratings Group had cut the IOUs' credit ratings to Baa3/BBB-minus, while Fitch Inc. consigned them to junk status.

Despite accusations by California's senators and Governor Grey Davis that SCE and PG&E were exaggerating their financial desperation, analysts more often than not sided with the utilities. In January, PG&E owed $2.2 billion in power bills due by March, which was "four times as much cash as it [had] and [would] soon face a cut-off from its suppliers."[73] Further, the company had an uncollected debt balance of $6.6 billion at the end of 2000, which is more than 100% of stockholders' equity. PG&E received permission from FERC to protect its remaining generation and energy-trading assets from liability stemming from the crisis.[74]

SCE faced similar problems with uncollected electricity costs of $5 billion from December 2000.[75] While SCE reported having $1.2 billion in cash reserves, the company sought to preserve those funds for ongoing expenses until restructuring problems could be resolved. It went so far as to say that SCE "intends to pay all of its obligations once a permanent solution to the current energy and liquidity crisis has been reached."[76]

At the end of January 2001, shares of the two firms soared after Wall Street analysts became convinced that California would soon pass "constructive legislation" to fix the power market. Shares in EI rose 25 percent, and shares in PG&E, Inc. (parent company of PG&E) rose 25 percent.[77] Steven Fleishman, a utility analyst for Merrill Lynch said, "the risk of bankruptcy, while still real, has dropped significantly. We sense the tide is turning."[78] It is interesting to note,

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[72] O'Leary, Christopher. "Wall Street Pans for Gold in the Detritus of California's Big Utilities." *Investment Dealers' Digest*. January 15, 2001. p1

[73] O'Leary, Christopher. "Wall Street Pans for Gold in the Detritus of California's Big Utilities." *Investment Dealers' Digest*. January 15, 2001. p1

[74] Shook, Barbara. "Two California Utilities Continue Their Slide Toward Bankruptcy." *The Oil Daily*. January 17, 2001. v51 i11 p1.

[75] O'Leary, Christopher. "Wall Street Pans for Gold in the Detritus of California's Big Utilities." *Investment Dealers' Digest*. January 15, 2001. p1

[76] Shook, Barbara. "Two California Utilities Continue Their Slide Toward Bankruptcy." *The Oil Daily*. January 17, 2001. v51 i11 p1.

[77] "California Utility Shares Rebound." *The Oil Daily*. January 26, 2001. v51 i18 p1.

[78] "California Utility Shares Rebound." *The Oil Daily*. January 26, 2001. v51 i18 p1.

though, that the shares in SCE and PGE remained unaffected, indicating perhaps that Wall Street was simply relieved the parent companies would not have to bail out their subsidiaries.

As of February 1, 2001 PG&E defaulted on obligations totaling more than $1.6 billion. SCE and PG&E told the Securities and Exchange Commission (SEC) that they were unable to make payments on $726 million worth of commercial paper, and that "they would pay power suppliers only $161 million of $1.5 billion owed." This amount would be paid to "qualified" alternate energy generators, CalPX and CalISO, who had made purchases on behalf of the utility.[79]

What impacts would the bankruptcies of the main energy providers have on California, the nation, and the universe? Immediate lenders such as "Bank of America Corp, Deutsche Bank AG, J.P. Morgan Chase & Co., and five other banking companies could lose more than $1 billion because they have letters of credit backing PG&E Corp's bonds."[80] These banks are vulnerable because they substituted their own credit for PG&E's, allowing the utility to pay lower interests rates based on the bank's creditworthiness.[81]

Local governments would take a hit as well. California's troubled Orange County went bankrupt in 1995 as a result of bad investments totaling a loss of $1.6 billion. Today, County Treasurer John Moorlach is facing harsh criticism for purchasing $40 million in bonds issued by Edison International in Fall 2000 for part of their schools portfolio.[82] It is unclear that Edison will be able to pay back the bonds when they mature. Riverside County purchased $39.7 million in PG&E bonds that matured in January 2001 for their investment pool. PG&E "failed to pay either the principal or interest, prompting credit-rating agency Fitch to downgrade the county's rating."[83]

Market Evolution: 1998 through Summer 2000

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[79] "California's Electric Nightmare: Utilities Fight to Stay Solvent." *International Petroleum Finance*. February 2001 v24 i2 p3.

[80] "In Brief: California Energy Woes could Cost Banks $1B." *American Banker*. January 26, 2001. v166 i18 p20.

[81] "In Brief: California Energy Woes could Cost Banks $1B." *American Banker*. January 26, 2001. v166 i18 p20.

[82] Pine, Howard. "City, County Pension Funds Avoid Hit in Energy Stocks." *Los Angeles Business Journal*. January 29, 2001. v23 i5 p9.

[83] Pine, Howard. "City, County Pension Funds Avoid Hit in Energy Stocks." *Los Angeles Business Journal*. January 29, 2001. v23 i5 p9.

The early period of market operation could by most accounts be considered successful. Wholesale prices were well below retail prices, allowing the IOUs to generate significant profits. The IOUs were on their way to recovering their stranded costs. Aggregate supply and demand was balanced enough to produce relatively stable market prices, fluctuating primarily with seasonal and other normal peak and off-peak periods. The IOUs continued to divest their generation assets and CalISO and CalPX appeared to be providing a coordinated and reliable electricity market. However, as the IOUs continued their divestitures, exports of electricity from California began to rise. This necessitated increases in imports to meet the steadily increasing demand within California. As participants in the CalISO and CalPX adjusted to the new market, they began to adjust their bidding behavior accordingly. Supply shortage conditions within California began to develop as more electricity physically generated within the state was shipped out to the parent companies for sale in the CalPX. The supply shortages were then combined with sharp increases in demand during the summer months of 2000.

SUMMER 2000

The summer of 200 marks the beginning of the electricity crisis that has plagued California for the past several months. Certainly, the seeds of this crisis were sown more than a decade ago, and in the initial restructuring plan

High temperatures in the summer of 2000 increased fuel costs and increased cost of NOX permits all contributed to the dramatic increase in electricity. Due to exceptionally high temperatures and both scheduled and unscheduled outages, CalISO declared system emergencies 39 times between May and August 2000. Consequently, the San Francisco Bay area suffered rolling blackouts in June. Fuel prices also rose this summer, which caused the price of generation to increase. This was true not only for California, but for the entire Western Region. Because of the high temperatures and resultant growth in demand, existing gas fire units were operating at record

levels. As a result, the price of NO_x credits climbed from approximately $6/lb to over $40/lb by the end of August 2000.[84]

During May 2000, the CalPX's DAM increased by 100 percent compared to the previous year. In one transmission zone CalPX's day-ahead price jumped to over $1,000 Mwh in late June. Similarly, CalISO's real-time market was experiencing price spikes. In this market, prices approached or reached CalISO's $750Mwh cap twice in May and eight times in June. In response, CalISO lowered its cap first from $750Mwh to $500Mwh, and then again from $500Mwh to $250Mwh.[85]

The FERC Staff Report comprehensively examines the supply and demand conditions and the price and cost conditions that were the foundation for the energy crisis that confronted California in the summer of 2000. Many of these conditions have persisted through the fall and are still plaguing the electricity market today. In terms of the underlying supply and demand conditions the FERC report highlights four primary conditions:

- Overall demand increased significantly
- Exports from California increased significantly while imports recorded little overall change
- Outages increased significantly
- Increased quantities of demand and supply were left unscheduled in the Day Ahead Market (DAM) and Hour Ahead M markets (HAM).[86]

All of these factors acted in concert to significantly constrict supply, and introduce volatility into the CalISO system. Because of the peculiar characteristics of electricity as a product, CalISO's task is to constantly maintain supply and demand balance in the system. This task is extremely difficult under normal circumstances, but under conditions that persisted in the summer of 2000, it was made nearly impossible. Their daily peak loads fluctuated widely from below 35,000

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[84] Market Order Proposing Remedies for California Wholesale Electrics, 11/1/2000.

[85] Market Order Proposing Remedies for California Wholesale Electrics, 11/1/2000.

[86] United States. Federal Energy Regulatory Commission. *FERC Staff Report to the FERC on Bulk Power Markets in the United States*. November 1, 2000. p. 2-1.

Mw to over 45,000 Mw, introducing extreme difficulties in maintaining system integrity. According to the FERC report average summer demand in the CalISO system increased 8 – 9 percent over the previous year. This rising demand in combination with the fluctuating daily peak loads and the increased exports and net import losses all combined to severely restrict supply, and introduce significant uncertainty into the process. This uncertainty was compounded by an increase in unplanned generation plant outages. The outages further constricted supply and raised the prices.

In an effort to stem the rising prices the price caps in CalISO were lowered from $750 to $500 in July, and down to $250 in August. The FERC report points to these price cap reductions as possible factors in the increased exports of generation out-of-state. FERC also notes however, that prices were generally higher compared to the previous year throughout the WSCC, and thus California was unable to look to out-of-state for imports to relieve some of the price pressures

With regard to prices and costs the FERC Staff Report notes several significant findings:

- Prices in the CalISO spiked and reached record levels in May, June and July of 2000.
- Average hourly prices were highest in August, under the lowest price cap.
- Prices at other hubs in the WSCC were highly correlated with California prices
- Costs for fuel and environmental NOX compliance increased significantly in July and August.
- Prices in some hours appear to have been above those that would have prevailed in a competitive short-term (hourly) market, if the competitive prices were determined from short-term marginal costs
- Bid patterns in the CalPX, the CalISO replacement reserve market and a review of the out of market purchase activity do not suggest substantial or sustained attempts to manipulate prices in these markets.[87]

The high prices and price volatility experienced over the summer were tied to the constricted supply and increased demand experienced, as well as to growth in the prices of inputs and increased costs of compliance with environmental regulations. The prices of inputs have continued to surge throughout the fall and winter months, and are still significant factors in the current

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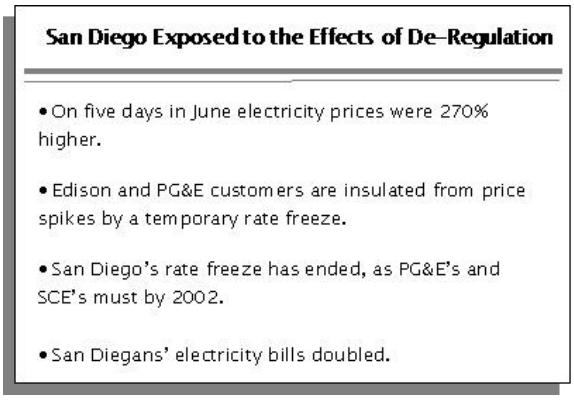
[87] United States. Federal Energy Regulatory Commission. *FERC Staff Report to the FERC on Bulk Power Markets in the United States.* November 1, 2000. P. 3-1 &3-2.

high price of electricity. The costs of compliance with environmental regulations have continued to increase, and in fact are an even more significant factor today, than in the summer. This is due to the fact that as the end of the year approached, the price of trading NOX credits increased as many plants sought to acquire more permits to replace those expended during the summer and fall months.

In response to the summer crisis, several events and actions have occurred that affect the electricity markets and their ability to provide reliable, stable and cost-efficient power. The State regulators in California enacted legislation AB265 in September to re-cap rates for SDG&E customers back at 6.5 cents per kilowatt-hour. SDG&E had recovered and paid off its stranded costs, and ended its price-cap in July of 1999. This allowed SDG&E to pass on actual costs of electricity to its customers, resulting in substantial price increases for SDG&E customers over the summer months of 2000. Consequently, the State enacted AB265, which was retroactively effective for certain customers from June 1, 2000.[88]



By October, a number of generators and IOUs petitioned FERC to intervene, asking for some kind of relief. Key statements from FERC were issued on November 1, November 21 and December 15, 2000. In response to the looming crisis, the California State Legislature called a special session January 24, 2001 to address the issues related to the shortage of electricity, as the major IOUs were now close to bankruptcy.

FERC Fall 2000 Remedies

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[88] "Energy Information Agency." Internet. February 1, 2001. www.eia.doe.gov/cneaf/electricity/california/subsequentevents.html

The November 1, 2000 report presented FERC's analysis of the California market system and suggested remedies for its shortcomings. Of primary concern was the lack of generating capacity in California. During the period of 1996 to 1999 California added only 700 megawatts of generation capacity while demand grew by 5,500 megawatts.[89] This promoted an increasing reliance on imported electricity from other states. Favorable weather (stable temperature and sustainable rainfall) and low spot market prices allowed IOUs to experience a windfall of income, particularly income received through the divestment of generation facilities.

Another concern was the prohibition of IOUs from taking part in forward contracting and the requirement that IOUs sell and purchase of electricity through CalPX. Insufficient supply of electricity in the market forced CalISO to become a broker, to solicit more supply, often as a matter of last resort at high prices. FERC held that essentially CalISO and CalPX were unable to effectively manage the market. At the time, CalISO managed the real-time market controlling 6,000 Mw of energy. FERC proposed that CalISO cut that number down to 2,000 Mw of real time energy.

The proposed remedies include the following:

- Eliminate the requirement that the three investor-owned utilities (IOUs) must sell into and buy from CalPX.
- Require, subject to a $100/MWh penalty, that all market participants schedule 95 percent of their energy consumed in the day-ahead and day-of markets.
- Implement a $150/MWh "soft-cap" on bids that set the market-clearing price in the CalPX and the CalISO, and pay-as-bid for CalPX and CalISO bids above $150/MWh.
- Impose a 24-month potential refund obligation on sellers into the PX and CalISO markets.[90]

The December 1, 2000 Market Surveillance Report (MSR) by the CalISO responded to the FERC report of November 1, 2000. The Report concluded that the "proposed order's

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[89] United States. Federal Energy Regulatory Commission. Docket 00-95-000. "Market Order Proposing Remedies for California Wholesale Electrics." Issued 11/1/2000.

[90] United States. Federal Energy Regulatory Commission. Issued 11/1/2000.

remedies are likely to be ineffective to constrain market power and, in fact could exacerbate California' supply shortfalls."[91]

The MSR proposed an alternative proposal, which included the following:

- The CalPX "must-buy" requirement would become a "must-schedule" requirement. IOUs would be required to schedule all forward energy through the PX, but would be free to purchase it from any source.
- California generators and entities that sell to any California purchaser (not limited to the CalPX and the CalISO) could continue to be eligible for market-based rates (and would be free of refund obligations) only if they offer a substantial portion of their sales in the form of two-year contracts at rates that approximate competitive prices. The volume offered by sellers, in the aggregate, would be sufficient to cover demand for an average load profile.
- Any market participant that does not offer these two-year forward contracts would be subject to cost-of-service rates for all of their sales of energy and ancillary services into the California market for at least the two-year period.
- CPUC would be encouraged to set a default rate for IOU residential and small commercial customers based on projected wholesale energy costs under the two-year contracts described above.
- The under-scheduling penalty should be even-handed. The MSC recommends a real-time trading charge that is applicable to both load and generation and, more importantly, does not distinguish between instructed and uninstructed deviations from schedule. [92]

The MSR felt that the root problem did not lie in the stakeholder board of directors. It contended that much of the problem could be corrected using price caps and guarding against the use of market power by generators. Further, much should be done to alleviate the lack of generation capacity in California. Talk of eliminating the soft cap on prices contributed to fears that prices would continue to skyrocket, and utilities would be left with little recourse.

On December 8, 2000 FERC granted an emergency waiver of Qualifying Facilities (QF) Regulations. In the petition for the emergency waiver, it was argued that if QF regulations could be

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[91] State of California. California ISO- Market Surveillance Committee. "Analysis of Order Proposing Remedies for California Wholesale Electrics." December 1, 2000. p. 2

[92] State of California. California Independent Systems Operator. *Market Surveillance Report*. December 1, 2000.

relaxed, approximately 1,000 megawatts of electricity would be available immediately. FERC agreed, on two conditions: that wavers be granted for a limited amount of time and that energy generated would need to stay within California.[93]

On December 15, 2000, FERC again restated its disagreement with any price caps, as caps do not encourage new participants in the market and do nothing to encourage generation capacity. FERC suggested market structure changes, such as eliminating the requirement that electricity be bought and sold through CalPX. This would encourage IOUs to enter longer-term bilateral contracts.

FERC mandated a soft price cap of $150Mw. If bids are submitted below $150Mw, they were to be sold at the market-clearing price. However, if bids are above $150, the electricity would be sold for the actual bid price. FERC refers to this soft price cap as a "benchmark" and CalPX calls it a "breakpoint." Regardless of the name, the benchmark was mandated to introduce an interim instrument in the CalPX auction that would limit the price raising effects of the single-price or uniform auction.

Along with reducing the price magnifying aspects of the uniform auction, FERC also believed that the benchmark requirement would reduce reliance on the spot market. The goal was to have the spot market represent only 5 percent of the transactions in the total market. To help assure this goal, penalties for under-scheduling, or scheduling more than 95 percent of the demand in the real-time and spot markets were also mandated by the FERC December 15th order.

In response to concerns regarding the exercise of market power, FERC mandated that a comprehensive systematic monitoring and mitigation system must be developed by March 1, 2001 and implemented by May 1, 2001. It is hoped that a structured monitoring system will be able to identify and track instances of collusion or deliberate manipulation of the market structures attempting to raise prices.

CalISO's stakeholder board was replaced with a non-stakeholder board, with experience but are "independent market participants."[94] For the long term, the FERC ordered the CPUC to

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[93] United States. Federal Energy Regulatory Commission. *FERC Order 93 FERC 239*. "Exemptions for Qualifying Facilities." Issued December 8, 2000. p. 25.

consider market rule changes that help ensure IOUs meet reserve requirements, explore options regarding the single price auction format, eliminate the requirement for the balance schedule, and propose a new congestion management design. Since the actual restructuring of the market was instituted at the state level, California, not FERC bears the burden of amended the system to ensure success.

In early January 2001, the State of California provided temporary rate relief to PG&E and SCE to reduce the losses that they sustained as a result of the disparity between the wholesale prices and the retail price caps. The State also passed AB970 that granted authorization to various state agencies to issue permits to operate power plants where necessary.[95] The legislature also earmarked an unprecedented $400 million to buy power directly from generators and to then make it available to the utilities at cost. FERC and the Department of Energy (DOE) have also been very involved in attempting to mitigate the problems occurring in the California electricity market.

The DOE directed electricity suppliers to continue supplying power to the utilities despite the financial risk inherent in this activity. Utilities have been amassing large debts as a result of the wholesale price increases and their inability to pass these costs onto retail consumers. The DOE also issued directives prohibiting natural gas suppliers from withholding their supply deliveries to utility companies despite the same financial risks facing the power suppliers.[96]

The Energy Information Agency (EIA) states that despite all of these measures, the crisis has continued. The EIA cites several factors that have contributed to this continuing crisis:

- Lack of precipitation in the Northwest, reduced already scarce amounts of hydroelectric capacity in the Western States.
- Constrained capacity of the transmission lines hindered the importation of electricity into the State.
- The extended use of the power plants during the exceptionally hot summer months created a high level of planned and unplanned outages during the winter.

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[94] United States. Federal Energy Regulatory Commission. *FERC order 93 FERC 61294*. Issued December 15, 2000

[95] United States. Federal Energy Regulatory Commission. *FERC order 93 FERC 61294*. Issued December 15, 2000

[96] United States. Federal Energy Regulatory Commission. *FERC order 93 FERC 61294*, Issued December 15, 2000

- Several power plants had used their allotted emission allowances during the summer months, and the high costs of purchasing additional emission allowances prohibited their continued operation. [97]

Despite the best intentions of the FERC CalPX has suspended trading in its day-ahead and day-of markets as of January 31, 2001. Consequently, CalPX is currently no longer operating as a centralized auction for the buying and selling of power in California. The forward contracts already scheduled in the CalPX Trading Services (CTS) markets will be scheduled according to approved alternate delivery mechanisms.[98] CalPX, according to a January 30, 2001 letter to the Secretary of the FERC, "repeatedly explained its inability to immediately implement the $150 breakpoint." Requests for technical assistance and meetings with FERC apparently failed to provide a satisfactory results in achieving FERC goals. In an order issued January 29, 2001, FERC rejected CalPX's requests, ordering CalPX to immediately implement the $150 benchmark and to re-calculate all bills consistent with the benchmark.[99] The CalPX determined that it would not be able to implement the benchmark, and therefore could not continue operations and be in compliance with the auction restrictions associated with the benchmark. The CalPX Board of Governors voted unanimously to suspend trading in the CalPX day-ahead and day-or markets pending a satisfactory resolution to the breakpoint issue.[100]

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[97] "Energy Information Agency" Internet. February 2, 2001. www.eia.doe.gov/cneaf/electricity/california/subsequentevents.html

[98] Letter from James H. McGrew, Counsel for the California Power Exchange Corporation to The Honorable David P. Boergers, Secretary Federal Energy Regulatory Commission, RE: *San Diego Gas & Electric Company* Docket Nos. EL00-95-00 *et al*. January 30, 2001, p.1.

[99] Letter from James H. McGrew, Counsel for the California Power Exchange Corporation to The Honorable David P. Boergers, Secretary Federal Energy Regulatory Commission, RE: *San Diego Gas & Electric Company* Docket Nos. EL00-95-00 *et al*. January 30, 2001, p.1.

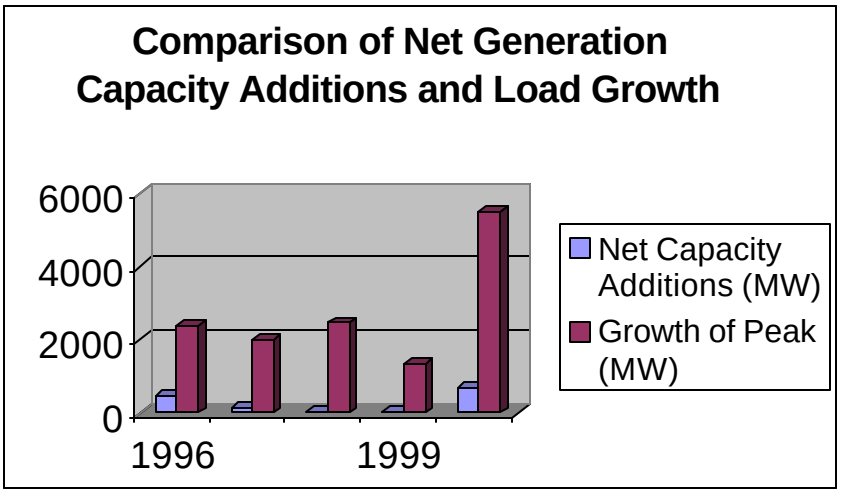
[100] Letter from James H. McGrew, Counsel for the California Power Exchange Corporation to The Honorable David P. Boergers, Secretary Federal Energy Regulatory Commission, RE: *San Diego Gas & Electric Company* Docket Nos. EL00-95-00 *et al*. January 30, 2001, p.1.

What Went Wrong?

Throughout recent months, it seems as though everyone has an opinion regarding the causes of the California energy crisis. The spectrum of these theories range from broad allegations of conspiracies and backroom deals manipulating prices and supply, criticisms of market structures and incentives, to blanket avowals that restructuring of the electricity market is simply not feasible and is potentially dangerous. An accurate assessment of the situation lies somewhere in the middle of this spectrum.

Six primary difficulties have plagued the California electricity markets: the disjunction between supply and demand, market design flaws, unrealistic expectations, a lack of incentives for conservation and demand-side responsiveness, insufficient transmission capacity, and the financial dire straits of the IOUs.

The first problem is the prolonged and fundamental disconnect between the level of supply and level of demand for electricity in California (and throughout the WSCC). Supply has remained flat and relatively stagnant while demand has increased sharply. Until the yawing gap between supply and demand is addressed, it is unlikely that other solutions will have a significant effect on ameliorating the impacts of the crisis.



The table above illustrates the gap between supply and demand faced by California. Demand increased 5,522 Mw, while supply or capacity has increased a mere 672 Mw. Other

authors have noted that during the past decade demand has increased 14 percent while supply has increased only 2 percent during the same period.[101]

Insufficient transmission capacity also negatively affects the operation of the electricity markets. Congestion on the grid results in significantly higher prices, because of the congestion charges tacked on to the wholesale price by CALISO. Congestion, particularly on Route 15, (the main line connecting northern and southern California) has contributed to a number of blackouts. For example, under congestion conditions surplus power generated in Southern California may not make it to Northern California where it might prevent a blackout in the San Francisco area.

Fundamental design flaws exist within the market structures created by AB1890. These flaws remained hidden while wholesale prices stayed below retail prices. Once shortage conditions arose, the market flaws were sharply exacerbated, manifesting in severe increases in the wholesale price of electricity over the summer of 2000. These market design flaws include: the exercise of market power, underscheduling in the forward markets and an over-reliance of the spot market for wholesale electricity purchases.

One of the major design flaws of the market (although intended to be a transitional structure) is the lack of demand-side responsiveness that translates into insufficient incentives for conservation. Retail customers have been insulated from the increasing cost of wholesale electricity because of the price cap. Thus, electricity end users have not faced prices that are tied to their consumption of electricity. The regulators therefore deregulated half of the electricity market while allowing the other half to remain under the old protective regulatory price caps. The retail price caps were effective in the early market, but under shortage conditions the IOUs were forced to buy electricity in the wholesale market at extremely high prices, yet were unable to pass the added cost onto their customers. Customers, because they did not feel the pinch of the increasing wholesale prices, had no incentive to conserve and cut back on their electricity consumption.

Extra-market conditions also have had a significant impact on the current energy crisis. Higher than average temperatures, below normal levels of rainfall in the West, and an increased

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[101] Moore, Adrian T, and Lynne Kiesling, "Policy Alternatives for the California Energy Crisis," p.8 http://www.rppi.org/ebrief109.html

number of unplanned maintenance outages are all conditions that further exacerbate tight supply conditions. There are no policy options that can address these conditions, and as such they introduce an element of uncertainty into the already delicate balancing act that a stable and reliable electricity grid requires.

In the months following the price spikes and ensuing electricity crisis of the summer of 2000, a wide variety of organizations and stakeholders have undertaken analyses of the causes of the crisis. Summaries of the most significant and illuminating of these are detailed below.

FERC

The FERC Staff Report identified three possible factors that contributed to the high prices of summer 2000. They are competitive market forces, market design problems and the exercise of market power. The FERC Staff Report stresses the importance of addressing these three problems in concert, as it is extremely difficult to assess the effects of any one explanation in isolation. For instance, even in a completely competitive market, scarcity alone can lead to price spikes and volatility that can be compounded by the increasing prices of inputs, leading to even higher prices.

CalISO:

CalISO, in its Comprehensive Market Redesign: Cost Impact Analysis identifies six fundamental problems that were the causes of the high prices seen this past summer:

- Exercise of Market Power (system-wide and locational)
- Insufficient Transmission Capacity
- Insufficient Generation Supply
- Inadequate Demand-Side Responsiveness to Prices
- Insufficient Forward Contracting
- Under-scheduling in the CalISO's Forward Markets.[102]

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[102] State of California. California Independent System Operator. "Comprehensive Market Redesign: Cost Impact Analysis." November 3, 2000. p. 8

CalISO has a slightly different assessment of the causes of the price spikes. While CalISO acknowledges the six different contributing factors, they stress the exercise of market power as being the "most direct and immediate cause of high wholesale prices."[103] Indeed, CalISO states that factors two through six that were the underlying causes of the structural market features that allowed significant abuse of market power to occur. Thus, their recommendations focus in the short-term on limiting the exercise of market power through the potential use of price caps (or bid caps) and providing incentives for buyers and sellers to enter into forward contracts. Simultaneously, CalISO will undertake long-term mitigation measures that will eventually eliminate the structural market design issues outlined by factors two through six. As explained above, FERC also notes that the exercise of market power was one factor, but does not elevate this factor as the primary cause of the high prices.

How Can We Fix It?

Goal

The Valley Industry and Commerce Association (VICA) is the client and primary consumer of this report. As such, the authors have taken into account the policy positions and goals of VICA in preparing the recommendations contained within this report. , In a meeting on (January 11, 2001, VICA's Environment, Infrastructure and Water Committee outlined VICA's position on the current energy crisis in California. The complete text of VICA's most current position paper on this issue is included as an appendix to this report.

VICA has outlined five broad goals that it believes must be met in order to resolve the current crisis in a manner satisfactory to consumers of electricity. Broadly, the goals that VICA seeks to attain identify a significant number of the underlying causes of the current energy crisis. The first goal advocated by VICA addresses the shortage of supply currently existing in the California electricity market, by advocating the adoption of measures to encourage the development of new

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[103] State of California. California Independent System Operator. "Comprehensive Market Redesign: Cost Impact

sources of energy. VICA also discusses the impact of the sharply increasing demand for electricity by advocating the adoption of measures that would encourage conservation and energy efficiency, as well as measures that would ultimately lead to the introduction of demand-side responsiveness in the retail market through real-time pricing for electricity consumers.

Also of concern is the worsening financial situation of IOUs. The IOUs have accumulated billions of dollars in debt due to the significant gap between the wholesale price and retail price of electricity. Their continuing debt burden and potential bankruptcy is especially disconcerting and has the potential, to further destabilize the electricity market and to create significant impacts on the state and national economy. Thus, VICA supports measures that would stabilize the financial situation of California's IOU's. Finally, VICA has correctly asserted that certain current market rules "prevent current generation capacity from operating at maximum production levels."[104] VICA advocates a review and revision of these regulations to mitigate some of the restrictive effects imposed by these regulations, while simultaneously minimizing the potential impacts of the revision on the environment and on other businesses.[105]

Criteria

In order to assess the relative efficacy of the various options available to both VICA and to state lawmakers, it is necessary to develop a set of criteria by which to evaluate these options. Since the purpose of our paper is to introduce a fully competitive electricity market, our criteria are designed to ferret out those options that will promote a sustainable competition in the electricity market. The criteria used for analysis include consumer protection, efficiency, safety and reliability, and environmental quality and resource diversity.

In the process of fixing the market and transitioning to a workable restructured industry, end consumers are not overburdened in the transition. Until competitive markets are instituted, they cannot be expected to bear the responsibility of the flawed design of the market structure.

Analysis." November 3, 2000. p. 8.

[104] Valley Industry and Commerce Association. "Position Paper on California's Energy Crisis of 2001." *Environment, Infrastructure & Water Committee*, January 11, 2001.

[105] Valley Industry and Commerce Association. "Position Paper on California's Energy Crisis of 2001." *Environment, Infrastructure & Water Committee*, January 11, 2001.

Furthermore, our recommendations must be such that they will allow price to behave as a proper informational signal to investors and participants in the market.

Ensuring the integrity of California's electrical grid will also be a goal of our recommendations. As for environmental quality and resource diversity, our recommendations need to take into account public interest in having a clean environment. Included in those considerations should be an unbiased evaluation of "alternate" sources of electricity including wind, solar and nuclear power.

Options

The authors of this paper have identified six primary difficulties that have plagued the California electricity market causing the crisis with which we are faced today. The six factors are the disjunction between levels of supply and demand, market design flaws, unrealistic expectations, a lack of incentives for conservation and demand-side responsiveness, insufficient transmission capacity, and the financial dire straits of the IOUs. The authors therefore categorize the options according to the problems they address.

Disparity Between Supply and Demand

This section discusses options that will increase the supply of electricity available to California, as well as options that focus on conservation and the introduction of demand-side responsiveness.

Increase Generation

One of the most obvious and yet cumbersome solutions to solving the energy crisis is increased generation. Unpredicted growth in California throughout the 1990s, coupled with increased demands of electricity through the growth of the digital economy caused the demand for

energy to balloon.[106] The Energy Information Administration (EIA) projects a continued national increase of electricity needs of 40 percent in the next 20 years, and the needed replacement of 25 percent of our current capacity.[107] Adrian T. Moore and Lynne Kiesling assert that over the past four years, the demand for energy in California grew by 14 percent. However, the supply of energy had increased by only two percent. No major power plants were built during the last decade. Throughout the 1990s, the state slipped from a position of supplying most of its own energy to importing more than 20 percent. [108] So far, generators are lining up to get into California's market. More than 17,000 Mw of new construction, expansion and upgrade projects have been licensed, filed or announced, according to the CEC.* (See appendix _)

While everyone agrees there is a great need to increase generation, there are vast differences as to what is the best method of producing additional generation. The construction of power plants is expensive with great barriers to entry. Developers must deal with a range of environmental restrictions mandated from the various levels of government from federal, to state, to county, and city. "Restrictions and red tape have presented a powerful disincentive to those who would build more power generators in California," stated Governor Gray Davis.[109] As a response to these disincentives, Davis has attempted to create a “fast track,” which would eliminate many of these barriers. Thus far however, there have been very few takers.

Besides the environmental restrictions, and the immense amount of capital investment required for the construction of new plants, there public opinion must also be confronted. The proximity of new energy generation facilities to urban areas is a huge concern to many residents and consumer advocacy groups. The concept of NIMBYism (Not In My Back Yard) is a strong force that politicians confront when the construction of new plants is proposed. Colorado Governor Bill Owens summarized California’s NIMBYism problem well when he said:

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[106] Hill, John, “How Utility Reform Fizzled,” *Bee Capitol Bureau*, January 7, 2001.

[107] Starr, Chauncey and Bertram Wolfe, “State's Energy Problem Has Roots Nationwide,” *Los Angeles Times*, January 3, 2001.

[108] Moore, Adrian T, and Lynne Kiesling, “Policy Alternatives for the California Energy Crisis,” pg.8 http://www.rppi.org/ebrief109.html

[109] Mendel, Ed. “Attempt to Spur Construction of Power Plants has Few Takers,” *Union Tribune*, January 8, 2001.

In Colorado, we've been building the power plants to serve our energy needs. It is tough, no one wants one in their backyard. It takes political will. Gov. Davis is a new governor but you can't brag on the one hand that California is No. 3 or No. 4 in the world as an economic force and on the other can't supply your own energy needs. I don't want Coloradoans to pay higher rates because someone else can't build plants and transmission stations. It's going to take political will to build the generating capacity.[110]

As recently as March 2001, residents in the City of San Jose were protesting the future construction of a power plant in their neighborhood. This same city experienced blackouts earlier this year during the state's extreme power crunch.

Further, there is the question of what type of generators should be constructed. In our not too distant past, nuclear power plants were hailed by all as the environmental solution to clean generation and the answer to efficient energy. Before 1973, even the Sierra Club supported nuclear power. Nuclear energy, which has no significant emissions, can also be among the low-cost energy sources, but it has political barriers to overcome. Since 1973, the influential "environmental" organizations have opposed oil, gas, coal and nuclear plants, as well as dams, and even geothermal plants. They instead argue for solar and wind power, which in order to supply significant amounts of energy, are impractical because of their immense land use and their intermittent availability; indeed, on such a scale they are environmentally detrimental.[111]

Due to concern over nuclear waste, and tightened environmental restrictions, no nuclear power plants have been constructed domestically since the late 1980s. Nevertheless, several nuclear power plants have been built abroad by U.S. companies, often constructed within four to five years. However, since environmental restrictions tightened significantly in 1973, these plants now take and cumbersome 10 to 20 years to build in the United States. Energy experts Chauncey

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[110] Kraul, Dan Morain, Chris, and Mitchell Landsberg, "Deepening Crisis Raises Specter of Power Rationing," *Los Angeles Times*, December 21, 2000.

[111] Starr, Chauncey and Bertram Wolfe, "State's Energy Problem Has Roots Nationwide," *Los Angeles Times*, January 3, 2001.

Starr and Bertram Wolfe[112] state: "the 103 existing nuclear plants (ordered before 1973) remain a vital, safe, electricity source in California and in the U.S."[113] Continued studies are needed to prove that safe nuclear plants can be built in the U.S. within an efficient time frame and with little nuclear waste. Starr and Wolfe assert:

Nuclear energy can provide an essentially unlimited supply of energy economically. [Although some environmentalists would disagree] the real concerns are fossil fuel environmental impacts and the lack of energy in the coming decades when oil and gas supplies are exhausted and, in the following century, when economic coal supplies are depleted. The near-term expansion of nuclear energy would allow us to mitigate global warming and to lengthen the availability of specially needed fossil fuels. Although long-term nuclear wastes can be safely accommodated, advanced nuclear plant designs will allow us to modify the nuclear wastes so that they lose their radioactivity in just a few hundred years.[114]

California First

Many critics have asserted that part of the current crisis is due to a lack of a "California first policy." That is, they judge that energy generated within the borders of California should be mandated to first fulfill all of California's energy needs before it is allowed to be sold to out of state buyers. There are many concerns with this approach. First, under AB 1890, the "voluntary divestiture" of generation capacity, invited several out of state companies to purchase electricity generators in California. Attempts by California to require out-of-state companies to sell its energy first to California, and only its surplus to other states would violate the "Interstate Commerce Clause." At best, California's Congressional delegation could advocate the passage of federal legislation allowing for a "state first" policy during times of crisis such as a stage two or three

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[112] Bertram Wolfe, a Former Vice President of General Electric, Is an Independent Consultant and a Fellow and Past President of the American Nuclear Society. Chauncey Starr, Dean of the UCLA School of Engineering and Applied Science From 1967 to 1973, Is President Emeritus of the Electric Power Research Institute, of Which he Was a Founder

[113] Starr, Chauncey and Bertram Wolfe, ""State's Energy Problem Has Roots Nationwide," *Los Angeles Times*, January 3, 2001.

[114] Starr, Chauncey and Bertram Wolfe, ""State's Energy Problem Has Roots Nationwide," *Los Angeles Times*, January 3, 2001.

alert.[115] It is unclear if Congress would consider passing a bill that would allow states a type of self-preservation during these types of crisis.

Another critique of this policy is that it contradicts the necessary regional solidarity of the Western states. It is dispiriting to consider what California's energy future might look like if either Oregon or Washington adopted such a policy. California has long depended on its Western neighbors in times of need when such unpredictable and uncontrollable factors such as weather and fuel prices have deprived California from being able to fully supply the state's energy needs. Regionalism, in fact, lowers the price of electricity. Without cooperation, California and the other Western states would each have to build enough power plants to supply energy to their respective states at their peak demands.[116] Implementing this plan in time for Summer 2001 will require fast action by the CPUC, the legislature the Governor. Once adopted, the utilities would have to act quickly to supply and install the meters before summer.

Relaxed Environmental Regulations

Another regularly mentioned solution to our crisis is to relax the environmental regulations that restrict certain plants from operating at full capacity. In September, the legislature passed a law allowing "fast track" granting of permits to build new plants. A part of this measure included relaxing environmental emission restrictions for certain plants that supply energy during peak periods of consumption.[117] However, pollution laws are still more stringent than they were 10 years ago. Thus far, only one plant (located near the San Francisco airport) that qualifies for this exception is currently under construction.[118] In February 2001, Davis also passed a slew of executive orders allowing for relaxation of environmental restrictions during California's "state of emergency" which he declared on January 17, 2001. *(See appendix _)

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[115] Stage two and three alerts have been defined as to periods when the State's available reserves dip below five and one and half percents, respectively.

[116] "Electrons without borders: California can't make itself an energy island," *Sacramento Bee*, January 10, 2001.

[117] Wilson, Marshal, " State Vetting 'Peaker' Power Plant Near SFO: Temporary site gets less stringent pollution rule," *San Francisco Chronicle*, January 3, 2001.

[118] Wilson, Marshal, " State Vetting 'Peaker' Power Plant Near SFO: Temporary site gets less stringent pollution rule," *San Francisco Chronicle*, January 3, 2001.

Decreasing demand & Incentives for Conservation

Real Time Pricing: Creating Demand Side Responsiveness

As previously mentioned, a major flaw in our current market structure created by the wholesale price caps imposed under AB1890 is the lack of demand-side responsiveness. At this time, the way the market is structured is such that energy prices escalate during peak hours of usage, as demand increases so do prices. Thus, if demand can be reduced during peak times, prices can theoretically be lowered. "A demand increase of 1,000 Mw increases the wholesale price much more when the system demand in California is already 41,000Mw than when it is 35,000."[119]

Real-Time Pricing (RTP) is one method of achieving conservation at the most crucial times of usage. By using meters that alert consumers when they use the most energy, consumers can precisely pinpoint hours to conserve energy. It sends an accurate economic signal about the value of conservation at the times that are most expensive to consumers. It also leaves the decision of how and when to conserve to the consumer, instead of service interruptions and rolling blackouts that are not only extremely inefficient, but also a threat to public safety. RTP also distributes conservation broadly instead of isolating specific cities or regions.[120]

By reducing demand at peak times and prices, RTP provides savings to the overall pricing scheme by eliminating the purchase of the most expensively priced energy, which is sold during those times to all buyers. The reduction of a few thousand Kw of energy bought during peak times lowers the overall marginal cost for all buyers. The foremost effect of RTP will be to reduce total payments to merchant generators in the wholesale market. Reducing these payments will benefit all customers in the state both those with RTP meters and those without.

Those who will most benefit from RTP are the consumers who use a lot of energy during peak times, and are able to reduce their usage during these times. Customers who consume a

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[119] Borenstein, Severin, "Frequently Asked Questions About Implementing Real-Time Electricity Pricing in California for Summer 2001," March 2001. p. 4.

[120] Borenstein, Severin, "Frequently Asked Questions About Implementing Real-Time Electricity Pricing in California for Summer 2001," March 2001. p. 5.

relatively flat amount of energy will also benefit greatly by paying lower prices during peak times due to the overall drop in the total amount of energy demanded and purchased.

The Summer 2001 forecast is bleak. There is much talk of looming blackouts and soaring energy prices statewide. The area controlled under the ISO is estimated to be 2,000-5,000 Mw short during peak times this summer.[121] Implementing real-time pricing meters on high-end energy consumers before the summer is one means of defending ourselves from the impending blackouts. The estimated cost of supplying and installing meters to all 200Kw and above users[122] is approximately $30 million. While this seems like a prohibitive cost, it must be weighed against the savings that it will produce. Borenstein asserts that the savings earned during the first few weeks of this type of program would outweigh the costs of implementation. More importantly, it would help California to avoid rolling blackouts, which is estimated to cost approximately $1 per California citizen during each blackout.[123]

In order to be effective, RTP will need to become the default option for all high-end energy users. Customers could still choose to sign financial contracts with energy marketers as shelter from peak time price gouging. However, these contracts are usually for a fixed amount of power, and still allow for exorbitant prices at the margin. Thus, even these customers would still have the incentive to conserve. By making RTP the default, if customers use extra power, they would pay the RTP price for the additional energy.[124]

Conservation and Increased Efficiency

A much mentioned topic in recent months is conservation. It is evident that there exists an energy shortage, and as previously mentioned, our current market structure provides little if any

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[121] Borenstein, Severin, "Frequently Asked Questions About Implementing Real-Time Electricity Pricing in California for Summer 2001," March 2001. p. 4.

[122] In his March 2001 report on RTP, Borenstein asserts that RTP "is clearly cost-effective for large users, but may not be for very small users." 200 KW and above users constitute about 30% of peak load. He explains that further study is needed to determine if it is cost-effective to install meters at the residential level.

[123] Borenstein, Severin, "Frequently Asked Questions About Implementing Real-Time Electricity Pricing in California for Summer 2001," March 2001. p. 7.

[124] Borenstein, Severin, "Frequently Asked Questions About Implementing Real-Time Electricity Pricing in California for Summer 2001," March 2001, pg. 10.

incentive to conserve. Most resident consumers are cushioned by the state mandated price cap, from experiencing any real fluctuation in their electricity bill. Unless changes are made to the market structure to create incentives to conserve, other measures must be taken to encourage conservation by both businesses and residents.

The state has already taken action in this measure through television commercials and other public announcements. Despite the lack of economical incentives, Californians can and should be encouraged to decrease the amount of energy consumed, especially during peak times. Habitual lifestyle changes are often difficult for the state to promote. However, in light of recent rolling blackouts, consumer awareness has been heightened, and consumers are beginning to cut back on electricity consumption.

Governor Davis has created an economic incentive for businesses to conserve through his executive order issued in February 2001. Through this order, businesses deemed to be wasting energy after hours by using outdoor lighting, can be charged with a misdemeanor and fined up to $1,000. More recently, Davis signed an executive order stating that the Department of Water Resources shall implement a limited-term rate reward program. Under this program, customers who conserve 20 percent of their June through September consumption will receive credit towards their future bills. *(see appendix)

Market Flaws & Redesign Options

Over reliance on the Spot market or increasing long-term contracting

Spot markets are plagued by volatility. In the state of California nearly 100 percent of the load is served by spot market purchases.[125] The volatility in the spot market translates into reliability and stability issues in the electricity grid. The shifting of purchases from the spot market into longer term contractual arrangements will generate increased price stability. Long-term contracts represent a significant and highly effective hedging instrument for IOUs to insulate themselves against volatile

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[125] United States. Federal Energy Regulatory Commission. *Staff Report*. ????

prices and increasing costs in the spot market. Increasing reliance on longer-term contracts also will have the effect of reducing opportunities for many suppliers to exercise market power. Therefore, forward long-term contracts have the potential to reduce the impact of cost increases on consumer bills and frequency and magnitude of price spikes.

A recent report conducted by the University of California at Berkeley's Energy Institute, states that while long-term contracting may reduce some of the volatility experienced in the costs of power purchases, the prices of long-term contracts are unlikely to be systematically lower than the spot prices on average.[126] The logic behind this reasoning is based upon expected prices. The current offer prices for power over the next couple of years in California are high. This is because sellers are anticipating that the spot market prices will continue to be high as well over the same period.

The two contrasting cases of California and the Pennsylvania-New Jersey-Maryland pool illustrate this point well. Over the summer of 2000, in California, power contracted for in advance was cheaper than spot power, because the expected prices for the summer were well below the spot prices that resulted. Meanwhile in the Pennsylvania-New Jersey-Maryland pool, those who contracted for summer power in advance ended up paying higher prices than those who bought in the spot market. This was because unseasonably mild temperatures led to lower prices than expected.[127]

One of the benefits of longer-term contracts is that they reduce the opportunity for multiple firms to exercise market power and operate less competitively in the marketplace.[128] The existence of many trading options (contracts) over time makes it very difficult for multiple firms to continually avoid cutting their prices, as they can in the spot market, because firms will be seeking a competitive edge in the long-term contracting markets. Essentially, "once a firm has sold some output in

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[126] Bornstein, Severin. *The Trouble With Electricity Markets (and some solutions).* POWER Working Paper, Program on Workable Energy Regulation, University of California at Berkeley, January 2001. p. .7.

[127] Bornstein, Severin. *The Trouble With Electricity Markets (and some solutions).* POWER Working Paper, Program on Workable Energy Regulation, University of California at Berkeley, January 2001. p. 8.

[128] Bornstein, Severin. *The Trouble With Electricity Markets (and some solutions).* POWER Working Paper, Program on Workable Energy Regulation, University of California at Berkeley, January 2001, p. 8.

advance, it had less incentive to restrict its output in the spot market in an attempt to push up prices in that market."[129]

Energy service providers (ESPs) and other buyers in the market have concerns regarding long-term contracts. There is the possibility that buyers could become locked in to paying prices that are significantly higher than they would have paid in the short-term markets. There is also the concern that those contracts could be considered imprudent, and that regulators would not allow the ESP's to pass those costs on to their consumers.

The FERC *Staff Report* lists several recommendations that were mandated through FERC's December 15th order, addressing the issue of long-term contracting. The December 15th order eliminates the CalPX buy-sell requirement, freeing utilities to enter into long-term forward contracting outside of the CalPX market structure. As a result, the IOUs can develop portfolios of supply contracts achieving more stable energy costs.[130] Options for encouraging the use of long-term contracts that FERC did not mandate in the December 15th order include requiring the IOUs to hedge and forward contract, and requiring all in-California thermal generation to be bid into forward markets. The FERC *Staff Report* recommended against the implementation of requiring the IOUs to hedge and forward contract because it was less efficient, substituting the judgment of regulators for the judgment of business managers. The FERC states that providing businesses with financial incentives in a manner that minimizes costs is more efficient than a regulatory strategy.[131]

The FERC also decided against the option of requiring all in-California thermal generation being bid into the California forwards markets. The reasoning behind the rejection of this option essentially boils down to the fact that it would be extremely difficult to administer, monitor and enforce. Creating a distinction between in state generators and out-of-state generators could have

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[129] Bornstein, Severin. *The Trouble With Electricity Markets (and some solutions).* POWER Working Paper, Program on Workable Energy Regulation, University of California at Berkeley, January 2001. p. 8.

[130] United States. Federal Energy Regulatory Commission. *FERC Staff Report to the FERC on Bulk Power Markets in the United States.* Issued November 1, 2000. p. 6-5.

[131] United States. Federal Energy Regulatory Commission. *FERC Staff Report to the FERC on Bulk Power Markets in the United States.* November 1, 2000. p. .6-6.

the effect of "balkanizing the wholesale market and discouraging new investment in generation in California."[132]

In its November 3, 2000 report, CalISO states that a potential long-term solution to the problem of over-reliance on the spot market is to shift a substantial portion of the load (80-90 percent each hour) to the forward contract markets.[133] CalISO states that forward contracting is the most reliable method to "reduce the impact of spot market volatility, advance the transition to a mature competitive market, and in combination with adequate supply capacity, to lower costs."[134] Long-term contracts also provide incentives for new investors as they represent a reliable income stream that potentially reduce the cost of project finance.[135]

Transforming the CALPX from a single-price (uniform) auction to a pay-as-you-bid (discriminatory) price auction

There has also been a great deal of discussion regarding changing the auction rules in the CalPX. The CalPX uses a uniform-price auction. In a uniform-price auction the auctioneer purchases power from the sellers who submit the lowest bids, but pays each successful bidder the highest bid accepted.[136] In a discriminatory auction the auctioneer also buys power from the lowest bidders, but in this type of auction the bidders are paid the price they bid. The common expectation is that the uniform price auction pays the majority of bidders a higher price than they would have received under a different set of auction rules. This is not the case, because under different auction rules, firms would simply alter their bidding behavior to take advantage of the new structure.

There have been several studies addressing the relative advantages of the discriminatory price auction versus the uniform-price auction. Wolfram, in her examination of the England and

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[132] United States. Federal Energy Regulatory Commission. *FERC Staff Report to the FERC on Bulk Power Markets in the United States*. November 1, 2000. p. 6-7.

[133] State of California. California Independent System Operator. *Comprehensive Market Redesign: Cost Impact Analysis*. November 3, 2000, p.11.

[134] State of California. California Independent System Operator. *Comprehensive Market Redesign*. p. .11.

[135] State of California. California Independent System Operator. *Comprehensive Market Redesign*. p. .11.

[136] Wolfram, Catherine D. "Electricity Markets: Should the Rest of the World Adopt the United Kingdom's Reforms?" *Regulation ?????*

Wales Electricity Pool, discusses the relative merits of the uniform and discriminatory auctions. She notes that if each bidder was educated about other likely bids and about the levels of demand, each firm would bid up to or at the expected market-clearing price in a uniform-price auction. Thus, the "apparent tendency of a uniform-price auction system to pay some producers more than they would be in a discriminatory auction is an illusion."[137]

The CalPX commissioned a study to analyze the potential impacts of a switch from a uniform to discriminatory price auction. The CALPX study states that:

…since all the infra-marginal bids-the ones below the highest marginal cost output necessary for the sum total of accepted bids to satisfy market demand-will under uniform pricing receive *more* than their bid prices…the change in rules would simply wipe out those markups; that the average price purchasers will have to pay under pay-as-bid will incorporate no markup above marginal costs at all.[138]

Several immediate effects would result from the introduction of the new auction rules. Firms would alter their bidding behavior radically. This altered bidding behavior would essentially wipe out the expected savings from the expected lower prices, weaken competition in generation, and impede the expansion of capacity in the market.[139] The CalPX commissioned study concludes that the introduction of a discriminatory price auction would do consumers more harm than good.

Open market bidding

Open market bidding has been a popularly voiced alternative to the current market system. As previously noted, presently there is a private bidding system through which the energy seller with the highest bid generates the "clearing price." All energy is then sold at that price for the allotted time of the specific market. The dilemma arises in that there is no public scrutiny of this process. Proxy measures can provide some evidence of the exercise market power. However, these measures are insufficient in pinpointing specific actions by individual firms or collusive groups of

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[137] Catherine Wolfram. "Electricity Markets: Should the Rest of the World Adopt the United Kingdom's Reforms?" *Regulation*

[138] Kahn, Alfred E., *et al. Pricing in the California Power Exchange Electricity Market: Should California Switch from Uniform Pricing to Pay-as-Bid Pricing?* Study Commissioned by the California Power Exchange, January 23, 2001, p. 4.

[139] Alfred E. Kahn. *Pricing in the California Electricity Market*. P.2.

firms. Opening the entire bidding process to public scrutiny would decrease the potential for such activities.[140]

Critics of the open market bidding proposal include the power companies who are selling the electricity. They argue that public scrutiny will display company secrets to rival firms. Rebuttals to the companies' concerns come in the form of delaying the release of the data for a few months in order to assure that rivals companies do not take advantage of the released information.[141]

During the last several months of the CalPX transactions, roughly 85 to 90 percent of all transactions and bidding were being done through the spot markets. In other restructured countries such as Norway and Sweden, only 10 percent of transactions are completed through these markets.[142] Frank Wolak compares this reliance on the spot markets as "to having air travelers show up at the airport the day before flying to bid on tickets."[143] FERC attempted to stymie the reliance on the spot markets in their December 15th 2000 order. However as previously mentioned, it arrived too late to enact, and the CalPX due to its inability to institute the mandated changes, was forced to relinquish its activities January 31st 2001.

Transmission Capacity

State government purchase of transmission lines

Recently, Governor Davis has pressed for the purchase of 40,000 miles of transmission lines owned by the utilities for $8 billion. He espouses that the state could better control them. This proposed solution is currently in committee, and would do little to change our current situation, because CalISO already controls the utilities lines. It would simply enable the State of California and Governor Davis to "bail out" the cash-strapped IOUs without facing public outcry that the utilities are getting "something for nothing."

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[140] Berthelsen, Christian, and Scott Winokur, "Secret Energy Pricing," *San Francisco Chronicle*, January 7, 2001.

[141] "Set Power Rates Openly, Not Behind Closed Doors." *San Francisco Chronicle.* January 9, 2001.

[142] Hill, John, "How Utility Reform Fizzled." *Bee Capitol Bureau*. January 7, 2001.

[143] Ibid.

Transmission Citing

According to the CEC's 1996 Energy Report (ER96), "transmission line citing jurisdiction is fragmented." [144] The report states that because of this fragmentation in the oversight of licensing, needed projects may not be built.

Miscellaneous options

Eminent domain

Several critics have scorned California Governor Gray Davis for his lack of action and leadership during the energy crisis. Consumer advocate, Harvey Rosenfield has been oft quoted criticizing Davis for not reacting to this crisis in manner that reflects the urgency of the situation. He asserts that there exists an "energy cartel,"[145] which needs to be confronted and that Davis has the power to move in that direction. Rosenfield goes so far as to say that plants should be seized by the state to "protect public health and safety."[146]

Rosenfield is not alone in his support of the use of eminent domain. Davis himself mentioned the possibility of seizing plants if necessary in his "State of the State" address in early January. He also advocated sending in state officials to assure that plants were operating at full capacity during peak times. He has yet however, to act on any of these threats.

The most likely reason that Davis has yet to pursue this option is that seizure of power plants does nothing to solve the problem. It only changes ownership of the plants, making them public instead of private property. The state would have to pay fair market value for the plants, and the added costs of any lawsuits that they might face in light of such seizures. Another reason that Davis has not proceeded with this option is that since many of the generators are owned by out of state companies, Davis may not have the jurisdiction to force them to operate at any cost. Ultimately, the U.S. Congress controls "interstate commerce."[147]

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[144] "Electricity Report, 1997", California Energy Commission, November 1997, pg. 76. http://www.energy.ca.gov/ER96/FINALER96.PDF

[145] Rosenfield, Harvey, "Power Grab not the Answer to Power Crisis." *San Francisco Chronicle*, December 21, 2000.

[146] Rosenfield, Harvey, "Power Grab not the Answer to Power Crisis." *San Francisco Chronicle*, December 21, 2000

[147] *U.S. Constitution*. Section 1, Article VIII.

Utility Bankruptcy

Since the electricity crisis that California faced this past summer, the IOUs have accumulated significant debts due to their inability to pass on the high costs of electricity to their customers because of the retail price caps. This debt accumulation has reached billions of dollars, and there is currently no end in sight. The stock of the IOUs is just shy of being classified as junk bonds, and they have defaulted on several loans. Banks have been unwilling to extend their credit leaving the IOUs unable to purchase electricity in the wholesale market for their customers. The state has been forced to enter into the market and purchase power directly from producers because the IOUs credit ratings have plummeted.

The question confronting policymakers and the citizens of California alike is who should pay the debt accumulated by the IOUs. Four primary groups could be saddled with this burden: electricity consumers, the taxpayers of California, IOU shareholders and producers. The most likely scenario is that the cost will be shared amongst these four groups.

Electricity customers are the most obvious and vulnerable group who could be burdened with this debt. Rate hikes are inevitable in California. The argument justifying this approach is that Californian electricity consumers have been insulated from the true cost of electricity by the retail price caps instituted under AB 1890. Therefore, it is appropriate to gradually and reasonably raise the price of electricity to a level that more closely matches costs. The arguments against burdening consumers are based upon the notion that the recent price hikes were done with market power by out-of-state producers who took advantage of the CALPX market rules.

Taxpayers are also likely to be burdened with a portion of the IOUs' debt. The argument in favor of this approach is that the taxpayers of California elected the legislators who designed the restructuring plan and implemented the structure in place today. Thus, by implication the taxpayers are responsible for the system, flawed though it may be, that we have now. Taxpayers are also likely to be the ultimate payers of this debt, through the repayment of bonds that will be issued if the state decides to purchase the transmission lines from the IOUs, or if the state embarks on a blatant 'bailout' of the utilities themselves. The arguments against burdening the taxpayers again place the blame for the debt on the utilities and the out-of-state producers who exercised market power and raised wholesale prices.

Shareholders of the IOUs are also expected to be targeted as debt payers. The arguments in favor of burdening the shareholders state that the shareholders accumulated significant gains during the initial operation of the market. Prior to the shortage conditions of the summer of 2000, the utilities were operating at a huge profit and distributing a portion of these profits to their shareholders. These arguments tend to view the IOUs as any other business, and claim that the shareholders of IOUs take risks, as do any other shareholders, and thus should be prepared to pay the cost when their investment goes sour.

The difficulty with this argument is that the market structure imposed by restructuring was ultimately the act of state regulators, which imposed upon the utilities the divestiture process, and retail price caps that have ultimately contributed to the financial difficulties of the IOUs. The absolute disconnect between wholesale costs and retail pricing has trapped the IOUs in a situation that would not have occurred had the electricity market been fully restructured for competition. The utilities have been prevented, by imposed regulations, from operating as any firm in a competitive market would. Thus, it is unclear that debt created by state mandated regulatory structures should fall upon the shoulders of IOU shareholders.

This situation is muddied further by the fact that the IOUs themselves played a large role in the design and passage of AB 1890. The IOUs were satisfied with the agreement back in 1996, and should not cry foul, because things did not turn out as planned.

The fourth group likely to be targeted for the debt burden is the out-of-state producers. These include the firms that purchased the divested assets of the California IOUs, as well as other generators that have been selling electricity in the California markets. At the time of the writing of this report, numerous investigations at both the state and national levels have been convened to assess the actions of the out-of-state producers from the summer of 2000 through the present. There have been widespread accusations that these producers, either singly or in concert, acted to restrict available supply and significantly raise the wholesale price of electricity.

In early March of 2001, the FERC ordered power producers to refund nearly $70 million or energy that was sold during the January 2001. The producers will be forced to pay this penalty if

they cannot prove that the prices they charged were justified.[148] This ruling placed the onus on producers to prove that they did not engage in behavior manipulating the market. The California State Senate, as well as both Houses of Congress, has launched similar investigations to determine whether or not producers engaged in collusive behavior manipulating the wholesale price of energy in the California market. The results of these investigations are critical with regard to the possible solutions available to address the debt burden of the IOUs in California.

Frank Wolak, an economist at Stanford University, conducts regular market surveillance reports for the CalISO, and has repeatedly found evidence of overt market manipulation.[149] Wolak states that his work showed that market manipulation accounted for $8 billion in overcharges out of a total of $27 billion paid for electricity in California for the year 2000.[150] A refund of that $8 billion would go along way to ameliorating the financial difficulties that the California IOUs currently face. The total combined debt is being reported by the utilities at nearly $13 billion.[151]

Due to the financial difficulties of the IOUs, and because the CalPX suspended trading on January 31, 2001, the State of California has been operating as the power buyer for the state. The state has been spending at least $1.5 billion a month from the general fund to purchase power for the state. Approximately $4.2 billion has been set aside for this purpose from the general fund so far.[152] State lawmakers are hoping to repay the general fund with the proceeds from a $10 billion bond that could be issued in May. The most recent estimates for purchasing power for next two years are in the neighborhood of $23 billion. The state has also announced a plan, ordering PG&E and SCE to pay the QFs that provide nearly a quarter of the state's power.[153] Several of the QFs ceased operations because SCE and PG&E have been unable to pay the small generators. The key

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[148] Kimberly Kindy. "Studies Show Pitfalls in Power Market." *Orange County Register*, www.ocregister.com/news/invest00325cci.shtml.

[149] Kimberly Kindy. "Studies Show Pitfalls in Power Market." Internet. *Orange County Register*, March 25, 2001. www.ocregister.com/news/invest00325cci.shtml.

[150] Kimberly Kindy. "Studies Show Pitfalls in Power Market." Internet. *Orange County Register*, March 25, 2001. www.ocregister.com/news/invest00325cci.shtml.

[151] Ed Mendel. "Bond May Fall Short, Davis Aides Fear." Internet. *San Diego Union Tribune*, march 25, 2001. www.uniontrib.com/news/uniontrib/sun/news/news_1n25power.html.

[152] Ed Mendel. "Bond May Fall Short, Davis Aides Fear." Internet. *San Diego Union Tribune*, march 25, 2001. www.uniontrib.com/news/uniontrib/sun/news/news_1n25power.html.

difficulty with the situation is that the state is ultimately going to have to finance all of this through bond issues. The current plan, including paying off the two proposed large bond issues and paying the QFs strains the existing rate structure in place.

Wall Street has told lawmakers that a clear revenue stream must be in place before the state can issue the bonds in May. To ensure this revenue stream CPUC on March 26 enacted a retail rate hike of 3 cents per kilowatt-hour. The rate hike is not an 'across the board' hike, and will address the financial situation of PG&E and SCE by generating an additional $2.5 billion in revenues for PG&E and an additional $2.3 billion for SCE.[154] However, according to Steven Fleishman, an analyst at Merrill Lynch, the rate hike order leaves some questions unanswered and has several strings attached to it. Fleischman stated in a research note that the order "deliberately restricts" the additional revenue from being put to use against past power purchases made by the utilities.[155] Therefore, it appears as though the rate hike will not adequately address the debt burden facing the utilities.

Recommendations

Identifying possible solutions to the California energy crisis is a daunting task. It is clear that the crisis will not be solved by a single policy option. Any set of recommendations must include a multiplicity of options integrated to achieve the long-term goal of instituting a stable, reliable and efficient market structure that will assure reasonably priced delivery of electricity to the citizens of California.

Crucial to the reparation of the electricity markets in California is the development of a long-term vision. The authors of this report believe the long-term goal should be to implement policy actions that will repair the flawed structures of the restructured electricity market, and to put

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[153] Ed Mendel. "Bond May Fall Short, Davis Aides Fear." Internet. *San Diego Union Tribune*, march 25, 2001. www.uniontrib.com/news/uniontrib/sun/news/news_1n25power.html.

[154] Myra P. Saefong. "Regulators Grant Rate Hike for Utilities." Internet. *CBS MarketWatch*, March 27, 2001, www.cbs.MarketWatch.com.

[155] Myra P. Saefong. "Regulators Grant Rate Hike for Utilities." Internet. *CBS MarketWatch*, March 27, 2001, www.cbs.MarketWatch.com.

California back on the road towards a competitive electricity market. The achievement of this goal must entail several steps:

- Addressing the Financial Stability of the Utilities
- Ending the State's Role as the Sole Power Purchaser in California
- Repairing Existing Market Structures
- Increasing Generation Capacity
- Instituting Demand-Side Responsiveness and Conservation Initiatives

A comprehensive plan to repair the electricity industry in California must recognize that it took a significant amount of time for the current crisis to occur, and that no short-term, painless solution is available. The choices to be made are difficult but essential to end the current crisis and to put California back on the road to a competitive electricity market.

Addressing the Financial Stability of the IOUs

The financial stability of the investor owned utilities in California is critical to the successful functioning of the restructured electricity market. The IOUs must be creditworthy in order to be able to purchase power and successfully perform their function in the restructured market. Currently the IOUs have accumulated combined debts estimated at some $13 billion dollars. In order for a competitive electricity market to once again emerge in California, the IOUs must be made financially solvent. IOU participation in the CalPX is necessary for its operation and success.

At the time of the writing of this paper, the precise options open to state regulators and other influential participants are unclear. There appear to be two separate strategies being advanced at this time: imposition of penalties against producers who illegally 'gamed' the market to raise wholesale prices; and rate hikes and bond issues.

As mentioned in the proceeding sections, the FERC recently issued an order requiring power producers to refund nearly $70 million dollars, unless the producers can prove that they did not engage in illegally manipulative behavior. There are several other investigations underway, and several independent studies appear to indicate that there is at least some evidence of illegally

collusive behavior. It is at the moment unclear as to what the results of these investigations will be. It is also unclear as to manner in which any penalties or potentially mandated refunds will be distributed. Should the utilities or the state receive payments first? Questions abound.

The CPUC issued a rate hike of 3 cents per kilowatt-hour on March 27, 2001. However, this rate hike apparently does not allow the utilities to apply any of the additional revenue against past-incurred debts. This essentially means that the rate hike will help prevent the accumulation of further debts, but does nothing to relieve the primary question of how to pay off the IOU debt. It would have been wiser to have issued the rate hike without the restrictions on usage of the additional revenues, and allow the IOUs to apply the additional funds according to their own needs assessment.

It is the recommendation of this report that any further measures to increase rates, or to distribute penalties or refunds should allow utilities to apply these funds against the debts accumulated during the crisis.

Ending the State's Role as the Sole Power Purchaser in California

The inability of the IOUs to recover the costs of wholesale power in the retail market has forced the utilities to finance the purchase of electricity through loans and other forms of credit. Eventually the banks simply refused to grant the utilities any further credit. The State of California was then forced to enter into the market as the sole power purchaser in the state. Thus, as a result of this crisis, the state has taken on a greater role in the electricity industry than it had under the previous regulatory regime.

It is difficult to envision the California electricity market two or five years in the future. The state simply cannot continue in its role as the sole purchaser of electricity in California. The costs of this endeavor are staggering. There are estimates that it will cost the state nearly $23 billion to continue to supply electricity to the citizens of California for the next two years.[156] Currently, the state is purchasing electricity with money from the surplus in the general fund. These expenditures will have to be recovered through a bond issuance likely to occur in May. There is doubt as to

whether the existing rate structure can withstand the pressure that will be created as a result of these increased expenditures by the state.

Therefore, it is the recommendation of this report that the state take measures to ensure the financial solvency of the IOUs and allow them to once again perform their role in the restructured market. The state should endeavor to remove itself from the market as the additional recommendations of this report are implemented and the market becomes increasingly competitive and viable. As a result, it is also the recommendation of this report that any measures that would require the state to become a more active participant in the electricity market, such as purchasing the transmission lines and the use of eminent domain, should be vigorously opposed.

Repairing Existing Market Structures

A third recommendation of this report is that steps should be taken by the appropriate regulatory bodies to repair the flawed market structures that have contributed to the current crisis. Naturally these recommendations are dependent upon the reopening of the CalPX auction, and the removal of the state as a power purchaser in the market.

Steps must be taken to prevent collusive behavior in the market. Instituting an open bidding process would provide the necessary information to market participants. Open bidding would also provide for an added measure of accountability as all bids, not just the market-clearing bid, would be available for immediate public review.

Further steps should be taken to allow participants in the CalPX to engage in long-term contracting. A variety of hedging instruments should be made available to market participants. A variety of long-term contracting options will allow market participants to spread the risks, and will reduce reliance on the spot markets. Long-term contracting also has the benefit of introducing added measures of security to the planning and scheduling operations of the CalISO, and will allow for increased accuracy in forecasting loads, and anticipating shortages and potential congestion issues.

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[156] Ed Mendel. "Bond May Fall Short, Davis Aides Fear." Internet. *San Diego Union Tribune.* March 25, 2001. www.uniontrib.com/news/uniontrib/sun/news/news_1n25power.html.

Therefore, it is the recommendation of this report that any measures increasing the availability and attractiveness of long-term contracting options should be advocated and supported. An open bidding process should also be advocated in order to allow for the curtailment of collusive behavior and the exercise of market power by energy producers.

Increasing Generation Capacity

Increasing generation capacity is critical to the success of the California energy market. There has been a fundamental and sustained disparity between the growth in energy demand and the growth of energy supply in California. California simply must increase its domestic generation capacity. It is no longer feasible to rely on imports of electricity from neighboring states, as demand in those states has also risen sharply in the past decade.

To achieve this goal, this paper recommends advocating and supporting measures that will allow for rapid development of new generation capacity. This recommendation should include measures to ease the burdensome bureaucratic process to obtain permits and licenses. Of course, retooling of the permitting process should not be enacted at any cost. While it may currently be necessary to reevaluate the balance between generation needs and environmental protection, policymakers must be sensitive to the potential environmental impacts of these new measures.

Instituting Demand-Side Responsiveness & Conservation Initiatives

Critical to the success of the restructured electricity industry is the introduction of demand-side responsiveness. One of the major causes of the current energy crisis was the disconnect between wholesale and retail prices. Residential end-users have been protected from price fluctuations by retail price caps. They have no economic incentive to alter their electricity consumption during times of shortage.

This paper recommends the introduction of real-time pricing. Evidence indicates that real-time pricing will reduce overall consumption, especially during peak hours. Overall costs will decline because less electricity will be purchased during expensive peak hours.

Major publicity campaigns have been initiated by the state to encourage energy conservation. While it is extremely difficult to alter consumer behavior, absent an economic incentive, a strong public relations campaign highlighting the severity of the crisis has had an ameliorating effect on electricity consumption. Thus, it is important to continue with this campaign.

Conclusion

In conclusion, the restructuring of the electricity market has not turned out to be the panacea of savings and efficiency as was the intention. The causes of the crisis are numerous. While no single factor can be isolated as the definitive cause, certain contributing factors were more influential than others. Generation capacity must increase to meet demand. Sufficient generation is essential in any successful energy market. Demand-side responsiveness must be introduced into the retail sector of the market. Because of the disparity between wholesale and retail prices, utility finances plummeted. Consequently, the considerable debt accumulated by the IOUs must be addressed prior to their re-entrance into a repaired market. Once the utilities are solvent, the State must relinquish its current role as the sole power purchaser in California, again introducing competition into the market. Clearly, there are several areas in which the California electricity market structure must be amended. These include shifting much of the reliance on the spot-market to long-term contracting and opening the bidding process to public scrutiny. By instituting these recommendations, California will achieve its long-term goal of a stable, reliable, and efficient competitive market that will assure the reasonably priced delivery of electricity to the citizens of California.

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Appendix

VICA Position Paper
New Projects
Executive Orders
Current Events

VICA Position Paper, http://www.vica.com/

VICA
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Environment, Infrastructure & Water Committee

Position Paper on California's Energy Crisis of 2001

January 11, 2001

Position: The VICA Environment, Infrastructure & Water Committee believes that prompt action must be taken to address the Energy Crisis in California. To solve the State's energy crisis, the following goals must be met:

A. Adopt measures to stimulate development of new energy sources so that supply will meet and exceed demand with stability and reliability,

B. Encourage conservation and energy efficiency to slow the rapid growth of demand;

C. Stabilize the financial situation of the State's Investor-Owned Utilities;

D. Review and revise the California Public Utilities implementation of AB 1890 (1996) in order to begin the transition to real-time pricing for consumers; and,

E. Review and revise regulations that prevent current generation capacity from operating at maximum production levels while minimizing impacts on the environment and other businesses.

Background: In 1996, the Legislature unanimously approved AB 1890—a bill to restructure California's electricity markets. Over the Summer of 2000, San Diego Gas & Electric became the first Investor-owned utility [IOU] to convert to a deregulated market where retail prices were tied to wholesale prices. In recent months, wholesale prices for electricity have surged, due to decreased supply and increased demand, while regulated retail prices have been frozen by state law—causing billions of dollars in indebtedness for Southern California Edison and Pacific Gas & Electric. Edison International, which includes Southern California Edison is currently being audited by the Public Utilities Commission. All PUC documents, including any audit, will be available under the Public Records Act.

As it became clear that the situation was turning into an electric, economic and financial crisis, VICA directly consulted key constituencies of its membership—including large consumers of power in the Investor-Owned Utilities Service Territory. On January 3, 2001, Governor Davis convened a special session of the State Legislature to take immediate action on the State's energy crisis.

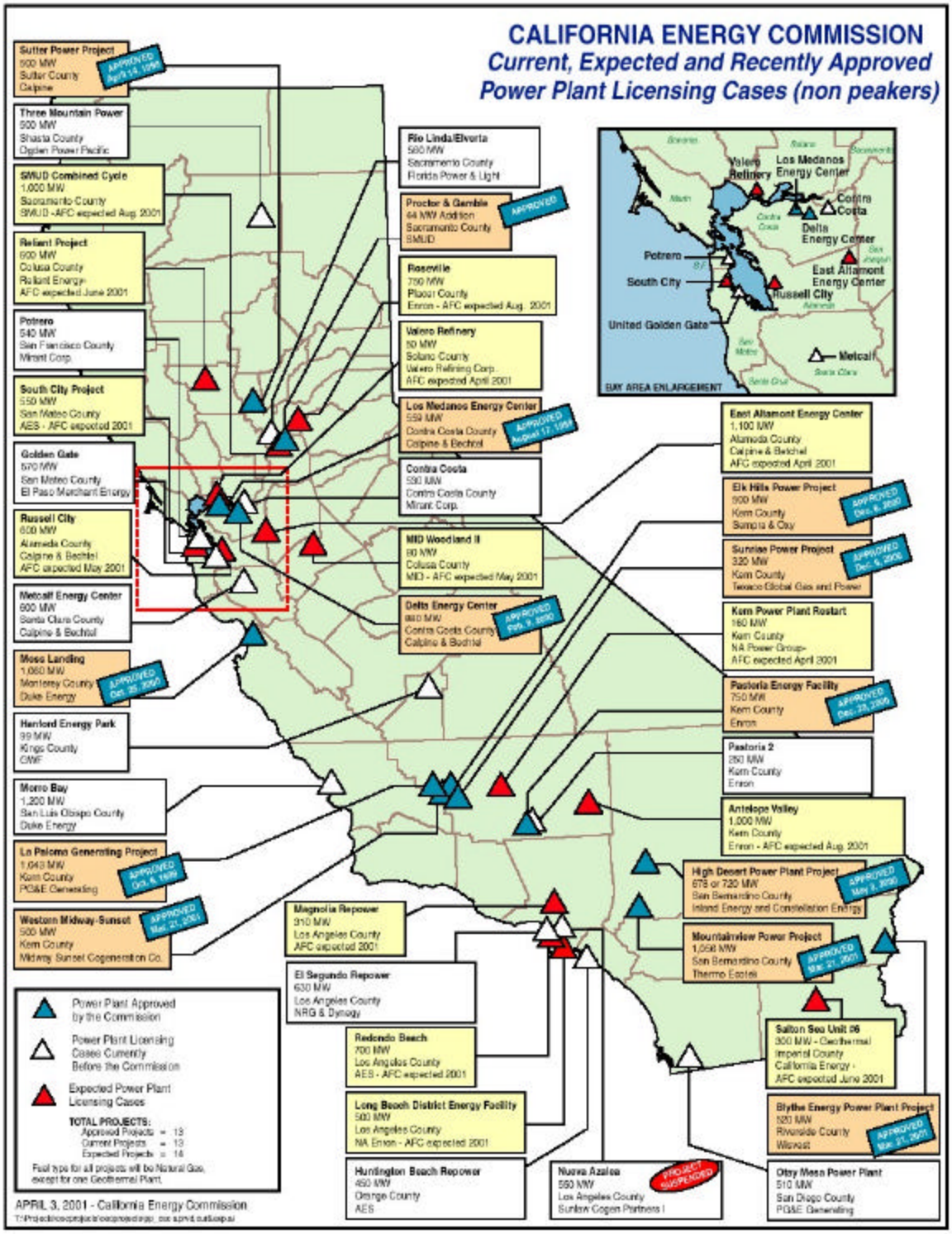
Economic Impact: Unknown but significant costs have been and will continue to be borne by the State's economy until the crisis is resolved. The major Investor-owned utilities are losing $40 million a day and have accumulated billions of dollars in debt. Should they not be able to pay these obligations, major financial institutions' solvency may be threatened. The proposed position minimizes the impacts on consumers, allows resolution to the financial crises and provides remedies to prevent future power crises.

Supporters: Unknown to date. Concepts drawn from comments from VICA members and the California Association of Retailers.

Opponents: Because they are proposing a State takeover of the utilities, consumer advocates such as Harvey Rosenfield would oppose this proposed VICA position.

Sunset Date: December 31, 2002.

New Projects, http://www.energy.ca.gov/sitingcases/index.html



EXECUTIVE DEPARTMENT

STATE OF CALIFORNIA

EXECUTIVE ORDER D-20-01
by the
Governor of the State of California

WHEREAS, on January 17, 2001, I proclaimed a State of Emergency to exist within the State of California due to the existing energy shortage in the State of California; and

WHEREAS, California's energy shortage has resulted in unanticipated power outages for California residents and for critical services in the State, including but not limited to, schools, transportation facilities, businesses, and agriculture; and

WHEREAS, these power outages threaten the health and safety of California residents, critical services in the State, and vital segments of California's economy; and

WHEREAS, it is necessary for the State to take control of the block forward market contracts to ensure a sufficient and continuous supply of electricity to meet California's energy needs and to mitigate the effects of this energy shortage; and

WHEREAS, the circumstances require extraordinary measures beyond the authority vested in the California Public Utilities Commission;

NOW, THEREFORE, I, GRAY DAVIS, Governor of the State of California, by virtue of the power and authority vested in me by the Constitution and the statutes of the State of California, including the California Emergency Services Act, and in furtherance of my Proclamation of a State of Emergency, do hereby issue this order to become effective immediately:

Pursuant to section 8572 of the California Emergency Services Act, it is ordered that the contracts and trades in the market for the sales and purchases of forward contracts and trades for electricity (known as the "Block Forward" market) for the delivery of electricity possessed by Southern California Edison Company, a corporation organized and existing under the laws of the State of California with its principal place of business in California, and subject to actions, including liquidation, by the California Power Exchange Corporation, a non-profit public benefit corporation organized and existing under the laws of the State of California, is hereby commandeered by the State of California to be held subject to the control and coordination of the State of California.

control and coordination of the State of California.

I FURTHER DIRECT that as soon as hereafter possible, this order be filed in the Office of the Secretary of State and that widespread publicity and notice be given to this order.

IN WITNESS WHEREOF I have hereunto set my hand and caused the Great Seal of the State of California to be affixed this the thirty-first day of January 2001.

Governor of California

ATTEST:

Secretary of State

EXECUTIVE DEPARTMENT

STATE OF CALIFORNIA

EXECUTIVE ORDER D-21-01
by the
Governor of the State of California

WHEREAS, on January 17, 2001, I proclaimed a State of Emergency to exist within the State of California due to the existing energy shortage in the State of California; and

WHEREAS, California's energy shortage has resulted in unanticipated power outages for California residents and for critical services in the State, including but not limited to, schools, transportation facilities, businesses, and agriculture; and

trades for electricity (known as the "Block Forward" market) for the delivery of electricity possessed by Pacific Gas and Electric Company, a corporation organized and existing under the laws of the State of California with its principal place of business in California, and subject to actions, including liquidation, by the California Power Exchange Corporation, a non-profit public benefit corporation organized and existing under the laws of the State of California, is hereby commandeered by the State of California to be held subject to the control and coordination of the State of California.

I FURTHER DIRECT that as soon as hereafter possible, this order be filed in the Office of the Secretary of State and that widespread publicity and notice be given to this order.

IN WITNESS WHEREOF I have hereunto set my hand and caused the Great Seal of the State of California to be affixed this the thirty-first day of January 2001.

Governor of California

ATTEST:

Secretary of State

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http://www.governor.ca.gov

performance benchmarks established by the Independent System Operator.

Consider seeking the authority under state law or federal regulation to impose fines on those generation facility owners whose generation facilities have fallen below performance benchmarks established by the Independent System Operator.

IT IS FURTHER ORDERED that the Electricity Oversight Board shall review the Independent System Operator Tariffs and Protocols, in consultation with the Independent System Operator, to identify any necessary revisions to increase the Independent System Operator's ability to ensure adequate availability of generation during periods of peak demand.

IT IS FURTHER ORDERED that the five-member independent governing board of the Independent System Operator shall ensure that all the aforementioned provisions of this order are executed and the Independent System Operator tariffs and protocols are so revised, based on recommendations from the Electricity Oversight Board, and shall make the necessary filings with the Federal Energy Regulatory Commission to implement these revisions.

IT IS FURTHER ORDERED that the California Public Utilities Commission shall ensure that generation facilities still owned by utilities subject to its jurisdiction are operated by the persons or corporations who own or control them in a manner that assures their availability to maintain the reliability of the electric supply system by issuing such orders and directives as it deems necessary and appropriate, after a hearing.

IT IS FURTHER ORDERED that the Electricity Oversight Board shall propose emergency legislation to expand its authority to issue audits of generation facilities that do not meet established benchmarks for availability and performance, and issue fines against those plants, after a hearing.

The activities herein are authorized to be carried out pursuant to the Emergency Services Act, Government Code Sections 8550 et seq.

I FURTHER DIRECT that as soon as hereafter possible, this order be filed in the Office of the Secretary of State and that widespread publicity and notice be given to this order.

IN WITNESS WHEREOF I have hereunto set my hand and caused the Great Seal of the State of California to be affixed this the eighth day of February 2001.

ATTEST:

Secretary of State

Current Events, http://www.governor.ca.gov

COMPLETED ACTIONS

Generation

"The brighter future we seek for California will require greater energy production within our borders."
- Governor Gray Davis

A reliable supply of electricity is the lifeblood of California's prosperity. Unfortunately, deregulation has left a dangerous imbalance between energy supply and demand.

For the twelve years before Governor Davis took office, the state failed to build a single major power plant. Under the Davis Administration, those days are over.

Since April 1999, 13 new power plants (11 major power plants) have been licensed. Seven are under construction. Three will be online by this summer. Three more will be online by the following summer.

Governor Davis will ensure that all generation measures maintain California's commitment to clean air and the environment. He has appointed a Clean Energy Green team to oversee the permitting and construction process.

He is also committed to upgrading the transmission system to improve its efficiency and improving fuel delivery.

Governor Davis has also announced a legislative package to provide incentives to power up more renewable energy, distributed generation and co-generation.

Governor Davis and his Administration have:

Signed an Executive Order to maximize generating output at existing facilities by allowing increased operating hours and waiving cumbersome timelines for retrofits and restarts (provided additional power is sold at reasonable rates under DWR).

Created an acceleration bonus for developers who can complete construction and bring plants on line by July 2001.

Directed State and local agencies to streamline the review and permit process for new baseload facilities that can come on line during peak demand periods in 2002.

Streamlined review process for siting of new natural gas fired or renewable peaking power plants that can be on line by summer 2001.

peaking power plants that can be on line by summer 2001.

Released a report by the California Energy Commission identifying 32 potential locations for the siting of "peaking" plants.

Taken steps toward providing low-interest financing for new peaking facilities and the "re-powering" of existing ones.

Encouraged construction of new renewable energy sources through rebates, commercial loan guarantees, and tax credits toward purchase and installation of renewable energy systems.

Coordinated power plant maintenance schedules through the Independent System Operator to ensure maximum operating capacity.

Conservation

"Yes, we have a power shortage, but we are far from powerless. By reducing our electricity demand by even a small amount, we can reduce the price, avoid shortages and lower energy bills."
- Governor Gray Davis

In his State of the State Address, Governor Davis issued a new call for energy efficiency and backed it up with a record commitment of funding.

In February, the Governor unveiled what is believed to be the most sweeping conservation campaign ever undertaken by a state. $404 million in new conservation initiatives will augment the $424 million in existing programs already funded by the Administration. The new initiatives alone are expected to reduce California's peak load demand by more than 3,200 MW this summer.

The state is leading by example. Every single day, state government is cutting its consumption by at least 8 percent. During Stage Two alerts, it's saving 20 percent.

In early March, Governor Davis announced that Californians had risen to the task: business and consumers slashed energy use during the month of February by eight percent.

Governor Davis also used his emergency powers to set up the 20/20 Rebate Program, which rewards those who reduce energy consumption during summer months by 20 percent with a 20 percent reduction in their rates.

New initiatives in the Governor's energy efficiency campaign include:

$75 million for consumer rebates for replacing energy-inefficient appliances.

$95 million in incentives for businesses that install demand-responsive systems in commercial buildings and reduce commercial lighting.

$60 million to fund innovative peak-load reduction proposals.

$50 million to improve energy efficiency in State buildings.

$50 million for reflective lighting and roofs, improved shading and other measures for commercial buildings.

$20 million for the first stage of a paid media campaign sponsored by the Department of Consumer Affairs. State agencies and departments will support this effort with four million public contacts a month.

Partnerships with 221 cities (nearly half the cities in the state), and a host of business organizations including the grocers, the retailers, the Chamber of Commerce and the Silicon Valley Manufacturers.

The Governor also signed an executive order requiring all retail establishments to reduce outdoor lighting during non-business hours to a fraction of maximum capability.

Stabilization

"Our first priority must be providing reliable, reasonably priced energy to power our homes and businesses."
- Governor Gray Davis

Governor Gray Davis is meeting the challenge of rate stabilization by working to: reduce the wholesale cost of electricity, keep consumer rates at a reasonable level, and maintain the solvency of the investor-owned utilities.

Recently, Governor Davis announced an agreement in principle with Southern California Edison on a plan to ensure reliable and affordable electricity and keep the utility solvent and viable.

The Davis administration is continuing negotiations with Pacific Gas & Electric and San Diego Gas & Electric to forge similar agreements.

In addition, other key rate stabilization initiatives include:

Assembly Bill 1X, signed by the Governor on February 1, which allowed the state to enter into long-term contracts. Its credit worthiness allows the state to purchase electricity at a better price than the utilities.

electricity at a better price than the utilities.

An unprecedented on-line energy auction for generators to submit bids to provide electricity in long-term contracts.

Agreements with generators for 40 long-term, low cost power contracts to supply an average of 8,886 MW per year over the next ten years.

Negotiations to reduce the price of power delivered by co-generation and renewable energy suppliers ("qualified facilities").

The seizure of less costly energy contracts from the now-defunct California Power Exchange that otherwise would have been auctioned for higher prices.

A new law making the Independent System Operator that manages the power grid truly independent, replacing its stakeholder board with independent leadership.

A new law to prohibit utilities from selling off any more of their power plants that produce low cost power without further approval of the state.

About the Authors

Jennifer Lake – Jennifer Lake graduated from Pepperdine University, with her Masters of Public Policy with a concentration in Economics and International Relations. Jennifer has recently been working as a Transportation and Intergovernmental Relations Intern at the City of Calabasas. Jennifer now looks forward to moving to Washington D.C. and working for the Congressional Research Service, as a Legislative Analyst in Social Policy.

Leah Pease - Leah Pease graduated Magna Cum Laude from Harding University in 1997 with a BA in Spanish and certified to teach both Spanish and Social Studies. She came to Pepperdine after two years of teaching high school Spanish in Houston, Texas. Last summer, she had an internship with the U.S. State Department at the U.S. Embassy in San Salvador, El Salvador. At Pepperdine, her areas of concentration are International Relations and American Politics. After graduation, Ms. Pease will be employed with the U.S. Department of State.

Ginny-Marie Case - Ginny-Marie Case graduated with her Masters of Public Policy in April of 2001. Her focus was in American Government and International Relations. Originally, from Washington State, she graduated with her B.A. in Public Policy from The Evergreen State College in June of 1999. She is active in the Green Party, serving as the local coordinator for the Los Angeles County Greens. She also is an alternate for the Green Party of California's Coordinating Committee. In her spare time, Ginny enjoys photography, hiking and rollerblading. Recently she has taken a position with The Robert Group, a public affairs firm specializing in the public education and outreach for regional transportation projects.

Jennifer Sutton-Hetzel - Jennifer Sutton-Hetzel specialized in International Relations and Regional & Local Policy while at Pepperdine University's School of Public Policy. Jennifer has long been active in politics, starting with U.S. Senator Tom Daschle's reelection campaign in 1998 and later as a member of the Finance team for LA Convention 2000, the Host Committee for the 2000 Democratic National Convention. Jennifer has also focused much of her graduate studies on housing and economic development issues, culminating in her work for Los Angeles Mayor Richard Riordan's Office of Economic Development. Most recently, Jennifer worked in political fundraising for Riffenburgh & Associates in Los Angeles, CA. Jennifer was honored as a 2001 Presidential Management Internship finalist and ultimately intends to work in corporate government affairs.