



## Greed and Good Intentions

# Greed

## and Good Intentions: What Really Happened in California's Electricity Markets?

By W. Michael Warwick and Stephen Grover

**A** ACCORDING TO POWER suppliers, the California energy crisis that began in the summer of 2000 was caused by extremely hot weather, drought-induced low hydropower exports from the Pacific Northwest, high natural gas prices, and environmental regulations that restricted plant operations.

However, when the crisis began, summer temperatures actually were lower, on average, than they had been the previous two years. Hydropower exports from the Northwest, although lower than in recent years, were about average. Natural gas prices

During the crisis, air-emissions officials and plant operators were directed to work together so that strict emission regulations would not curtail operations. Singly or together, the factors that suppliers claim caused the crisis cannot fully explain the rapid increase

and Electric, and dramatically higher electricity rates in the Pacific Northwest.

Prior to deregulation in California, the state's investor-owned utilities generated power as large, regulated monopolies, selling it directly to residential and business consumers at rates set by the California Public Utilities Commission (CPUC). These rates were based on the utilities' costs, plus what the commission determined to be a "just and equitable" rate of return. Prodded by these "cost-based plus" rates that were 50 percent higher than the national

average, the CPUC began deregulation or, more accurately, market restructuring in 1992. In an effort to stimulate market competition, the CPUC prohibited utilities from entering into long-term contracts. It also embraced the concept of divestiture, directing utilities to sell off part of the total capacity of their generating plants to private interests.

The CPUC proposed that utilities buy and sell all of their power through two new markets, the Power Exchange (PX) and the Independent System Operator (ISO). CPUC deregulators thought that using the ISO to manage electricity capacity would reduce the high cost of reserve power through market competition. The California legislature formally authorized the process in August 1996. To minimize the effect of restructuring on consumers, the CPUC froze retail rates for four years.

California's restructuring experiment was modestly successful until the summer of 2000, when competitive prices climbed through the stratosphere, supplies ran short, and utilities ran out of money to operate. The spectacular failure of California's restructured energy market affected many states, including Oregon, which had begun restructuring the previous spring. In order to make a clear assessment of Oregon's restructuring plan, it is important that Oregonians understand the nuts and bolts of the CPUC's restructuring scheme and why it failed.

### Divestiture and Reserves

The story of the California energy crisis begins with divestiture. In order to stimulate competition, the CPUC required utilities to sell at least half of their generating capacity. Since no one

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had just begun to increase but actually peaked later in 2000 while wholesale power prices spiked early in the summer and stayed high throughout the year.

and persistence of high prices early in the summer of 2000—an event that led eventually to the bankruptcy of California's largest investor-owned utility, Pacific Gas

knew how to sell a nuclear plant and there were public concerns about private operation of hydropower plants, utilities sold off their oil and gas plants. Out-of-state, non-utility owners gained control of the bulk of these divested plants by early 2000, shortly before the crisis began. These sales set the stage for California's energy crisis because of their effect on the CPUC's plan for managing reserves.

In the United States, for equipment to run properly and clocks to keep time, power generation must match power demand from moment to moment. To fill the gap between actual demand and anticipated demand, and to ensure a reliable, continuous power supply, power systems need backup capacity—reserve power from plants that can start quickly and be accelerated or slowed down easily, such as those fired by natural gas or oil. Without reserves, utilities would have to curtail power to consumers in order to avoid uncontrolled, cascading, region-wide outages. California hoped to save consumers money by paying for the minimum amount of reserves necessary. As part of restructuring, the CPUC lowered the reserves

requirement from 15 percent to 7 percent of demand, assuming that increased competition would ensure availability of more reserve capacity when it was needed. The reduced reserve capacity, while it represented only a portion of the total energy demand, played a crucial role in California's energy crisis.

### Long-term Contracts

Most states reduce the risk of high energy prices by requiring their utilities to secure future supplies through long-term, bilateral (between two private parties) contracts at fixed prices. California deregulators theorized that long-term private contracts would take energy out of the market and reduce competition in the PX and ISO spot markets, so they prohibited utilities from entering into long-term agreements to sell or buy power. California's reliance on spot, or daily, markets for power and reserves contrasted with utility practice in every other state, where power was purchased on long-term contracts for fixed prices and only supplemented by spot market purchases. As the crisis developed, the lack of such agreements put the ISO fully at the mercy of suppliers manipulat-

ing both the PX market and the ISO's reserve margins.

### PX and ISO Spot Markets

In order to exploit the new competitive environment and manage reserves, the CPUC created two new markets for the sale and purchase of energy. The Power Exchange (PX) managed purchases of electrical power while the Independent System Operator (ISO) managed ancillary services, including transmission and reserves. Under restructuring, electric utilities could purchase and sell power only through these two spot markets. These commodity-type markets operated around the clock and conducted day-ahead, hour-ahead, and real-time auctions for short-term contracts to deliver power into the California system. As is typical of spot markets, prices sometimes rose and dipped dramatically.



## The Fundamental Requirement of a Free Market: Flexibility for the Buyer

One way to understand how wholesale electricity suppliers were free to charge the ISO and PX whatever price they wanted is to compare the California situation to the airline industry. When pricing a flight, all of the airlines have established a set of rules to determine how flexible a traveler's plans are. If you are able to plan ahead and are willing to stay over on a Saturday, for example, you are communicating to the airline that you have a flexible schedule and are likely to shop around. Given this information, the airline knows that, to make a sale, they need to offer relatively low fares.

Now, consider the case of purchasing a ticket one day ahead of time for a trip. Given that the price rules have been established and everyone (presumably) knows them, anyone who decides to purchase a ticket in this situation communicates to the airline that they have little or no flexibility in their travel plans. Anyone who has had to fly at the last minute for a business meeting or a funeral knows that they may pay five or even ten times as much for their ticket.

It is important to note that all of the airlines adhere to this pricing policy without any type of collusion. All any airline needs to know is that you have an inflexible demand for a ticket and it will raise its price.

In California, utilities were forced to purchase power from one place, the PX spot market, one day in advance. Power suppliers to the PX only needed to know when demand would exceed supply—information that was readily available from the Weather Channel.

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Independent of the ISO and all other market participants, the PX provided and managed the day-ahead market for electricity—the kilowatt-hours needed to meet routinely anticipated energy demand for uses such as heating, lighting, and industrial equipment. Known as the base load market, the PX market tended to attract bids from larger-capacity plants (coal, nuclear, and hydro) that could not start up or shut down efficiently. Occasionally, when spot market prices were very low, these plants actually placed no-cost bids (they bid \$0) to stay in the day-ahead market and avoid the high cost of going offline.

The ISO, meanwhile, maintained reserve capacity—the kilowatts needed to meet unanticipated demand at any moment to keep the power system running smoothly—while also coordinating power transmission. Known as the peak load market, the ISO received bids for reserve capacity primarily from power plants that could supply power on a moment's notice (typically oil and natural gas plants). The ISO also ensured the reliability of the California electric grid and made sure that failure of the California grid would not affect other Western states.

In order to avoid power interruptions, California's market-based approach to both reserves and power relied on daily bids from investor-owned utilities (who could only do business with the PX and ISO) and non-utility suppliers (who could sell to anyone) such as Enron, Duke Energy, Reliant Energy, and Dynergy, to supply power to the PX and

ISO. The ISO bought the bare minimum of reserves each day and assumed that generators that did not win bids at that point could be "picked up later" if their capacity was needed.

Whenever reserves dropped to less than 7 percent for a given service control area, the ISO activated its electrical emergency plan, which included paying premiums for power necessary to meet the 7 percent requirement; a reserve of 1.5 percent or less triggered involuntary power interruptions to customers. Because the ISO paid premiums for power as the reserve margin got closer to zero, non-utility generators fig-

ured out that they could panic the ISO and drive prices higher in the peak load (hour-ahead and real-time) markets if they withheld power from the day-ahead market. This required no illegal communication between suppliers, just close observation of the bidding taking place every hour as well as watching the weather. The frequency of the PX and ISO auctions allowed non-utility generators to easily determine how much power the day-ahead market would need, as well as what other suppliers were bidding. The "withholding advantage" went to generators who could start and wind down their plants efficiently—which allowed them to drop out of the market and re-enter as premium prices kicked in. These plants were the oil- and natural gas-fueled facilities that the CPUC's commitment to divestiture had forced California utilities to sell.

For reasons not yet determined, the new owners of these plants closed them for maintenance more often than their previous owners. These shutdowns, combined with legal, if ethically questionable, power exports from

California, further reduced supplies and bids for the PX and ISO spot markets, putting the PX and ISO in a "must buy" position. (See sidebar on the previous page by Steve Grover titled "The Fundamental Requirement of a Free Market: Flexibility for the Buyer" -ed.) Utilities that could have sold power to the ISO's hour-ahead and real-time markets had they retained their oil and gas plants were forced instead to purchase high-cost power from the same plants through the spot markets. California utilities ended up buying 35 percent of the power they needed to serve customers from the PX and ISO at prices manipulated by out-of-state owners of California's non-utility generating facilities.

To ensure that retail customers would not suffer rate increases as the kinks in market restructuring worked themselves out, state regulators had frozen retail rates for four years. As a tradeoff, utilities were allowed to keep profits made during the freeze period as compensation for losses taken under forced divestiture. However, these price controls exposed utilities to the full

### Deregulation, Restructuring, and Unbundling Rates

During what we commonly call deregulation, only the energy components of the electric system are deregulated, not the different aspects of transmission, distribution, and associated services. This is why the term "restructuring" arose to describe how California and other states have changed their energy systems. Restructuring required that states unbundle the rates charged by utility monopolies so regulators could isolate the portion of rates they wanted to be controlled by freer markets. Some restructuring plans deregulate only wholesale rates, while others such as Oregon's plan allow retail customers access to freer markets as well.

Unbundling makes it easier for customers to choose a generator other than their transmission provider. Unbundling also allows deregulators to determine who owes whom money as a system moves from a monopoly to a freer market. In Oregon, for example, under complete regulation some large customers paid for generation assets owned by the utility, through the utility's rate structure. In Oregon's restructuring plan, the utilities will rebate this asset value through mechanisms such as discounts on a utility's transmission service.

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brunt of spot market price volatility and market manipulation. Utilities were forced to buy expensive power through the PX and ISO, which they then had to sell below cost to customers. Market-based, or even cost-based, retail rates would have reduced customer demand and helped bring the markets back to earth. In fact, television interviews with consumers at the time indicated that most of the public did not believe that the crisis was real because rates had not increased.

### They Took the Money and Ran

The rising wholesale prices demanded by out-of-state power suppliers deepened the energy crisis in the fall of 2000. Regulators from California and surrounding states, California state officials, and the ISO asked the Federal Energy Regulatory Commission (FERC) to intervene in the market, set price caps, and order refunds. FERC refused. Utilities, losing money at an increasing rate, asked the CPUC and then the courts to let them increase retail rates. State regulators refused, still hoping that FERC would relent and roll back prices. The crisis escalated. At its height, utilities were losing about 3 cents on every kilowatt-hour of power they sold. Eventually, the utilities ran out of cash and had to borrow from banks to cover operating costs. They also slowed payments to generators (for contracts made prior to restructuring) and to the PX and ISO. The rapid financial decline of the utilities, slow payments to generators, and the lack of mitigating action by FERC and state regulators made power suppliers nervous. Fearing they would not be paid at all, they added “payment risk” pre-

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miums that resulted in even higher wholesale prices. Eventually, some generators who did not receive timely payments stopped selling power because they could not afford to continue buying the fuel needed to operate.

All these factors combined to make it impossible for the ISO to guarantee a 7 percent reserve, and its automatic crisis response went into effect. When reserves dropped below 1.5 percent, the ISO initiated an ongoing series of rotating blackouts. The state’s response to the blackouts signaled to suppliers that they could increase wholesale prices even more. The next stage of the crisis was brought to a head in 2001 when Pacific Gas & Electric declared bankruptcy. The failure of this gigantic utility made it clear to regulators and politicians that it was past time for them to take drastic action.

The state of California, in the form of the Department of Water Resources (DWR), intervened and purchased power on behalf of the cash-strapped utili-

ties. Unfortunately, at that time power prices were at their peak. The highest contracted price (which was reduced retroactively) was \$3,880 per megawatt-hour (MWh), when the going rate in other regions at that time was \$273 per MWh. Prior to the crisis, the spot market price in California was approximately \$30 per MWh.

In order to negotiate a reasonable price, California had to enter into contracts with terms as long as 15 years. The state also had to purchase a substantial quantity of power in order to defeat future attempts at price manipulation. The resulting contracts cost billions of dollars and for the term of the contracts will provide enough power to meet over 30 percent of expected demand, at a final price expected to be close to \$80 per MWh. This process encumbered Californians with billions of dollars in debt, fixed power prices at a level far above average for many years, and undermined the process and institutions that enabled restructuring in the first place.

At present, power from utility-controlled generation and that purchased in long-term contracts by the state exceeds projected need for the next several years by almost 10 percent. The surplus is being sold into a weak power market at a substantial loss. To prevent taxpayers from absorbing these losses, the state wants to force utilities to buy state-owned power prior to using their own power resources. Obviously, such a move would shift the responsibility for any losses to the utilities, terminating consumer choice by ensuring that new and existing utility customers would use the power purchased by the state. Ironically,

DWR also gained the option to bypass regulators when setting utility rates so it could ensure that utility customers—the main victims of this fiasco—paid enough to cover all of the future costs of the power DWR purchased.

### More on Reserves

The ISO pays for the reserves it purchases, even if it doesn’t use them. There are two types of reserves: “spinning” or operating capacity reserves, and “non-spinning” or installed capacity. The reserves are just that, in reserve. They are not expected to be used unless there is an emergency. Spinning reserves must be available instantly, hence the generator must be “spinning” at the time, or operating at less than full capacity, with the spare capacity available as a reserve. Non-spinning reserves come from plants that aren’t running but can be up in about 10 minutes. Essentially these plants get paid for doing nothing. Sometimes generators sell non-spinning reserves for plants that can’t run, gambling that they won’t get called to provide power. If they get caught, the fine is usually less than the money they’ve made. The charges for reserves, other ancillary services, and transmission are rolled into the ISO’s operating fees. Customers that supply these services on their own, get either a credit or payment for ancillary services they don’t need.

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As things stand, California utilities and consumer advocates are unhappy with DWR and may take the issue to court or to the voters in an effort to force DWR to negotiate lower prices or terminate some of its long-term contracts.

The goal of California's experiment in deregulation was to lower electricity rates through the use of competitive mar-

kets. The state now faces at least a decade of higher power prices resulting from belated and ill-conceived intervention by the state in those same markets.

On January 1, 2001, as a consequence of the power crisis, the PX ceased operation, effectively ending California's experiment with de-regulation. The ISO continues to operate, maintaining reserve capacity as well as buying and selling energy and ancillary services.

### Bringing California's Lessons Home to Oregon

The policies that California implemented to guard consumers

from price hikes and interrupted service instead caused these problems to occur spectacularly. Selective power plant divestiture, unchecked price manipulation in the ISO, exclusive reliance on short-term contracts, and retail price freezes created a catastrophe with national implications. And the story is not over. As this issue goes to print, more revelations of manipulation by major energy suppliers such as Enron are coming to light. An excellent, though partisan, blow-by-blow chronology of the complex series of events that led to the current stage of the California energy crisis can be found at [www.consumerwatchdog.org](http://www.consumerwatchdog.org), a site produced by the Foundation for Consumer and Taxpayer Rights.

Restructuring is coming to Oregon. The authors believe that Oregon can benefit from free-market innovations and still protect consumers from drastic market swings by choosing the right mix of free-market activity and government control. Others—such as Congressman Peter DeFazio—disagree, while still others see only benefits. In the Forum section of this *Oregon's Future* issue entitled "Restructuring," Congressman DeFazio, Pamela Lesh, and Jason Eisdorfer, as well as Julie Brandis, Ken Cannon, Jeff Hammarlund, and Jeff Bissonnette discuss Oregon's restructuring plan, often highlighting the difference between California's restructuring experiment and Oregon's.



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