

California's Electricity Crisis Continues

By Fereidoon P. Sioshansi*

The Golden State's electricity crisis, which began in earnest last May, continued to take turns for the worst. For the first time in recent memory, there were rolling blackouts in January, normally a low-demand period. The state's two investor-owned utilities became technically insolvent as they defaulted on payments that became due. The state's politicians, who had been indecisive for months, could no longer ignore the seriousness of the problem. An article in the last issue of this newsletter described the situation. This is a sequel.

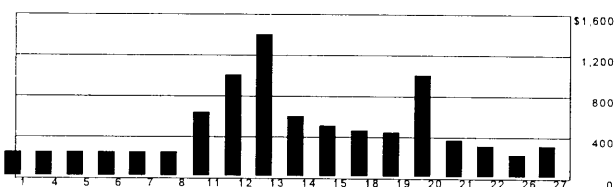
First Signs of Trouble

As early as spring of 2000, there were ample signs that it was going to be a rough summer. California's Independent System Operator (ISO) began to warn that a hot summer could spell disaster for California's over-stretched electricity infrastructure.

The summer was not unusually hot, but hot enough to push wholesale electricity prices out of sight. Severe capacity shortages meant that the independent generators, who now supply the bulk of power in the state, could demand exorbitant prices, and get away with it. Prices at the Power Exchange's (PX) Day-Ahead auction reached unprecedented levels, and have stayed high ever since, as the figure below shows for the month of December, normally a low-demand period.

Out of Sight, But Not Out of Mind

Daily Average Peak Wholesale Electricity Prices in California's Day-Ahead Market



Source: California Power Exchange

As if this were not bad enough, the ISO has been paying equally exorbitant prices in the real-time market for ancillary services (AS), which are needed to maintain the system's reliability. Generators had learned that they could make more money by withholding some of their generation from the PX auction, and by bidding into the real-time AS market. Under the rules of the market, it was perfectly legal.

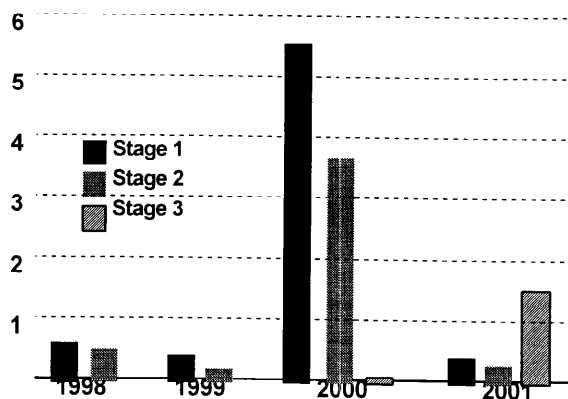
As shocking as these prices were, they could be rationalized by the fact that the state was operating with virtually no spare reserve margin. For days on end, the ISO has been managing a system running on the verge of collapse. As shown in the accompanying graph, California has experienced far too many Stage 1, 2, and 3 alerts than most people would like to remember. Since December 2000, it has

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become a daily routine – the only question is which stage we're in. During a two week period in January, the system was continuously on Stage 3 alert.

Running on Empty – Day After Awful Day

Number of Stage 1, 2, and 3 Alerts* Declared by Cal ISO



* Stage 1 alert is declared when demand reaches within 7% of available capacity under ISO's control; 5% for Stage 2; 1.5% for Stage 3, the most serious

Source: California ISO, as of late January 2001

By mid-summer, the crisis could no longer be ignored, particularly in San Diego where the local utility was passing on the higher wholesale electricity costs directly to customers. Still, the politicians did not take decisive action. Instead, they launched a number of inquiries in search of the guilty parties and began a protracted game of finger pointing. The confusion about who was to blame, and who was responsible to fix the problem, did not help matters either. The ensuing friction between the state and federal regulators became noticeably counter-productive, as state officials waited for the Feds to act, and vice versa.

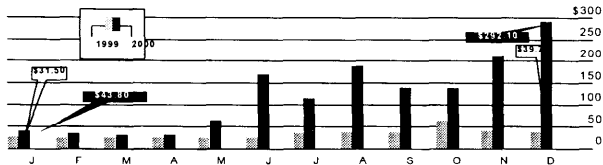
Easy Fixes Don't Solve the Problem

Instead of focusing on the fundamental – but painful – solutions (e.g., inadequate supplies, long-term, fixed price contracts), the politicians initially began to look for quick and easy fixes. For example, on three consecutive votes, they lowered the price cap on the wholesale market, from \$750/MWh, to \$500, to \$250. But California is not an island, and electrons flow to the highest bidder. Artificial price caps may make good headlines, but do not solve the underlying problem – in this case, inadequate supplies. In the mean time, everybody was betting that with the cooler winter temperatures, and falling demand, the whole fiasco would simply go away – at least until the following summer.

Simultaneously, the utilities were accumulating debt at an alarming rate. Because the retail rates they could charge their customers were frozen by the restructuring legislation, they were unable to pass on the high cost of wholesale power at the daily PX auction (see accompanying chart). The original legislation did not allow the utilities to hedge their bets easily through long-term supply contracts, nor allowed them to bypass the state-mandated PX. This meant that they were fully exposed to price volatility in the spot market for virtually all their requirements.

Recipe for Disaster: Rising Wholesale Prices, Frozen Retail Rates

The Average Monthly Power Bill Paid by PG&E in 1999 and 2000, \$/MWh*



* Under legislation, PG&E can charge no more than \$54/MWh to its customers. The picture is similar for SCE, numbers are slightly different. Source: PG&E

Betting on Cool Temperatures and Falling Prices

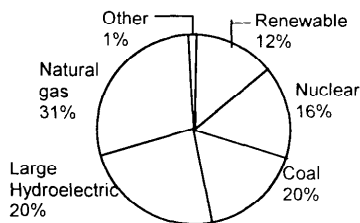
For their part, the utilities did not play their cards too well either. Even though they were under-collecting millions of dollars from their customers on a daily basis, they did not wish to alarm their lenders, shareholders, or the credit agencies that rate their bonds. They were also betting that prices would drop in the winter, allowing them to recoup their losses. They were wrong.

Starting in November, temperatures dropped – but to everyone’s surprise, wholesale electricity prices did not. As a result of a highly unlikely set of events, prices remained unusually high, and the capacity crunch became even more critical.

- natural gas prices, which fuel most of the state’s thermal units (see accompanying chart) surged due to unusually cold weather and scarcer supplies.
- many units were simultaneously taken out of service for scheduled maintenance and/or (in the case of nuclear units) for refueling.
- with the new price caps in effect, and the worsening financial plight of the utilities, generators increasingly looked at ways not to sell their output in the California market – for fear of not getting paid.

Where is the Juice Coming From?

Primary Source of Electricity for the Golden State



Source: California Energy Commission, 1999 data

For strategic as well as legal reasons, the independent generators would not dream of coordinating when units are taken out of service. Everybody, it seems, assumed that the fall and the winter is the right time to do this. And guess what? During days when the ISO was desperately scrambling for capacity, as much as 12,000 MW of generation – roughly one third of the state’s requirements – was off line. Some skeptics believe that many units were off line because the generators did not wish to have them available, thus creating artificial scarcity and pushing prices even higher. Regardless

of the causes, the net result was unprecedented high prices during months when electricity is normally plentiful and inexpensive.

What is more surprising, prices remained high during all hours – not just peak hours. One possible explanation for this unusual phenomenon? Since winter months in California are characterized by two distinct peaks in the morning and evening, most thermal units that bid into the market have to stay on during the whole day to serve both peaks. Consequently they bid the same high price for all hours. In other words, there were no off-peak hours in California market anymore.

In early December, just as people were getting ready to turn on their Christmas lights for the holidays, the ISO decided that it had had enough of the politicking, bickering and the constraining price caps. Defying the regulators, the overstressed agency unilaterally declared that it would henceforth buy power from anybody at any price, price caps notwithstanding. But it was too late. The power shortage had become so severe that consumers were asked not to turn their decorative lights until after the peak evening hours.

More Ominous Threat: Utility Bankruptcies

But by this time (early December 2000), the crisis had reached a new and more ominous stage. High prices were no longer the issue. A much larger problem was looming over the industry: impending bankruptcy of the two giant investor-owned utilities (IOUs) in California. With some \$12 billion of debt (at the time of this writing), and counting, once mighty Pacific Gas & Electric Company (PG&E) and Southern California Edison (SCE) had become poor credit risks. Suppliers no longer wanted to sell to them for fear of not getting paid. For a few tense days in early December, the lights almost went out in California. It wasn’t just electricity either. Natural gas suppliers wanted cash on delivery, and the utilities did not have the cash.

Governor Davis, who had been indecisive – some would say irresponsible – up to this point finally got the message that the energy crisis was serious, and would not go away on its own. Still, he was reluctant to accept that this was primarily a California problem, that required a California solution.

Mr. Davis flew to Washington DC to confer with former President Bill Clinton, Alan Greenspan, the Treasury and the Energy Secretaries, and the former Chairman of the Federal Energy Regulatory Commission (FERC). Many observers are at a loss to explain what he expected to get out of the former president or the Chairman of the Federal Reserve System. Perhaps he was still under the illusion that the federal government would somehow magically solve California’s problems. All he got was symbolic sympathy from administration officials who were packing their desks to make room for their Republican counterparts who were about to take office on 20 January.

The only person who could help was the outgoing Energy Secretary, William Richardson. He invoked a rarely used emergency power act that would essentially force suppliers to continue to sell energy to California, even if there were no assurance that they would get paid. This federal order, which was subsequently renewed several times, more than anything else has been responsible for keeping the lights on in California in December and January. At the time of this writing, the order is to expire in early February, by which time the Feds

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California's Electricity Crisis (continued from page 11)

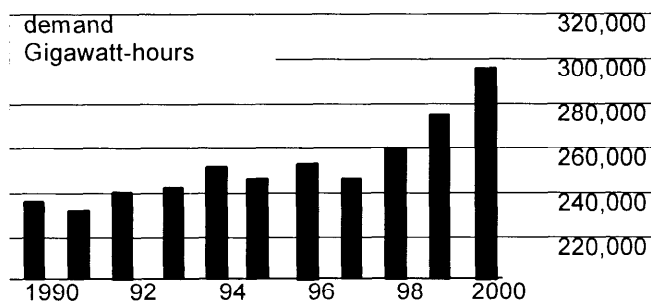
hope California has come up with a fix to its problems.

Rolling Blackouts

The climax (thus far) finally came on 17 and 18 of January when rolling blackouts could no longer be avoided. On two consecutive days, 500,000 and 2 million customers in Northern California suffered outages that lasted 90 minutes or more, many with little or no warning. Never in recent memory had the mighty Golden State been so humbled and humiliated, deprived of the most essential and critical business sustaining service, electrical power. The world's sixth largest economy had turned into a third world country, ridiculed around the world for not being able to keep the lights on during a period when demand is not even high. The state had simply run out of juice and its neighbors did not have enough to make up the difference (see accompanying chart)

Demand is Up, Investment in New Generation Capacity is Not

Electricity Generation in California, 1990-1999



Source: Cambridge Energy Research Associates

The chronic shortages of electricity began to affect other industries in ways that were hard to imagine. For example, inventories of gasoline and jet fuel hit dangerously low levels, threatening flights at major airports and supplies at petrol stations. Everyone began to realize just how serious this crisis had become. The Federal Reserve Chairman, Alan Greenspan, referred to the energy crisis in California as a major threat to the U.S. economic growth in his speech.

In the mean time, a prolonged cold spell had increased demand for natural gas. But suppliers were reluctant to sell to PG&E for the same reason that the generators did not wish to sell electricity to the California market. Even though the increased cost of natural gas could be passed on to customers, suppliers were reluctant to deal with a company on the verge of going bankrupt. They demanded cash on delivery, or else.

The beleaguered utilities were pleading to the state officials that they be relieved of their traditional obligation to serve customers. The California Public Utilities Commission (CPUC) in a comical emergency session voted on a restraining order that would force utilities to continue to serve the customers – even though it was hugely unprofitable to do so.

End of the Beginning?

At the time of this writing in late January, the situation in California is far from settled, the problems far from resolved. The Governor and the state legislators, however, have finally come to the realization that they must act, and act now. Among the steps being taken:

- An Internet-based auction to secure long-term supply contracts at fixed prices is expected to help alleviate the short-term high prices.
- The state's Department of Water Resources is expected to buy as much as one-third of the state's requirements and resell to the utilities.
- New bonds are expected to be issued by the state to help write-off some of the \$12 billion of debt accumulated by the two investor-owned utilities. The bonds are likely to be paid off through a surcharge on utility bills over 10 years, making it relatively painless on consumers.
- The licensing and siting of new power plants are to be accelerated – a sorely needed remedy that will, unfortunately, not help in the next year or two.

Policy Lessons: Many Ways to Get it Wrong

The fiasco in California has had two major consequences; one positive, one not so:

- First, policy makers and regulators in other countries and states now have a model of how things may go wrong – and their disastrous consequences – if you don't design the new market rules properly. This is a hugely positive contribution – offered at great expense to California's consumers and utilities who are now experiencing the serious negative consequences.
- Second, the world-wide momentum towards liberalizing electricity markets has come to a screeching halt in many places as regulators take a time out to see if similar things are likely to happen to them. In the process, deregulation has become a dirty word. This, in our opinion, is unfortunate.

In the United States, for example, several states have now delayed the opening of their own markets pending a review of the lessons from California. These include neighboring Nevada, and the western states of Minnesota and New Mexico, but also states geographically removed including Arkansas, Oklahoma, and North Carolina.

Jeffrey Skilling, President of Enron, who is soon to become CEO, told reporters recently that "California had only itself to blame for runaway wholesale electricity prices." He went on to say that, "You probably couldn't have designed a worse system." Commenting on the so-called deregulated market in California he said, "So they say that they deregulated that market. That's just nonsense. It's probably a more regulated market today than any other market in the U.S."

More importantly, many states have taken special measures to avoid some of the problems that have plagued California. For example, politicians in Texas, which is proceeding with its own competitive market later this year, feel that their system is not likely to experience the problems of the Golden State. Others like Wisconsin, are working on beefing up their transmission network to avoid the bottlenecks that plague California. Many overseas countries send delegations to California to see the problems first hand. Few are thanking the state for providing so many useful lessons to take home.

As far as deregulation becoming a dirty word, this is unfortunate and undeserved. Enron's Skilling summed our own sentiment nicely when he said, "People are saying that deregulation causes problems. No. Stupid deregulation causes problems."