

The California Power Crisis 2000-2001

On April 6, 2001, Pacific Gas & Electric (PG&E), one of the largest investor-owned utility companies in the US, filed for bankruptcy protection after sustaining devastating financial losses. Along with fellow utilities Southern California Edison (SCE) and San Diego Gas & Electric (SDG&E), the company had suffered for more than a year as a massive gap opened up between the rates that Californian utilities were allowed to charge consumers, and the price they had to pay for supplies in the wholesale electricity market.

The utilities weren't the only ones in pain. Companies that had sold electricity to them or lent them money found themselves looking at billions of dollars in potential credit losses. Consumers that depended on the utilities had to deal with uncertainty of supply as rolling blackouts swept through one of the most economically vibrant regions of the world. The debacle eventually threatened the health of the California economy and became one of the first big political problems facing the newly elected US president, George W Bush.

The biggest financial disaster in the US energy industry since the oil crisis of the 1970s had begun five years earlier with an optimistic plan to deregulate the state's electric industry.

But the plan was based on several flawed assumptions, which failed to predict the market behaviour of generators and consumers. A potent mix of market, credit, regulatory and political risks led to the

unravelling of the plan and led to disaster for the utilities involved.

Wrong-headed reform triggers crisis

Between 1996 and 1998, California implemented a plan to deregulate its electric industry, beginning with the wholesale market, in the hope of pushing down its relatively high electricity prices. Though the details were controversial, the move was broadly welcomed as a strategy in which everyone would win. Utilities would sell their gas-fired power plants to independent producers, making the electricity generation process more efficient. Streamlined production and market forces would lower the wholesale cost of power, saving money for the utilities, and these could pass on the savings to consumers.

Under the plan, individuals and businesses that bought their electricity from major utilities saw their rates fall by 10 per cent immediately after industry restructuring

began, and many were protected from future price spikes by rate caps. Yet, four years later, the system fell apart as wholesale electricity prices spiralled out of control and the major utilities found themselves struggling to pay for the power that consumers demanded.

While there were other contributing factors, most experts agree the crisis was born out of the partial nature of the deregulation process, and the flawed assumptions underpinning it:

● **Assumption 1: Capping retail prices will protect consumers, but it is not necessary to restrict wholesale prices.**

This belief trapped retailers such as PG&E and SCE when wholesale prices rose above the figure that had been used to calculate retail rate caps. Consumers' prices were set based on the belief that wholesale prices would not rise above \$55 per megawatt hour (MWh). In 1999, when the average price was \$32/MWh, this figure seemed rea-

Lessons learned

- If the structure of an industry or market changes, predictions of "likely" or "unlikely" market extremes can be far from the mark;
- It's often the interaction between risks – market, credit, liquidity, regulatory – that turns a survivable incident into a crisis;
- In a competitive market, players behave selfishly at critical moments: profit and self-preservation are the only real motivators;
- Don't rely on regulatory action as a form of worst-case market risk management, as gaps can open up between the motivations and powers of key regulators, and regulators' actions may be too little, too late;
- It's easy to find yourself in trouble in a physical commodity market. The California power crisis was unusual only in that a complete industry segment ended up in a corner, having first helped build the walls.

sonable. During the crisis, however, the average price was more than \$200, and at some points was as high as \$1,900. Power retailers could not pass this increase along, and were expected to absorb the difference between wholesale costs and their retail intake.

● **Assumption 2: Wholesale prices will fall if power plants are sold to competitive, independent generators.**

Instead of streamlining the industry and ushering in a golden age of efficiency and low pricing by electricity generators, divesting power plants served only to leave utilities with few defences against rising wholesale prices. They still controlled nuclear and hydroelectric

plants, but these facilities could not produce enough electricity to meet demand, particularly in times of peak demand. So, when the companies that had bought gas-driven power plants raised their prices, retailers had no choice but to continue buying power from them.

● **Assumption 3: Long-term contracts between producers and retailers are not needed; utilities can buy their power on the spot market.**

If the wholesale electricity market were truly competitive, the spot market might have worked in this way – though many commentators believe that the utilities should have had more freedom to risk manage

their future financial exposures. But, since utilities were dependent upon the generators that had bought their gas-fired power plants, and demand proved much more flexible than supply for fundamental reasons we look at below, a seller's market developed. Rather than keeping prices low, the wholesalers behaved in the way for-profit companies usually behave: they tried to make a profit. Controversy continues over whether they made use of their position in the market – their “market power” – in an inappropriate manner.

Also, because electricity can be “shipped” through wires to distant locations, the producers that now owned California power plants

Timeline of events

May 2000: The first signs of impending disaster surface, as California's power reserves fall noticeably.

July: SDG&E customers begin to receive electric bills that are significantly higher than those from previous summers.

September 30: PG&E and SCE's under-collections exceed \$2.3 billion.

January 2001: PG&E and SCE suspend payments to creditors and eliminate dividend payments. Their credit ratings are downgraded to “junk” status.

January 17: Rolling blackouts begin, primarily impacting customers on “voluntary interruptible programmes”.

February 2: Governor Gray Davis signs a law allowing the state to purchase power under long-term contracts, and authorising bond issues to pay for the purchases.

February 14: The Federal Energy Regulatory Commission (FERC) rules that California cannot force private electricity generators to sell power to utilities, without

assurances that they will receive payment.

April 3: PG&E and SCE are ordered by the Californian Public Utilities Commission (CPUC) to begin making payments to California for electricity purchases.

April 6: PG&E files for Chapter 11 bankruptcy protection.

April 9: SCE signs a memorandum of understanding (MOU) with the state, outlining the steps it must take to return to financial stability.

May 7 & 8: Two days of record heat lead to rolling blackouts, as suppliers are unable to meet demand for electricity.

May 15: CPUC publishes its new rate structure, outlining price increases for customers of PG&E and SCE.

June 18: SDG&E signs a MOU with the state, ending its claim that customers owe the firm \$747 million and agreeing to sell its transmission lines to the state for \$1 billion (2.3 times book value). But the terms of the agreement are being

reviewed by the state's legislature, for approval by August 15 – and this and other plans for resolving the utilities under-collections are proving contentious.

June 18: FERC allows Cal-ISO, the independent system operator for California, to regulate wholesale prices on electricity sold to the state. Price cap is effective until September 30, 2002, and is to be determined based on the cost of generating power at the least efficient plant in the system. Controls apply to electricity sold in several western states, and not just California.

July 2: Several outside producers cancel sales to California, citing uncertainty about the effects of price restrictions passed in June.

This timeline was completed in July 2001. For the latest events in this ongoing crisis, check out CNN.com's [In-Depth Special](#).

“FERC believed the problems were caused by local market rules and that deploying federal price caps would do long-term damage to market mechanisms in all deregulated states’

were not constrained to sell their power only to the California market. If they could get a better price in a different location, they would sell their power to retailers in the other location.

● **Assumption 4: Cutting retail prices will benefit consumers.**

Cutting retail prices benefits consumers' wallets. The rate reduction did have a short-term economic benefit for consumers, but in the long term, retail price cuts had the negative effect of encouraging higher consumption of electricity. Consumers have little financial incentive to control their use of inexpensive resources and, in this case, demand for power rose to a level that has been very difficult to sustain.

Other factors help explain why the deregulation plan went so spectacularly wrong. The first is the inadequacy of California's present generation facilities. The state does not have enough power plants to keep up with rising demand, but it appears that constructing new power plants is nearly as difficult as recreating dinosaurs from fossilized DNA. Thus, little new capacity came on line in the decade before the crisis erupted. In recent years, companies that have tried to build new facilities have met with opposition from homeowners and communities that do not want to live next to a power plant.

Meanwhile, environmental restrictions limit the total amount of pollution that can be released by the state's power plants, and an individual plant's permitted pollution level is determined by the emissions vouchers it holds. New facilities cannot acquire emissions

vouchers unless they outbid existing facilities for them, or the existing plants dramatically reduce their emissions (thereby freeing up vouchers for use by new producers) or the state increases the number of vouchers available to producers.

These long-term issues were exacerbated by a series of unusually dry seasons in the US Northwest, a region that supplies power to California from its hydroelectric facilities. Under normal circumstances, these plants may have been able to sell enough extra electricity to dampen the price spikes in the southern state. Although California was able to buy some power from surrounding states, the supply was not enough to lower wholesale prices.

Adding to the problem of insufficient supply is instability within the distribution grid. At peak times, such as during daytime working hours, the grid that transports power from generation facilities to intermediate stations, and then to consumers, is placed under great stress. If anything goes wrong, such as a bottleneck or breakdown in one of the lines, blackouts can occur.

Then there's the rising price of natural gas, which is used as a fuel in many power plants. Wholesale electricity prices are sensitive to fluctuations in the cost of natural gas, and independent generators have pointed to this factor as justification for the rising wholesale price of power.

Finally, the government, which

created the untenable deregulation strategy in the first place, was slow to react after the crisis emerged. As we describe below, although California's woes provided ample fodder for political debate, regulators did not cap wholesale prices until 2001, after the crisis had taken a heavy toll on both utilities and consumers. That was partly because a dangerous gap had opened up between local and national regulatory forces.

The Federal Energy Regulatory Commission (FERC), which regulates US wholesale energy markets, believed the problems in California were caused by local market rules, and that deploying federal price caps would do long-term damage to market mechanisms in all deregulating states.

Meanwhile, the local Californian political and regulatory forces, which had more immediate worries, preferred to see the problem as price gouging by energy interests controlled from outside the state. It saw a simple and instant solution in the form of price capping. Neither position sat easily with the unique physical characteristics of power markets: demand must be met immediately, but above a certain threshold, demand can only be satisfied if players have made long-term decisions that ensure adequate supply.

The story: summer 2000 to summer 2001

With the scene set for trouble, the first unmistakable signs of disaster surfaced in May 2000, as California's power reserves fell noticeably. On May 22, the independent system operator for the

Californian power system, Cal-ISO, declared the first of many Stage 2 electrical emergencies, when reserves dropped below 5 per cent.

By June, to avoid jeopardising the system's stability, the ISO had started to ban work on any critical transmission or generation infrastructure for periods of time. But by mid-month, peak demand in the Bay area led to rotating outages for about 97,000 PG&E customers; on June 22, the Californian Public Utilities Commission (CPUC) voted to allow utilities to buy power from firms outside the PX wholesale market that formed a key feature of the deregulated market.

Meanwhile, by July, SDG&E customers had begun to receive electric bills that were significantly higher than those from previous summers. SDG&E had, temporarily, escaped retail price caps after fulfilling certain regulatory criteria, but PG&E and SCE had not. So while the customers of the latter two utilities did not immediately feel the impact of the emergency in the form of price increases in their monthly electric bills, their finances were left vulnerable. By the end of July, PG&E and SCE's "undercollections" – the gap between what they paid for power and what they could charge their customers – totalled \$1.1 billion.

The debacle took on a national flavour in late August, as President Clinton ordered the US Department of Health and Human Services to release \$2.6 million of emergency funds. This was to help pay the electricity bills of low-income families, senior citizens and people with disabilities, who could not afford them after SDG&E's rate increases.

By September 30, PG&E and

SCE's undercollections exceeded \$2.3 billion, and California's utilities were in deep trouble. US energy secretary Bill Richardson had to intervene to oblige credit-wary out-of-state suppliers to sell power to California.

By January 2001, SCE had suspended payments to creditors and eliminated dividend payments, and SCE's and PG&E's credit ratings were downgraded to "junk" status. The CPUC allowed the utilities to raise their rates, but on January 17 rolling blackouts began, mainly hurting customers on "voluntary interruptible programmes". By

force private electricity generators to sell power to utilities, without an assurance that the generators would receive payment. Davis began to formulate plans to pump money into the utilities in return for a state purchase of their transmission facilities.

Meanwhile, eight alternative energy producers formed a creditors' committee to discuss collection of SCE's \$210 million debt. The firms claimed that they had not received payment for purchases dating back to November 2000. On March 2, PG&E obtained a loan of \$1 billion to pay its creditors.

By September 30, PG&E and SCE's undercollections exceeded \$2.3 billion and California's utilities were in deep trouble. The US energy secretary had to intervene to oblige credit-wary out-of-state suppliers to sell power to California'

the end of the month, Vice President Dick Cheney had been appointed head of a task force to address US energy problems.

On February 2, California's governor, Gray Davis, signed in a law allowing the state to purchase power under long-term contracts to avoid more blackouts, and to authorise bond issues to pay for the purchases. The Department of Water Resources was also authorised to use taxpayers' money to purchase electricity on behalf of the state's consumers, providing some relief to utilities. But FERC continued to resist imposing wholesale price caps, arguing it was not the right solution. And on February 14, FERC ruled that California could not

Desperate to cut summer energy consumption, on March 13, Davis announced that households and businesses that reduced energy consumption by 20 per cent, compared with their usage the previous summer, would receive a rebate of 20 per cent on their electric bills. Mid-March brought the first statewide blackouts, affecting some 1.5 million customers.

On March 27, customers of all three Californian utilities began to see the financial effects of the situation, when the CPUC authorised a rate increase of 3 cents per kilowatt hour (KWh), as well as an emergency procurement surcharge of 1 cent/KWh. Meanwhile, demand remained high, and blackouts con-

tinued to be a threat. On April 3, the CPUC ordered PG&E and SCE to begin making payments to California for electricity purchases. FERC began to order some power suppliers to refund tens of millions of dollars to the utilities, but by now this was a drop in their ocean of debt.

The measures proved too late to prevent the biggest financial casualty of the crisis, and on April 6, PG&E filed for Chapter 11 bankruptcy protection. A few days later, SCE signed a memorandum of understanding (MOU) with the state, outlining the steps it had to take to return to financial stability.

On April 25, FERC voted to allow some price controls when energy supplies reached emergency levels. The California Assembly authorised the creation of a state-owned power company that could produce electricity at its own power plants, and sell the electricity at rates based on production costs. But two days of record heat on May 7 and 8 led to rolling blackouts, as suppliers proved unable to meet demand for electricity.

One tangle seemed to be resolved on June 18, as SDG&E signed an MOU with the state, ending its claim that customers owed the firm \$747 million to compensate for the difference between wholesale and retail prices after the retail rate freeze.

The company also agreed to sell its transmission lines to the state for \$1 billion, 2.3 times the book value of the assets, if the deal were approved by the state legislature later in the summer. But doubts emerged about the deal as the summer wore on, and it became clear that apportioning the bills for

the debacle between the taxpayer, residential consumer, business consumer and so on would not come easily, however urgent the need for resolution.

On June 18, FERC allowed CalISO to regulate wholesale prices on electricity sold to the state. The price cap is effective until September 30, 2002, and is to be determined based on the cost of generating power at the least efficient plant in the system. The controls apply to electricity sold in several western states, not just California.

But on July 2, several outside producers cancelled sales to California, citing uncertainty about the effects of price restrictions passed in June. The next day, Davis suggested that utilities cut voltage by 2.5 per cent for the remainder of the summer, to reduce peak demand. By mid-summer 2001, it had become clear that while the crisis had lost some of its immediacy, the wrangling over who was to blame and who will pick up the bill is far from over.

The aftermath – so far

The implications of the crisis are all too clear from this brief account: higher retail energy bills, rolling blackouts, bankruptcies, state bailouts and political drama. PG&E took the most drastic hit, when it filed for bankruptcy protection on April 6, 2001. SCE and SDG&E were also squeezed financially, but so far have not filed for Chapter 11 protection. Instead, they have signed MOUs with California to work out plans for returning the two companies to financial health. These agreements are awaiting approval by the state legislature. Eventually,

FERC and the US courts are likely to oblige providers of wholesale power during the crisis to refund some of their takings – though probably only a small fraction of the \$8.9 billion claimed by state officials.

The cost in any wider sense is difficult to assess, but ranges from a conservative \$16 billion to a figure of \$50-80 billion according to some expert commentators. Worries are emerging, too, about the long-term costs of some of the power supply contracts that the state entered into in an attempt to defuse the crisis.

As California's ratepayers are discovering to their cost, nothing is more expensive than risk managing a crisis when it is already raging. ■

Lisa Royan of Zurich IC Squared contributed this ERisk case study

Web Resources

An abundance of material can be found by searching for "California power crisis" or searching for the names of the main players and regulatory bodies named in the above text.

The TV programme-linked Web sites, [California Power Play](#) and [Frontline - Blackout](#) offer an easy neutral route to relevant news stories and background analysis.

The principal victims also offer background information, from their perspective. [Letter from PG&E Chairman](#) summarises how the company got into trouble and why it filed for protection, a topic explored in more detail at [this PG&E corporate page](#), while SCE reviews regulatory news relevant to its crisis [here](#).

The state of California offers a [Flex Your Power](#) site, with information on electricity usage and current efforts to resolve the situation.