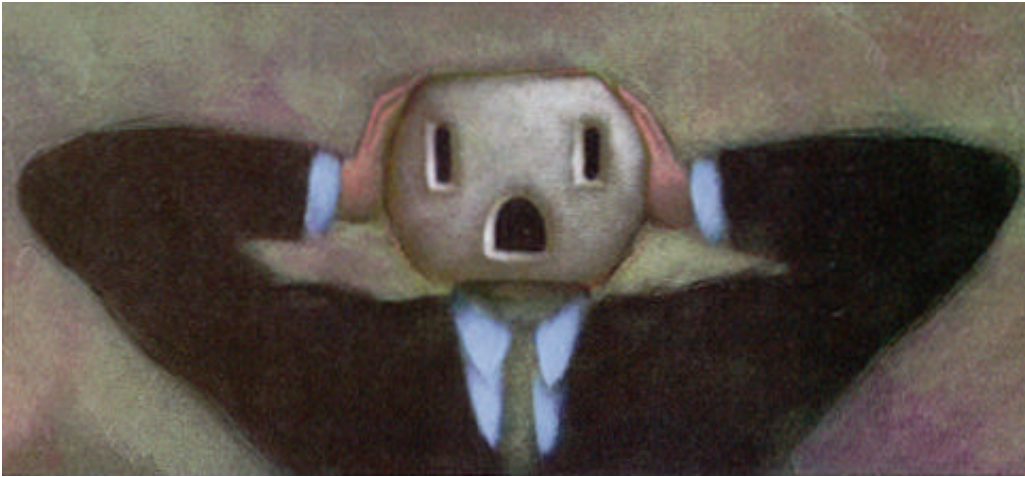


Are You Ready for a Blackout?

Every corporate executive needs to learn five lessons from California's electricity crisis.

by Peter Navarro



The wreckage of the California electricity market is a gruesome sight indeed. Thousands of manufacturing companies employing millions of people have endured repeated power interruptions and soaring electricity prices. Two of the world's largest electric utilities huddle in the shadow of bankruptcy. The stock prices of several large banks and electricity generators have wilted on fears that the utilities will fail to pay their debts. And the once robust California economy is reeling from the widespread recessionary effects of a crisis that has no end in sight.

The only good news in this otherwise grim situation is that it offers some important lessons in energy management to corporate executives everywhere.

Of course, California's crisis resulted from a unique confluence of events. For more than a decade, the state's Big Three utilities—Pacific Gas & Electric, Southern California Edison, and San Diego Gas & Electric—built no new power plants because regulated electricity prices didn't

provide the rate of return to justify such large investments. Deregulation in 1996 was supposed to fix this, but stringent air pollution laws, overly conservative forecasts of future energy demand, and constraints on natural-gas pipeline capacity in the state conspired to hamper new plant construction. With insufficient power generation of its own, California has relied heavily on electricity imports from other states. Increasingly, however, those states have kept the electricity for themselves, as their own demand has soared. Add to this supply scarcity an electricity market that, because of California's original deregulation legislation, is vulnerable to price manipulation by wholesale generators, and you have all the ingredients for rolling blackouts and skyrocketing prices.

But if California's case is particularly dire, many of its problems could emerge elsewhere. For example, the "dash for gas"—virtually every large new power plant in the world today is fueled by

natural gas—has driven prices upward and made supplies less dependable for utilities. Given the realities of the energy market, all companies should take steps to shield themselves from power shortages. Here are five lessons from California's harrowing experience.

1. Know where your electricity comes from. Your electricity provider and your place in the transmission grid both affect your exposure to risk. For example, companies like 3Com and Sun Microsystems have facilities in the heart

of Silicon Valley that use power from a municipally run utility. During the crisis, this particular hookup has been more reliable and less expensive than the hookups of those companies that rely on the investor-owned Pacific Gas & Electric. An understanding of where your electricity comes from is particularly important as you contemplate expansion. Intel CEO Craig

Barrett has said his company won't be expanding in California any time soon. Neither should your company move into any state where electricity rates and supplies are uncertain, especially if your production process is dependent on a highly reliable supply of electricity.

2. Realize the risks of being an "interruptible customer." In both the natural gas and the electricity markets, your company may be offered lower prices if you agree to have your electricity or gas supplies interrupted during an emergency. Unfortunately, thousands of California companies have become involuntary hostages to what has turned into a devil's bargain. Even though they signed up for interruptible status assuming they could leave the program at any time, once the crisis hit, state regulators froze their interruptible status. This has devastated companies that don't have any backup electricity generation.

3. Consider electricity independence—but wisely. Companies should

consider adding the capacity for backup electricity generation *before* a crisis hits—otherwise, they will face steep prices and long waits for generators that will be in short supply. Many businesses have gone a step further, asking themselves the broader question: should we become fully or partially electricity-independent? It is relatively simple for many medium to large companies to build their own natural-gas-fired plants. But beware: by going down this "old technology" road, you may be trading the problems of scarcity and high prices for other ones. With the entire world relying on gas for its incremental electricity needs, expect strong price pressures and possible supply disruptions

for years to come. In considering electricity independence, investigate emerging technologies, some of which are becoming increasingly viable and cost effective. (See the exhibit "Emerging Electricity Technologies:")

4. Pursue smart energy conservation. It will almost always be cheaper at the margin to save a kilowatt-hour than to buy one. The old-fashioned, Jimmy Carter, cardigan sweater approach involves sacrifices: the industrial equivalent of lowering the thermostat in the winter and raising it in the summer, turning off the hall light, and using the dishwasher just once a day. But a bigger payoff may well lie in newer, high-tech conservation approaches that utilize "smart metering," energy-efficient equipment, and computer hardware and software to help improve the way your company handles and consumes electricity.

5. Get into politics or get out of business. How electricity rates are set, where and when power plants get built, and whose electricity gets cut off when supplies are tight are all highly charged political

issues. Executives from large corporations who sit on the political sidelines, as many did during the California deregulation debate, are just plain foolish. Executives from smaller corporations who do not band together in coordinated political action are, at best, free-riding on the backs of the larger companies. At worst, they will bear the regulatory burdens when times get tough.

But keep long-term implications in mind when trying to shape political outcomes. Utility executives and several large business customer groups in California drafted much of the 1996 deregulation legislation now destroying their companies. If these executives-motivated by the short-term benefits of

lower energy costs and higher profits—had taken a longer-term, more strategic view, they would have clearly seen this: agreeing to cap retail rates in a market where electricity shortages would eventually put intense upward pressure on wholesale rates was a recipe for financial disaster.

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Technology	How It Works	Providers Include
Flywheel energy storage system	Stores power in kinetic form in the spinning motion of a flywheel. The stored energy is reconverted into electricity by running the flywheel as a generator.	* Active Power * Acumentrics * Beacon Power
Fuel cell	Electrochemically converts hydrogen or hydrocarbon fuels directly into an electrical current. The heat produced by the process is used to run a turbine, which generates more electricity.	* Ballard Power Systems * FuelCell Energy * Global Thermoelectric * H Power * Plug Power
Microturbine	Produces electricity in a conventional manner but on a small scale. These refrigerator-sized power plants, known as "jets in a box," run on everything from kerosene, natural gas, and propane to gases flared from petroleum fields.	* AlliedSignal Power Systems * Capstone Turbine * Elliott Power Systems * Ingersoll-Rand Energy Systems * Solo Energy
Solar photovoltaics	Converts light from the sun into electricity—unlike the previous generation of solar power, which merely generated heat through the use of solar panels.	* ASE Americas * AstroPower * BP Solar * Energy Conversion Devices * Siemens Solar * SunWize Technologies
Computer software and hardware	Lets companies integrate energy management systems at different locations and use the Internet to control the systems. This helps companies analyze and monitor data to improve the way they handle and consume electricity.	* CMS Viron Energy Services * Echelon * Invensys Building Systems * Ortega InfoSystems * Powerware * Siemens Building Technologies * Silicon Energy * Strategic Resource Solutions