

Poor Planning Left California Short of Electricity in a Heat Wave

Scores of power plants were down or operating below their capacity just as hot weather drove up demand.



By Ivan Penn

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Everybody had known for days that a heat wave was about to wallop California. Yet a dashboard maintained by the organization that manages the state's electric grid showed that scores of power plants were down or producing below peak strength, a stunning failure of planning, poor record keeping and sheer bad luck.

All told, power plants with the ability to produce almost 6,000 megawatts, or about 15 percent of the electricity on California's grid, were reported as being offline when temperatures surged last Friday. The shortfall, which experts believe officials should have been able to avoid, forced managers of the grid to order rolling blackouts in the middle of a pandemic and as wildfires across the state were spreading.

But even if all of the missing capacity had been available, California would probably still have struggled to deliver enough electricity to homes where families were cranking up air-conditioners. That's because the manager of the grid and state regulators were relying on power from plants that either had permanently shut down or could not have realistically achieved the targets set for them.

For example, the California Public Utilities Commission had assumed that hydroelectric plants would provide as much as 8,000 megawatts when demand peaked this summer. But that number appears to have failed to take into account low water levels at many dams, including the Big Creek Hydroelectric Project high in the Sierra Nevada. And those plants delivered only 5,514 megawatts last Friday, according to data from the nonprofit that manages the state's grid and maintains records about power plants, the California Independent System Operator.

"This is like brain surgery," said Robert McCullough, a utility industry consultant in Oregon. "You don't make mistakes. People actually die when you mess it up."

The last time power plant outages in California totaled 15 percent or more during the summer peak was in 2000 and 2001, when the state was grappling with an energy crisis created by a botched deregulation of the industry and market manipulation by traders at Enron and other companies, Mr. McCullough said. As they did then, wholesale electricity prices in California spiked in recent days because of the supply shortfall.

"It's bizarre. It's unbelievable," Mr. McCullough said, adding that North American grids are typically designed to handle plant outages up to about 7 percent.



State regulators were expecting more power from hydroelectric plants than they delivered. Stephen Saks Photography/Alamy

Other plants that the grid manager listed as being down or producing at lower levels should never have been on the list. A natural gas unit at the Inland Empire Energy Center, southeast of Los Angeles, was listed as down for planned maintenance — though state regulators had approved its demolition back in December. A state official said Thursday that about half of it had been torn down.

Other mistakes might have led grid managers to believe more plants were affected than was the case. The Geysers geothermal power plant, about 72 miles north of San Francisco, was listed as operating at less than its usual capacity, but its owner, Calpine, said on Thursday that it had in fact been generating electricity at normal levels.

In a statement on Thursday, California I.S.O. said that some of the plants on its list were out of state and that some might have been providing power outside its system. In addition, the organization said some plants, including those that burn natural gas, might have been producing less power because it was too hot for them to operate normally.

Almost a week after the blackouts began, neither the grid operator nor state energy regulators have offered a clear and detailed explanation of why California was so short of power even though peak demand was lower than it had been during other hot days in recent years. They have broadly attributed the energy shortage on their inability to secure more electricity from other states and sources.

In a letter to Gov. Gavin Newsom late Wednesday, the heads of three agencies that oversee the state's electricity system said they were working to determine what had gone wrong. They acknowledged that the electricity demand on Friday and Saturday — when hundreds of thousands of homes and business went dark — was “high but not above similar hot days in prior years.”

When utilities cut power to their customers, the peak demand had reached 47,000 megawatts on Friday and 45,000 on Saturday. Those were far below the highest day — 50,270 on July 24, 2006 — or the 50,116 clocked three years ago.

Perhaps even more baffling is that the agencies did not turn to the state government for help until just before the blackouts began. Had they done so, Mr. Newsom could have called on power plants that the state and municipal utilities control to generate more power or made a plea to businesses and homeowners to conserve power — steps he took on Monday after the scope of the problem became clear.

“The lack of transparency around the reality of this situation contributed to the problem,” said Carrie Bentley, chief executive officer of Gridwell Consulting and a former official at the California I.S.O.

Mr. Newsom, a Democrat, sharply criticized state regulators. “Grid operators were caught flat footed, unable to avert disruptive blackouts and to adequately warn the public,” he wrote in a terse letter to energy officials.

Mr. Newsom has ordered an investigation into what went wrong, and state lawmakers have called for public hearings.

California's electricity system has been under scrutiny for two decades. After its last energy crisis led to rolling blackouts and skyrocketing electricity prices, the state has worked to end its reliance on fossil fuels and shift to carbon-free energy sources, chiefly solar power. Dozens of power plants have closed because of environmental concerns and competition from cheaper renewable sources of electricity.

In addition, the state's nuclear fleet is in its final years. The San Onofre plant in Southern California shut down in 2013 after a failed upgrade proved too costly to repair, and the only remaining nuclear plant in the state, Diablo Canyon, is set to close by 2025.

The current energy emergency has focused attention on the Diablo Canyon plant, which Pacific Gas & Electric owns. The utility recently asked federal regulators to allow it to inspect and potentially repair one of its two units without shutting down the plant.



Pacific Gas and Electric has asked federal regulators to let it inspect and potentially repair one of the units at its Diablo Canyon nuclear plant in Avila Beach, Calif. Michael

PG&E contends that its request would not pose a safety risk. But some energy experts have expressed alarm about the company's plan.

"It's akin to having someone change your brake pads while you're still rolling down the road in your car," said Arnold Gundersen, a nuclear engineer and consultant.

If regulators require PG&E to shut down the unit before inspecting and repairing it, the loss could further strain the state's grid.

California I.S.O., which manages 80 percent the state's electricity operations, depends heavily on power imported into its system, from other utilities in the state like the Los Angeles Department of Water and Power and from plants in neighboring states. But the heat wave engulfing the West has increased demand in other states, too, tying up some resources.

Climate change, the main reason California is seeking to move to carbon-free energy sources, has become a hurdle in itself.

Summer temperatures are regularly breaking records, and recently hit 130 degrees in Death Valley. The heat and lack of rainfall have turned the summer wildfire season into a year-round phenomenon, putting yet more pressure on the grid.

Although California I.S.O. "could not have predicted the specific series of events that ultimately required power outages, better communications and advance warnings about tight supply conditions were possible, and should have been done," the agencies said in their letter to Mr. Newsom.

Steve Berberich, president and chief executive officer of California I.S.O., on Tuesday defended his organization's decision to order rolling blackouts rather than dipping into reserve power supplies set aside for emergencies. He said the grid had to keep some reserves on hand in case a plant like Diablo Canyon unexpectedly shut down.

Some conservatives have blamed California's growing reliance on solar and wind power for undermining the reliability of the state's grid. President Trump said on Twitter that the state's Democratic leaders had "intentionally implemented rolling blackouts — forcing Americans in the dark." He added that the Green New Deal, a proposal for 100 percent renewable and zero-emission energy embraced by many liberals, "would take California's failed policies to every American!"

But Mr. Berberich said the reliance on renewables was not a factor because the state was facing such a huge shortfall in generating capacity. "It's simply a matter of raw capacity."

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