

Power Outages Could Rise as Freezing Temperatures Persist

Electrical grids appeared to have handled the storm over the weekend relatively well, but energy experts said the risk of more outages remained.



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As wintry conditions and frigid temperatures gripped much of the United States this weekend, the nation's power system has avoided buckling like it has in past years. But the system faces severe strain Tuesday, as the nation's largest electricity market projects its highest ever winter demand.

Hundreds of thousands of residents and businesses largely in the southern parts of the country had no electricity on Monday. Most of those outages resulted from the typical challenges that accompany winter storms: snow piling up on electrical equipment and ice dangling from branches and power lines, causing them to snap. And with temperatures below freezing and demand for electricity expected to stay high, outages could very likely expand.

The storm this weekend blanketed wide parts of the nation under more than a foot of snow in some places and sheets of ice in others. Some weather models are predicting another storm, but meteorologists have cautioned that the forecast was hypothetical and should not be treated as a certainty.

“This next wave of ice that may be coming in is going to test the system even further,” said Calvin Butler, the chief executive of Exelon, which owns regulated utilities in New Jersey, Maryland, Delaware, Pennsylvania and Illinois. “All that ice, they’re just not used to it,” he said, referring to the Southeast. “We’re more used to hurricanes in the Southeast.”

The explosive winter storm that moved from the Southwest to the Northeast comes as electric grids struggle to manage a staggering rise in electricity demand from data centers, some of which support the development of artificial intelligence.

This is the first major test of the power system’s resilience during a potent winter storm in the era of huge data center expansion. In an unusual move, the Department of Energy late Sunday ordered the manager of Texas’ main electric grid, the Electric Reliability Council of Texas, to direct data centers and other facilities that consume a lot of energy to begin using backup generators in an effort to prevent blackouts.

Like other grid operators, ERCOT issued weather alerts ahead of the storm but expected conditions on the system to remain normal.

Texas experienced a widespread electric grid failure during a severe winter storm in February 2021 that killed more than 200 people. Energy companies in the state have since added more batteries, power plants and other resources, but industry experts said the state still had work to do.

“This is the fourth once-in-a-hundred-year winter storm in ERCOT in 25 years,” said Robert McCullough, principal of McCullough Research, a consulting firm in Portland, Ore. “We are forecasting poorly and preparing even worse.”

For many decades U.S. electricity use has hit its highest levels in the summer when residents and businesses turned up their air-conditioners. But in recent years, as more people have begun using heating systems and cars that run on electricity, demand has increasingly hit peak levels during winter in more parts of the country. That has tested power plants and grids in the South and the Mid-Atlantic region.

ERCOT and PJM, which manages the grid across 13 states and the District of Columbia, have struggled to keep some power plants online during recent winter emergencies, especially plants that burn natural gas.

About 40 percent of the electricity produced in the United States comes from natural gas — far more than any other single technology or fuel, according to the Energy Information Administration. As a result, in some places, residents could be hit with much higher electric bills as gas prices rose.

U.S. demand for natural gas remained near record levels on Monday, as companies burned much more of the fuel to generate electricity than they typically did this time of year, according to S&P Global Energy.

Prices, which had risen late last week, surged higher on Monday. In the futures market, prices briefly topped \$7 per million British thermal units for gas to be delivered in February, more than double what the price was earlier this month.

But gas production was beginning to recover after falling as the winter storm swept across the country, S&P Global Energy said.

Higher gas prices could add to the already growing frustration with the nation's utilities. Energy reliability and affordability has emerged as leading political issues heading into the November congressional and state elections.

Blunting the impact of rising gas prices is the use of battery storage. In Texas, these systems helped ensure that the state's grid remained stable and kept electricity prices from spiraling out of control, energy experts said.

During periods of high demand, which tend to occur during winter storms and summer heat waves, utilities rely on power plants that sit idle for much of the year. These little used plants typically provide power that is much more expensive than those used more regularly.

Batteries, though, can bring stability to the grid throughout the year and during extreme weather events. This weekend, when many power plants in Texas were shutdown or failed to run, batteries stepped in and helped keep the grid going.

“Once you keep the lights on, how much did it cost to keep the lights on,” said John Zahurancik, chief customer success officer at Fluence, a manufacturer of energy storage systems for utilities and power developers throughout the world. “Storage gives us a way to do that more cost effectively. Usually your most expensive power is also your dirtiest power.”

During severe weather two years ago, energy provided by battery systems in Texas eliminated the need for grid managers to ask residents to conserve electricity and saved customers an estimated \$750 million, according a study by the American Clean Power, an association of renewable energy resource providers.

California recently announced similar results. Because of the growth in batteries, the state hasn’t had to issue conservation alerts during heat waves in recent years.

But grid managers outside California and Texas are way behind in adding batteries to their systems. PJM has not installed as many battery systems, though it was one of the first electricity systems to begin using them. Demand for electricity on PJM’s grid, which serves 67 million people, is expected to be at its highest level ever in winter on Tuesday.

“The system is operating on a much thinner razor’s edge,” said George Katsigiannakis, a vice president at ICF, an energy consulting firm.

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