Calif. dilemma: Fight climate change and keep on the lights

By Anne C. Mulkern | 06/06/2022 06:32 AM EDT

The sun shines through towers carrying electrical lines in South San Francisco, Calif. Justin Sullivan/Getty Images

California sees itself as a global leader in the fight against climate change. But keeping on the lights over the next five summers is likely to increase the state's greenhouse gas emissions, energy experts said.

The nation's most populous state faces an electricity supply crunch, with projections showing that peak demand could exceed available supplies by as much as 3,500 megawatts. That would leave as many as 3.5 million homes without power.

To address the problem, Democratic Gov. Gavin Newsom wants to spend $5.2 billion to boost reliability. Initial plans include keeping open natural gas plants that were due to retire.

For now, state leaders should prioritize preventing blackouts over concerns about greenhouse gas emissions, said several experts. Doing so would help maintain support for long-term climate goals.

"If the public sees this year after year — shortages and blackouts and curtailment — I think there will be a lot of setback for the long-term green energy plan that everyone hopes will come to pass," said Ahmad Faruqui, energy economist formerly with the Brattle Group consulting firm. "We live in the short run. Unless we make it through the short run, we are not going to get the long run."

California aims to make its grid carbon-free by 2045. Additionally, state law mandates California must generate 60 percent of its electricity from renewable sources in less than eight years. But supply chain disruptions have stalled generation projects.

Meanwhile, extreme heat, wildfires and drought threaten to cut supplies and drive up electricity demand. Rolling blackouts hit the state for two evenings in August 2020 during a West-wide heat wave.

As a result, energy planners want a 22.5 percent buffer of available electricity supplies over projected peak demand. Right now, they lack that buffer for the next five summers (*Climatewire*, May 23).

This summer, the potential gap between energy demand and supply could hit 3,500 megawatts. In California, 1 MW powers between 750 and 1,000 homes.

Starting next summer, the state should have sufficient electricity supply under normal circumstances. But extreme events could create a demand surge and electricity supply shortage, planners said. In 2023, the power supply gap in those cases is 600 MW. In 2024, it rises to 2,700 MW. A year later, in 2025, the potential shortfall is 3,300 MW.

Compounding the issue is that power plant retirements are expected to take away about 6,300 MW of supply by 2025. Those includes the planned retirement of the Diablo Canyon nuclear plant's two generators in 2024 and 2025. The Newsom administration has asked the Department of Energy for help in getting federal funding that could delay the plant's closure (*Energywire*, May 25).

California Energy Commission spokesperson Lindsay Buckley said in an email that the agency recognizes "reliability challenges may lead to a short-term increase in greenhouse emissions in the electricity sector."

"This is also occurring as a record-breaking amount of clean energy is planned to come online, lowering the net increase in emissions," she said in an email.

Since the August 2020 rolling blackouts, the state has ordered utilities to procure 11,500 MW of power and accelerate generation projects, Buckley said. Battery storage capacity grew twentyfold in 2.5 years. State officials also installed emergency generators and delayed planned retirement dates for existing power plants.

Even with those actions, she said, "climate impacts are outpacing our efforts and continuing to cause unprecedented stress on California's energy system, threatening reliability and [putting] Californians at risk of additional outages."

State Sen. Bob Wieckowski (D), chair of the senate budget subcommittee on environmental issues, said he fears what an electricity supply crunch would mean for a California mandate to shrink its greenhouse gas emissions 40 percent below 1990 levels by 2030.

To meet that requirement, the state needs to cut emissions about 4.3 percent annually — about 2.5 times its 2019 reduction level (*Climatewire*, Dec. 15, 2021).

Continuing to operate natural gas plants that were due to close compounds the climate challenge, he said in an interview. "We calculated that we would meet part of these" greenhouse gas emissions reduction goals "based on those things coming offline," Wieckowski said.

He added that he's asked the Newsom administration for more specifics on what electricity generation sources it would include in the reliability project, as well as options to offset emissions increases.

Limited options for this summer

Siva Gunda, vice chair at the California Energy Commission, said that the bulk of Newsom's proposed funding would go toward securing electricity supply sources. That includes extending the lives of plants that were scheduled to retire, as well as ramping up new generation and storage projects, new clean energy backup generation projects, and diesel and natural gas backup generation units with emission controls.

In terms of this summer, however, there's not much that can be done, said Jan Smutny-Jones, CEO of the Independent Energy Producers Association, a trade group.

"If we're talking about next year," he said, "there may be some opportunity" to add resources.

The $5.2 billion, if it's approved, is needed in part to pay natural gas-fired plants to stay online, because many lose money during the day, he said. Their power is more expensive than solar electricity that's abundant in the Golden State.

"If you need the gas fleet, and you're only operating, say, 10 percent of the time, how do you keep them around economically?" Smutny-Jones said.

Several energy experts suggested that California needs to change how it prices electricity and the incentives it offers to businesses and residents to cut their power consumption.

California needs more "dynamic pricing," where electricity consumers get a price that varies based on supply and demand conditions, said energy economist Faruqui.

Only about 2 percent of California electricity ratepayers have dynamic pricing, Faruqui said. Some customers have "time of use" rates, but those rates don't vary based on supply and demand.

Buckley at the CEC said that an upcoming rule development would address dynamic pricing, asking utilities to take steps that include creating electricity rates that change at least hourly to reflect location-based events.

V. John White, executive director of the Center for Energy Efficiency and Renewable Technologies, said Newsom's budget initiative should include an expansion of incentives to get people and businesses to plug in at non-peak times. There are several companies that recruit groups of those people and then offer up electricity use reductions for sale.

That "would be a very good tool for us to have, and it would also help minimize the greenhouse gas emissions from other forms" of maintaining reliability, White said. "The way we're going to avoid it is by moving the load; that's the single best and most cost-effective thing we can do."

More money offered to cut consumption

California needs to beef up its programs that pay customers to reduce their consumption when asked, an arrangement known as demand response, several experts said.

Right now, there are budgetary limits for those programs, said Mona Tierney-Lloyd, head of state Public Policy at Enel North America, a power company focused on green electricity and demand response. Its subsidiary Enel X contracts with commercial users to cut their load in response to payments.

"More funding could be helpful in soliciting more customers to participate," Tierney-Lloyd said.

White said that in the last five years, California has lost about half of its demand response capability, and that "many of the prominent demand response providers have left California."

Buckley with the California Energy Commission said that officials have launched a new alert system asking customers to cut consumption. A new customer payment program automatically enrolled low-income Californians.

There's also a new incentive program, she said, tied to smart thermostats. Utilities have increased the amount they pay for cutting electricity use, she said. Emergency load reduction programs that paid $1 per kilowatt-hour when they were launched last year now pay $2 per kWh.

"They are only activated under emergency conditions, and there is no guarantee of payment if the programs are not activated," she said.

Enel through its arm Enel X manages electric vehicle charging "so that if there is a high demand period on the grid, we can manage our charging so that we're reducing that demand," Tierney-Lloyd said.

It did that in August 2020 when the state went through several weeks of tight power supplies during record-breaking heat waves, she said.

Tierney-Lloyd said Enel has been talking with California energy and utility regulators about the possibility of allowing locally based energy sources such as batteries to export power to the grid. That's not currently available, she said. Battery owners only can use the devices to lower their own on-site consumption.

The state needs a plan on both supply and reducing electric bill costs, said Arne Olson, a senior partner at Energy and Environmental Economics, or E3, an energy consulting firm that produced a 2020 reliability study for the California Air Resources Board. California electricity bills are rising sharply (*Climatewire*, April 5).

"We're going to triple the amount of electricity we use in California," he said, as part of the state plan to get to carbon neutrality in 2045. "You're not going to get people to want to electrify their homes or electrify their vehicles if they can't rely on having sufficient electricity and they can't afford it."

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