

California must prepare its electric grid for complex climate risks

By Anna Brockway, Laurel Dunn and Steven Weissman | Aug. 27, 2020



Firefighters respond to a structure fire along Riverdale Boulevard as the fire line creeps up on Highway 9 during the CZU Lightning complex fire on Sunday in Boulder Creek.

Photo: Kent Nishimura / Los Angeles Times / TNS

California was caught flat-footed by the climate-driven challenges it has faced last week: extreme temperatures, unseasonable lightning strikes, diminishing water supplies and red flag fire conditions. As a result, CalFire was short on firefighters to battle the blazes and the electric utilities had too little power to serve all of their customers at the same time.

We are learning the hard way that it is not enough to acknowledge our changing climate. We need more and better information to know how to act, and better coordination among the actors. Last week's blackouts stand as proof that there is more work to do.

In order to make good decisions about maintenance, facility siting and the specs of new equipment, electric grid operators must understand how weather and climate affect electricity demand, supply and delivery. Normally, they look at historical weather patterns and operating conditions. But now, the electricity system must prepare for more record-setting events. Making credible decisions in the face of climate uncertainty requires changing how we plan for the future.

Where we now lean on experience, we must begin to consider a range of possible futures, and the implications of getting it wrong.

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Consider a future where more frequent heat waves increase electricity demand while stressing generators and power lines, resulting in power shortages. Separately, changing precipitation patterns cause reservoirs to flood in the spring and dry up in the fall, reducing overall hydropower generation. Planning ahead to keep the grid running under these conditions will require a better understanding of how different climate trends can build on each other to threaten reliability.

The truth is that we are still learning how to make good decisions in the face of climate change. Climate scientists study how global weather patterns might evolve over the next century. Decision-makers typically need much more specific information — such as whether a particular watershed is more likely to experience flooding or drought in the coming hours, days or years. The science of understanding how global climate trends affect local weather is still evolving.

Scientists have made more progress in developing climate data than society has made in understanding how to use it. With state-of-the-art climate data, we can describe a range of possible climate futures, but have no certainty about which future will unfold. Decision-makers must learn how to act in spite of this uncertainty, weighing the cost of preparing the grid for a particular future against the very real possibility that hindsight will favor a different course of action.

By reimagining the way it plans the electric grid, California could become a national leader in climate adaptation. To do so requires unprecedented coordination among decision-makers throughout the state. Here are key steps planning agencies must take:

- The California Public Utilities Commission (CPUC), which determines how much money utilities may spend and oversees how resources are allocated, has to make sure that relevant climate information becomes part of every CPUC proceeding. To examine how different climate effects interact and to identify knowledge gaps, the CPUC must more consistently call on climate scientists, power engineers and experts in decision-making under uncertainty to shed light on new risks and to help utilities take appropriate action.
- The California Energy Commission (CEC), which funds climate research, must do more to ensure that the CPUC and utilities have the data they need to take informed action. They must fill gaps in knowledge — such as how utility tree-trimming strategies have to change as the climate changes. The CEC also tries to predict the future demand for electricity, which is heavily dependent on climate

realities. And the CEC must begin to forecast demand across a range of possible climate outcomes.

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- The California Independent System Operator (CAISO), which has to keep the grid balanced and service reliable, must begin planning for operating scenarios that have never been seen before, and examine how climate trends could introduce new operational risks.

In the years ahead, California will have to make decisions about generating electricity in conditions more challenging than we have ever faced. Today, however, the processes are not up to the task, and so it's essential that we reimagine our planning for the future.

That effort begins with the governor's office, which can do much to ensure stronger coordination among all authorities in grid operation, planning and research in pursuit of effective climate adaptation. Sustained funding enabled by the Legislature is critical to help generate new knowledge, and that knowledge must be widely shared so that various partners — including CalFire, other first responders and local governments — can be ready.

The reliability and safety of our electricity system, and the welfare of all Californians, depends on it.

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