

Drought is killing California's hydroelectric power. Can solar make up the difference?

By Steve Scauzillo , San Gabriel Valley Tribune

sgvtribune.com



A lone boat on a dock on what's left of Huntington Lake, now a dry lake bed. The Fresno-area lake is one of six reservoirs that powers Big Creek, a hydroelectric facility run by Southern California Edison. Photo courtesy of Paul Griffo/SCE.

A view of Huntington Lake near Fresno. The shrinking lake is a result of low snowmelt, which has reduced power at the adjacent Southern California Edison's nearby Big Creek hydroelectric power complex. Photo courtesy of Paul Griffo/SCE



Snowmelt entering Big Creek's hydroelectric powerhouses has slowed to a trickle. Reservoirs sit at their lowest levels ever.

The 102-year-old central-California complex owned and operated by Southern California Edison lost 80 percent of its hydroelectric power this year, a direct result of a persistent drought that has wiped clean the Sierra Nevada snowpack and produced an eerie silence inside Big Creek's 27 dams and nine powerhouses.

"This is definitely the worst I've ever seen," said Andrew McMillan, operations manager for Edison's

massive hydro plant, a historic project situated between Yosemite and King's Canyon financed by Henry Huntington in 1913 to send power to his Pacific Electric Red Cars.

Knowing droughts can hang around for years, even decades, Edison managed the water to keep some generators humming during peak summer demand, McMillan said. SCE then added new solar and wind power to replace the 800 megawatts of hydroelectric evaporated by the drought, said Colin Cushnie, SCE's vice president of energy procurement and management.

"It was our good fortune that there were (solar and wind plants) already in the pipeline," Cushnie said.

Largest state drop in decade

Statewide, the pattern is repeated, only on a grander scale.

California is approaching the largest reduction in hydroelectricity in 10 years, said Steven Greenlee, spokesman for the California Independent Systems Operator, which monitors 80 percent of the state electric grid. (The Los Angeles Department of Water and Power and the Sacramento Municipal Utility Department are not part of the California Independent Systems Operator.)

The four-year drought has cut hydroelectricity by 36 percent, Greenlee said. Now, the state has 4,700 megawatts of hydroelectric power available from central and Northern California dams, down from a

capacity of 7,400 megawatts.

“It is shaping up to be one of the lowest in 10 years,” he said.

Solar power filling gaps

Although the state’s electrical grid has taken a punch from the drought and record-high summer month temperatures, it has remained standing. A state mandate to convert from burning oil, coal and natural gas, which release carbon dioxide into the atmosphere and contribute to global warming, to solar, wind and geothermal energy has helped.

For example, state utilities filled the hydro gap by adding 2,300 megawatts of new electricity generation, 96 percent of which was from solar energy, Greenlee said.

Advertisement

“The bottom line is, we have had less hydroelectricity, but it has not impacted the operations or the reliability of the grid,” he added.

Well, not that much.

Heat equals high demand

On June 30 and July 1, the California Independent Systems Operator called two flex alerts, asking utility customers to conserve by turning off appliances during the day and adjusting air conditioning to 78 degrees or higher. But it’s not clear how much of that was due to a lack of hydropower.

Hydroelectricity can account for 10 percent to 20 percent of the electricity consumed in the state, said Peter Gleick, founder and director of the Pacific Institute, an Oakland-based environmental think tank.

It is clear the drought has taken a bite out of the state’s electrical pie and that bite grows bigger as the drought drags on. In July 2012, the state’s hydroelectricity average hourly production reached 3,000 megawatts. In the same month in 2013, it dropped to 2,800 megawatts and then to 2,200 megawatts in July 2014, Greenlee reported.

The highest use of electricity so far this year occurred Aug. 28, when the state used 47,196 megawatts. The all-time record peak was set in July 2006 at 50,270 megawatts. Peak usage is driven by home and business air conditioners running longer during heat spells, he said.

The California Independent Systems Operator is required to keep a 7 percent reserve. It has access to 65,000 megawatts of electrical power, Greenlee said.

“We have plenty of capacity. Now, it is just a matter of using it efficiently,” he said.

Will El Niño help?

Throughout the drought, the state augmented new solar and wind power with electricity from plants burning natural gas. Since natural gas is not free like snowmelt, this has cost the state an extra \$1.5 billion, Gleick said.

Farmers facing rapidly dropping groundwater levels are running electric well pumps longer. This increases electric demand and raises costs, Cushnie said.

Like water officials, electricity managers are banking on a strong El Niño this winter that could bring normal to above-average rain and snowfall.

“Our reservoirs are so very low, we should be able to absorb most of that,” McMillan said, adding that hydroelectricity at Big Creek could then reach 100 percent.

But due to global climate changes, a strong El Niño might not increase hydroelectric production if precipitation falls mainly as warm rain in Southern California.

“Hydroelectricity is very dependent on snowpack that melts slowly during those first few weeks of summer,” Greenlee said. “If we don’t get any snow in the Sierra, there would be little to no hydroelectric power.”



Steve Scauzillo

Reach the author at Steve.Scauzillo@sgvn.com or follow Steve on Twitter: [@stevscaz](https://twitter.com/stevscaz).

- [Full bio and more articles by Steve Scauzillo](#)
- [Back to top](#)