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## Wind, water and solar energy aren't enough. California needs nuclear options

December 4, 2025 Guest Commentary by Leonard Rodberg (lrodberg@gmail.com)



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Twin containment domes rise above the Diablo Canyon Nuclear Power Plant in San Luis Obispo on Aug. 9, 2024. Photo by Genaro Molina, Los Angeles Times via Getty Images

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Sure, California can swear off fossil fuels and shut down its nuclear plants, powering itself entirely with wind, water, and sun.

All it takes is getting used to weekly rolling blackouts.

Some energy predictions are tricky; this one isn't. We can estimate how much electricity each solar panel and wind turbine will produce, and when they'll produce it. Then we can plug those numbers into a computer, along with green advocates' optimistic projections of future electricity demand, to see how supply and demand match up on an hourly and seasonal basis.

Even with vastly expanded battery storage capacity to smooth things out, the match is poor.

California will sometimes generate renewable energy in abundance, but grid operators will still face tough choices — such as disconnecting generators when there's too much sun and little demand or firing up fossil-fuel based gas turbines when there's no sun or wind at all.

During much of the year, especially in late summer and throughout December and January, solar and wind power will meet demand for some hours but not have enough excess to charge the batteries.

California might generate as much energy from wind and sun as it uses overall, but not when it's needed. To keep the power flowing, the state will actually need up to 80 gigawatts of gas-fired backup capacity — far more than it has today — or risk repeated shortfalls.

Eighty gigawatts is enormous. California's current peak demand is just over 52 gigawatts, but by 2050 — with millions of [electric vehicles](#), heat pumps, and [energy-hungry data centers](#) — electric demand will be far higher.

Keeping all that backup generation on standby won't come cheap. The cost of maintaining this fossil fuel capacity must be added to the already high cost of intermittent renewables like solar and wind.

A system powered solely by [solar](#), [wind](#), and [hydro](#) isn't an engineering strategy; it's a belief system. Zealotry and energy reliability don't mix.

Some zealots who advocate for an all-renewable energy future have [offered unrealistic scenarios](#) for powering California while eliminating carbon emissions. Our recent studies show their plan for California would [leave it short of power](#) at least 50 days a year.

The state's official energy plan isn't much better. A new grid simulator — the Hourly Electric Grid Analysis, or HELGA — compares expected demand with renewable output on an hour-by-hour basis. It shows California's plan would [cost nearly a trillion dollars](#) yet still require the grid to burn almost as much natural gas as it does today.

Like every other state, California will need large, zero-carbon generators that operate independently of the weather to meet its climate goals.

Realistically, that means nuclear power.

A fleet of advanced reactors running around the clock can provide reliable, carbon-free electricity. New designs — such as Bill Gates's [Natrium](#) reactor with molten salt thermal storage — are engineered to ramp output up and down in response to grid demand. Others will [operate continuously](#), supplying the grid or charging storage systems as needed.

California can reach its climate goals, but not through blind adherence to ideology. Clean, reliable power is possible, but only if the state faces reality about what it takes to get there.