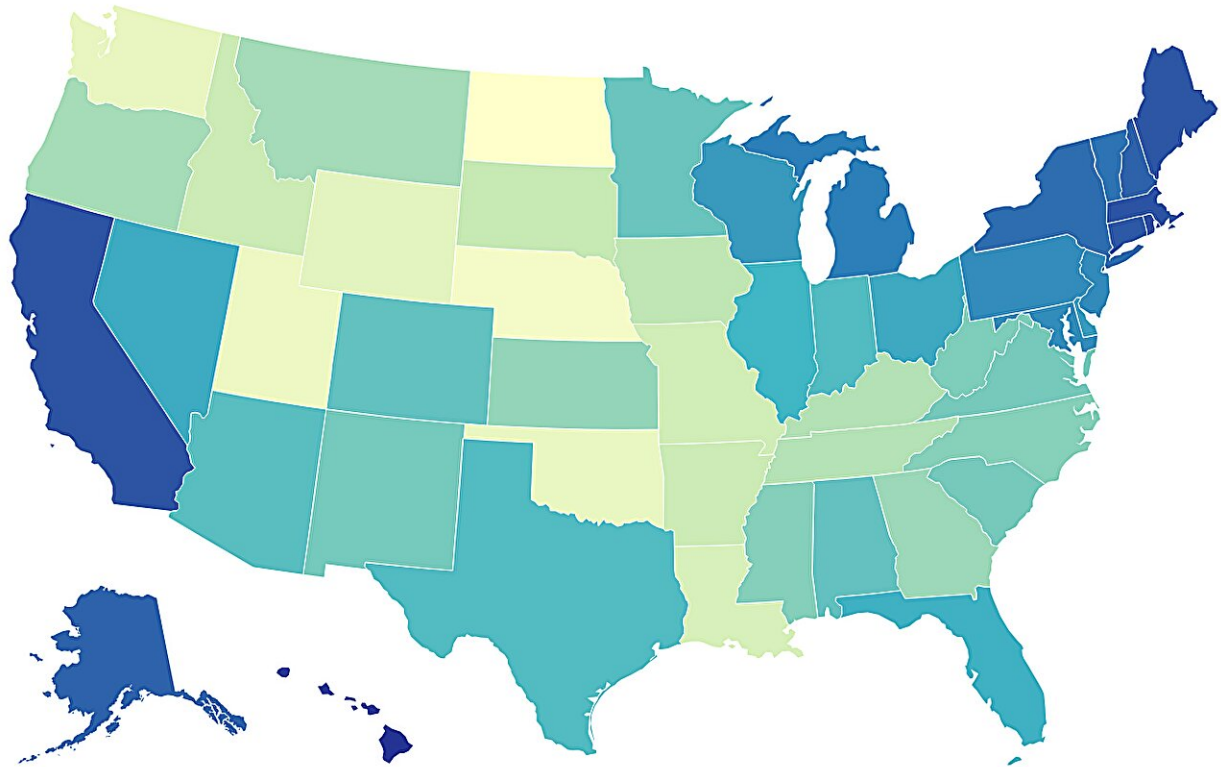


California is wrestling with electricity prices—how to design a system to fix the grid while keeping prices fair

March 21 2024, by Yihsu Chen and Andrew L. Liu

California's residential electricity prices are among the highest in the US

Cents per kilowatt-hour



Average price of residential electricity, December 2023

Map: The Conversation, CC BY-ND • Source: EIA • Created with Datawrapper

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Small-scale solar power, also known as rooftop or distributed solar, has grown considerably in the U.S. over the [past decade](#). It provides electricity without emitting air pollutants or climate-warming greenhouse gases, and it meets local energy demand without requiring costly investments in transmission and distribution systems.

However, its expansion is making it harder for [electric utilities](#) and power grid managers to design fair and efficient retail electricity rates—the prices that households pay.

Under traditional electricity pricing, customers pay one charge per kilowatt-hour of electricity consumption that covers both the energy they use and the fixed costs of maintaining the grid. As more people adopt rooftop solar, they buy less energy from the grid. Fewer customers are left to shoulder utilities' fixed costs, potentially making power more expensive for everyone.

This trend can drive more customers to leave the system and raise prices further—a scenario known as the [utility death spiral](#). One [2018 study](#) calculated that two-thirds of recent electricity distribution cost increases at California's three investor-owned utilities were associated with the growth of residential solar.

With abundant sun and solar-friendly policies, California has [36% of U.S. small-scale solar capacity](#), much more than any other state. And the state is engaged in a heated debate over [pricing electricity](#) in ways designed to make energy less expensive for [low-income households](#).

We study [energy markets](#) and [public policy affecting energy and the environment](#), and have analyzed various [retail electricity rate structures](#) and their economic impacts on power producers and consumers. Our key finding is that an income-based, fixed-charge rate structure of the type that California is currently considering offers the most efficient and equitable solution—if it is designed correctly.

Two-part power bills

The debate over fixed charges began in 2022, when the California Legislature [enacted an energy bill](#) that ordered state regulators to study income-based fixed charges and decide whether to adopt them by July 1, 2024. Then the state's three largest utilities—Southern California Edison, Pacific Gas and Electric, and San Diego Gas & Electric—[submitted a proposal](#) to the state Public Utilities Commission in mid-2023 that would separate retail bills into two parts: a fixed charge and a variable charge.

The fixed charge would be a preset monthly fee, independent of [energy usage](#) but tied to income levels, so wealthier customers would [pay a larger share of grid maintenance costs](#). The variable charge would be based on the amount of electricity consumed and would cover the actual costs of electricity production and delivery.

Historically, these actual costs have typically ranged between [4 to 6 cents per kilowatt-hour](#). Today, the average residential rate in California [often exceeds 30 cents per kilowatt-hour](#) because it covers fixed costs as well as electricity use.

Who benefits?

A two-part billing system that separates fixed costs from variable usage charges offers [potential benefits](#) for both consumers and utilities.

For utilities, the fixed charge offers a stable revenue stream. The companies know how many households they serve, and they can plan on the fixed amounts that those households will pay each month. Households that go solar would still pay the fixed charge, since most of them draw electricity from the grid when the sun doesn't shine.

This approach provides financial stability for the utility and access to the grid for all. Consumers would benefit because with a certain amount of

income guaranteed, utilities could charge significantly less per kilowatt-hour for the actual electricity that households use.

One significant concern is that if electricity costs less, people may use more of it, which could undermine efforts toward energy conservation and lead to an increase in emissions. In our view, the way to address this risk is by fine-tuning the two-part billing structure so that it covers only a portion of the utilities' costs through fixed charges and incorporates the rest into the variable usage rates.

Put another way, combining a lower fixed charge with a higher variable charge would ensure that utilities can still cover their fixed costs effectively, while encouraging mindful energy use among consumers. Ensuring affordable electricity for consumers, fair cost recovery for utilities and overall fairness and efficiency in the energy market requires striking a delicate balance.

Another argument from critics, often labeled "[energy socialism](#)," asserts that higher-income households might end up [subsidizing excessive electricity use](#) by lower-income households under the income-based rate structure. In our view, this perception is inaccurate.

Wealthy households would pay more to maintain the grid, via larger fixed charges, than poorer households, but would not subsidize lower-income households' energy use. All income groups would pay the same rate for each additional kilowatt-hour of electricity that they use. Decisions on energy use would remain economically driven, regardless of consumers' income level.

Fixed fees are too big

While our research supports California utilities' approach in principle, we believe their proposal has shortcomings—notably in the proposed

income brackets.

[As currently framed](#), households with annual incomes between US\$28,000 and \$69,000 would pay a fixed fee of \$20 to \$34 per month. Households earning between \$69,000 and \$180,000 would pay \$51 to \$73 per month, and those earning more than \$180,000 would pay \$85 to \$128.

The middle-income bracket starts just above California's [median household income](#). Consequently, nearly half of all California households could find themselves paying a substantial monthly fee—\$51 to \$73—regardless of their actual electricity usage.

It could be hard to convince consumers to pay significant fixed fees for intangible services, especially middle-income residents who have either gone solar or may do so. Not surprisingly, the proposal has encountered considerable [pushback from the solar industry](#).

Finding the sweet spot

In response to public outcry, California lawmakers recently introduced [Assembly Bill 1999](#), which would replace the income-graduated fixed-charge requirement with fixed charges of \$5 per month for low-income customers and up to \$10 per month for others. In our view, this reaction goes too far in the other direction.

Capping fixed charges at such low levels would force utilities to hike their energy use rates to cover fixed costs—again, risking the death spiral scenario. Our research indicates that there is a [range for the fixed charge](#) that would cover a reasonable share of utilities' fixed costs, but is not high enough to burden consumers.

Without utility cost data, we can't pinpoint this range precisely.

However, based on [estimates of utilities' costs](#), we believe the caps proposed in AB 1999 are too low and could end up unfairly burdening those the bill aims to protect.

In our research, based on a hypothetical case study, we found a sweet spot in which fixed charges cover about 40% of utilities' fixed costs. Charges at this level provide maximum benefit to consumers, although they reduce energy producers' profits.

Our findings are similar to an [alternative proposal](#) jointly presented by [The Utility Reform Network](#), a nonprofit consumer advocacy organization, and the [Natural Resources Defense Council](#), an environmental advocacy group. This plan suggests a two-part rate structure with an average fixed charge of about \$36 per month. Low-income households would pay \$5 per month, and those earning over \$150,000 yearly would pay about \$62.

We believe this proposal moves in the right direction by ensuring fair contributions to grid costs, while also encouraging efficient energy use and investment in clean energy infrastructure. It could act as a guide for other U.S. states searching for methods to balance utility fixed-cost recovery with fair pricing and continued growth of small-scale [solar power](#).

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