

# How far is too far in promoting solar?

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Like anything in life, there are always two sides to every story. Take the case of net metering, a policy that allows homeowners and commercial entities with solar photovoltaic panels on their roofs to barter electricity with their utility company.

At night, when virtually all of us are drawing power from the utility grid, your meter measuring consumption spins forward, adding to your monthly utility bill. During the day, if you have a solar panel on your rooftop and the sun is shining, the meter would instead spin backward under net metering, taking demand for power off the utility system.

Utility companies complain that this policy – which is the dominant approach to promoting solar energy in the United States – is unfair to customers who do not have solar panels.

The utilities complain that net metering is a way for wealthy customers who can afford solar photovoltaic, or PV, systems on their rooftops to avoid paying their fair share of the costs incurred to run the distribution and transmission grid that benefits us all. Net metering therefore reduces the fees they otherwise would be charged to maintain the grid.

Apparently, the perception that solar PV systems are toys for the rich in Malibu or Marin is no longer true. "Solar PV is no longer for the wealthy," points out Ed Fenster, co-founder of Sunrun Inc., one of a new breed of solar companies that will lease you solar PV systems, often for no money down. In the process, these solar PV systems can save you money while reducing air pollution linked to power production. Thanks to this recent solar lease model, two-thirds of solar PV installations over the last three years in California have occurred in ZIP codes with median income of less than \$85,000, clearly not the wealthiest regions in the state.

Fenster said that the poorest of California ratepayers are insulated from possible cost shifts from solar PV adoption due to ratepayer protections afforded in the California Alternative Rates for Energy program, which, generally speaking, offers 20 percent discounts to low-income households.

In California, the nation's most successful solar market, the state's three investor-owned utilities have calculated that solar photovoltaic systems that will be added to the state's grid by 2015 under net metering will add up to approximately \$1.3 billion in increased electricity costs for the state's ratepayers without their own solar PV systems.

Here's how that more than a billion dollars is split among the state's three investor-owned utilities:

- San Diego Gas & Electric: \$200 million.
- Southern California Edison: \$400 million
- Pacific Gas & Electric: \$700 million

New study touts net metering

To fans of solar energy, net metering is a phenomenal success story. According to a report by GreenSource

of solar PV flow to customers who do not have solar on their rooftops, since they reap the benefits of reduced demand on utility grids, lowering overall system costs.

PG&E claims the study is bogus. The wrong natural gas price forecast was used, which means solar PV is less economical, since natural gas prices have dropped an additional 20 percent from the prices used by Crossborder, largely due to the controversial practice of fracking. That's just one in a long list of esoteric assumptions behind competing calculations of costs and benefits.

The biggest bone of contention, however, is that the Crossborder Energy study looked at just 30 percent of the total power exported to the grid by a solar PV panel under typical circumstances. The remaining 70 percent is usually consumed on site, at the house or business. PG&E, and its utility brethren, claim the entire output of the system should be counted when number crunching on the magnitude of a cost shift.

"The Crossborder study was funded by Vote Solar, who work to allow strong solar markets to grow, but without any balancing concerns about who pays that cost," said Denny Boyles of PG&E's external communications department. "Over the long term, PG&E seeks a sustainable solar market to provide our customers with choices, while being cognizant of the rate impacts solar installations can have on other customers."

Bringing this issue to a boil is a state law that places a cap on net metering that, thanks to a ruling by the California Public Utilities Commission, is now higher than originally thought: 5,700 megawatts of solar PV, or the equivalent amount of potential power that could be produced by more than six Rancho Seco nuclear reactors. At present, the amount of net metered solar PV feeding into California's grid is just under 2,000 megawatts, which, due to the intermittency of solar, is less than 0.4 percent of utility total power demand in the state.

While a victory of sorts for solar power, the PUC ruling would also end the net metering program as of Jan. 1, 2015. PG&E is expecting that the number of solar PV customers using net metering within its service territory will reach its cap of 5 percent of its systemwide peak demand for electricity this year, hence its particularly aggressive stance on net metering. Even in the Crossborder Energy study, PG&E customers are singled out as the only ratepayers in California subjected to any cost shifting from those with solar to those without.

To put this issue in context, consider that state rebates to install solar PV are declining to near zero under the California Solar Initiative program, a 10-year program designed to wean the solar industry off subsidies. Solar PV costs are declining to near the utilities' retail price for electricity. Though consumers throughout the United States can still access a federal investment tax credit, the need for an additional state subsidy has shrunk over time. Yet in order for consumers to fully maximize the value of their solar systems, net metering is now more important than ever before.

"Utilities such as PG&E see the writing on the wall as solar PV is being installed at costs near parity with generic, dirty grid power," commented Adam Browning, executive director of Vote Solar, a nonprofit solar advocate. As state subsidies run out, "there is no other way than net metering to capture the value these solar PV systems bring to California's grid."

Who's right, who's wrong?

As anyone who has put together an Excel spreadsheet knows, numbers can say very different things based on one's assumptions. Dueling studies and statistics highlight how beauty clearly lies in the eye of the beholder. The PUC, thanks to Assembly Bill 2514, is now performing its own study on cost shifts, which the solar industry claims is based on a methodology skewed to make solar look bad. Though not required to be released until October, rumor has it the study is being rushed out the door, setting up a major battle in the Legislature.

The solar industry is not fully united on the topic of net metering. Some, such as Craig Lewis, executive director of the CLEAN coalition, a Palo Alto-based nonprofit promoting local energy solutions, claim there is a better way. Lewis likes the model that has flourished in European countries, such as Germany. It is called a "Feed-in Tariff," which pays consumers for the power they generate as it flows onto the grid just like any other power source.

"I think both the utilities and net metering advocates are right," said Lewis, acknowledging that calculating cost shifts and benefits attached to net metering is incredibly complicated.

"If taken to the extreme, net metering could lead to a downward spiral death for utilities," he warned.

Interestingly enough, the Sacramento Municipal Utility District has just deployed the feed-in tariff model and added almost 100 megawatts of new solar PV over the past two years at a cost of 14 cents per kilowatt-hour. For comparison purposes, SMUD has added 34 megawatts of solar PV on rooftops through net metering.

The vast majority of solar PV developed across the globe relies upon feed-in tariffs, though there is a backlash occurring against this policy as well. Take the case of Germany, where payments to consumers for rooftop solar PV was two to three times what is paid in the United States, but where the actual cost for installation is a third of what it is here. Germany is restructuring its incentives so that more power is consumed on-site, reducing feed-in tariff rates by as much as 26 percent. The purpose of the cuts is to shrink the size of solar PV systems, limiting the power flowing beyond the site owner's property and into the grid, a goal that aligns with the basic concept of net metering.

SMUD is not the only California utility developing significant solar PV without net metering. PG&E, SCE and SDG&E also have been authorized by the PUC to build and own solar PV that will add up to 1,100 megawatts. They can charge up to 28 cents per kilowatt-hour, double what SMUD just paid for solar PV, and costs which are spread over all of its ratepayers, whether they like solar or not.

There are two sides to every story. In the end, it is likely that there are some small cost shifts with net metering, but there are benefits to the power grid as well. When you consider that ratepayers in Southern California are paying utilities \$1 billion over the course of a year for a shuttered San Onofre nuclear power plant that is not producing any power at all, any cost shift appears to be a small price to pay for democratizing our power supply with solar energy, rooftop by rooftop.