



## The Unintended Consequences of Net Metering\*

*At first glance, the concept of promoting rooftop solar energy seems like a good idea: homeowners are incentivized to buy or lease solar panels; they benefit from reduced reliance on their local utility for electricity; they benefit directly from clean solar energy; and they sell any excess power to the electric utility for credit or payment. The subsidies, in theory, make solar energy an affordable alternative for consumers. But that is not the whole story. As this ConsumerGram shows, net metering can produce many unintended consequences that in the end lead to higher costs for all consumers.*

### What is Net Metering?

Net metering is a program that allows consumers to generate energy from rooftop solar panels for their own use and to offset the cost of any energy they purchase from electric utilities. Because solar panels can be costly to purchase and install in homes, homeowners generally finance or lease the cost of these solar panels.

In an effort to reduce the costs of solar energy and encourage the production of carbon-free energy, regulators and policymakers, both state and federal, have put a number of measures in place to incentivize homeowner investment in solar panel systems. These measures come in the form of federal tax credits for solar panel equipment and installation and, in some cases, a host of other state tax breaks and other incentives. In California, for example, net metering homeowners have received renewable energy credits, as well as a financial rebates for car chargers, preferential access to carpools and free use of public charging stations.<sup>1</sup> In addition to these incentives, states allow homeowners with solar panels to sell the excess power they produce from their rooftops to their electric utility for credit or payment.

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\* Contributing authors include Steve Pociask, Krisztina Pusok, Liam Sigaud and Oliver McPherson-Smith for the American Consumer Institute, a nonprofit educational and research organization. For more information, visit [www.theamericanconsumer.org](http://www.theamericanconsumer.org).

<sup>1</sup> Jonathon Lesser, "Are electric cars worse for the environment?" *Politico*, May 15, 2018, <https://www.politico.com/agenda/story/2018/05/15/are-electric-cars-worse-for-the-environment-000660>. Also see, "Net Energy Metering (NEM)," California Public Utilities Commission, downloaded January 11, 2019, <http://www.cpuc.ca.gov/General.aspx?id=3800>.

However, several states require utilities to buy excess solar energy from net metering consumers at or near retail prices, which makes net metering costly for electric utilities and thus consumers as well. In addition, the times when excess solar energy is produced and sold to an electric utility may not coincide precisely with the electric utility's demand, which means that some of the solar energy that is being purchased by the utility has less value or little offsetting benefit to the utility, its customers, and even the environment.

In fact, net metering can lead to unintended consequences that increase costs for others. Giving some homeowners tax breaks is a cost that some other party must bear. There are also opportunity costs incurred when homeowners sell solar electricity without paying the taxes and fees that typical electricity producers would pay. In addition, if electric utilities are required to pay more than the market price to buy excess energy from net metering consumers, then non-solar consumers are subsidizing solar consumers. In short, legislative measures used to encourage rooftop solar energy carry unintended consequences for consumers and need to be carefully examined.

## **Welfare for the Rich**

The price of electricity can be divided primarily into the full cost of generating the energy itself and the full cost of transmitting it to the end user. When net metering consumers are allowed to sell excess solar electricity to the utility at or near retail rates, as some states allow, they are compensated not just for the energy they produce, but also receive the portion of retail rates normally devoted to maintaining the electrical grid.<sup>2</sup> Net metering deprives the utility of this portion of cash flow, reducing its ability to invest in and maintain its distribution infrastructure. Fixed costs for an electric utility can be substantial and recovery of these costs is necessary to ensure reliable service. If prices are not set correctly, the financial losses from net metering could undermine the very infrastructure upon which all electricity consumers depend, including net metering consumers. Unless addressed, this will jeopardize service reliability and ratepayers will be on the hook to pay the difference.

Homeowners who benefit from net metering should pay their fair share. Consumers without solar panels should not be subsidizing consumers with solar panels. To avoid this inequitable market distortion, electric utilities should be paying a price substantially less than the retail rate for excess solar electricity. As a general rule, the price should approximate the cost that the utility avoids by not producing the energy itself, or what is sometimes referred to as the *avoided-cost*. The price should not include the distribution and transmission costs

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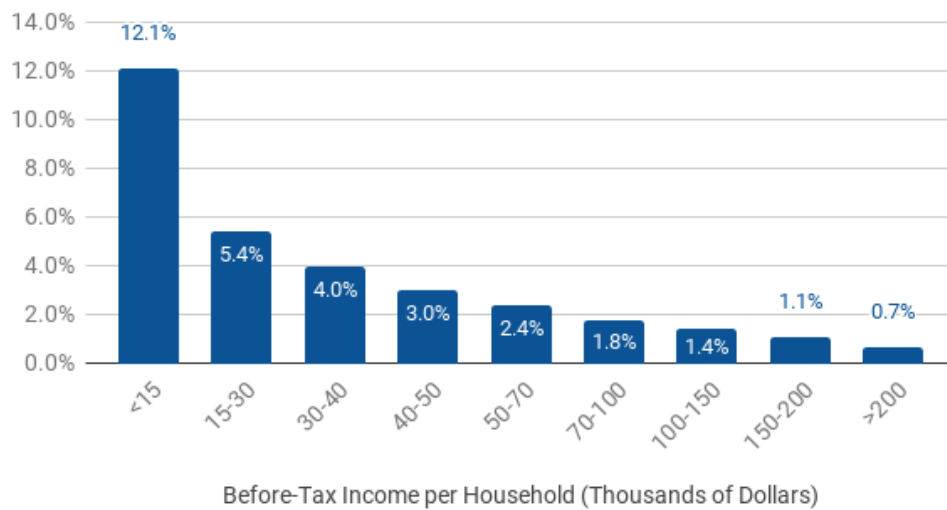
<sup>2</sup> For example, Californians have been credited for the excess energy produced by selling it to the public utility at the same retail rate that retail consumers would pay. See "Net Energy Metering (NEM)," California Public Utilities Commission, <http://www.cpuc.ca.gov/General.aspx?id=3800>. For an example in Florida, see Todd Ulrich, "Action 9: Lake County Man Says Solar Panels Haven't Lowered His Electric Bill," WFTV-9 (ABC Affiliate), December 18, 2018, <https://www.wftv.com/news/action-9/action-9-lake-county-man-says-solar-panels-haven-t-lowered-his-electric-bill/891039593>.

reflected in the retail price, since net metering consumers use utilities' existing infrastructure to tap into the grid.

Why should getting the price right matter to policymakers? Partly because consumers owning solar panels tend to have much higher incomes than other consumers, so lower-income families are effectively subsidizing higher-income families. For example, the California Public Service Commission estimated that households with solar panels had incomes that were 68% higher than the average household.<sup>3</sup> Essentially, these subsidies amount to welfare for the rich.

Asking lower-income consumers to subsidize higher income consumers becomes even more contemptible when considering the large proportion of income that low-income consumers pay for electricity. Data from the Bureau of Labor Statistics shows that households with before-tax earnings of less than \$15,000 spend 12% of their income on electricity, while households with before-tax income over \$200,000 spend only 0.7% of their income on electricity, 17 times less than the lowest-income households. This disparity is shown below in Figure 1.<sup>4</sup>

**Figure 1: Percent of Income Spent on Electricity, 2017**



Source: U.S. Bureau of Labor Statistics

How much money is being transferred from ordinary ratepayers to net metering customers? It varies by state and region. The Nevada Public Utilities Commission, for example, reported that the annual subsidy is approximately \$623 per year for each residential net metering customer in Southern Nevada and \$471 per year for each residential net metering

<sup>3</sup> "California Net Energy Metering Ratepayer Impacts," California Public Utilities Commission, October 2013.

<sup>4</sup> "Income before taxes: Annual expenditure means, shares, standard errors, and coefficients of variation, Consumer Expenditure Survey, 2017," U.S. Bureau of Labor Statistics, Consumer Expenditure Survey, Released September 2018, Table 1203, <http://www.bls.gov/cex/>.

customer in Northern Nevada.<sup>5</sup> Before reforms were passed in Arizona in 2015, non-solar customers were collectively paying an additional \$9 to \$10 million annually to cover the cost of solar customers.<sup>6</sup>

Encouraging alternative energy may be a well-intentioned idea, but subsidizing rooftop solar energy hits lower-income consumers the hardest. Policies that subsidize solar panels on the roofs of homes are discriminatory, because they unfairly raise the costs of energy for the other consumers. Given society's limited resources, these subsidies effectively compete for funding from other state programs and they undermine the basic infrastructure that all consumers depend on for reliable energy.

### Lopsided Solar Incentives

As noted above, net metering is just one of the many federal and state financial incentives to encourage rooftop solar systems. A recent study showed that in all but five of the twenty-five states examined, homeowners who purchase a solar system directly (instead of leasing from a third-party) receive at least 75 percent of total system costs in taxpayer-funded government incentives. Due to additional tax benefits, third-party owners get an even better deal; only one of the twenty-five states cover less than 80 percent of total system costs.<sup>7</sup>

However, the judiciousness of this huge taxpayer investment is called into question when one considers the far greater efficiencies of utility-scale solar installations compared to rooftop systems. If policymakers' objective is to reduce carbon emissions and support clean energy sources, they should recognize that incentivizing rooftop systems is an inefficient and expensive strategy. In fact, studies indicate that than utility-based systems lead to lower solar costs – thanks to economies of scale, better placement and tracking capabilities – thereby avoiding about half of the carbon emissions compared to residential rooftop panels.<sup>8</sup>

Figure 2 shows that the total cost of utility-scale solar is less than 50 percent of the total cost of residential solar systems, regardless of the ownership model.<sup>9</sup> In addition, in terms of dollars per watt, Figure 2 below shows that even though utility-scale solar installations are

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<sup>5</sup> "Net Metering Rates & Rules," Nevada Public Utilities Commission, March 2016, [http://puc.nv.gov/uploadedFiles/pucnv.gov/Content/Consumers/Be\\_Informed/Fact\\_Sheet\\_Net\\_Metering.pdf](http://puc.nv.gov/uploadedFiles/pucnv.gov/Content/Consumers/Be_Informed/Fact_Sheet_Net_Metering.pdf).

<sup>6</sup> Ryan Randazzo, "SRP board OKs rate hike, new fees for solar customers," *The Republic*, February 26, 2015, <https://www.azcentral.com/story/money/business/2015/02/26/srp-board-oks-rate-hike-new-fees-solar-customers/24086473/>.

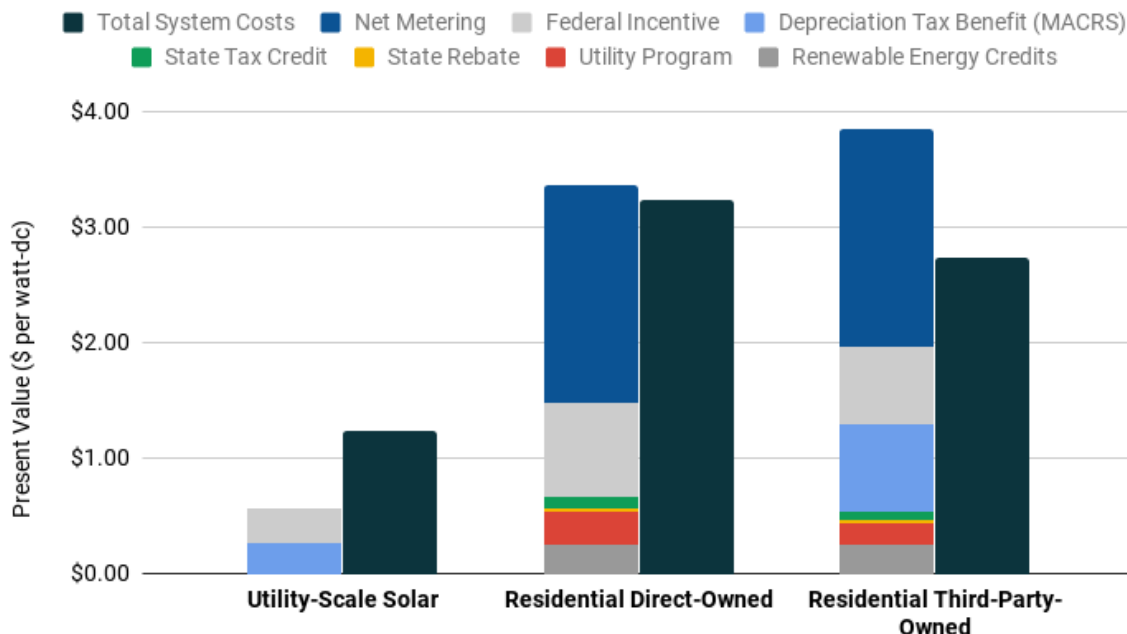
<sup>7</sup> "Incentivizing Solar Energy: An In-Depth Analysis of U.S. Solar Incentives," Consumer Energy Alliance, prepared by ScottMadden, Inc., June 2018, <https://consumerenergyalliance.org/cms/wp-content/uploads/2018/06/Solar-incentive-report-060418.pdf>.

<sup>8</sup> "US: Utility-Scale Solar More Cost Effective Than Residential Rooftop," *PV Magazine*, July 14, 2015, [https://www.pv-magazine.com/2015/07/14/us-utility-scale-solar-more-cost-effective-than-residential-rooftop\\_100020200/](https://www.pv-magazine.com/2015/07/14/us-utility-scale-solar-more-cost-effective-than-residential-rooftop_100020200/).

<sup>9</sup> "Incentivizing Solar Energy: An In-Depth Analysis of U.S. Solar Incentives," Consumer Energy Alliance, prepared by ScottMadden, Inc., June 2018, <https://consumerenergyalliance.org/cms/wp-content/uploads/2018/06/Solar-incentive-report-060418.pdf>.

significantly less expensive to install and maintain, they are incentivized at a much lower rate than rooftop solar systems. Residential solar systems receive, on average, 104 percent (for direct-owned) and 140 percent (for third-party owned) of total system costs in incentives. In contrast, utility-scale solar panels are only subsidized at about 45 percent of total system costs. This incentive structure sharply tilts the playing field in favor of residential rooftop systems, despite the fact that utility-scale installations are a more cost-effective way of generating solar electricity.

**Figure 2: Incentives for Residential Solar vs. Utility-Scale Solar (\$ per Watt-DC)**



Source: Consumer Energy Alliance

## The Cottage Economy

When governments give subsidies, some businesses find ways to benefit from these actions. While the leases for rooftop solar systems can appear very attractive to homeowners – offering free energy, low payments, and no maintenance costs – the deals are often fraught with inaccuracies about future energy savings, overlook insurance expenses, and downplay the escalation of future lease payments. Moreover, according to *Energy Daily*, the financial survival of the industry rests on duping consumers:

*“The company’s [SolarCity] lease model depends largely on uninformed customers buying the unattractive lease/PPA [Power Purchasing Agreement] products. The supply of this class of customers is likely to be plentiful as the company targets new geographies, but we expect the supply of gullible customers to decline as solar penetration increases.”<sup>10</sup>*

<sup>10</sup> For example, see Bradley Blakeman, “Solar Industry Under Fire,” *Newsmax*, August 14, 2014, <http://www.newsmax.com/BradleyBlakeman/Solar-Energy-SolarCity-Homeowners/2014/08/13/id/588557/>.

In some instances, questionable sales practices have led leasing representatives to give misleading information in order to encourage consumers to sign long-term lease contracts. The structure of many of these solar deals leaves leasing companies as the owners of the panels, meaning that homeowners have additional debt obligations that may complicate their ability to repair their roofs or sell their homes. In a few years, some consumers could find themselves paying more for electricity than before the installation of solar panels. Here are just a few examples of these questionable practices:

- In 2015, the owners of the Arizona-based company Stealth Solar were forced to pay \$92,000 in restitution for “illegally advertised services.” Instead of seeing their utility bills plummet as they were promised, some customers saw their electricity rates rise due to the cost of installation.<sup>11</sup>
- Solar installation companies have a long history of using aggressive telemarketing to sell their products. In 2017, SolarCity agreed to pay \$15 million in a class action lawsuit for violating federal robocall rules and continuing to call numbers listed on the National Do Not Call Registry.<sup>12</sup>
- After a year-long inquiry ending in 2017, the Campaign for Accountability, a nonprofit watchdog organization, documented thousands of consumer complaints against solar installation businesses.<sup>13</sup> In 2018, the group urged attorneys general in the states of Arizona, Nevada, and New York to investigate the dubious practices of rooftop solar companies.
- In 2018, the New Mexico Attorney General initiated a lawsuit against Vivint Solar, claiming the company binds its customers into 20-year contracts without disclosing that rates increase by more than 72 percent over that period and distorts real estate records to make it more difficult for homeowners to sell their property.<sup>14</sup> Earlier in the year, Vivint paid \$10 million to settle a Florida suit alleging deceptive sales tactics.<sup>15</sup>

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<sup>11</sup> Robert Anglen, “Arizona’s Stealth Solar Owners Admit Fraud,” *The Republic*, February 9, 2015, <https://www.azcentral.com/story/money/2015/02/09/arizonas-stealth-solar-owners-admit-duping-customers/23121947/>.

<sup>12</sup> Anne Bucher, “SolarCity Telemarketing Calls Class Action Settlement,” *Topclassactions.com*, October 23, 2017, <https://topclassactions.com/lawsuit-settlements/closed-settlements/823991-solarcity-telemarketing-calls-class-action-settlement/>.

<sup>13</sup> “What Consumer Complaints Reveal About the Solar Industry: CFA’s Year-Long Investigation Reveals Vivint and SolarCity are the Industries Bad Actors,” *Campaign for Accountability*, December 7, 2017, <https://campaignforaccountability.org/wp-content/uploads/2017/12/CfA-Report-FTC-Complaints-Solar-12-7-17.pdf>.

<sup>14</sup> Tiffany Caldwell, “Vivint Solar Accused of Dishonest Sales Practices by New Mexico Attorney General,” *The Salt Lake Tribune*, March 13, 2018, <https://www.sltrib.com/news/2018/03/11/vivint-solar-accused-of-dishonest-sales-practices-by-new-mexico-attorney-general/>.

<sup>15</sup> Pamela Manson, “Vivint Agrees to Pay \$10 Million to Settle Lawsuit Alleging Deceptive Sales Practices,” *The Salt Lake Tribune*, January 9, 2018, <https://www.sltrib.com/news/2018/01/09/vivint-agrees-to-pay-10-million-to-settle-lawsuit-alleging-deceptive-sales-practices/>.

Several other state attorneys general and consumer protection agencies all over the country have warned homeowners to be vigilant concerning these fraudulent activities.<sup>16</sup>

In some cases, solar panel deals would more accurately be called *consumer scams*.<sup>17</sup> The cottage industry that has sprouted up across the nation is fueled, in large part, by the net metering subsidies that have distorted market prices and presented a lucrative opportunity for unscrupulous businesses. Consumer protection is necessary to prevent fraudulent practices from spreading. To achieve that, consumers need the correct information to make informed decisions, and policymakers need to be steadfast in eliminating subsidies – both explicit and implicit.

## Reform is Needed

Legislators across the country are coming to recognize the damage that poorly planned net-metering policies can cause. In June 2019, New Hampshire Governor Chris Sununu vetoed a bill that would have raised the state’s cap on net metering from 1 to 5 megawatts, saying that, “*We should not force our ratepayers to massively subsidize those who can afford to construct 40-acre solar farms.*”<sup>18</sup> Similarly, the Kentucky state legislature passed a bill in February that would allow the state’s Public Service Commission to determine the price at which electricity can be sold back to utilities.<sup>19</sup> The bill amends previous regulations that forced utilities to purchase solar electricity at a rate above the avoided cost.

Rather than focusing on the rate at which net metering customers sell their electricity, some states have sought to level the cost of infrastructure across conventional and solar customers alike. Kansas, for example, has implemented regulations which ensure solar panel owners do not shirk their share of the responsibility for maintaining the grid infrastructure. While residential producers can sell their energy at the retail rate, in September 2018,

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<sup>16</sup> Will Stone, “Arizona Attorney General Issues Warning About Deceptive Solar Flyers,” KJZZ Radio, November 27, 2018, <https://kjzz.org/content/730028/arizona-attorney-general-issues-warning-about-deceptive-solar-flyers>; “New Mexico Attorney General Sues Rooftop Solar Company Over Sales Practices,” *Santa Fe New Mexican* (Associated Press), March 8, 2018, [http://www.santafenewmexican.com/news/local\\_news/new-mexico-attorney-general-sues-rooftop-solar-company-over-sales/article\\_57faaa95-c3c3-58a9-8d7a-1f325d9f8ade.html](http://www.santafenewmexican.com/news/local_news/new-mexico-attorney-general-sues-rooftop-solar-company-over-sales/article_57faaa95-c3c3-58a9-8d7a-1f325d9f8ade.html); and Daniel Stevens “Why California’s Attorney General Must Stand Up to Solar Companies,” *The Sacramento Bee*, April 25, 2018, <https://www.sacbee.com/opinion/op-ed/soapbox/article209758284.html>.

<sup>17</sup> “Second St. Joseph Business Owner Pleads Guilty to Solar Company’s \$1.4 Million Fraud Scheme,” United States Attorney’s Office, Department of Justice, February 2, 2016, <https://www.justice.gov/usao-wdmo/pr/second-st-joseph-business-owner-pleads-guilty-solar-companys-14-million-fraud-scheme>.

<sup>18</sup> See Oliver McPherson-Smith, “Legislatures Should Put Rate Payers First When It Comes to Net Metering,” *Inside Sources*, June 28 2019, <https://www.insidesources.com/legislatures-should-put-rate-payers-first-when-it-comes-to-net-metering/>.

<sup>19</sup> Erik Slobe, “Kentucky Senate passes net-metering bill impacting home solar compensation,” *Jurist*, February 14 2019, <https://www.jurist.org/news/2019/02/kentucky-senate-passes-net-metering-bill-impacting-home-solar-compensation/>.

regulators in Topeka, Kansas allowed utilities to levy a “demand charge” on residential producers to contribute to infrastructural upkeep.<sup>20</sup>

Iowa’s state senate has also passed a similar bill that would allow utilities to charge solar net metering customers additional fees.<sup>21</sup> The bill was spurred by concerns that net metering customers were each avoiding costs of up to \$328 per year. It remains to be seen whether the bill will advance through the state house.

Other states, however, have moved backwards on the issue. In early 2019, Maine lawmakers reimplemented retail-rate net metering and, in June 2019, passed a bill that would expand a limit on community net metering from 9 participants up to 200.<sup>22</sup> The overhaul also raised the capacity of potential participants from 660 kW to 5 MW. Furthermore, in May 2019 South Carolina’s state legislature unanimously approved a two-year extension to net-metering at the retail rate.<sup>23</sup> The state previously had a cap of 2% of electricity generation from net metering but, in a win for the state’s wealthiest residents, the cap was abolished. For those with private solar panels, this now creates unlimited upside and, conversely, unlimited downside for those who cannot afford their own panels. The silver-lining of the bill has a mandate for authorities to develop a permanent system of net-metering after two years.

While many states are coming to realize the detrimental impact of poorly planned net metering, others continue to pursue costly policies. Many of the recent state-level reforms seek to fix or limit the expansion of regressive net metering. However, they offer little compensation to the communities that had previously shouldered the burden of poor policymaking. Rather than approaching the development of the solar power industry through a process of trial and error, lawmakers should take heed of the costly mistakes that other states have endured.

## Policy Solutions

The intent of policies that incentivize homeowners to buy or lease solar panels may be a good one in that its goal is to encourage the use of clean energy. But many of the net metering policies in effect around the country have adverse consequences that could be minimized. Rooftop solar energy is supported by net metering and tax incentive programs that translate into higher costs for taxpayers and ratepayers. Net metering laws disproportionately help high-income consumers at the expense of low-income consumers who already spend a significant

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<sup>20</sup> Jeffrey Tomich, “Regulators OK mandatory demand charges for residential solar,” *E&E News*, September 28 2018, <https://www.eenews.net/stories/1060099991>.

<sup>21</sup> Robert Walton, “Iowa bill to hike distributed solar fees stalls after Senate passage,” *Utility Dive*, April 16 2019, <https://www.utilitydive.com/news/iowa-bill-to-hike-distributed-solar-fees-stalls-after-senate-passage/552812/>.

<sup>22</sup> Catherine Morehouse, “Maine steps up clean energy turnaround, passes 100% RPS, pro-solar bills,” *Utility Dive*, June 13 2019, <https://www.utilitydive.com/news/maine-steps-up-clean-energy-turnaround-tees-up-80-rps-pro-solar-bills/556783/>.

<sup>23</sup> Catherine Morehouse, “South Carolina unanimously passes solar bill to lift 2% net metering cap,” *Utility Dive*, May 10 2019, <https://www.utilitydive.com/news/south-carolina-unanimously-passes-solar-bill-to-lift-2-net-metering-cap/554490/>.



portion of their earnings on electricity. In essence, these programs help consumers who can afford to buy solar panels and own homes at the expense of those who cannot. The subsidies can undermine electricity infrastructure funding, which threatens to raise consumer costs and will eventually adversely affect grid reliability. Net metering also encourages questionable leasing schemes that hurt homeowners.

The obvious and reasonable solution is simple. Policymakers need to get the prices right. The price at which net metering customers are compensated for excess production should reflect no more than the avoided cost of producing the electricity by other means. This would set proper market incentives, end the regressive subsidization of high-income households, financially support network infrastructure, maintain customer reliability, and lead to workable public policies that promote clean energy consumption and production.

State consumer protection agencies, state attorneys general, the Consumer Financial Protection Bureau, and the Federal Trade Commission should become more involved and investigate the rooftop solar leasing dealers who are fleecing consumers across the country. The U.S. Congress should also hold hearings to expose the scope of this problem and seek solutions that protect consumers. At a minimum, consumers are entitled to accurate information to make responsible purchasing decisions. Implicit, hidden subsidies designed to encourage rooftop solar energy, including tax breaks, need to be made explicit so consumers and taxpayers know what they are paying for.

For net metering to be successful, it is crucial that policymakers find solutions that produce benefits that outweigh the costs. Accomplishing this requires getting the prices right and increasing consumer protection.