Blocking the Sun

Utilities and Fossil Fuel Interests That Are Undermining American Solar Power

2017 Edition

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Executive Summary

Solar power is clean, affordable and popular with the American people. The amount of solar energy currently installed in the U.S. can power one in 14 American homes; that amount is expected to triple within the next five years.

The growth of American solar energy in the past decade has been the result of smart solar-friendly state policies like net metering and tax incentives for solar infrastructure, putting clean energy within financial reach of millions more Americans. The recent appointment of officials favored by electric utilities and fossil fuel interests to key positions within the Department of Energy and other federal agencies makes the preservation of strong solar policies in the states more important than ever.

In 2017, utilities continue to chip away at key state policies that put rooftop solar on the map in the United States, making it harder for Americans to invest in clean energy.

This report documents 20 fossil fuel-backed groups and electric utilities running some of the nation's most aggressive campaigns to slow the growth of solar energy in 12 states, including eight attempts to reduce net metering benefits and seven attempts to create demand charges for customers with solar power. Citizens and policy-makers must be aware of the tools that utilities are using to undermine solar energy across America and redouble their commitment to strong policies that move the nation toward a clean energy future.

A national network of utility interest groups and fossil fuel-backed think tanks has provided the funding, model legislation and political cover to discourage the growth of rooftop solar power.

- The **Edison Electric Institute**, the trade group that represents U.S. investor-owned electric utilities, launched the current wave of attacks on solar in 2012. Since then, EEI has worked with the American Legislative Exchange Council to create model legislation to repeal state renewable electricity standards and attack net metering.
- The **American Legislative Exchange Council** also provides utility and fossil fuel interests with access to state legislators, and its anti-net metering policy resolution has inspired legislation in states like Washington and Utah.
- The Koch brothers have provided funding to the national fight against solar by funneling tens of millions of dollars through a network of opaque nonprofits. The Koch-funded campaign organization **Americans for Prosperity (AFP)** has carried out anti-solar organizing efforts.
- **The Consumer Energy Alliance (CEA)** is a Houston-based front group for the utility and fossil fuel industry, representing companies like Florida Power and Light, ExxonMobil, Chevron and Shell Oil. CEA has spent resources and shipped representatives across the country to help utilities fight their battles in states like Florida, Indiana, Maine and Utah.
- The state industry group **Indiana Energy Association** successfully lobbied on behalf of the state's biggest electric utilities to end net metering, replacing it instead with a new solar policy that limits consumer compensation for generating rooftop power.

At the state level, electric utilities have used the support provided by national anti-solar interests, as well as their own ample resources, to attack key solar energy policies.

- In Florida, **Florida Power and Light**, **Gulf Power Electric**, **Tampa Electric Company** and **Duke Energy**, the largest utility in the U.S., spent millions of dollars funding the front group, Consumers for Smart Solar, which was the primary backer of a failed 2016 ballot initiative that would have restricted rooftop solar growth. In 2017, Florida Power and Light drafted language for a new bill to restrict solar growth in Florida.
- Two major Arizona utilities – **Arizona Public Service** and **Salt River Project** – have successfully pushed for anti-rooftop solar policies. Arizona Public Service, the biggest utility in Arizona, has also been accused of improperly cultivating influence with the state commission that regulates utilities and funneling dark money into recent commissioner elections.
- In Utah, **Rocky Mountain Power** tried once again to eliminate net metering and charge additional fees to its 20,000 customers that generate rooftop power. Public outcry from ratepayers and the solar industry forced Rocky Mountain Power to settle, grandfathering all current solar customers into net metering.
- In Texas, **El Paso Electric** renewed its past attempt to create a separate, and more expensive, rate class for solar customers. In 2015, the utility spent $3.1 million on filing and negotiating fees, an amount ultimately charged to ratepayers, before dropping the proposal, only to pick it up again this year.
- In 2015, **Nevada Energy** successfully campaigned the Nevada utilities commission to eliminate net metering, a move that effectively halted the growth of rooftop solar in its service territory for two years. After widespread public protest, state legislators effectively reinstated net metering in 2017.

As of mid-2017, there were at least 90 ongoing policy actions in U.S. states with the potential to affect the growth of rooftop generation, such as limits on net metering or new utility fees that make solar power less affordable.

State decision-makers should resist utility and fossil fuel industry influence, and reject policies such as

- Elimination of, restrictions on, or unfair caps on net metering;
- Discriminatory surcharges or tariffs for solar customers;
- Utility rate designs that discourage solar adoption;
- Unnecessary regulatory burdens on solar energy; and
- Rollbacks of renewable electricity standards.

In addition, state leaders should embrace ambitious goals for solar energy and adopt policies that will help meet them, including:

- Considering the benefits of distributed solar energy to the grid, to ratepayers and to society in any rate making or policy decisions about solar energy;
- Implementing strong net metering and interconnection standards, which enable many customers to meet their own electricity needs with solar power;
- Encouraging community shared solar projects and virtual net metering, which can expand solar access to more customers;
- Enacting or expanding solar or distributed renewable carve-outs and renewable electricity standards;
- Enabling financing mechanisms to allow for greater solar access to businesses and residents;

- Allowing companies other than utilities to sell or lease solar to residents and businesses; and
- Making smart investments to move toward a more intelligent electric grid that will enable distributed sources of energy such as solar power to play a larger role.

Policymakers should also uphold our country's commitment to reduce carbon pollution. Solar power will play a major role in any strategy to reduce global warming pollution and the carbon footprint of the energy we generate and consume.

Introduction

In the past decade, solar energy has boomed across the United States. As prices for solar panels fell by 73 percent from 2006 to 2016, the number of U.S. residential rooftop solar installations saw consistent growth, hitting the 1 million mark in 2016.[1] Today, there is enough solar energy in the United States to power one in 14 American homes.[2]

In 2017, solar generation averted approximately 55 million metric tons of carbon dioxide pollution, equivalent to taking nearly 12 million passenger vehicles off the road.[3] By the end of 2016, there were more than 260,000 solar industry workers in the U.S., a 25 percent increase from 2015.[4] It's not a surprise, then, that the vast majority of Americans support solar energy: a 2016 Pew Research Center survey showed that 89 percent of Americans favor increasing the use of solar power.[5]

But many electric utilities and the fossil fuel industry disagree. These special interests perceive solar power – especially solar power generated locally by ordinary residents and businesses, as opposed to in centralized, utility-owned power plants – not as an opportunity to clean our air, take action on climate change and build a more distributed and resilient energy system, but as a threat to established ways of doing business. As a result, many of these companies – among the most powerful in the world – have thrown their power and resources behind campaigns to attack solar energy and the key public policies that make it accessible and affordable to Americans.

In the second quarter of 2017, U.S. states considered at least 90 policy actions with the potential to impact the economic viability of distributed solar energy, including restrictions on community solar installations, reductions in the compensation that utilities provide consumers for the excess solar power they supply to the grid (net metering), and the creation of new demand charges for residential customers that undermine the economics of solar energy.[6]

These fights have largely occurred at the state level, but recent appointments of electric utility and fossil fuel industry favorites to federal positions raise questions about the future of rooftop solar. Strong pro-solar state policies have never been more important to the future of solar energy, and understanding how utility interests have fought solar growth at the state level could illustrate how such attacks may happen at the federal level.

Many of these battles are being waged in the shadows – in regulatory agencies largely removed from public view, where public support for solar energy and the contribution of solar power to a cleaner environment can have little impact on decision-making.

This report – the third in a series – attempts to pull back the veil on the latest efforts by major utilities, fossil fuel companies, front groups and special interest think tanks to fight solar power in America. By shining a light on the companies and entities attacking solar energy – and the tactics they use – citizens and decision-makers will be better equipped to respond to the nationwide assault on solar energy.

Strong Public Policies Have Fueled the Rise of Solar Energy

The rise of American solar energy, which has grown more than 43-fold in capacity since 2007, is no accident.[7] In addition to dramatic price drops – residential solar installations fell in price by 43 percent from 2010 to 2015 – forward-looking policies have cut red tape and made solar power more affordable for consumers.[8]

A number of policies have been particularly important to the growth of solar energy:

- *Net metering policies* guarantee owners of solar power systems a fair return for the excess electricity they supply to the grid by crediting them with the value of such electricity, typically at the retail rate. Net metering essentially allows the customer's power meter to "spin backwards" at times when solar power production exceeds on-site needs.
- *Renewable electricity standards* (RES, also known as renewable portfolio standards) set minimum renewable energy requirements for utilities. RESs with a specific minimum requirement for solar or distributed renewable energy have played a major role in fostering a stable solar energy market.
- *Third-party ownership policies* allow companies other than utilities to use financing tools like power purchase agreements or solar leasing that can reduce consumers' upfront costs for installing rooftop solar. Power purchase agreements, for example, let a company install a solar energy system on a consumer's rooftop at no upfront cost, and then sell power generated by the panels back to the customer at a fixed cost.
- The *Property Assessed Clean Energy program* (PACE) allows local and state governments to lend money to homeowners and businesses for energy improvements, including a financing option available to property owners who want to install rooftop solar. A PACE loan ties the debt to the property itself, rather than the owner, so it transfers with real estate contracts. For property owners concerned about having to move before recouping their investment in home solar power, the PACE program has proven to be key.
- *Federal and state tax credits* have made solar a more affordable option for consumers and businesses. In 2015, of the 10 U.S. states with the most solar capacity per capita, six offered tax credits for solar installations, and four offered rebates or grants. In December 2015, federal lawmakers renewed the 30 percent solar Investment Tax Credit (ITC) through the end of 2019, resulting in a predicted additional $38 billion in solar energy investment through 2021.[9]

The presence of strong solar policies has been consistently linked with the emergence of strong solar energy markets. In 2014, the U.S. Department of Energy's National Renewable Energy Laboratory found that strong solar policies were important indicators of a state's solar capacity.[10] Of the 10 states with the most solar capacity per person in 2016, nine

had strong net metering policies; nine had strong interconnection policies; nine had policies that allow creative financing options like power purchase agreements; and all had renewable electricity standards.[11]

Electric utilities seeking to undermine solar growth often target these policies. In addition to replacing net metering with lower reimbursement rates for excess solar energy, other common tactics seek to complicate rate design and make solar less of a good investment.

Demand charges change the economic calculus of going solar, as they are based not on electricity use, but on peak electricity demand for a short (typically 15 to 60 minute) period over the course of a month. As a result, the savings resulting from low grid electricity use over the course of a month can be offset by short periods of heavy electricity use, for example at night or on a cloudy day.[12]

Traditionally, **time-of-use rates** schedule the most expensive time to use electricity (on-peak hours) during the day.[13] By shifting the schedule of on-peak and off-peak hours to later in the evening, when solar panels are inactive, utilities can minimize net metering payments to solar customers and charge them more for night-time electricity use.

Solar-specific fees are extra monthly charges levied on customers with rooftop solar systems. Utilities justify these fees as critical to ensure grid reliability, subsidize net metering programs, and maintain infrastructure.[14] Creating a **solar rate class** is a similar mechanism to discriminate against solar customers by charging them more for the same electricity use. Instead of a predetermined monthly charge, solar customers are billed more per kilowatt-hour of electricity than regular customers.

Industry-Friendly Appointments Change the Playing Field for Federal Solar Policy

Electric utilities and other special interests looking to slow the growth of rooftop solar have primarily focused on influencing state-level policy by affecting the outcomes of regulatory proceedings to favor utilities over rooftop solar. Others have sought state-level changes using campaign contributions to statehouse politicians and involvement in local ballot initiatives. However, under the Trump administration, political appointments of longtime utility and fossil fuel industry allies to federal government roles related to the development of renewable energy policy may present an opportunity for special interests to slow the progress of rooftop solar at the federal level.

The presence of anti-solar interests started as early as President Trump's transition team. Thomas Pyle, president of the Koch-funded Institute for Energy Research and former Koch lobbyist in D.C., led the Department of Energy transition.[15] Doug Domenech, a director at the Texas Public Policy Foundation – which has received Koch funding and worked against state renewable portfolio standards – headed up the Department of the Interior transition.[16] And Myron Ebell, director of the Center for Energy and Environment at the Competitive Enterprise Institute, another Koch-funded group, which has openly lobbied Congress to end a federal program that helps fund net metering programs for those with rooftop solar panels, led the Environmental Protection Agency transition.[17]

Administrative appointments have continued the trend. In May, President Trump appointed the former vice president for policy at the Institute for Energy Research, Daniel Simmons, to oversee the Department of Energy's Office of Energy Efficiency and Renewable Energy. [18] The agency's primary purpose is to encourage the development of renewable energy technology, and was targeted by the Institute for Energy Research's advocacy arm in 2015, which called on Congress to dismantle the agency altogether.[19]

In August, Mark Menezes, the current Vice President of Berkshire Hathaway Energy, which owns utilities PacifiCorp and NV Energy, was nominated to become the Under Secretary of Energy.[20] Menezes has a long history of lobbying for electric utilities and trade groups, including Duke Energy and the Edison Electric Institute.[21]

That same month, Neil Chatterjee was confirmed for a seat on the Federal Energy Regulatory Commission, an independent agency that provides regulatory guidance on many facets of energy policy, including electricity transmission rules that can affect state net metering policies.[22] Chatterjee once served as a federal lobbyist for the National Rural Electric Cooperative Association, a trade group that later supported the Florida anti-solar initiative Amendment 1 and has advocated for other anti-solar policies such as monthly fixed fees for rooftop solar customers

and applying lower, wholesale rates for net metering instead of retail rates.[23]

In October, President Trump nominated Kathleen Hartnett-White to lead the White House Council on Environmental Quality.[24] Hartnett-White, like Trump's transition lead for the Department of the Interior, Doug Domenech, is also an alumna of the Texas Public Policy Foundation and co-authored the think tank's book *Fueling Freedom: Exposing the Mad War on Energy,* which argues against shifts from oil and gas to renewable energy sources.[25]

Secretary of Energy Rick Perry appointed Brian McCormack, a former Edison Electric Institute executive who served as the vice president of political and external affairs for the utility group, to serve as his chief of staff.[26] McCormack oversaw the writing of a Department of Energy report released in August 2017 on the effects of renewable energy on the electric grid; one of the report's authors, Travis Fisher, once served as an economist for the Institute for Energy Research, and his 2015 report for the Institute named clean energy policies the greatest threat to the electric grid above such specters as cyberattacks and terrorism.[27]

The new positioning of electric utilities to influence policy on a federal level warrants vigilance and strong policies in the states to ensure rooftop solar continues to have a bright future.

Many Utilities and the Fossil Fuel Industry Are Fighting to Stop the Growth of Solar Energy

Solar energy is a boon to the environment and is popular with the American people. But to many utilities, along with the fossil fuel industry, the rapid growth of solar energy is something to fear, not celebrate.

To companies that sell coal, oil and natural gas, solar energy represents an obvious long-term threat to the viability of their businesses. To electric utilities that burn these fossil fuels, solar energy installed by individuals and businesses represents a different type of threat, one with much more immediate consequences. Some electric utilities warn that distributed generation is shifting costs from solar customers to average ratepayers; as more individuals and businesses "go solar" and benefit from programs like net metering, they argue, the cost of providing access to the grid will be shared by fewer ratepayers. As the price of energy storage technology declines, more customers will have the ability and the incentive to abandon the grid altogether, triggering a "utility death spiral."

Research from the Lawrence Berkeley National Laboratory suggests that concerns about the so-called death spiral are probably overblown.[28] And some utilities have responded to the challenge posed by solar energy by working constructively with regulators and other decision-makers to develop new business models that maintain consumers' access to an affordable, reliable electric grid while at the same time supporting further solar growth.

Other utilities have invested resources in utility-owned solar power plants, while simultaneously fighting to limit consumers' ability to generate their own solar power. Still others have attempted to slow the growth of solar energy by fighting to eliminate policies that support the transition to a clean energy economy. Those fights – against distributed, local solar power and generally against all forms of clean energy – are happening with increasing frequency across the United States. In the second quarter of 2017, U.S. states considered at least 90 policy actions with the potential to impact the economic benefits of distributed solar energy, such as reducing net metering compensation and creating demand charges for residential electric customers.[29]

The campaigns to slow the rise of solar energy have often been conducted as if money were little object. The oil and gas industry and electric utilities are the fourth and fifth biggest spenders on federal lobbying in the United States, respectively.[30] Yet many of these battles have been waged with hidden campaign spending, or in regulatory agencies that tend to receive limited public scrutiny.

Who are the interests behind these attacks on solar energy? And how have they waged their campaigns? The following section provides a list of key players and a glimpse at the fossil fuel industry's anti-solar playbook.

Solar Power Is Popular across the Political Spectrum

Solar energy's immense popularity isn't limited to any one segment of the population. According to a 2016 Pew Research Center poll, 89 percent of Americans – including 83 percent of conservative Republicans – favor expanding solar power in the U.S.[31]

Among the most passionate champions of solar energy in some states are conservatives affiliated with the Tea Party movement, who see rooftop solar energy as a means to greater autonomy for individuals. According to Debbie Dooley, the cofounder of the Atlanta Tea Party, as quoted in the *New Yorker*: "I thought that the regulated monopoly in Georgia had far too much power… The average person cannot build a power plant, but they can install solar panels on their rooftop, and they should be able to sell that energy to friends and neighbors if they wish."[32]

In states like Florida, members of the Tea Party have butted heads with industry-backed groups such as Americans for Prosperity. One conservative citizens' group accused Americans for Prosperity of launching a "campaign of deception" against net metering in Florida.[33]

The rhetoric of the 2016 presidential campaign, which framed the clean energy debate along state lines, does not represent public opinion. A 2017 poll found that 87 percent of Ohio residents supported more clean energy. Even among respondents in the state's coal-mining region, only 19 percent believed that elected officials should oppose renewable energy policies, such as the state's renewable portfolio standard, which was saved from repeal in December 2016 by a veto from Republican Governor John Kasich.[34]

Despite the attempts of industry public relations campaigns to polarize the solar energy debate on traditional conservative-liberal lines, solar power is only increasing in popularity with the American public.[35]

Blocking the Sun: Utilities and Fossil Fuel Groups Undermining Solar Energy

Solar power is clean, affordable and popular with the American people. Yet, powerful interests with deep pockets have been determined to undermine distributed solar. The following electric utilities and fossil fuel-backed groups are running some of the country's most aggressive campaigns against solar power.

Laying the Groundwork: The National Support Network for Anti-Solar Campaigns

A national network of utility interest groups and fossil fuel industry-funded think tanks launched the fight against rooftop solar by providing funding, model legislation and political cover for anti-solar campaigns across the country.

Setting the Policy: **Edison Electric Institute**

Edison Electric Institute (EEI) is the trade group that represents U.S. investor-owned electric companies. EEI put in motion what has become the utility industry's national campaign to slow the growth of rooftop solar, and played a prominent role funding and actively participating in both national and state-level campaigns against solar energy.

In 2012, EEI effectively kicked off the utility war on rooftop solar when it brought together top utility executives to describe the threat posed to the utility business model by rooftop solar. At the meeting, EEI put forth an "action plan" of outreach to convince state legislators, governors, regulators, consumer advocates and customers, that net metering policies must change.[36] One year later, EEI published a report titled "Disruptive Challenges" that warned of net metering's "significant potential adverse impact to utility investors."[37]

After creating the utility case against solar power, EEI helped put in motion the utility industry's state-level

legislative attacks. EEI, and in particular then-vice president for political and external affairs Brian McCormack, worked with the American Legislative Exchange Council (ALEC) to craft and distribute sample bill language to state legislatures that attacked net metering and created solar surcharges.[38] In 2016, EEI released a communications handbook entitled "The Future of Energy," largely focused on "resetting the terms of the discussion" in an effort to improve electric utilities' PR in public discussion of rooftop solar.[39] In addition to distributing the handbook to member utilities, EEI also presented the information to members of the National Association of Regulatory Utility Commissioners, a group of public utility and service commissioners from around the U.S..[40] EEI also funds a number of groups who publicly oppose net metering, including Hispanics in Energy (HIE), whose president, Monica Martinez, has published multiple op-eds in local papers opposing solar-friendly policies, including in Illinois in 2016 and Utah in 2017.[41] EEI has been responsible for a significant chunk of the funding for Hispanics in Energy. At its founding in 2012, the group's total revenue was $79,850; in 2013, they received $10,000 from EEI.[42] HIE's website also lists a number of other big fossil fuel and utility companies as its partners, such as ExxonMobil, the American Petroleum Institute and Pacific Gas & Electric.[43]

EEI also engages directly with lawmakers to make the case against rooftop solar. Leading up to a 2016 Federal Trade Commission (FTC) panel on solar energy and consumer protections, New York Congresswoman Yvette Clarke submitted a letter to the FTC critiquing rooftop solar as a financial risk for consumers. Metadata contained in the digital version of the letter revealed EEI's director of governmental relations, Eric Grey, created the document, and that it was last edited by a lobbyist for Gray Global Advisors, a group which represents EEI. [44]

In May 2017, the Energy and Policy Institute reported that at least two dozen companies recover a significant portion of their EEI dues from customers, not investors.[45] In 2014, California's Public Utilities Commission offloaded some of the burden from ratepayers by ruling that Pacific Gas & Electric shareholders must pay for 43 percent of the utility's EEI dues.[46] Meanwhile, in Florida, customers of Florida Power & Light appear on tap to pay nearly $2.5 million to EEI in 2018.[47]

Now, EEI may face an even broader reach with former EEI executive Brian McCormack's appointment as Secretary of Energy Rick Perry's chief of staff.[48]

Providing the Funding and Running Ground Campaigns: **The Koch Brothers**

Using the vast wealth accumulated from their fossil fuel businesses, the Koch brothers – Charles and David Koch – are notorious for heavy spending to influence American politics. In the two years leading up to the 2016 election, for example, the Koch brothers were projected to have spent $250 million on campaign contributions.[49]

In recent years, the Koch brothers have turned their attention to attacks on solar power, applying their funding and political resources through a variety of avenues. The Koch brothers typically fund their anti-solar activity through a difficult-to-trace web of nonprofit organizations.

The Koch brothers are able to apply political pressure through Americans for Prosperity (AFP) and its state-based network of citizen members. Americans for Prosperity runs 34 state chapters, 29 of which have registered lobbyists.[50] Through these and other means, the Koch brothers have taken part in fights

against solar power all over the country, including Arizona, New Hampshire, Florida, Ohio, South Carolina and Washington state.[51]

In June 2017, the head of Arizona's chapter of Americans for Prosperity testified in favor of a proposal by Arizona utility Tucson Electric Power Co. (TEP) to cut reimbursement rates and charge new fees to solar customers.[52] Also in 2017, the New Hampshire branch of Americans for Prosperity came out in support of two bills to kill clean energy policies.[53]

The Koch brothers have been particularly active in Florida, the Sunshine State, where they have fought solar energy side-by-side with state utilities. In 2016, the Koch-funded group 60 Plus donated at least $1 million to the utility-backed Amendment 1 ballot initiative, which would have prohibited net metering and created new barriers to rooftop solar ownership.[54] Amendment 1 was defeated by voters in November 2016.[55]

The Koch brothers also advance their agenda by funding and supporting university research. The brothers support at least 350 programs at more than 250 schools and universities.[56] At Utah State University (USU), Professor Randy Simmons is a senior fellow at the Koch-funded Property and Environment Research Center, and runs an education program called "Koch Scholars," which depends on a Koch foundation grant.[57] Between 2008 and 2013, Simmons served as the Charles G. Koch Professor of Political Economy at USU, and has been involved with a variety of anti-renewable research projects.[58] One such study blamed renewable energy for effects of the economic downturn of the Great Recession; another attacked Ohio's renewable electricity standard, which included provisions that would expand solar energy.[59]

George Mason University has also been a long-time recipient of Koch foundation funding, totaling over $50 million in all. The law school's Center for the Study of the Administrative State in particular has received direct funding from the foundation, and in July 2017, the Center's founder, Neomi Rao, was confirmed as the head of the federal Office of Information and Regulatory Affairs.[60] The agency, housed within the Office of Management and Budget, reviews federal rulemaking across all departments – including the Department of Energy and its subagencies working on renewable energy policy – in part to ensure new agency rules reflect the policy priorities of the sitting President.[61]

Koch-funded groups also dominated the Trump transition team, with the transition heads of the Department of Energy, Department of the Interior and the EPA all having been current or former leadership of industry groups working against pro-rooftop solar policies with Koch support.[62] Thomas Pyle, who led the Department of Energy transition, was a former federal lobbyist for Koch Industries.[63]

ALEC | American Legislative Exchange Council

Selling Legislative Influence: **American Legislative Exchange Council**

The American Legislative Exchange Council, or ALEC, gives the fossil fuel and utility industries direct access to lawmakers. By distributing model legislation to its more than 2,000 state legislator members, who then introduce the bills, ALEC has enabled its industry funders to push the introduction of anti-solar legislation in statehouses across the country.[64] ALEC's work to attack solar is wide-reaching, and includes efforts to kill net metering and repeal renewable electricity standards.

ALEC's funding sources have included the Koch brothers, ExxonMobil and Chevron.[65] While it describes itself as a helpful policy aid for state legisla-

tors, ALEC has been described by the *New York Times* as a "stealth business lobbyist," and runs legislative campaigns across the country to prevent or repeal pro-solar policies.[66] In the past, it has boasted that its high success rate at passing legislation makes ALEC a "good investment." [67]

ALEC has seen the introduction of its model "Electricity Freedom Act," legislation to repeal RES standards, in at least 19 states.[68] The group has pushed for solar power surcharges in Oklahoma, Kansas and Washington state.[69] And ALEC's "Updating Net Metering" resolution has inspired legislation to hamper net metering in Washington state and Utah.[70]

Most recently, ALEC might be eyeing the PACE program – a financing mechanism for renewable energy that eliminates upfront cost barriers and some investment risk – as its potential next target. At a 2017 ALEC meeting, a "Resolution Regarding Property-Assessed Clean Energy Programs" was listed on the agenda as a proposed policy.[71]

ALEC's influence is often exerted through its legislator members, many of whom hold powerful positions in state politics. More than a third of Arizona's Republican legislators attended the 2017 annual ALEC meeting, a three-day conference in Denver in part funded by Arizona's biggest utilities like Arizona Public Service (APS) and the Salt River Project.[72] Emails obtained by *The Arizona Daily Independent* revealed that state politicians often rely on APS lobbyists to pay for lapels, drinks and catered lunches.[73]

ALEC legislative members were also involved in the Ohio clean energy freeze in 2014, which stalled the ramp-up of Ohio's renewable energy standard, rolled back energy efficiency provisions and created a committee on whether to dismantle even more of the law.[74] Ohio state senator Bill Seitz sits on ALEC's national board."[75] His advocacy on behalf of ALEC's position came despite ample evidence of the Clean Energy Law's benefits for Ohio's economy, including a reduction in electric bills and carbon emissions within four years.[76] Two ALEC members were on the state's six-person committee to decide the future of the state's frozen Clean Energy Law, and in September 2015, recommended to extend the freeze "indefinitely."[77] In 2016, Governor John Kasich vetoed a bill that would have continued the freeze, reinstating the state's original goals.[78]

ALEC's influence even extends beyond state legislatures to state utility commissions. When the Arizona Corporation Commission voted to let Arizona Public Service increase costs for its solar customers in 2013, four of the five ACC commissioners were or had been ALEC members.[79]

CONSUMER ENERGY ALLIANCE
THE VOICE OF THE ENERGY CONSUMER

Deceptive Front Group: **Consumer Energy Alliance**

The Houston-based Consumer Energy Alliance (CEA), a front group for utilities and the fossil fuel industry, helped to pioneer deceptive tactics that other utilities and fossil fuel interests would later employ in their efforts to slow solar power's growth.[80] Calling itself the "voice of the energy consumer," CEA's members include ExxonMobil, Chevron and Shell Oil.[81]

CEA's policy aims are often hidden behind a seemingly pro-solar public image. For example, in October 2016, CEA hosted a petition on its homepage asking for signatures to "call on policymakers to create policies that are pro-solar, pro-grid and pro-consumer."[82] The policies CEA promoted as pro-solar during its involvement in the 2016 Florida ballot election included eliminating net metering and introducing solar-specific fees.[83] CEA worked in Florida alongside

the similarly-named and similarly-deceptive utility front group Consumers for Smart Solar. That group was a leading backer of Amendment 1, a failed proposal to create economic barriers to rooftop solar ownership.[84] CEA's Florida executive director, Kevin Doyle, wrote an op-ed in the *Orlando Sentinel* under the headline "Amendment 1 Would Boost Solar Energy and Benefit All." His op-ed hailed "the Sunshine State's advance in solar energy technology" in its support of a ballot initiative that saw universal opposition from the solar industry.[85]

CEA continues fighting for utility companies across the country, shipping their advocates state-to-state to make their case. In 2017, CEA representative James Voyles gave public comment in support of Rocky Mountain Power's plan to charge rooftop solar fees in Utah.[86] Voyles also went to Indianapolis to testify in favor of a bill to eliminate net metering, which ultimately passed both houses of the state legislature.[87] With the governor's signature earlier this May, net metering will disappear in Indiana by 2027.[88]

Lobbying in the States: **Indiana Energy Association**

Trade groups representing utilities at the state level have started to affect the fight over solar policy. The Indiana Energy Association (IEA), a state-specific industry group, represents Indiana's largest utilities, including Duke Energy and Indianapolis Power & Light Company.[89] In a state where solar energy is becoming cheaper and more popular – the price for solar arrays in Indiana has plummeted by 64 percent in the last five years, and more than 1,100 residents have solar panels and benefit from net metering – IEA has proved a powerful representative for utilities seeking to slow the growth of rooftop solar.[90]

In 2015, IEA lobbied Indiana legislators to pass a bill lowering the reimbursement rate for net metering customers, despite there being only 600 net metering customers in the state at the time, as well as granting electric utilities the power to create solar-specific monthly fees and establish grid interconnection fees for customers with solar panels.[91] Mark Maassel, IEA president and former president of Northern Indiana Public Service Company, another investor-owned utility represented by IEA, drafted multiple op-eds and letters to the editor against net metering, in addition to providing testimony supporting the anti-solar legislation.[92]

The 2015 bill failed, but less than a week into the 2017 legislative session, state lawmakers pushed forward with a new bill to eliminate net metering.[93] Senator Brandt Hershman, a member of ALEC and previously a board advisor for another think tank with an anti-solar agenda, Heartland Institute, introduced the bill.[94] Indiana's five investor-owned utilities, all represented by IEA, are among the biggest political contributors in state politics, donating $3 million over the past four election cycles.[95] During the previous Indiana elections in 2016, winning legislators received a total of nearly $700,000 from electric utilities and fossil fuel companies; candidates who lost received short of $13,000.[96]

A week before the bill's committee hearing, IEA handed out talking points to statehouse politicians on the cost-shift theory, arguing that homeowners with solar panels are more of a cost liability than a net benefit.[97] A representative from the national anti-solar group CEA also visited Indianapolis to testify in favor of the bill, which ultimately passed both houses of the state legislature.[98]

With the governor's signature earlier this May, net metering will disappear in Indiana by 2027.[99] Only customers who install solar panels before December 31, 2017 will be able to keep the current net metering benefits for the next 30 years.[100] Net metering will be replaced with a "buy-all, sell-all" model – solar

customers will not be allowed to use the power they generate; instead, they must sell it all to the utility at a wholesale rate and buy all the energy they use back at a higher price.[101] The adoption of this model has made Indiana home to the most anti-solar policies for rooftop arrays, according to some solar advocates.[102]

In response, businesses and homeowners are scurrying to meet the December 31 deadline, leaving local solar companies struggling to keep up.[103] Mayors from across the state also gathered in Indianapolis this September, urging lawmakers to pass more solar subsidies and reinstate net metering.[104] In October 2017, Indiana public schools testified against the elimination of net metering in front of a legislative study committee, claiming that net metering helped offset the cost of electricity so they could spend more of their taxpayer dollars on education.[105]

Battling Solar in the States: Electric Utilities

While national trade groups, funders and think tanks provide the backbone of the national fight against local solar energy, electric utilities are leading the fight in state legislative offices and regulatory agencies.

Duke Energy, Florida Power and Light Company, Gulf Power Company and Tampa Electric Company: Waging a Deceptive Fight against Solar Energy in the Sunshine State

Florida, the Sunshine State, has not lived up to its name. Despite being one of the sunniest states on the East Coast, when it comes to solar capacity, Florida lags behind small northern states including New Jersey and Massachusetts.[106]

As of 2017, Florida was one of just four states to ban third-party power purchase agreements, a popular financing option for home solar panel installations, and was one of the minority of states without a renewable electricity standard.[107] As a result, Florida's solar capacity lags well behind states with similar solar potential.[108] While Florida ranks third in the nation for rooftop solar potential, it is only 12th in installed solar capacity.[109] According to Project Sunroof, a Google tool that uses maps and satellite imagery to predict solar capacity, at least 88 percent of Florida's rooftops could install solar panels and generate enough clean energy to avoid 56.4 million tons of carbon from being emitted annually – the rough equivalent of taking 12 million cars off the road.[110]

In recent years, attacks on solar power have been led by Florida's largest utilities – Duke Energy, Florida Power and Light Company (FPL), Tampa Electric Company and Gulf Power Company – powerful companies with a long record of exerting political influence. A 2014 report by Integrity Florida tracked more than $30 million in campaign and lobbying expenditures by the four utilities, and noted extensive revolving door practices by FPL, which hired or retained lobbying firms employing at least 18 former Public Service Commission officials.[111]

In 2016, FPL and other state utilities came out in support of the anti-solar Amendment 1 ballot initiative, which would have put barriers to rooftop solar in the state constitution.[112] Amendment 1 was placed on the ballot by Consumers for Smart Solar, a group that received $22 million of its $26.4 million in campaign funds from Duke Energy, Florida Power and Light Company, Tampa Electric Company and Gulf Power Company. [113] The Amendment 1 campaign also received $1.8 million from the Koch-funded organization 60 Plus.[114]

Similar to the national fossil fuel front group Consumer Energy Alliance, Consumers for Smart Solar purported to be a pro-solar consumer group. The group's logo proclaimed "Yes on 1, for the sun," while its website claimed that the amendment "promotes solar in the Sunshine State, protects Florida's consumers from scams and rip-offs and guarantees the right to place solar panels on your home."[115] The *Miami Herald* reported accounts that some petition gatherers for the campaign to put Amendment 1 on the ballot intentionally misled petition signers into thinking they were signing a petition for a competing, legitimately pro-solar energy ballot initiative (which ultimately failed to qualify for the ballot).[116] One signer reported to the *Herald* that the Amendment 1 petition was described as a "revised, updated version" of the legitimate pro-solar petition. [117]

Florida Supreme Court Justice Barbara Pariente, who voted against allowing the bill on the ballot, wrote in a dissenting opinion of Amendment 1: "Masquerading as a pro-solar energy initiative, this proposed constitutional amendment, supported by some of Florida's major investor-owned electric utility companies, actually seeks to constitutionalize the status quo."[118]

Less than a month before the November election, an audio recording caught the policy director of the James Madison Institute (JMI) in Tallahassee, a think tank supported by Gulf Power Company, admitting the deceptive strategy behind Amendment 1.[119] After noting that polls show solar energy to be extremely popular with the public, Sal Nuzzo, JMI's policy director, described Amendment 1 as "political *jiu jitsu,*" and praised the political savviness of using "the language of promoting solar, and kind of, kind of put in these protections for consumers that choose not to install rooftop."[120]

In November 2016, Amendment 1 was rejected by Florida voters, falling nine percentage points short of the 60 percent approval required for adoption into the state constitution.[121]

Despite the public loss, Florida utilities have continued attempts to shape the state's solar policy. Last year, Florida voters passed a ballot initiative that would cut property taxes on renewable energy equipment, including solar panels, by 80 percent.[122] While state legislators were drafting the language that would implement the initiative, FPL lobbyists sent their own draft bill to state Representative Ray Rodrigues. A state attorney determined that FPL's version of the bill established "extensive requirements before a solar electric equipment can be installed," which would potentially be "a huge barrier" in selling rooftop solar panels.[123] Rodrigues later filed an amendment to the House's bill which featured language directly taken from FPL's draft in eight different sections.[124]

Arizona Public Service and Salt River Project: Battling Rooftop Solar in One of America's Best Solar States

In 2013, Arizona was one of the top states in the country in terms of total solar capacity, solar capacity per capita and number of solar jobs.[125] Yet today, Arizona is slipping from its position as a national solar leader, in part due to efforts by large utilities to slow the growth of rooftop solar in their service territories.[126]

Arizona Public Service

Arizona Public Service (APS), the biggest utility in America's sunniest state, has waged an extensive battle against distributed solar energy in Arizona. In 2013, it was the first utility to charge for installed solar capacity on a per-kilowatt basis, increasing solar bills by an average of $4.20 per month.[127] APS initially tried to pass a much higher monthly charge, nearly $50 for most solar customers, but was forced into compromise by regulators after public outcry.[128]

Since then, APS has worked to impose high costs on its solar customers, most directly through rate proposals to the Arizona Corporation Commission (ACC), which regulates Arizona's investor-owned utilities. Some of its efforts have been behind closed doors: APS has been accused of funding dark money political campaigns to elect members of the ACC and meeting with them in secret.[129]

In 2016, APS spent $4.2 million to influence campaigns for ACC commissioner.[130] In October, APS's parent company Pinnacle West formed the AZ Coalition for Reliable Energy, a group which aimed to spend at least $1 million supporting the election of newcomer candidate Boyd Dunn and reelection campaigns of two ACC commissioners.[131] All three were elected in 2016, and serve on the board today.[132] After the ACC voted 4-1 in August 2017 to approve an immediate 3.3 percent rate hike – on average about $80 more per year for all APS customers – the lone commissioner voting against, Bob Burns, raised questions about the ACC's ability to hear APS rate cases, between the utility's $4.2 million spent on the 2016 election and another alleged $3.2 million in 2014.[133] Burns then filed a lawsuit with the Arizona Supreme Court to void the rate increase that is still under review.[134] In September 2017, Doug Little, one of the Republican commissioners elected to the ACC in 2014 and an alleged recipient of APS funding, was announced as the new deputy assistant secretary for intergovernmental and external affairs for the federal Department of Energy.[135]

In APS' most recent rate case, filed with the ACC in June 2016, the utility proposed both instituting a demand charge for most of its customers while dramatically reducing net metering compensation for its solar customers. Under the proposal, net metering credits for consumer-generated solar would drop by more than three-quarters.[136] "It's a proposal guaranteed to stop APS's customers from going solar," said an attorney for the Energy Freedom Coalition of America, Court Rich.[137]

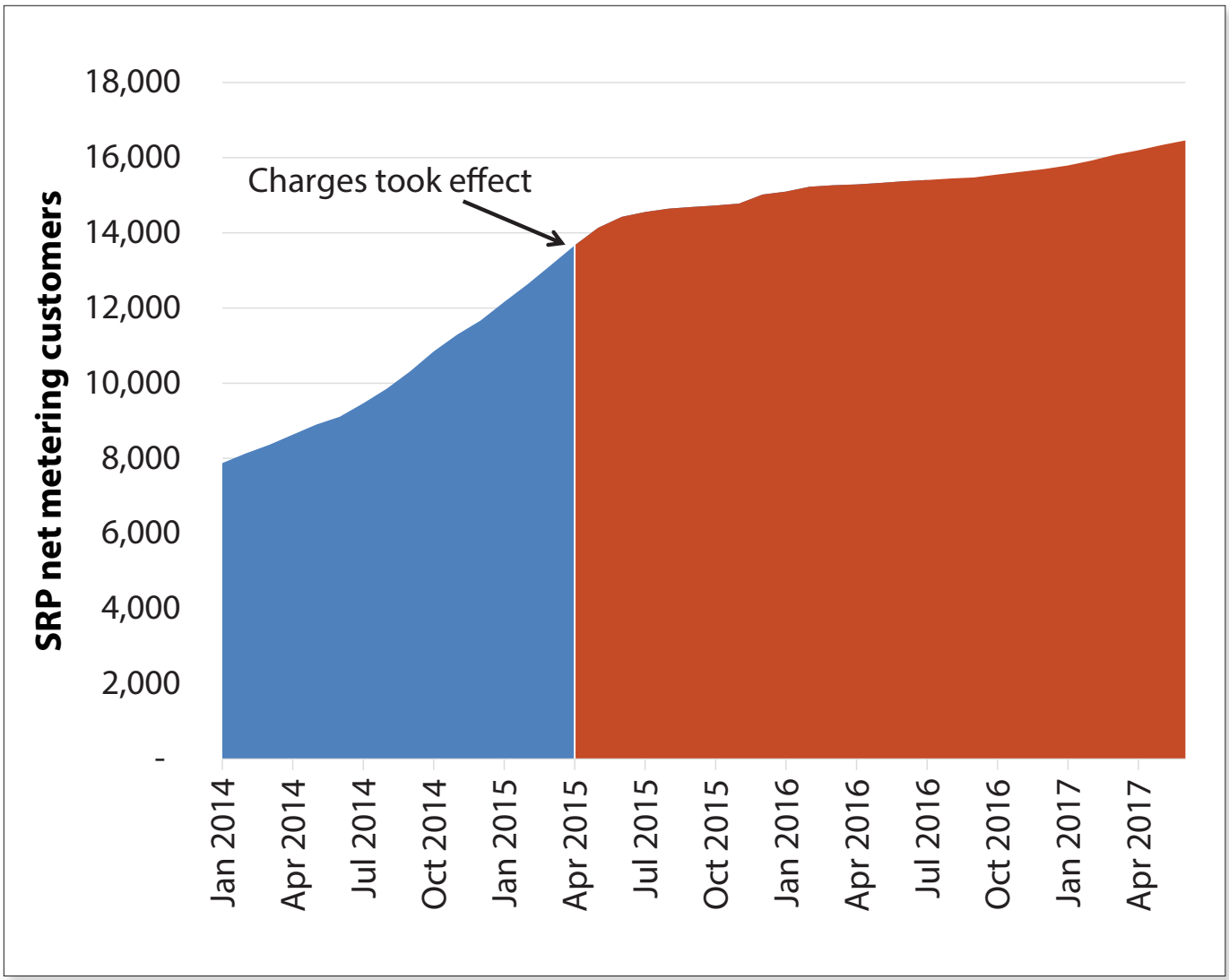
The APS rate case was settled in March 2017 and finalized in August 2017, dropping the demand charge for all residential customers and granting current solar customers the original retail net metering rate for the next 20 years. But for new solar customers, net metering will no longer be an option: surplus energy will be sold back to the grid at a fixed credit rate, expected to decline by up to 10 percent each year.[138] The APS settlement increased the basic service charge for most residential customers – part of the bill that can't be mitigated by using solar or using less energy. APS is also forcing some customers to adopt time-of-use rates that are unfavorable to solar generation – instead of noon to 7 p.m., peak hours will be 3 p.m. to 8 p.m. in the summer.[139]

Salt River Project

Salt River Project, a public utility that serves much of the Phoenix metropolitan area, devastated the growth of distributed solar power in its territory by imposing discriminatory charges for solar customers in 2015.[140] SRP's solar charge was based in part on an internal SRP analysis that, according to some critics, failed to account for solar energy's full value to the grid.[141] The utility's estimate of solar energy's value was far below what similar studies conducted elsewhere have found.[142]

The solar-specific charge crippled SRP's growth in rooftop generation. The year before SRP's new charge took effect, SRP added an average of nearly 400 new net metering customers per month.[143] In June 2017,

Fig 1. Salt River Project Rooftop Solar Growth Has Stagnated Since the Implementation of New Charges for Solar Customers[149]



the latest month for which data is available, SRP added only 123 new net metering customers.[144]

In 2015, Tesla Inc.'s SolarCity, a solar installer, filed a lawsuit against SRP for illegally maintaining a monopoly with these solar charges – based on geography, some customers have no choice but to connect to SRP's grid unless they have sufficient battery storage.[145] SRP tried to put the lawsuit on hold, claiming it was immune to antitrust suits because of its status as a quasi-public agency with state government oversight.[146] After the lower court ruled against SRP's argument, the utility appealed to the federal Ninth Circuit court only to be rejected again in June 2017.[147] In September 2017, SRP filed a petition with the U.S. Supreme Court to hear their case.[148]

Imperial Irrigation District and San Diego Gas & Electric: Slowing Growth in the Top Solar State

California is America's solar powerhouse, home to nearly half of the country's total installed solar energy.[150] In 2016, the California Public Utilities Commission (CPUC) helped ensure that California's solar growth would continue, despite the efforts of California's largest investor-owned utilities, when it voted to mandate retail net metering for these private utility companies through 2019, affecting the majority of the state's residents.[151] But the CPUC's decision to keep net metering does not apply to everyone. California's publicly-owned utilities are not regulated by the CPUC – rather, their net metering policy is bound by state 2010 legislation that allows publicly-owned utilities to cap their net metered solar energy systems at 5 percent of utility peak demand. [152]

Shortly after the CPUC's 2016 decision was released, the Imperial Irrigation District (IID), a publicly-owned utility that serves over 6,000 square miles of California including parts of San Diego and Riverside counties, abruptly announced it would be ending its net metering payments for all new solar customers.[153] Because California allows publicly-owned utilities to devise their own formulas for calculating peak demand, IID determined it had reached its net metering cap earlier than it would have had it used a standardized methodology that the state requires investor-owned utilities to use.[154]

IID's decision not only stunted future solar energy growth in its territory, but it also stranded an estimated 1,200 owners of homes and businesses who had already signed contracts with solar installers, were in the midst of installing projects, or had already installed solar panels but not yet connected to the grid.[155] Because there was no alternative tariff adopted at the time that IID ended its net metering program, these 1,200 customers were not able to use their solar panels to generate their own electricity, much less receive compensation for the electricity they sent back to the electric grid.[156] Among the solar customers left stranded were several multi-family affordable housing projects and dozens of low-income families.[157]

Finally, after six months of negotiations, with help from state legislators, IID signed an agreement that would grant interconnections and net metering benefits to most of its stranded customers, including those who had submitted an interconnection application before IID made its decision.[158] For new solar customers, IID has replaced net metering with a "buy-all, sell-all" arrangement – customers buy energy from the grid at retail rate and sell back the surplus energy generated at a cheaper wholesale rate.[159] Meanwhile, other publicly-owned utilities in California, including Anza Electric Cooperative and Turlock Irrigation District, recently ended their net metering programs altogether.[160]

Meanwhile, investor-owned utilities are finding ways around the state's net metering mandate by establishing new time-of-use rates. These changes shift the schedule of on-peak and off-peak hours to later in the day in order to minimize compensation for solar customers.[161] For most rooftop solar installations, peak hours are noon to 6 p.m.[162] San Diego Gas and Electric (SDG&E) filed a rate case this year to change its on-peak hours to 4 p.m. to 9 p.m. for both residential and commercial ratepayers, slashing the retail rate for net metering when panels are most productive, around midday.[163] A 2017 analysis by the Solar Energy Industries Association recommended that peak hours be scheduled earlier in the day, from 2 p.m. to 7 p.m., claiming that the utility analysis relied solely on energy production without factoring in transmission and distribution costs.[164]

The CPUC first suggested the San Diego utility change its peak hours to start earlier at 3 p.m., but three days

before the Commission vote, moved their suggested start time back to 4 p.m..[165] The CPUC approved the final change in August 2017.[166] Pacific Gas and Electric (PG&E) is now awaiting approval to move its peak rate hours as well, from noon to 6 p.m. currently to much later in the day, from 5 p.m. to 10 p.m.[167]

Central Maine Power: Defeating Pro-Solar Legislation

This year, Central Maine Power, with the help of Governor Paul LePage, worked to defeat a bipartisan pro-solar bill that would have encouraged the growth of community solar projects and preserved net metering policies.[168]

The bill was introduced in response to a controversial decision to phase out net metering, made in February 2017 by public utility commissioners who were newly appointed by Governor LePage.[169] Both the Senate and the House passed the pro-solar bill in late June 2017, only to be struck down by the governor's veto.[170] Legislators nearly had enough votes to override Governor LePage, succeeding in the Senate but falling short in the House.[171]

Central Maine Power hired several lobbyists to testify against the bill and push lawmakers to vote no throughout the legislative session. Governor LePage also sent his staff to the statehouse to oppose the bill within two weeks of its introduction.[172] After LePage's veto in July 2017, Central Maine Power spent at least $8,100 on state lobbyists throughout July and August, flipping enough votes in the House to block any chance of an override.[173]

There are strong ties between Central Maine Power and Governor LePage. In October 2016, LePage sent his energy advisor to recommend an end to net metering in front of the state's Public Utilities Commission.[174] Shortly after, Central Maine Power's political action committee donated $1,000 to LePage's Increasing Citizen Engagement political action committee that channels campaign funds to Maine Republicans running for state office.[175] LePage's daughter, Lauren LePage, was recently hired by a lobbying team contracted by Central Maine Power.[176]

In addition to LePage's support, Central Maine Power received support from EEI and the Consumer Energy Alliance.[177] EEI launched a social media campaign against the pro-solar bill, while CEA took out full-page ads in local newspapers.[178]

American Electric Power: Influence in Ohio

American Electric Power (AEP), one of the biggest utilities in the country, is also one of the most aggressive backers of anti-solar legislation.

A huge utility, with more than 5 million customers in 11 states, AEP has used its money and influence to back anti-solar campaigns.[179] In Ohio, AEP mounted a campaign of legal and regulatory challenges to limit the value of net metering for its nearly 1.5 million customers.[180] In August 2016, AEP proposed to double the distribution charge for all customers from roughly $8 to $18 per month, regardless of how much energy they used.[181] The company spokesperson blamed the rate increase on the growing number of customers who generate their own energy and receive retail rates for excess energy sold back to the grid.[182] In August 2017, AEP decided to postpone this rate increase until 2020, instead reaching a settlement with staff of the Public Utilities Commission of

Ohio (PUCO) to raise everyone's bills by less than $1 per month.[183]

AEP also appealed PUCO's decision in 2014 that electric customers are entitled to the retail rate of electricity they feed back into the grid from rooftop solar and other distributed generators, which increased net metering compensation by about 15 percent.[184] The case was still under review by the Ohio Supreme Court as of September 2017.[185] AEP also joined FirstEnergy and other state utilities in successfully pushing for the freeze of Ohio's renewable electricity standard, which resulted in a significant decrease in state solar investment while it remained in effect.[186]

Rocky Mountain Power: Net Metering in Utah

In the past, Rocky Mountain Power (RMP) has tried to impose new costs on its solar customers, negatively impacting Utah's small but growing solar industry, which as of 2017 employed 4,408 people across the state.[187]

In 2014, RMP lobbied for state legislation designed to make it easier to impose fees on solar customers in addition to filing two separate cases with the Utah Public Service Commission requesting permission to impose a solar surcharge.[188] Both requests were ultimately denied.[189]

In November 2016, RMP returned to the Utah Public Service Commission with another proposal to change its net metering policy, potentially affecting the bills of its 20,000 rooftop solar customers.[190] The utility estimated that the result of the policy would be a $20 increase in monthly bills for net metered customers, though solar industry experts warned that customers could see a much steeper hike of $86.[191] A June 2017 report by Utah Clean Energy found that net metering customers did not increase the cost to provide electricity as RMP suggested in the rate case, but instead cut into the utility's profits.[192]

Two weeks before the case's hearing in front of the state's Public Service Commission, public comments poured in; in late July, the commission received hundreds of emails commenting on RMP's plan.[193] After its August hearing was delayed, RMP decided to negotiate with more than a dozen parties, including the Utah Division of Public Utilities and solar companies.[194] In September 2017, an agreement was reached to grandfather current solar customers into its net metering program through 2035 and offer new customers a "transitional" net metering rate – about a penny less per kilowatt-hour than the average retail rate – until 2020, when the utility's study on the value of solar study is complete.[195] In exchange, all customers face higher energy bills in order to compensate for the utility's expected loss in profits due to net metering.[196] In October 2017, the state commission approved the agreement, and the new policy will begin in mid-November of 2017.[197]

Commonwealth Edison: Statewide Legislation:

In Illinois, solar energy is just starting to take off. Although Illinois only ranks 34th nationally for cumulative solar energy installed, the state installed 14 times more solar in the second quarter of 2017 than in the entirety of the previous year.[198] In 2016 Commonwealth Edison (ComEd) – Illinois' biggest utility, which serves 70 percent of the state's population – tried to change the way residential customers are charged for electricity in a way that would slow the state's burgeoning solar growth.

A subsidiary of Exelon, one of the nation's largest utilities, ComEd set its focus on implementing a

statewide demand charge for residential customers. Illinois Attorney General Lisa Madigan has noted that "by subjecting consumers to demand rates, ComEd's proposal could unfairly allow consumers to be charged more for using less."[199]

ComEd's proposal would have reduced the value of net metering while instituting a statewide demand charge.[200] A compromise was reached late last year after backlash from environmental groups and Governor Rauner, which removed the anti-solar policies from the bill.[201]

ComEd was not alone among utilities in pushing for a demand charge – in Arizona, for example, the Salt River Project has imposed a demand charge on its solar customers, which has resulted in stagnant solar growth. Yet ComEd's original demand charge proposal was novel in that it was through the state legislature, and would have resulted in mandatory residential demand charges throughout the state, as opposed to just the utility's customers.

The latest proposal follows anti-solar legislation first proposed in 2015. After the original bill's failure in 2015, ComEd and parent company Exelon donated heavily to state politicians. Exelon donated over $240,000 to Illinois lawmakers' campaigns in 2016, while ComEd donated over $320,000. Meanwhile, Exelon and ComEd have combined to contribute more than $50,000 over the past 10 years to state Senator Donne Trotter.[202] Senator Trotter was the chief sponsor of demand charge legislation proposed in 2016, and is also a member of the Illinois General Assembly Committee for Energy and Public Utilities, through which the statewide demand charge legislation would have had to pass through before becoming law.[203]

ComEd promoted its demand charge legislation through a group it founded in 2016, the Illinois Smart Solar Alliance (ISSA).[204] Like the national fossil fuel front group Consumer Energy Alliance, and the Florida utility group Consumers for Smart Solar, ISSA misleadingly branded itself as a pro-solar consumer group, calling on the public to "help Illinois grow its clean energy future."[205]

El Paso Electric:
Minimum Monthly Fees

El Paso Electric (EPE) is a Texas-based utility providing power to more than a million residents in western Texas and New Mexico.[206]

The utility has filed consecutive rate cases in recent years to discourage the growth of rooftop solar.[207] In 2015, the utility tried to create a new rate class for solar customers with extra charges, a proposal it later dropped after negotiations with solar advocates and the Texas Public Utilities Commission (PUCT).[208] The PUCT instead allowed EPE to add a 21-cent monthly surcharge to all its customers for two years to recoup the $3.1 million cost of filing and settling the case.[209]

In February 2017, the utility filed a new rate plan to increase monthly bills of all customers by $8.25 on average.[210] The 2,800 customers generating rooftop power would be put into a separate class and their average price hike would be nearly twice as steep at $14.09.[211] In August 2017, Texas state senator Jose Rodriguez wrote a letter to the El Paso City Council to oppose the plan: "If EPE gets its way, only solar customers would be charged more for wanting to rely on EPE's grid less," he wrote.[212]

The rate case went into a hearing with the PUCT on August 21.[213] Three days later, EPE cancelled the hearing to try and reach a compromise with the city of El Paso, which opposed the rate changes.[214] During the negotiation, EPE scrapped its plans to create a separate rate class for existing solar customers.[215] In

exchange, new solar customers would have to pay a minimum monthly fee of $30, even if their electric bills ended up being less.[216] Similar to its last rate case, EPE tacked on a surcharge for all ratepayers to foot EPE's $3 million expense for filing and negotiation fees.[217] The PUCT is expected to rule on the settlement by the end of 2017.

Nevada Energy:
Rooftop Solar Prevails

Nevada Energy (NV Energy), the state's largest utility, successfully campaigned to eliminate net metering and institute new charges for its solar customers as the state was becoming a leader in rooftop solar power. In 2013, Nevada had the fastest growth of solar jobs and the largest number of solar jobs per capita in the country.[218] By the end of 2015, Nevada had more cumulative solar capacity per person than any state in the country.[219]

In 2015, NV Energy began a push for new fees for solar customers and proposed putting solar customers into a new, more expensive rate class.[220] NV Energy also worked to keep in place Nevada's net metering cap as solar companies in the state claimed that NV Energy misled them about the speed at which the cap would be reached.[221]

In December 2015, the Public Utilities Commission of Nevada (PUCN) voted to triple the fixed charges that customers with rooftop solar will have to pay over the next 12 years while also slashing the net metering benefits received by solar customers.[222] The decision was supported by the political action committee Citizens for Solar Energy Fairness, a group funded by NV Energy.[223] That group aired ads characterizing net metering as a "subsidy with no limits."[224]

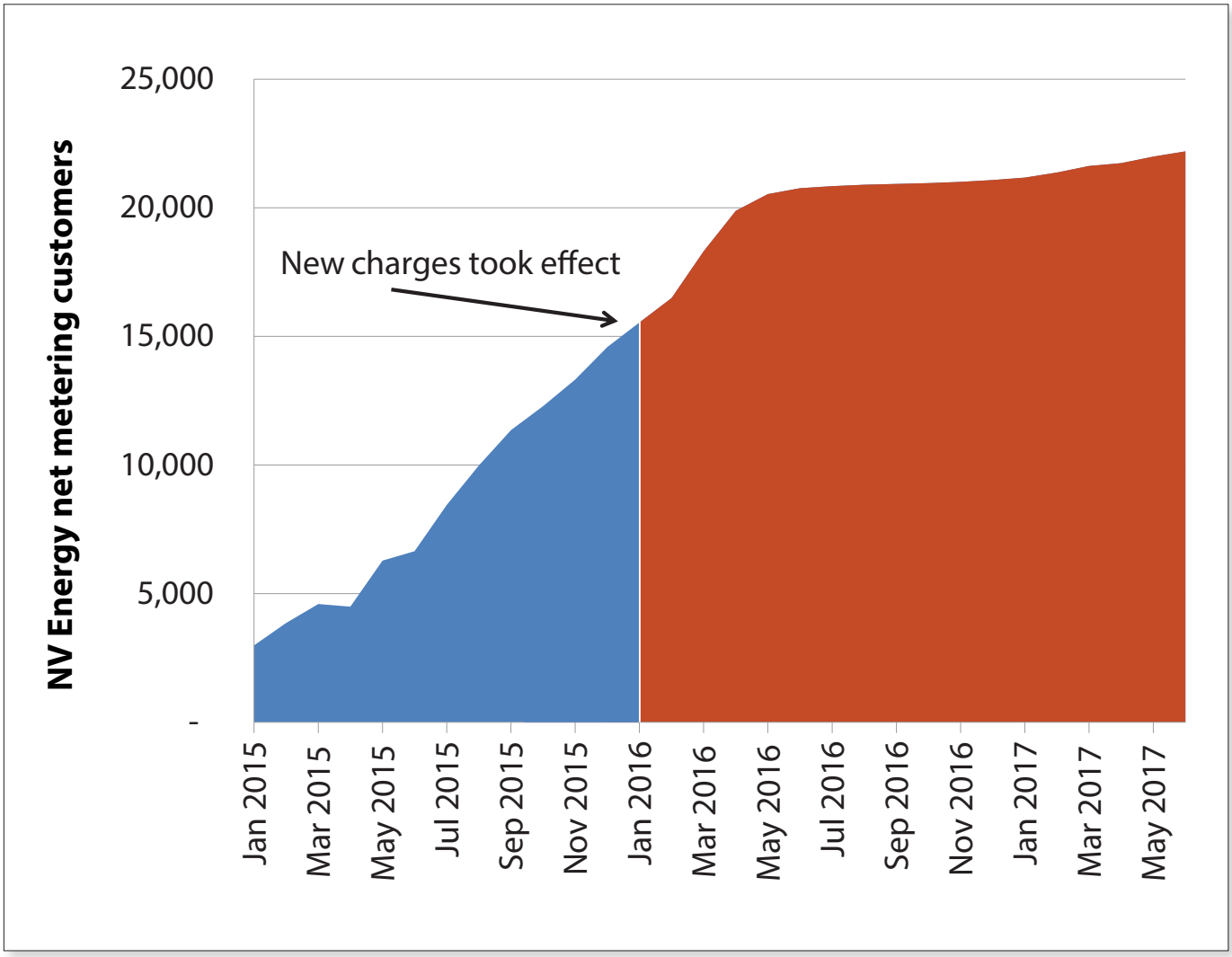
NV Energy's charges and reduced compensation for solar customers temporarily crippled the growth of solar energy. During 2015, prior to the changes, NV Energy added an average of more than 1,000 new net metering customers every month.[225] In September 2016, NV Energy reached its lowest enrollment with only 34 new net metering customers.[226]

The anti-solar policies led to the exodus of clean tech companies like Tesla's SolarCity from the state, taking with them local jobs and investments.[227] NV Energy's largest customer, MGM Resorts International, which owns most properties on the Las Vegas strip, defected from the grid in October 2016, in part to seek more affordable renewable energy.[228] Coupled with citizen concerns over the rapid loss of solar jobs and worry that the state was infringing on citizens' right to generate energy, Governor Brian Sandoval built a special task force in 2016, urging legislators to repeal the anti-solar policies.[229] That September, a Nevada judge also ruled that the PUCN violated "fairness and due process" by revoking one-to-one net metering for existing solar customers.[230]

In June 2017, Governor Sandoval signed an unanimously passed bill to restore net metering up to 95 percent of the retail rate and ban utilities from charging extra fees to solar customers.[231] NV Energy's number of new net metering customers has started to slowly increase again, with 207 enrollments in June compared to 98 in January of 2017.[232]

After the bill was signed, NV Energy announced a new plan in July 2017 to increase the basic fixed payment for all customers while lowering the rate paid for energy used.[233] Solar advocates argued that the new plan didn't make environmental sense: it decreased the incentive to conserve energy while forcing those who generate clean power to pay more.[234] Two months later, the Public Utilities Commission of Nevada ruled against the new plan, calling the utility's attempt to change rates outside the standard three-year process as "absurd."[235]

Fig 2. NV Energy Rooftop Solar Growth Stagnated with the Implementation of New Solar Charges and Reduced Net Metering Credits. (Growth Through Approximately May 2016 Reflects a Backlog of Projects Submitted under Previous Net Metering Rules.)[236]



Utilities Fighting Rooftop Solar Earlier in Emerging Markets

As solar panel prices continue to fall, rooftop solar systems are beginning to catch on with Americans living in states that have historically lagged in solar generation. Even in these emerging markets, where the effect of distributed generation on utility revenue is likely small, utilities are revving up to stop the solar revolution before it gains momentum.

Kansas

After a failed attempt to leverage a fee on solar customers in 2015, Kansas utility Westar Energy returned to the state's regulatory commission for utilities, the Kansas Corporation Commission (KCC). In September 2017, the KCC ruled that utilities could charge higher rates for electricity to residential customers with rooftop solar.[237] The KCC sided with utilities, citing their internal analyses that cost-shift was happening and their concerns over revenue were real.[238] The utility reports, unverified by a third-party, raised eyebrows among solar advocates, who argued that solar penetration in Kansas is nowhere close to significantly impacting utility profits.[239] Westar currently serves 700,000 customers in the state, 710 of which have rooftop solar installations.[240]

Montana

Following heated conversations during the 2015 legislative session, five bills related to net metering were proposed for the next legislative year.[241] During the 2017 legislative session, NorthWestern Energy, the state's dominant utility, came out in support of a bill to lessen the value of net metering credits.[242] Of the 363,000 customers NorthWestern Energy serves in Montana, less than 0.5 percent (1,800 customers) own solar panels.[243]

Though the Montana Legislature approved the bill to eliminate net metering, Governor Steve Bullock vetoed it in April 2017, calling for the state's regulatory commission to investigate the cost-shift phenomenon before taking action.[244] The Montana Public Service Commission established the study's criteria to focus on both the costs and benefits of net metering that have "a direct impact on the utility system."[245] NorthWestern Energy began its study in August 2017, to be completed by April 2018.[246]

A smaller utility that serves the eastern part of the state, Montana Dakota Utilities, tried and failed in 2016 to institute demand charges on households with rooftop solar; it reported serving four net metering customers in January 2017.[247]

Conclusion

Solar power has been almost universally embraced by the American public and is delivering benefits to the environment and economy. Widespread popular support for solar energy, combined with a growing understanding of solar energy's benefits, has limited the success of fossil fuel interests' anti-solar lobbying campaigns.

States where solar potential is high have taken an especially hard hit from opposition to solar energy by fossil fuel and utility interests. In parts of Arizona, residential solar energy is being installed at a slower pace; and in Florida, the Sunshine State, rooftop solar is barely getting a foothold. Well-funded attacks on key solar policies have left the rooftop solar industry in both fledgling and established markets fighting to survive. And with industry interests now well represented in the federal government, state-level solar policy will play an even more crucial role in ensuring we unleash the next wave of clean energy innovation and deployment.

Recommendations:

State decision-makers should resist utility and fossil fuel industry attempts to reduce the economic viability of distributed solar energy, and reject policies such as:

- Elimination of, restrictions on, or unfair caps on net metering;
- Discriminatory surcharges or tariffs for solar customers;
- Utility rate designs that discourage solar adoption;
- Unnecessary regulatory burdens on solar energy; and
- Rollbacks of renewable electricity standards.

In addition, state leaders can do more to encourage solar energy's growth. They should embrace ambitious goals for solar energy and adopt policies that will help meet them, including:

- Considering the benefits of distributed solar energy to the grid, to ratepayers and to society in any rate making or policy decisions about solar energy;
- Implementing strong net metering and interconnection standards, which enable many customers to meet their own electricity needs with solar power;
- Encouraging community shared solar projects and virtual net metering, which can expand solar access to more customers;
- Enacting or expanding solar or distributed renewable energy carve-outs and renewable electricity standards;
- Enabling financing mechanisms to allow for greater solar access to businesses and residents;
- Allowing companies other than utilities to sell or lease solar to residents and businesses; and
- Making smart investments to move toward a more intelligent electric grid that will enable distributed sources of energy such as solar power to play a larger role.

Policymakers should also uphold our country's commitment to reduce carbon pollution, and ensure that solar power plays a major role in any strategy to reduce global warming pollution.

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