



Blocking Rooftop Solar

The companies, lobbyists and front groups undermining local clean energy



FRONTIER GROUP

NHPIRG | Education Fund

Blocking Rooftop Solar

The companies, lobbyists and front groups
undermining local clean energy



FRONTIER GROUP

NHPIRG | Education
Fund

Written by:

J. David Lippeatt, Adrian Pforzheimer and Bryn Huxley-Reicher
Frontier Group

Bronte Payne
Environment America Research & Policy Center

June 2021

Acknowledgments

The authors wish to thank Glen Brand, Vice President of Policy and Advocacy, Solar United Neighbors; Nikhil Vijaykar, Staff Attorney, Environmental Law and Policy Center; David Pomerantz, Executive Director, Energy and Policy Institute; Dorothy Barnett, Executive Director, Climate + Energy Project; Scott Thomasson, President, Sunbelt Strategies; Randi Leppla, Vice President for Energy Policy and Lead Energy Council, Ohio Environmental Council; Bridget Sanderson, State Director, Environment Missouri; Jenna Stevens, State Director, Environment Florida; and Ryann Lynn, Climate and Clean Energy Advocate, Environment Florida, for their contributions in reviewing and improving this paper. The authors also thank Susan Rakov, Tony Dutzik, Elizabeth Ridlington, Jamie Friedman and James Horrox of Frontier Group for editorial support.

The authors bear responsibility for any factual errors. Policy recommendations are those of Environment New Hampshire Research & Policy Center and NHPIRG Education Fund. The views expressed in this report are those of the authors and do not necessarily reflect the views of our funders or those who provided review.

© 2021 Environment New Hampshire Research & Policy Center and NHPIRG Education Fund. Some Rights Reserved. This work is licensed under a Creative Commons Attribution Non-Commercial No Derivatives 3.0 Unported License. To view the terms of this license, visit creativecommons.org/licenses/by-nc-nd/3.0.

Environment New Hampshire Research & Policy Center is a 501(c)(3) organization. We are dedicated to protecting New Hampshire's air, water and open spaces. We investigate problems, craft solutions, educate the public and decision-makers, and help the public make their voices heard in local, state and national debates over the quality of our environment and our lives. For more information about Environment New Hampshire Research & Policy Center or for additional copies of this report, please visit www.environmentnewhampshirecenter.org.

Frontier Group provides information and ideas to build a healthier, more sustainable America. We focus on problems that arise from our nation's material and technological wealth – the problems of abundance. We deliver timely research and analysis that is accessible to the public, applying insights gleaned from diverse fields of knowledge to arrive at new paths forward. For more information about Frontier Group, please visit www.frontiergroup.org.

With public debate around important issues often dominated by special interests pursuing their own narrow agendas, NHPIRG Education Fund offers an independent voice that works on behalf of the public interest. NHPIRG Education Fund works to protect consumers and promote good government. We investigate problems, craft solutions, educate the public, and offer meaningful opportunities for civic participation. For more information about NHPIRG Education Fund or for additional copies of this report, please visit nhpirgedfund.org.

Layout: Alec Meltzer/meltzerdesign.net

Cover photo: Rooftop solar panels in Austin, Texas. Courtesy of Roschetsky Photography via Shutterstock.com

Table of contents

- Executive summary** 1
- Introduction** 4
- Solar power is on the rise, with public support and policy backing** 6
 - Public support for solar is increasing 6
 - Strong state policies have catalyzed solar expansion 6
 - Plummeting prices are speeding solar growth 7
- Utilities and the fossil fuel industry continue to fight rooftop solar power** 8
- Utility policies aim to undermine solar power** 8
- A national lobbying network is active against solar** 9
 - Edison Electric Institute: Utility trade group lobbying against solar power 9
 - Consumer Energy Alliance (CEA): Utility and fossil fuel front group 10
 - The American Legislative Exchange Council (ALEC): Selling state legislative access and influence 10
 - Koch Industries: Using fossil fuel wealth to fight solar and other renewables 11
- Utilities are working to block residential solar around the country** 12
 - New England Ratepayers' Association attacks states' right to offer net metering 12
 - Ohio: Utility opposition to solar at heart of massive bribery scandal 13
 - Florida: Florida Power & Light, Duke Energy and Tampa Electric Company fight pro-solar policies 14
 - Illinois: Ameren inflated solar numbers in effort to stop paying net metering rates 16
 - California: PG&E, SoCal Edison and SDG&E push drastic net metering rollback, high fixed solar charges 17
 - Kansas: Evergy pushes to price solar out of the state 19
 - South Carolina: Dominion Power seeking to hike solar fees 21
- Recommendations** 22
- Notes** 23

Executive summary

Solar power is cheaper, more efficient and more abundant than ever before. Over the past decade, the amount of solar energy produced in the United States has increased 30-fold, while the average cost of a residential solar energy system has fallen by more than half.¹ The American public is increasingly supportive of solar energy. By 2020, according to Pew Research, 79% of Americans – a broad majority – believed that developing non-fossil fuel energy sources, including solar and wind power, should be the country’s top energy priority.²

Solar power is helping move the United States toward a future of 100% renewable energy, while reducing global warming pollution, cleaning up the air in our communities, and empowering homeowners and business owners to generate their own electricity. **And increasingly, solar power can do all that at a lower cost than electricity produced from fossil fuels.**

Utilities increasingly fear that the falling prices and rising availability of clean solar power will threaten their business model, which ties profits to the amount of capital investment they make in the grid, and sometimes to the amount of electricity sold. Consequently, in states across the country, utilities are using their money and clout to push policymakers to undercut solar power and make it harder for homeowners and small business owners to produce their own clean energy. A particular utility target is the policy used (as of June 2020) in 40 states, Washington, D.C., and some U.S. territories to ensure solar panel owners receive fair compensation for the clean energy they supply to the electric grid, known as “net metering.”³

Recent corruption scandals in Ohio and Illinois, in which utilities and other special interests allegedly used their clout to twist public policy in their favor, highlight how far anti-solar efforts have gone. **Policymakers must resist pressure from utilities and the fossil fuel industry and implement pro-solar policies that will continue America’s momentum toward clean energy.**

In 2021, a national network of utility interest groups and fossil fuel-linked think tanks continues to offer funding, advice and support to utilities across the country seeking to undermine rooftop solar power. These include:

- **Edison Electric Institute.** Edison Electric Institute (EEI), the trade group that represents U.S. investor-owned electric utilities, developed the model for utilities to use in attacking solar at the state level. EEI worked with the American Legislative Exchange Council to create model legislation to attack net metering.⁴ EEI has trained utility executives in how to run advocacy campaigns and has consistently been a major donor to national Congressional candidates and parties.⁵
- **Consumer Energy Alliance.** The Consumer Energy Alliance (CEA) is a Houston-based front group for the utility and fossil fuel industry, representing companies like Florida Power & Light, ExxonMobil, Chevron and Shell Oil.⁶ CEA has spent resources or shipped representatives across the country to help utilities fight their battles in states like Florida, Indiana and Utah.⁷
- **The American Legislative Exchange Council (ALEC).** ALEC is a nationwide organization funded in part by anti-solar interests including major

utilities, fossil fuel companies and affiliated lobby groups.⁸ ALEC claims to be primarily a membership organization but is dominated by its corporate and other outside donors, who provide 98% of its budget.⁹ It has worked for years to fight renewable energy and pro-solar policies across the country by coordinating with utilities and other local special interests and introducing legislation through policy-makers who are ALEC members.¹⁰

- **Koch Industries.** The Koch organization has provided funding to the national fight against solar by funneling tens of millions of dollars through a network of opaque nonprofits.¹¹ The Koch-funded campaign organization **Americans for Prosperity (AFP)** has carried out extensive anti-solar organizing efforts.¹² Koch organizations have directly supported utility fights against solar power in a number of states.¹³

Utilities in many states have worked with these and other national anti-solar groups to undermine pro-solar policies, with varying degrees of success.

- Fossil fuel industry-tied group **the New England Ratepayers' Association (NERA)** filed a petition with the Federal Energy Regulatory Commission (FERC) in 2020 arguing that solar customer sales of electricity back to utilities should be considered wholesale sales under FERC's jurisdiction, and that states thus do not have the legal right to impose net metering policies and payment rates.¹⁴ In the face of strong public and state government opposition to the petition, FERC dismissed it in July 2020, saying NERA did not prove any harm, but did not explicitly rule out any FERC jurisdiction over solar customer sales back to the grid.¹⁵
- In Ohio, utilities have frequently attacked rooftop and utility-scale solar expansion. Former state subsidiaries of mega-utility **FirstEnergy** allegedly engaged in a massive \$61 million bribery and influence campaign that secured the passage of a 2019 law removing state incentives for further renewable energy development and charging ratepayers to bail out uncompetitive coal and nuclear power plants.¹⁶ Despite criminal charges against key players, including the ex-speaker of the

State House of Representatives, the anti-solar law remains on the books in 2021.¹⁷

- Florida's three investor-owned utilities (IOUs) – **Florida Power & Light (FPL), Duke Energy and Tampa Electric Company** – have engaged in aggressive anti-solar tactics that have kept solar power producing just 3% of all electricity in the Sunshine State.¹⁸ These tactics include donating to the campaigns of state political figures and parties, employing an army of lobbyists, funding a deceptive 2016 anti-solar ballot initiative (rejected by voters) that would have inserted language imposing barriers to rooftop solar into the state constitution, and unsuccessfully pressuring the state Public Service Commission (PSC) in September 2020 to roll back net metering rules.¹⁹
- In Illinois, utility **Ameren** fought fiercely to replace net metering with lower payments to solar owners. A 2017 law gave rooftop solar customers full net metering benefits until solar generation reached 5% of utility peak demand.²⁰ In October 2020, the utility said it had reached the 5% solar threshold and would switch to smaller rebates.²¹ In December 2020 the state regulator showed Ameren's calculations were wrong and ordered it to restore full net metering payments.²² The regulator and solar advocates calculated that Illinois is unlikely to reach the 5% solar level before 2023, but the utility continues pushing to replace net metering with lower payments as soon as possible.²³
- California's major investor-owned utilities – **Pacific Gas & Electric (PG&E), Southern California Edison (SoCal Edison) and San Diego Gas & Electric (SDG&E)** – are pushing for dramatic changes in the net metering policies that have helped the state become the nation's leader in rooftop solar adoption. The utilities' proposal would create the nation's highest fixed charges for solar customers while slashing net metering payments.²⁴ The changes would severely hamper the state's solar market at a moment when the state must accelerate clean energy deployment to meet its climate and energy goals. The California Public Utilities Commission is expected to rule on the future of net metering in the state near the end of 2021.²⁵

- Kansas utilities have opposed solar power intensely for years. **Westar Energy and Kansas City Power & Light**, which merged in 2018 to form **Evergy** – plus Empire District Electric, the third IOU in the state – made campaign contributions and lobbied for elimination of state net metering in 2014.²⁶ The utilities failed to get the state to scrap net metering completely, but legislators did cut the policy’s benefits to solar owners.²⁷ Evergy kept up its attacks by imposing a demand fee in 2018 on residential solar owners – sometimes over \$100 monthly – which deterred new solar customers.²⁸ The fee was approved by the Kansas Corporation Commission (KCC), the state regulator, but the Kansas Supreme Court ruled in April 2020 that the utilities and the regulator had engaged in illegal price discrimination against solar customers and remanded the issue back to KCC.²⁹ Evergy kept the charge intact until the KCC unanimously ruled on February 25, 2021 against the demand fee in Evergy’s central territory, as well as a backup Evergy proposal for a minimum charge for all ratepayers.³⁰ Evergy’s solar customers in other parts of the state, however, are still paying the demand fee.³¹
- In May 2019, South Carolina enacted a new pro-solar law which lifted the state cap on net metering, ensured full compensation for solar power for two years, and created a customer bill of rights.³² In December 2020, however, state utility **Dominion Energy South Carolina** sought to raise costs and uncertainty for solar owners, proposing new fees and charges that in total would cost the average solar owner \$750 annually.³³ Solar advocates said the proposed changes would hamper the growth of solar power in the state, in conflict with the intent of the 2019 law.³⁴ The state Public Service Commission held a March 23 hearing where nearly all attendees opposed the Dominion proposal, and rejected Dominion’s proposal in an April ruling.³⁵

State decisionmakers, including legislators, utility oversight boards and others, should resist efforts by utilities and their special interest supporters to limit the spread of rooftop solar, including to marginalized communities. Decisionmakers should reject these groups’ efforts to weaken pro-solar policies, including:

- Caps, restrictions on or elimination of net metering;
- Rollbacks or elimination of state renewable energy standards;
- Unfair or discriminatory charges or tariffs on solar power system owners;
- Utility rate structures that penalize or discourage solar installation; and
- Other unneeded regulatory burdens on solar energy.

States should also promote and defend policies that support the growth of rooftop solar and speed the national transition toward 100% renewable energy. These include:

- Considering the full benefits of distributed solar energy to the grid, to ratepayers and to society in solar energy ratemaking or policy decisions;
- Implementing strong net metering and interconnection standards, which enable many customers to meet their own electricity needs with solar power;
- Supporting community shared solar projects and virtual net metering, which can expand public access to solar power;
- Enacting or expanding solar carve-outs and renewable electricity standards;
- Enabling financing mechanisms to allow for greater solar access for businesses and individuals;
- Allowing companies that are not utilities to sell or lease solar power to residents and businesses; and
- Investing wisely in making the electric grid more intelligent, which will facilitate a greater role for distributed sources of energy such as solar power.

In addition, policymakers should reaffirm and strengthen U.S. national and international commitments to reduce emissions that cause global warming. Solar power will play an increasing role in reducing U.S. carbon emissions, shrinking the carbon footprint of our energy production and usage, and moving the country toward a cleaner future.

Introduction

In 1883, the same year that Roselle, N.J. became the first town in the world to be illuminated with electricity, a New York inventor, Charles Fritts, coated a layer of selenium with gold to produce a small working solar cell, though it converted only 1% to 2% of the sun's energy hitting it into power.³⁶ Fritts was followed by inventor Edward Weston, who registered two U.S. patents for solar cells in 1888.³⁷ Over ensuing decades, entrepreneurs patented various devices to transform solar light into power or heat, but it was only in the 1950s that Bell Laboratories inventors Daryl Chapin, Calvin Fuller and Gerald Pearson developed silicon-based solar cells.³⁸ Those first silicon solar cells eked out just 6% efficiency, but they laid the technological groundwork for the solar panels which have proliferated across the country and the world.³⁹

And proliferated they have, particularly over the past ten years. The rapid growth of solar energy – from a curiosity to a mainstream source of energy – provides new hope that America can transition to a future of 100% clean energy.

But it hasn't just been scientific innovation that has fueled the solar boom. Policy innovation has been equally important. In the early 1980s, states began to adopt policies to encourage their residents to go solar – including policies known as “net metering” that enable owners of solar energy systems to receive retail credit for the extra power they supply to the grid. Arizona adopted the first such law in 1981, Massachusetts followed in 1982, and other pro-solar policies came afterward.⁴⁰

Pro-solar policies in general, and net metering policies in particular, have driven billions of dollars of investment into the solar industry and huge growth of rooftop solar across the country in the last few decades.⁴¹

This process took time. After decades of slow growth, by 2010, there were just over 100,000 solar photovoltaic installations (both rooftop and utility-scale) in the U.S.⁴² That number grew more and more rapidly as prices fell, however, hitting one million installations in 2016 and two million in 2019.⁴³ Solar power generation rose from under 0.1% of U.S. electricity generation in 2010 to 3.3% in 2020, enough to power 12.5 million homes.⁴⁴ The future of solar power looks bright.

So why, amid all this success, are electric utilities, the fossil fuel industry and their lobbying organizations attacking the key public policies that have enabled solar power's rise?

These special interests perceive solar power – especially that generated locally by ordinary residents and businesses, as opposed to in centralized, utility-owned power plants – not as an opportunity to help address climate change, clean the air, and build a more distributed and resilient energy system, but as a threat to their business models and profits. As a result, many of these powerful firms have directed their massive financial resources and political influence toward attacks against solar energy and the public policies that make it accessible and affordable to Americans.⁴⁵

These campaigns largely have been fought at the state level, waged in obscure regulatory agencies, out of public view, where citizens – the vast majority of whom

support growth in clean energy sources like solar power – have limited impact on decision-making.⁴⁶

This report shines sunlight on ongoing efforts by utilities, fossil fuel companies, front groups and special interest think tanks to fight solar power in America. By highlighting these groups and their tactics, citizens and

decision-makers will be better equipped to promote and defend solar energy as a promising way to power the America of the future.

More than a century after the invention of the first solar cell, solar energy is finally achieving its promise as a source of abundant clean energy. Now is no time to turn back.

Solar power is on the rise, with public support and policy backing

In just the past few years, solar energy has taken hold and expanded across the U.S. due to dramatic drops in prices, supportive public policies and growing public backing for clean energy. Homeowners and small business owners are increasingly pursuing rooftop solar installations to save money and generate clean energy.

Solar power generation in the U.S. increased more than 30-fold between 2010 and 2019.⁴⁷ The U.S. Energy Information Administration (EIA) reported that the nation generated 132,631 gigawatt-hours (GWh) of solar electricity, or 3.3% of total U.S. electricity generation in 2020.⁴⁸ Small-scale (usually rooftop) photovoltaic systems accounted for 41,740 GWh of that total.⁴⁹

Public support for solar is increasing

Public support for expanding the use of solar and other alternative energy sources has been rising for years. By 2020, according to Pew Research Center, 79% of Americans felt that developing “alternative” (non-fossil fuel) energy sources, such as solar and wind power, should be the country’s top energy priority.⁵⁰ This includes a majority of voters in both parties: 91% of Democrats and Democrat-leaning independents prioritized alternative energy development, as well as 65% of Republicans and Republican-leaning independents.⁵¹ Americans from all walks of life increasingly see benefits to adopting solar for their homes and businesses.

Strong state policies have catalyzed solar expansion

Rising public support for solar energy has been bolstered by key policies, primarily at the state level, which have facilitated solar growth:

Net metering has been particularly important in making solar economically attractive to homeowners and business owners. Net metering guarantees owners of solar power systems a return for excess electricity produced by their solar panels, crediting them with the value of such electricity.⁵² Solar owners typically receive such credit on their utility bills at the retail rate.⁵³ In essence, net metering “rolls back” a customer’s power meter at periods when the customer’s solar power system generates more electricity than the home or business is using at the time.⁵⁴ Net metering saves solar owners money on their utility bills, and as of mid-2020 was allowed in 40 states, Washington D.C. and some U.S. territories⁵⁵

Renewable electricity standards (RES, also known as renewable portfolio standards) set minimum renewable energy requirements for utilities. RESs setting a specific minimum requirement for solar or distributed renewable energy have played a major role in fostering a stable solar energy market.⁵⁶ As of January 2021, 30 U.S. states, Washington, D.C., and three U.S. territories had adopted an RES.⁵⁷

Federal and state tax credits, tax exemptions and rebates have made solar power a more affordable option for consumers and businesses. The Consolidated Appropriations Act of 2021, which former president Donald Trump signed in December 2020, extended the current 26% federal solar tax credit (formally the Investment Tax Credit) through 2022.⁵⁸

States with strong solar policies have tended to develop strong solar energy markets. In 2020, the 10 states with the most installed solar capacity were California, Texas, North Carolina, Florida, Arizona, Nevada, New Jersey, Massachusetts, Georgia and New York, eight of which had renewable electricity standards (RES).⁵⁹ Eight of these states also had net metering policies in place.⁶⁰ And furthermore, eight of these states also allowed power purchase agreements (PPAs) and/or solar leasing (as of 2019), both of which allow easier access to solar financing for homeowners.⁶¹ Likewise, as of the middle of 2020, the 10 U.S. states with the most solar capacity *per resident* were Nevada, Hawaii, California, Arizona, North Carolina, Vermont, Utah, New Mexico, Massachusetts and New Jersey.⁶² These states offered a range of solar tax credits and incentives – eight offered some form of net metering, five offered tax credits, seven offered sales or property tax exemptions, a few offered rebates and several offered low interest financing to improve solar affordability.⁶³

Third-party ownership policies allow companies other than utilities to use financing tools like power purchase agreements or solar leasing that can reduce consumer upfront costs for installing rooftop solar.⁶⁴ Power purchase agreements, for example, allow a company to 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.⁶⁵

The Property Assessed Clean Energy (PACE) program 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.⁶⁶ A PACE loan links the debt to the property itself, rather than the owner, so the loan transfers with real estate contracts.⁶⁷ For property owners concerned about having to move before recouping their investment in home solar power, the PACE program has proven to be helpful. As of early 2021, 24 states plus Washington, D.C. offer commercial PACE loans, with California, Florida and Missouri also offering residential PACE loans.⁶⁸

Plummeting prices are speeding solar growth

Rapidly dropping costs for solar energy installations, as well as increased efficiency and other technological improvements, have driven solar energy expansion across the U.S. and worldwide over the past decade. Between 2010 and 2019, U.S. solar power generation increased 30 times over.⁶⁹ While much of this growth has been via larger-scale facilities, residential solar is also increasing, since the average cost of a typical U.S. residential solar power system is less than half of what it was a decade ago.⁷⁰ In 2019, the U.S. installed its two millionth solar photovoltaic system, and solar power accounted for almost 40% of all new electrical generation capacity installed that year.⁷¹ All told, solar power generated 3.3% of America's electricity in 2020, enough to power 12.5 million homes, up from under 0.1% in 2010.⁷²

Solar power has the potential to continue to grow rapidly around the country. America has the technical potential to generate more than 75 times the electricity it currently uses with solar power, and every state has enough solar energy potential to meet all of its electricity needs.⁷³ Energy technologies like wind energy, geothermal energy, energy storage, demand-side resources and others will be important complements to solar, however, to speed America's shift to a zero-carbon future.

Utilities and the fossil fuel industry continue to fight rooftop solar power

Many electric utilities, the fossil fuel industry and their lobbying arms see distributed solar power as an existential threat to their business models and profits. As we show in the following sections, these deep-pocketed, highly influential companies have deployed huge resources toward attacking the pro-solar policies around the country that have made solar energy an attractive option for more and more Americans.

Utility policies aim to undermine solar power

Electric utilities generally make profits based on their capital investments in the electric grid.⁷⁴ In traditionally regulated states, utilities may also own the sources of generation, providing another vehicle for making money.

Distributed solar energy challenges traditional utility profit models by putting the generation of power in the hands of consumers and by reducing the need for large, centralized grid infrastructure and fossil fuel power plants. As a result, electric utilities and fossil fuel interests have long used a variety of strategies to hinder the growth of solar energy. As solar power has grown in popularity, those efforts have intensified.

Utilities and fossil fuel interests have taken aim at policies and tax credits that favor the growth of residential solar. The tools they use to fight that growth include fixed charges (either solar-specific or general), variable charges, demand charges and unfavorable rate changes.

Fixed charges. A major utility tactic has been to impose high fixed charges on solar panel owners. Utilities have levied or sought to levy either higher flat monthly fees for all customers or solar-specific fees, imposed only on customers with rooftop solar systems.⁷⁵ Utilities justify these fees by arguing that they are needed to ensure grid reliability, subsidize net metering programs, and maintain infrastructure.

Variable charges. Many utilities offer variable rate plans to consumers, under which monthly rates vary depending on changes in energy markets.⁷⁶ These plans can provide consumers savings when market prices drop, but also may hit consumers with price spikes when temperatures hit extreme highs or lows, thus making it difficult for both solar and non-solar consumers to budget consistently for their electricity costs.⁷⁷

Demand charges. Utilities sometimes impose demand charges, which can vary monthly and affect consumers' economic calculus on going solar. These charges 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.⁷⁸ As a result, the savings solar owners may gain 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.

Rate changes. Utilities across the country have fought to cut rates for net metering payments to solar owners, which reduces the incentive for homeowners to install panels and extends the payback period of solar generation systems.⁷⁹

A national lobbying network is active against solar

Utility efforts against solar in states around the country have been coordinated and supported by a national network of deep-pocketed, pro-fossil fuel lobbying groups that has been active for years. These groups have worked closely together, supporting each other financially and coordinating strategies, tactics and funding for anti-solar campaigns.

Edison Electric Institute: Utility trade group lobbying against solar power

The Edison Electric Institute (EEI) is the primary trade group representing U.S. investor-owned electric utilities. The Institute's website notes that its members deliver electricity to about 220 million Americans and are active in all 50 states as well as Washington, D.C.⁸⁰ Besides including most major U.S. utilities, EEI's membership also includes international electric companies, as well as many associate members from across the spectrum of U.S. business, including from technology, law, consulting, construction and other sectors.⁸¹

EEI developed what has become the utility industry's national campaign to impede the expansion of rooftop solar and has played a prominent role funding and actively participating in both national and state-level anti-solar campaigns. EEI fully launched this campaign with a 2013 report, "Disruptive Challenges," that warned of photovoltaic solar power's potential to directly threaten the utility business model and net metering's significant potential to adversely impact utility investors.⁸² The report stressed that "the long-term

threat of [solar customers] fully exiting from the grid... raises the potential for irreparable damages to [utility] revenues and growth prospects."⁸³

After developing the utility case against distributed solar power, EEI helped advance utility state-level legislative attacks. EEI worked in 2014 with the American Legislative Exchange Council (ALEC) to prepare and distribute to state legislatures sample bill language attacking net metering and creating solar surcharges, arguing this was needed to improve "fairness" of ratepayer cost distribution.⁸⁴

At a January 2016 board meeting, EEI President Thomas Kuhn warned utility executives in attendance against complacency regarding the solar threat, saying the group was working in two dozen states and would be happy to come to any others to campaign on behalf of members.⁸⁵ EEI has continued to push this message at major meetings and events. In December 2019, for example, the Institute held a weeklong political "bootcamp" for utility executives and government affairs representatives, where EEI used case studies of its successful anti-clean energy campaigns to train attendees on running campaigns, and made presentations highlighting how net metering, renewable energy standards and other pro-solar policies represent ongoing threats.⁸⁶

EEI has a Political Action Committee (PAC) which has spent over \$700,000 in each national election cycle since 2010 to advance organizational issue priorities.⁸⁷ In the 2020 electoral cycle, for example, the EEI PAC

spent \$793,180, \$519,000 of which went to individual federal candidates (57% to Republicans and 43% to Democrats).⁸⁸ EEI has also funded groups that oppose net metering.⁸⁹ Some utilities have even charged ratepayers for their annual payments to EEI, in effect forcing ratepayers to pay for political activities and advocacy with which they may not agree.⁹⁰

EEI parlayed its donations and access to legislators and the federal government into significant influence during the Trump administration. As an example, Brian McCormack, who was EEI's Vice President for External Affairs from 2011 to 2017, served as Chief of Staff to Trump Energy Secretary Rick Perry.⁹¹

Consumer Energy Alliance (CEA): Utility and fossil fuel front group

Houston-based Consumer Energy Alliance (CEA) is a major front group for some of the largest utilities and fossil fuel companies in the United States, and has pioneered anti-solar tactics used by other utility and fossil fuel-linked groups.⁹² CEA purports to be the “leading voice for sensible energy and environmental policies for consumers,” but has no nationally-respected consumer organizations among its members.⁹³ While CEA claims 550,000 individual members, as of early 2021 the organization's membership roster lists utility and fossil fuel companies and associations including Ameren Missouri, the American Gas Association, Dominion Energy, the Edison Electric Institute, Florida Power & Light Company, Georgia Power, the Indiana Energy Association, British Petroleum (BP), Cheniere (the largest producer of liquefied natural gas in the U.S.), Chevron, ExxonMobil, Shell Oil, Marathon Petroleum, the Texas Oil & Gas Association, Phillips 66, and many others.⁹⁴ Members also include many state and local Chambers of Commerce and other business groups.⁹⁵

CEA claims to be “pro-solar,” but its policy aims are often hidden. CEA released a September 2016 report that

attacked solar tax credits and net metering while overlooking studies showing the value of solar power to consumers.⁹⁶ CEA also was a leading supporter of the deceptive Amendment 1 in Florida, which would have created a range of economic barriers to rooftop solar in the Sunshine State and appeared on the state's 2016 ballot (see page 14).⁹⁷

In February 2018, Rhode Island Senator Sheldon Whitehouse stated on the Senate floor that CEA was a “fake consumer group” created by fossil fuel lobbyists, citing CEA's efforts to pass legislation weakening net metering in Kentucky.⁹⁸ CEA has been called out for misrepresenting petition signatures it has collected and for generating template emails supposedly from citizens pressing for specific legislative initiatives.⁹⁹ CEA continues to fight for utility companies across the country, sending its advocates from state to state to make their case.¹⁰⁰

The American Legislative Exchange Council (ALEC): Selling state legislative access and influence

The American Legislative Exchange Council, or ALEC, is a nationwide organization that gives fossil fuel and utility industry lobbyists direct access to state lawmakers. ALEC's website describes the group, founded in 1973, as “America's largest nonpartisan, voluntary membership organization of state legislators dedicated to the principles of limited government, free markets and federalism.”¹⁰¹ Almost a quarter of U.S. state legislators – a group that represents an electorate of over 60 million Americans – are ALEC members.¹⁰²

ALEC is more than just a front group or lobbying organization – it has been described as a “corporate bill mill” that has been influential in advancing anti-consumer and anti-environmental causes in states across the country.¹⁰³ ALEC has worked for years against renewable energy and pro-solar policies by coordinating with utilities, corporations and legislators and then providing template legislation to its many members in state legisla-

tures.¹⁰⁴ These members then introduce bills based on ALEC's templates in state houses across the country.¹⁰⁵

ALEC has engaged in repeated attacks against solar power over the past decade. The group's Energy, Environment and Agriculture task force, which has extensive representation from fossil fuel companies, has produced model bills to kill net metering and repeal renewable electricity standards.¹⁰⁶ State legislators have introduced a number of these bills into state legislatures around the country, then work with fossil fuel interests to use biased studies to justify their stances against solar policies.¹⁰⁷

Though ALEC calls itself an organization of legislators, it is really a pay-to-play lobbying powerhouse – 98% of its budget is from outside donors, corporations and corporate foundations.¹⁰⁸ ALEC's website acknowledges that it currently has nearly 300 corporate and foundation members but does not list them.¹⁰⁹ The Center for Media and Democracy's Sourcewatch project, however, lists hundreds of companies and organizations that are or have been involved with ALEC and its work.¹¹⁰ Fossil-fuel, utility and anti-solar members of ALEC have included foundations linked to Koch Industries and corporations including American Electric Power, Atlantic Richfield Company (ARCO), Cheniere Energy, Chevron, Duke Energy, Exelon, Illinois Power Company, Mississippi Power, Peabody Energy, San Diego Gas & Electric, Tampa Electric Company and many others.¹¹¹

ALEC's donors have provided the organization with substantial resources to advance its agenda – in its 2018 annual report, ALEC listed annual income of \$9.7 million, but did not list specific donors.¹¹²

It is notable that many of ALEC's highest-profile corporate members, including Amazon, Microsoft, Facebook, Google, Coca-Cola, ExxonMobil, Walmart, BP and others have cut their ties to ALEC in recent years, with a number of the companies ascribing this to ALEC's opposition to efforts to fight climate change.¹¹³

Koch Industries: Using fossil fuel wealth to fight solar and other renewables

The Koch brothers – Charles and the late David Koch – have used their enormous wealth, accrued from a

business that began as an oil extraction and refining company, to advance right-wing goals across the country for many years.¹¹⁴ Both Koch brothers (until David Koch's passing in 2019) consistently sought to advance their libertarian views, including pushing for drastic cuts in environmental and other regulation on industry, through a large, well-funded network of think tanks, foundations and politically active groups.¹¹⁵

Among the most important and influential Koch groups is Americans for Prosperity (AFP), an organization which claims a grassroots focus but that is in reality a dark money group through which the brothers have funneled hundreds of millions of dollars to advance their deregulatory agenda, fight efforts to address climate change, attack solar power, and promote their other priorities.¹¹⁶ AFP claims to be active in 38 states, and the organization reported revenues of about \$54.5 million in 2019.¹¹⁷

The Koch brothers have used their funding and political influence to support fights against solar power all over the country, including in Arizona, New Hampshire, Florida, Ohio, South Carolina and Washington state.¹¹⁸ They have been particularly active in Florida, 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.¹¹⁹ (See page 14.)

The Koch brothers have also advanced their agenda by funding and supporting university research that supports their issue stances. The Koch brothers have supported hundreds of programs at more than 250 schools and universities.¹²⁰ As an example, George Mason University in Virginia has been a long-time recipient of Koch foundation funding, receiving an estimated \$50 million by 2018.¹²¹ The donations bought the Koch brothers' influence over academic appointments at the school.¹²²

Koch-funded groups also had strong links to the Trump administration, with the Trump 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.¹²³

Utilities are working to block residential solar around the country

Utilities around the country have followed similar playbooks in attacking net metering and other pro-solar policies, sometimes in concert with the large national associations, or within various state-level coalitions comprised of utility, fossil fuel and business interests. Utility tactics in these fights have included aggressive lobbying of statehouses or public service commissions, large donations to legislators, and even alleged bribery, among others.

New England Ratepayers' Association attacks states' right to offer net metering

The New England Ratepayers' Association (NERA) has a history of opposing solar policies.¹²⁴ NERA presents itself as pro-consumer, and its website claims the group is “a non-profit advocacy group focused on promoting sound public policy that protects utility customers, both families and businesses, and lowers the cost of regulated services.”¹²⁵ In reality, the organization, incorporated as a non-profit in Massachusetts in 2013, has extensive ties to utilities and natural gas firms.¹²⁶ For example, NERA has engaged in anti-net metering advocacy in New Hampshire as part of a coalition including utilities such as Eversource and Liberty Utilities, as well as with the Consumer Energy Alliance (see page 10).¹²⁷ NERA's membership, which the organization does not disclose, may consist of only a small number of companies, according to clean energy advocates.¹²⁸ Marc Brown, who served as NERA's Executive Director, is a registered corporate lobbyist who has been involved with a number of anti-renewable energy organizations,

and now serves as the Northeast Regional Director for the Consumer Energy Alliance.¹²⁹

A 2015 NERA policy brief outlines the organization's opposition to clean energy policies, including retail net metering, renewable energy standards, and energy efficiency programs.¹³⁰ NERA has supported federal legislation to facilitate permitting of natural gas pipelines, alongside such groups as the Edison Electric Institute, the American Gas Association, and Koch-affiliated groups.¹³¹

NERA has a lengthy record of opposition to net metering policies in New Hampshire and Maine, but its attack in 2020 was particularly audacious.¹³² In April 2020, NERA filed a petition with the Federal Energy Regulatory Commission (FERC), which had only four members for its five seats, all nominated by then-president Trump.¹³³ NERA argued in the petition that solar customer sales of electricity back to utilities should be considered wholesale sales under FERC's jurisdiction, and that states thus do not have the legal right to impose net metering policies and payment rates.¹³⁴ NERA argued that small solar installations be regulated under the federal Public Utilities Regulatory Policy Act, which would reduce utility payments to solar owners by more than half.¹³⁵

NERA's petition generated opposition from a wide range of energy trade organizations, state utility regulators, free market proponents, environmental groups and solar power system owners.¹³⁶ State utility regulators told FERC

they considered the petition a direct attack on states' regulatory authority, while solar advocacy groups argued it could heavily damage the residential solar industry and upend rooftop solar contracts across the country.¹³⁷

FERC commissioners unanimously dismissed the petition in July 2020, saying NERA did not prove any harms or controversies that the commission should address, but did not explicitly rule out FERC jurisdiction over solar customer sales back to the grid.¹³⁸ One commissioner wrote that the petition had raised "substantive issues" FERC could take up later, and another wrote that the "the proper place for considering the issues [raised by the petition] is [FERC]."¹³⁹

Ohio: Utility opposition to solar at heart of massive bribery scandal

Ohio has emerged as a disturbing example of how aggressive utility anti-solar campaigns and spending have resulted in policy changes that undermine rooftop solar power. Despite having respectable solar potential, as of late 2020, Ohio hosted only 361 MW of installed solar capacity, which generated less than 0.5% of the state's electricity.¹⁴⁰ This puts Ohio in 28th place nationally in solar energy generation.¹⁴¹

Anti-solar efforts by Ohio utilities are largely responsible for the state's slow adoption of solar power. While the state allows net metering and other solar benefits, state utilities have repeatedly attacked these and other policies that support rooftop solar.

First, the utilities succeeded in convincing Ohio lawmakers to weaken the state renewable energy standard, a rare occurrence nationally. Ohio passed a Renewable Electricity Standard (RES) law (called a Renewable Portfolio Standard – RPS – in Ohio) in 2008 requiring utilities to obtain 12.5% of their energy from renewable power sources by 2025 and to implement energy use reduction and energy efficiency programs.¹⁴² In 2014, however, a collection of utilities and business groups – which included the Industrial Energy Users of Ohio, a lobby group for energy-intensive state manufacturers – convinced the legislature to pass S.B. 310, which froze RES implementation for two years and pushed the deadline to 2026.¹⁴³ The law was further weakened in 2019.

The utilities also have battled net metering for years. The Ohio affiliates of giant utilities FirstEnergy and American Electric Power (AEP), plus Dayton Power & Light and Duke Energy, fought a 2014 ruling by the Public Utilities Commission of Ohio (PUCO) affirming retail rates for net metering for six years.¹⁴⁴ In October 2019, PUCO issued updated state net metering rules that removed uncertainty by preserving most net metering benefits for rooftop solar owners, and a year later the Ohio Supreme Court dismissed the utilities' appeal of net metering legislation in Ohio.¹⁴⁵

The saga of Ohio House Bill 6 (H.B. 6), however, is a particularly egregious case of utility efforts to block solar energy in the state. FirstEnergy was the principal backer of this bill, passed by the state legislature in July 2019, which clean energy expert David Roberts called "the worst piece of energy legislation in the 21st century" and "the most counterproductive and corrupt piece of state energy legislation" he had seen.¹⁴⁶ H.B. 6, which took effect in October 2019, cut the renewable energy standard target to 8.5% by 2026 and eliminated the standard altogether after 2026.¹⁴⁷ The law also cut utilities' required savings from energy efficiency from 22% below 2008 levels by 2027 to 17.5% (which most utilities had already achieved), and then allowed them to end their efficiency programs.¹⁴⁸

Finally, H.B. 6 imposed surcharges on ratepayers to bail out two nuclear power plants, which FirstEnergy claimed were losing money, and two old, dirty coal plants, one in Ohio and one in Indiana, owned by a utility-controlled collective.¹⁴⁹ The effect of the new law was to remove incentives for further renewable energy development and energy efficiency increases in the state while providing over \$1 billion to subsidize four uncompetitive power plants.¹⁵⁰

H.B. 6 was opposed by ratepayers, environmentalists, and even some business groups. So how did the bill pass? Details emerged in July 2020, when U.S. prosecutors announced that the push to pass the law was the central element of a \$60+ million alleged bribery scheme, the largest in Ohio history.¹⁵¹ Federal prosecutors arrested Republican Speaker of the Ohio House Larry Householder, aide Jeff Longstreth, lobbyist and

former Ohio state Republican Party chair Matt Borges, lobbyist Neil Clark, and FirstEnergy Solutions (a then-subsi-dary of FirstEnergy now known as Energy Harbor) lobbyist Juan Cespedes, on charges of alleged racketeering.¹⁵² U.S. attorneys also charged officials of a dark money group, Generation Now, for being a central part of the scheme.¹⁵³

FirstEnergy was unsuccessful in convincing the state legislature and governor to approve a nuclear bailout plan in 2017 and early 2018.¹⁵⁴ The FirstEnergy subsidi-ary controlling its two Ohio nuclear plants, FirstEnergy Solutions, then declared bankruptcy in 2018.¹⁵⁵

The federal complaint describes how Householder’s associates established Generation Now in 2017 and funneled money through the entity, away from public scrutiny, to candidates in the 2018 Republican pri-mary elections who would back Householder’s effort to become Ohio House Speaker and vote in favor of the nuclear and coal bailout.¹⁵⁶ The complaint states that FirstEnergy (referred to in the complaint as “Company A”) was the principal funder of this effort.¹⁵⁷ At least nine candidates backed by Householder won seats.¹⁵⁸

After the 2018 election, Householder still lacked enough Republican support to gain the speakership, so he made a deal with some Ohio House Democrats to support his bid in return for not introducing legisla-tion to curb unions, plus other concessions.¹⁵⁹ He then won the speakership and helped engineer the passage of H.B. 6. The bill passed and was signed into law by Governor Mike DeWine in 2019.¹⁶⁰ The federal com-plaint alleges that Householder and his associates then worked “corruptly,” using money funneled from FirstEn-ergy-controlled accounts through Generation Now, to stop a ballot initiative that would have blocked H.B. 6 from taking effect.¹⁶¹ In all, the complaint charges, FirstEnergy and its subsidiaries paid Householder’s group about \$60 million between March 2017 and March 2020.¹⁶²

After the arrests, Householder was swiftly replaced as speaker, and a number of legislators signed onto bills to repeal H.B. 6. Two defendants pleaded guilty to racketeering charges.¹⁶³ Despite the scandal, however,

Householder won reelection in November 2020, and legislators wavered on repeal of the bill. The Ohio House and Senate met in lame duck sessions to con-sider repeal, but the legislative session ended in late December 2020 with the law still in place.¹⁶⁴

On March 31, 2021, Governor Mike DeWine signed a bill passed unanimously by the state Senate which revoked H.B. 6’s nuclear subsidies, as well as another provision benefiting FirstEnergy, while keeping subsi-dies for the coal plants and maintaining the renewable energy and energy efficiency rollbacks.¹⁶⁵

Florida: Florida Power & Light, Duke Energy and Tampa Electric Company fight pro-solar policies

Florida, the Sunshine State, has the third largest rooftop solar power potential in the country, behind only California and Texas.¹⁶⁶ Google’s Project Sunroof estimates that 92% of the roughly 4.8 million roofs in Florida could generate solar power, producing up to 158,000 gigawatt-hours (GWh) of electricity from solar annually, enough to power 14.8 million homes.¹⁶⁷ Project Sunroof calculates that if all potential rooftop solar installations were built, the state would prevent 84.8 million metric tons of CO₂ emissions each year, equivalent to removing 17.9 million passenger cars from the roads.¹⁶⁸

Despite Florida’s vast solar potential, the state lan-guished for years with few rooftop solar energy instal-lations. By 2019, just 60,000 homes and businesses – just over 0.5% of Florida’s electricity customers – had installed rooftop solar.¹⁶⁹ This left the state 26th nation-wide in rooftop solar as a percentage of all generation, behind much less sunny states such as Vermont, Dela-ware and Maine.¹⁷⁰ Florida’s overall solar generation did grow 44-fold from 105 GWh in 2010 to 4,595 GWh in 2019, but solar nevertheless still accounts for just around 3% of total state electricity generation.¹⁷¹

Why has Florida lagged so badly in rooftop solar devel-opment? This is primarily because of fierce opposition to its expansion from the state’s three investor-owned utilities (IOUs) – Florida Power & Light (FPL), Duke



Photo by Dennis Schroeder via National Renewable Energy Laboratory, CC BY-NC-ND 2.0.

Energy and Tampa Electric Company. (Note: FPL parent company NextEra acquired Florida's prior fourth IOU, Gulf Power, which is currently being incorporated into FPL.)¹⁷² The utilities' ongoing anti-rooftop solar campaigns, backed by huge spending, have produced policies that have served as roadblocks to faster rooftop solar growth.

Florida lacks a renewable portfolio standard, does not allow solar power purchase agreements (PPAs), which facilitate solar power financing in other states, and requires homeowners to purchase expensive insurance for solar power systems.¹⁷³ While the state offers net metering, property tax exemptions for renewable energy equipment, and special residential loans for renewable energy property upgrades, the overall policy framework is not conducive to rooftop solar growth.¹⁷⁴

The major utilities have wielded their political spending to great effect in the state. A 2018 report by government watchdog Integrity Florida documented that the IOUs

directed over \$43 million to state-level political parties, candidates and committees, including to the governor, over the 2014 and 2016 election cycles.¹⁷⁵ FPL, the largest state utility, was the biggest contributor, alone giving almost \$23 million in the 2014 and 2016 elections.¹⁷⁶ The companies also paid for an army of lobbyists: between 2014 and 2017, the companies employed a total of between 90-100 lobbyists annually, more than one for every two state legislators.¹⁷⁷ In 2020, although there were no major solar-related initiatives on the ballot, the IOUs again made heavy campaign donations in Florida, contributing over \$9.2 million, most of it to political committees.¹⁷⁸

The utilities try to influence how they are regulated by the Florida Public Service Commission (PSC) by contributing to leading legislators who select members of the council which nominates PSC board members, as well as to legislators directly serving on the council.¹⁷⁹ The council makes PSC commissioner recommenda-

tions to the governor, who makes the ultimate selections. The utilities consequently contributed over \$1.8 million in the 2014 and 2016 election cycles to then-governor Rick Scott's campaign committee and his Let's Get to Work PAC.¹⁸⁰ Finally, the utilities also made contributions to politically influential business organizations, including the Florida Chamber of Commerce, to help advance their interests.¹⁸¹

Florida utilities have a long history of campaigning against policies benefiting rooftop solar. In 2016, the state's major utilities, plus business groups including the Florida Chamber of Commerce, spent over \$26 million on a front group, "Consumers for Smart Solar," which promoted passage of Amendment 1, a deceptive, anti-solar ballot initiative which would have inserted into the state constitution language imposing barriers to rooftop solar.¹⁸² Despite the utilities' huge financial backing for the initiative, voters rejected it in November 2016.¹⁸³

Undaunted, utilities have continued to make it difficult for homeowners trying to install rooftop solar systems: recent anecdotal reports showcase how utilities have delayed connecting new residential systems to the grid for months, causing new owners to lose money.¹⁸⁴

State utilities also have repeatedly targeted net metering. The Florida Municipal Power Agency, a wholesale power agency which is owned by the state's smaller municipal utilities, has worked against net metering for some time.¹⁸⁵ Most recently, the PSC held a September 17, 2020 workshop to consider changes to net metering rules.¹⁸⁶ The PSC scheduled the workshop after a utility front group, "Energy Fairness," released a report claiming net metering is unfair to consumers.¹⁸⁷ Energy Fairness, formerly the Partnership for Clean and Affordable Energy, lobbies for utility and fossil fuel interests, and has had ties with Southern Company, a major Georgia-based utility holding company, and with the Consumer Energy Alliance, a fossil fuel-backed advocacy group.¹⁸⁸ The PSC sought public comment and received over 16,000 emails urging the preservation of Florida's net metering program, which includes incentives for solar panel installation as well as credit for excess power production.¹⁸⁹

At the workshop, the IOUs pushed to roll back net metering.¹⁹⁰ Advocacy groups, including the Florida Solar Energy Industries Association, Vote Solar and the Southern Alliance for Clean Energy (SACE), countered with data showing that net metering saves money, promotes economic development and does not harm lower income ratepayers.¹⁹¹ The PSC subsequently reaffirmed its support for net metering. SACE ascribed the positive outcome to the advocacy coalition's rapid mobilization of a "very strong show of support" from the public but noted "we must continue to remain vigilant" against new attacks against rooftop solar in the legislature or at the PSC.¹⁹²

Illinois: Ameren inflated solar numbers in effort to stop paying net metering rates

In 2017, the Illinois Legislature passed the Future Energy Jobs Act, designed to support the state's growing solar industry. The act ensured rooftop solar customers would receive full net metering credits for the power they send back to the grid. Once customer generation reached 5% of the utility's peak demand, the credits would be partially replaced with payments based on the value of solar to the grid.¹⁹³ Regulators were to investigate how that value would be calculated once residential solar reached 3% of peak demand.¹⁹⁴

Ameren, a Fortune 500 that runs the distribution system for all electricity customers in about three-fourths of Illinois, and also owns multiple generation companies and generating facilities, announced in April 2020 that it had reached the 3% threshold.¹⁹⁵ Solar advocates challenged the utility's calculations in determining the thresholds, concerned that Ameren was inappropriately accelerating the end of net metering.¹⁹⁶ Although the language of the Future Energy Jobs Act doesn't specify a formula, advocates argued that its clear intent was to support the steady growth of distributed solar, not to quickly reduce its incentives.¹⁹⁷

The Illinois Commerce Commission, which regulates utilities and other industries in the state, began to examine Ameren's claim. In July 2020, an Illinois Commerce Commission Administrative Law Judge ruled that Ameren had calculated the percentage of

rooftop solar power inaccurately.¹⁹⁸ The ICC asked Ameren to continue full net metering until the ICC could complete its audit of the utility's calculations and proposed rebate, but Ameren rejected the ICC request.¹⁹⁹ In October 2020, Ameren announced it had reached the 5% threshold, and said new solar customers would no longer receive full retail net metering, and instead receive rebates at some point in the future once the utility had calculated the value of those rebates.²⁰⁰ The utility and other parties estimated that these rebates – as proposed by Ameren – would be worth about half the value of full net metering credits.²⁰¹ Ameren argued that it could not abide by the ICC request because the utility had determined that the threshold had been reached and, therefore, by law the utility was compelled to end retail net metering.²⁰² In response to this claim, the ICC quickly reviewed Ameren's arguments and calculations.²⁰³

In the meantime, the pricing uncertainty caused by Ameren's claims slowed residential solar growth. Installers and buyers suddenly worried they would have to redo their calculations to lower the apparent value of solar and increase the payback period of the systems. "We had to go back and tell clients, 'Hey, you may not get the net metering we sold you,'" AES Solar sales manager Shariff Shakir told Energy News Network.²⁰⁴

In December 2020, the ICC released a final order finding that Ameren had miscalculated residential solar levels, inflating the apparent reach of distributed energy.²⁰⁵ Ameren based its calculation of peak demand on the second, smaller figure, not the first, more relevant, one. The ICC rejected what advocates labeled an "apples to oranges" calculation.²⁰⁶ In a 4-1 vote, it ordered Ameren to restore full net metering credits and to "make whole" any customers who had signed up after 2 October 2020 and had not received full net metering credits.²⁰⁷

Although net metering has been restored to southern Illinois, the cost uncertainty resulting from Ameren's inaccurate calculations remains. In October 2020, the company claimed distributed solar made up 5.3% of its total load.²⁰⁸ But solar advocates calculated, and the ICC agreed, that, including peak demand from all customers Ameren served, the true value was 1.4% – well

below the threshold to begin planning for the transition from net metering to value-based rebates.²⁰⁹

The regulator now estimates that Illinois will reach a true net metering threshold of 5% in about two years.²¹⁰ However, Ameren is pushing the ICC to issue a final order by mid-2021 approving its methodology for calculating rebate values after the final threshold is reached.²¹¹ Advocates say that given the new timeframe there is no rush, and accuse Ameren of pushing an "overly complex and opaque" formula that leaves solar owners unsure if they're getting fair value for their power, instead of developing a fair, transparent and comprehensive methodology for calculating the value of solar.²¹²

California: PG&E, SoCal Edison and SDG&E push drastic net metering rollback, high fixed solar charges

California is the nation's leader in the adoption of solar power.²¹³ As of the 4th quarter of 2020, the state had 31,288 MW of installed solar capacity, more than any other state, generating 22.7% of California's electricity.²¹⁴ California rooftops host almost 10.5 gigawatts of solar energy capacity.²¹⁵

Strong public policies – such as the state's renewable electricity standard and Million Solar Roofs program – have helped spur the growth of solar energy in California.²¹⁶ Those policies have included utility rate structures that make rooftop solar power a financially viable option for millions of Californians. California will need to ensure that public policy continues to support the growth of the rooftop solar market if it intends to reach its goal of a 100% carbon-free electricity system by 2045.²¹⁷

California residents increasingly recognize the value of solar power to themselves and their state. A February 2021 poll sponsored by the solar industry showed that 71% of state voters want the state to encourage more use of solar power, and another 14% want to at least maintain the status quo.²¹⁸ The poll showed that 80% of state voters support net metering, and 64% oppose proposals to reduce net metering benefits for state solar owners.²¹⁹

Despite the importance of rooftop solar, California's three investor-owned utilities (IOUs) – Pacific Gas and Electric (PG&E), Southern California Edison (SoCal Edison) and San Diego Gas & Electric (SDG&E) – recently proposed dramatic changes to the state's net metering program that would impose mandatory fees on solar customers and slash net metering payments.²²⁰ The drastic changes pushed by the utilities would eliminate the economic viability of solar power for many Californians, especially those with low to moderate incomes.²²¹

California's strong net metering rules have historically been a key factor in the state's success in expanding solar adoption. The state put net metering in place in 1995 with Senate Bill 656, which was designed to encourage private investment in renewable energy but included a size limit on systems and a tight cap on total net metering payments.²²² Subsequent legislation in 2001, 2002, 2006 and 2010 raised the net metering cap successively to 5% of peak load, but in 2013, a new bill directed the California Public Utility Commission (CPUC) to develop a successor program to full net metering, which would end in mid-2017.²²³

In 2016, the CPUC issued updated net metering rules (NEM 2.0), which kept the overall system in place but cut credits to solar owners for power they sent to the grid by about 2-3 cents/kWh, in theory to make sure solar owners paid fairly for utility costs related to energy efficiency and low-income assistance programs.²²⁴ The update also required new solar owners to sign up for time of use billing (TOU), which allowed utilities to charge higher rates for power at certain times of the day.²²⁵

The CPUC committed to review and update net metering rules again in 2019 (NEM 3.0), but this process was delayed by the bankruptcy of PG&E, and then by the COVID-19 pandemic.²²⁶ The CPUC's decision to undertake a new review was timed in part to coincide with the reduction of the federal solar tax credit from 30% to 26% at the end of 2019 – the CPUC sought to examine whether rooftop solar would need fewer incentives to continue flourishing.²²⁷ The CPUC finally began the NEM 3.0 update process in late 2020 and laid out a timeline to complete the new rules around the end of 2021.²²⁸

On March 15, 2021, PG&E, SoCal Edison and SDG&E issued their proposal for the next version of net metering. The utilities proposed to impose high solar fixed charges and severe cutbacks to net metering payments, which, combined, would make solar power prohibitively expensive for many Californians.²²⁹ The utilities have proposed the highest fixed charges for solar in the country – SDG&E seeks a charge of almost \$91/month on average for residential solar owners, while PG&E seeks \$86/month on average and SoCal Edison \$56/month on average.²³⁰ The utilities also seek higher monthly fees for government and commercial solar installations. Schools installing solar would need to pay an estimated \$3,400/month in SDG&E territory, with SoCal Edison charging \$1,100/month and PG&E charging \$950/month, under their proposals.²³¹ In addition, the utilities seek to block solar power owners from rolling unused credits over from month to month, substantially cutting the value of solar power for owners.²³²

Utilities argue that these dramatic changes in solar compensation are justified because net metering shifts some of the cost of maintaining the grid from solar customers to those without solar power. However, utilities typically back up this assertion with calculations that omit or undervalue the numerous benefits that rooftop solar delivers for electricity customers generally, and for society at large.

By producing electricity locally, for example, rooftop solar reduces the need for expensive investments in long-distance transmission capacity. In 2018, California's independent grid operator, CAISO, canceled \$2.6 billion in planned transmission expenditures from its long-term investment plan, citing reduced forecasts of electricity demand “strongly influenced by energy efficiency programs and increasing levels of residential, rooftop solar generation.”²³³ Yet, it was not until 2020 that the CPUC moved to ensure that avoided transmission costs are factored into utilities' calculations of the value provided by distributed solar power.²³⁴

Rooftop solar delivers an array of other benefits as well. It contributes to the development of a more flexible and resilient power system better able to withstand threats like wildfire – an important benefit

in California, which has recently endured widespread power outages to reduce wildfire risks.²³⁵ In addition, a recent national study found that enhanced use of distributed energy technologies such as rooftop solar and energy storage is the most cost-effective route to a clean energy system, generating hundreds of billions of dollars of cost savings by 2050 compared with systems that are more reliant on delivering power long distances over the grid.²³⁶ Indeed, when these and other benefits are factored in, the value provided by distributed solar often exceeds the compensation provided to its owners under net metering.²³⁷

Under its NEM 3.0 process timeline, the CPUC plans to collect testimony and hold hearings over the next few months as it weighs those proposals, and then plans to issue a final decision on new rates and charges – which could be its own plan, one of the proposals submitted by utilities or other stakeholders, or a combination of plans – near the end of 2021.²³⁸

Kansas: Evergy pushes to price solar out of the state

Despite the fact that Kansas is one of the ten sunniest states in the country, there were fewer than 1,300 residential solar energy systems in the state at the end of 2019, and just 0.23% of the state’s power came from solar energy.²³⁹

This is likely due in part to the state’s utility rate design, which has allowed Evergy – Kansas’ largest utility – to charge solar customers large extra fees, reducing the benefits for those who already have solar panels and discouraging other Kansans from adding solar power to their homes.²⁴⁰

Kansas utilities, along with the American Legislative Exchange Council (ALEC) and the Koch brothers’ political affiliate, Americans for Prosperity, pushed an initial attack on solar in 2014.²⁴¹ Both Westar Energy and Kansas City Power & Light – the two utilities that in 2018 merged to form Evergy – as well as Empire District Electric, the third IOU in the state – lobbied for bills introduced in the Kansas House and Senate to eliminate the state’s net metering policy, which allowed

customers with solar panels to be fairly compensated for extra power they supply to the utility’s grid.²⁴²

In 2014, Kansas utilities spent \$116,500 on campaign contributions to state legislators.²⁴³ Kansas City Power & Light gave \$1,000 to the 2014 campaign of Representative Dennis Hedke, the chairman of the Kansas House Standing Committee on Energy and the Environment, and \$500 to the 2012 campaign of Senator Forrest Knox, the chairman of the Kansas Senate Committee on Utilities, while Westar Energy gave \$500 to each.²⁴⁴ These two committees discussed the net metering bills.²⁴⁵

The legislature did not end up repealing net metering outright but passed an amended bill that reduced the value of the power solar owners sell back to the grid and reduced the size of solar installations that qualify for net metering.²⁴⁶ These reductions in compensation occurred despite the fact that only 201 utility customers were actively using net metering for rooftop solar or small wind installations.²⁴⁷

But Evergy’s attacks on solar didn’t end at this point. In October and December 2018 (in different geographical areas), Evergy instituted a demand fee – a monthly charge based on peak electricity use – for customers with residential solar installations.²⁴⁸ Evergy charged customers \$3 in colder months and \$9 in warmer months per kilowatt of peak demand each billing period, regardless of the total amount of energy used.²⁴⁹ This led to extra charges that were sometimes more than \$100 per month, and caused a huge drop in the number of Kansans hooking solar panels to the grid.²⁵⁰

The demand fee was approved by the Kansas Corporation Commission (KCC), the utility regulatory body in Kansas.²⁵¹ Both Westar Energy and Kansas City Power & Light contributed to the 2010 and 2014 campaigns of Governor Sam Brownback and his Lieutenant Governor Jeff Colyer – a combined \$8,363 in 2010 and \$12,107 in 2014.²⁵² Governor Brownback appointed two of the KCC Commissioners who approved the demand fee, and Jeff Colyer, who briefly became Governor when Sam Brownback secured a Trump administration posting, appointed the third.²⁵³



Photo: Elena Elisseeva via Shutterstock.com.

In April 2020, the Kansas Supreme Court ruled that the utilities and the KCC had engaged in illegal price discrimination against customers with solar installations – charging only customers who generate their own power an extra fee unconnected from possible extra services they require – and remanded the issue back to KCC.²⁵⁴ Kansans with solar panels, however, continued to pay the illegal fee, because Evergy claimed it could not change prices without approval from the KCC.²⁵⁵

Even after engaging in illegal price discrimination and being soundly defeated in the Kansas Supreme Court, Evergy is still trying to stop the growth of solar power in Kansas. In November 2020, prior to KCC hearings for Evergy’s rate design update in response to the Kansas Supreme Court Ruling, Evergy offered two new proposals.²⁵⁶ Evergy’s preferred option is to reinstate the demand fee, repackaged as a \$3-per-kilowatt monthly “grid access

fee” charged to all customers based on the size of any distributed generation capacity they own.²⁵⁷ The grid access fee would only charge customers with generating capacity – everyone else would pay \$0 – but Evergy’s proposal suggests that the utility believes the slight change will allow the proposal to pass legal muster.²⁵⁸

In case that new fee was rejected by the KCC, Evergy had a back-up proposal: a \$35 per month minimum service charge for all of its customers.²⁵⁹ This would represent a 240% increase from the current \$14.50 service fee Evergy charges, and increase monthly bills for over 140,000 low-income Kansans and many senior citizens – who already struggle to afford energy costs – as well as for those who need separate meters to power detached barns or garages.²⁶⁰

The KCC received nearly 1,100 calls, emails and letters from Kansans who almost uniformly opposed Evergy’s

proposed rate increases.²⁶¹ On February 25, 2021, the KCC ruled unanimously against both Evergy's demand fee and minimum charge proposals in its Central territory (former Westar service area).²⁶² While this was a win for solar owners in this part of Kansas, solar owners in other parts of the state are still paying the demand fee.²⁶³

South Carolina: Dominion Power seeking to hike solar fees

In May 2019, South Carolina governor Henry McMaster signed into law the Energy Freedom Act, which had passed the legislature with unanimous support.²⁶⁴ The law was designed to bolster the state's strong and growing demand for solar power and was supported by utilities and solar developers alike. It lifted the cap on net metering, ensured full compensation for solar power for at least two years, and created a customer bill of rights.²⁶⁵

A major incumbent utility in the state, South Carolina Electric & Gas Company, was renamed Dominion Energy South Carolina in 2019 after Virginia-based Dominion acquired the South Carolina utility's parent company.²⁶⁶ Dominion operates electric and natural gas service across a large portion of south and central South Carolina. In 2020, Dominion proposed a suite of new fees, fixed charges and changes that undermine the Energy Freedom Act and directly threaten the growth of solar power in South Carolina.²⁶⁷

Dominion targeted a new charge specifically at solar customers that would more than double their monthly service charge, from \$9 to \$19.50.²⁶⁸ Dominion also proposed a new monthly "solar subscription fee" that would charge customers \$5.40 for every kW of solar power they install - \$43 a month for an 8 kW system (a large residential system of this size takes up to 600 square feet of space and can generate 500-1400 kWh/per month of power, often enough to meet a home's full power con-

sumption needs).²⁶⁹ Combined with the newly doubled monthly service charge, these additional fees would cost the average solar owner \$750 every year.²⁷⁰

Frank Knapp, President and CEO of the South Carolina Small Business Chamber of Commerce, expressed an understanding that some utility fees might be necessary but also concern that Dominion's proposals were unreasonable and counterproductive, saying "if it's so draconian, the new tariffs that Dominion is offering, that no one will want to do it, well we've basically said goodbye to the solar industry in South Carolina."²⁷¹

Dominion is also attempting to reduce the compensation solar customers of all types receive for supplying power back to the grid. While the current net metering system compensates solar owners for the full value of the electricity their panels generate, Dominion is trying to slash this compensation, known as the solar export credit.²⁷² The South Carolina Public Service Commission (PSC) held a hearing on March 23 in which only five of over 250 attendees supported Dominion's proposals targeting solar customers.²⁷³ In late April, the PSC ruled unanimously against Dominion's proposals, instead adopting a proposal put forward by solar advocates to use Dominion's time-of-use retail rates in determining compensation for Dominion's solar customers.²⁷⁴ The ruling re-affirmed that solar energy has real value to South Carolinians, and that utilities have to take that value into account when setting solar policies.²⁷⁵

Beyond discouraging rooftop solar, Dominion also substantially undervalued the rate it offered to pay large, independent solar providers and has resisted pressure from stakeholders and the PSC to expand its community solar offering.²⁷⁶ The PSC overturned the utility's earlier proposal to pay about \$21 per megawatt-hour (MWh) of solar, which would have been among the lowest rates in the country.²⁷⁷ Dominion will now pay between \$27.51 and \$32.52 per MWh over 10-year contracts.²⁷⁸

Recommendations

State decisionmakers, including governors, legislators, utility oversight boards and others, should resist efforts by utilities and other special interests to limit the spread of rooftop solar. Decisionmakers should reject these groups' efforts to weaken pro-solar policies, including:

- Caps, restrictions on or elimination of net metering;
- Rollbacks or elimination of state renewable energy standards;
- Unfair or discriminatory charges or tariffs on solar power system owners;
- Utility rate structures that penalize or discourage solar installation; and
- Broader, unneeded regulatory burdens on solar energy.

States should also promote and defend policies that support the growth of rooftop solar and speed the national transition toward 100% renewable energy. These include:

- Considering the full benefits of distributed solar energy to the grid, to ratepayers and to society in solar energy ratemaking or policy decisions;

- Implementing strong net metering and interconnection standards, which enable many customers to meet their own electricity needs with solar power;
- Supporting community shared solar projects and virtual net metering, which can expand public access to solar power;
- Enacting or expanding solar carve-outs and renewable electricity standards;
- Enabling financing mechanisms to allow for greater solar access for businesses and residents;
- Allowing companies that are not utilities to sell or lease solar to residents and businesses; and
- Investing wisely in making the electric grid more intelligent, which will facilitate a greater role for distributed sources of energy such as solar power.

In addition, policymakers should reaffirm and strengthen U.S. national and international commitments to reduce emissions that cause global warming. Solar power will play an increasing role in reducing U.S. carbon emissions, shrinking the carbon footprint of our energy production and usage, and moving the country toward a cleaner future.

Notes

1 Tony Dutzik and Jamie Friedman, Frontier Group, and Emma Searson, Environment America Research & Policy Center, *Renewables on the Rise 2020: A Decade of Progress Toward a Clean Energy Future, Solar Energy on the Rise Factsheet*, 21 October 2020, available at <https://environmentamerica.org/feature/ame/renewables-rise-2020>.

2 Alec Tyson and Brian Kennedy, “Two-thirds of Americans think government should do more on climate,” *Pew Research Center for Science and Society*, 23 June 2020, archived at <https://web.archive.org/web/20210130065900/https://www.pewresearch.org/science/2020/06/23/two-thirds-of-americans-think-government-should-do-more-on-climate/>.

3 DSIRE, NC Clean Energy Technology Center, *Net Metering*, June 2020, accessed 12 April 2021 at https://s3.amazonaws.com/ncsolarcen-prod/wp-content/uploads/2020/06/DSIRE_Net_Metering_June2020.pdf.

4 Jeff St. John, “Edison Electric Institute declines to support petition seeking federal overturn of net metering,” *GreenTech Media*, 4 June 2020, archived at <https://web.archive.org/web/20210310184119/https://www.greentechmedia.com/articles/read/edison-electric-institute-wont-endorse-petition-seeking-federal-overturn-of-net-metering>.

5 Trained utility executives: David Pomerantz, Energy and Policy Institute, *EI Used Anti-Clean Energy Campaigns as Role Models in Political Boot Camp for Utility Execs*, 27 August 2020, archived at <https://web.archive.org/web/20210310191931/https://www.energyandpolicy.org/eei-campaign-institute/>. Major donor to candidates: OpenSecrets.org, *Edison Electric Institute PAC Contributions to Federal Candidates*, archived at <https://web.archive.org/web/20210310190505/https://www.opensecrets.org/political-action-committees-pacs/edison-electric-institute/C00095869/candidate-recipients/2020>; Sent staff to Trump administration: The Southern Environmental Law Center, *The Facts behind Rick Perry’s Renewable Energy Review*, archived 10 March 2021 at https://web.archive.org/web/20210310213310/https://www.southernenvironment.org/uploads/words_docs/SELC_Perry_Review_Factsheet.pdf.

6 Consumer Energy Alliance, *About, Members*, archived at <https://web.archive.org/web/20210309200017/https://consumerenergyalliance.org/about/our-members/>.

7 Energy and Policy Institute, *Consumer Energy Alliance*, archived at <https://web.archive.org/web/20210309194949/https://www.energyandpolicy.org/consumer-energy-alliance/>; Matt Kasper, “Utility industry third-parties emerge in Utah to defend Rocky Mountain Power’s proposed solar fees,” *Energy and Policy Institute*, 25 August 2017, archived at <https://web.archive.org/web/2020111224146/https://www.energyandpolicy.org/utah-rocky-mountain-power-proposed-solar-fees/>.

8 The Center for Media and Democracy, Sourcewatch, *ALEC Corporations*, accessed 11 March 2021 at https://www.sourcewatch.org/index.php?title=ALEC_Corporations.

9 The Center for Media and Democracy, Sourcewatch, *American Legislative Exchange Council*, updated 20 November 2020, archived at https://web.archive.org/web/20210311192806/https://www.sourcewatch.org/index.php/American_Legislative_Exchange_Council.

10 Hye-Jin Kim and Rachel J. Cross, Frontier Group, and Bret Fanshaw, Environment America Research & Policy Center, *Blocking the Sun: Utilities and Fossil Fuel Interests that are Undermining American Solar Power – 2017 Edition*, November 2017, p. 13-14, available at <https://frontiergroup.org/reports/fg/blocking-sun-1>.

11 The Center for Media and Democracy, Sourcewatch, *Koch Brothers*, archived 11 March 2021 at https://web.archive.org/web/20210311204309/https://www.sourcewatch.org/index.php?title=Koch_Brothers.

12 The Center for Media and Democracy, Sourcewatch, *Americans for Prosperity*, updated 20 November 2020, accessed 11 March 2021 at https://www.sourcewatch.org/index.php/Americans_for_Prosperty.

13 See note 10, p. 13.

14 Fossil fuel industry-tied: Energy and Policy Institute, *New England Ratepayers Association*, accessed 30 May 2021, archived at <https://web.archive.org/web/20210531003224/https://www.energyandpolicy.org/new-england-ratepayers-association>; Argument: Jeff St. John, “FERC unanimously dismisses effort to undermine solar net metering,” *GreenTech Media*, 16 July 2020, archived at <http://web.archive.org/web/20210406141937/https://www.greentechmedia.com/articles/read/ferc-dismisses-effort-to-undermine-state-net-metering-regulations>.

15 Strong opposition: Glen Brand, Solar United Neighbors, personal communication, 8 April 2021; Petition dismissed: Kim Riley, “New England Ratepayer Association’s net metering petition dismissed,” *Daily Energy Insider*, 17 July 2020, archived at <https://web.archive.org/web/20201224040000/https://daily-energyinsider.com/news/26358-new-england-ratepayers-associations-net-metering-petition-dismissed/>.

16 David Roberts, “Ohio just passed the worst energy bill of the 21st century,” *Vox*, 27 July 2019, archived at <https://web.archive.org/web/20210125125451/https://www.vox.com/energy-and-environment/2019/7/27/8910804/ohio-gop-nuclear-coal-plants-renewables-efficiency-hb6>.

17 Arrests: Eric Heisig, “Read the criminal complaint against Ohio House Speaker Larry Householder, aide, lobbyists charged with racketeering conspiracy,” *Cleveland.com*, updated 21 July 2020, archived at <https://web.archive.org/web/20201225060837/https://www.cleveland.com/open/2020/07/read-the-complaint-against-ohio-house-speaker-larry-householder-aide-lobbyists-charged-with-racketeering-conspiracy.html>; Law still in effect: Kathiann M. Kowalski, “Utility and fossil fuel interests still ahead in Ohio under House Bill 6,” *Energy News Network*, 19 April 2021, archived at <https://web.archive.org/web/20210531003519/https://energynews.us/2021/04/19/utility-and-fossil-fuel-interests-still-ahead-in-ohio-under-house-bill-6/>.

18 Solar Energy Industries Association, *State Solar Spotlight – Florida*, March 2021, archived at <https://web.archive.org/web/20210412200209/https://www.seia.org/sites/default/files/2021-03/Florida.pdf>.

19 Utility donations and lobbyists: Alan Stonecipher et al., “Power play redux: Political influence of Florida’s top energy corporations,” *Integrity Florida*, May 2018, 5, archived at <https://web.archive.org/web/20201130144159/http://files.constantcontact.com/d9f43dd5201/aae879d2-dd7c-419e-b4a4-59803d95b7a4.pdf>; Ballot initiative in 2016: See note 10, p. 17; Lobbying PSC against net metering: John Haughey, “Utilities lobby to change Florida’s solar net metering rule,” *The Center Square*, 18 September 2020, available at https://www.thecentersquare.com/florida/utilities-lobby-to-change-florida-s-solar-net-metering-rule/article_9589ec6af9e9-11ea-b7d3-d386761470e1.html; Bryan Jacob, “Solar cavalry turns out to defend net metering,” *Southern Alliance for Clean Energy*, 22 September 2020, archived at <https://web.archive.org/web/20210122001700/https://cleanenergy.org/blog/solar-cavalry-turns-out-to-defend-net-metering/>.

20 Kari Lydersen, “As Illinois begins shift from net metering, advocates say slow down,” *Energy News Network*, 14 April 2020, archived at <https://web.archive.org/web/20210311112213/https://energynews.us/2020/04/14/as-illinois-begins-shift-from-net-metering-advocates-say-slow-down/>.

21 John Funk, “Ameren rejects Illinois regulators’ request, ends retail net metering for new residential solar customers,” *Utility Dive*, 6 October 2020, archived at <https://web.archive.org/web/20210216075256/https://www.utilitydive.com/news/ameren-rejects-illinois-plea-net-metering-for-new-residential-solar/586452/>.

22 John Funk, “Illinois rejects Ameren move to abandon full retail net metering for new home solar arrays,” *Utility Dive*, 7 December 2020, archived at <https://web.archive.org/web/20210115210128/https://www.utilitydive.com/news/illinois-rejects-ameren-move-to-abandon-full-retail-net-metering-for-new-ho/591651/>.

23 5% cap: Kelsey Misbrener, “Illinois Commerce Commission vote reinstates full retail net-metering for Ameren customers,” *Solar Power World*, 3 December 2020, archived at <http://web.archive.org/web/20210225192607/https://www.solarpowerworldonline.com/2020/12/illinois-commerce-commission-vote-reinstates-full-retail-net-metering-ameren/>.

24 California Solar and Storage Association, “IOUs Pressure CPUC to make rooftop 2x more expensive, slash value of solar exports by 77%,” *Cision PR Newswire*, 16 March 2021, archived at https://web.archive.org/web/20210524200220/https://www.prnewswire.com/news-releases/iou-pressure-cpuc-to-make-rooftop-2x-more-expensive-slash-value-of-solar-exports-by-77-301248936.html?tc=eml_cleartime.

25 California Public Utilities Commission, *Net Energy Metering Rulemaking (R) 20-08-020*, archived at <https://web.archive.org/web/20210408202420/https://www.cpuc.ca.gov/nemrevisit>.

26 Evergy formed from merger of Westar Energy and Kansas City Power & Light: Evergy, *History*, archived at <http://web.archive.org/web/20210125194024/https://www.evergy.com/about-evergy/history>; Westar Energy and Kansas City Power & Light supported the bills: Andy Marso, “Utility companies lobby for lower solar reimbursement,” *The Topeka Capital-Journal*, 4 February 2014, archived at <http://web.archive.org/web/20201027152614/https://www.cjonline.com/article/20140204/NEWS/302049758>; All three investor owned utilities lobbied for the bills: Scott Gibson, “Net-metering is preserved in Kansas,” *Green Building Advisor*, 9 April 2014, archived at <https://web.archive.org/web/20210129204310/https://www.greenbuildingadvisor.com/article/net-metering-is-preserved-in-kansas>.

27 Scott Gibson, “Net-metering is preserved in Kansas,” *Green Building Advisor*, 9 April 2014, archived at <https://web.archive.org/web/20210129204310/https://www.greenbuildingadvisor.com/article/net-metering-is-preserved-in-kansas>.

28 Charges over \$100 per month: Tim Carpenter, “Kansas Supreme Court balks at price discrimination against home solar producers,” *The Topeka Capital-Journal*, 3 April 2020, archived at <http://web.archive.org/web/20201127152714/https://www.cjonline.com/news/20200403/kansas-supreme-court-balks-at-price-discrimination-against-home-solar-producers>; Huge drop in solar panel grid connections: Karen Uhlenhuth, “Kansas solar installations drop by more than a third after utility adds demand fee,” *Energy News Network*, 7 January 2020, archived at <http://web.archive.org/web/20201128100951/https://energynews.us/2020/01/07/midwest/kansas-solar-installations-drop-by-more-than-a-third-after-utility-adds-demand-fee/>.

29 Tim Carpenter, “Kansas Supreme Court balks at price discrimination against home solar producers,” *The Topeka Capital-Journal*, 3 April 2020, archived at <http://web.archive.org/web/20201127152714/https://www.cjonline.com/news/20200403/kansas-supreme-court-balks-at-price-discrimination-against-home-solar-producers>.

30 Sierra Club, “Kansas Corporation Commission ruling a win for solar and customers,” 25 February 2021, available at <https://www.sierraclub.org/press-releases/2021/02/kansas-corporation-commission-ruling-win-for-solar-and-customers>; Central territory: Dorothy Barnett, Climate and Energy Project, personal communication, 8 April 2021.

31 Dorothy Barnett, Climate and Energy Project, personal communication, 8 April 2021.

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

33 Tim Sylvia, “Aggressive new fees for South Carolina solar customers draw fire,” *PV Magazine*, 16 December 2020, available at <https://pv-magazine-usa.com/2020/12/16/aggressive-new-fees-for-south-carolina-solar-customers-draw-fire/>.

34 Ibid.

35 Sam Spence, “BIG STORY: Dominion’s solar proposal could dim S.C. market, critics say,” *Statehouse Report*, 5 March 2021, accessed 16 March 2021 at <https://www.statehousereport.com/2021/03/05/big-story-dominions-solar-proposal-could-dim-s-c-market-critics-say/>; April ruling: Southern Environmental Law Center, “SC regulatory board rules in favor of utility customers,” press release, 28 April 2021, archived at <http://web.archive.org/web/20210428193449/https://www.southernenvironment.org/news-and-press/press-releases/sc-regulatory-board-rules-in-favor-of-utility-customers>.

36 Roselle N.J. illuminated by electricity: Maps of the World, January, 19 January, *January 19 1883 – First Time Use of Electric Lighting System*, accessed 16 March 2021 at [https://www.smithsonianmag.com/sponsored/brief-history-solar-panels-180972006/#:~:text=Take%20a%20light%20step%20back,a%20thin%20layer%20of%20gold](https://www.mapsofworld.com/on-this-day/january-19-1883-overhead-wires-are-used-for-an-electric-lighting-system-for-the-first-time-designed-by-thomas-edison-for-roselle-new-jersey/#:~:text=On%20January%2019%2C%201883%2C%20the,%2C%201847%2C%20in%20Milan%20Ohio; Charles Fritts invented solar panels: Elizabeth Chu and D. Lawrence Tarranzo, “A brief history of solar panels,” <i>Smithsonian Magazine</i>, 22 April 2019, available at <a href=).

37 Elizabeth Chu and D. Lawrence Tarranzo, “A brief history of solar panels,” *Smithsonian Magazine*, 22 April 2019, available at <https://www.smithsonianmag.com/sponsored/brief-history-solar-panels-180972006/#:~:text=Take%20a%20light%20step%20back,a%20thin%20layer%20of%20gold>.

38 Ibid.

39 Ibid.

40 Roberto Verzola, “Net metering history and logic, part 1,” *CleanTechnica*, 6 September 2015, archived at <http://web.archive.org/web/20210220140013/https://cleantechnica.com/2015/09/06/net-metering-history-logic-part-1/>.

41 Ben Huffman and Marc Palmer, “FERC might rewrite solar net metering. Here’s what that could mean,” *GreenTech Media*, 22 May 2020, archived at <http://web.archive.org/web/20210330142122/https://www.greentechmedia.com/articles/read/ferc-might-rewrite-solar-net-metering-heres-what-that-means>; Jeff St. John, “Solar net metering under threat as shadowy group demands intervention in state policies,” *GreenTech Media*, 20 April 2020, archived at <http://web.archive.org/web/20210315105922/https://www.greentechmedia.com/articles/read/a-new-threat-to-solar-net-metering-arises-as-nonprofit-demands-federal-intervention-in-state-policies>.

42 Solar Energy Industries Association, *#2MillionSolar-Strong*, archived at <https://web.archive.org/web/20201125025632/https://www.seia.org/us-2-million-solar-strong>.

43 Ibid.

44 Solar as percentage of total U.S. electricity generation: U.S. Energy Information Administration, *Electricity Data Browser*, accessed 19 May 2021 at <https://www.eia.gov/electricity/data/browser/>, percentage calculated by dividing “All solar” generation by the sum of “All fuels” generation and “Small-scale solar photovoltaic” generation; Average U.S. home power usage in 2019, U.S. Energy Information Administration, *Frequently Asked Questions, How Much Electricity Does an American Home Use?* archived at <https://web.archive.org/web/20210225064111/https://www.eia.gov/tools/faqs/faq.php?id=97&t=3>. Total homes powered by solar determined by dividing total solar generation by average electricity/home/year.

45 See note 10.

46 Ibid.

47 See note 1.

48 U.S. Energy Information Administration, *Electricity Data Browser*, updated February 2021, archived at <https://web.archive.org/web/20210224153655/https://www.eia.gov/electricity/data/browser/>. Percentage of total generation calculated by dividing “All solar” generation by the sum of “All fuels” generation and “Small-scale solar photovoltaic” generation.

49 U.S. Energy Information Administration, *Electricity Data Browser*, updated February 2021, archived at <https://web.archive.org/web/20210224153655/https://www.eia.gov/electricity/data/browser/>.

50 Alec Tyson and Brian Kennedy, “Two-thirds of Americans think government should do more on climate,” *Pew Research Center for Science and Society*, 23 June 2020, archived at <https://web.archive.org/web/20210130065900/https://www.pewresearch.org/science/2020/06/23/two-thirds-of-americans-think-government-should-do-more-on-climate/>.

51 Ibid.

52 See note 40.

53 Ibid.

54 Ibid.

55 See note 3.

56 U.S. Environmental Protection Agency, *EPA Energy and Environment Guide to Action: Chapter 5. Renewable Portfolio Standards*, August 2015, p. 5-1 and 5-2, archived at https://web.archive.org/web/20210519191759/https://www.epa.gov/sites/production/files/2015-08/documents/guide_action_chapter5.pdf.

57 National Conference of State Legislatures, *State Renewable Portfolio Standards and Goals*, 4 January 2021, archived at <https://www.ncsl.org/research/energy/renewable-portfolio-standards.aspx>.

58 Megan Wollerton, “Here’s how to take advantage of the solar tax credit extension in 2021,” CNET, 23 January 2021, available at <https://www.cnet.com/how-to/heres-how-to-take-advantage-of-the-solar-tax-credit-extension-in-2021/>.

59 Top ten solar states: Solar Energy Industries Association, *Top Ten Solar States*, archived at <http://web.archive.org/web/20210321163100/https://www.seia.org/research-resources/top-10-solar-states-0>; States with RES: National Conference of State Legislatures, Research, Energy, *State Renewable Portfolio Standards and Goals*, 4 January 2021, archived at <https://web.archive.org/web/20210305210717/https://www.ncsl.org/research/energy/renewable-portfolio-standards.aspx>.

60 Go Solar, *Net Metering Policies in the 10 Most Popular States for Solar*, updated 13 October 2020, archived at <https://web.archive.org/web/20210305213353/https://gosolargroup.com/solar-community/net-metering-policies-in-the-10-most-popular-states-for-solar/>; Solar Reviews, *Summary of New York solar incentives 2021*, archived at <https://web.archive.org/web/20210519194314/https://www.solarreviews.com/solar-incentives/new-york>.

61 Sustainable Capital Finance, SCF team, *Solar PPAs: The State of the Market* (blog), 25 July 2019, archived at <https://web.archive.org/web/20210305215031/https://scf.com/blog/solar-ppas-the-state-of-the-market/>.

62 Zachary Shahan, “Top solar power states per capita – CleanTechnica report,” *CleanTechnica*, 4 October 2020, archived at <https://web.archive.org/web/20210118161355/https://cleantechnica.com/2020/10/04/top-solar-power-states-per-capita-cleantechnica-report/>.

63 Nevada: EnergySage, *Nevada Solar Incentives*, archived at https://web.archive.org/web/20210519200250/https://www.energysage.com/local-data/solar-rebates-incentives/nv/?__hstc=162943075.35183d62579421b6f76ed594e866c471.1609090188305.1609090188305.1609090188305.1; Hawaii: Sunrun, solar by state, HI, *Hawaii Solar Incentives*, 2021, available at <https://www.sunrun.com/solar-by-state/hi/hawaii-solar-incentives>; California: EnergySage, *California Solar Incentives*, archived at <https://web.archive.org/web/20210519200243/https://www.energysage.com/local-data/solar-rebates-incentives/ca/>; Arizona: EnergySage, *Arizona Solar Incentives*, archived at <https://web.archive.org/web/20210519200252/https://www.energysage.com/local-data/solar-rebates-incentives/az/>; North Carolina: EnergySage, *North Carolina Solar Incentives*, archived at <https://web.archive.org/web/20210519200312/https://www.energysage.com/local-data/solar-rebates-incentives/nc/>; Vermont: EnergySage, *Vermont Solar Incentives*, archived at <https://web.archive.org/web/20210519200320/https://www.energysage.com/local-data/solar-rebates-incentives/vt/>; Utah: EnergySage, *Utah Solar Incentives*, archived at <https://web.archive.org/web/20210519205234/https://www.energysage.com/local-data/solar-rebates-incentives/ut/>; New Mexico: EnergySage, *New Mexico Solar Incentives*, archived at <https://web.archive.org/web/20210519205242/https://www.energysage.com/local-data/solar-rebates-incentives/nm/>; Massachusetts: EnergySage, *Massachusetts Solar Incentives*, archived at <https://web.archive.org/web/20210519205252/https://www.energysage.com/local-data/solar-rebates-incentives/ma/>; New Jersey: EnergySage, *New Jersey Solar Incentives*, archived at <https://web.archive.org/web/20210519205328/https://www.energysage.com/local-data/solar-rebates-incentives/nj/>.

64 EnergySage, *Solar Leases and Solar PPAs*, 8 October 2020, archived at <http://web.archive.org/web/20210428021950/https://www.energysage.com/solar/financing/solar-leases-and-solar-ppas/>.

- 65 Ibid.
- 66 PACE Nation, *PACE, Property Assessed Clean Energy*, October 2016, archived at https://web.archive.org/web/20201030215355/https://www.pacenation.org/wp-content/uploads/2016/10/PACEBasics_2016_10_7.pdf.
- 67 Ibid.
- 68 PACE Nation, *PACE Programs*, archived at <http://web.archive.org/web/20210406034957/https://www.pacenation.org/pace-programs/>.
- 69 See note 1.
- 70 Ibid.
- 71 Ibid.
- 72 See note 44.
- 73 See note 1.
- 74 David Pomerantz, Energy and Policy Institute, personal communication, 8 April 2021.
- 75 Solar United Neighbors, *Fixed Charges*, archived at <http://web.archive.org/web/20210421180805/https://www.solarunitedneighbors.org/learn-the-issues/fixed-charges/>.
- 76 Electric Choice, “Variable vs. fixed rate electricity plans,” (blog), archived 26 March 2021 at <https://web.archive.org/web/20210326161007/https://www.electricchoice.com/blog/fixed-variable-electricity-plans/>.
- 77 Ibid.
- 78 See note 10, p. 6.
- 79 Solar Reviews, “What is net metering and how does it work?,” 5 May 2021, archived at <https://web.archive.org/web/20210520213054/https://www.solarreviews.com/blog/what-is-net-metering-and-how-does-it-work>.
- 80 Edison Electric Institute, *Members List*, August 2020, archived at https://web.archive.org/web/20210310142729/https://www.eei.org/about/Documents/memberlist_print.pdf.
- 81 Ibid.
- 82 Peter Kind, *Disruptive Challenges: Financial Implications and Strategic Responses to a Changing Retail Business*, Edison Electric Institute, January 2013, p. 1-2, archived at <https://web.archive.org/web/20210310145649/http://roedel.faculty.asu.edu/PVGdocs/EEI-2013-report.pdf>.
- 83 Ibid., p. 3.
- 84 See note 4.
- 85 Hiroko Tabuchi, “Rooftop solar dims under pressure from utility lobbyists,” *The New York Times*, 8 July 2017, archived at <http://web.archive.org/web/20210506204426/https://www.nytimes.com/2017/07/08/climate/rooftop-solar-panels-tax-credit-utility-companies-lobbying.html>.
- 86 David Pomerantz, “EEI used anti-clean energy campaigns as role models in political boot camp for utility execs,” *Energy and Policy Institute*, 27 August 2020, archived at <https://web.archive.org/web/20210310191931/https://www.energyandpolicy.org/eei-campaign-institute/>.
- 87 OpenSecrets.org, *Edison Electric Institute PAC Profile*, accessed 10 March 2021 at <https://www.opensecrets.org/political-action-committees-pacs/edison-electric-institute/C00095869/summary/2020>.
- 88 OpenSecrets.org, *Edison Electric Institute PAC Contributions to Federal Candidates*, accessed 10 March 2021 at <https://www.opensecrets.org/political-action-committees-pacs/edison-electric-institute/C00095869/candidate-recipients/2020>.
- 89 See note 10.
- 90 David Anderson, Matt Kasper and David Pomerantz, Energy and Policy Institute, *Paying for Utility Politics*, May 2017, p. 4-5, archived at <https://web.archive.org/web/20210316192318/https://www.energyandpolicy.org/wp-content/uploads/2017/05/Ratepayers-funding-Edison-Electric-Institute-and-other-organizations.pdf>.
- 91 Matt Kaspar, “New DOE Chief of Staff, Brian McCormack, played critical role in EEI’s rooftop solar campaign,” *Utility Secrets*, 14 March 2017, archived at <https://web.archive.org/web/20200920151123/https://www.utilitysecrets.org/brian-mc-cormack-doe-rooftop-solar/>.

92 Energy and Policy Institute, *Consumer Energy Alliance*, archived at <https://web.archive.org/web/20210309194949/https://www.energyandpolicy.org/consumer-energy-alliance/>.

93 Voice for consumers: Consumer Energy Alliance, *About Consumer Energy Alliance*, archived at <https://web.archive.org/web/20210309195733/https://consumerenergyalliance.org/about/>; No consumer group members: Consumer Energy Alliance, *Members*, archived at <https://web.archive.org/web/20210309200017/https://consumerenergyalliance.org/about/our-members/>.

94 Consumer Energy Alliance, *Members*, archived at <https://web.archive.org/web/20210309200017/https://consumerenergyalliance.org/about/our-members/>; Cheniere largest U.S. LNG supplier: Cheniere, *We are U.S. LNG*, archived at <https://web.archive.org/web/20210315205400/https://www.cheniere.com/about>.

95 Consumer Energy Alliance, *Members*, archived at <https://web.archive.org/web/20210309200017/https://consumerenergyalliance.org/about/our-members/>.

96 See note 92.

97 Ibid.

98 Ibid.

99 Ibid.

100 Ibid.

101 Founded in 1973: American Legislative Exchange Council, *2018 ALEC Annual Report*, September 2019, p. 16, archived at https://web.archive.org/web/20210310224612/https://www.alec.org/app/uploads/2019/09/2018-Annual-Report_FINAL_WEB_R1.pdf; Group description: American Legislative Exchange Council, *About ALEC*, accessed 10 March 2021 at <https://www.alec.org/about/>.

102 American Legislative Exchange Council, *About ALEC*, accessed 10 March 2021 at <https://www.alec.org/about/>.

103 See note 9.

104 Energy and Policy Institute, Front groups, *American Legislative Exchange Council*, archived at <http://web.archive.org/web/20210506142316/https://www.energyandpolicy.org/american-legislative-exchange-council/>.

105 Ibid.

106 Ibid.

107 Ibid.

108 See note 9.

109 American Legislative Exchange Council, *Membership*, archived at <https://web.archive.org/web/20210311193902/https://www.alec.org/membership/>.

110 See note 8.

111 Ibid.

112 American Legislative Exchange Council, *2018 ALEC Annual Report*, September 2019, p. 43, archived at https://web.archive.org/web/20210310224612/https://www.alec.org/app/uploads/2019/09/2018-Annual-Report_FINAL_WEB_R1.pdf.

113 The Center for Media and Democracy, Sourcewatch, *Corporations That Have Cut Ties to ALEC*, accessed 11 March 2021 at https://www.sourcewatch.org/index.php?title=Corporations_that_Have_Cut_Ties_to_ALEC.

114 The Center for Media and Democracy, Sourcewatch, *Koch Brothers*, archived at https://web.archive.org/web/20210311204309/https://www.sourcewatch.org/index.php?title=Koch_Brothers.

115 Ibid.; David Koch's death: Elisha Fieldstadt, "David Koch, billionaire conservative activist and philanthropist, dies at 79," *NBC News*, 23 August 2019, accessed 11 March 2021 at <https://www.nbcnews.com/news/us-news/david-koch-billionaire-conservative-activist-philanthropist-dies-79-n1045696>.

116 See note 12.

117 Ibid.

118 See note 13.

119 Ibid.

120 Ibid.

121 Erica L. Green and Stephanie Saul, “What Charles Koch and other donors to George Mason University got for their money,” *The New York Times*, 5 May 2018, available at <https://www.nytimes.com/2018/05/05/us/koch-donors-george-mason.html>.

122 Ibid.

123 See note 13.

124 Dave Anderson, Energy and Policy Institute, *New England Ratepayers’ Association*, archived at <https://web.archive.org/web/20210308201537/https://www.energyandpolicy.org/new-england-ratepayers-association/>.

125 New England Ratepayers’ Association, *Frequently Asked Questions*, archived at <https://web.archive.org/web/20210308195511/http://www.neratepayers.org/faq/>.

126 See note 124.

127 Ibid.

128 Ibid.

129 NERA and lobbying: Dave Anderson, *New England Ratepayers’ Association*, Energy and Policy Institute, archived at <https://web.archive.org/web/20210308201537/https://www.energyandpolicy.org/new-england-ratepayers-association/>; Consumer Energy Alliance: Ibid.

130 New England Ratepayers’ Association, *Policy Brief on New Hampshire Energy Policy*, January 2015, p. 2-4, archived at <https://web.archive.org/web/20210308201009/http://www.neratepayers.org/wp-content/uploads/2015/11/New-Hampshire-Policy-Brief.pdf>.

131 See note 124.

132 Ibid.

133 Petition: Ibid; Members in April 2020: U.S. Federal Energy Regulatory Commission, *Current and Previous Chairmen*, archived at <https://web.archive.org/web/20210522005336/https://www.ferc.gov/about/commission-members/current-previous-chairmen>; Commissioner Danly: U.S. Federal Energy Regulatory Commission, *Commissioner Danly*, archived at <http://web.archive.org/web/20210425195548/https://ferc.gov/about/commission-members/commissioner-danly>; Chairman Glick: U.S. Federal Energy Regulatory Commission, *Chairman Glick*, archived at <http://web.archive.org/web/20210515204435/https://www.ferc.gov/about/commission-members/chairman-glick>; Commissioner Chatterjee: U.S. Federal Energy Regulatory Commission, *Commissioner Chatterjee*, archived at <http://web.archive.org/web/20210515204433/https://www.ferc.gov/about/commission-members/commissioner-chatterjee>; Commissioner McNamee: U.S. Federal Energy Regulatory Commission, *Former Commissioner McNamee*, archived at <https://web.archive.org/web/20201201032155/https://ferc.gov/about/commission-members/commissioner-mcnamee>.

134 Kim Riley, “New England Ratepayer Association’s net metering petition dismissed,” *Daily Energy Insider*, 17 July 2020, archived at <https://web.archive.org/web/20201224040000/https://dailyenergyinsider.com/news/26358-new-england-ratepayers-associations-net-metering-petition-dismissed/>.

135 Gavin Bade, “Wide range of groups urge FERC to reject anti-net metering petition,” *Politico*, 16 June 2020, available at <https://www.politico.com/news/2020/06/16/wide-range-of-groups-urge-ferc-to-reject-anti-net-metering-petition-324198>.

136 Ibid.

137 Ibid.

138 See note 134.

139 Ibid.

140 Solar potential: Anthony Lopez, et al., *U.S. Renewable Energy Technical Potentials: A GIS-Based Analysis*, U.S. National Renewable Energy Laboratory, July 2012, p. 10-12, archived at <http://web.archive.org/web/20210507051526/https://www.nrel.gov/docs/fy12osti/51946.pdf>; Current capacity and generation: Solar Energy Industries Association, *State Solar Spotlight, Ohio*, December 2020, archived at <https://web.archive.org/web/20210205165127/https://www.seia.org/sites/default/files/2020-12/Ohio.pdf>.

141 Solar Energy Industries Association, *State Solar Spotlight, Ohio*, December 2020, archived at <https://web.archive.org/web/20210205165127/https://www.seia.org/sites/default/files/2020-12/Ohio.pdf>.

142 Steven Mufson and Tom Hamburger, “Ohio governor signs bill freezing renewable energy standards,” *The Washington Post*, 13 June 2014, archived at https://web.archive.org/web/20210316092928if_/https://www.washingtonpost.com/business/economy/ohio-governor-signs-bill-freezing-renewable-energy-standards/2014/06/13/730d8b44-f33b-11e3-9ebc-2ee6f81ed217_story.html; John Funk, “Ohio renewable energy and energy efficiency rules frozen for two years as Gov. John Kasich signs legislation,” *The Plain Dealer*, updated 12 January 2019, archived at https://web.archive.org/web/20210524163255/https://www.cleveland.com/business/2014/06/ohio_renewable_energy_and_effi.html.

143 S.B. 310 impact: John Funk, “Ohio renewable energy and energy efficiency rules frozen for two years as Gov. John Kasich signs legislation,” *The Plain Dealer*, updated 12 January 2019, archived at https://web.archive.org/web/20210524163255/https://www.cleveland.com/business/2014/06/ohio_renewable_energy_and_effi.html; Industrial Energy Users of Ohio role: Industrial Energy Users of Ohio, *About Us*, archived at <https://web.archive.org/web/20201129045118/https://www.ieu-ohio.org/about-us/>.

144 Kathiann Kowalski, “Ohio utilities take net metering fight to state Supreme Court,” *Energy News Network*, 4 August 2014, archived at <https://web.archive.org/web/20200929045453/https://energynews.us/2014/08/04/midwest/ohio-utilities-fight-net-metering-rules/>; fought until a 2020 decision by the Ohio Supreme Court: Ohio Public Utilities Commission, *Document Record*, 12-2050-EL-ORD, 12 May 2020, available at <https://dis.puc.state.oh.us/DocumentRecord.aspx?DocID=453d2718-c0fb-42c4-a921-141074610660>.

145 PUCO update of net metering rules: JD Supra, Legal News, *New Ohio Net Metering Rules: Additional Certainty, Remaining Questions*, 18 October 2019, archived at <https://web.archive.org/web/20210205202927/https://www.jdsupra.com/legalnews/new-ohio-net-metering-rules-additional-88364/>; Ohio Supreme Court dismissed case: Ohio Public Utilities Commission, *Document Record*, 12-2050-EL-ORD, 12 May 2020, available at <https://dis.puc.state.oh.us/DocumentRecord.aspx?DocID=453d2718-c0fb-42c4-a921-141074610660>.

146 See note 16.

147 Ibid.; Ohio State Legislature, *House Bill 6*, archived at <http://web.archive.org/web/20210522000921/https://www.legislature.ohio.gov/legislation/legislation-summary?id=GA133-HB-6>.

148 See note 16.

149 Ibid.

150 Dan Gearino, “Inside Clean Energy: Ohio’s bribery scandal is bad. The state’s lack of an energy plan may be worse,” *Inside Climate News*, 23 July 2020, available at <https://insideclimatenews.org/news/23072020/inside-clean-energy-ohio-bribery/>.

151 Ibid.

152 Eric Heisig, “Read the criminal complaint against Ohio House Speaker Larry Householder, aide, lobbyists charged with racketeering conspiracy,” *Cleveland.com*, updated 21 July 2020, archived at <https://web.archive.org/web/20201225060837/https://www.cleveland.com/open/2020/07/read-the-complaint-against-ohio-house-speaker-larry-householder-aide-lobbyists-charged-with-racketeering-conspiracy.html>.

153 See note 150.

154 Ibid.

155 See note 16.

156 Criminal complaint, U.S. District Court for the Southern District of Ohio, *United States of America vs. Matthew Borges*, Case No. 1:20-MJ-00526, 16 July 2020, archived at <https://web.archive.org/web/20210122025250/https://assets.documentcloud.org/documents/6999130/Ohio-House-complaint.pdf>.

157 *Ibid.*, p. 4.

158 See note 150.

159 *Ibid.*

160 See note 16.

161 See note 156.

162 *Ibid.*

163 Andy Chow, “2020 in Ohio: Republican leaders keep HB 6 despite racketeering scandal,” WOSU Public Media, 28 December 2020, available at <https://radio.wosu.org/post/2020-ohio-republican-leaders-keep-hb6-despite-racketeering-scandal#stream/0>.

164 Law still in effect: Ohio State Legislature, *House Bill 6: Status*, archived at <https://www.legislature.ohio.gov/legislation/legislation-status?id=GA133-HB-6>.

165 Nuclear subsidies removed: “Ohio bill repealing nuclear subsidies signed by Ohio governor,” *Nuclear Newswire*, 31 March 2021, accessed 9 April 2021 at <https://www.ans.org/news/article-2755/ohio-bill-repealing-nuclear-subsidies-heads-to-governors-desk/>. Renewable energy/efficiency rollbacks remain in place: David Pomerantz, Energy and Policy Institute, personal communication, 8 April 2021.

166 Pieter Gagnon et al., *Rooftop Solar Photovoltaic Technical Potential in the United States: A Detailed Assessment*, U.S. National Renewable Energy Laboratory, January 2016, p. 35-36, archived at <http://web.archive.org/web/20210501065742/https://www.nrel.gov/docs/fy16osti/65298.pdf>.

167 Florida solar potential: Google Project Sunroof data explorer, *Florida Estimated Solar Potential*, November 2018, available at <https://www.google.com/get/sunroof/data-explorer/place/ChIJvypWkWV2wYgR0E7HW9MTLvc/>; Number of houses this would power: 158,000,000 MWh divided by average U.S. home usage of 10.7 MWh/year, from: U.S. Energy Information Administration, *Frequently Asked Questions: How Much Electricity Does an Average American Home Use?*, updated 9 October 2020, available at <https://www.eia.gov/tools/faqs/faq.php?id=97>.

168 Google Project Sunroof data explorer, *Florida Estimated Solar Potential*, November 2018, accessed 24 May 2021 at <https://www.google.com/get/sunroof/data-explorer/place/ChIJvypWkWV2wYgR0E7HW9MTLvc/>.

169 Solar United Neighbors, *The State of Rooftop Solar in Florida*, August 2020, p. 7, archived at https://web.archive.org/web/20210203215120/https://www.solarunitedneighbors.org/wp-content/uploads/2020/11/The_State_of_Rooftop_Solar_in_Florida.pdf.

170 *Ibid.*, p. 2.

171 Growth in solar generation: See note 47; Percentage of state solar generation: See note 18.

172 David Pomerantz, Energy and Policy Institute, personal communication, 7 April 2021.

173 No RPS or PPAs: Solar Energy Industries Association, *Florida Solar, Data Through Q3 2020*, archived at <https://web.archive.org/web/20201205061741/https://www.seia.org/state-solar-policy/florida-solar>; Insurance requirement: Ivan Penn, “Florida’s utilities keep homeowners from making the most of solar power,” *The New York Times*, 7 July 2019, available at <https://www.nytimes.com/2019/07/07/business/energy-environment/florida-solar-power.html>.

174 Net metering: Solar United Neighbors, *The State of Rooftop Solar in Florida*, August 2020, p. 4, archived at https://web.archive.org/web/20210203215120/https://www.solarunitedneighbors.org/wp-content/uploads/2020/11/The_State_of_Rooftop_Solar_in_Florida.pdf; Property tax exemptions: Ballotpedia, “Florida property tax exemptions for renewable energy equipment, Amendment 4 (August 2016),” archived at

[https://web.archive.org/web/20201108160946/https://ballotpedia.org/Florida_Property_Tax_Exemptions_for_Renewable_Energy_Equipment,_Amendment_4_\(August_2016\)](https://web.archive.org/web/20201108160946/https://ballotpedia.org/Florida_Property_Tax_Exemptions_for_Renewable_Energy_Equipment,_Amendment_4_(August_2016)); PACE loans: Zeeshan Hyder, “PACE program solar panels: are they the right option for you?” (blog), *Solar Reviews*, updated 7 November 2020, archived at <https://web.archive.org/web/20201202224412/https://www.solarreviews.com/blog/pace-program-solar-panels-are-they-the-right-option-for-you>.

175 Alan Stonecipher, Brad Ashwell and Ben Wilcox, *Power Play Redux: Political Influence of Florida’s Top Energy Corporations*, Integrity Florida, May 2018, p. 5 and 9, archived at <https://web.archive.org/web/20201130144159/http://files.constantcontact.com/d9f43dd5201/aae879d2-dd7c-419e-b4a4-59803d95b7a4.pdf>.

176 *Ibid.*, p. 5.

177 *Ibid.*, p. 11.

178 No solar ballot measures: Politico, “We’re tracking all six ballot measures up for a vote in Florida tonight,” 6 January 2021, accessed 24 May 2021 at <https://www.politico.com/2020-election/results/florida/ballot-measures/>; Utility spending: Alissa Jean Schafer, Energy and Policy Institute, *Florida’s Investor-Owned Utilities Spent Heavily on Republican Interest Groups in 2020 Elections*, 4 December 2020, accessed 12 April 2021 at <https://www.energyandpolicy.org/floridas-investor-owned-utilities-spent-heavily-on-republican-interest-groups-in-2020-elections/>.

179 See note 175, p. 8-9, archived at <https://web.archive.org/web/20201130144159/http://files.constantcontact.com/d9f43dd5201/aae879d2-dd7c-419e-b4a4-59803d95b7a4.pdf>.

180 *Ibid.*, p. 9.

181 *Ibid.*, p. 8.

182 *Ibid.*, p. 17, available at <https://frontiergroup.org/reports/fg/blocking-sun-1>.

183 *Ibid.*

184 Ivan Penn, “Florida’s utilities keep homeowners from making the most of solar power,” *The New York Times*, 7 July 2019, archived at <https://web.archive.org/web/20210517220537/https://www.nytimes.com/2019/07/07/business/energy-environment/florida-solar-power.html>.

185 Alissa Jean Schafer, Energy and Policy Institute, *FMPA Coordinating Statewide Campaign to Raise Florida Municipal Utilities’ Fixed Fees, Block Solar*, 22 August 2019, accessed 12 April 2021 at <https://www.energyandpolicy.org/fmpa-raise-fixed-fees-block-solar/>.

186 Michelle Lewis, “EGEB: What happened at Florida’s solar net metering meeting,” *Electrek*, 23 September 2020, available at <https://electrek.co/2020/09/23/egeb-what-happened-at-floridas-solar-net-metering-meeting/>.

187 *Ibid.*

188 Energy Fairness utility front group: Alissa Jean Schafer, Energy and Policy Institute, *Utility Front Group Sparks Attack on Rooftop Solar Amid Ongoing COVID Crisis*, 11 September 2020, accessed 12 April 2021 at <https://www.energyandpolicy.org/energy-fairness-mcclure-attack-florida-solar/>; Southern Company: Southern Company, *About Us*, archived at <https://web.archive.org/web/20201127064618/https://www.southerncompany.com/about-us.html>; Southern Company subsidiaries: Southern Company, *Subsidiaries*, archived at <https://web.archive.org/web/20201125221941/https://www.southerncompany.com/about-us/our-business/service-territory.html>; Energy and Policy Institute, *Energy Fairness*, accessed 30 May 2021, archived at <https://web.archive.org/web/20210530203730/https://www.energyandpolicy.org/energy-fairness-partnership-affordable-clean-energy/>.

189 John Haughey, “Utilities lobby to change Florida’s solar net metering rule,” *The Center Square*, 18 September 2020, available at https://www.thecentersquare.com/florida/utilities-lobby-to-change-florida-s-solar-net-metering-rule/article_9589ec6a-f9e9-11ea-b7d3-d386761470e1.html.

190 *Ibid.*

191 *Ibid.*

192 Bryan Jacob, “Solar cavalry turns out to defend net metering,” *Southern Alliance for Clean Energy*, 22 September 2020, archived at <http://web.archive.org/web/20210122001700/https://cleanenergy.org/blog/solar-cavalry-turns-out-to-defend-net-metering/>.

193 Kari Lydersen, “As Illinois begins shift from net metering, advocates say slow down,” *Energy News Network*, 14 April 2020, available at <https://energynews.us/2020/04/14/midwest/as-illinois-begins-shift-from-net-metering-advocates-say-slow-down/>.

194 Ibid.

195 Fortune 500 utility: Ameren, *About Ameren*, archived at <https://web.archive.org/web/20210209080550/https://www.ameren.com/company/about-ameren>; Service area: Ameren Illinois, *Ameren Illinois Service Area*, archived at <http://web.archive.org/web/20210302111340/https://www.ameren.com/illinois/company/about-ameren/service-territory>; Ownership of generation companies: Ameren, *Generation*, archived at <https://web.archive.org/web/20210525162455/https://ameren.mediaroom.com/index.php?s=25336>; Ownership of generation facilities: Ameren, *American Corporate Facts*, archived at <https://web.archive.org/web/20210309184440/https://www.ameren.com/media/corporate-site/files/aboutameren/amerencorporatefact-sheet.pdf?la=en&hash=5831EE2D8AE1B72BE0AC370D7B-48DEFB6927920C>; Announcement of 3% threshold: See note 193.

196 See note 193.

197 Ibid.

198 John Funk, “Illinois Commerce Commission launches new probe to resolve questions about Ameren’s net metering claims,” *Utility Dive*, 9 October 2020, archived at <http://web.archive.org/web/20210118052905/https://www.utilitydive.com/news/illinois-regulators-launch-new-probe-to-resolve-Ameren-net-metering-solar-questions/586728/>.

199 See note 21.

200 Nikhil Vijjekar, Environmental Law and Policy Center, personal communication, 8 April 2021.

201 See note 21.

202 See note 200.

203 See note 198.

204 Kari Lydersen, “Southern Illinois solar energy growth prompts fight over net metering math,” *Energy News Network*, 14 October 2020, available at <https://energynews.us/2020/10/14/midwest/southern-illinois-solar-energy-growth-prompts-fight-over-net-metering-math/>.

205 K Kaufman, “Illinois regulators restore retail-rate net metering,” *PV Magazine*, 4 December 2020, available at <https://pv-magazine-usa.com/2020/12/04/illinois-regulators-restore-retail-rate-net-metering/>.

206 Ibid.

207 See note 22.

208 See note 21.

209 See note 205.

210 Kelsey Misbrenner, “Vote Solar says Ameren pushing flawed, incomplete solar plan,” *Solar Power World*, 8 February 2021, available at <https://www.solarpowerworldonline.com/2021/02/vote-solar-says-ameren-pushing-flawed-incomplete-solar-plan/>.

211 *Illinois Commerce Commission v Ameren Illinois*, Docket no. 20-0389, *Document for 20-0389*, 21 January 2021, p. 98, downloaded 24 May 2021 at <https://www.icc.illinois.gov/docket/P2020-0389/documents/307507>.

212 See note 210.

213 Solar Energy Industries Association, *California Solar*, archived at <https://web.archive.org/web/20210329185607/https://www.seia.org/state-solar-policy/california-solar>.

214 Ibid.

215 California Distributed Generation Statistics, accessed 25 May 2021 at <https://www.californiadgstats.ca.gov/>.

216 California Energy Commission, *Renewables Tracking Progress*, 18 February 2020, p. 2-4 and 7, archived at http://web.archive.org/web/20210320060737/https://www.energy.ca.gov/sites/default/files/2019-12/renewable_ada.pdf.

217 California Energy Commission, *California Releases Report Charting Path to 100% Clean Electricity* (press release), 15 March 2021, accessed 16 April 2021 at <https://www.energy.ca.gov/news/2021-03/california-releases-report-charting-path-100-percent-clean-electricity>.

218 California Solar and Storage Association and Solar Rights Alliance, “New poll shows utility efforts to roll back net metering are very unpopular with California voters,” *Cision PR Newswire*, 16 March 2021, archived at <http://web.archive.org/web/20210319051125/https://www.prnewswire.com/news-releases/new-poll-shows-utility-efforts-to-roll-back-net-metering-are-very-unpopular-with-california-voters-301248881.html>.

219 Ibid.

220 Public Utilities Commission of California, *Joint Proposal of Pacific Gas and Electric Company (U 39-E), San Diego Gas and Electric Company (U 902-E) and Southern California Edison Company (U 338-E)*, re: Order Instituting Rulemaking to Revisit Net Energy Metering Tariffs Pursuant to Decision D.16-01-044, and to Address Other Issues Related to Net Energy Metering, Docket No. R.20-08-020, 15 March 2021, p. 8, archived at https://web.archive.org/web/20210521142944/https://static1.squarespace.com/static/54c1a3f9e4b04884b35cfef6/t/605120343d32dd18332462a2/1615929399865/R.20-08-020_Joint%20Proposal_3.15.2021.pdf.

221 See note 24.

222 Ben Zientara, “Big changes on the horizon for California net metering in 2021,” *Solar Reviews*, archived at <https://web.archive.org/web/20210218172938/https://www.solarreviews.com/blog/big-changes-for-california-net-metering>.

223 Ibid.

224 Ibid.

225 Ibid.

226 Ibid.

227 Ibid.

228 See note 25.

229 See note 24.

230 Includes proposed customer charge from Table 4 and grid benefits charge from Table 12, assuming a 6kW residential solar energy system, and therefore multiplying the grid benefits charge by six: Public Utilities Commission of California, *Joint Proposal of Pacific Gas and Electric Company (U 39-E), San Diego Gas and Electric Company (U 902-E) and Southern California Edison Company (U 338-E)*, re: Order Instituting Rulemaking to Revisit Net Energy Metering Tariffs Pursuant to Decision D.16-01-044, and to Address Other Issues Related to Net Energy Metering, Docket No. R.20-08-020, 15 March 2021, p. 11 and 20, archived at https://web.archive.org/web/20210521142944/https://static1.squarespace.com/static/54c1a3f9e4b04884b35cfef6/t/605120343d32dd18332462a2/1615929399865/R.20-08-020_Joint%20Proposal_3.15.2021.pdf.

231 See note 24.

232 Ibid.

233 California ISO, *Board Approves 2017-18 Transmission Plan, CRR Rule Changes* (press release), 23 March 2018, archived at https://web.archive.org/web/20210314235528/http://www.caiso.com/Documents/BoardApproves2017-18TransmissionPlan_CRR-RuleChanges.pdf.

234 Kavya Balaraman, “CPUC finds DERs save on transmission investments, but implementation remains ‘the big question,’” *Utility Dive*, 5 May 2020, archived at <https://web.archive.org/web/20210504204450/https://www.utilitydive.com/news/cpuc-finds-ders-save-on-transmission-investments-but-implementation-remain/577343/>.

235 Resilience: U.S. Department of Energy, *Solar Integration: Distributed Energy Resources and Microgrids*, no date, archived at <http://web.archive.org/web/20201205022148/https://www.energy.gov/eere/solar/solar-integration-distributed-energy-resources-and-microgrids>.

236 Christopher T.M. Clack, et al., Vibrant Clean Energy, LLC, *Why Local Solar for All Costs Less: A New Roadmap for the Lowest Cost Grid*, 1 December 2020, p. 3, archived at https://web.archive.org/web/20210126154115/https://www.vibrantcleanenergy.com/wp-content/uploads/2020/12/WhyDERs_TR_Final.pdf; Local Solar for All, “Expanding local solar and storage could save ratepayers nearly a half a trillion dollars,” PR Newswire, 1 December 2020, accessed at <https://www.prnewswire.com/news-releases/expanding-local-solar-and-storage-could-save-ratepayers-nearly-a-half-a-trillion-dollars-301182636.html>.

237 Gideon Weissman, Frontier Group; Emma Searson and Rob Sargent, Environment America Research & Policy Center, *The True Value of Solar: Measuring the Benefits of Rooftop Solar Power*, July 2019, available at <https://frontiergroup.org/reports/fg/true-value-solar>; Koami Soulemane Hayibo and Joshua M. Pearce, “A review of the value of solar methodology with a case study of the U.S. VOS,” *Renewable and Sustainable Energy Reviews*, 137: 110599, March 2021, p. 1, doi: 10.1016/j.rser.2020.110599, archived at https://web.archive.org/web/20210525141733/https://www.researchgate.net/profile/Joshua-Pearce/publication/347840155_A_review_of_the_value_of_solar_methodology_with_a_case_study_of_the_US_VOS/links/5fe79b80299bf140884aa41b/A-review-of-the-value-of-solar-methodology-with-a-case-study-of-the-US-VOS.pdf.

238 See note 25; possible plan options: Steve Puterski, “Energy utilities, groups file reform proposals for net energy metering,” *The Coast News Group*, 29 March 2021, archived at <https://web.archive.org/web/20210329233602/https://thecoastnews.com/energy-utilities-groups-file-reform-proposals-for-net-energy-metering/>.

239 Sarah Spicer, “Kansas is a state full of sun, so why does Kansas lag behind in solar power?” *The Wichita Eagle*, 6 October 2020, archived at <https://web.archive.org/web/20201105063634/https://www.kansas.com/news/local/article245482665.html>.

240 Largest utility in Kansas: Brian Grimmett, “The largest utility in Kansas wants to charge everyone to collect more from solar users,” *Shawnee Mission Post*, 2 November 2020, archived at <http://web.archive.org/web/20201125051021/https://shawneemissionpost.com/2020/11/02/the-largest-utility-in-kansas-wants-to-charge-everyone-to-collect-more-from-solar-users-105435/>.

241 Utility attack: Andy Marso, “Utility companies lobby for lower solar reimbursement,” *The Topeka Capital-Journal*, 4 February 2014, archived at <http://web.archive.org/web/20201027152614/https://www.cjonline.com/article/20140204/NEWS/302049758>; Date of introduction: Kansas State Legislature, S.B. 280, archived at http://web.archive.org/web/20201203011722/http://www.kslegislature.org/li_2014/b2013_14/measure/sb280/; Net metering bills part of effort by ALEC: Scott Gibson, “Net-metering is preserved in Kansas,” *Green Building Advisor*, 9 April 2014, archived at <https://web.archive.org/web/20210129204310/https://www.greenbuildingadvisor.com/article/net-metering-is-preserved-in-kansas>; Americans for Prosperity involved: Evan Halper, “Koch brother, big utilities attack solar, green energy policies,” *The Los Angeles Times*, 19 April 2014, accessed 30 March 2021 at <https://www.latimes.com/nation/la-na-solar-kochs-20140420-story.html>. Note: the Koch brothers were from Kansas and have a history of heavy involvement there in promoting fossil fuels over renewables.

242 Evergy formed from merger of Westar Energy and Kansas City Power & Light: Evergy, *History*, archived at <http://web.archive.org/web/20210125194024/https://www.evergy.com/about-evergy/history>; Westar Energy and Kansas City Power & Light supported the bills: Andy Marso, “Utility companies lobby for lower solar reimbursement,” *The Topeka Capital-Journal*, 4 February 2014, archived at <http://web.archive.org/web/20201027152614/https://www.cjonline.com/article/20140204/NEWS/302049758>; The three investor-owned utilities in Kansas: Natalie Nelson, *Kansas Legislator Briefing Book 2019: M-3 Electric Utility Regulation and Ratemaking*, Kansas Legislative Research Department, 2019, p. 1, archived at <https://web.archive.org/web/20200503142256/http://www.kslegresearch.org/KLRD-web/Publications/BriefingBook/2019Briefs/M-3-ElectricUtility-RegulationandRatemaking.pdf>; All three investor-owned utilities lobbied for the bills: see note 27.

243 FollowTheMoney.org, *Show Me: Electric Utilities Contributions to State House/Assembly or State Senate Candidates in Elections in Kansas 2014 (within Federal, State and Local Data)*, accessed 25 May 2021 at <https://www.followthemoney.org/show-me?dt=1&s=KS&y=2014&c-exi=1&c-r-ot=S,H&d-cci=36>.

244 Kansas City Power & Light: FollowTheMoney.org, *Kansas City Power & Light: General Data: As a Contributor: Candidates*, accessed 3 February 2021 at <https://www.followthemoney.org/entity-details?eid=7354>; Westar Energy: FollowTheMoney.org, *Westar Energy: General Data: As a Contributor: Candidates*, accessed 3 February 2021 at <https://www.followthemoney.org/entity-details?eid=9484>.

245 Committees that heard the bills: Kansas State Legislature, S.B. 280, archived at http://web.archive.org/web/20201203011722/http://www.kslegislature.org/li_2014/b2013_14/measure/sb280/ and Kansas State Legislature, H.B. 2458, archived at http://web.archive.org/web/20201117144127/http://kslegislature.org/li_2014/b2013_14/measure/hb2458/.

246 See note 27.

247 201 net metering customers: Ibid.

248 Karen Uhlenhuth, “Kansas solar installations drop by more than a third after utility adds demand fee,” *Energy News Network*, 7 January 2020, archived at <http://web.archive.org/web/20201128100951/https://energynews.us/2020/01/07/mid-west/kansas-solar-installations-drop-by-more-than-a-third-after-utility-adds-demand-fee/>; Different geographical areas: Dorothy Barnett, Climate and Energy Project, personal communication, 8 April 2021.

249 Karen Uhlenhuth, “Kansas solar installations drop by more than a third after utility adds demand fee,” *Energy News Network*, 7 January 2020, archived at <http://web.archive.org/web/20201128100951/https://energynews.us/2020/01/07/mid-west/kansas-solar-installations-drop-by-more-than-a-third-after-utility-adds-demand-fee/>.

250 See note 28.

251 See note 29.

252 FollowTheMoney.org, *Westar Energy*, accessed 3 February 2021 at <https://www.followthemoney.org/entity-details?eid=9484>; FollowTheMoney.org, *Kansas City Power & Light*, accessed 3 February 2021 at <https://www.followthemoney.org/entity-details?eid=7354>.

253 Commissioners that approved the demand fee: The State Corporation Commission of the State of Kansas, *Docket No. 18-WSEE-328-RTS*, 27 September 2018, archived at <http://web.archive.org/web/20181215082744/http://estar.kcc.ks.gov/estar/ViewFile.aspx/20180927103146.pdf?Id=6a4e143a-438b-4437-8364-894d8b7310d5>; Commissioners appointed by Gov. Brownback and Gov. Colyer: Ballotpedia, *Shari Feist Albrecht*, archived at http://web.archive.org/web/20181110033221/https://ballotpedia.org/Shari_Feist_Albrecht, Ballotpedia, *Jay Emler*, archived at http://web.archive.org/web/20181110033145/https://ballotpedia.org/Jay_Emler, Ballotpedia, *Dwight Keen*, archived at http://web.archive.org/web/20201109193457/https://ballotpedia.org/Dwight_Keen; Jeff Colyer became Governor after Sam Brownback was appointed to the Trump administration: Ballotpedia, *Jeff Colyer*, archived at http://web.archive.org/web/20181107065138/https://ballotpedia.org/Jeff_Colyer.

254 See note 29.

255 Sarah Spicer, “The Kansas Supreme Court ruled solar fees illegal. Customers are still paying it,” *The Wichita Eagle*, 22 September 2020, archived at <http://web.archive.org/web/20201201084222/https://www.kansas.com/news/business/article245482550.html>.

256 Sarah Spicer, “Energys’s proposed electric rates for solar find few supporters, many critics,” *The Wichita Eagle*, 8 January 2021, archived at <http://web.archive.org/web/20210115043713/https://www.kansas.com/news/politics-government/article247936975.html>; Sarah Spicer, “Energys’s proposed electric rates leave some Kansans feeling ‘nickel and dimed,’” 5 November 2020, archived at <http://web.archive.org/web/20201201084231/https://www.kansas.com/news/business/article246843497.html>.

257 Preferred proposal: Ibid; Grid access fee: Sarah Spicer, “Energys’s proposed electric rates leave some Kansans feeling ‘nickel and dimed,’” 5 November 2020, archived at <http://web.archive.org/web/20201201084231/https://www.kansas.com/news/business/article246843497.html>.

258 Sarah Spicer, “Energys’s proposed electric rates leave some Kansans feeling ‘nickel and dimed,’” 5 November 2020, archived at <http://web.archive.org/web/20201201084231/https://www.kansas.com/news/business/article246843497.html>.

259 Ibid.

260 See note 256.

261 Ibid.

262 Sierra Club, “Kansas Corporation Commission ruling a win for solar and customers,” 25 February 2021, available at <https://www.sierraclub.org/press-releases/2021/02/kansas-corporation-commission-ruling-win-for-solar-and-customers>; Former Westar service area: Dorothy Barnett, Climate and Energy Project, personal communication, 8 April 2021.

263 Customers in other parts of the state: Dorothy Barnett, Climate and Energy Project, personal communication, 8 April 2021; A win for solar: Sierra Club, “Kansas Corporation Commission ruling a win for solar and customers,” 25 February 2021, available at <https://www.sierraclub.org/press-releases/2021/02/kansas-corporation-commission-ruling-win-for-solar-and-customers>.

264 South Carolina General Assembly, *SC Energy Freedom Act*, 123rd Session, 2019-2020, archived at http://web.archive.org/web/20200804022744/https://www.scstatehouse.gov/sess123_2019-2020/bills/3659.htm; SC Governor: Office of the Governor Henry McMaster, *Governor, South Carolina*, archived at <https://web.archive.org/web/20210315215314/https://governor.sc.gov/>.

265 See note 32.

266 Avery G. Wilks, “SCG&E changing name after VC Summer nuclear fiasco, takeover,” *The State*, 29 April 2019, archived at <https://web.archive.org/web/20210307225031/https://www.thestate.com/news/politics-government/article229799614.html>.

267 New fees: Tim Sylvia, “Aggressive new fees for South Carolina solar customers draw fire,” *PV Magazine*, 16 December 2020, archived at <http://web.archive.org/web/20210218064258/https://pv-magazine-usa.com/2020/12/16/aggressive-new-fees-for-south-carolina-solar-customers-draw-fire/>.

268 Ibid.

269 Solar subscription fee charge: See note 268; Capacity of 8k system: GoGreenSolar, *8000 watt (8kw) DIY solar install kit with string inverter*, accessed 26 March 2021 at [270 See note 267.](https://www.gogreensolar.com/products/8000w-diy-solar-panel-kit-grid-tie-inverter#:~:text=A%208kW%20Solar%20Kit%20requires,the%20solar%20array%20facing%20South; Charge per KW of installed capacity: Thad Culley, Sunrun, personal communication, 7 April 2021.</p></div><div data-bbox=)

271 Danielle Miller, “Dominion energy proposes new solar energy fees in South Carolina,” *WLTX*, 23 February 2021, available at <https://www.wltx.com/article/news/local/dominion-energy-proposes-new-solar-energy-fees/101-cd3e764f7ab1-4028-99c4-51ecd03d55d7>.

272 See note 267.

273 Thad Culley, senior manager for public policy, Sunrun, personal communication, 7 April 2021.

274 Southern Environmental Law Center, *SC regulatory board rules in favor of utility customers* (press release), 28 April 2021, archived at <http://web.archive.org/web/20210428193449/https://www.southernenvironment.org/news-and-press/press-releases/sc-regulatory-board-rules-in-favor-of-utility-customers>.

275 Ibid.

276 See note 273.

277 Catherine Morehouse, “South Carolina raises rates Dominion must pay to solar providers, reversing earlier decision,” *Utility Dive*, 7 January 2020, archived at <https://web.archive.org/web/20200107181826/https://www.utilitydive.com/news/south-carolina-raises-rates-dominion-must-pay-to-solar-providers-reversing/569875/>.

278 Ibid.