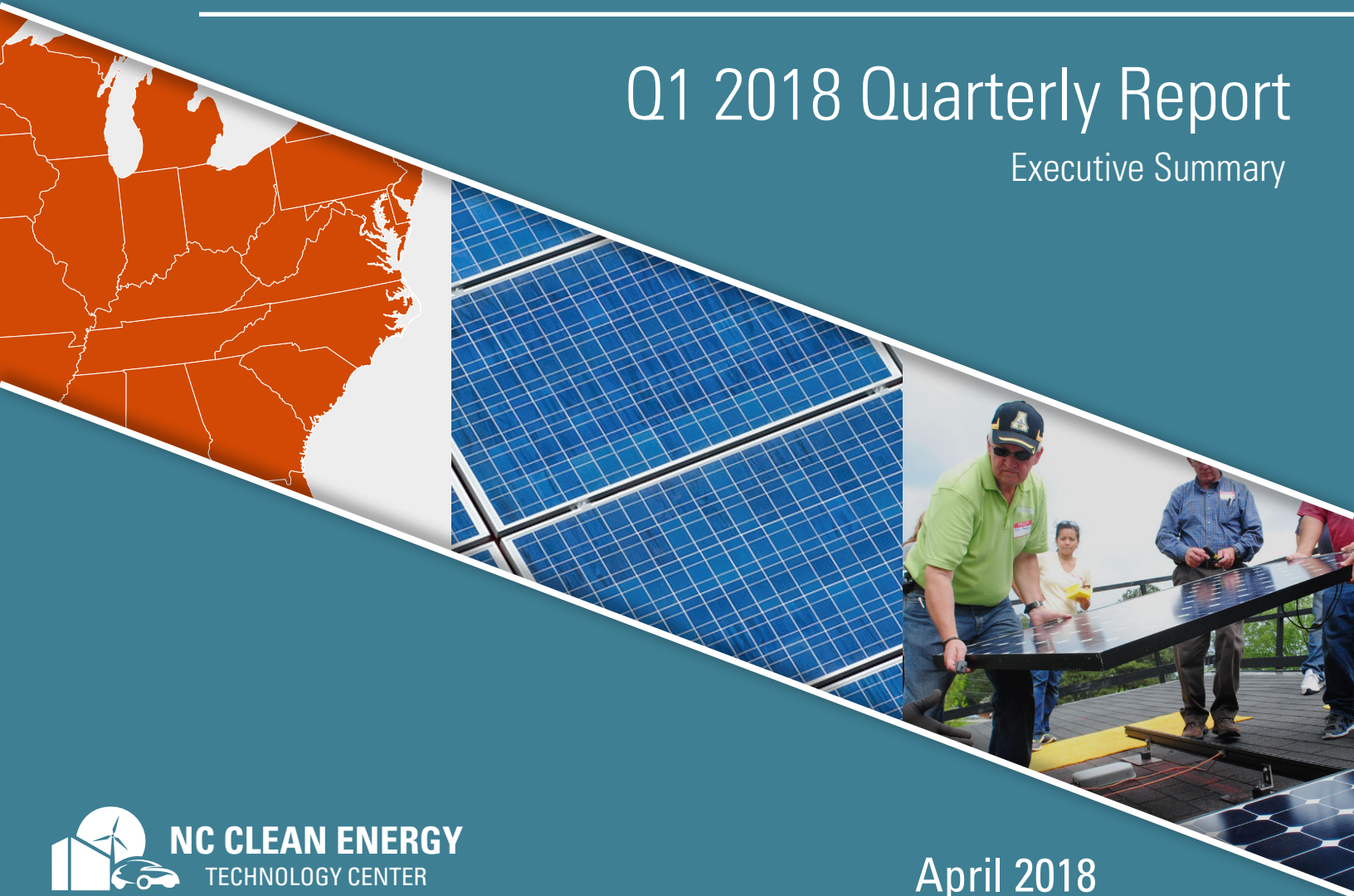


50 States of SOLAR

Q1 2018 Quarterly Report
Executive Summary



NC CLEAN ENERGY
TECHNOLOGY CENTER

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The NC Clean Energy Technology Center is a UNC System-chartered Public Service Center administered by the College of Engineering at North Carolina State University. Its mission is to advance a sustainable energy economy by educating, demonstrating and providing support for clean energy technologies, practices, and policies. The Center provides service to the businesses and citizens of North Carolina and beyond relating to the development and adoption of clean energy technologies. Through its programs and activities, the Center envisions and seeks to promote the development and use of clean energy in ways that stimulate a sustainable economy while reducing dependence on foreign sources of energy and mitigating the environmental impacts of fossil fuel use.

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PREVIOUS EDITIONS

The 50 States of Solar is a quarterly publication. Previous executive summaries and older full editions of *The 50 States of Solar* are available here:

- [Q4 2017 and 2017 Policy Review – Executive Summary](#)
- [Q3 2017 Executive Summary](#)
- [Q2 2017 Executive Summary](#)
- [Q1 2017 Executive Summary](#)
- [Q4 2016 and 2016 Policy Review – Executive Summary](#)
- [Q3 2016 Executive Summary](#)
- [Q2 2016](#)
- [Q1 2016](#)
- [Q4 2015 and 2015 Policy Review](#)
- [Q3 2015](#)
- [Q2 2015](#)
- [Q1 2015](#)
- [Q4 2014](#)

ABOUT THE REPORT

PURPOSE

The purpose of this report is to provide state lawmakers and regulators, electric utilities, the solar industry, and other energy stakeholders with timely, accurate, and unbiased updates on state actions to study, adopt, implement, amend, or discontinue policies associated with distributed solar photovoltaics (PV). This report catalogues proposed and enacted legislative, regulatory policy, and rate design changes affecting the value proposition of distributed solar PV during the most recent quarter, with an emphasis on the residential sector.

The 50 States of Solar series provides regular quarterly updates of solar policy developments, keeping stakeholders informed and up to date on a timely basis.

APPROACH

The authors identified relevant policy changes through state utility commission docket searches, legislative bill searches, popular press, and direct communication with stakeholders and regulators in the industry.

Questions Addressed

This report addresses several questions about the changing U.S. solar policy landscape:

- How are (1) state legislatures and regulatory authorities and (2) electric utilities addressing fast-growing markets for distributed solar PV?
- What changes to traditional rate design features and net metering policies are being proposed, approved, and implemented?
- Where are distributed solar markets potentially affected by policy or regulatory decisions on community solar, third-party solar ownership, and utility-led residential rooftop solar programs?

Actions Included

This report series focuses on cataloguing and describing important proposed and adopted policy changes affecting solar customer-generators of investor-owned utilities (IOUs) and large publicly-owned or nonprofit utilities (i.e., those serving at least 100,000 customers). Specifically, actions tracked in these reports include:

- Significant changes to state or utility **net metering** laws and rules, including program caps, system size limits, meter aggregation rules, and compensation rates for net excess generation
- Changes to statewide **community solar** or **virtual net metering** laws and rules, and individual utility-sponsored community solar programs arising from statewide legislation
- Legislative or regulatory-led efforts to study the **value of solar, net metering**, or **distributed solar generation policy**, e.g., through a regulatory docket or a cost-benefit analysis
- Utility-initiated rate requests for **charges applicable only to customers with solar PV** or other types of distributed generation, such as added monthly fixed charges, demand charges, stand-by charges, or interconnection fees
- Utility-initiated rate requests that propose a 10% or larger increase in either **fixed charges** or **minimum bills** for all residential customers
- Changes to the legality of **third-party solar ownership**, including solar leasing and solar third-party solar power purchase agreements (PPAs), and proposed **utility-led rooftop solar** programs

In general, this report considers an “action” to be a relevant (1) legislative bill that has been passed by at least one chamber or (2) a regulatory docket, utility rate case, or rulemaking proceeding. Introduced legislation related to third-party sales is included irrespective of whether it has passed at least one chamber, as only a small number of bills related to this policy have been introduced. Introduced legislation pertaining to a regulatory proceeding covered in this report is also included irrespective of whether it has passed at least one chamber.

Actions Excluded

In addition to excluding most legislation that has been introduced but not advanced, this report excludes a review of state actions pertaining to solar incentives, as well as more general utility cost recovery and rate design changes, such as decoupling or time-of-use tariffs. General changes in state implementation of the Public Utility Regulatory Policies Act of 1978 and subsequent amendments, including changes to the terms of standard contracts for Qualifying Facilities or avoided cost rate calculations, are also excluded unless specifically related to the policies described above. The report also does not cover changes to a number of other policies that affect distributed solar, including solar access laws, interconnection rules, and renewable portfolio standards. Details and updates on these and other federal, state, and local government policies and incentives are available in the NC Clean Energy Technology Center’s Database of State Incentives for Renewables and Efficiency, at www.dsireusa.org.

EXECUTIVE SUMMARY

OVERVIEW OF Q1 2018 POLICY ACTION

In the first quarter of 2018, 40 states plus DC took a total of 149 actions related to distributed solar policy and rate design (Figure 1). Table 1 provides a summary of state actions related to DG compensation, rate design, and solar ownership during Q1 2018. Of the 149 actions catalogued, the most common were related to residential fixed charge and minimum bill increases (49), followed by DG compensation rules (39), and DG valuation or net metering studies (21).

Table 1. Q1 2018 Summary of Policy Actions

Policy Type	# of Actions	% by Type	# of States
Residential fixed charge or minimum bill increase	49	33%	26
DG compensation rules	39	26%	25 + DC
DG valuation or net metering study	21	14%	17 + DC
Community solar	18	12%	15
Residential demand or solar charge	10	7%	5 + DC
Third-party ownership of solar	8	5%	3 + DC
Utility-led rooftop PV programs	4	3%	4
Total	149	100%	40 States + DC

Note: The “# of States/ Districts” total is not the sum of the rows, as some states have multiple actions. Percentages are rounded and may not add up to 100%.

TOP FIVE SOLAR POLICY DEVELOPMENTS OF Q1 2018

Five of the quarter’s top policy developments are highlighted below.

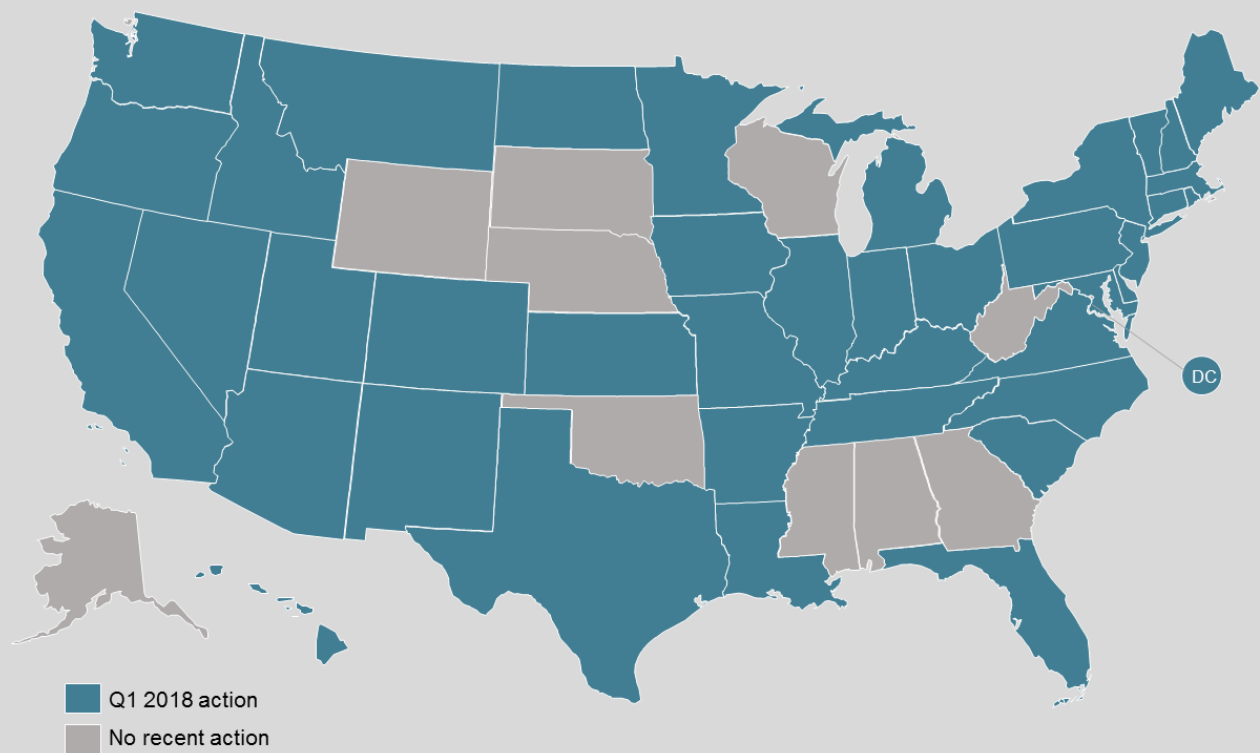
Michigan Public Service Commission Staff Proposes Net Metering Successor

The Michigan Public Service Commission (PSC) Staff published its final net metering successor tariff recommendations in February 2018, proposing an “inflow-outflow”, or net billing, structure. The Staff recommended opening a separate, contested proceeding to determine the outflow compensation rate. The PSC approved the inflow-outflow successor tariff in April 2018, but declined to open a proceeding to determine the outflow credit rate. Final tariffs will be approved in utility-specific rate cases.

Massachusetts Department of Public Utilities Approves Mandatory Demand Charge for Residential DG Customers

In January 2018, the Massachusetts Department of Public Utilities (DPU) approved Eversource's proposed mandatory demand charge for new net metering customers. This is the first mandatory residential demand charge approved for an investor-owned utility in the U.S.* This follows legislation enacted in 2016, authorizing the DPU to approve a minimum monthly reliability contribution for net metering customers.

Figure 1. Q1 2018 Action on DG Compensation, Rate Design, & Solar Ownership Policies



NorthWestern Energy Publishes Montana Net Metering Cost-Benefit Study

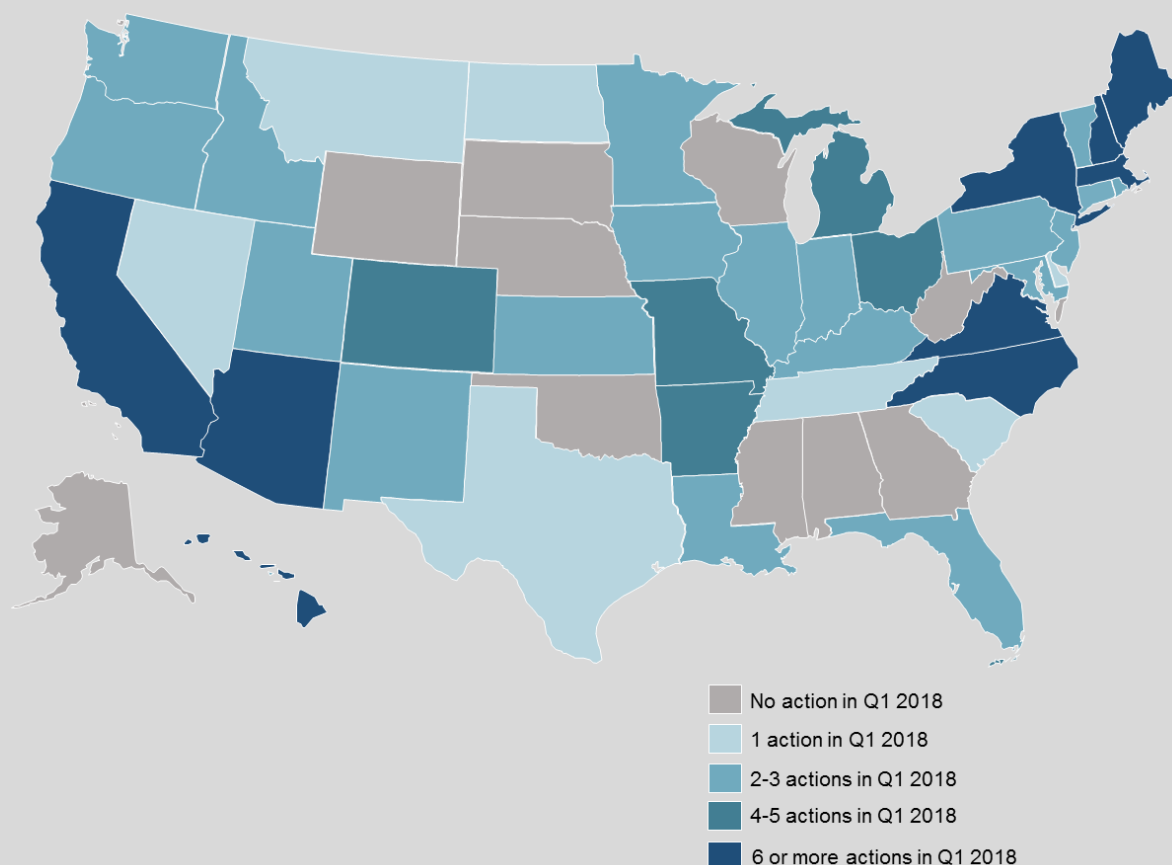
Pursuant to legislation enacted in 2017, NorthWestern Energy hired a consultant to conduct a study of the costs and benefits of customer generation. The study was published in late March 2018, finding the net value of solar to be 4.2 to 4.6 cents per kWh when avoided CO₂ costs are included and 3.5 to 3.8 cents per kWh when avoided CO₂ costs are excluded.

* The exception is a mandatory demand charge for Arizona Public Service residential customers with refrigerated air conditioning approved in 1980. The charge was changed after initial implementation to no longer be mandatory.

Utilities in North Carolina and Virginia File Proposed Community Solar Plans

Duke Energy in North Carolina and Dominion Virginia Power in Virginia filed proposed community solar program plans during Q1 2018. Both filings were the result of legislation enacted in each state in 2017, creating pilot programs for utility-sponsored community solar. While Duke Energy's proposed program requires an upfront participation payment, Dominion's program would require a monthly per-kWh subscription fee.

Figure 2. Q1 2018 Action on Solar Policy & Rate Design, By Number of Actions



Illinois Commerce Commission Initiates DG Valuation Efforts

The Illinois Commerce Commission initiated its distributed generation valuation and compensation reform efforts in Q1 2018 with the release of a white paper reviewing key considerations and approaches taken by other states. This effort will inform the development of a net metering successor tariff to take effect once the state's aggregate cap is reached.

THE BIG PICTURE: INSIGHTS FROM Q1 2018

State Legislators Considering Over 50 Bills Related to Distributed Solar Compensation Policies and Studies

Most states entered their 2018 legislative sessions during the first quarter of 2018, and state legislators considered over 50 bills related to distributed generation compensation and studies during the quarter. The majority of bills under consideration related to credit rates for excess generation, studies examining the value of distributed energy resources or costs and benefits of net metering, and aggregate caps on net metering. Massachusetts and Virginia considered the greatest number of bills during the quarter.

Policy Discussions Broadening Scope From Solar to Distributed Energy Resources

While net metering discussions have traditionally focused on distributed solar in particular, state policy proceedings are increasingly addressing the broader set of distributed energy resources, including energy storage and electric vehicles, as opposed to solar photovoltaics only. In Q1 2018, several states, including Arkansas, Connecticut, Illinois, Missouri, and New York, were involved in investigating the value of distributed energy resources.

Value of Distributed Energy Resource Studies Exhibit Wide-Ranging Results

Although more and more states are studying the value of distributed energy resources or working to develop value-based compensation structures, there has been little convergence in methodologies and resulting values. Two recent studies – NorthWestern Energy’s Montana net metering cost-benefit analysis and the Maryland Public Service Commission’s draft solar cost-benefit study – demonstrate this. While NorthWestern Energy’s study identified a value ranging from 3.5 to 4.6 cents per kWh, the Maryland draft study identified a value of 25 to 40 cents per kWh.

States and Utilities Taking Unique Approaches to Community Solar Program Design

As the number of states adopting community solar policies increases, so has the diversity of community solar program designs. Minnesota is taking a value-based credit approach, Hawaii is moving toward time-varying community solar credit rates, and several other states use a virtual net metering model. Utilities in North Carolina and Virginia proposed community solar program designs in Q1 2018, with one planning an upfront participation fee and the other planning a monthly per-kWh subscription fee.

FULL REPORT DETAILS & PRICING

FULL REPORT DETAILS

Content Included in the Full Quarterly Report:

- Detailed policy tables describing each pending and recently decided state and utility action regarding:
 - Net Metering
 - Distributed Solar or DG Valuation
 - Community Solar
 - Residential Fixed Charge and Minimum Bill Increases
 - Residential Solar Charges (Demand Charges, Standby Charges, & Grid Access Charges)
 - Third-Party Ownership
 - Utility-Led Rooftop Solar
- Links to original legislation, dockets, and commission orders for each policy action
- Summary maps of action for each policy category above, including a separate Powerpoint file of all summary maps
- Qualitative analysis and descriptive summaries of solar policy action and trends
- Outlook of action for the next quarter

WHO SHOULD PURCHASE THIS REPORT

The 50 States of Solar allows those involved in the solar and electric utility industry to easily stay on top of legislative and regulatory changes. The report provides a comprehensive quarterly review of actions, an undertaking that would take any one business or organization weeks of time and thousands of dollars in staff time. At a cost of \$500 per issue (or \$1,600 annually), the 50 States of Solar offers an invaluable time and financial savings. With direct links to original sources for all actions, customers may stay on top of legislative and regulatory developments between quarterly reports.

Solar Installation and Manufacturing Companies

- Identify new market opportunities, as well as changing and risky markets
- Stay on top of state policy developments relevant to your business
- Give your own team a head start in tracking legislative and regulatory proceedings

Investor-Owned and Public Power Utilities

- Learn about the approaches being taken by other utilities facing similar challenges
- Stay on top of relevant state policy developments
- Utilize an objective source of information in legislative and regulatory proceedings

Investors and Financial Analysts

- Identify new investment opportunities and emerging areas of growth, as well as risky investments
- Access rate data that is often buried in regulatory filings

Advocacy Organizations

- Learn about the diverse solar policy and rate proposals in other states
- Learn about the outcomes of other state's policy and rate decisions
- Utilize an objective source of information in legislative and regulatory proceedings

Researchers and Consultants

- Access valuable data requiring an immense amount of time to collect first-hand
- Identify research needs to inform solar policy and rate design proceedings
- Cite an objective source in your own research and analysis

PRICING

Visit <https://commerce.cashnet.com/NCSU-NCCECTC> to purchase the full 50 States of Solar Q1 2018 Quarterly Report.

Customer Type	Annual Subscription	Single Report – Current Quarter
Business or Individual	\$1,600	\$500
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Previous editions of the 50 States of Solar are offered at a discounted rate. Visit the link above for details. Customers purchasing an annual subscription, receive complimentary access to all past editions of the report.

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We offer complimentary copies of the 50 States of Solar to **policymakers and regulators** (limited to federal and state legislators and staffers, utility commissioners,

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