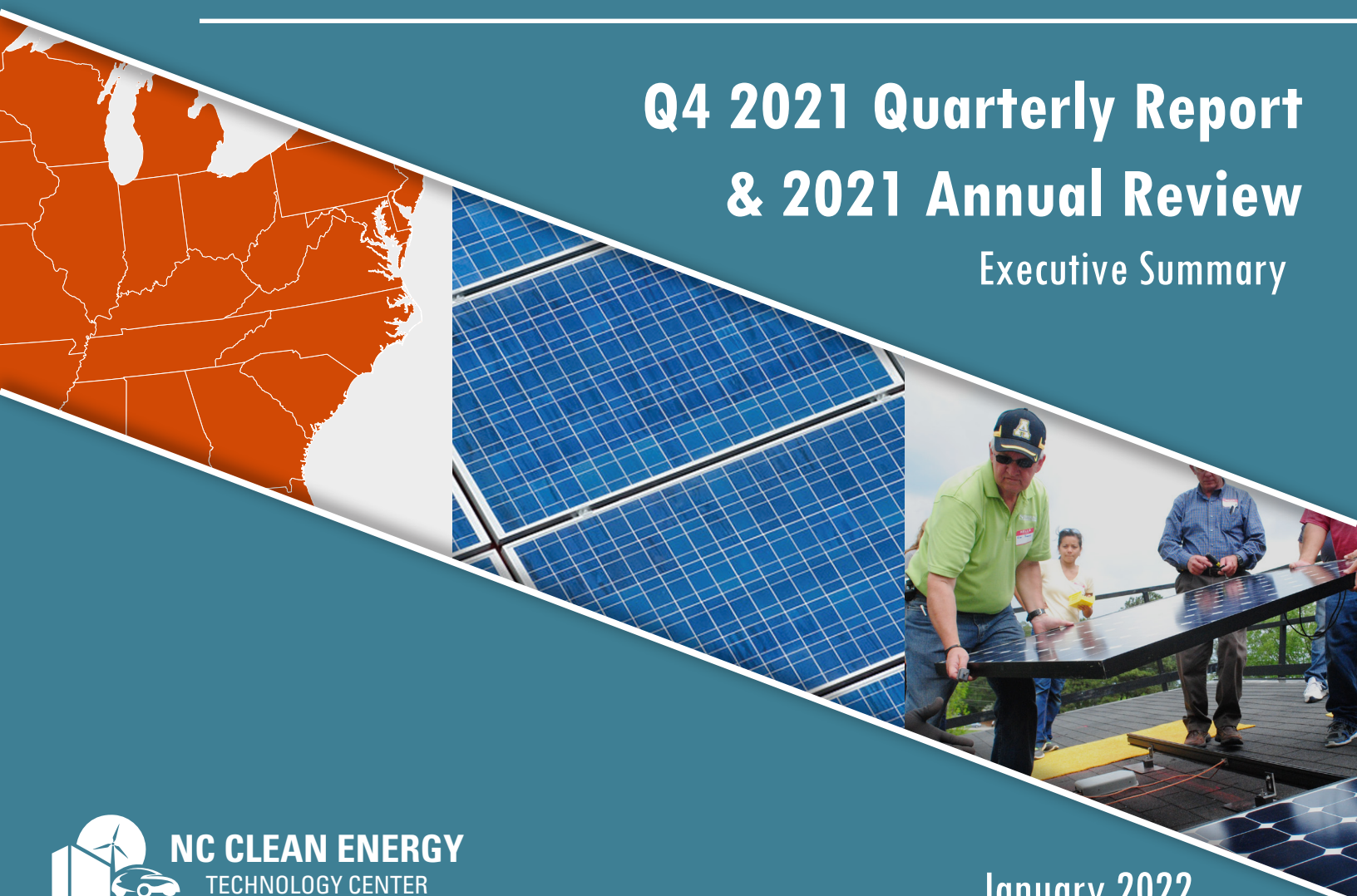


# 50 States of SOLAR

**Q4 2021 Quarterly Report  
& 2021 Annual Review**  
Executive Summary



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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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# ABOUT THE REPORT

## PURPOSE

The purpose of this report is to provide state lawmakers and regulators, electric utilities, the solar industry, and other 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.

## 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 state legislatures, regulatory authorities, and 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 cataloging 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 they are related specifically 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](http://www.dsireusa.org).

# EXECUTIVE SUMMARY

## 2021 SOLAR POLICY ACTION

State and utility solar policies continued to undergo review in 2021, with nearly every state in the country considering policy or rate design changes – a trend which has continued over the past several years and is likely to continue through 2022 and beyond. Table 1 provides a summary of state actions related to DG compensation, rate design, and solar ownership during 2021. Of the 286 actions identified, the most common were related to DG compensation policies (98), community solar policies (69), and residential fixed charge and minimum bill increases (43). The actions occurred across 46 states plus DC in 2021 (Figure 1). The states that saw the most solar policy action, or the most impactful actions, during 2021 are highlighted below.

**Table 1. 2021 Summary of Policy Actions**

Policy Type	# of Actions	% by Type	# of States
DG Compensation Policies	98	34%	35
Community solar	69	24%	24 + DC
Residential fixed charge or minimum bill increase	43	15%	26 + DC
DG valuation or net metering study	25	9%	16 + DC
Residential demand or solar charge	24	8%	11
Third-party ownership of solar	22	8%	10
Utility-led rooftop PV programs	5	2%	4
<b>Total</b>	<b>286</b>	<b>100%</b>	<b>46 States + DC</b>

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 TEN MOST ACTIVE STATES OF 2021

While nearly every state in the country took some type of action on distributed solar policy or rate design during 2021, some states were particularly active, taking many different actions or especially impactful actions. The following states stood out in 2021 for their solar policy activity:

### 1. South Carolina

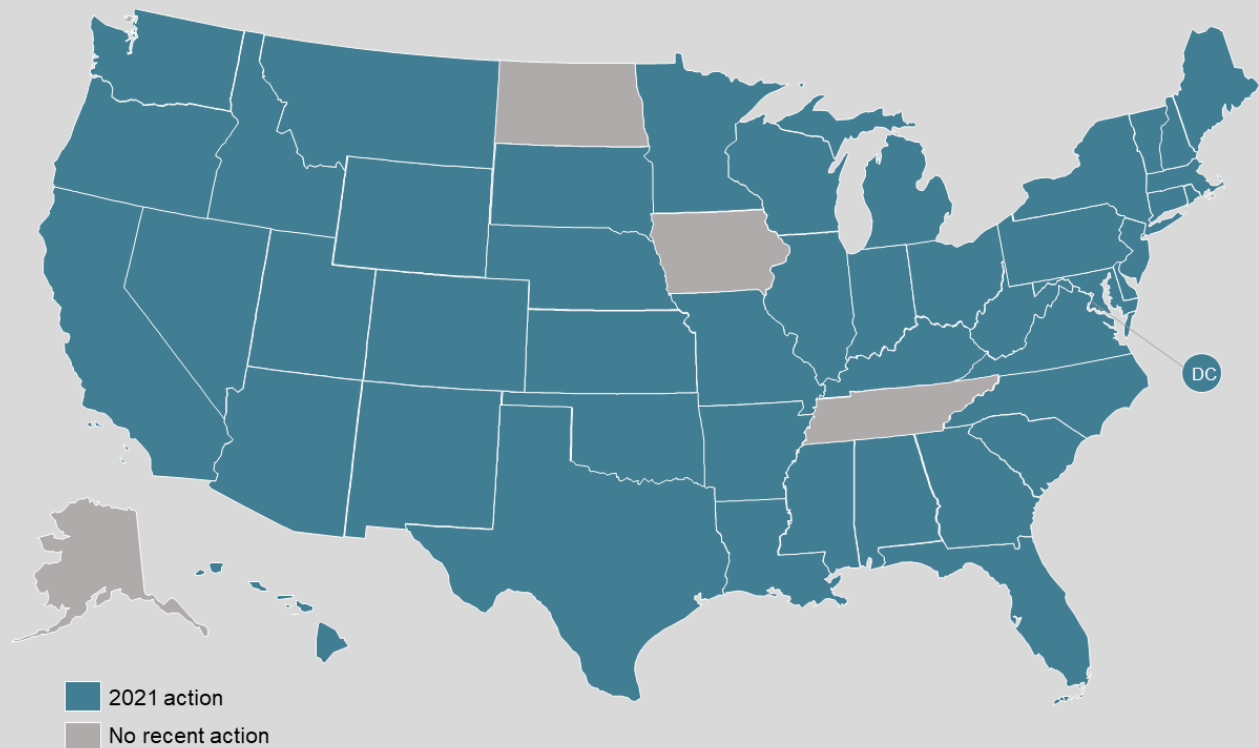
South Carolina regulators approved net metering successor tariffs for Duke Energy and Dominion Energy during 2021, with both tariffs featuring monthly time-of-use netting and minimum bills. Duke Energy’s tariff also includes charges based on system capacity. Duke Energy’s tariff proposal, in particular, garnered national attention with numerous solar stakeholders supporting

the compromise design. The utilities also considered community solar programs, as required by H.B. 3659 of 2019.

## 2. Connecticut

The Public Utilities Regulatory Authority (PURA) issued a major decision in February 2021, adopting two net metering successor options, a netting tariff and a buy-all, sell-all tariff. The netting tariff features monthly netting of production and consumption, while the buy-all, sell-all tariff will compensate generators at a fixed rate for gross production. The PURA also considered modifications to its shared clean energy facility program during the year.

**Figure 1. 2021 Action on Net Metering, Rate Design, & Solar Ownership Policies**



## 3. Kentucky

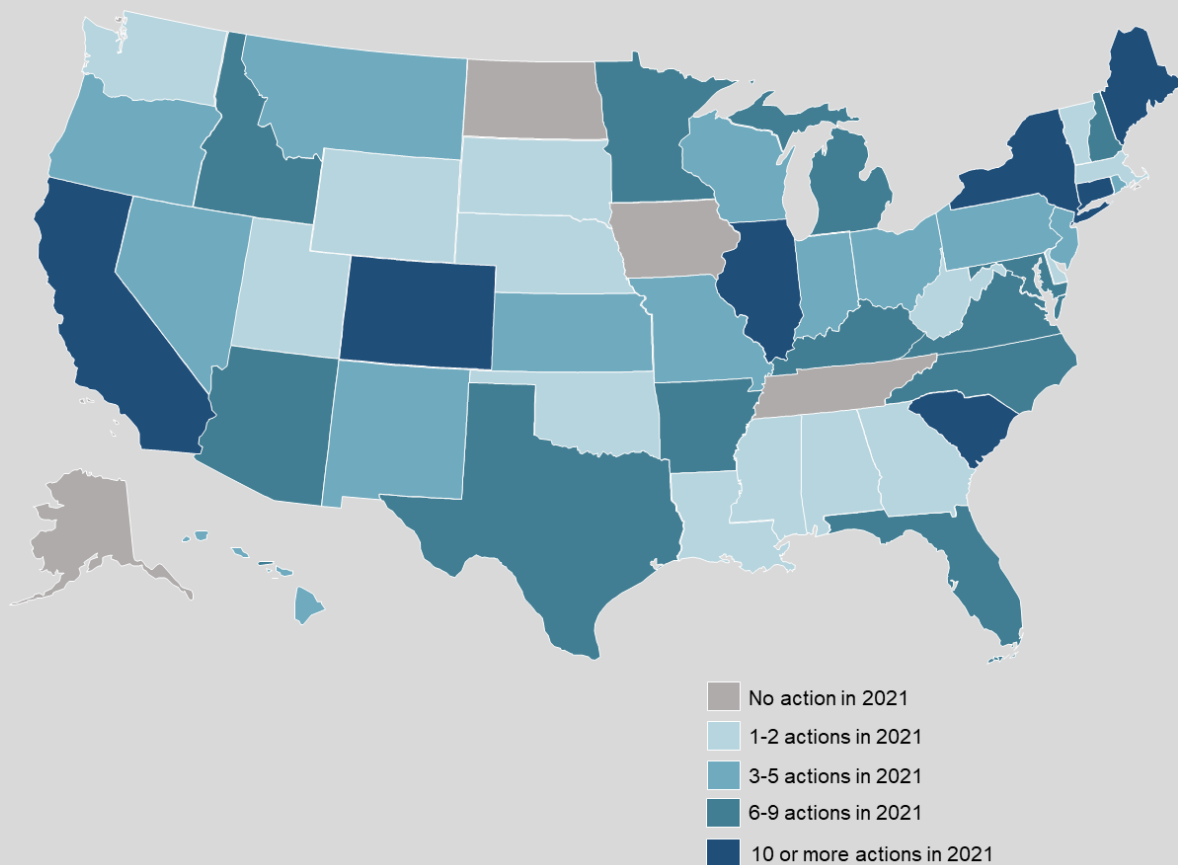
In Kentucky, regulators issued decisions on three utilities' (Kentucky Power, Kentucky Utilities, and Louisville Gas & Electric) net metering successor tariff proposals. In all three cases, the Public Service Commission rejected the utility's design in favor of continuing traditional monthly net metering. The Commission did approve a reduction in monthly net excess generation credit rates for the utilities.



## 4. California

Efforts to develop California's Net Metering 3.0 design continued in earnest through 2021, with numerous parties filing recommendations early in the year and a proposed decision released in December. The proposed decision would adopt an instantaneous netting system, with excess generation credited at an hourly rate based on the utility's avoided cost. The proposed decision also includes a monthly grid participation charge of \$8.00 per kW of system capacity, a market transition credit, and a storage rebate for legacy customers voluntarily moving to the new tariff.

**Figure 2. 2021 Solar Policy & Rate Design Action, by Number of Actions**



## 5. Illinois

Illinois lawmakers enacted a major piece of energy legislation in September 2021, which expands the availability of incentives for net metering and community solar projects. The bill also increased the system size limit for community solar facilities and set a specific date for the state's net metering transition, replacing the installed capacity threshold that was previously established as the transition point and a source of debate earlier in the year.



## **6. Maine**

The Maine State Legislature enacted a bill halting the state's distributed generation procurement program and directing the Governor's Energy Office to convene a stakeholder group to consider future program changes. The group began meeting in the latter part of 2021. The Public Utilities Commission also considered several technical issues related to the state's net energy billing rules during the year, including the ability of solar-plus-storage projects to participate.

## **7. New York**

The New York Public Service Commission issued an order in 2021, approving the addition of a customer benefit contribution based on system capacity to the mass market net metering tariff. The New York State Energy Research and Development Authority also launched a new Inclusive Community Solar Adder program and released a Distributed Solar Roadmap, aiming to add approximately 2,000 MW of new community distributed generation.

## **8. North Carolina**

Duke Energy filed a net metering successor tariff proposal with the North Carolina Utilities Commission in November 2021, which resembles the utility's net metering tariff design recently approved in South Carolina. North Carolina lawmakers also considered a major piece of energy legislation that originally included substantial changes to the state's community solar and net metering rules. However, these provisions were removed from the bill before its final passage.

## **9. New Mexico**

New Mexico lawmakers enacted legislation during 2021 establishing a statewide community solar program. The bill authorizes community solar facilities of up to 5 MW and includes a capacity carve-out for low-income customers and service organizations. The program will have an initial cap of 200 MW until November 2024, with the Public Regulation Commission determining the cap for later years. The Commission is currently developing rules to implement the program.

## **10. Michigan**

Michigan's Distributed Energy Resources (DER) Rate Design working group met throughout 2021, with a final report released in November. The report outlines three possible paths for DER rate design – a shift to time-of-use rates, compensation based on the value of distributed generation, and a choice between a buy-all sell-all and a net metering analogue with a grid access charge. The Public Service Commission continued to address technical issues related to the current inflow-outflow model.

# TOP SOLAR POLICY TRENDS OF 2021

## **States Showing Support for Time-Varying DG Compensation Structures**

A number of states showed interest in time-varying DG compensation structures during 2021. In South Carolina, regulators approved a net metering successor tariff design featuring time-of-use credit rates, and Duke Energy proposed a similar tariff design in North Carolina. The California Public Utilities Commission released a proposed decision that would involve hourly credit rates calculated each month, while a working group report in Michigan proposes a shift to time-of-use rates as an option for future DG rate design.

## **Utility Proposals for Grid Access Fees on the Rise**

Utility proposals to implement grid access fees for net metering customers increased throughout 2021, with regulators in two states – New York and South Carolina – approving grid access charges based on DG system capacity for new net metering customers. Grid access fee proposals are also currently under consideration in California and North Carolina. The magnitude of these proposals varies substantially, from about \$0.36 per kW to \$11.09 per kW.

## **Promoting Low-Income Community Solar Participation with Carve-Outs and Incentives**

Policymakers continue to pay special attention to encouraging greater low-income customer participation in community solar programs. To accomplish this, several states are adopting carve-outs and additional incentives for low-income participation. In 2021, Delaware and New Mexico approved low-income carve-outs, while New York launched dedicated incentives for low-income community solar projects.

## **Establishing Distinct DG Program Designs for Residential and Non-Residential Classes**

As states consider net metering successor policies, several are opting to establish separate tariff designs for residential and non-residential customer-generators. South Carolina's new Solar Choice tariffs differ significantly for residential and non-residential customers, while a proposed decision in California's Net Metering 3.0 proceeding would subject only residential customers to a new grid participation charge. Connecticut regulators also established separate residential and non-residential DG compensation programs in 2021.

## **Reconsideration of Additional Fees for Customer-Generators**

Although utility proposals for grid access fees are on the rise, previously approved charges for customer-generators are being reconsidered in several places. Following a court order striking down Evergy's DG customer demand charge, the Kansas Corporation Commission removed the charge and declined to adopt a grid access charge or minimum bill in its place. Arizona regulators also removed Arizona Public Service's grid access charge, which applied to net metering customers on the utility's non-demand, time-of-use rate.

## **Increasing DG Program System Size Limits and Aggregate Caps**

A number of states expanded their net metering programs during 2021 by increasing system size limits or aggregate program caps. Maryland lawmakers doubled the state's aggregate cap on net metering capacity, while Massachusetts also loosened certain net metering caps. Legislators in Illinois and Maine both increased system size limits to 5 MW. Hawaii regulators also increased program capacity for HECO's customer grid supply plus and smart export programs.

## **Designing Net Metering Successor Tariffs with Battery Storage in Mind**

As more states work to develop net metering successor tariffs, these are increasingly being designed with the intention of promoting greater solar-plus-storage adoption. The Sacramento Municipal Utility District's successor program is explicitly called the "Solar and Storage Rate", while California regulators' proposed Net Metering 3.0 decision includes a storage rebate. In Idaho, Idaho Power will be considering storage in its study of customer generation.

## **Tying New Incentive Programs to Net Metering Decisions**

A growing number of states have been considering new incentive programs as part of net metering decisions. In Illinois, the state's successor program will include upfront rebates, while net metering compromises reached in the Carolinas include solar incentive proposals for customers participating in Duke Energy's smart thermostat program. Regulators in California have proposed energy storage incentives as part of a Net Metering 3.0 proposed decision, while Mississippi regulators are considering solar rebates to target low-income customers.

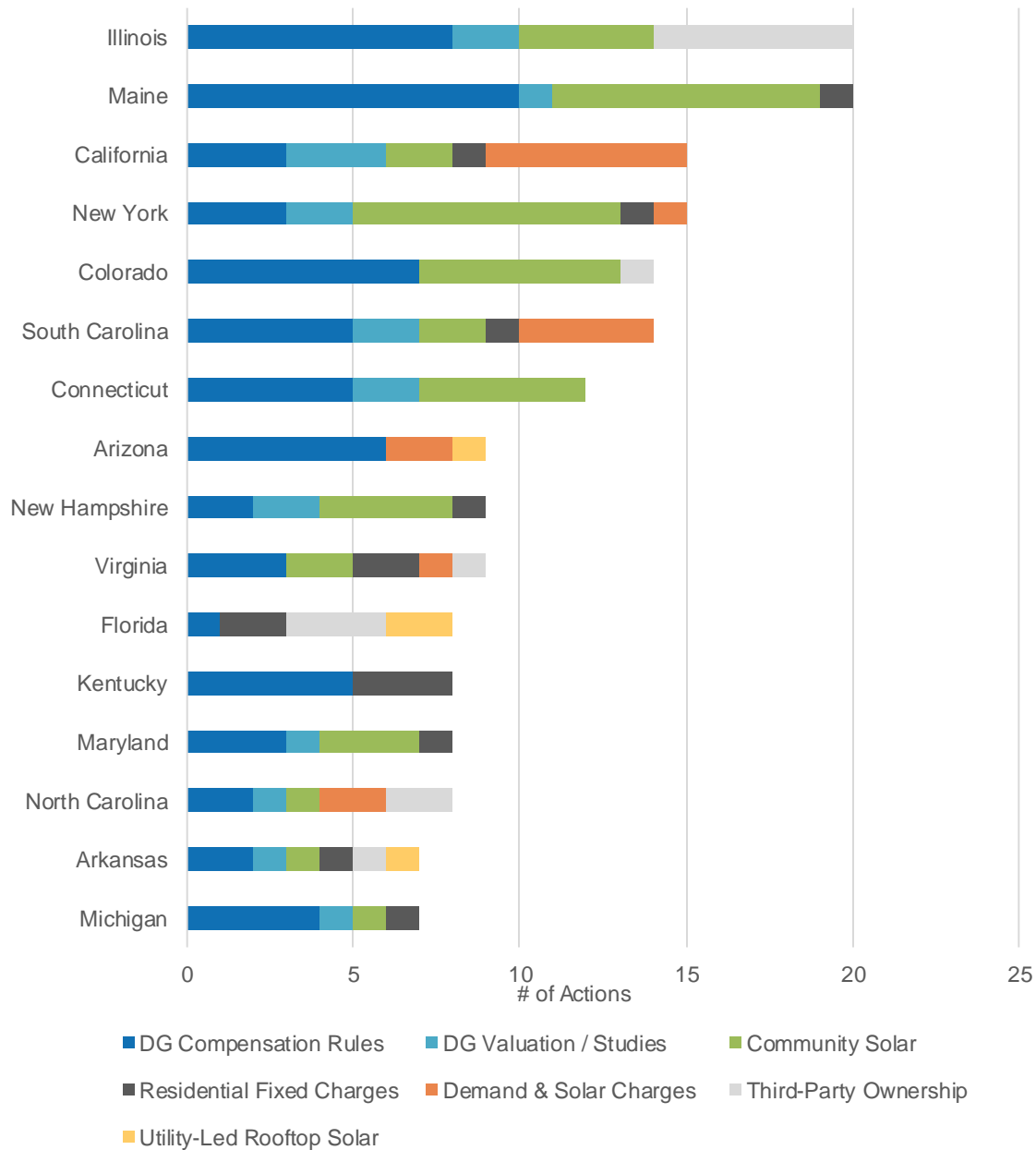
## **Utilizing Competitive Procurement for Community Solar Projects**

Many states are utilizing competitive procurement mechanisms for their community solar programs. The latest state to adopt a community solar policy, New Mexico, is planning to use a competitive procurement model. Many of the more recently adopted community solar programs, such as those in Virginia, Connecticut, and New Jersey, also use competitive procurement processes to select projects. This is in contrast to the virtual net metering model used in several states, as well as Minnesota's community solar gardens program.

## **Interest Continues in Value of Solar Based Compensation**

Although only one state – New York – has explicitly adopted a net metering successor based on the value of solar, states continue to show interest in exploring DG compensation structures based on the value of solar or distributed energy resources. Studies are currently underway in Idaho and New Hampshire to identify the value of solar and inform future changes to the states' net metering rules. In Michigan, a working group report proposes a value of DG tariff as one option for future DG rate design in the state.

**Figure 3. Most Active States of 2021, by Type of Action**

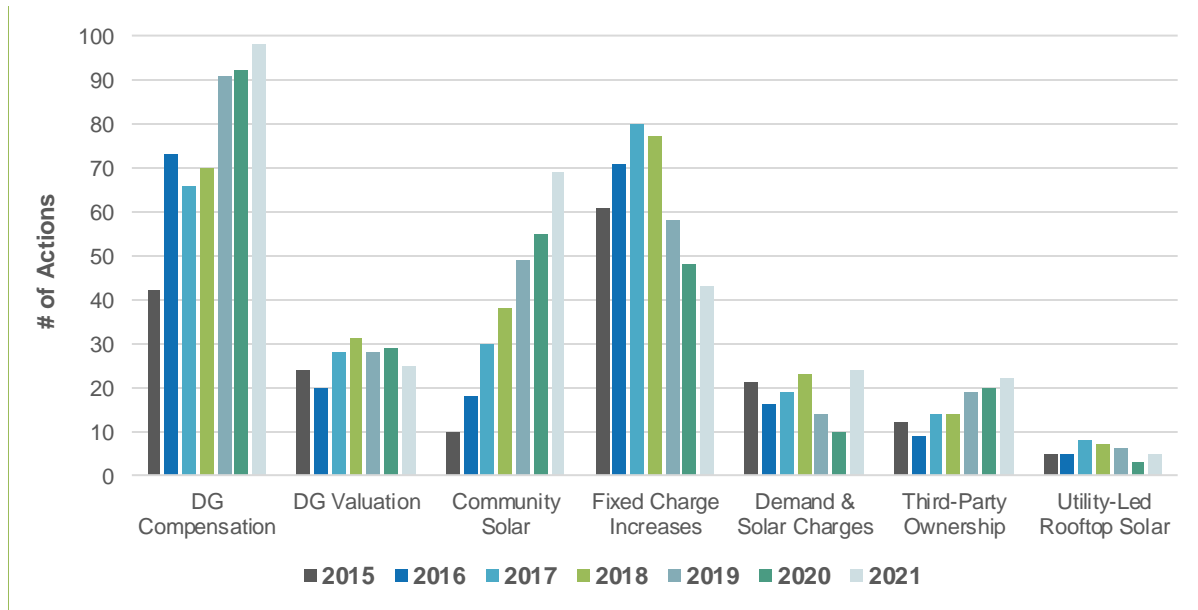


## LOOKING BACK: 2015 - 2021

State and utility action on distributed solar policy and rate design increased in 2021, reaching the highest level of activity yet. States and utilities took a total of 285 actions in 2021, as compared to 257 actions in 2020, 265 actions in 2019, 264 actions in 2018, 249 actions in 2017, 212 actions in 2016, and 175 actions in 2015. Figure 4 shows the total number of solar policy actions taken in each year, by category, while Figure 5 displays the number of states taking action in each category. Note that several actions were considered over multiple years.

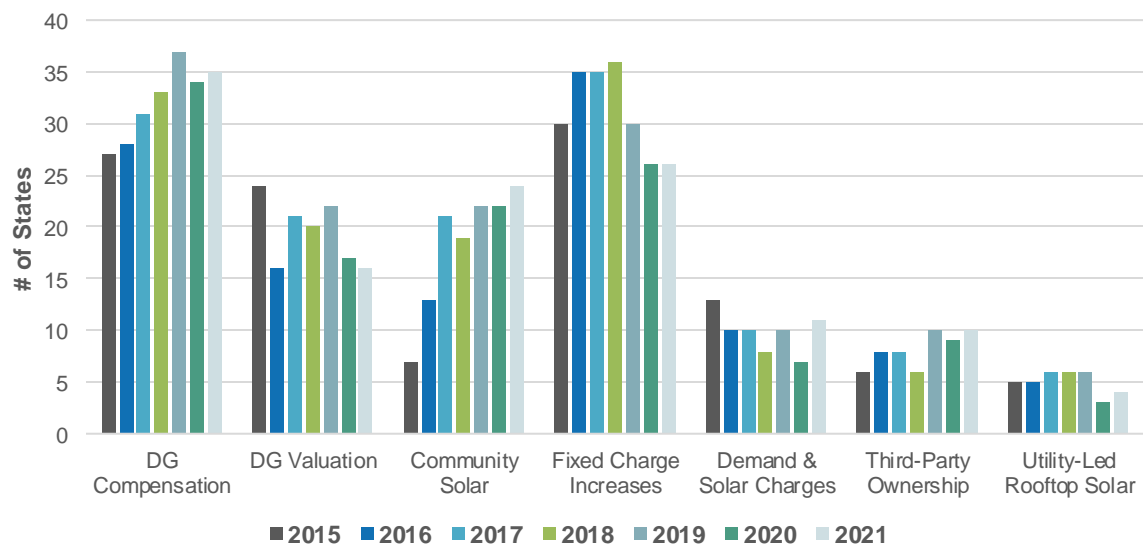
In 2021, activity in all categories except for DG valuation and residential fixed charges increased. Community solar activity has shown the steadiest growth, increasing every year since 2015. Activity related to DG solar charges saw a significant uptick since last year, largely driven by new utility interest in grid access fees, as opposed to demand charges.

**Figure 4. Number of Solar Policy Actions 2015-2021**



The number of states taking solar policy actions increased slightly or held steady in all categories except DG valuation. Overall, a total of 46 states and DC took actions considering changes to distributed solar policy and rate design during the year.

**Figure 5. Number of States Taking Solar Policy Action 2015-2021**



## OVERVIEW OF Q4 2021 POLICY CHANGES

In the fourth quarter of 2021, 38 states plus DC took a total of 162 actions related to distributed solar policy and rate design (Figure 6). Table 2 provides a summary of state actions related to DG compensation, rate design, and solar ownership during Q4 2021. Of the 162 actions identified, the most common were related to DG compensation rules (51), followed by community solar (35), and residential fixed charge and minimum bill increases (32).

**Table 2. Q4 2021 Summary of Policy Actions**

Policy Type	# of Actions	% by Type	# of States
DG compensation rules	51	31%	25
Community solar	35	22%	17 + DC
Residential fixed charge or minimum bill increase	32	20%	22
Residential demand or solar charge	17	10%	8
DG valuation or net metering study	15	9%	12 + DC
Third-party ownership of solar	9	6%	3
Utility-led rooftop PV programs	3	2%	3
<b>Total</b>	<b>162</b>	<b>100%</b>	<b>38 States + DC</b>

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 Q4 2021

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

### California Regulators Issue Net Metering 3.0 Proposed Decision

The California Public Utilities Commission released a proposed decision in the state’s Net Metering 3.0 proceeding in December 2021. The proposed decision features a net billing structure with an instantaneous netting period and excess generation credited at hourly rates based on avoided cost. The proposed decision also includes a monthly grid participation charge based on a customer’s system capacity, market transition credits, and a storage rebate.

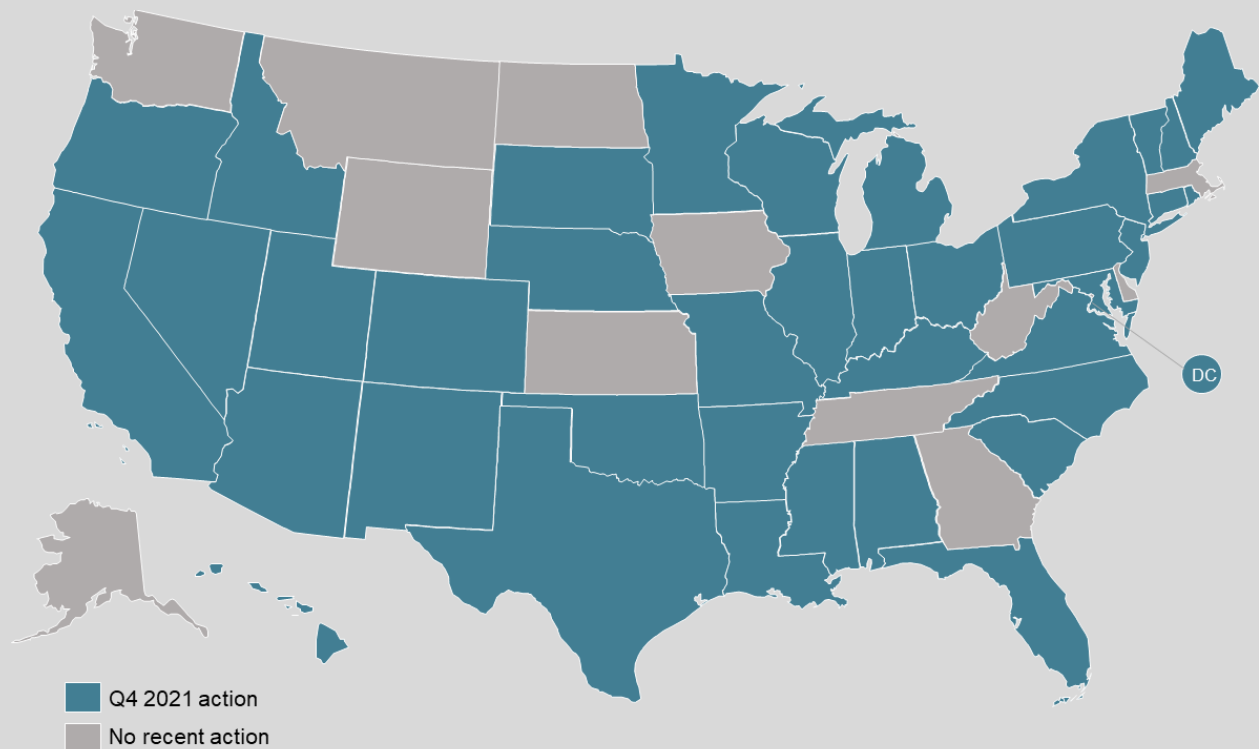
### Duke Energy Files Net Metering Successor Proposal in North Carolina

In November 2021, Duke Energy filed a net metering successor tariff proposal with North Carolina regulators. The proposal, which has the support of many stakeholders in the state, resembles the utility’s net metering successor recently approved in South Carolina. The proposed tariff features monthly time-of-use netting periods, a minimum bill, non-bypassable charges based on system capacity, and a grid access fee for larger systems.

## Arizona Regulators Remove Arizona Public Service Grid Access Charge

As part of a November 2021 decision in Arizona Public Service's general rate case, the Arizona Corporation Commission removed the utility's existing grid access charge for distributed solar customers participating in the TOU-E tariff (time-of-use rates with no demand charges). The Commission found that these solar customers on the TOU-E rate generally cover their costs of service within a range of other residential customers without revenue from the grid access charge.

**Figure 6.** Q4 2021 Action on DG Compensation, Rate Design, & Solar Ownership Policies



## Distributed Energy Resources Rate Design Study Released in Michigan

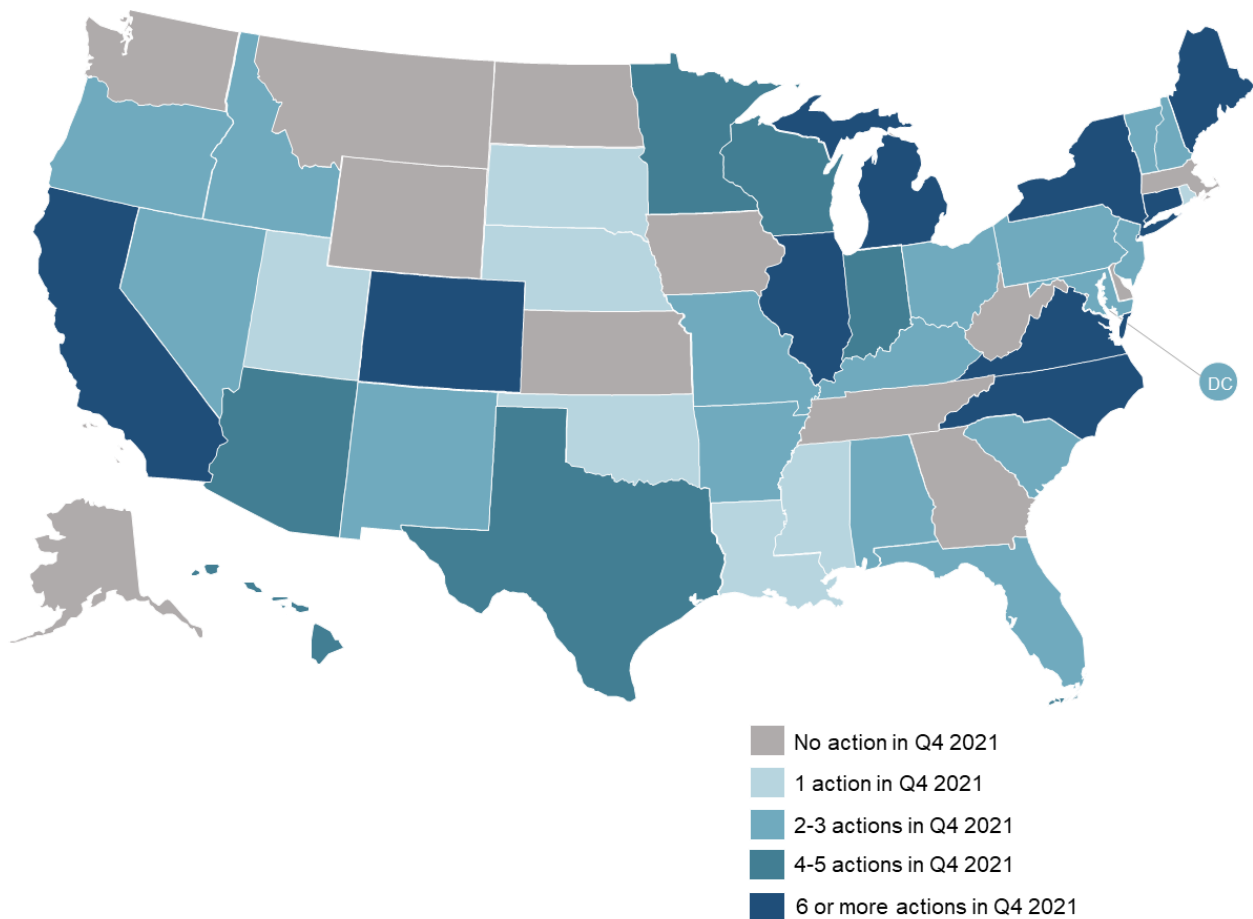
Michigan's final report on rate design for distributed energy resources (DERs) was released in November 2021. The study outlines three possible paths for DER rate design in the state: (1) shifting new customers to time-of-use rates while maintaining the current inflow-outflow model, (2) migrating customers to a new rate based on the value of distributed generation, and (3) offering new customers a choice between a buy-all, sell-all rate and a net metering analogue with a grid access charge.



## Pedernales Electric Cooperative Approves Net Metering Changes in Texas

In Texas, Pedernales Electric Cooperative approved changes to its net metering rates in December 2021, following the release of its value of solar study the previous month. The cooperative is moving from a monthly net metering structure to a net billing regime beginning in March 2022, which will credit all excess generation at a \$0.05377 per kWh sustainable power credit rate.

**Figure 7.** Q4 2021 Action on Solar Policy & Rate Design, by Number of Actions



# 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
- Excel spreadsheet file of all actions taken during the quarter and separate Powerpoint file of all summary maps available upon request
- 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 \$1,500 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.

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- 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

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- 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

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- 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

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<b>All-Tech Subscription</b> <i>(Includes 50 States of Solar report, 50 States of Grid Modernization report, &amp; 50 States of Electric Vehicles report; plus comprehensive biweekly legislative &amp; regulatory tracking; policy data sheets, &amp; curated monthly policy updates)</i>	\$10,500	N/A

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