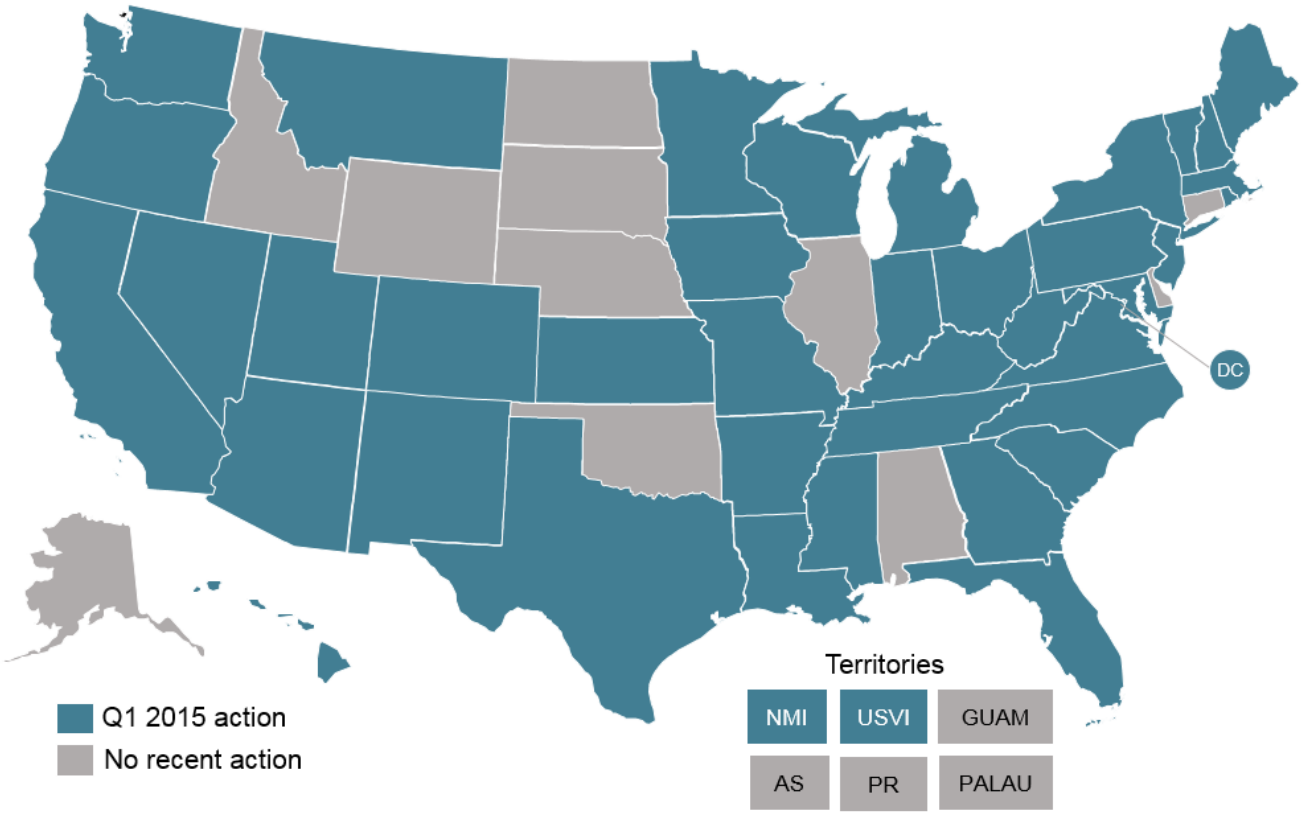
THE 50 STATES OF SOLAR



A QUARTERLY LOOK AT AMERICA'S FAST-EVOLVING DISTRIBUTED SOLAR POLICY CONVERSATION

Q1 2015

AUTHORS

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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 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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THE STATE OF STATE DISTRIBUTED SOLAR POLICY AND MARKETS

Distributed solar continues to thrive in many U.S. markets. Through the end of 2014, more than 600,000 homes and businesses had installed on-site solar.[1] The residential market grew by more than 50% annually in 2012, 2013, and 2014[2]—a trend that some experts predict will continue for 2015 and 2016.[3] Although other states have rapidly expanding distributed solar markets, California accounts for approximately half of all residential solar installations. More than two-thirds of residential solar installed in 2013 used a third-party ownership model (i.e., solar leasing or a third-party power purchase agreement(PPA)),[4] although tailored solar loan options are now rising in popularity.

Community solar programs are expanding into new states and utility service areas, yet this option is not available to most U.S. residential customers. Community solar has sparked strong interest among many electric utilities.[5] As of August 2014, there were 57 active or proposed utility-offered community solar programs in 22 states.[6] These utility programs range significantly in design and size. For example, Xcel Energy's community solar program in Colorado, stemming from Colorado's landmark 2010 community solar legislation, is currently capped at 30 megawatts annually, whereas Xcel Energy's solicitation for community solar projects in Minnesota resulted in applications for more than 430 megawatts (MW) in proposed projects, which if developed, will make it the largest community solar program of its kind in the U.S.[7]

Despite strong near-term growth projections for distributed solar, mid- to long-term policy uncertainties pose a major challenge for the industry.

- At the federal level, an important policy supporting residential solar, the 30% investment tax credit, is set to expire after December 31, 2016.[8]
- At the state level, the general trends are that solar rebate incentives are decreasing, solar tax incentives are expiring, renewable portfolio standards are nearing their final targets, net metering caps are being reached, and net metering and rate design are undergoing regulatory and legislative review.

Rate design, net metering, and distributed solar ownership are among the most contentious ongoing renewable energy policy issues. Some states have initiated studies or opened dockets to address these issues, and others have already approved some changes.

Many utilities have proposed or advocated for changes to net metering rules or residential customer rate design. Many utilities claim that net-metered customers are unfairly subsidized under existing net metering rules. The utility industry's chief concern is the recovery of its fixed costs to avoid both stranded assets and cost shifts, where non-solar customers pay a larger share of the fixed costs than solar customers who continue to use the grid.[9] Consequently, many utilities have proposed

net metering changes, such as reducing compensation rates for electricity customers put onto the grid, or rate design changes that impose higher costs on solar customers. Thus far, no consensus on the presence or absence of a cost shift has been reached based on empirical evidence. Many (but not all—e.g., Louisiana) studies conducted by state governments on these issues show that existing net-metered customers produce net benefits to all customers (e.g., Mississippi) and that solar electricity production caries substantial value comparable to or in excess of the retail rate (e.g., Maine).

PURPOSE OF THIS REPORT

The purpose of this quarterly report is to provide state lawmakers and regulators, electric utilities, the solar industry, and other energy stakeholders with timely, accurate, informative, and unbiased quarterly updates on how states are choosing to study, adopt, implement, amend, or discontinue policies associated with distributed solar photovoltaics (PV). This report catalogues proposed and enacted legislative and regulatory policy and rate design changes affecting the value proposition of distributed solar PV during the first quarter (Q1) of 2015 (January 1-March 31), with an emphasis on the residential sector.

APPROACH

The authors identified relevant policy changes through state utility commission docket searches on state websites or through Advanced Energy Economy's DocketDash tool (http://powersuite.aee.net), bill searches using Advanced Energy Legislation Tracker (www.aeltracker.org) and LexisNexis (www.lexisnexis.com), energy news articles, and direct communication with stakeholders and regulators in the industry. Despite the authors' best efforts to be comprehensive, omissions might have occurred due to relevant information, including dockets, being unavailable; readers are invited to send omissions or corrections to the authors for inclusion in future editions.

Questions Addressed

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

- How are (1) state regulators and legislatures and (2) investor-owned and public power 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 residential solar markets potentially affected by policy or regulatory decisions on community solar, third-party solar ownership and financing, and utility-led residential rooftop solar programs?

Actions Included

This quarterly report focuses on cataloguing and describing important proposed and adopted policy changes affecting solar customer-generators of investor-owned utilities and large publicly-owned utilities, along with some notable examples (but not a comprehensive review) of rate design changes at electric cooperatives. Specifically, actions tracked in this issue include:

- Significant changes to state or local **net metering** or **community solar** laws and rules; including program caps; system size limits; aggregate net metering rules; and compensation rates for net excess generation
- Legislative or regulatory-led efforts to study the **value of solar**, **net metering**, or **distributed generation policy**, e.g., through a regulatory docket or a cost-benefit analysis
- Utility-initiated rate requests for **charges applicable only to residential 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 **fixed charges** for all residential customers
- Changes to the legality of **third-party solar ownership**, including solar leasing and solar third-party solar power purchase agreements, and proposed **utility-led rooftop solar** programs

In general, only legislation that has been passed by at least one chamber is included, although proposed legislation related to third-party sales is included irrespective of its present legislative status, as only a small number of bills related to this policy have been introduced.

Actions Excluded

In addition to excluding most legislation relating to net metering and rate design that has only been introduced, this report excludes a review of state actions pertaining to solar incentives, as well as more general rate design changes, like decoupling or time-of-use tariffs. The report also excludes changes to solar access laws, interconnection rules, and renewable portfolio standards. Details and updates on these policies and incentives are available at www.dsireusa.org.

OVERVIEW OF Q1 2015 POLICY CHANGES

Summary of State Actions

Table 1 provides a summary of state action related to net metering, rate design, or solar ownership during Q1 2015. Of the 70 actions catalogued, 22 were related to net metering and community solar, followed by fixed charge increases (19) and studies or discussions of net metering and solar valuation (15). Box 1 highlights the top actions of Q1 2015, described in greater detail in the following sections.

The actions occurred across thirty-nine states, two territories, and the District of Columbia in Q1 2015 (Figure 1).

Table 1. Summary of Policy Actions (Q1 2015)

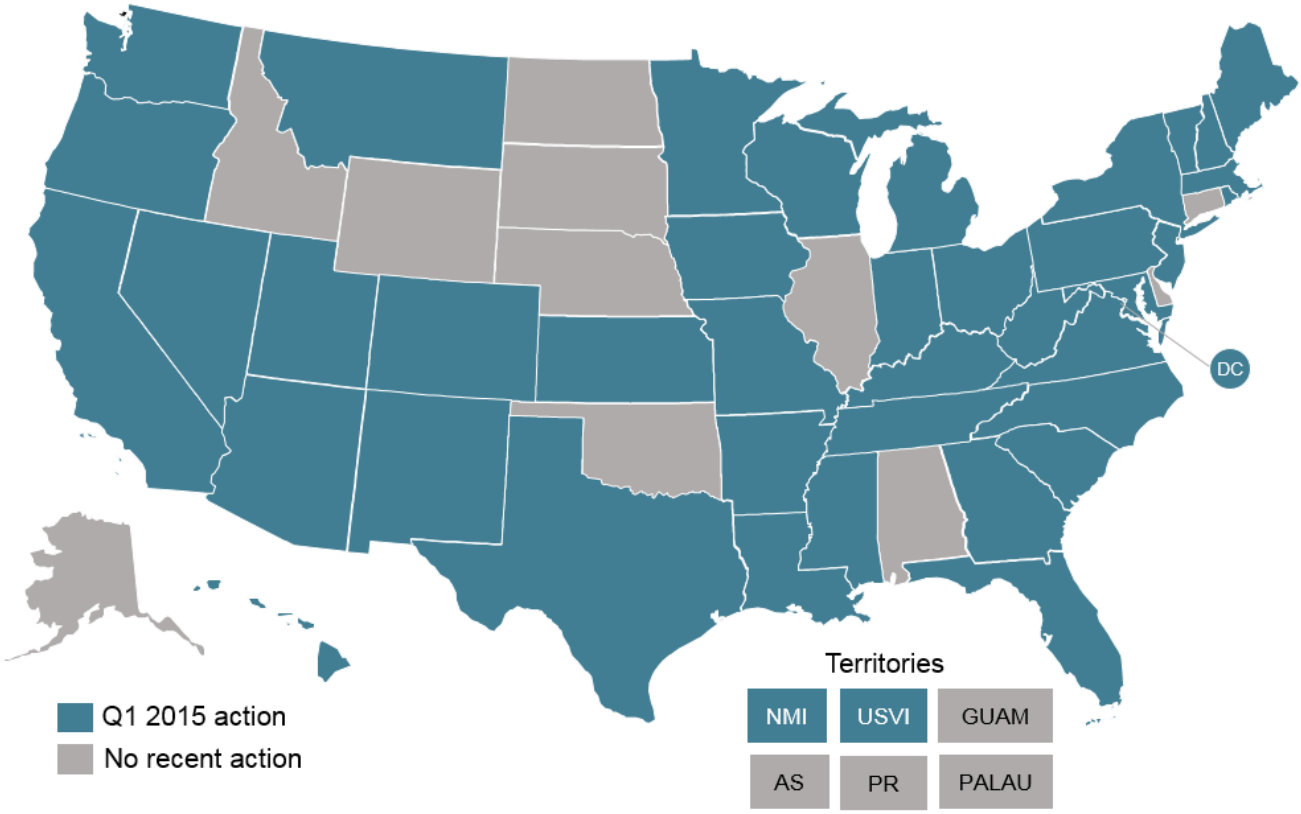
Policy Type	# of Actions	% by Type	Affected States/ Districts/ Territories
Net metering and community solar	22	31%	22
Solar valuation or net metering study	15	21%	15
Fixed charge increase for all customers	19	27%	10
Charges applied to solar customers only	5	7%	5
Third-party ownership of solar	6	9%	5
Utility-owned solar PV programs	3	4%	3
Total	70	100%	39 states + DC + 2 territories

Note: The "Affected States/ Districts/ Territories" total is not the sum of the cells, as some states have multiple actions.

Box 1. In Brief: Top 5 Solar Policy Developments of Q1 2015

1. **NET METERING**
   South Carolina became the 44th state to create net metering rules when regulators approved a comprehensive settlement agreement, and **Mississippi** is expected in Q2 to issue a proposed rule establishing net metering in the state for the first time.
2. **FIXED CHARGES**
   Across 24 utilities in 13 states, the average proposed increase in monthly residential fixed charges during Q4 2014 – Q1 2015 was $8.81 (58%). The average existing charge was $10.37 and the average proposed new charge was $19.18.
3. **SOLAR CHARGES**
   The board of public power utility Salt River Project in **Arizona** approved new rates that include approximately $50 in new demand and other charges for solar customers, which are among the highest solar charges levied by any utility in the nation to date. SolarCity is appealing the decision.
4. **THIRD-PARTY OWNERSHIP**
   As **South Carolina's** settlement agreement cleared the way for solar leasing, bills were filed to legalize some types of third-party ownership models in **Georgia**, **Florida**, and **North Carolina**. An initiative in Florida to put the issue on the 2016 ballot reached a critical milestone in March, obtaining enough signatories to trigger the required review of the language by the Florida Supreme Court.
5. **UTILITY-OWNED ROOFTOP SOLAR**
   Pursuant to a Track 1 Order adopting a regulatory policy framework in **New York** as part of the Reforming the Energy Vision, utilities will generally be unable to own distributed solar.

Figure 1. Recent Action on Net Metering, Rate Design, and Solar Ownership Policies



NET METERING AND COMMUNITY SOLAR POLICY CHANGES

Net metering policy action in Q1 2015 came in several different forms (see Table 2). Most notable was South Carolina's adoption of legally-binding, statewide net metering rules, making it the 44th state to do so. Following this trend, the Mississippi Public Service Commission is currently considering a plan to implement net metering in the state.[1]

Table 2. Summary of Net Metering and Community Solar Changes (Q1 2015)

Type of Change	# of Changes	% by Type	Affected States/ Districts/ Territories
Net metering rules	11	31%	11
Net excess generation	7	20%	6
Aggregate cap	6	17%	6
System size limits	4	11%	4
Meter aggregation	2	6%	2
Community solar	5	14%	5
Total	35	100%	19 states + DC + 2 territories

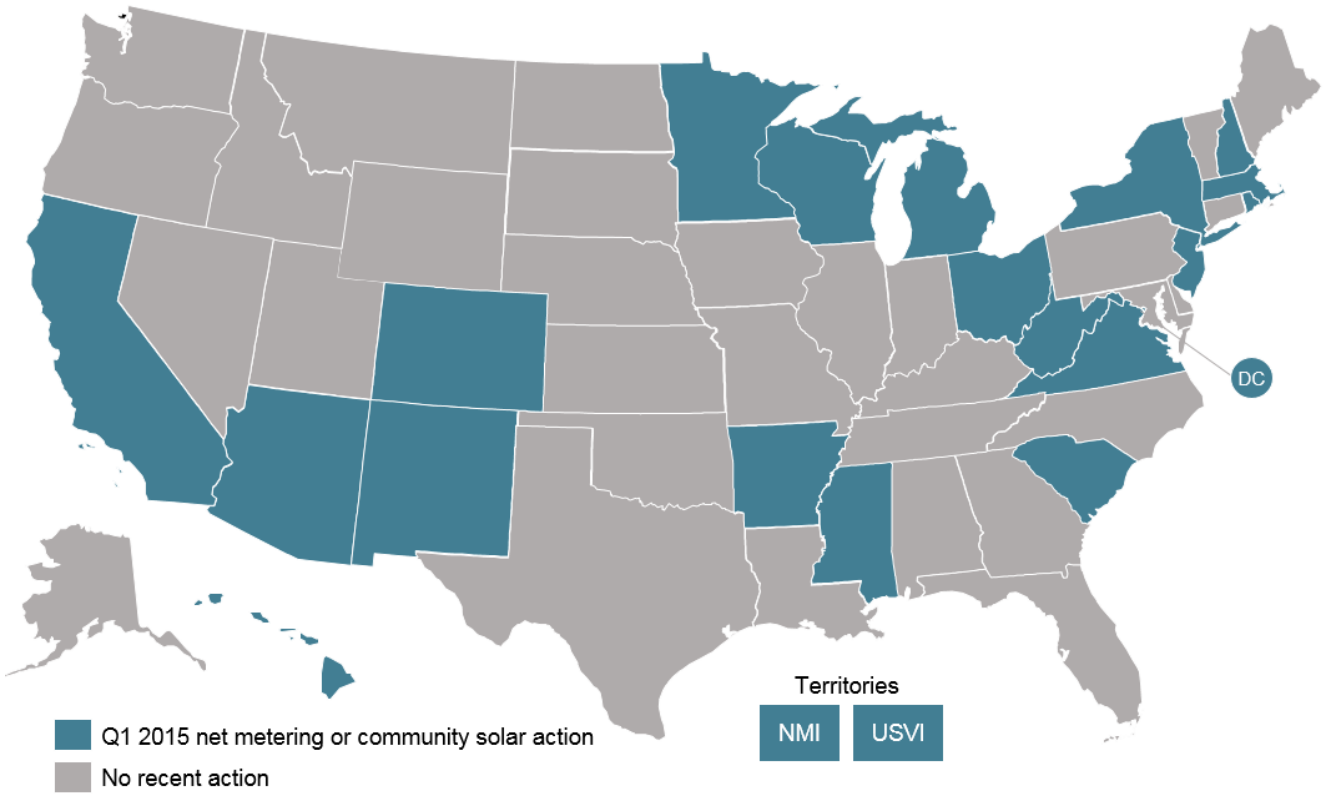
Six states saw actions regarding credit for net excess generation this quarter, five of which were actions related to reducing the rate paid for net excess generation from retail rate to avoided cost or near-avoided cost rates. In Arizona, Hawaii, and New Mexico, investor-owned utilities have pending proposals to reduce compensation rates in cases before their respective utility commissions. Arkansas' proposed change is legislative. In Wisconsin, a previous Public Service Commission decision allowing a utility to reduce compensation for net excess generation was overturned and remanded for further fact-finding.

Several states also saw action to adjust limits on system size and aggregate capacity. Proposed legislation in Arkansas would both limit system size for residential customers to 100% of the highest monthly usage over the previous twelve months and increase the system size for non-residential customers. While a Virginia bill passed increasing the eligible system size for non-residential customers, Wisconsin and the U.S. Virgin Islands saw actions to reduce their eligible system sizes for some net metering customers.

Finally, five states saw actions to amend or establish community solar programs. As Xcel Energy's community solar program in Colorado was expanded, a request to reduce the size of Xcel's Minnesota program was declined by the state's Public Utilities Commission. A bill making its way through Hawaii's legislature may open the door to community solar in the state. In Michigan, Consumers Energy proposed a new 10 MW community solar program.

[1] During the editing of this issue, the Mississippi Public Service Commission released a proposed rule on net metering.

Figure 2. Action on Net Metering and Community Solar Policy (Q1 2015)



Box 2. A Note on Net Metering and Community Solar Terminology

"Net excess generation" includes changes to how excess electricity exported to the grid is compensated. An "aggregate cap" refers to the total limit on net-metered systems allowed by a state or a utility, whereas the "system size limits" are PV capacity sizes allowed to net meter. "Aggregate net metering" refers to a program design allowing one or more customers to aggregate multiple electric meters for the purpose of allocating net metering credits. Virtual net metering is a type of aggregate net metering, where commonly credits from one solar PV system are used to offset *multiple* customers' electricity bills. Meter aggregation is another type of aggregate net metering, in which a single customer may be able to offset electrical use from multiple meters on his or her property.[10] "Net metering rules" encompass other policy changes to net metering not covered by any of the other categories.

"Community solar" refers to a voluntary program where a solar PV system "provides power and/or financial benefits to, or is owned by, multiple community members."[11] While some community solar projects share similarities with utility-scale solar projects (e.g., large in size, located off-site from consumption, ground-mounted systems, on utility-side of the meter), this report treats it as a type of distributed solar because it is community-focused and provides solar benefits to residential customers.

Table 3. Net Metering and Community Solar Policy Updates (Q1 2015)

State	Type of Change	Description	Source
Arizona 	Net Excess Generation	In March 2015, Tucson Electric Power and UniSource Energy Services, two investor-owned utilities owned by Fortis, submitted requests to the Arizona Corporation Commission (ACC) to revise the bill credits customers receive for net excess generation. New net metering customers would receive credits equal to what the utility pays to purchase utility-scale renewable energy, rather than the existing retail rate. Credits would continue to roll over month-to-month.	Dockets No. E01933A-15-0100 and E-04204A-15-0099
Arkansas 	Net Excess Generation, Aggregate Cap, System Size, Net Metering Rules	Both chambers passed H.B. 1004 in Q1 2015. The bill requires utilities to compensate net metering customers for net excess generation at the annual average avoided cost rate (if the customer opts to); adds a system size limit of 100% of the highest monthly usage in the previous 12 months for residential customers; allows net metering credits to be carried forward to subsequent billing cycles indefinitely; allows the Public Service Commission (PSC) to increase net metering for non-residential customers beyond the 300 kW system capacity limit; and requires the PSC to open a docket to determine fees for net metering customers.	H.B. 1004
California 	Net Metering Rules	In July 2014, the California Public Utilities Commission (CPUC) issued an order establishing a new proceeding to address a net metering successor tariff and other net metering issues pursuant to A.B. 327. The California Public Utilities Commission (CPUC) is required to develop an alternative tariff to net metering by the end of 2015, as investor-owned utilities are only required to offer net metering through July 1, 2017 (or when the program cap is reached). A tool for evaluating net metering alternatives was made publicly available in Q1.	Docket No. R1407002, CPUC Proceedings on Development of Public Tool
Colorado 	Community Solar Program Cap	At the end of December 2014, the Public Utilities Commission increased the Xcel Energy community solar program from an annual maximum of 6 MW to a program size of 6.5 MW to 30 MW per year for 2014, 2015, and 2016.	Docket No. 13A-0836E

District of Columbia 	Community Solar Rules	The Community Renewable Energy Amendment Act of 2013 established a community net metering program in the District. In September 2013, the PUC published first Notice of Rulemaking to amend the net metering laws to include standards for community net metering. The Public Service Commission amended the proposed rules and in January 2015 issued a Notice of Second Proposed Rulemaking. The proposed rules would allow third-party owned and operated community energy facilities up to 5 MW; if the energy is not fully subscribed then the Standard of Service Administrator would have to buy it at PJM locational marginal price. The Standard Offer Service Rules would apply to electric customers who opted not to buy electricity from certified competitive retail providers, for whom the PUC could determine rates.	Case No. FC1017
Hawaii 	Aggregate Cap, Net Excess Generation, Net Metering Rules	In August 2014, Hawaiian Electric Companies (HECO) proposed a Distributed Generation Integration Plan (DGIP) for customers beginning in 2017. In January 2015, HECO proposed a Transitional Distributed Generation Tariff (TDGT) that would discontinue net metering and replace it with a tariff where any electricity exported to the grid would be purchased at a rate substantially lower than the retail rate. In March of 2015, the DGIP and TDGT were both deemed to be "insufficiently supported" by the Public Utility Commission (PUC). No direct ruling was made on particular elements of HECO's proposal, but the PUC ordered HECO to come up with a two-phase plan to clear the interconnection backlog of 7,200 customers. Circuits previously capped at holding 120% of daytime minimum load in 2013 will now be re-opened to solar until a new cap of 250% of daytime minimum load is reached. (Hawaii's aggregate caps are based on individual circuit load.)	Docket No. 2014-0192
	Community Solar Rules	In March 2015, a bill that would establish a "community-based renewable energy program" passed the House. The bill explicitly prohibits potential cross-subsidization and allows both utilities and private individuals and companies to own or operate community-based renewable energy projects.	H.B. 484

Massachusetts 	Aggregate Cap	In early January 2015, the Department of Public Utilities (DPU) adopted an order to increase aggregate capacity caps to 5% of a distribution company's historical peak load for public facilities and 4% for private facilities. This maintains the increases ordered by S.B. 2214 in late July 2014.	Docket No. 14-104
Michigan 	Community Solar Rules	In January 2015, Consumers Energy proposed a 10 MW community solar pilot program. The proposal, which was pending before the Michigan Public Service Commission at the end of Q1 2015, would credit participants at a value of solar rate of $0.075 per kWh.	Docket No. 17752
Minnesota 	Community Solar Program Cap	In March 2015, Xcel Energy requested that the Minnesota Public Utilities Commission (PUC) reduce the aggregate size of the community solar gardens program from 431 MW of proposed capacity to 80 MW. In a reply letter to Xcel Energy, the PUC declined to change the program rules for the time being, stating it would more fully evaluate program implementation in Q2 or Q3 2015.	Docket No.13-867
	Net Excess Generation, Net Metering Rules	In December 2014, the PUC issued proposed rules pursuant to H.F. 729 of 2013. The proposed rules prohibit standby charges for net-metered customers (100 kW or less), provide compensation rates for net excess generation, allow meter aggregation, and specify renewable energy certificate (REC) ownership with the customer-generator. The PUC accepted comments on the proposed rule in Q1 2015.	Docket No. 13-729
Mississippi 	Net Metering Rules	The Mississippi Public Service Commission is expected to consider allowing public comment in Q2 2015 on a plan to implement net metering. (Mississippi is one of only six states without state-developed mandatory net metering rules for certain utilities.)	Reporting of PSC interest

New Hampshire 	Aggregate Net Metering	S.B. 98, enacted in 2013, directed the New Hampshire Public Utilities Commission to develop group (i.e., aggregate) net metering rules. Interim rules were established in January 2014, an initial proposal was submitted in June 2014, and comments on the proposal were accepted into September. The Commission adopted final group net metering rules in January 2015.	Docket No. DRM 13-311
New Jersey 	Aggregate Cap	S.B. 2420 would increase the net metering cap to 4% of the total annual electricity sold by the supplier. Net metering is currently capped at 2.5% of peak electricity demand. The bill passed the Senate and is currently at the Assembly Committee on Telecommunications and Utilities.	S.B. 2420
New Mexico 	Net Excess Generation	In December 2014, PNM Resources proposed eliminating "net metering banking" (month-to-month carryover of credits earned from net excess generation) for new installations starting in 2016. The case is pending before the New Mexico Public Regulation Commission.	Docket No. 14-00332-UT
New York 	Aggregate Net Metering	In February 2015, the New York Public Service Commission ordered a stay on elements of its December 2014 net metering order, pending further guidance on new regulations. The PSC removed a deadline for utilities to file tariffs that reflected the issuance of excess remote net energy metering in volumetric rather than monetary terms. This stay reflects concerns that the new regulations would harm the project economics of solar projects using remote net metering.	NY PSC Stay of Order
Northern Mariana Islands 	Net Metering Rules	In February 2015, P.L. 18-75 was enacted. It prioritizes net metering for the Commonwealth Healthcare Corp. and the Public School System over residential net metering customers. (The capacity in the Commonwealth Utility Corporation's net metering queue exceeds the aggregate capacity limit of accommodating both customer classes.)	P.L. 18-75

Ohio 	Net Metering Rules	In May 2014, the Public Utilities Commission of Ohio (PUCO) adopted revised net metering rules, which granted NEM eligibility to systems generating up to 120% of on-site load. American Electric Power and FirstEnergy appealed the ruling to the Ohio Supreme Court. In November 2014, PUCO withdrew the proposed rules from the Joint Committee on Agency Rule Review (JCARR). In Q1 2015, PUCO scheduled a workshop for May 5, 2015, to get additional input from stakeholders on its net metering rules as it considers additional revisions.	Docket No. 12-2050-EL-ORD
Rhode Island 	Aggregate Cap, Net Metering Rules	Pursuant to 2014 S.B. 2690, National Grid submitted a tariff advice filing to the Rhode Island Public Utilities Commission to amend its net metering program to eliminate the program cap of 3% and to expand the rules for participation of municipal entities to all public entities.	Docket No. 4549
South Carolina 	Net Metering Rules	In March 2015, the Public Service Commission of South Carolina approved a settlement agreement that stipulates how costs and benefits of solar should be derived for tariff purposes. The approval of the settlement agreement makes South Carolina the 44th state to enact legally-binding, statewide net metering rules. Approval of specific tariffs are pending.	Docket 2014-246 E
U.S. Virgin Islands 	System Size, Net Metering Rules	In December 2014, Act 7705 was signed into law. It reduces the eligible size for net metering to systems 10 kW or smaller, sunsets systems larger than 10 kW in 2025, and prohibits net metering to renters and non-property owners.	Act 7705
Virginia 	System Size	In March 2015, S.B. 1395 was signed into law, increasing the net metering system size limits for non-residential customers from 500 kW to 1000 kW effective July 2015.	S.B. 1395

West Virginia 	Aggregate Cap, Net Metering Rules	In March 2015, H.B. 2201 was signed into law after a prior version was vetoed. The bill prohibits "cross-subsidization" of ratepayers potentially caused by net metering tariffs, requires the Public Service Commission to investigate current and adopt new net metering and interconnection rules, re-affirms existing investor-owned utility limits of 3% of aggregate load generated by net-metered customers, and reserves no less than 0.5% of aggregate load for residential customer-generators.	H.B. 2201
Wisconsin 	Net Excess Generation, System Size	In February 2015, a Dane County Circuit Court judge overturned two Public Service Commission (PSC) rulings from Wisconsin Public Service Company's (WPSCo) 2013 rate case and remanded the decisions to the PSC for additional fact-finding (while keeping the current rules in place). The PSC rulings had allowed WPSCo to reduce the eligible size of net-metered renewable energy systems from 100 kW to 20 kW and to keep a monthly true-up period for net excess generation, which meant customers were credited only at the avoided cost rate for net excess generation (whereas other utilities had an annual banking period, with net excess generation credits rolling over month-to-month at the retail rate).	Case No. 2014CV000169 and 2013CV000851

DISTRIBUTED SOLAR VALUATION AND NET METERING STUDIES

There are many debates underway about how to properly value key attributes of distributed generation while also addressing potential cost-shifting among customer-generators and other customers. During Q1 2015, at least 15 states published studies, proposed new studies, or had ongoing, formal regulatory discussions regarding the proper value of distributed solar generation and net metering in general (see Figure 3). South Carolina and Utah have approved basic analytical frameworks for approaching the valuation of distributed generation. Studies conducted via the utility regulatory processes that include specific policy recommendations have recently been published in either draft or final form in Louisiana, Maine, and Hawaii. Regulators in West Virginia received a legislative mandate to re-examine net metering rules, while legislators in Montana and New Hampshire are considering similar mandates. Table 4 describes these studies and dockets in more detail.

Figure 3. Action on Studying Solar or Net Metering (Q1 2015)

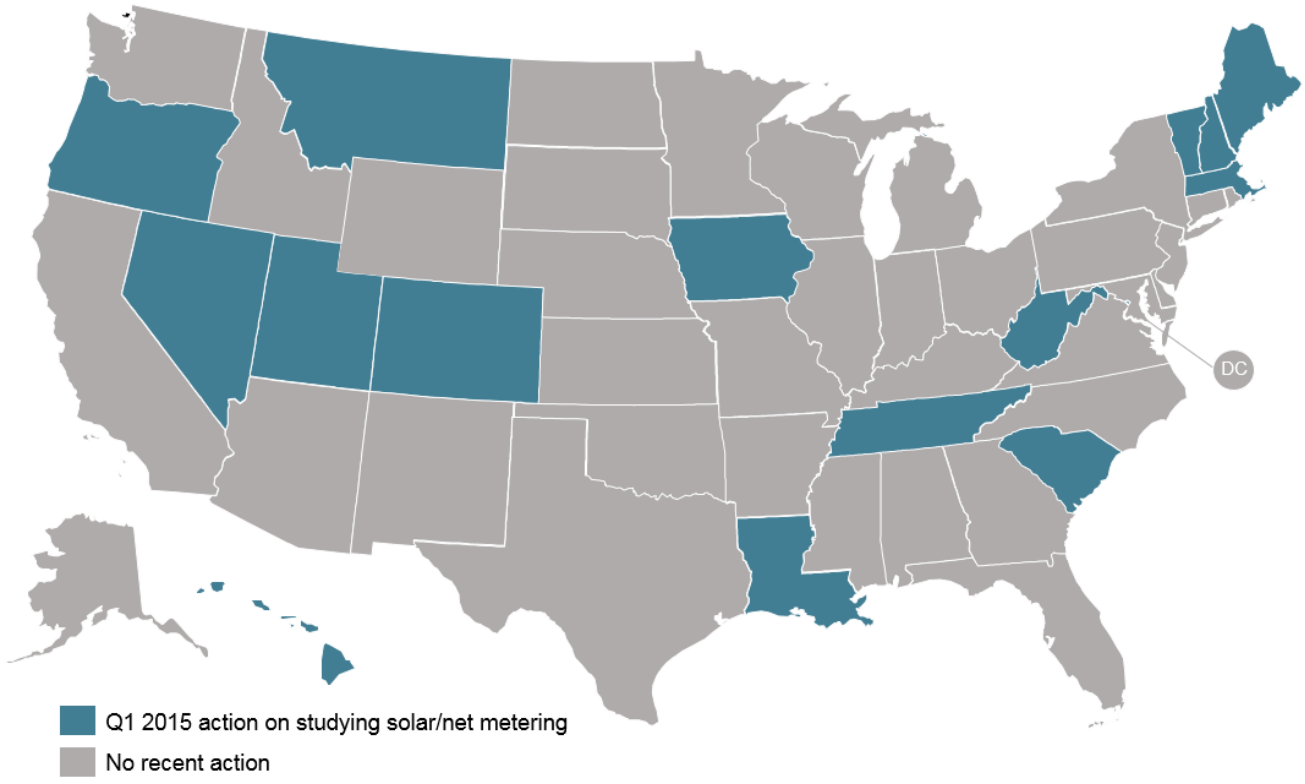


Table 4. Solar and Net Metering Study Updates (Q1 2015)

State	Description	Source
Colorado 	In March 2014, the Public Utilities Commission opened a miscellaneous proceeding to consider the issues of retail renewable distributed generation and net metering. The PUC held hearings in July, October, and December. The final hearing is planned for April 23, 2015.	Docket No. 14M-0235E
Hawaii 	In August 2014, the Hawaii Public Utilities Commission (PUC) opened a docket to investigate distributed energy resource policies. On March 31st, the public staff issued a report including several proposals to address "high priority challenges associated with continued growth in distributed energy resources." The report addresses methods to quickly process interconnection requests, enable distributed energy market generation growth, and create new distributed generation market choices for customers.	Docket No. 2014-0192
Iowa 	In January 2014, the Iowa Utilities Board (IUB) issued an order commencing an inquiry into issues surrounding distributed generation (DG), including possible changes to net metering and interconnection rules, which remains pending before the IUB. In Q1 2015, the IUB finalized a comprehensive guide for residential and small business customers, *Informational Guide for On-Site Generation (Distributed Generation)*, and received comments on updates to its DG interconnection rules.	NOI-2014-0001
Louisiana 	In May 2014, the Louisiana Public Service Commission hired a consulting group to study the impact of net metering in the State. The draft report released in February 2015 shows that the costs of solar net metering outweigh benefits to the ratepayers. According to the study, NEM customers do not pay their full cost of service and are subsidized by other ratepayers. The draft report and comments are available in the docket. The final report is due this spring.	X-33192 Draft NEM Study
Maine 	Enacted in April 2014, S.P. 644 directed the Maine Public Utilities Commission to prepare a report on the value of distributed solar energy generation to the state. The final study was released on March 3, 2015. The study determined the first-year value of distributed solar to be $0.182 per kWh and the long term (25-year levelized) value to be $0.337 per kWh.	Docket No. 2014-00171

Massachusetts 	The Massachusetts Net Metering Task Force, established by Section 7, of Chapter 251 of the Acts of 2014, concluded its work in March 2015. The Task Force was charged with evaluating alternatives to net metering for the state's 1600 MW goal. The report and findings from the Taskforce will be sent to the Massachusetts legislature in Q2 2015. In the interim, the public sector project queue has already exceeded the net metering cap in some utility territories.	Net Metering Allocation Report MA DOER Net Metering Task Force Updates
Montana 	In March 2015, a Senate joint resolution requiring a study of the benefits and costs of net-metered energy generation systems to public utilities and rural electric cooperatives, as well as the benefits and costs to customers who do not use net-metered energy generation systems passed the state Senate. At the end of March 2015, the resolution was in the House Committee on Federal Relations, Energy, and Telecommunications.	S.J.R. 12
Nevada 	The Nevada Public Utilities Commission (PUC) is currently deciding whether to finalize a draft order that would require Nevada Power to conduct a cost-of-service study analyzing whether distributed generation customers should be put in their own rate class. A previous study conducted in July 2014 evaluated the costs and benefits of net metering in Nevada.	Docket No. 14-06009 (Draft Order 44715)
New Hampshire 	S.B. 117 requires an investigation of the costs and benefits of net-metered renewable energy generation. This bill passed the state Senate, and was in the House Committee on Science, Technology, and Environment at the end of March 2015.	S.B. 117
Oregon 	In 2013, H.B. 2893 required the Public Utility Commission (PUC) to evaluate the effectiveness of Oregon's solar incentive programs, including an examination of the resource value of solar. As part of the recommendations from the resulting report, the PUC opened a docket to determine the resource value of solar and whether net metering results in any cost shifts. The PUC will also use the docket to evaluate the impacts of increasing solar installations on reliability and grid operations. Scoping workshops are set for May and June of 2015.	Docket No. UM 1716

South Carolina 	On March 20th, the Public Service Commission of South Carolina approved a settlement agreement that stipulates how costs and benefits of solar should be derived for tariff purposes. The following cost components will be tallied for a final value attributed in solar tariffs: avoided energy, line losses, avoided capacity, ancillary services, transmission & distribution, avoided criteria pollutants, avoided CO_2 emissions cost, fuel hedging, integration and interconnection costs, utility administration costs, and environmental costs.	Docket 2014-246 E
Tennessee 	A Distributed Generation Integration Value stakeholder process began in April 2014. The ultimate goal is to develop a methodology to implement new programs for residential and commercial customers by 2016. Once TVA's internal stakeholder group reaches a consensus on a methodology, a report will be released for public review and comment.	TVA Website TenneSEIA
Utah 	In August 2014, the Utah Public Service Commission (PSC) opened a docket to review the costs and benefits of net metering. A technical conference was held in November 2014 to outline PacifiCorp's study of a load research study for residential net metering customers. The results of this study are expected by September 2015, and an analytical framework for the cost-benefit study will be set by the end of the third quarter 2015.	Docket No. 14-035-114
Vermont 	In 2014, Vermont's Act 99 required the Public Service Department to file a report on the impacts of net metering to kick off a public engagement on future net metering rule revisions. The report was filed in October 2014. During Q1 2015, working group meetings and a workshop were held on the rules.	Public Service Board website
West Virginia 	H.B. 2201 instructs the Public Service Commission (PSC) to conduct a general investigation into current net metering rules with the goal of adopting new rules that do not cause cross-subsidization (or cost-shifting) between customer-generators and non-customer generators. The PSC will be required to consider rules from other states, potential rebates and discounts for solar customers, and shifting system capacity limits.	H.B. 2201

FIXED CHARGE INCREASES

Among the most common proposed rate design changes to address reduced utility revenue related to increasing numbers of solar customers has been increasing fixed charges on all residential customers, often with an accompanying reduction in variable (per-kilowatt-hour (kWh) of consumption) charges. This rate design change reduces the solar value proposition in two ways: it increases a solar customer's monthly minimum bill (solar customers typically must pay fixed charges regardless of their electricity production) and it reduces the value of any net excess generation their system produces because its value is tied to the variable charges.

Figure 4 shows states where utility proposals for substantial increases in monthly fixed charge increases were pending or decided in Q4 2014 through Q1 2015. The largest pending increases were proposed by utilities in Hawaii, Kansas, and Missouri.

Figure 4. Action on Residential Fixed Charge Increases (Q4 2014 - Q1 2015)

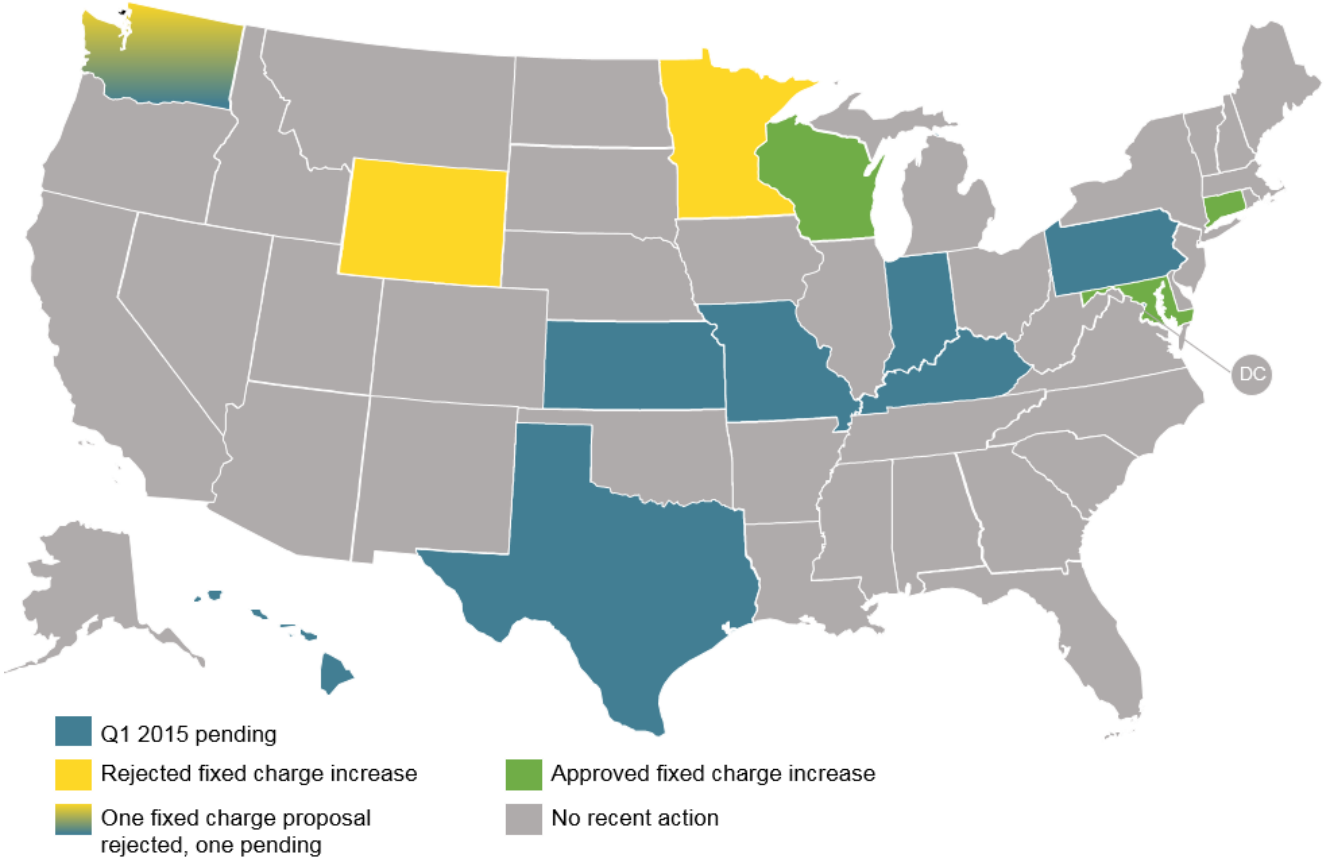


Table 5 details proposed and adopted (if applicable) utility fixed charge increases for Q4 2014 to Q1 2015. **Of the 24 proposed changes presented in Table 5, the average existing monthly residential fixed charge is $10.37, and the average proposed fixed charge is $19.18—an average proposed increase of 58%.**

Sixteen of the 24 proposed fixed charge increases remain pending as of the end of Q1 2015. Of the eight fixed charges increase cases that have been decided, three in Wisconsin and one in Maryland were approved by regulators at the requested level, one (Connecticut) was approved at only half the requested increase, and the remaining three (Washington, Wyoming, Minnesota) were rejected. In these eight examples, the average monthly residential fixed charge approved by regulators was $16.86, a 41% increase above the average existing fixed charge of $11.96 (but less than the average request of $18.93).

Table 5. Residential Fixed Charge Increase Updates (Q1 2015)

State	Utility	Monthly Residential Fixed Charge			Description	Source
		Existing	Proposed	Approved		
Connecticut 	Connecticut Power and Light	$16.00	$25.50	$19.25	The Federal Energy Regulatory Commission rejected a request by U.S. Senator Richard Blumenthal to review increased fixed charges approved in December 2014 by the Connecticut Public Utilities Regulatory Authority. Commission Chairwoman Cheryl LaFleur noted that "FERC does not have authority to review the retail ratemaking decisions of state regulatory Commissions."	Docket No. 14-05-06
Hawaii * 	Hawaiian Electric Companies*	$16.00	$50 - $61	*Pending*	The Distributed Generation Integration Plan (DGIP) that contained these proposed fixed charge increases was deemed to be insufficient by the Public Utilities Commission in an order issued on March 31st, but no direct ruling on the fixed charge or remedial plans for the DGIP have been issued.	Docket No. 2014-0192
Indiana 	Indianapolis Power and Light	$11.00	$17.00	*Pending*	In December 2014, Indianapolis Power and Light proposed a residential monthly fixed charge increase.	Docket No. 44576

Kansas ** 	WeStar	$12	$27 - $50	*Pending*	In March 2015, WeStar Energy proposed a residential monthly fixed charge increase. Solar customers would only be able to opt-in to the Residential Demand Plan (RDP), which includes a demand charge (see Table 6 below), or the Residential Stability Plan (RSP). Non-solar residential customers can select the Residential Standard Service (RSS), which reflects a monthly basic service charge and volumetric rate. The monthly basic service fee for RDP and RSS options would increase from $12 to $15, with an annual increase of $3 for four years to $27. The RSP rate option features a $50 fixed charge.	Docket 15-WSEE-225-RTS - Direct Testimony of Ahmad Faruqui on Behalf of WeStar Energy
Kentucky 	Kentucky Utilities	$10.75	$18.00	*Pending*	In November 2014, Kentucky Utilities proposed raising its residential fixed charges. The Kentucky Public Service Commission will begin a hearing on April 21st to decide whether to approve the fixed charge increase.	Docket No. 2014-00371
	Louisville Gas and Electric Co.	$10.75	$18.00	*Pending*	In November 2014, Louisville Gas and Electric Co. proposed raising its residential fixed charges. The Kentucky Public Service Commission will begin a hearing on April 21st to decide whether to approve the fixed charge increase.	Docket No. 2014-00372
	Kentucky Power	$8.00	$16.00	*Pending*	In December 2014, Kentucky Power proposed raising its residential fixed charges.	Docket No. 2014-00396
Maryland 	Choptank Electric Cooperative	$10.00	$17.00	$17.00	In October 2014, Choptank Electric Cooperative filed a rate case application with the Public Service Commission (PSC) to increase its residential monthly fixed charge. The PSC approved the increase in March 2015.	Docket No. 9368

Minnesota 	Xcel Energy	$8.00	$9.25	$8.00	In March 2015, the Minnesota Public Utilities Commission rejected Xcel Energy's request to increase its residential monthly fixed charge.	Docket No. GR 13 - 868
Missouri 	Empire District Electric	$12.52	$18.75	*Pending*	In August 2014, Empire District Electric proposed a residential monthly fixed charge increase.	Docket No. ER-2014-0351
	Kansas City Power and Light	$9.00	$25.00	*Pending*	In October 2014, Kansas City Power and Light proposed increasing its residential monthly fixed charge.	Docket No. ER-2014-0370

Pennsylvania 	West Penn Power	$5.00	$7.35	*Pending*	In August 2014, West Penn Power proposed an increase in its residential monthly fixed charge. In March 2015, the parties reached joint agreement, which is yet to be reviewed by the Public Utility Commission.	Docket No. R-2014-2428742
	Pennsylvania Power	$8.89	$12.71	*Pending*	In August 2014, Pennsylvania Power proposed an increase in its residential monthly fixed charge. In March 2015, the parties reached joint agreement, which is yet to be reviewed by the Public Utility Commission.	Docket No. R-2014-2428744
	Pennsylvania Electric	$7.78	$11.92	*Pending*	In August 2014, Pennsylvania Electric proposed an increase in its residential monthly fixed charge. In March 2015, the parties reached a joint agreement, which is yet to be reviewed by the Public Utility Commission.	Docket No. R-2014-2428743
	Metropolitan Edison	$8.11	$13.29	*Pending*	In August 2014, Metropolitan Edison proposed an increase in its residential monthly fixed charge. In March 2015, the parties reached a joint agreement, which is yet to be reviewed by the Public Utility Commission.	Docket No. R-2014-2428745
	Peco Energy Co.	$7.13	$12.00	*Pending*	In March 2015, Peco Energy Co. filed a request with the Pennsylvania Public Utility Commission to increase residential monthly fixed charges	Docket No. R-2015-2468981
	PPL Electric	$14.13	$20.00	*Pending*	In March 2015, PPL Electric filed a request with the Pennsylvania Public Utility Commission to increase residential monthly fixed charges.	Docket No. R-2015-2469275
Texas 	Southwestern Public Service Co.	$7.60	$9.50	*Pending*	In December 2015, Southwestern Public Service Co. proposed an increase in its residential monthly fixed charge.	Docket No. 43695

Washington 	Avista Utilities	$8.50	$14.00	*Pending*	In February 2015, Avista Utilities proposed increasing its residential monthly fixed charge along with increases in per kWh energy charges.	Docket No. UE-150204
	Pacific Power and Light	$7.75	$14.00	$7.75	In May 2014, Pacific Power requested revised rates, including an 81% increase in the basic charge for residential customers. The Washington Utilities and Transportation Commission rejected the fixed charge increase in March 2015.	Docket No. UE 140762
Wisconsin 	Wisconsin Public Service Corporation	$10.40	$19.00	$19.00	In December 2014, the Public Service Commission of Wisconsin approved an increase in Wisconsin Public Service Corporation's residential monthly fixed charge.	Docket No. 6690-UR-123
	Madison Gas and Electric	$10.44	$19.00	$19.00	In December 2014, the Public Service Commission of Wisconsin approved an increase in Madison Gas and Electric's residential monthly fixed charge.	Docket No. 3270-UR-120
	We Energies	$9.13	$16.00	$16.00	In December 2014, the Public Service Commission of Wisconsin approved an increase in We Energies residential monthly fixed charge.	Docket No. 5-UR-107
Wyoming 	Rocky Mountain Power	$20.00	$22.00	$20.00	In March 2014, Rocky Mountain Power proposed increasing its residential monthly fixed charge. At the end of December, the Wyoming Public Service Commission rejected the fixed charge increase.	Docket No. 13816

Notes: Cells shaded grey were decided in Q4 2014.

* Oahu Island's fixed charge of $55 was used when calculating descriptive statistics.

** WeStar's RPS rate tariff ($50 per month fixed charge) was used when calculating descriptive statistics.

SOLAR AND DISTRIBUTED GENERATION CHARGE INCREASES

In 2013, Arizona Public Service was among the first utilities to propose extra charges that apply only to solar or net-metered customers, and the Arizona Corporation Commission approved a monthly charge of $0.70 per installed kW. (Requests by Georgia Power in 2013 and Rocky Mountain Power in Utah in early 2014 for fees on residential solar customers were denied.)

In Q1 2015, the Arizona public power utility Salt River Project approved a new rate plan for solar customers. The changes include lowering per-kWh energy charges, adding a fixed charge for equipment and services, and adding a demand charge based on peak usage. SolarCity filed a lawsuit in response to the new rate charge. Similarly, subsequent to the Wisconsin Public Service Commission's December 2014 approval of a monthly solar charge of $3.79 per kW of installed solar, solar advocate groups Alliance for Solar Choice and RENEW Wisconsin filed a lawsuit in state court appealing the decision.

Solar charge proposals are pending before regulators in New Mexico, Kansas, and Hawaii as of the end of Q1 2015.

Figure 5. Action on Residential Solar/DG Charges (Q4 2014 - Q1 2015)

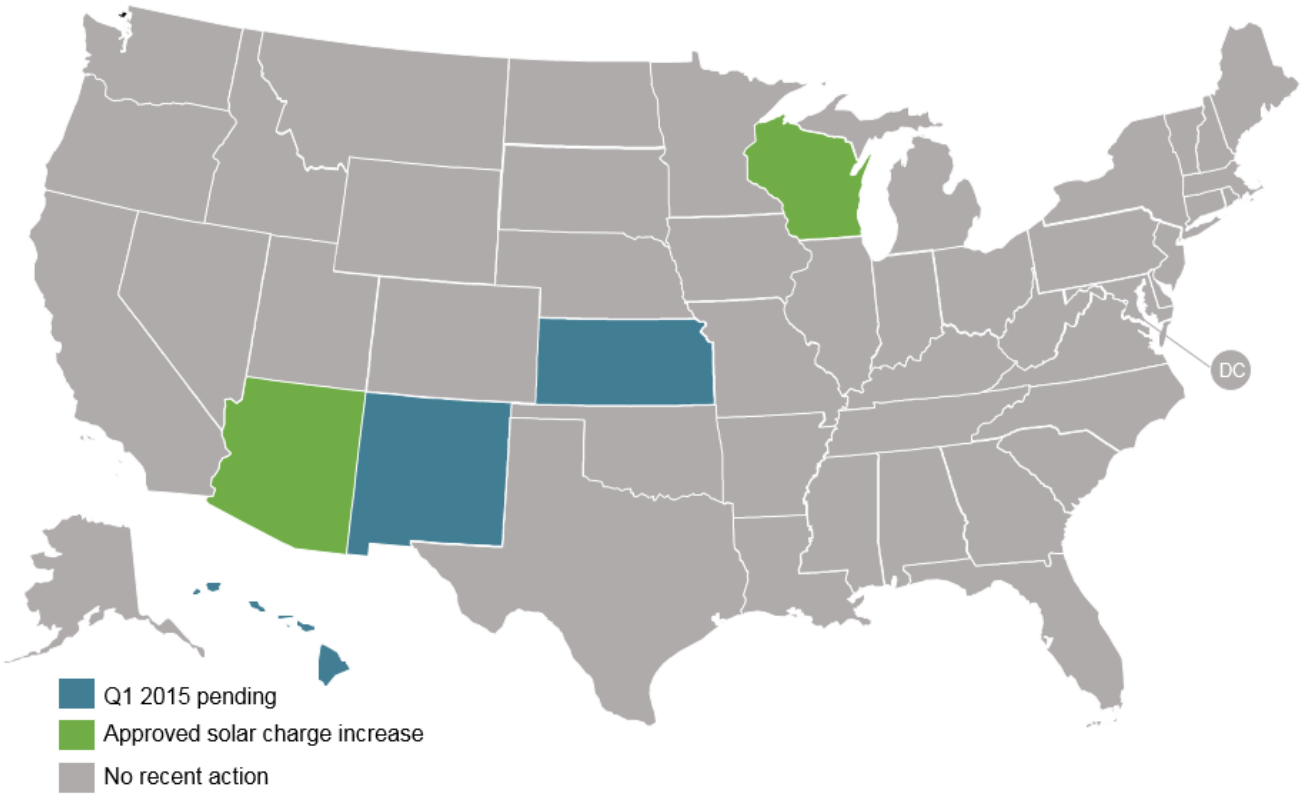


Table 6. Residential Solar/DG Charge Updates (Q1 2015)

State	Utility	Current Solar/DG Charge	Proposed Solar/DG Charge	Approved Solar/DG Charge	Description	Source
Arizona 	Salt River Project	$0	Varies based on the maximum 30-minute kW demand occurring during the on-peak periods of the billing cycle; the average user will pay ~$50 more without adjusting peak demand.	Varies based on the maximum 30-minute integrated kW demand occurring during the on-peak periods of the billing cycle; the average user will pay ~$50 more without adjusting peak demand.	Salt River Project (SRP) made several changes to its rate plan for self-generation customers in 2015, effective in the April billing cycle. The new plan lowers per-kWh energy charges, but adds a fixed charge for equipment and services and a demand charge based on peak usage. SolarCity filed a lawsuit in United States District Court for Arizona.	April 2015 Ratebook *Solar City Corporation v. Salt River Project Agricultural Improvement and Power District, Complaint*
Hawaii 	Hawaiian Electric Companies	$0	$16.00 (Oahu, Hawaii) $12.00 (Maui) Note - Hawaii has multiple islanded grid systems.	*Pending*	Cost shifting from non-solar to solar customers was estimated at $3.30 per bill by Hawaiian Electric Companies (HECO). HECO's Distributed Generation Integration Plan (DGIP) that contained these proposed fixed charge increases was deemed to be insufficient by the Public Utilities Commission in an order issued on March 31st. However, no direct ruling on the fixed charge or remedial plans specifically related to fixed charges for the DGIP have been issued. The public staff has proposed a minimum bill approach as an alternative.	Docket No. 2014-0192

Kansas 	WeStar	$0	$3 per kW based on the maximum 30-minute kW demand during the billing cycle	*Pending*	In March 2015, WeStar Energy proposed a demand charge option for residential solar customers in a pending docket before the Kansas Corporation Commission. Solar customers can either opt-in to the Residential Demand Plan (RDP), which would include a $3 per kW demand charge and a $27 per month fixed charge, or the Residential Stability Plan (RSP), which includes no demand charges but a $50 fixed charge (see Table 5 above).	Docket 15-WSEE-225-RTS - Direct Testimony of Ahmad Faruqui on Behalf of WeStar Energy
New Mexico 	PNM Resources	$0	$6 per kW of installed solar per month	*Pending*	In December 2014, PNM proposed implementing a solar distributed generation interconnection fee based on the size of the on-site solar energy system. The case is pending before the New Mexico Public Regulation Commission.	Docket No. 14-00332-UT
Wisconsin 	We Energies	$0	$3.79 per kW of installed solar per month	$3.79 per kW of installed solar per month	In January 2015, The Alliance for Solar Choice and Renew Wisconsin appealed the Wisconsin Public Service Commission's December 2014 order approving a We Energies charge for solar customers.	PSC Final Decision *The Alliance for Solar Choice and RENEW Wisconsin v. Public Service Commission of Wisconsin*

THIRD-PARTY OWNERSHIP LAWS

State third-party solar ownership laws—or the lack thereof—can be a financing barrier for distributed solar in some states. Florida, Georgia, Kentucky, Oklahoma, and North Carolina currently disallow third-party solar PV PPAs, and the legality is unclear in 21 other states.[12]

Policy changes in third-party solar ownership laws or rules were proposed in three southeastern states in Q1 2015. A bill that unanimously passed Georgia's legislature and is awaiting a signature would allow residential and commercial customers to enter into agreements with third parties to finance, install, and lease solar panels. A bill has been proposed in North Carolina that would allow third-party sales of electricity for all customers. A similar bill has been proposed in Florida that would allow third-party sales for commercial customers. Florida's third-party sales bill is opposed by a group that initiated a ballot initiative to bring third-party sales for all Floridians to a statewide vote in 2016.

Figure 6. Action on Third-Party Solar Ownership (Q1 2015)

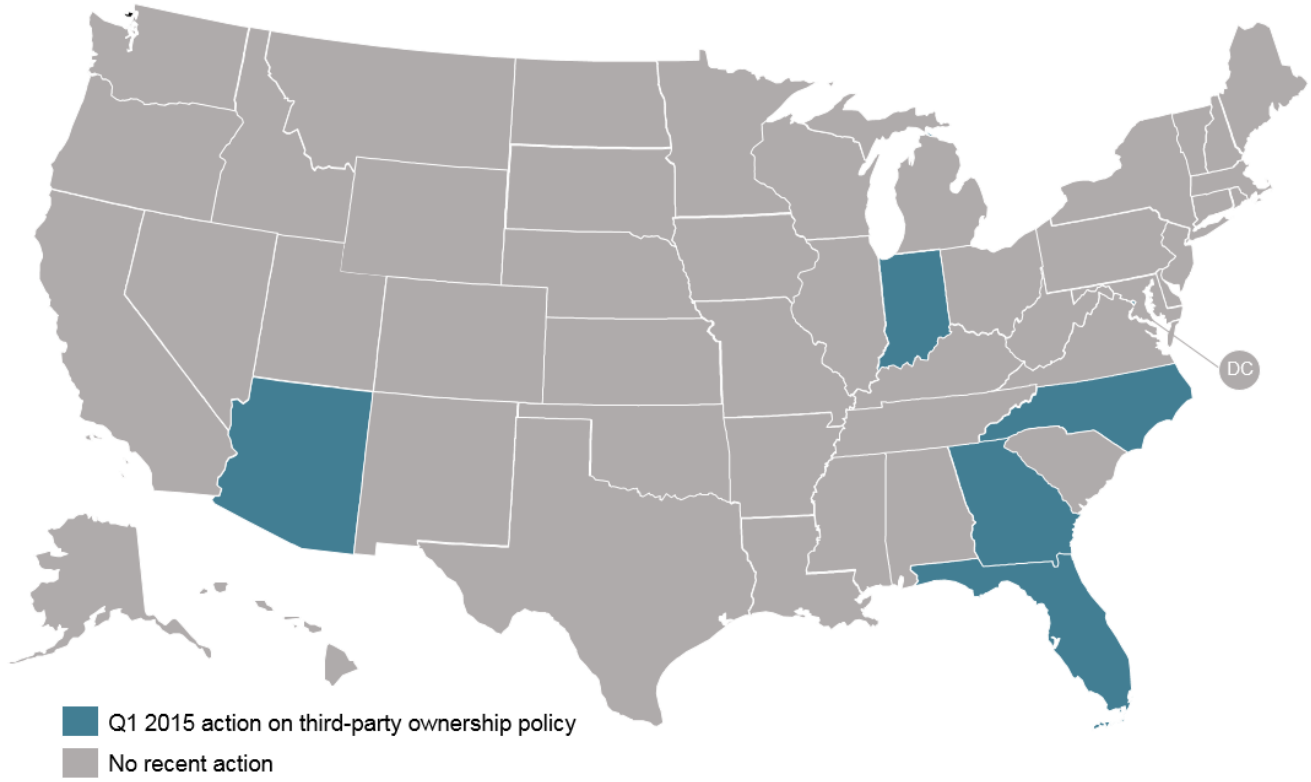


Table 7. Third-Party Solar Ownership Updates (Q1 2015)

State	Description	Eligible Sector(s)	Source
Arizona 	In December 2014, the ACC opened a generic docket to investigate solar distributed generation business models and practices and their impacts on utilities and ratepayers.	--	Docket No. E-00000J-14-0415
Florida 	Floridians for Solar Choice launched a third-party sales ballot initiative for all customers in January 2015. The group reported collecting 100,000 signatures in the first month, with 72,000 signatures verified by the Florida Board of Elections as of March 24th. To put their third-party sales provision on the Florida ballot, a total of 683,149 verified signatures are required by February 1, 2016.	Residential, Commercial, Industrial (All)	Floridians for Solar Choice Website, Tampa Bay Times
	S.B. 1118, a bill introduced in February 2015, would allow third-party ownership solely for businesses.	Commercial, Industrial	S.B. 1118
Georgia 	The Georgia legislature unanimously passed H.B. 57, a bill that would allow commercial and residential customers to enter into solar energy procurement agreements for financing, installation, and leasing of panels. Capacity limits are currently set at 10 kW for residential customers and 100 kW or 125% of demand for commercial customers.	Residential, Commercial	H.B. 57
Indiana 	The Indiana legislature declined to bring H.B. 1320 to vote after it passed Committee. The bill would have allowed leasing of solar PV systems, which is currently prohibited. (Other provisions in the bill would have permitted solar charges and reduced compensation for net excess generation.)	Residential, Commercial, Industrial (All)	H.B. 1320
North Carolina 	H.B. 245 would allow individuals and entities to build or contract with third parties to supply electricity if the generation sources are located on their property and if the total electricity supplied does not exceed 125% of annual demand. The bill also authorizes the owners of generation assets to enter into net metering arrangements with the utility.	Residential, Commercial, Industrial (All)	H.B. 245

UTILITY-LED, RESIDENTIAL ROOFTOP SOLAR

Table 8 identifies three states with action on policies or programs related to utility-led rooftop solar for residential customers. Legislation was pending in New Hampshire at the end of Q1 2015 that would create a presumption that a utility's investment in rooftop solar is in the public interest, and therefore recoverable through customer rates. CPS Energy in Texas has already begun a local rooftop solar pilot program in San Antonio. Arizona Public Service and Tucson Electric Power have already started to implement their utility-owned rooftop solar programs in Arizona (see the Q4 2014 issue of *The 50 States of Solar* for details).

Table 8. Utility-Led, Residential Rooftop Solar Program Updates (Q1 2015)

State	Utility	Description	Source
New Hampshire 	Statewide	S.B. 117 would facilitate investor-owned utility ownership of distributed renewable energy generation by easing the burden for recovery of these investments through a utility's rates. Currently, the New Hampshire Public Utilities Commission must determine that the utility's investment and recovery through its rates are in the public interest by examining several factors. The pending legislation creates a rebuttable presumption that the investment is in the public interest, and thus, eligible for recovery. S.B. 117 passed the state senate and was in the House Committee on Science, Technology, and Environment at the end of March 2015.	S.B. 117
New York 	Statewide	The New York Public Service Commission Track I Order indicates that utilities will not be permitted to own distributed solar resources except in cases where the market does not provide adequate resources.	NY PSC REV Track I Order
Texas 	CPS Energy	CPS Energy has started a pilot program that aims to grow rooftop solar in San Antonio. This will be done through power purchase agreements issued by CPS to developers. Solar systems will be installed on the roofs of residential, commercial, and industrial customers.	KSAT12 News

Q2 2015 SOLAR POLICY OUTLOOK

Many states' legislative sessions are reaching their cross-over deadlines and traditionally adjourn in Q2. As such, Q2 2015 is likely to be heavy on legislative decisions. Notably, Georgia's governor will decide whether to sign a unanimously passed bill that would allow residential and commercial customers to enter into agreements with third parties to finance, install, and lease solar panels.

Several utility requests for fixed charge and solar charge increases are pending, with final approval or rejection by state regulators on several of these expected in Q2. One significant request, filed in early April 2015 by Arizona Public Service (APS), would increase the monthly lost fixed cost recovery-distributed generation (LFCR) charge from $0.70 per kW to $3 per kW beginning in August 2015. APS suggests that unprecedented growth in rooftop solar is shifting fixed costs from customers with distributed generation (DG) to customers without DG. This charge would amount to average of $21 per customer per month.

Mississippi will be a state to keep an eye on in Q2, as the state's Public Service Commission recently announced its decision to move forward with the development of statewide net metering rules. Massachusetts will be another state to watch, as their Net Metering Task Force's final report is read by state legislators. Some Massachusetts utilities are already at or near the state's net metering caps.

ENDNOTES

[1] Kann, S. et al. (2015). U.S. solar market insight: Year in review (executive summary). Retrieved from http://www.greentechmedia.com/research/ussmi

[2] Kann, S. et al. (2015). U.S. solar market insight: Year in review (executive summary). Retrieved from http://www.greentechmedia.com/research/ussmi

[3] Trabish, H. (2015, March 26). What the solar market looks like now, and where it's headed. Utility Dive. Retrieved from http://www.utilitydive.com/news/what-the-solar-market-looks-like-now-and-where-its-headed/379048/

[4] Barbose, G., Weaver, S., and Narghouth, N. (2014, September). Tracking the sun VII: An historical summary of the installed price of photovoltaics in the United States from 1998 to 2013. Retrieved from http://eetd.lbl.gov/sites/all/files/tracking_the_sun_vii_report.pdf

[5] Trabish, H. (2015, January 22). Why utilities across the nation are embracing community solar. Utility Dive. Retrieved from http://www.utilitydive.com/news/why-utilities-across-the-nation-are-embracing-community-solar/354164/

[6] Campbell, B., Chung, D., and Venegas, R. (2014, September). Expanding solar access through utility-led community solar: Participation and design trends from leading U.S. programs. Retrieved from http://www.solarelectricpower.org/media/214996/community-solar-report-ver5.pdf.

[7] Xcel Energy. (2015, February 10). Comments, community solar gardens, Docket No. E002/M13-867. Retrieved from https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={AE9FC948-4354-49EF-A3CF-32AD59E11424}&documentTitle=20152-107208-01

[8] 26 U.S.C. § 25D.

[9] Kind, P. (2013, January). Disruptive challenges: Financial implications and strategic responses to a changing retail electric business. Retrieved from http://www.eei.org/ourissues/finance/documents/disruptivechallenges.pdf

[10] Barnes, C. (2013, July). Aggregate net metering: Opportunities for local governments. *U.S. Department of Energy SunShot Solar Outreach Partnership.* Retrieved from http://www.icleiusa.org/action-center/aggregate-net-metering-opportunities-for-local-governments

[11] Coughlin, J. et al. (2010). A guide to community solar: Utility, private, and non-profit project development. *National Renewable Energy Laboratory*, p. 2.

[12] Database of State Incentives for Renewables and Efficiency. (2015, March). 3rd party solar PV power purchase agreement (PPA). Retrieved from http://ncsolarcen-prod.s3.amazonaws.com/wp-content/uploads/2015/01/3rd-Party-PPA_0302015.pdf