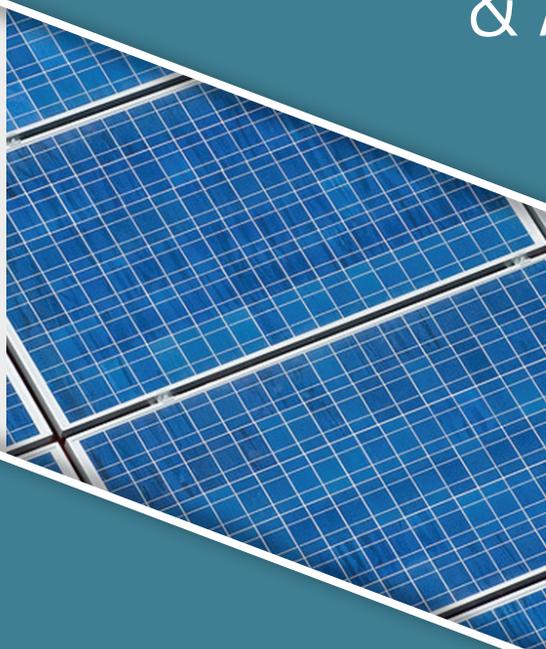


50 States of SOLAR

Q4 2016 Quarterly Report
& Annual Review

Executive Summary



NC CLEAN ENERGY
TECHNOLOGY CENTER

January 2017

AUTHORS

Autumn Proudlove
Brian Lips
David Sarkisian
Achyut Shrestha

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.

CONTACT

Autumn Proudlove (afproudl@ncsu.edu)

PREFERRED CITATION

North Carolina Clean Energy Technology Center, *The 50 States of Solar: Q4 2016 & Annual Review Executive Summary*, January 2017.

ACKNOWLEDGMENTS

We would like to acknowledge the Solar Energy Industries Association for its support of the NC Clean Energy Technology Center.



The authors would like to thank Tom Stanton of the National Regulatory Research Institute for his insightful comments and review of a report draft. Any omissions or inaccuracies are the authors' own.

COVER PHOTO CREDIT

Photo by Wayne National Forest. “Wayne National Forest Solar Panel Construction.” July 15, 2009. CC-By 2.0. Retrieved from <https://www.flickr.com/photos/waynenf/3725051641>

Photo by North Carolina Clean Energy Technology Center. “Training Class – PV Installation.” April 25, 2014.

DISCLAIMER

While the authors strive to provide the best information possible, neither the NC Clean Energy Technology Center nor NC State University make any representations or warranties, either express or implied, concerning the accuracy, completeness, reliability or suitability of the information. The NC Clean Energy Technology Center and NC State University disclaim all liability of any kind arising out of use or misuse of the information contained or referenced within this report. Readers are invited to contact the authors with proposed corrections or additions.

PREVIOUS EDITIONS

The 50 States of Solar is a quarterly publication. Previous editions of *The 50 States of Solar* are available for complimentary download at www.nccleantech.ncsu.edu or by clicking here:

- [Q3 2016 Executive Summary](#)
- [Q2 2016 Executive Summary](#)
- [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 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, regulatory, 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 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 regulatory bodies and legislatures 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 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 this issue include:

- Significant changes to state or utility **net metering** laws and rules, including aggregate caps, system size limits, aggregate net metering rules, and compensation rates for net excess generation
- Changes to statewide **community solar** 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 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 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 policies and incentives are available at www.dsireusa.org.

EXECUTIVE SUMMARY

2016 SOLAR POLICY ACTION

State and utility solar policies continued to undergo review in 2016, with nearly every state in the country considering policy or rate design changes – a trend which is likely to continue through 2017 and beyond. Table 1 provides a summary of state actions related to net metering, rate design, and solar ownership during 2016. Of the 212 actions catalogued, the most common were related to net metering (73), followed by residential fixed charge and minimum bill increases (71), and solar valuation or net metering studies (20). The actions occurred across 47 states plus DC in 2016 (Figure 1). The states that saw the most solar policy action during 2016 are highlighted below.

Table 1. 2016 Summary of Policy Actions

Policy Type	# of Actions	% by Type	# of States
Residential fixed charge or minimum bill increase	71	33%	35 + DC
Net metering	73	34%	28
Solar valuation or net metering study	20	9%	16 + DC
Community solar	18	8%	13
Residential demand or solar charge	16	8%	10
Third-party ownership of solar	9	4%	8
Utility-led rooftop PV programs	5	2%	5
Total	212	100%	47 States + DC

Note: The “# of States/ Districts” total is not the sum of the rows, as some states have multiple actions.

TOP TEN MOST ACTIVE STATES OF 2016

While nearly every state in the country took some type of action on distributed solar policy or rate design during 2016, some states were particularly active, taking many different actions or especially impactful actions. The following states stood out in 2016 as hotbeds for solar policy action:

1. Arizona

Arizona undoubtedly saw the most solar policy action of 2016, with all three of the state’s investor-owned utilities requesting major changes to net metering, as well as residential demand charges and increased residential fixed charges. The state also continued a proceeding on the value of distributed generation, which ultimately led to a decision on the framework for a net metering successor tariff.

Resources (DER) proceeding at the end of 2016. During 2016, a new DER valuation methodology – “LMP + D” – emerged from the REV proceeding, garnering significant interest across the country.

5. California

California became one of the first states to adopt a net metering successor tariff in January 2016, which became effective for San Diego Gas and Electric customers in June and is set to become effective for Pacific Gas and Electric customers by the end of 2016. California also developed rules regarding net metering of solar plus storage systems and saw Imperial Irrigation District adopt a net metering successor tariff.

6. Massachusetts

After a legislative standstill, a compromise bill was passed in 2016, increasing Massachusetts’ net metering aggregate cap and reducing the net excess generation credit rate for certain customer types. The bill also authorized the Department of Public Utilities to approve a minimum bill for net metering customers and directed the Department of Energy Resources to develop a solar incentive program to succeed the SREC II program.

7. Florida

Florida’s most notable solar policy action of 2016 was a contentious ballot initiative, which would have amended the state constitution to ensure solar customers are not subsidized by non-solar customers. The divisive proposal, originally introduced as a counter to a separate ballot initiative which would have allowed third-party electricity sales, was defeated in November 2016. In addition to the ballot initiative, two of the state’s investor-owned utilities proposed residential fixed charge increases.

8. Hawaii

Hawaii ended net metering in 2015, providing customer-generators with two new options, Grid-Supply and Self-Supply. Utilities hit their caps for the grid-supply option in 2016, leaving self-supply as the only option for new customer-generators. The Hawaii Public Utilities Commission also came out with draft rules for a community-based renewables program, which would credit customers at time-varying rates.

9. New Hampshire

New Hampshire officially embarked on the journey toward a net metering successor tariff in 2016 with the passage of H.B. 1116. The Public Utilities Commission initiated a proceeding to develop this successor, which has sparked a number of diverse proposals. In addition to the work toward a net metering successor, two of the state’s utilities proposed increased fixed charges, and one proposed a demand charge for residential solar customers.

10. Colorado

Xcel Energy in Colorado proposed a new residential rate structure in 2016, which would have included a tiered grid use charge on top of the typical monthly fixed charge. In a settlement agreement, the grid use charge was dropped and Xcel agreed to begin time-of-use pilot rate programs with the intent of moving all residential customers to these rates eventually.

IN COMPARISON: 2016 VS. 2015

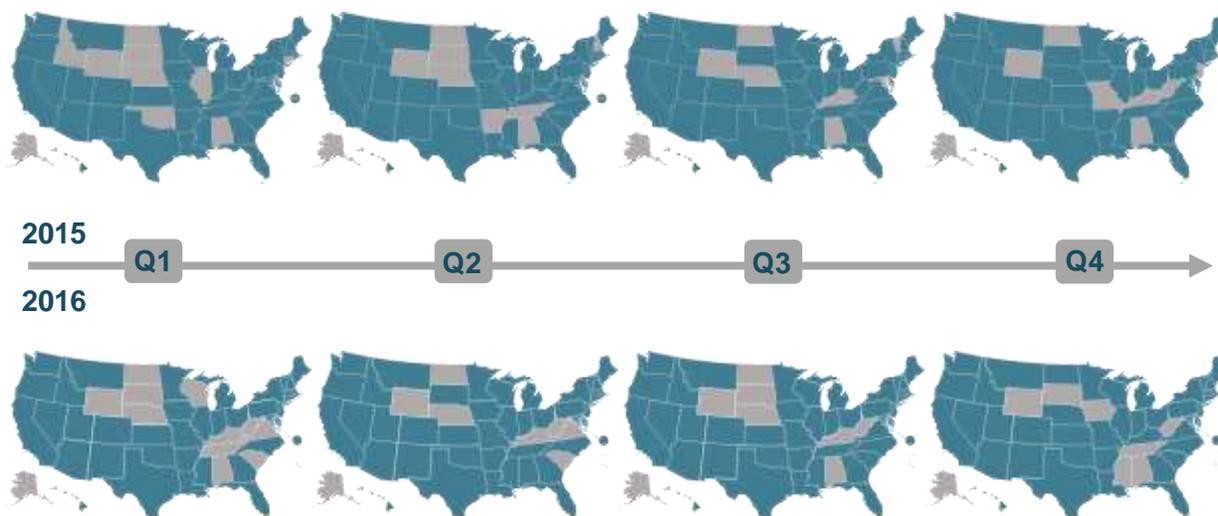
2016 SUMMARY

- **Net Metering:** 73 actions in 28 states
- **DG Valuation:** 20 actions in 16 states + DC
- **Community Solar:** 18 actions in 13 states
- **Fixed Charge & Minimum Bill Increases:** 71 actions in 35 states + DC
- **Demand & Solar Charges:** 16 actions in 10 states
- **Third-Party Ownership:** 9 actions in 8 states
- **Utility-Led Rooftop Solar:** 5 actions in 5 states

2015 SUMMARY

- **Net Metering:** 42 actions in 27 states
- **DG Valuation:** 24 actions in 24 states
- **Community Solar:** 10 actions in 7 states + DC
- **Fixed Charge & Minimum Bill Increases:** 61 actions in 30 states
- **Demand & Solar Charges:** 21 actions in 13 states
- **Third-Party Ownership:** 12 actions in 6 states
- **Utility-Led Rooftop Solar:** 5 actions in 5 states

Figure 2. Solar Policy Action by Quarter (Q1 2015 to Q4 2016)



THE BIG PICTURE: TOP TRENDS OF 2016

Reconsidering Net Metering (and Community Solar) Credit Rates

Considering changes to net metering credit rates was one of the biggest solar policy trends of 2016. Net metering successor tariff discussions continue to spread to new states, even those without a significant amount of installed solar capacity. As states reconsider net metering credit rates, community solar credit rates are being examined as well, with some states moving toward time-varying rates, location-based rates, and rates based on the value of solar.

Requests to Increase Residential Fixed Charges

Utility requests to increase residential fixed charges showed no sign of slowdown in 2016, even increasing over the number of requests in 2015. Forty-six investor-owned and large public power utilities proposed residential fixed charge increases of at least 10% in 2016, while thirty-five proposals were initiated in 2015. Of the decisions made in 2016, 79% of utilities were granted only a partial increase or no increase.

Increased Attention to Residential Demand Charges, yet Fewer Proposals

Residential demand charges drew much attention in 2016, yet fewer utilities proposed these charges in 2016 as in 2015. While ten investor-owned utilities proposed residential demand charges in 2015, only five utilities proposed these charges in 2016. Regulators continued to deny requests for residential demand charges in 2016, with no Commission approving such a charge.

Less Talk, More Action on Net Metering Policies

Compared with 2015, there were fewer actions to study the value of solar or costs and benefits of net metering in 2016, but also many more actions to make specific changes to net metering policies. Many of the states that previously conducted these studies are now proposing net metering changes, suggesting a shift in focus from studies to concrete proposals as states move further along in these efforts.

Stakeholder Efforts and Settlement Agreements

While solar policy discussions have frequently been controversial over the last few years, 2016 was characterized by an increase in collaborative stakeholder efforts and settlement agreements. Through multiple settlement agreements in different states, controversial demand or grid access charges were dropped in favor of other options.

OVERVIEW OF Q4 2016 POLICY CHANGES

In the fourth quarter of 2016, 42 states plus DC took a total of 131 actions related to distributed solar policy and rate design (Figure 3). These actions span at least 100 unique regulatory dockets. Table 2 provides a summary of state actions related to net metering, rate design, and solar ownership during Q4 2016. Of the 131 actions catalogued, the most common were related to residential fixed charge and minimum bill increases (49), followed by net metering (38), and solar valuation or net metering studies (15).

Table 2. Summary of Policy Actions (Q4 2016)

Policy Type	# of Actions	% by Type	# of States
Residential fixed charge or minimum bill increase	49	37%	28 + DC
Net metering	38	29%	23
Solar valuation or net metering study	15	11%	13 + DC
Community solar	12	9%	9
Residential demand or solar charge	9	7%	6
Utility-led rooftop PV programs	4	3%	4
Third-party ownership of solar	4	3%	3
Total	131	100%	42 States + DC

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

TOP FIVE SOLAR POLICY DEVELOPMENTS OF Q4 2016

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

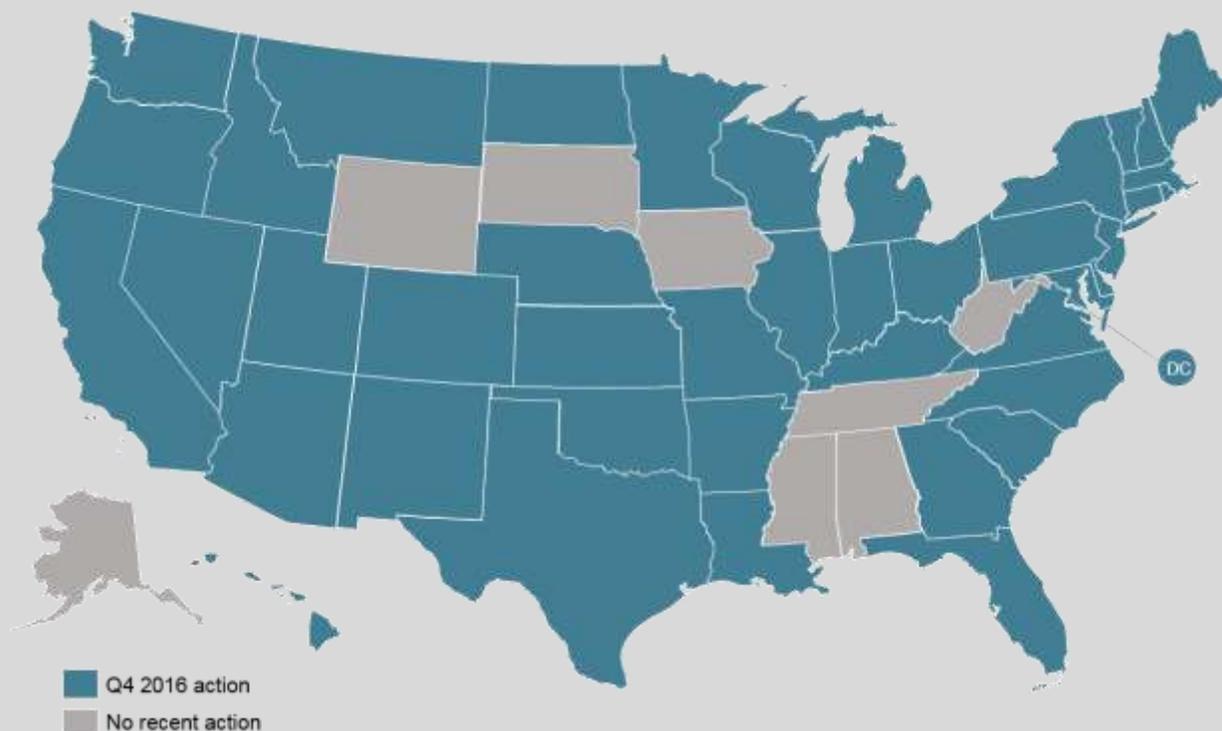
Net Metering Successor Path Decided in Arizona

In December 2016, after a lengthy proceeding on the value of distributed generation, the Arizona Corporation Commission decided to end retail rate net metering and move to a system of crediting customers at an avoided cost rate for solar energy sent to the grid. This credit rate will be determined in the three investor-owned utilities' rate cases.

Rocky Mountain Power Proposes New Rates for Residential Solar Customers in Utah

Rocky Mountain Power, Utah's only investor-owned electric utility, proposed new rates for residential solar customers in November 2016. New net metering customers would have a demand charge, a higher fixed charge, and significantly lower energy rates. The Public Service Commission suspended implementation of the rates to allow stakeholders to continue to seek mutually acceptable solutions.

Figure 3. Action on Net Metering, Rate Design, & Solar Ownership Policies (Q4 2016)



Gulf Power Requests \$48.06 Residential Fixed Charge

In October 2016, Gulf Power Company in Florida requested a 155% increase in its residential fixed charge, which would amount to a monthly charge of approximately \$48 – one of the highest residential fixed charges requested over the last two years.

Connecticut Regulators Decrease United Illuminating’s Residential Fixed Charge

At the opposite end of the spectrum, regulators in Connecticut reduced United Illuminating’s residential monthly fixed charge from \$17.25 to \$9.64. United Illuminating had proposed increasing the customer charge to \$18.74. The Public Utilities Regulatory Authority plans to re-examine the customer charge for years two and three of the rate case in the future.

Diverse Net Metering Successor Proposals Filed in New Hampshire

Stakeholders filed their proposals for New Hampshire’s net metering successor policy in Q4 2016. The various proposals submitted include real-time pricing or time-of-use based crediting, a fixed solar credit rate, credits at the default energy rate, and residential demand charges.

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

Content Included in the Full 2016 Policy Review:

- Summary maps of action for each policy category over all of 2016, as well as Powerpoint versions of each map
- Additional qualitative and quantitative analysis of action for each policy category, including trends and highlights
- Bar graphs of all residential fixed charge proposals and decisions pending or decided during 2016
- Summary tables of net metering successor tariff and aggregate cap action in 2016
- State watch list for net metering action in 2017

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-NCETC> to purchase the full 50 States of Solar 2016 Policy Review and Q4 Quarterly Report.

Customer Type	Annual Subscription	Single Report – Current Quarter
Business or Individual	\$1,600	\$500
Non-Profit, Government, or Education	\$1,300	\$400

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.

COMPLIMENTARY COPIES FOR POLICYMAKERS

Policymakers and regulators (limited to federal and state legislators and staffers, utility commissioners, utility commission staff, state consumer advocate office staff, and state energy office staff) and **students** (for academic purpose only): [Contact us](#) to receive a complimentary copy of the most recent report.

CUSTOMIZED SOLUTIONS

The NC Clean Energy Technology Center also offers customized policy research and analysis services. Visit <http://www.dsireusa.org/services/> to learn more.