

50

STATES OF

GRID MODERNIZATION

Q1 2023 Quarterly Report

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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Full editions of and annual subscriptions to the 50 States of Grid Modernization may be purchased [here](#).

The 50 States of Grid Modernization is a quarterly publication. Previous executive summaries and older full editions of *The 50 States of Grid Modernization* are available [here](#).

In addition to *The 50 States of Grid Modernization*, the NC Clean Energy Technology Center publishes additional quarterly reports called *The 50 States of Solar* and *The 50 States of Electric Vehicles*. These reports may be purchased at [here](#). Executive summaries and older editions of these reports are available for download [here](#).

ABOUT THE REPORT

WHAT IS GRID MODERNIZATION?

Grid modernization is a broad term, lacking a universally accepted definition. In this report, the authors use the term grid modernization broadly to refer to actions making the electricity system more resilient, responsive, and interactive. Specifically, in this report grid modernization includes legislative and regulatory actions addressing: (1) smart grid and advanced metering infrastructure, (2) utility business model reform, (3) regulatory reform, (4) utility rate reform, (5) energy storage, (6) microgrids, and (7) demand response.

PURPOSE

The purpose of this report is to provide state lawmakers and regulators, electric utilities, the advanced energy industry, and other energy stakeholders with timely, accurate, and unbiased updates about how states are choosing to study, adopt, implement, amend, or discontinue policies associated with grid modernization. This report catalogues proposed and enacted legislative, regulatory, and rate design changes affecting grid modernization during the most recent quarter.

The 50 States of Grid Modernization report series provides regular quarterly updates and annual summaries of grid modernization policy developments, keeping stakeholders informed and up to date.

APPROACH

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

Questions Addressed

This report addresses several questions about the changing U.S. electric grid:

- How are states adjusting traditional utility planning processes to better allow for consideration of advanced grid technologies?
- What changes are being made to state regulations and wholesale market rules to allow market access for distributed energy resources?
- How are states and utilities reforming the traditional utility business model and rate designs?

- What policy actions are states taking to grow markets for energy storage and other advanced grid technologies?
- Where and how are states and utilities proposing and deploying advanced grid technologies, energy storage, microgrids, and demand response programs?

Actions Included

This report focuses on cataloguing and describing important proposed and adopted policy changes related to grid modernization and distributed energy resources, *excluding policies specifically intended to support only solar technologies*. While some areas of overlap exist, actions related to distributed solar policy and rate design are tracked separately in the *50 States of Solar report series*, and are generally not included in this report.

In general, this report considers an “action” to be a relevant (1) legislative bill that has been introduced or (2) a regulatory docket, utility rate case, or rulemaking proceeding. Only statewide actions and those related to investor-owned utilities are included in this report. Specifically, actions tracked in this issue include:

Studies and Investigations

Legislative or regulatory-led efforts to study energy storage, grid modernization, utility business model reform, or alternative rate designs, e.g., through a regulatory docket or a cost-benefit analysis.

Planning and Market Access

Changes to utility planning processes, including integrated resource planning, distribution system planning, and evaluation of non-wires alternatives, as well as changes to state and wholesale market regulations enabling market access.

Utility Business Model and Rate Reform

Proposed or adopted changes to utility regulation and rate design, including performance-based ratemaking, decoupling, time-varying rates, and residential demand charges.

Grid Modernization Policies

New state policy proposals or changes to existing policies related to grid modernization, including energy storage targets, energy storage compensation rules, interconnection standards, and customer data access policies.

Financial Incentives for Energy Storage and Advanced Grid Technologies

New statewide incentives or changes to existing incentives for energy storage, microgrids, and other modern grid technologies.

Deployment of Advanced Grid Technologies

Utility-initiated requests, as well as proposed legislation, to implement demand response programs or to deploy advanced metering infrastructure, smart grid technologies, microgrids, or energy storage.

Actions Excluded

This report excludes utility proposals for grid investments that do not include any specific grid modernization component, as outlined above, as well as specific projects that have already received legislative or regulatory approval. Actions related exclusively to pumped hydroelectric storage or electric vehicles are not covered by this report (a separate report series available from the NC Clean Energy Technology Center covers electric vehicle actions). Time-varying and residential demand charge proposals are only documented if they are being implemented statewide, the default option for all residential customers of an investor-owned utility, or a notable pilot program. Actions related to inclining or declining block rates are not included in this report. While actions taken by municipal utilities and electric cooperatives are not comprehensively tracked in this report, particularly noteworthy or high-impact actions are included. The report also excludes changes to policies and rate design for distributed generation customers; these changes are covered in the 50 States of Solar quarterly report.

EXECUTIVE SUMMARY

Q1 2023 GRID MODERNIZATION ACTION

In the first quarter of 2023, 47 states plus DC and Puerto Rico took a total of 540 policy and deployment actions related to grid modernization, utility business model and rate reform, energy storage, microgrids, and demand response. Table 1 provides a summary of state and utility actions on these topics. Of the 540 actions catalogued, the most common were related to policies (129), planning and market access (91), and financial incentives (88).

Table 1. Q1 2023 Summary of Grid Modernization Actions

Type of Action	# of Actions	% by Type	# of States
Policies	129	24%	33 + PR
Planning and Market Access	91	17%	30 + DC
Financial Incentives	88	16%	32 + PR
Business Model and Rate Reform	82	15%	32
Deployment	78	14%	35
Studies and Investigations	72	13%	29 + DC, PR
Total	540	100%	47 States + DC, PR

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

TOP 5 GRID MODERNIZATION DEVELOPMENTS OF Q1 2023

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

Illinois Utilities File First Integrated Grid Plans

Ameren Illinois and Commonwealth Edison filed their first integrated grid plans in January 2023, as required by legislation enacted in 2021. Commonwealth Edison's \$12 billion plan includes a variety of grid investments, such as an advanced distribution management system and a distributed energy resource management system (DERMS). Ameren's \$2.7 billion plan similarly includes a DERMS investment and other grid modernization technologies.

Texas Regulators Recommend Performance Credit Mechanism

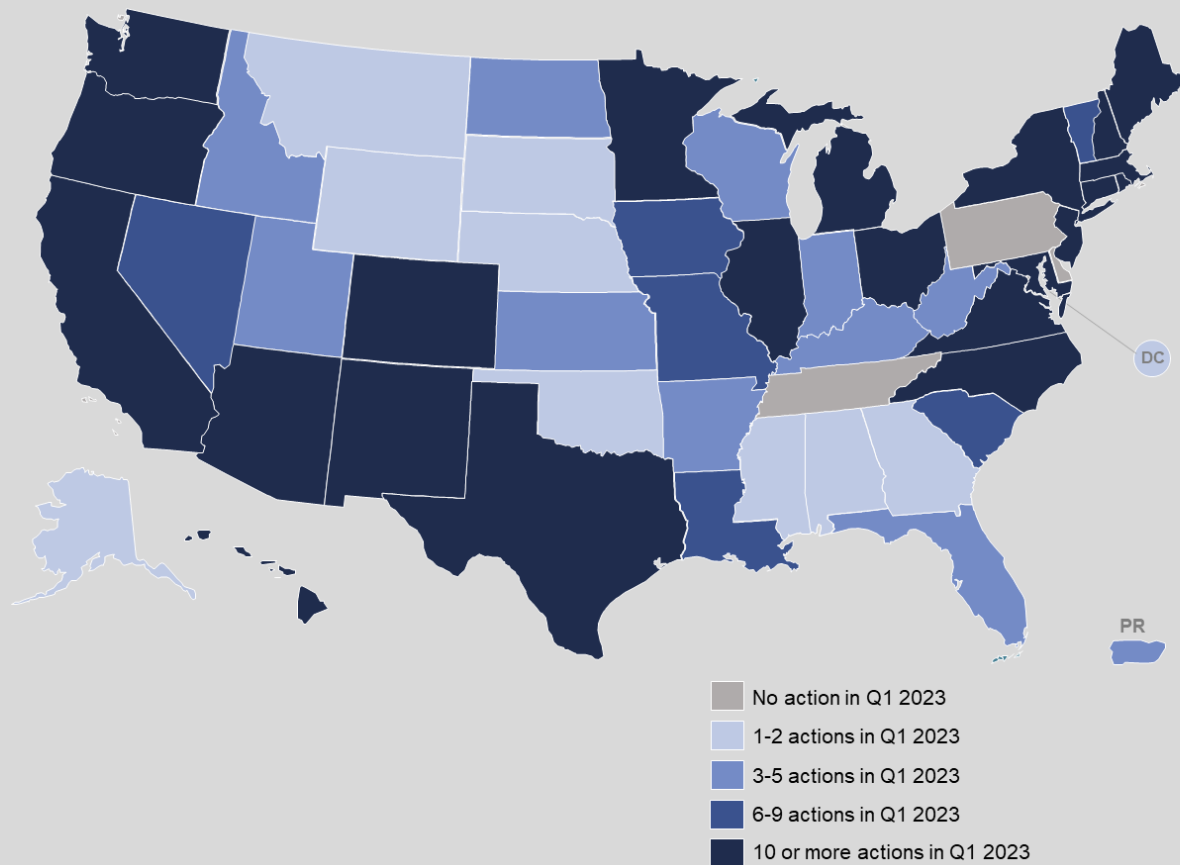
Texas regulators recommended the creation of a new Performance Credit Mechanism (PCM) in January 2023, which would offer credits to dispatchable energy providers to ensure their generation is available during the hours of highest reliability risk. The Commission is deferring

to ERCOT for much of the implementation and is waiting for the state legislature to indicate its support for the PCM or establish an alternative.

Dominion Energy Virginia Proposes Phase 3 Electric Grid Transformation Projects

In late March 2023, Dominion Energy Virginia filed its Phase 3 Electric Grid Transformation projects. Dominion is seeking approval for investments in advanced metering infrastructure (\$23.2 million) and a distributed energy resource management system (\$9.3 million). The utility is also proposing a non-wires alternative evaluation process, which focuses on energy storage in the near-term.

Figure 1. Q1 2023 State and Utility Action on Grid Modernization



AEP Ohio Files Electric Security Plan

AEP Ohio filed its Electric Security Plan in January 2023, which includes a total of \$2.2 billion in reliability and resilience investments over six years. The plan involves a new community grid resiliency pilot program targeting socially vulnerable populations. The pilot would make use of

distributed energy resources and microgrids. The utility is also proposing new demand response programs for both residential and commercial customers.

California Regulators Propose Updated Rate Design Principles

In California, a proposed decision filed in March 2023 would adopt ten updated rate design principles for the state, as well as six demand flexibility principles. The rate design principles address issues related to equity, price signals for consumers, and marginal cost and cost causation. Among the principles for demand flexibility tariffs, the proposed order asserts that tariffs should provide a dynamic price signal in a standardized format that can be integrated into third-party distributed energy resource and demand management solutions.

MOST ACTIVE STATES AND SUBTOPICS OF Q1 2023

The most common types of actions across the country related to energy storage deployment (49), utility business model reforms (42), distribution system planning (32), interconnection rules (29), and integrated resource planning (25).

The states taking the greatest number of actions related to grid modernization in Q1 2023 can be seen in Figure 4. California, Texas, New York, Minnesota, Connecticut, and Maine saw the most action during the quarter, followed by Massachusetts, New Jersey, and New Mexico. Overall, 47 states, plus DC and Puerto Rico, took actions related to grid modernization in Q1 2023.

TOP GRID MODERNIZATION TRENDS OF Q1 2023

States Consider Options to Promote Microgrid Development

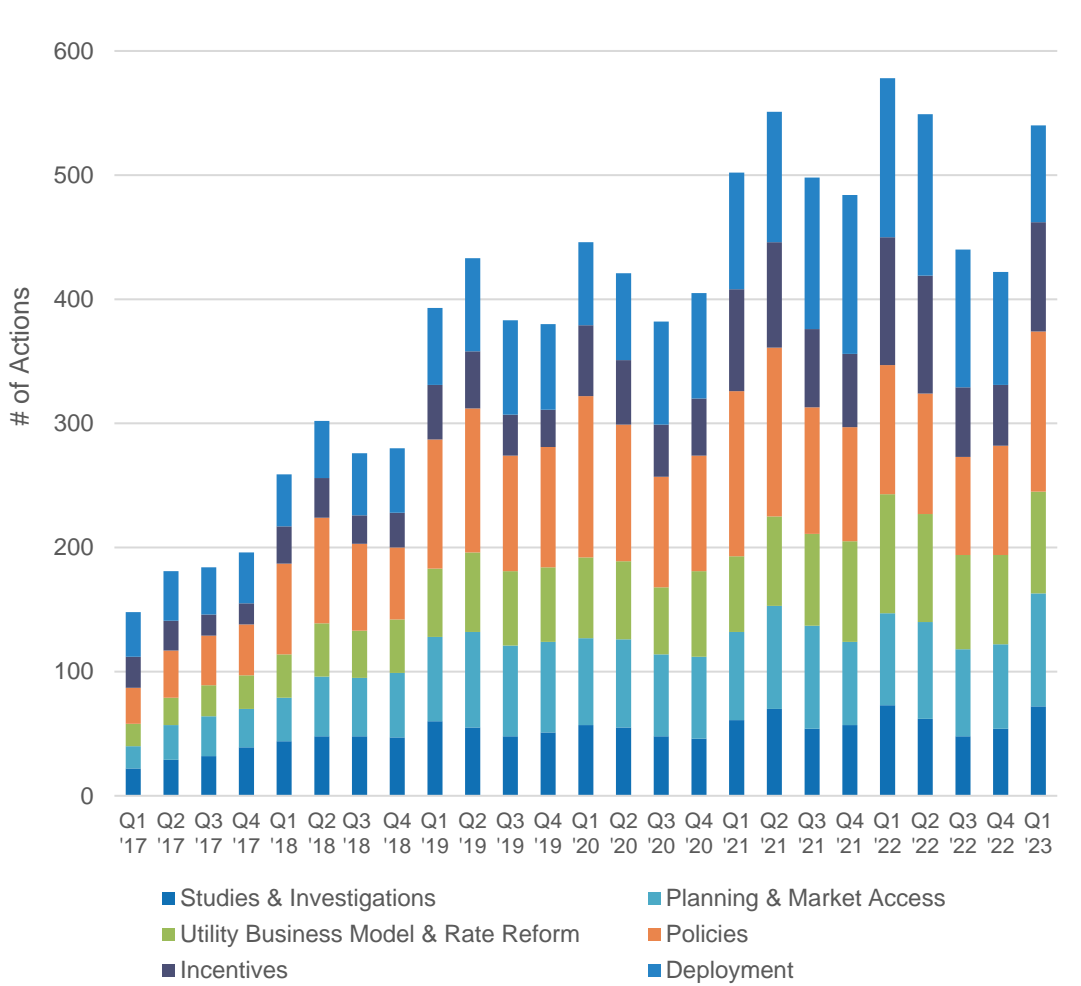
States considered a variety of options aimed at promoting microgrid development during Q1 2023. Legislation introduced in Rhode Island would require the Public Utilities Commission to establish a microgrid services tariff, while a bill introduced in New Hampshire would designate land for microgrid zones. In Oregon, proposed legislation would require a study to be conducted related to the development of microgrids and their use for increasing resilience. In several states, lawmakers are considering legislation that would enable property assessed clean energy financing for microgrids. California regulators continued work to implement a microgrid incentive program, issuing decision in early April 2023. In Hawaii, the Public Utilities Commission continued efforts to determine microgrid compensation and grid services, utility compensation, customer protection, and interconnection as part of its work to design a microgrid services tariff.

States and Utilities Examine Low-Income Customer-Specific Rate Reforms

Across the country, a number of states and utilities are considering specific rate structures for low-income customers. In California, the state's major investor-owned utilities have proposed

a significant reform that would establish income-graduated monthly fixed charges for residential customers, ranging from \$15-\$24 for the lowest income bracket and \$85-\$128 for the highest income bracket. Meanwhile in Virginia, Appalachian Power requested approval to exempt low-income customers from the monthly fixed charge. A decision issued in Connecticut in late 2022 approved low-income discount rates and credits. Legislation introduced in Maine would allow regulators to consider the design of special rates for low-income customers. In New Mexico, proposed legislation that did not pass before the end of the legislative session would have required utilities to offer affordable rates for low-income customers, which could be a dollar-amount reduction or a percentage reduction.

Figure 2. Total Number of Grid Modernization Actions by Quarter



States Study and Plan for Electric Grid Resilience

A growing number of states are taking steps to study the resilience of the electric grid or to require utilities to develop plans focused on grid resilience. Several states, including Arkansas and Vermont, have ongoing investigations into severe weather events and their impacts on the grid. Connecticut regulators recently approved a resilience framework, with utilities required to

make annual filings. Legislation introduced in Massachusetts would require electric utilities to file climate vulnerability and resilience plans, while proposed legislation in Texas directs the Public Utility Commission to conduct a study on electric grid resilience. Another Texas bill would allow utilities to file transmission and distribution system resilience plans; the utilities could also propose riders to recover costs of planned resilience investments.

Figure 3. Most Common Types of Actions Taken in Q1 2023

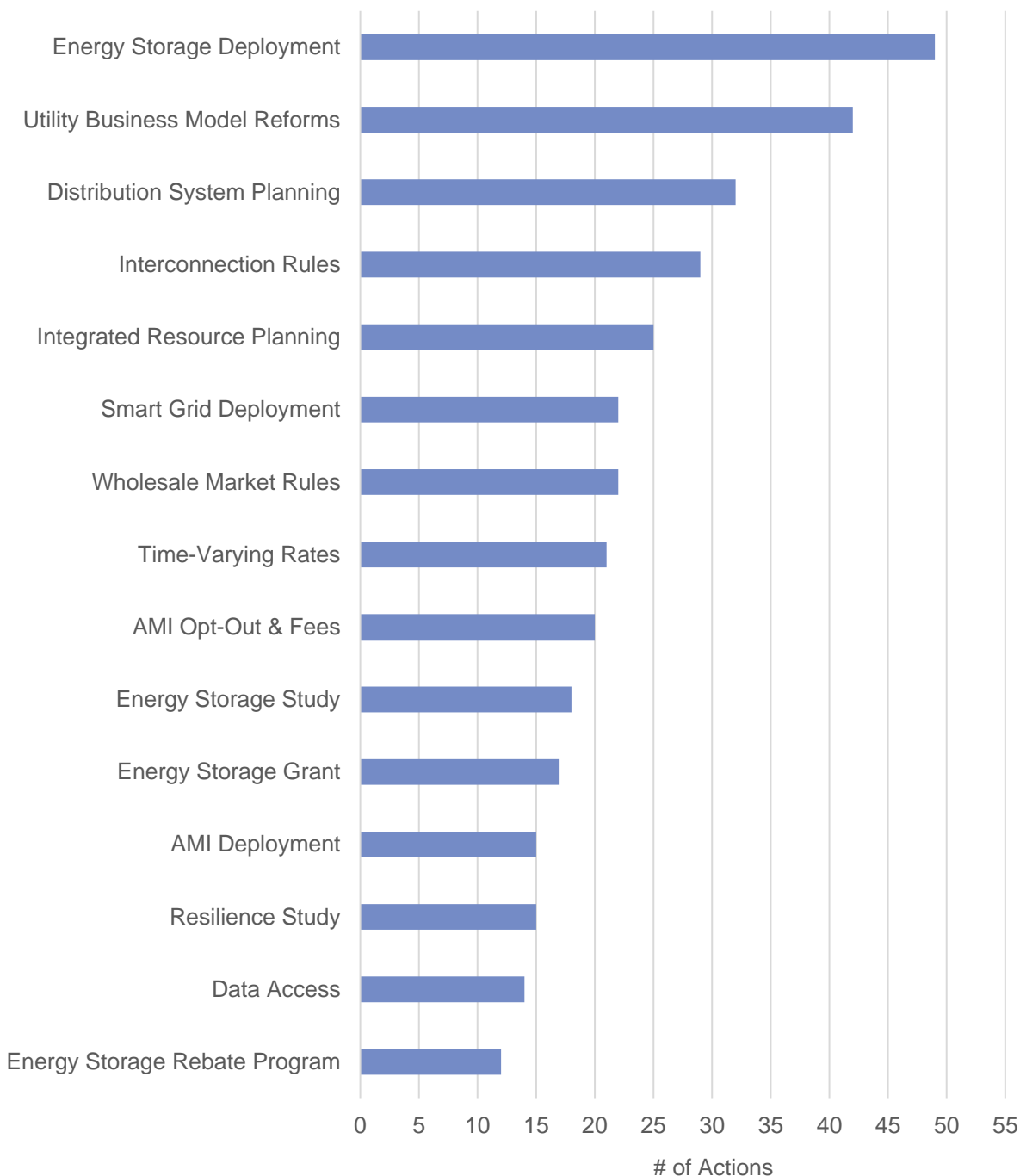


Figure 4. Most Active States of Q1 2023

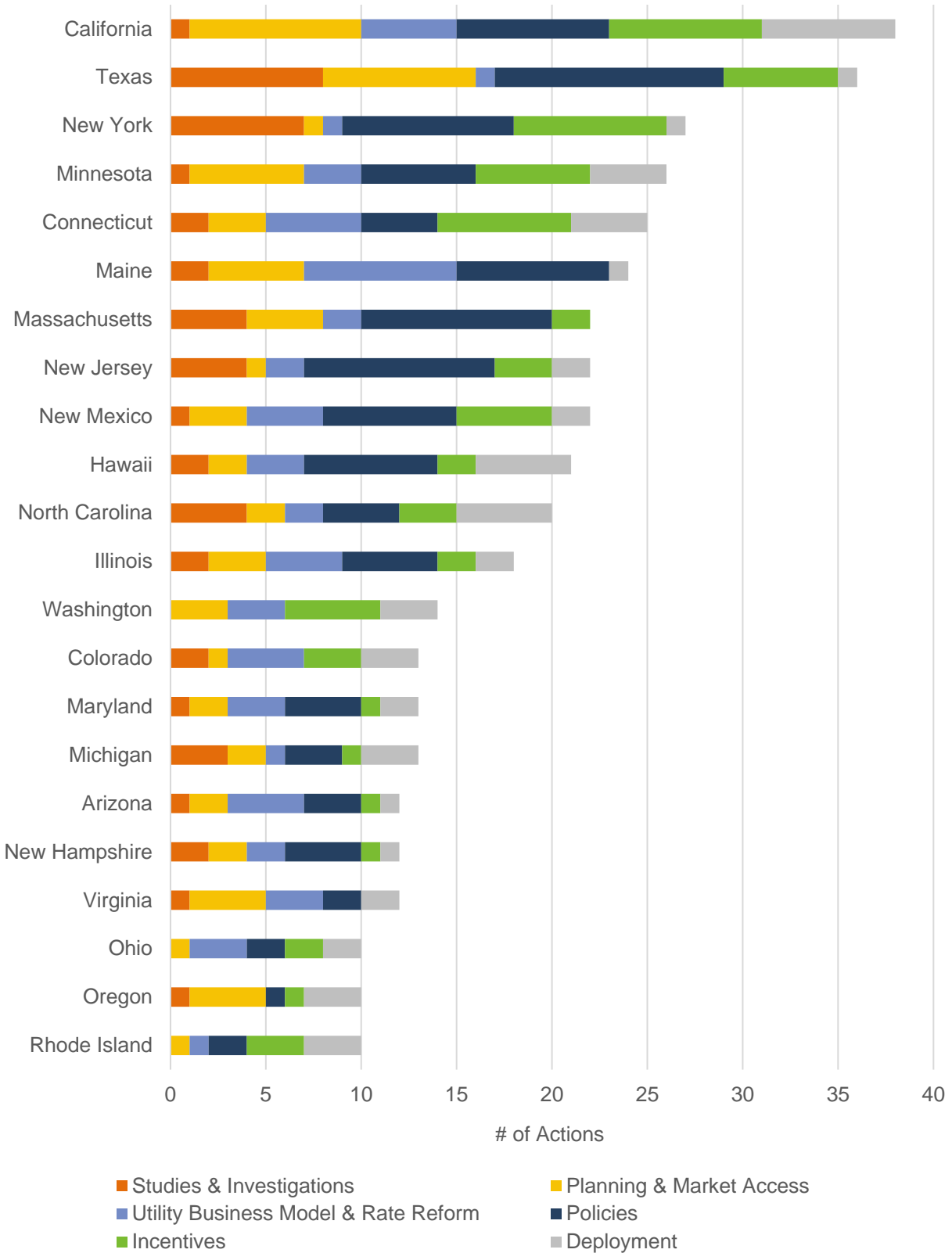
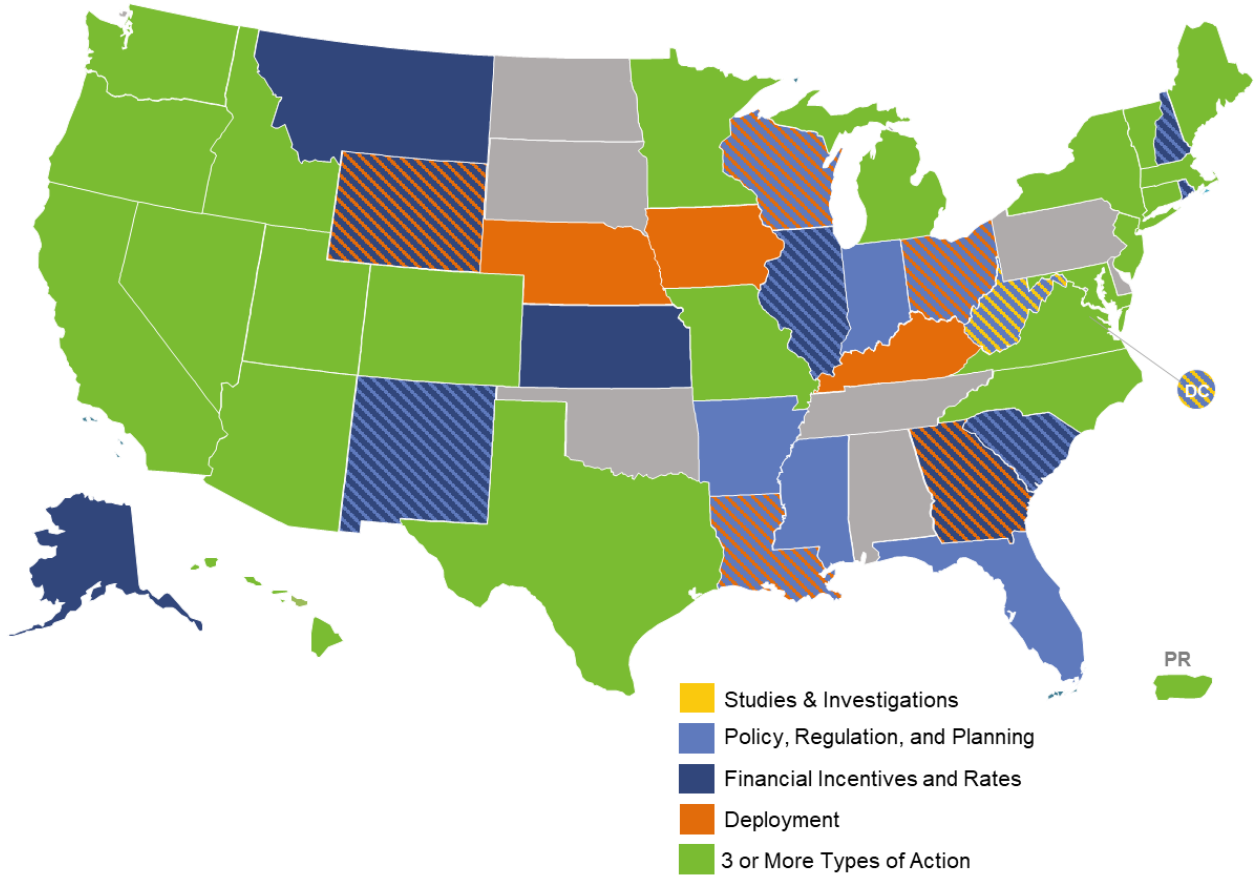


Figure 5. Q1 2023 Energy Storage Action, by Action Type



FULL REPORT DETAILS & PRICING

FULL REPORT DETAILS

Content Included in the Full Quarterly Report:

- Detailed tables describing each pending and recently decided state and utility grid modernization action addressing: (1) smart grid and advanced metering infrastructure, (2) utility business model reform, (3) regulatory reform, (4) utility rate reform, (5) energy storage, (6) microgrids, and (7) demand response. Actions are broken out into the following categories:
 - Studies and Investigations
 - Planning and Market Access
 - Utility Business Model and Rate Reforms
 - Policies
 - Financial Incentives
 - State and Utility Deployment
- Links to original legislation, dockets, and commission orders for each legislative and regulatory action
- 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 grid modernization policy action and trends
- Outlook of action for the next quarter

WHO SHOULD PURCHASE THIS REPORT

The 50 States of Grid Modernization allows those involved in the electric industry to easily stay on top of legislative and regulatory changes. The report provides a comprehensive quarterly review of actions. At a cost of \$500 per issue (or \$1,500 annually), the 50 States of Grid Modernization offers a significant time and financial savings. With direct links to original sources for all actions, customers may stay on top of policy developments between quarterly reports.

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- Identify research needs to inform grid modernization proceedings
- Cite an objective source in your own research and analysis

PRICING

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