

50

STATES OF

GRID MODERNIZATION

Q1 2025 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*, *The 50 States of Electric Vehicles*, and *The 50 States of Power Decarbonization*. 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 passed at least one chamber 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. An appendix of relevant bills that have been introduced, but not yet passed a chamber is provided at the end of the 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 2025 GRID MODERNIZATION ACTION

In the first quarter of 2025, 47 states plus DC and Puerto Rico took a total of 362 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 362 actions catalogued, the most common were related to deployment (91), policies (76), and utility business model and rate reform (60).

Table 1. Q1 2025 Summary of Grid Modernization Actions

Type of Action	# of Actions	% by Type	# of States
Deployment	91	25%	35 + DC, PR
Policies	76	21%	28 + DC, PR
Business Model and Rate Reform	60	17%	32 + PR
Financial Incentives	50	14%	26 + DC
Planning and Market Access	50	14%	24 + DC
Studies and Investigations	35	10%	19 + DC
Total	362	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 2025

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

FERC Approves Southwest Power Pool’s Markets+

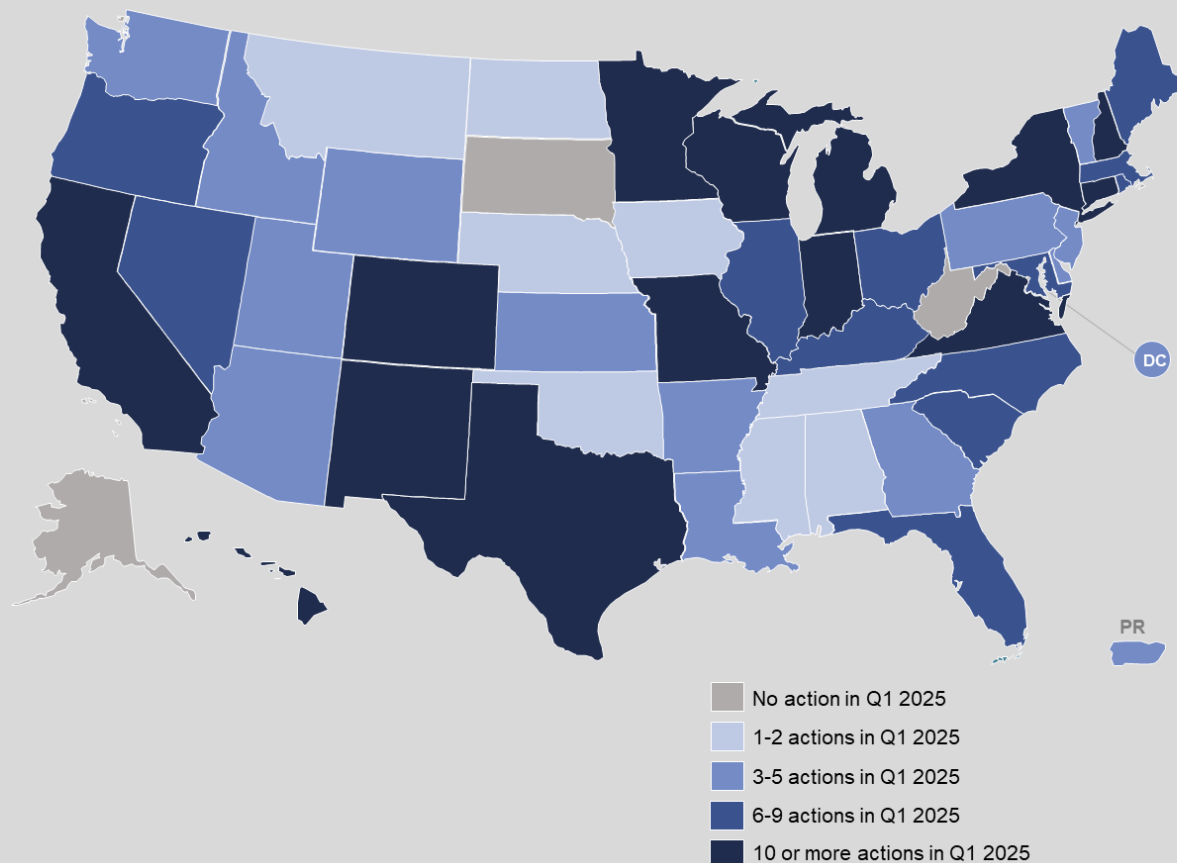
FERC approved the Southwest Power Pool’s (SPP) long-awaited Markets+ in January 2025. Markets+ is a day-ahead and real-time energy market that will provide capacity and flexibility for the Western Interconnection. SPP will begin full operation of the market in 2027. El Paso Electric in New Mexico and Xcel Energy Colorado announced this quarter that they will join Markets+, with eight other participants already listed on the Markets+ website.

Colorado and Georgia Utilities Propose New Virtual Power Plant Programs

Georgia Power included a new 50 MW virtual power plant pilot within its latest integrated resource plan filing. The pilot would have two participation modes: customer-directed load curtailment during peak events and utility-directed remote system dispatch. Xcel Energy

Colorado proposed a 125 MW Aggregator Virtual Power Plant program, with participation led by third-party aggregators.

Figure 1. Q1 2025 State and Utility Action on Grid Modernization



Missouri Legislators Passes Bill Mandating Standard Residential Rate Option

The Missouri General Assembly passed a bill overturning a Public Service Commission decision that implemented mandatory time-varying rates for residential customers. The bill allows customers to opt out of a time-of-use rate and use an advanced meter. Functionally, this will require utilities to re-implement standard rates for residential customers. The Governor signed the bill in early Q2 2025.

New York Regulators Release First Grid of the Future Plan

The New York Department of Public Service released the first iteration of the Grid of the Future plan to improve utilities' distribution system implementation planning. Based on a phase 1 grid

flexibility study also released this quarter, the plan provides recommendations to align the utility plans with the state's Climate Leadership and Community Protection Act.

Maine Governor's Energy Office Publishes Final Report on Distribution System Operator Feasibility

The Governor's Energy Office of Maine published the state's final Distribution System Operator (DSO) Feasibility study. The study found that a DSO could reduce costs, enhance grid performance, and accelerate climate goals; however, development would require significant investment and coordination, and there are alternative paths to reach a similar solution, so the Office is declining to pursue the development of a DSO at this time.

MOST ACTIVE STATES AND SUBTOPICS OF Q1 2025

The most common types of actions across the country related to energy storage deployment (52), interconnection rules (32), smart grid deployment (31), utility business model reforms overall (27), time-varying rates (25), and performance-based regulation (20).

The states taking the greatest number of actions related to grid modernization in Q1 2025 can be seen in Figure 4. Connecticut, Michigan, Minnesota, Texas, and Virginia saw the most action during the quarter, followed by California, New Mexico, and Wisconsin. Overall, 47 states, plus DC and Puerto Rico, took actions related to grid modernization in Q1 2025.

TOP GRID MODERNIZATION TRENDS OF Q1 2025

Regulatory Commissions Approve Residential Critical Peak Pricing Pilots

Critical Peak Pricing (CPP) rates are a type of time-varying rate with increased pricing during certain high-demand on-peak periods. Utility regulators approved various CPP pilots for residential customers this quarter across the country. CenterPoint Indiana South will start a CPP pilot utilizing smart thermostats, while Dominion Energy will begin an experiential time-varying rate with winter CPP in North Carolina. El Paso Electric will implement a time-varying rate pilot in New Mexico, including a CPP rate, a CPP-with-enabling-technology rate, and even a small commercial CPP rate; the utility is awaiting a decision on the same pilot in its Texas territory.

Utilities Pursue Virtual Power Plant Programs

Virtual power plants (VPPs) are distributed energy resources that are aggregated to balance electric loads and provide grid services, similar to traditional power plants. Utilities have begun proposing VPP offerings in response to statutory requirements and directive from utility

for deployment of GETs, and the New York Senate passed a bill allowing regulators to approve utility development of GETs.

Figure 3. Most Common Types of Actions Taken in Q1 2025

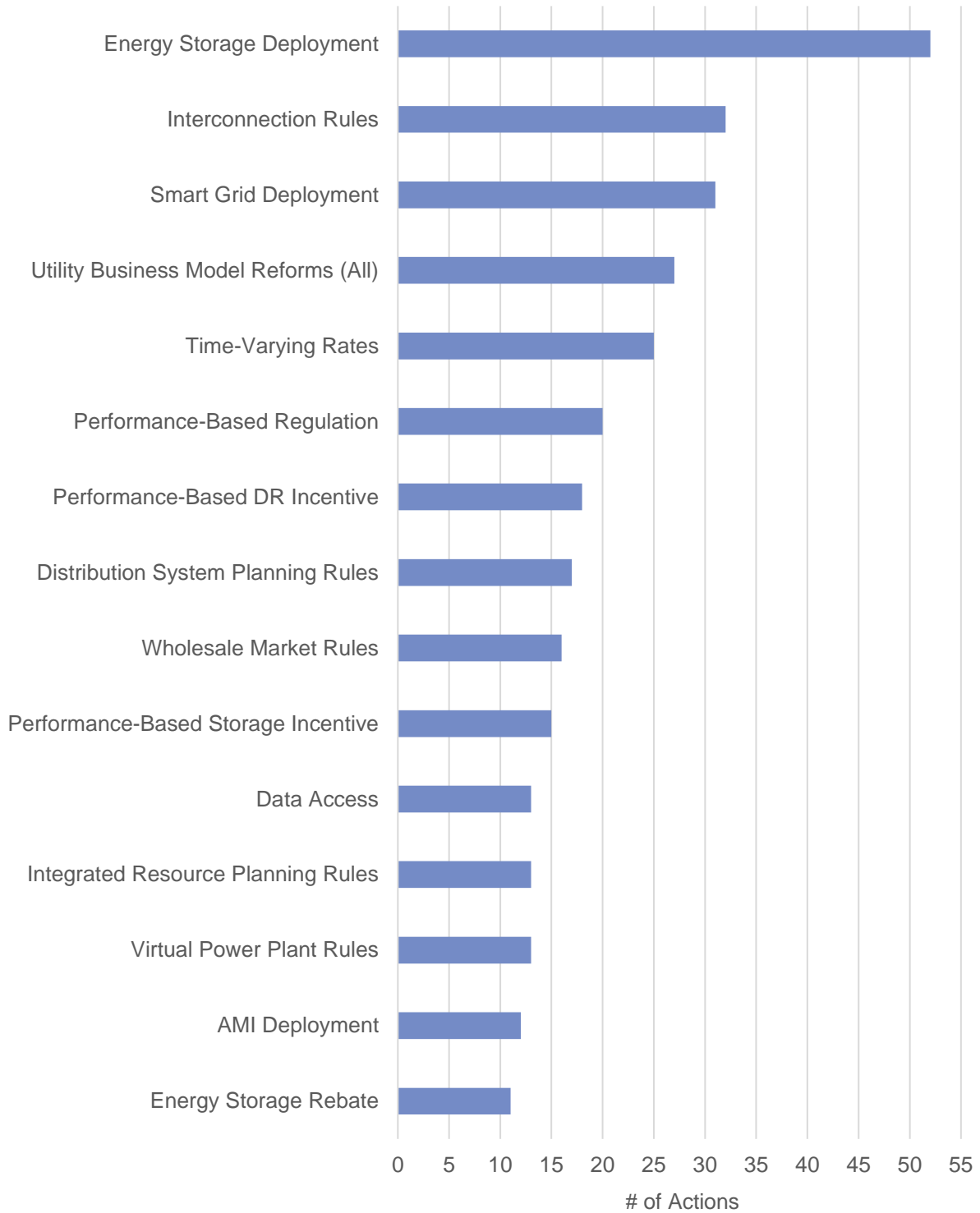


Figure 4. Most Active States of Q1 2025

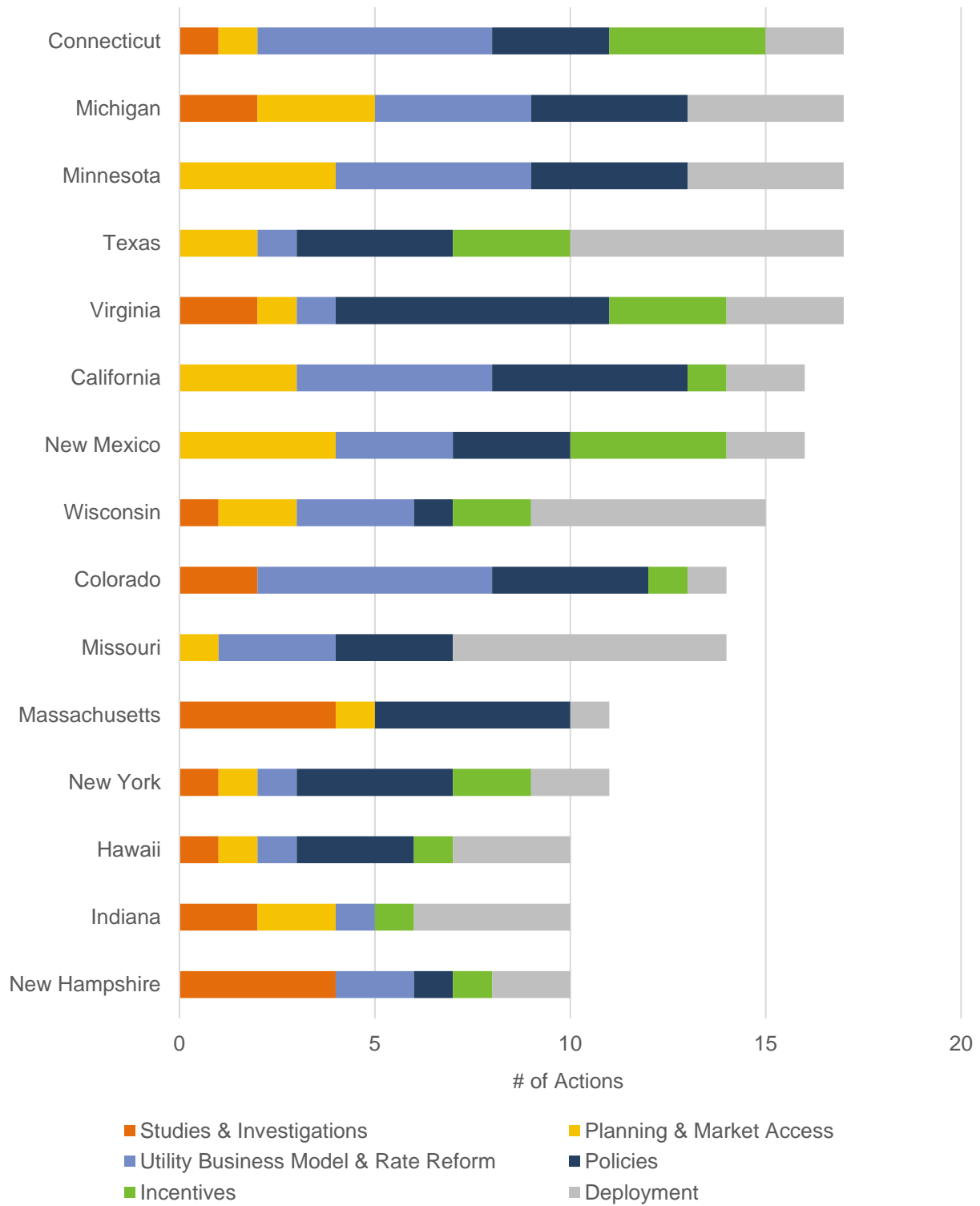
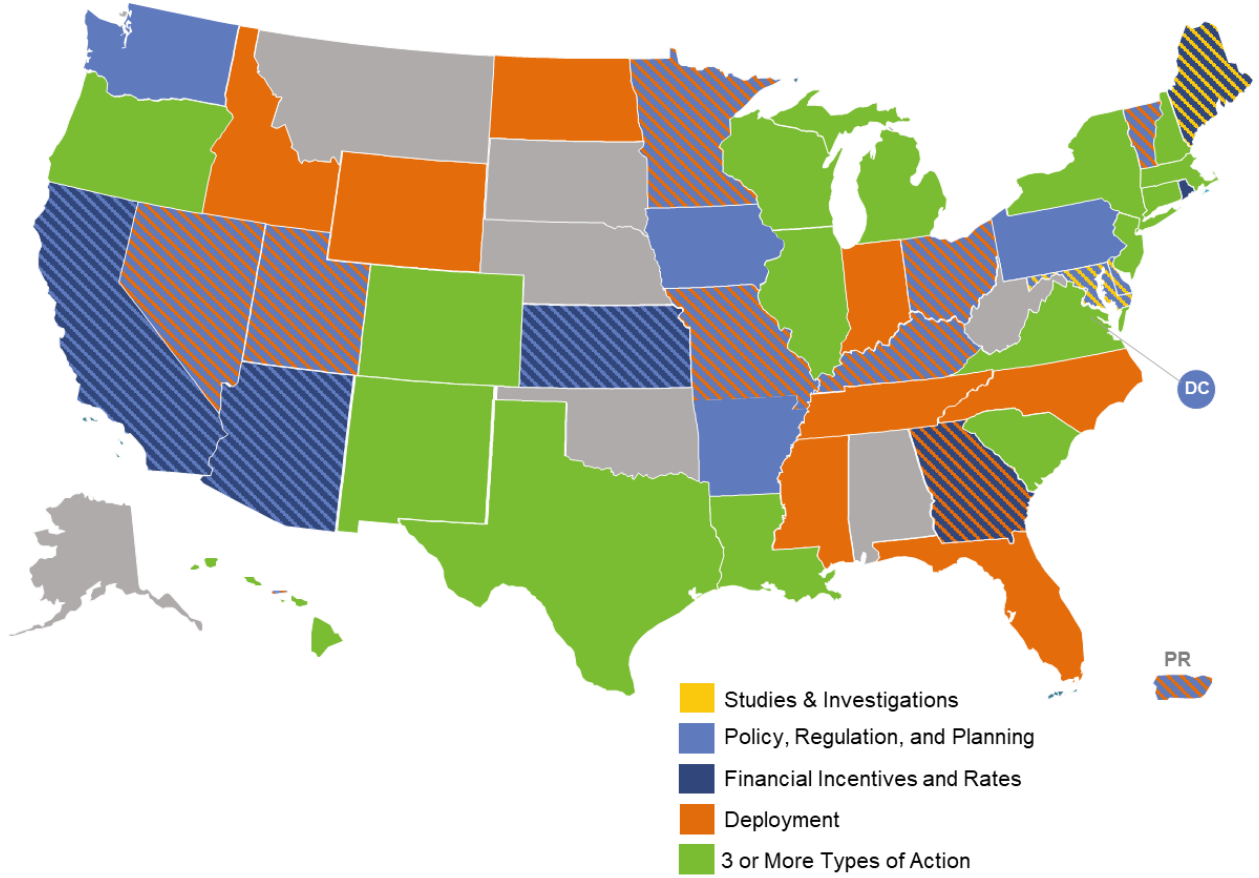


Figure 5. Q1 2025 Energy Storage Action, by Action Type



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.

Advanced Energy Technology Businesses

- 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 opportunities and 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
- Identify active utility investment proceedings

Advocacy Organizations

- Learn about the diverse grid modernization actions occurring across the country
- Learn about the outcomes of other states' policy decisions
- Utilize an objective source of information in legislative and regulatory proceedings

Researchers and Consultants

- Access valuable data requiring a vast amount of time to collect first-hand
- Identify research needs to inform grid modernization proceedings
- Cite an objective source in your own research and analysis

PRICING

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