

50

STATES OF

GRID MODERNIZATION

Q3 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*, *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 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

Q3 2023 GRID MODERNIZATION ACTION

In the third quarter of 2023, all 50 states plus DC and Puerto Rico took a total of 468 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 468 actions catalogued, the most common were related to policies (96), deployment (87), and planning and market access (79).

Table 1. Q3 2023 Summary of Grid Modernization Actions

Type of Action	# of Actions	% by Type	# of States
Policies	96	21%	24 + PR
Deployment	87	19%	34
Planning and Market Access	79	17%	29 + DC, PR
Business Model and Rate Reform	75	16%	35
Financial Incentives	70	15%	24
Studies and Investigations	61	13%	26 + DC, PR
Total	468	100%	50 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 Q3 2023

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

Federal Appeals Court Rescinds FERC Approval of the Southeast Energy Exchange Market

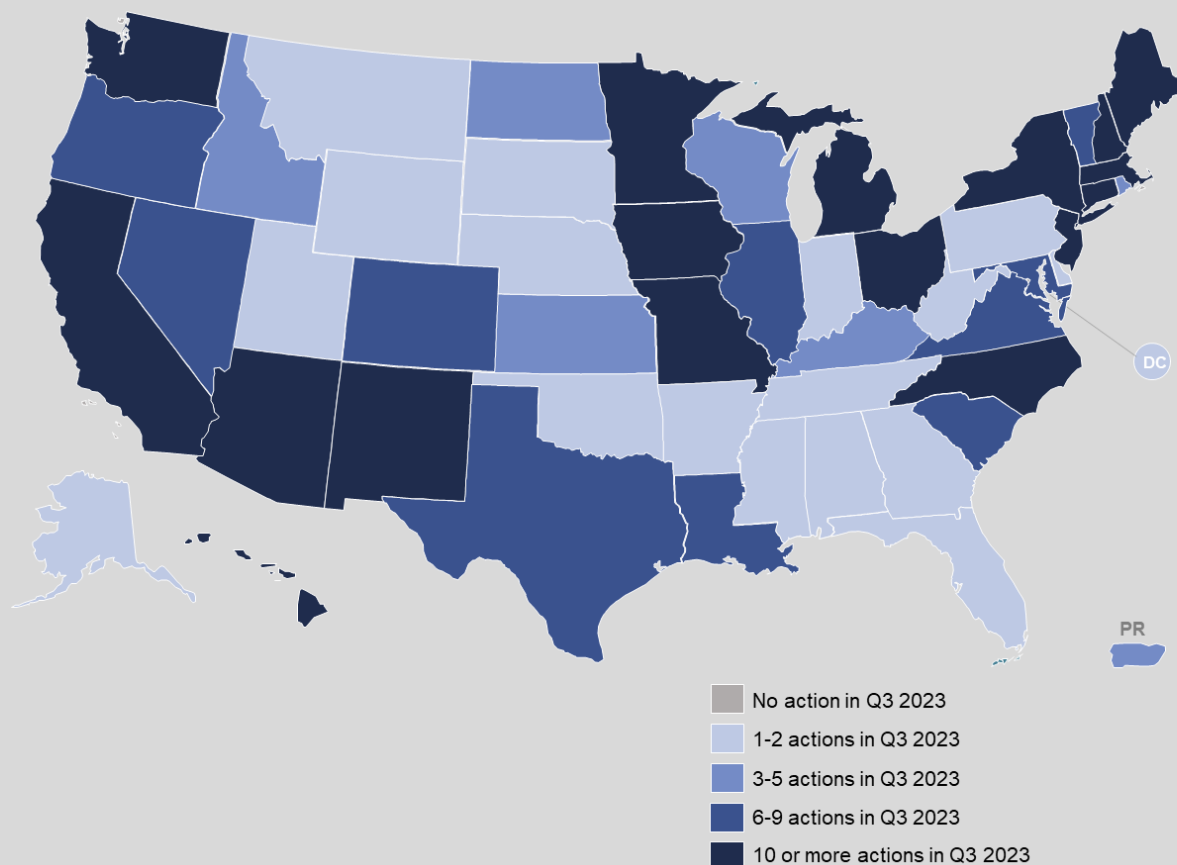
In July 2023, a federal appeals court rescinded the Federal Energy Regulatory Commission’s (FERC) order approving the Southeast Energy Exchange Market (SEEM) on the basis that SEEM is inconsistent with FERC Order 888, which requires transmission owners to provide non-discriminatory access to their transmission systems. SEEM plans to continue functioning while FERC prepares its response to the appeals court decision.

California Energy Commission Approves Incentives for Virtual Power Plants

The California Energy Commission approved a new incentive program for virtual power plants in July 2023, which will compensate customers for upfront capacity commitments and per-unit reductions in net energy load during extreme events. The Market-Aware Behind-the-Meter

Battery Storage Pilot will make incentive payments to virtual power plant aggregators, which will then be allocated to participants.

Figure 1. Q3 2023 State and Utility Action on Grid Modernization



Michigan Utilities File Five-Year Distribution System Plans

Consumers Energy, DTE Electric, and Indiana Michigan Power filed their latest five-year distribution system plans in September 2023. Consumers Energy’s plan includes \$427 million in investments, including an advanced distribution management system and a distributed energy resource (DER) management system. DTE’s plan includes \$1.36 billion in smart grid investments, including grid automation and DER management, and Indiana Michigan Power’s plan contains \$56.8 million for grid modernization.

Virginia Regulators Approve Dominion Energy Grid Modernization Investments

Virginia regulators issued a decision on Dominion Energy’s proposed Phase 3 Electric Grid Transformation Projects in September 2023. The order approves cost caps for several projects, including investments in advanced metering infrastructure, a customer information

platform, voltage optimization enablement, a distributed energy resource management system, an outage management system, and a non-wires alternative pilot.

Massachusetts Utilities Submit Draft Electric Sector Modernization Plans

Eversource, National Grid, and Unitil filed their draft electric sector modernization plans in September 2023. The 10-year plans evaluate future grid needs and describe investment plans to accommodate increasing demand, expand hosting capacity, and enable greater clean energy and electrification. National Grid specified that the company will invest more than \$2 billion in the next five years to meet electrification needs.

MOST ACTIVE STATES AND SUBTOPICS OF Q3 2023

The most common types of actions across the country related to energy storage deployment (57), utility business model reforms (42), distribution system planning (31), interconnection rules (25), and smart grid deployment (25).

The states taking the greatest number of actions related to grid modernization in Q3 2023 can be seen in Figure 4. New York, California, Massachusetts, Michigan, Minnesota, and New Jersey, saw the most action during the quarter, followed by Connecticut, North Carolina, Hawaii, Maine, and New Hampshire. Overall, 50 states, plus DC and Puerto Rico, took actions related to grid modernization in Q3 2023.

TOP GRID MODERNIZATION TRENDS OF Q3 2023

States Examining the Costs and Benefits of RTO Participation

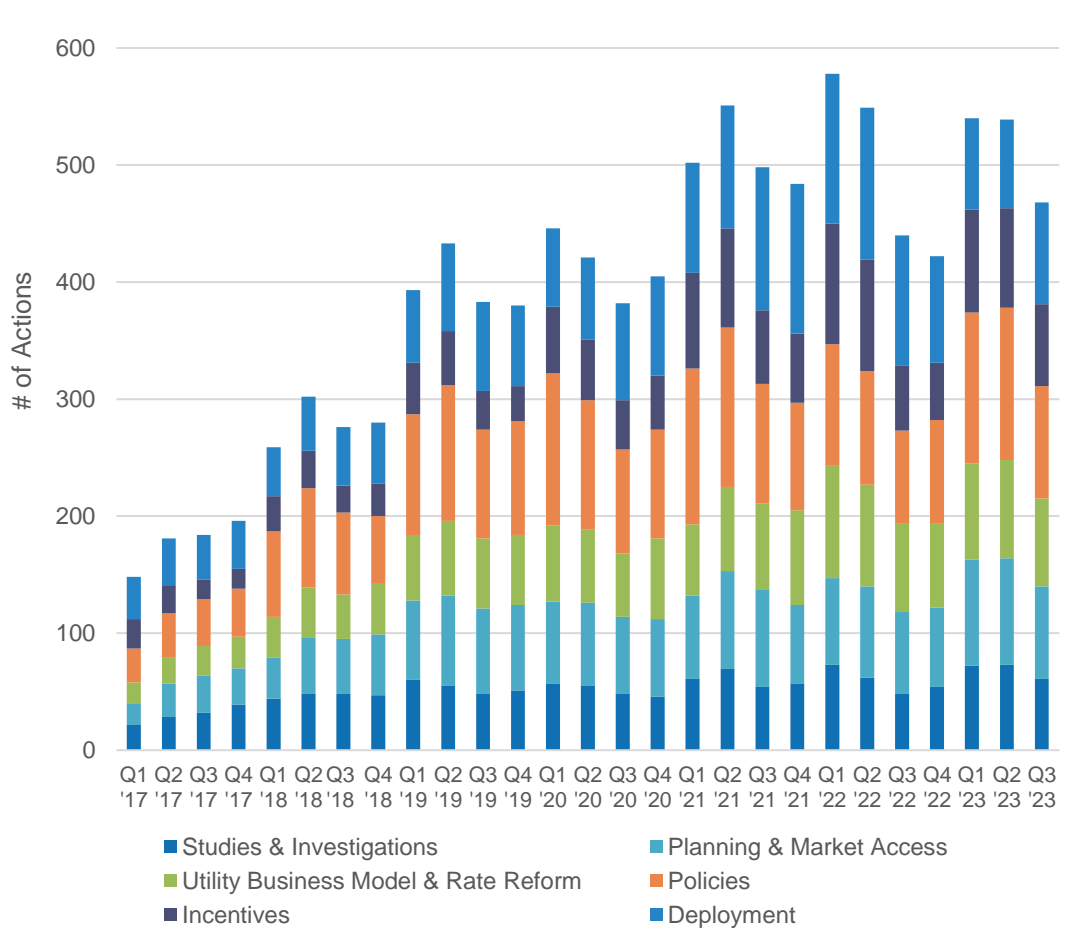
A number of states have recently taken steps to examine the costs and benefits of regional transmission organization (RTO) participation. In September 2023, Arizona Public Service filed its Western Day Ahead Market Production Cost Impact Study, performed by E3, which looks at the economic impacts of participation in CAISO and the Southwest Power Pool. In Illinois, Ameren filed an RTO Cost-Benefit Study in July 2023, concluding that Ameren remaining in MISO avoids significant costs compared to Ameren joining PJM. Last quarter, a study released in South Carolina, conducted by Brattle, found that South Carolina utility customers could save up to \$362 million annually if the state joins PJM. Colorado, Nevada, and Missouri are among the other states that have examined RTO participation costs and benefits within the past year.

States and Utilities Enabling Virtual Power Plants with DER Aggregation

One of the buzziest phrases of the year thus far has been “virtual power plants”, with states and utilities across the country taking steps to allow for the aggregation of distributed energy resources (DERs). The California Energy Commission issued a major decision in July 2023,

approving a new incentive program to compensate virtual power plants for load reduction or capacity commitments. In Colorado, the Public Utilities Commission opened a new proceeding in September 2023 to explore third-party implementation of virtual power plant pilots in Xcel Energy's service area. In Arizona, Arizona Public Service is continuing efforts to refine its Distributed Demand-Side Resource Aggregation Tariff before refileing it for Commission approval. Meanwhile, many utilities are proposing programs where they would serve as the aggregator and compensate participating customers for capacity contributions during peak demand.

Figure 2. Total Number of Grid Modernization Actions by Quarter



States Taking a Coordinated Approach to Distribution Grid Investment Planning

A growing number of states are requiring utilities to file regular distribution system plans, which evaluate future grid needs and identify needed grid investments. In this way, states are establishing a regular cadence and required components for plans, as opposed to grid investments being proposed by utilities in a more piecemeal fashion. Nevada and Michigan are among the states requiring utilities to file regular distribution system plans, with utilities in these states filing plans during Q3 2023. In Massachusetts, utilities filed draft electric system modernization plans in September 2023, pursuant to legislation enacted last year. The

Louisiana Public Service Commission filed final proposed rules for grid resilience planning in August 2023, which set forth requirements for utilities to assess grid vulnerabilities and investment needs. In Illinois, regulators continued to review integrated grid plans filed by Commonwealth Edison and Ameren Illinois, following the enactment of legislation establishing these requirements in 2021.

Figure 3. Most Common Types of Actions Taken in Q3 2023

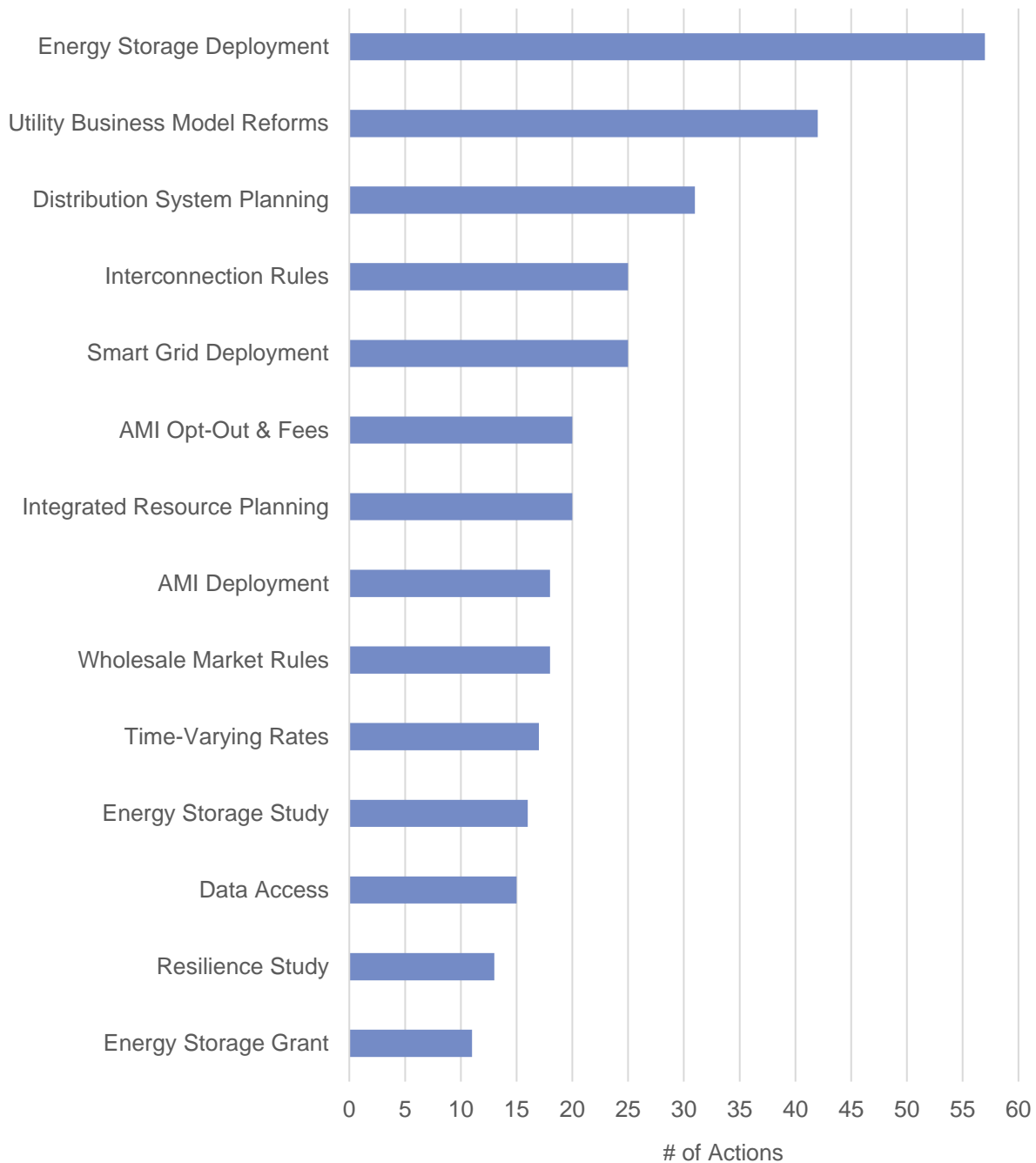
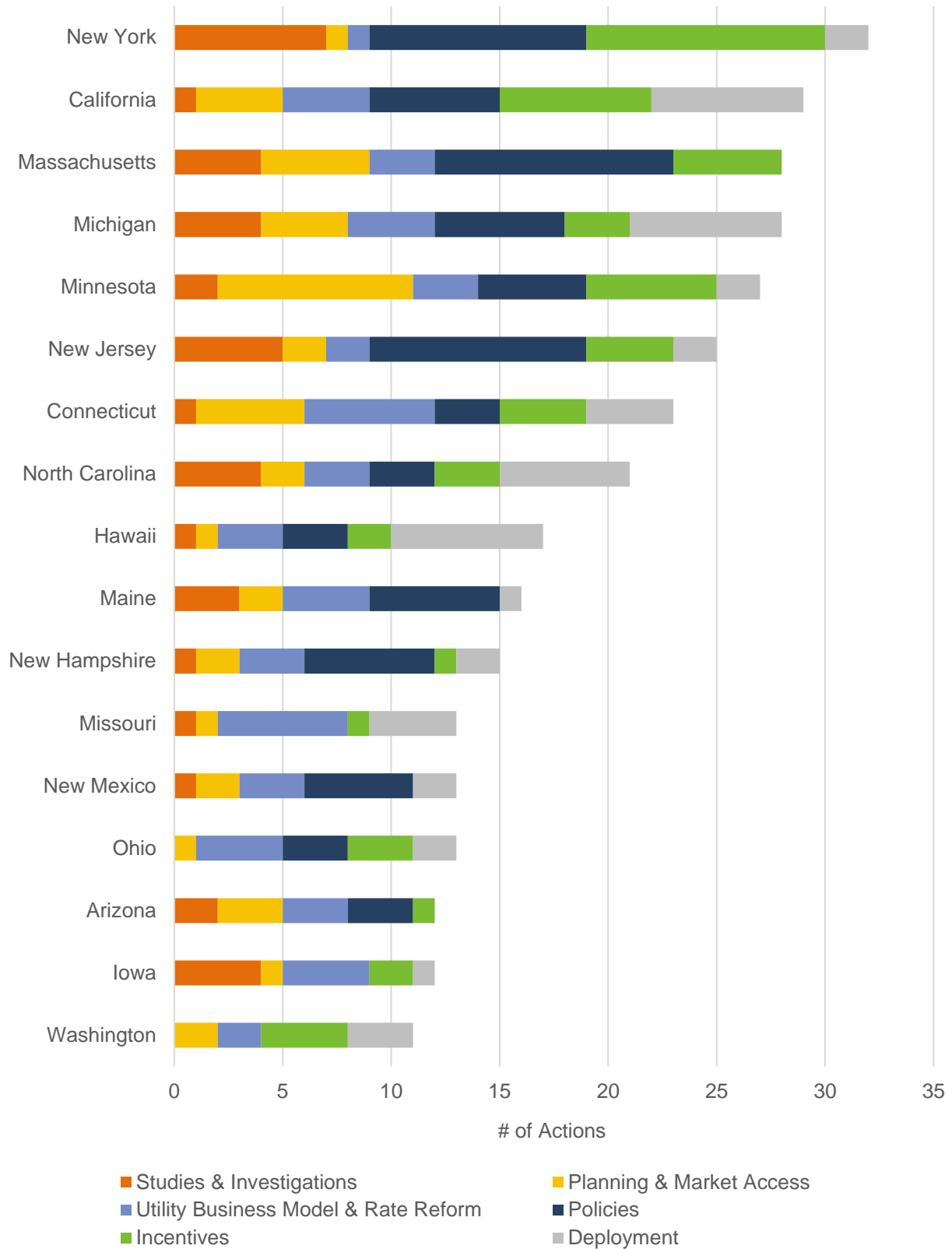


Figure 4. Most Active States of Q3 2023



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 new investment opportunities and emerging areas of growth, as well as risky investments
- Identify active utility investment proceedings

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- Learn about the diverse grid modernization actions occurring across the country
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Researchers and Consultants

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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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