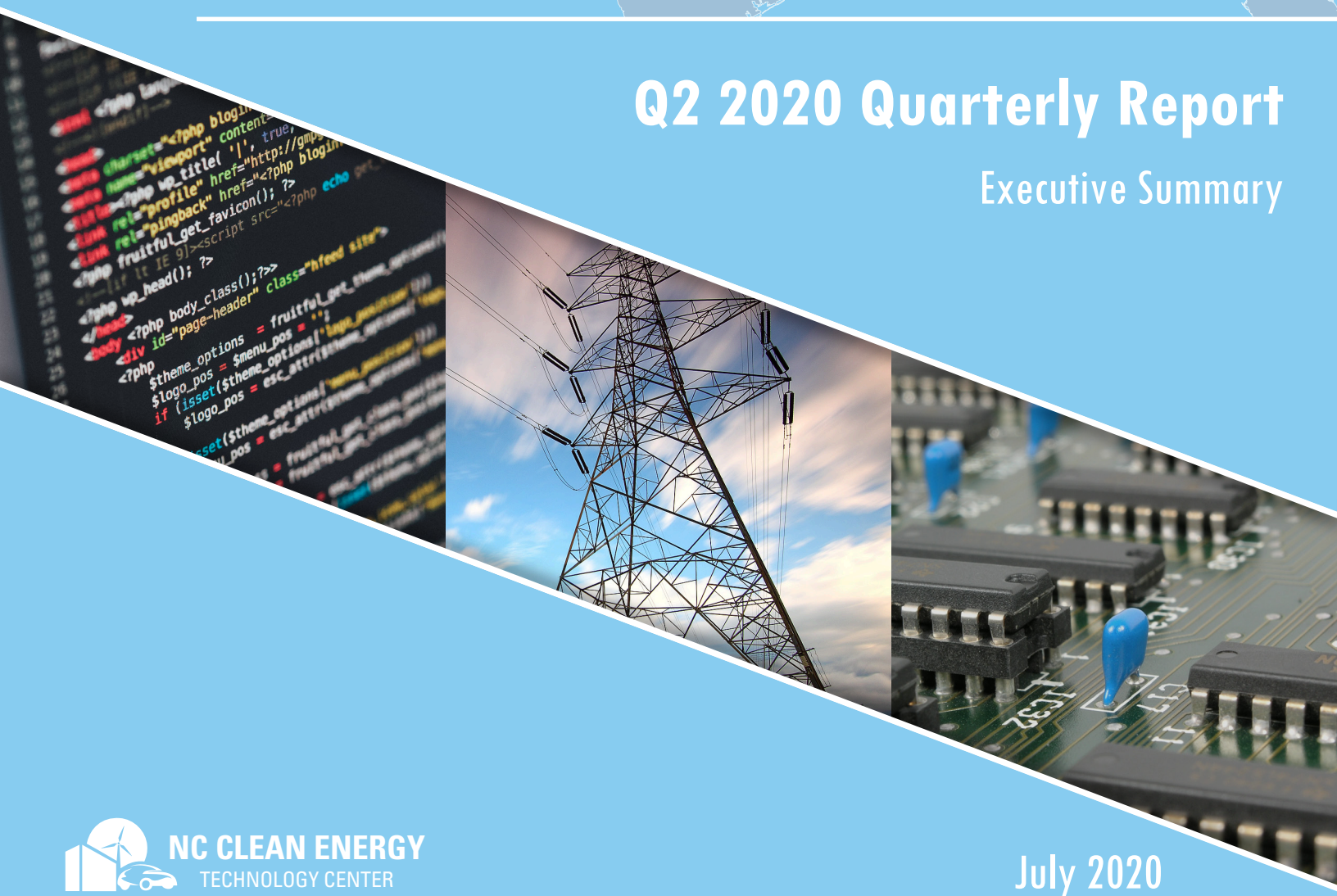
50 States of GRID MODERNIZATION

Q2 2020 Quarterly Report

Executive Summary



NC CLEAN ENERGY
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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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PREVIOUS EDITIONS AND OTHER 50 STATES REPORTS

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

Q2 2020 GRID MODERNIZATION ACTION

In the second quarter of 2020, 45 states plus DC took a total of 421 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 421 actions catalogued, the most common were related to policies (110), planning and market access (71), and deployment (70).

Table 1. Q2 2020 Summary of Grid Modernization Actions

Type of Action	# of Actions	% by Type	# of States
Policies	110	26%	33 + DC
Planning and Market Access	71	17%	23 + DC
Deployment	70	17%	27
Business Model and Rate Reform	63	15%	27 + DC
Studies and Investigations	55	13%	26 + DC
Financial Incentives	52	12%	16
Total	**421**	**100%**	**45 States + DC**

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 Q2 2020

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

California Regulators Adopt Staff Microgrid and Resilience Recommendations

The California Public Utilities Commission issued a decision in June 2020 adopting several of the Commission Staff's recommendations to accelerate microgrid deployment and resilience solutions. The decision directs utilities to take several steps to standardize and improve the interconnection process for resiliency projects and adopt solutions that modernize tariffs to maximize social resiliency benefits.

Oregon Public Utility Commission Approves Residential Storage Incentive Program for Portland General Electric

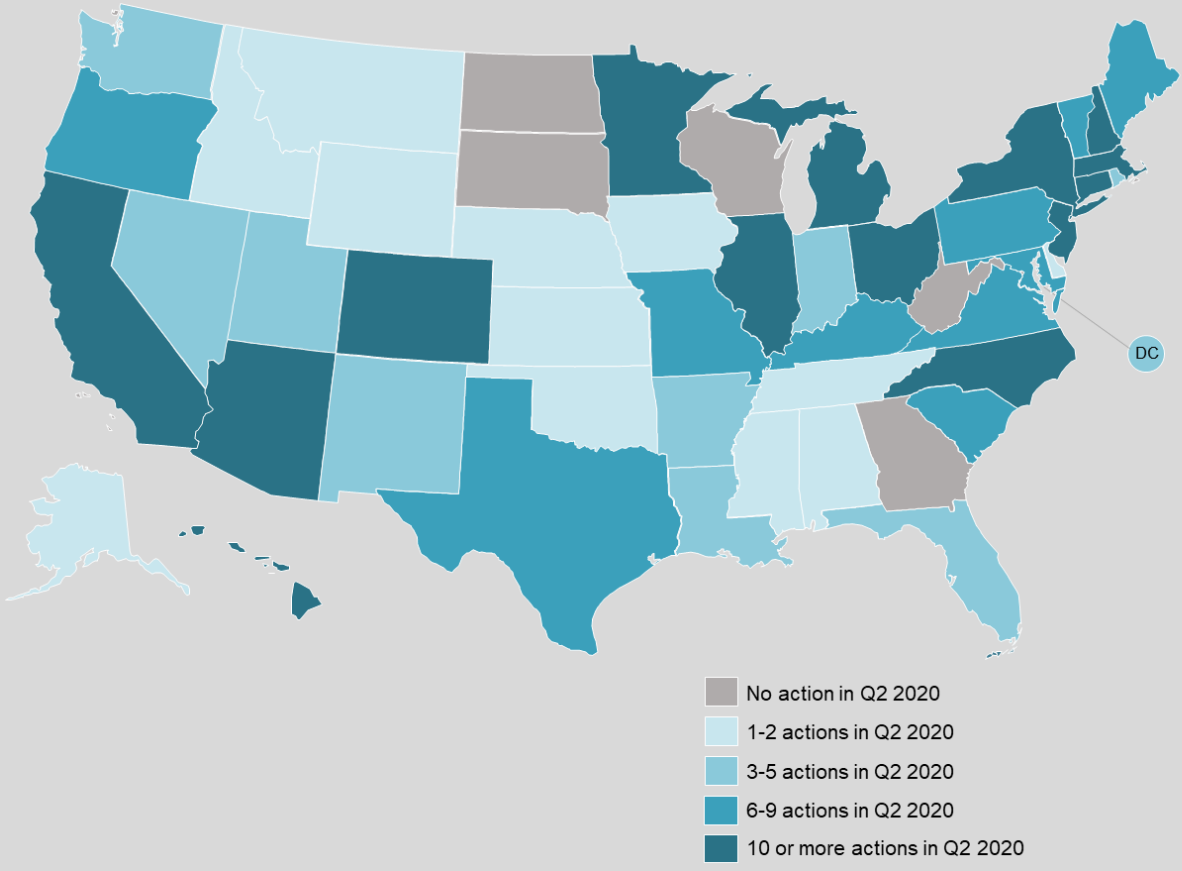
In June 2020, the Oregon Public Utility Commission approved a new residential battery energy storage pilot program proposed by Portland General Electric. The program will allow

participating customers to receive a monthly bill credit for letting the utility control the charging and discharging of the battery. Low-income customers in the test bed will also be eligible for rebates to purchase new battery systems.

Connecticut PURA Opens Three Additional Grid Modernization Dockets

The Connecticut Public Utilities Regulatory Authority (PURA) opened three additional sub-dockets during Q2 2020 as part of its expansive grid modernization efforts. One proceeding is addressing non-wires alternatives, the second is examining reliability and resilience standards, and the third is considering distributed energy resources and renewables programs.

Figure 1. Q2 2020 State and Utility Action on Grid Modernization



DC Public Service Commission Approves Grid Modernization Recommendations

In June 2020, the DC Public Service Commission issued an order approving many of the Commission Staff's grid modernization recommendations. These recommendations include improving customer data access, examining distributed energy resource ownership rules, and developing a non-wires alternative pilot. These efforts build upon the grid modernization recommendations approved by the Commission in January 2020.

Kentucky Power Company Files AMI Deployment and Rider Proposal

Kentucky Power Company filed a request to deploy advanced metering infrastructure as part of its general rate case, filed in late June 2020. Kentucky Power's $37 million investment would be recovered through a proposed Grid Modernization Rider. If approved, the rider would be used to recover costs for additional grid modernization efforts undertaken in the future.

MOST ACTIVE STATES AND SUBTOPICS OF Q2 2020

The most common types of actions across the country related to energy storage deployment (46), data access policies (32), utility business model reforms (31), distribution system planning (28), and rules related to advanced metering infrastructure opt-out (25). In Q2 2020, grid modernization activity decreased slightly by 3% over Q2 2019, but increased by 40% over Q2 2018.

The states taking the greatest number of actions related to grid modernization in Q2 2020 can be seen in Figure 4. New York, California, Massachusetts, and Minnesota saw the most action during the quarter, followed by New Jersey, Michigan, Hawaii, and Arizona. Overall, 45 states, plus DC, took actions related to grid modernization in Q2 2020.

TOP GRID MODERNIZATION TRENDS OF Q2 2020

Utilities Increasingly Proposing Residential Battery Storage Programs

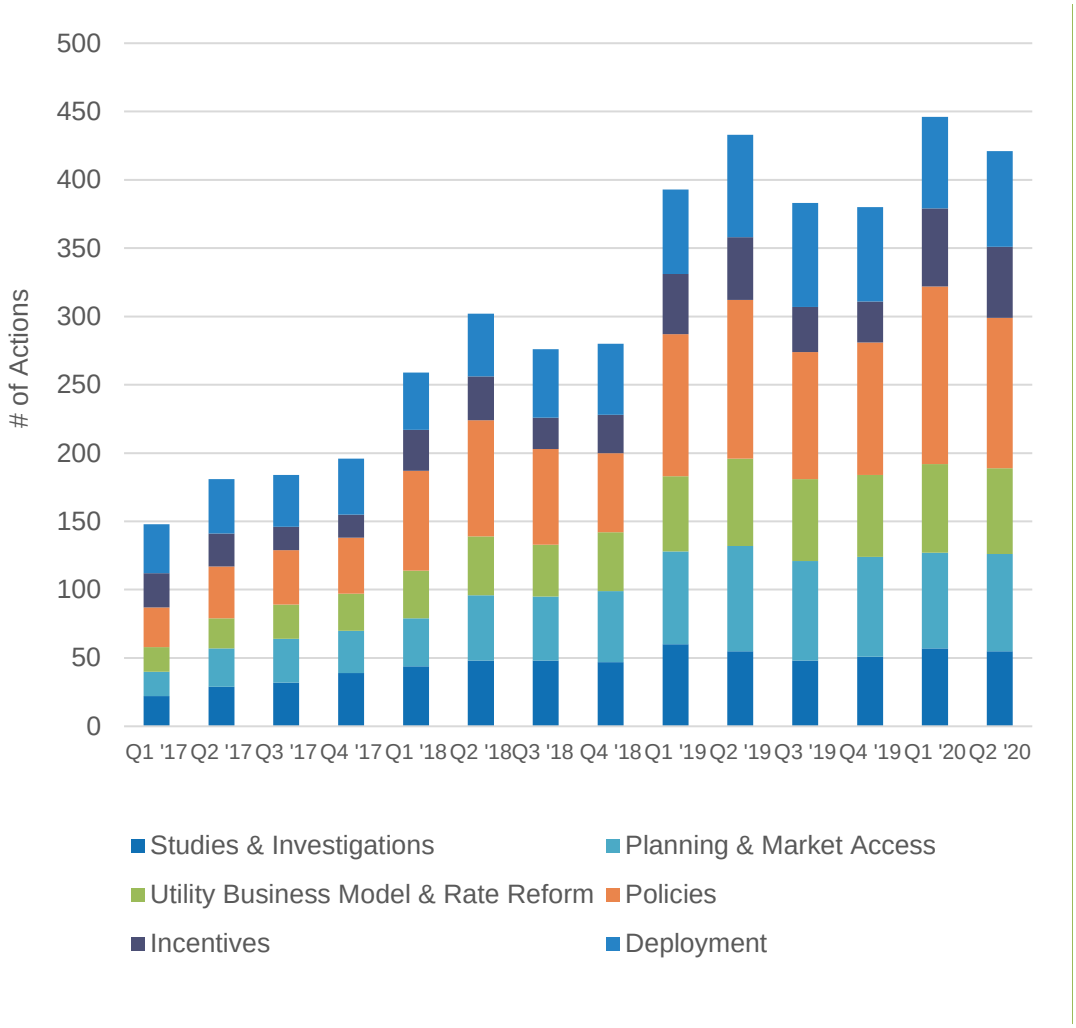
Utilities across the country are increasingly proposing programs focused on encouraging and managing residential battery storage systems. In Oregon, regulators approved a new residential battery storage pilot program proposed by Portland General Electric, in which participating customers will receive monthly bill credits for allowing the utility to control charging and discharging of the battery. The Vermont Public Utility Commission approved a new program for Green Mountain Power, where residential and small commercial customers may lease battery storage systems from the utility, with Green Mountain Power having the ability to manage the batteries. Green Mountain Power also has a Bring Your Own Device program for residential customers. In Arizona, Tucson Electric Power and UNS Electric proposed residential energy storage incentives for systems that can dispatch during on-peak hours, but will not require direct utility operation or control of the systems.

States Undertaking Efforts to Improve Electric Grid Resilience

Although most states have yet to establish specific methodologies for identifying the resilience value of different investments and programs, many states are considering a variety of efforts to improve electric grid resilience. In California, the Public Utilities Commission directed utilities to improve the interconnection process for resiliency projects and modernize tariffs to

maximize social resiliency benefits. Connecticut regulators opened a new proceeding in June 2020 to develop reliability and resilience targets and metrics. In North Carolina, a proposed settlement between Duke Energy and Vote Solar would require the utility to convene a climate risk and resilience working group and develop a climate resilience plan. DC and Hawaii regulators are also heavily considering resilience in their grid modernization and microgrid proceedings.

Figure 2. Total Number of Grid Modernization Actions by Quarter



Critical Peak Pricing and Peak Time Rebates on the Rise

While time-of-use rates have become a relatively common option across the country, more and more utilities are proposing critical peak pricing and peak time rebate programs. The Hawaii Public Utilities Commission recently accepted HECO's advanced rate design strategy, which includes critical peak incentives, and Indiana regulators approved a critical peak pricing tariff for Duke Energy Indiana. The Kentucky Public Service Commission approved a new peak time rebate pilot program for Duke Energy Kentucky, while Illinois regulators approved a proposal from Commonwealth Edison to continue its peak time rebate program and Oregon

regulators approved an application from Portland General Electric to increase the size of its peak time rebate program. In DC, Pepco recommended the establishment of a critical peak rebate dynamic pricing rate during Q2 2020.

Figure 3. Most Common Types of Actions Taken in Q2 2020

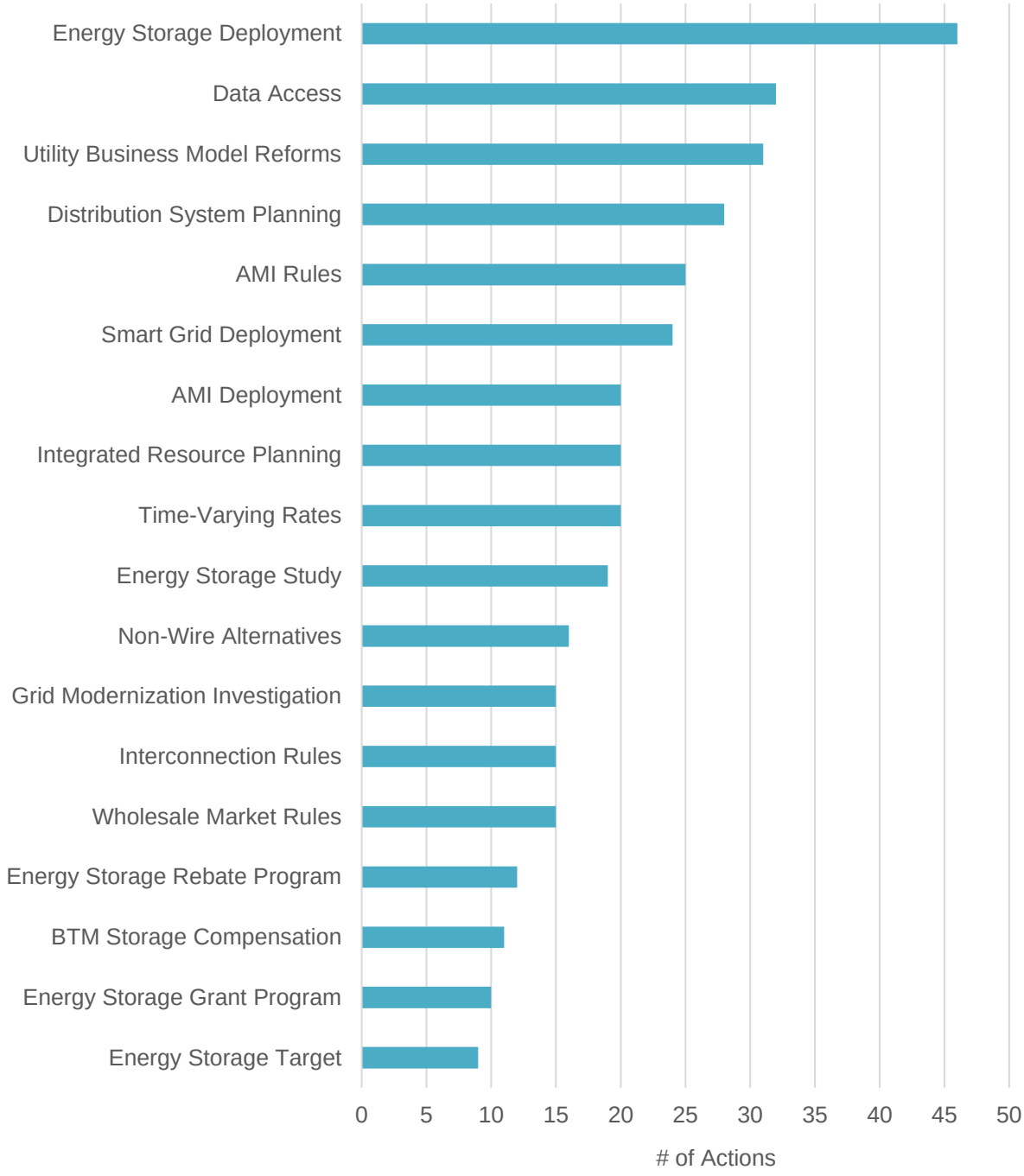


Figure 4. Most Active States of Q2 2020

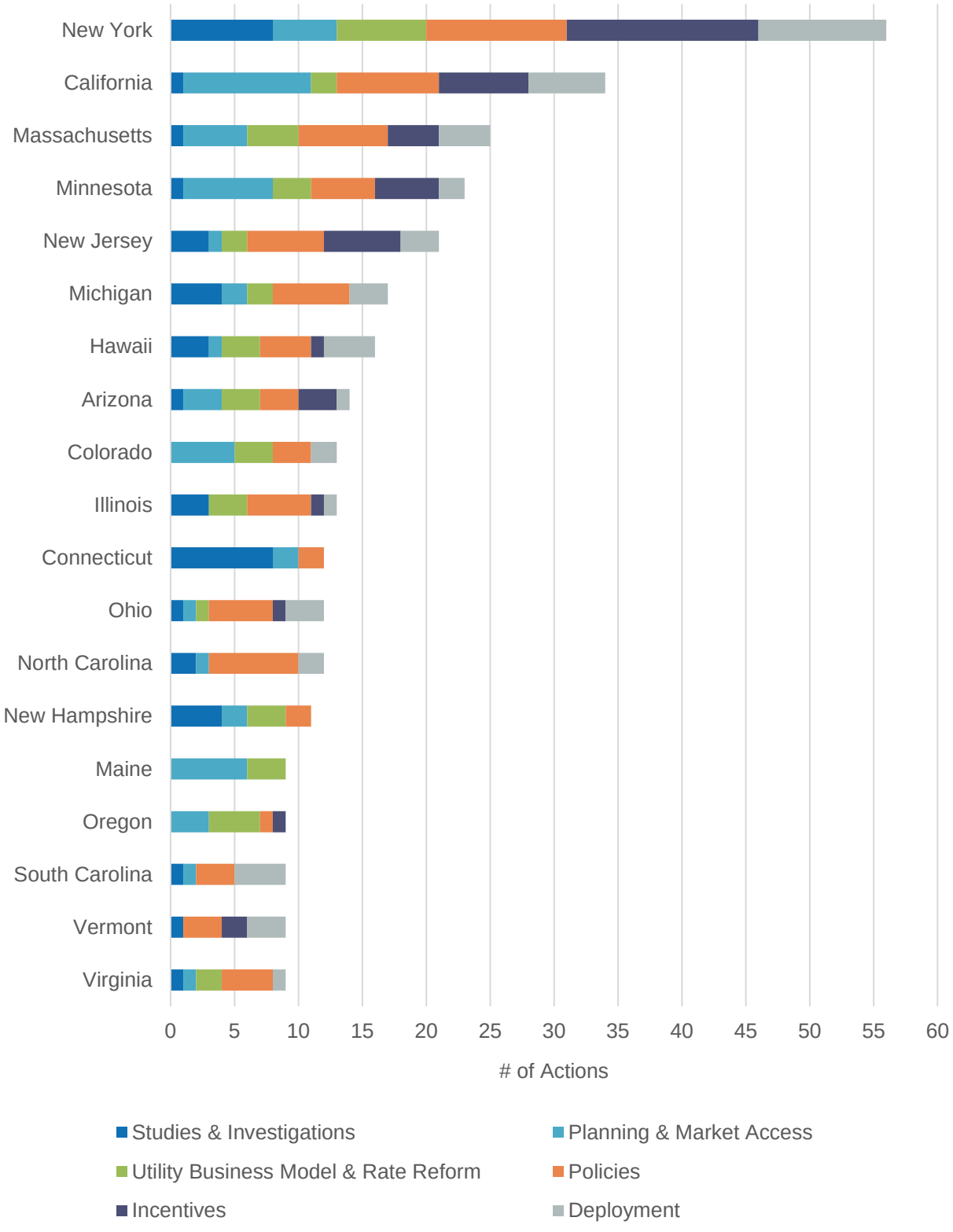
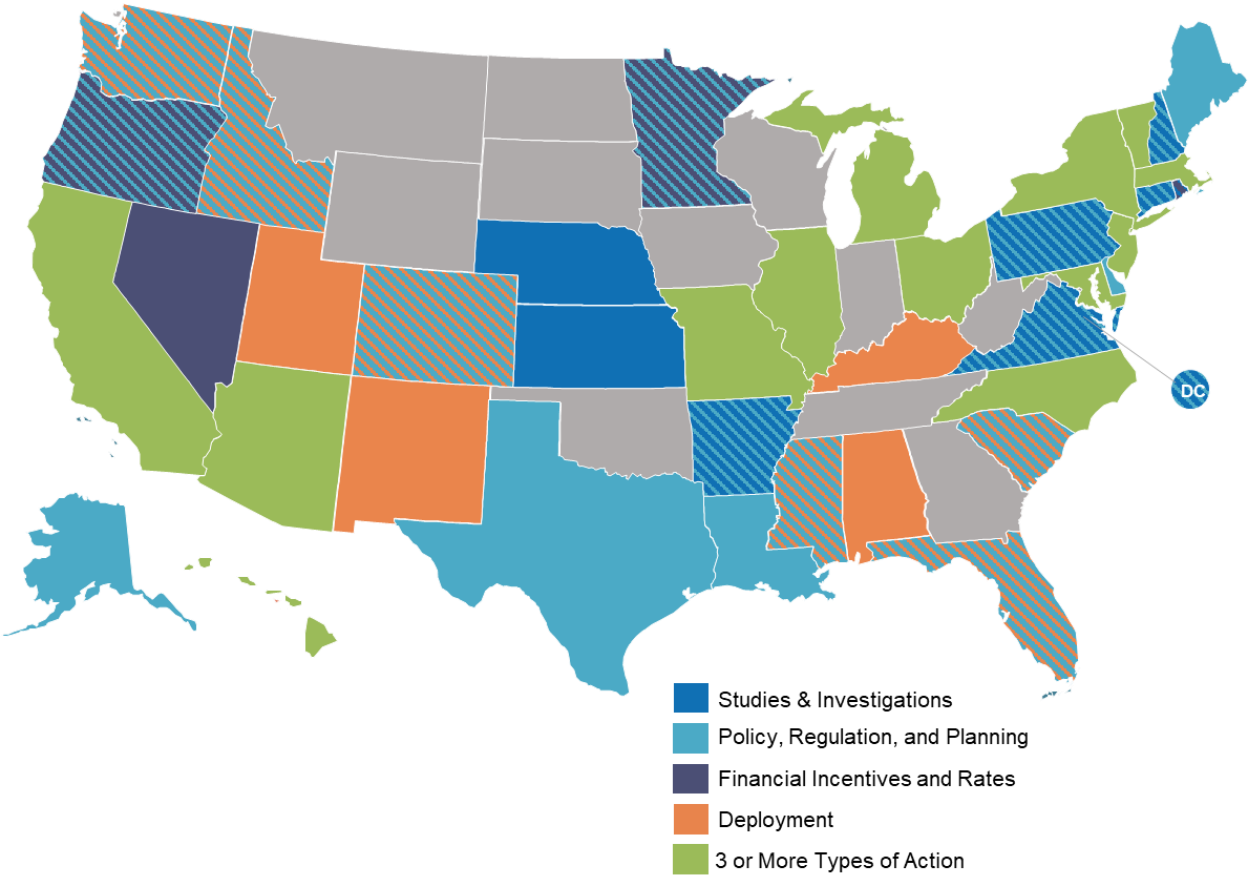


Figure 5. Q2 2020 Energy Storage Action, by Action Type



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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Subscription Type	Annual Subscription	Single Report
50 States of Grid Modernization Report	$1,500	$500
Single-Tech Subscription (Grid Modernization & Energy Storage) *(Includes 50 States of Grid Modernization report, plus biweekly legislative & regulatory grid modernization/energy storage tracking, policy data sheets, & quarterly webinars)*	$4,500	N/A
All-Tech Subscription *(Includes 50 States of Grid Modernization report, 50 States of Solar report, & 50 States of Electric Vehicles report; plus biweekly legislative & regulatory tracking; policy data sheets, & quarterly webinars for solar, grid modernization/energy storage, & electric vehicles)*	$10,500	N/A

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