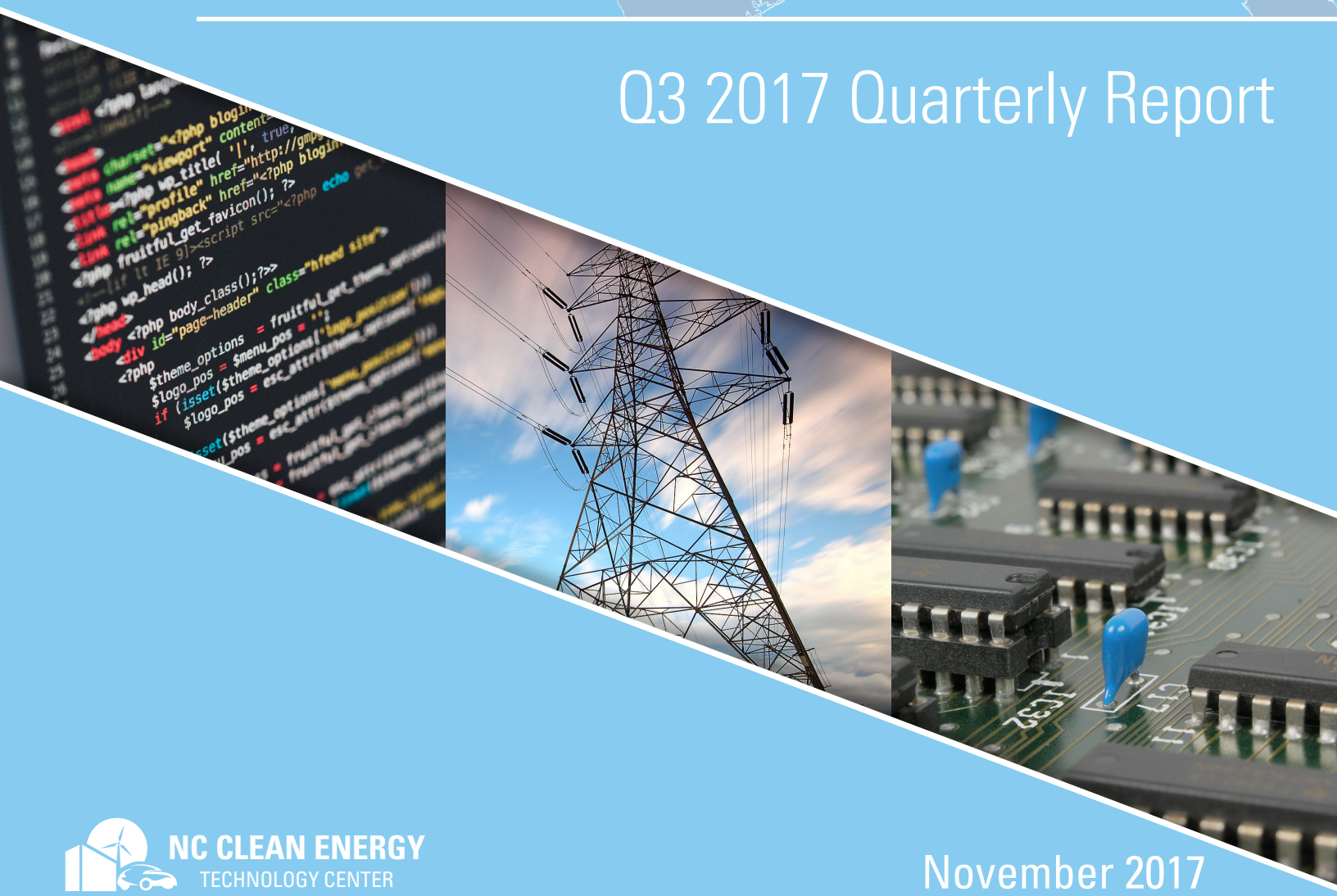
50 States of GRID MODERNIZATION

Q3 2017 Quarterly Report



NC CLEAN ENERGY
TECHNOLOGY CENTER

November 2017

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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 of *The 50 States of Grid Modernization* are available for download at www.nccleantech.ncsu.edu/the-50-states-reports/ or by clicking here:

- Q2 2017: Full Report | Executive Summary
- Q1 2017: Full Report | Executive Summary

In addition to *The 50 States of Grid Modernization*, the NC Clean Energy Technology Center publishes a quarterly report called *The 50 States of Solar*. Previous editions of *The 50 States of Solar* are available for download at www.nccleantech.ncsu.edu/the-50-states-reports/ or by clicking below. Full versions may be purchased at https://commerce.cashnet.com/NCSU-NCCETC.

- Q3 2017 Executive Summary
- Q2 2017 Executive Summary
- Q1 2017 Executive Summary
- Q4 2016 and 2016 Policy Review – Executive Summary
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GLOSSARY OF ABBREVIATIONS

ALJ	Administrative Law Judge
d/b/a	Doing Business As
DER	Distributed Energy Resource
DG	Distributed Generation
FERC	Federal Energy Regulatory Commission
IOU	Investor-Owned Utility
IRP	Integrated Resource Plan
GW	Gigawatt
ISO	Independent System Operator
kW	Kilowatt
kWh	Kilowatt-Hour
MW	Megawatt
NEM	Net Energy Metering
PACE	Property Assessed Clean Energy
PPA	Power Purchase Agreement
PV	Photovoltaics
REC	Renewable Energy Credit
RPS	Renewable Portfolio Standard
RTO	Regional Transmission Organization
TOU	Time-of-Use

OVERVIEW

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 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 stakeholders and regulators in the industry.

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 deployment of 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.

Time-varying rate 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 intended to soon become a default option. Actions related to inclining or declining block rates are not included in this report.

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 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. While actions taken by municipal utilities and electric cooperatives are not comprehensively tracked in this report, particularly noteworthy or high-impact actions will be covered. 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.

THE U.S. ELECTRICITY SYSTEM IN TRANSITION

The U.S. electricity grid is in a state of transition. The system has traditionally been a “one-way street”, with power flowing from utility-owned centralized generation, via utility-owned transmission and distribution lines, toward end-use customers. However, the electric system is increasingly becoming more of an interconnected web, with small but growing numbers of end-use customers also generating electricity with small-scale, distributed systems that are capable of providing various services to the grid.

Technology is making rapid advancements, continuing to offer new benefits to the electric system. Policy, however, has not kept pace with the speed of technical energy advancements, with most U.S. electricity policy still focused primarily on the traditional one-way, centralized system model and its institutions. This is changing, though, with more and more states initiating investigations into advanced grid technologies and proposing legislative and regulatory changes intended to enable the development of a modern electric system.

Grid Modernization

Grid modernization is an expansive topic, capturing the many individual pieces of the transition occurring in our nation’s energy system. A major element of this transition is the deployment of new technologies, such as advanced metering infrastructure and smart grid technologies, including communications and control technologies for managing distributed energy resources of all kinds. These technologies offer the opportunity to bring new benefits to both utilities and consumers, including economic, environmental, reliability, security, and consumer experience benefits.

The deployment of advanced grid technologies is already underway. The market for distributed generation, namely solar photovoltaics, is already scaling rapidly, while the energy storage market is expected to grow from an expected 6 GW of annual installed capacity in 2017 to over 40 GW in 2022.[1] Utilities had already deployed nearly 65 million smart meters by the end of 2015, covering over 50% of U.S. households, and more installations are underway.[2]

But before advanced grid technologies can be utilized to their fullest extent, regulatory structures must be examined to determine whether current regulations are resulting in unintended barriers to deployment. By reevaluating regulatory frameworks, business models, and rate designs, an energy system that allows for fair evaluation of technological options, greater market participation, and full and open compensation may be created.

Over half of U.S. states are currently examining these regulatory frameworks or actively working to deploy advanced grid technologies. This activity is expected to continue, much like the ongoing evaluation of state solar policies, as states and utilities conduct studies, try new approaches, and learn from each other about how best to achieve the many benefits of a more modern grid.

OVERVIEW OF Q3 2017 POLICY CHANGES

Table 1 provides a summary of state actions related to grid modernization occurring during Q3 2017. Of the 184 actions catalogued, the most common were those related to policies (40), followed by deployment of advanced grid technologies (38), studies and investigations (32), and planning and market access (32). The actions occurred across 33 states plus DC in Q3 2017 (Figure 1). Box 1 highlights some of the key actions of Q3 2017, described in greater detail in the following sections.

Table 1. Summary of Grid Modernization Actions (Q3 2017)

Type of Action	# of Actions	% by Type	# of States
Policies	40	22%	20
Deployment	38	21%	21
Studies and Investigations	32	17%	19 + DC
Planning and Market Access	32	17%	15 (+ 4 RTOs)
Business Model and Rate Reform	25	14%	12 + DC
Financial Incentives	17	9%	7
Total	**184**	**100%**	**33 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%.

Figure 1. Legislative and Regulatory Action on Grid Modernization (Q3 2017)

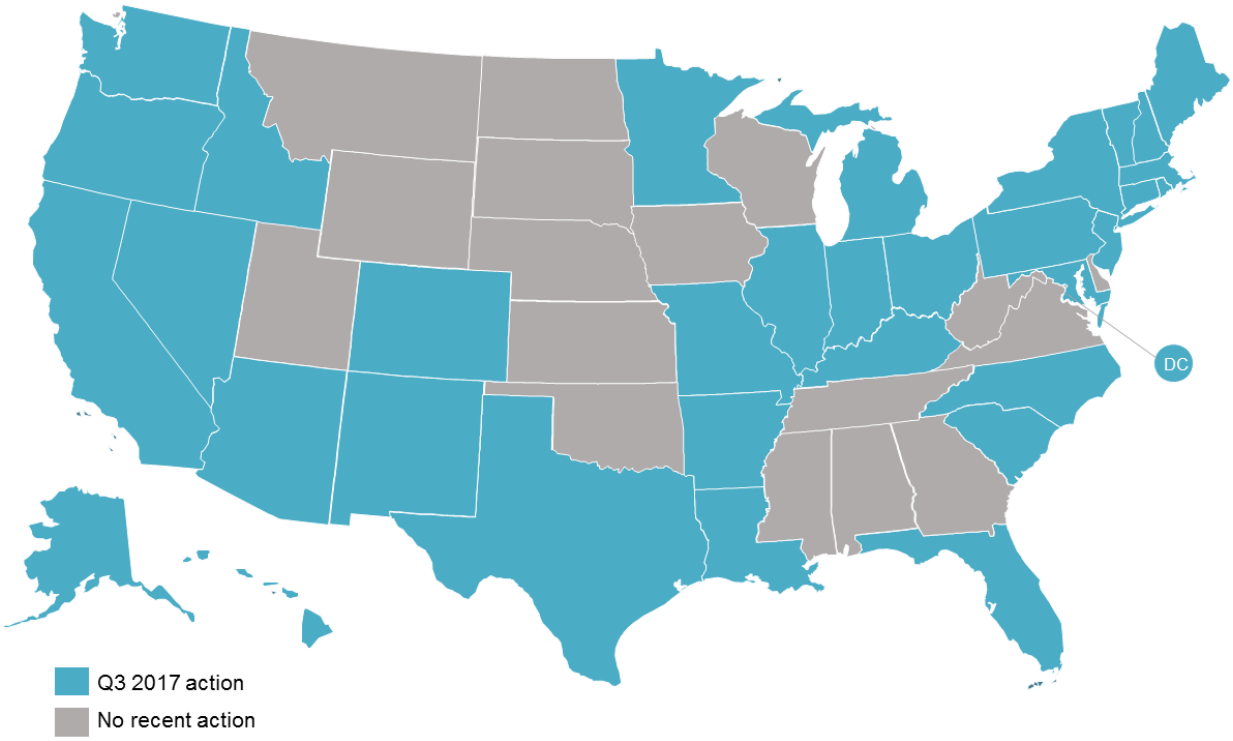


Figure 2. Most Active States of Q3 2017

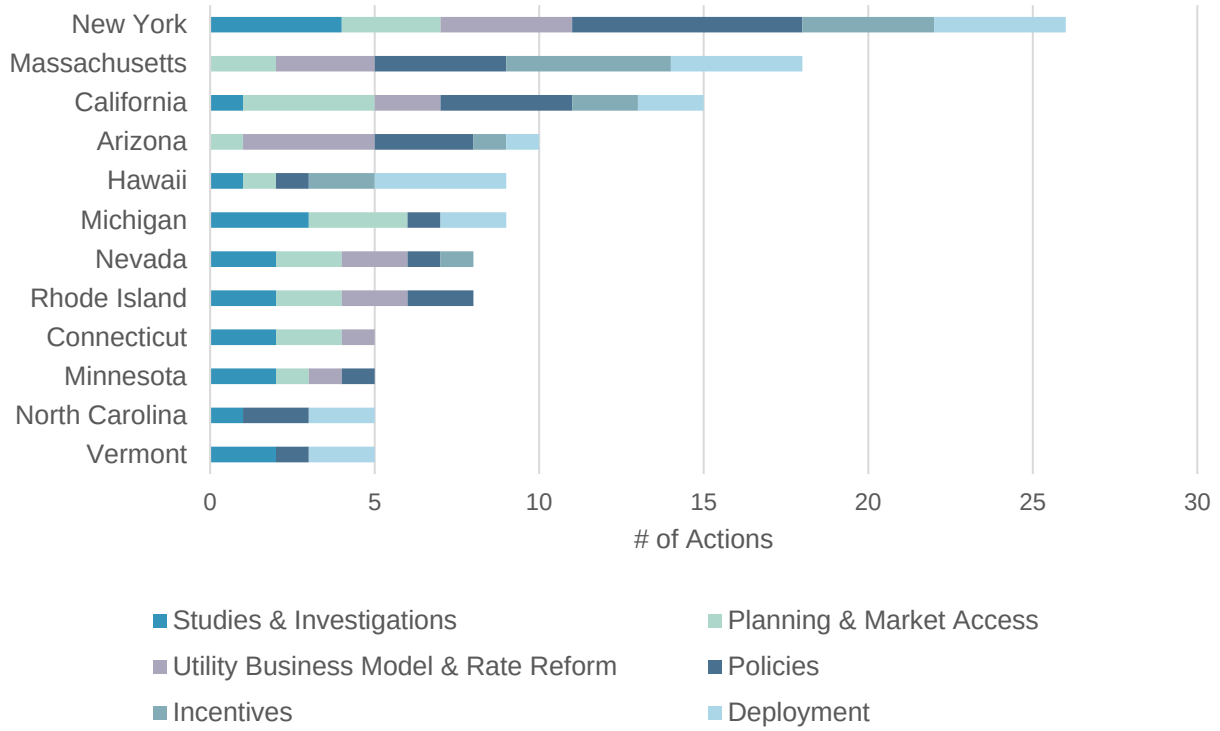


Figure 3. Most Active States of Q3 2017, By Action Status

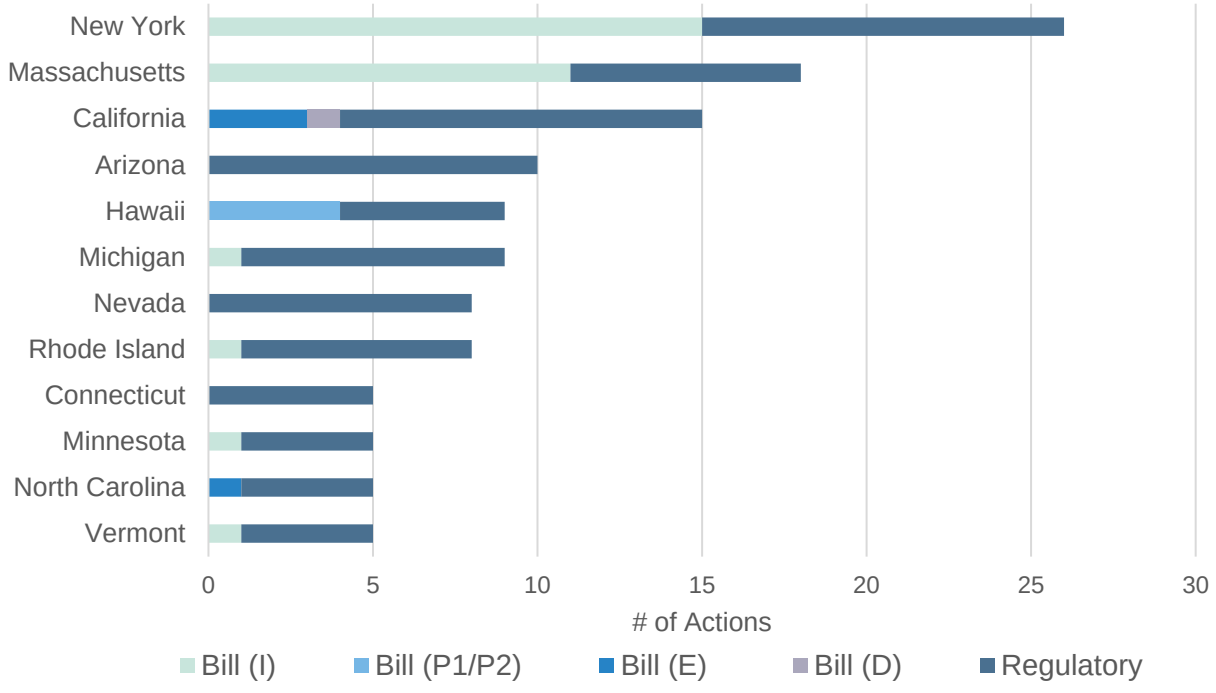


Figure 4. Most Common Types of Actions Taken in Q3 2017

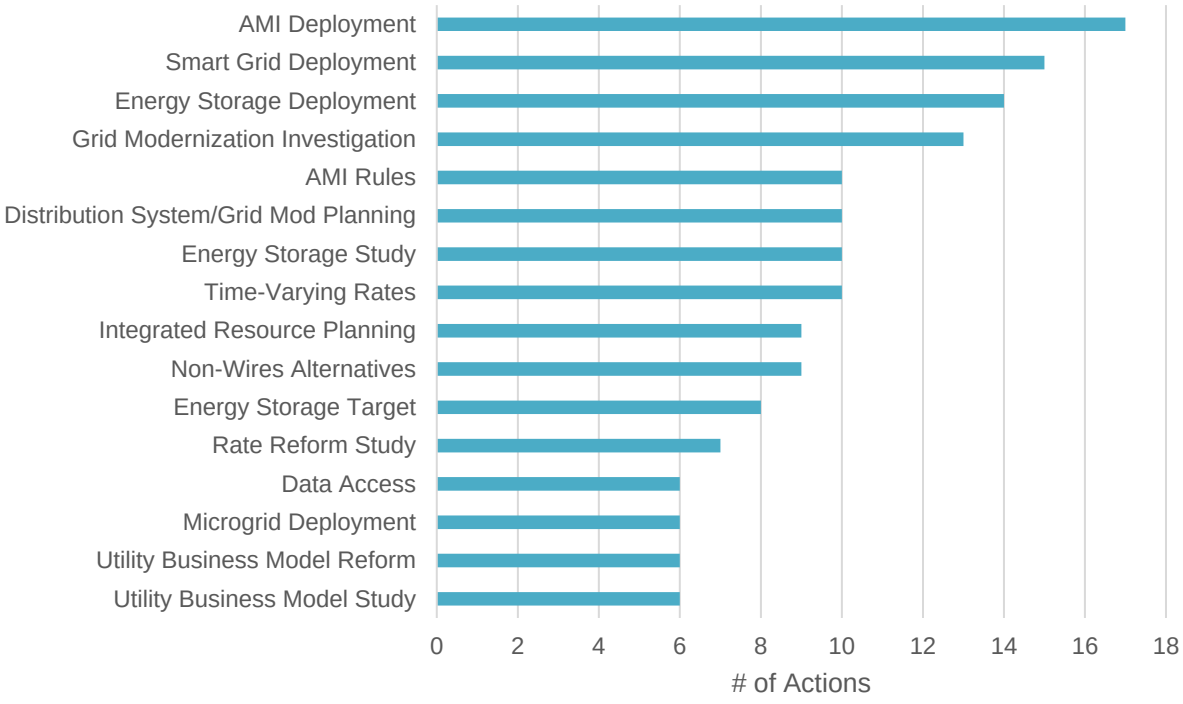
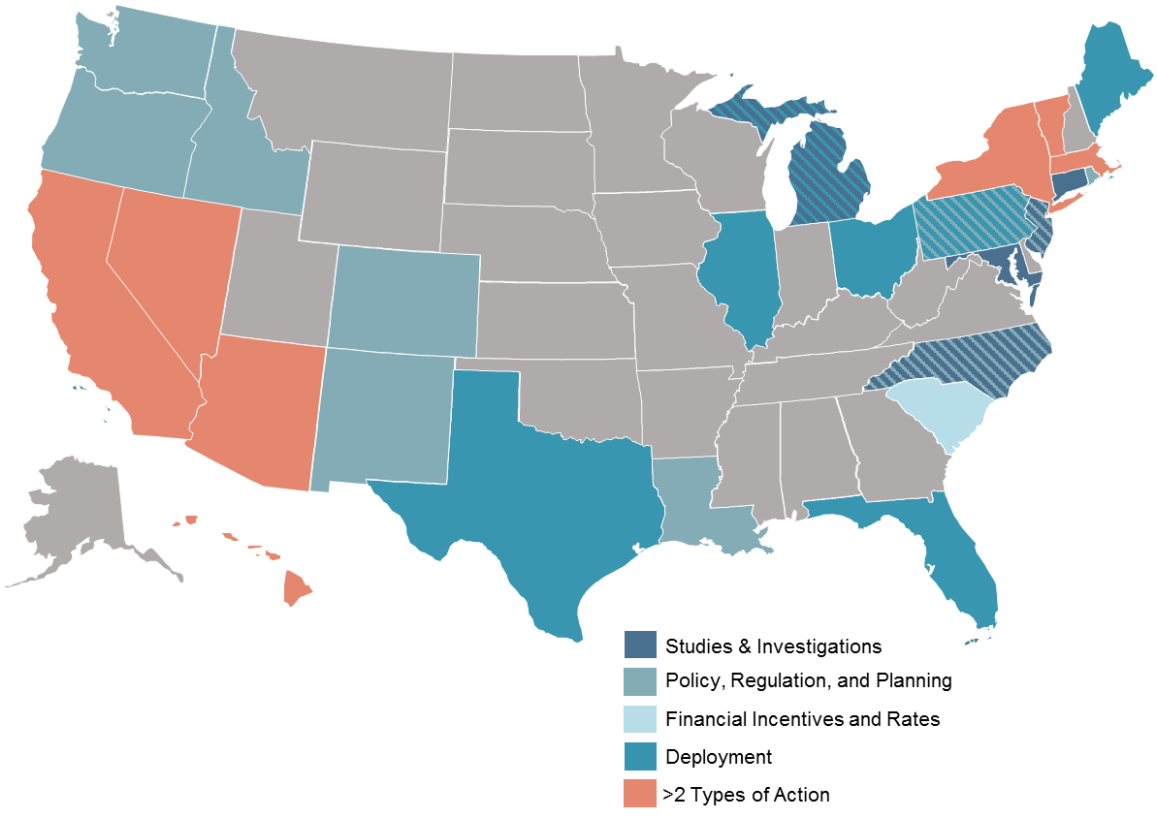


Figure 5. Q3 2017 Action on Energy Storage, By Type of Action



Box 1. Top Five State Grid Modernization Developments of Q3 2017

Washington and New Mexico Adopt Amendments to Statewide IRP Rules

In Q3 2017, both Washington and New Mexico adopted amendments to their statewide integrated resource planning rules, now requiring utilities to fully evaluate energy storage alongside other resource options. Similar requirements for Arizona Public Service and Entergy New Orleans were also approved during the quarter.

Oregon Initiates Investigation into Grid Modernization and Utility Business Models

A bill directing the Oregon Public Utility Commission to investigate the impact of developing industry trends, technologies, and policy drivers on the existing regulatory system and utility incentives was passed and signed into law in Q3 2017. The legislation calls out many specific issues across a wide range of energy topics to be examined.

Proposed Decision Allows AEP Texas North to Own Battery Storage

AEP Texas North Company proposed the deployment of two battery storage projects to defer transmission and distribution investments in September 2016. In Q3 2017, the ALJ issued a proposal for decision, which would approve the projects – a notable outcome in a state where utilities are not permitted to own generation assets. The proposal will be considered by the Commission in December.

California Enacts Bill to Evaluate Clean Options to Meet Peak Demand

The California legislature enacted a bill requiring utilities to consider the role of DERs and energy storage to meet peak demand needs as part of their integrated resource planning processes. Specifically, the bill notes that existing renewables, grid operational efficiencies, energy storage, and DERs (including efficiency) should be evaluated.

Connecticut Department of Energy & Environmental Protection Recommends Expansive Grid Modernization Proceeding

As part of the Connecticut Department of Energy and Environmental Protection's July 2017 draft Comprehensive Energy Strategy, the Department recommended that the state's Public Utilities Regulatory Authority open a generic proceeding covering grid modernization and utility business models. The Department specifically mentioned non-wires alternatives, time-varying rates and dynamic pricing, and energy storage as key topics to address.

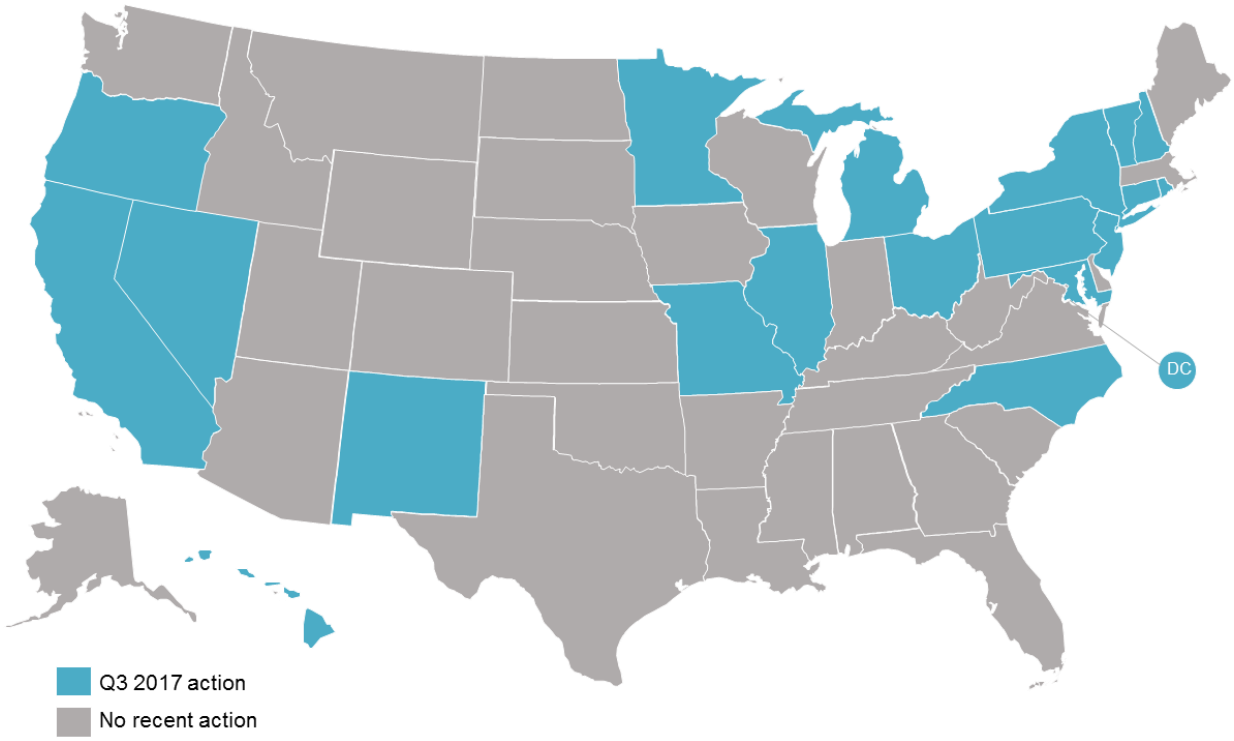
STUDIES AND INVESTIGATIONS

Key Takeaways:

- In Q3 2017, 19 states plus DC took action to study or investigate issues related to grid modernization, energy storage, demand response, and rate reform.
- Two states – North Carolina and Oregon – enacted legislation during Q3 2017 initiating studies related to grid modernization or energy storage.
- As of Q3 2017, eight states are currently studying or considering studying energy storage.

New technologies, including energy storage, microgrids, and smart grid technologies, offer opportunities to strengthen the grid and enhance the customer experience. However, they can also challenge policymakers and regulators to rethink current regulatory models and determine the best ways to integrate these technologies into the electric system.

Figure 6. Action on Grid Modernization Studies and Investigations (Q3 2017)



While some states and utilities are developing pilot projects to learn more about the operation of and opportunities for new technologies, others states are beginning with studies and investigations to gather information. In some cases, these studies look at technologies themselves and how to integrate them into the grid, while other studies are focused on exploring the policy and rate changes necessary to enable technology deployment. Several states are opting to examine these two aspects in a single, unified proceeding.

In Q3 2017, two governors – in North Carolina and Oregon – signed legislation related to grid modernization studies. Oregon's bill focuses more on the regulatory side of the discussion, directing the Public Utility Commission to investigate how developing industry trends and technologies are impacting the existing regulatory system. North Carolina's legislation focuses specifically on energy storage, but calls for a broad study on its economic development and grid benefits, as well as policy recommendations for supporting storage development.

Box 2. Categorizing Studies and Investigations

Actions included within Studies and Investigations do not include a defined policy proposal or a directive to make a policy or regulatory change. Once a specific proposal is introduced, the action will be included in the more specific category pertaining to that particular type of change, such as Grid Modernization Planning, Utility Business Models, Rate Reforms, or the specific categories listed under Grid Modernization Policies, such as interconnection rules, changes to renewable portfolio standards, energy storage targets, and AMI rules.

Q3 2017 also saw the completion of a demand response study in Michigan. The study, published by the state's Public Service Commission, estimates that there are 1.3 to 2.2 GW of potential demand response resources available by 2037. The study also found a strong interest from Michigan businesses in new demand response options.

Figure 7. Action on Studies and Investigations by Topic (Q3 2017)

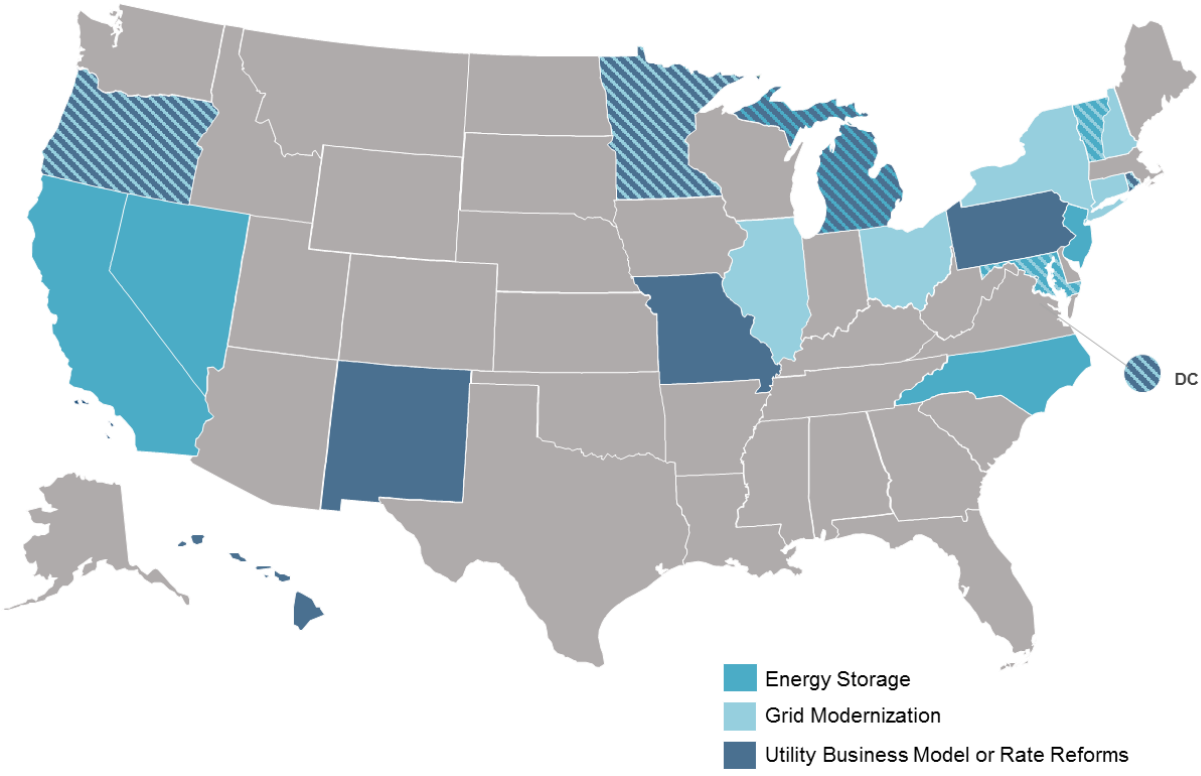


Table 2. Updates on Grid Modernization Studies & Investigations (Q3 2017)

State	Type of Study	Description	Source
CA	Energy Storage	California has an ongoing proceeding examining the value of DERs to the distribution system. Utilities have proposed a range of demonstration projects to examine various scenarios related to the location on the grid and technology options, some of which include storage. In a February 2017 decision, the California Public Utilities Commission (CPUC) granted approval to some Track 2 demonstration projects, rejected others, and approved only some elements of other projects. The utilities filed revisions to their proposed projects, which the CPUC approved in June 2017. The CPUC granted approval to Track 1 projects in August 2017.	Docket No. R. 14-08-013
CT	Energy Storage	In August 2017, the Public Utilities Regulatory Authority (PURA), in conjunction with the Department of Energy and Environmental Protection (DEEP), opened a proceeding in accordance with Executive Order No. 59. This joint proceeding will not hold any legal authority, but will instead function as a platform where studies, documents, and related public comments can be accessed. The Executive Order notes that a resource assessment is necessary to determine whether Connecticut should take action to support continued operation of existing nuclear plants, as well as other zero-emission energy sources and demand reduction alternatives to meet the state's Global Warming Solutions Act requirements, minimize ratepayer risk, and maintain reliability. The Executive Order directs PURA and DEEP to publish a study by February 2018 that considers (1) the economic viability of continued operation of the Millstone nuclear facilities, (2) the role of existing nuclear facilities, large hydropower, demand reduction measures, energy storage, and renewables in meeting the state's carbon and emission targets, (3) the best mechanism to reach emission targets, and (4) the compatibility of such a mechanism with competitive wholesale and retail electricity markets, as well as the financial impact on electric ratepayers.	Docket No. 17-07-32 Executive Order 59
	Energy Storage, Grid Modernization, Rate Reform, Utility Business Model	In July 2017, the Connecticut Department of Energy and Environmental Protection (DEEP) published its 2017 Draft Comprehensive Energy Strategy. As part of the report's recommendations, DEEP suggests that the Public Utilities Regulatory Authority initiate a generic proceeding on grid modernization and adaption of utility business models. DEEP's suggested topics include non-	DEEP Website 2017 Draft Comprehensive Energy Strategy

		wires alternatives, TOU rates and dynamic pricing, energy storage, and the role of electric distribution companies (EDCs) in owning, operating, and dispatching energy storage and microgrids. DEEP also recommended that EDCs submit energy storage pilot proposals. DEEP held technical and public meetings on the draft strategy in August and September 2017, and accepted comments through September 25th.	
DC	Grid Modernization	In June 2015, the DC Public Service Commission (PSC) initiated a proceeding to identify technologies and policies that can modernize its energy delivery system for increased sustainability, reliability, efficiency, cost-effectiveness, and interactivity. In January 2017, the staff presented its Modernizing the Distribution Energy Delivery System for Increased Sustainability (MEDSIS) report. The Commission accepted comments on the report through April 2017. In October 2017, the PSC accepted the staff's proposed MEDSIS report. The PSC is seeking comments on whether a full assessment of the District's capabilities and characteristics is warranted at this time, and to what extent a consultant should be used to move MEDSIS forward more expeditiously. Comments are being accepted until December 2017.	Formal Case No. 1130 MEDSIS website MEDSIS Staff Report
	Rate Reform	As part of PEPCO's most recent general rate case, the utility asked the Public Service Commission to review alternative rate design issues in a separate proceeding and a working group. PEPCO requested that the proceeding review issues related to inclining block rate, electric heating rates, PEPCO's RTM schedule, and low-income rates. Other parties proposed that the proceeding also consider additional issues, including customer and grid access charges. In July 2017, the Commission issued a decision, holding PEPCO's rate design review request in abeyance.	Formal Case No. 1139 Final Order
HI	Utility Business Model	H.B. 1700 of 2016 appropriated funds for the Hawaii Energy Office to commission a study of alternative utility and regulatory models to enable the state to (1) meet its energy goals; (2) maximize consumer savings; (3) enable a competitive distribution system; and (4) eliminate or reduce conflicts of interest in energy resource planning, delivery, and regulation. The Energy Office selected London Economics International, LLC to lead the project, and scheduled three rounds of community meetings in each of the counties. The first round of community meetings	H.B. 1700 (2016) Study Website

		were held in mid-October 2017 and focused on the topic of utility ownership and the utility's role in meeting community and state goals. The second round of meetings will be held in Spring 2018 and will focus on utility regulatory models. The third round of meetings will be held in Fall 2018 and will focus on the draft finds of the report, with the final report planned to be released in January 2019.	
IL	Grid Modernization	In March 2017, the Illinois Commerce Commission opened the "NextGrid" proceeding following the passage of legislation in December 2016 that makes comprehensive changes to various aspects of Illinois energy policy. This will be a collaborative process between stakeholders and will involve a broad array of topics. Seven working groups have been established, each addressing topics potentially pertaining to grid modernization: (1) New Technology and Grid Integration, (2) Electricity Markets, (3) Customers and Community Participation, (4) Regulatory, Environmental, and Policy Issues, (5) Metering, Communications, and Data, (6) Reliability, Resiliency, and Cyber Security, and (7) Ratemaking. In late June 2017, the Commission issued a request for information regarding selection of an independent facilitator for the process. In August 2017, it was announced that the lead facilitator for NextGrid will be the Power and Energy System Area of the Electrical and Computer Engineering Department at the University of Illinois at Urbana-Champaign. The NextGrid process officially began in late September 2017 with a kickoff conference in Chicago.	Docket No. 17-0142 NextGrid
MD	Energy Storage	H.B. 773, enacted in May 2017, directs the Maryland Power Plant Research Program to conduct a study of regulatory reforms and market incentives that are necessary or beneficial to increase the use of energy storage devices in the state. In Q3 2017, the Program conducted multiple meetings to develop an outline for the report. The report is due by December 2018.	H.B. 773 (E) Power Plant Research Program Website
	Grid Modernization	In September 2016, the Maryland Public Service Commission (PSC), as part of the Exelon-PHI merger condition, initiated a grid modernization proceeding to ensure that the electric distribution system in Maryland is customer-centric, affordable, reliable, and environmentally sustainable. The proceeding is addressing rate design, electric vehicles, competitive markets and customer choice, the interconnection process, energy storage, and distribution system planning. The PSC held an initial public hearing in	Public Conference No. 44

		December 2016 and issued a detailed schedule in January 2017. Proposed pilot programs for time-varying rates are to be developed between February and June 2017, with pilot programs occurring between July 2017 and June 2018. Regarding competitive markets and customer choice, a statewide standard data sharing format and changes to retail choice will be considered. A rulemaking to define residential energy storage and how it is interconnected and classified in PSC rules, as well as criteria for utility evaluation of energy storage as a distribution grid investment will be considered. The PSC also intends to hold a technical conference on distribution system planning. The Public Staff has organized working groups to study (1) rate design, (2) competitive markets and consumer choice, (3) interconnection, and (4) energy storage. In August 2017, the Rate Design Working Group submitted its report. The group noted that although the working group members agreed on discrete elements, the group was unable to reach consensus on the design of the pilot program. The report recommends a pilot program that tries to best reflect the different viewpoints discussed in the group. The proposed pilot would include two separate programs one available for the utility's Standard Offer Service and one available as a Retail Supplier option. The PSC accepted initial public comments and held a hearing in mid-September 2017.	
MI	Demand Response	Legislation enacted in December 2016 directs the Public Service Commission (PSC) to assess the use of demand response (DR) in Michigan. In March 2017, the PSC released a draft plan for the scope of the study, determining that the study will assess DR potential for the 20-year period beginning in 2018. The completed study was posted in early October 2017. One portion of the study, focusing on technical potential, found the realistic, achievable potential of various DR programs to be 1.3 to 2.2 GW in the 2037, which would correspond to roughly a 5% to 10% reduction in electricity demand in the state. The other portion of the study, focusing on market interest in DR, found significant interest in new DR options from Michigan businesses.	Docket No. 18369 Michigan Demand Response Potential Study S.B. 437 (2016) S.B. 438 (2016)
	Energy Storage	Legislation enacted in December 2016 directs the Public Service Commission (PSC) to conduct a study on an appropriate DG tariff that reflects an equitable cost of service for utility revenue requirements. At the initial DG working group	Docket No. 18383

		meeting in March 2017, the PSC staff provided details on its plan to implement the legislation. The PSC staff proposed limiting the scope of the study to solar and solar plus battery storage. The PSC will conduct a cost of service study, and PSC staff will aim to prepare a report on the study by January or February 2018, with a final report being published in March or April 2018. Parties will also be able to file their own studies and tariff filings for the PSC to consider. The study and tariff development must be completed by April 20, 2018. A working group meeting was held in June 2017, and in mid-July, the PSC issued guidelines for new DG programs. Utilities will submit new DG tariffs as part of their rate cases after June 1, 2018; until then, the current net metering program will remain active, and customers who begin net metering under the current program will be able to do so for ten years. The working group held meetings in August and October 2017. In October, the PSC staff presented a concept tariff program. The concept tariff contemplates that service charges for DG customers may be different than for non-DG customers in order to allocate costs accurately; on this point, the concept tariff appeared to reference a study presented at the same meeting by Charthouse Energy, a renewable energy developer, which found that the service costs for DG customers were lower than for non-DG customers.	Distributed Generation Study Concept Tariff S.B. 437 (2016) S.B. 438 (2016)
	Utility Business Model	Legislation enacted in December 2016 directs the Public Service Commission (PSC) to conduct a study on performance-based regulation, under which a utility's authorized rate of return is dependent on achievement of targeted policy outcomes. The study is due by April 20, 2018. Stakeholder meetings were held in July and August 2017, and stakeholders submitted feedback on a draft outline of the study process in September 2017. Another stakeholder forum is scheduled for November 8th.	Performance-Based Regulation Report S.B. 437 (2016) S.B. 438 (2016)
MN	Grid Modernization	The Public Utilities Commission (PUC) opened a docket in May 2015 to consider the development of policies related to grid modernization. The proceeding features broad stakeholder engagement and numerous workshops. In April 2017, the PUC issued a request for comments from Xcel Energy, Minnesota Power, and Otter Tail Power (cooperative and municipal utilities were encouraged but not required to respond) related to the following questions: (A) How do	Docket No. 15-558

		Minnesota utilities currently plan their distribution systems? (B) What is the status of each utility's current plan? and (C) Are there ways to improve or augment utility planning processes? The utilities were given until June 21st to file reply comments for questions A and B, and other stakeholders were given until July 21st to file reply comments. All parties were invited to respond to question C with initial comments due in August and reply comments in September. In their responses to question C, Xcel Energy and the Minnesota Department of Commerce, Division of Energy Resources both argued that the results of a utility's distribution planning efforts could be submitted to the PUC as informational, but should not be subject to PUC approval, due to the shorter time horizon for its impact.	
	Rate Reform	The Public Utilities Commission (PUC) initiated a stakeholder proceeding in July 2015 to consider alternative rate designs for Xcel Energy. The proceeding has held workshops and heard from various speakers about alternative rate design implementation across the country. In April 2017, Xcel Energy presented on its ongoing development of an alternative rate design pilot, and the PUC solicited comments on the pilot and whether this generic docket should continue in parallel to the Xcel pilot development. The PUC received comments from stakeholders during May 2017, and no parties appear to be opposed to Xcel developing a pilot, or leaving the current docket open after Xcel files its pilot program. Xcel is developing its alternative rate design pilot with a group of stakeholders, facilitated by the Great Plains Institute and the Center for Energy and Environment. Xcel presented its draft design for the pilot in a public forum in September 2017. This will be followed by three small stakeholder meetings, which will help Xcel refine the pilot design in advance of its formal submission in November 2017.	Docket No. 15-662
MO	AMI, Rate Reform	In March 2017, the Missouri Public Service Commission opened a proceeding to gather information on issues including AMI installation, PACE financing programs, and alternative rate design proposals. A workshop was held in May 2017, where these issues were discussed. In July 2017, the Commission staff filed a report with recommended next steps. The report recommends that workshops be held to discuss several issues, including new rate designs, particularly time-of-use rates and inclining block rates. However, as no significant issues related to	Docket No. EW-2017-0245 Staff Report

		AMI were identified during the comment period or workshop, the staff did not recommend additional workshops on AMI.	
NC	Energy Storage	H.B. 589 directs the North Carolina Policy Collaboratory at UNC Chapel Hill to conduct a study on energy storage. The Collaboratory would first have to raise at least $75,000 in non-state funds to match the $75,000 allocated by the state before the Collaboratory would be obligated to complete the study. The study would address how energy storage technologies may or may not provide a benefit to North Carolina consumers based on a number of factors, the feasibility of storage in the state, and policy recommendations for energy storage. The Collaboratory is to provide the results of its study to the North Carolina Energy Policy Council by December 1, 2018. In late July 2017, the Governor signed the bill into law.	H.B. 589 (E)
NH	Grid Modernization	In July 2015, the New Hampshire Public Utilities Commission (PUC) opened a docket on grid modernization, pursuant to H.B. 614 of 2015. The PUC convened a formal working group to develop recommendations on several issues, including distribution system planning, advanced metering functionality, rate design, customer data and education, and utility cost recovery and financial incentives. In March 2017, the working group submitted its final report to the Commission, and comments on the final report were accepted through May 19th. The proceeding remains open, but no action occurred during Q3 2017.	Docket No. IR 15-296 NH Grid Modernization Working Group Document Repository Final Report
NJ	Energy Storage	Companion bills A.B. 4728 and S.B. 3064 would require the Board of Public Utilities to conduct a study on energy storage, identifying needs and opportunities for the state. The study would consider implementation of storage technologies, benefits and costs to ratepayers, and an optimum target. The bill was reported favorably by committee.	A.B. 4728 (I) S.B. 3064 (I)
NM	Regulatory Reform	In March 2017, the New Mexico Public Regulation Commission initiated an investigation to determine whether it should standardize or change its ratemaking policies. Specifically, the Commission is requesting information related to developing a standardized method for determining return on equity (ROE), whether ROE should be adjusted under an incentive/disincentive mechanism, providing access to proprietary software used by utilities to support positions in rate cases to all intervenors and staff, defining regulatory assets,	Docket No. 17-00046-UT

		and recovery of certain regulatory case expenses. A public workshop was held in mid-September and will continue on November 6th and 7th.	
NV	Energy Storage	The Public Utilities Commission of Nevada (PUCN) opened an investigatory docket in January 2016 to explore energy storage technologies. The PUCN convened a series of meetings and workshops throughout 2016, and in Q1 2017 held a stakeholder meeting and a workshop to discuss interconnection issues related to energy storage. In April 2017, NV Energy submitted a redlined version of its Rule 15 tariffs to accommodate the interconnection of energy storage, and received comments from the Interstate Renewable Energy Council, which provided its own redlined version. The docket remains open, though no action took place during Q3 2017.	Docket No. 16-01013
	Energy Storage	S.B. 204 requires the Public Utilities Commission of Nevada (PUCN) to determine whether it is in the public interest to adopt annual requirements for the procurement of energy storage by utilities. In making the determination, the PUCN must study all measurable costs and benefits. The Governor signed the bill in May 2017. In July 2017, the PUCN opened a docket to implement the legislation and scheduled a workshop for November 9th.	Docket 17-07014 S.B. 204 (E)
NY	Grid Modernization	The "New York Grid Modernization Act" (A.B. 7480) would establish a Smart Grid Advisory Council, which would be tasked with conducting a study on the feasibility of establishing a statewide smart grid system. The smart grid system envisioned would include AMI, incorporate consumer products, promote DERs, and protect privacy and security. The comprehensive bill includes provisions for cost allocation, workforce development, low-income programs, and more.	A.B. 7480 (I)
	Grid Modernization	As part of the New York Public Service Commission's May 2017 decision approving Con Edison's tariff amendment allowing for the export of electricity from battery storage systems to the distribution grid, the Commission directed the state's IOUs to study the impacts of DERs, including energy storage, participating in the Dynamic Load Management program exporting electricity to the distribution grid. The utilities are to publish their analyses in their Dynamic Load Management Program annual reports, due in December 2017.	Docket No. 17-E-0104

	Microgrids	A.B. 6134 directs the New York Public Service Commission to develop recommendations regarding the establishment of microgrids in the state. Specifically, the Commission is to submit a report with recommendations on: (1) the use of microgrids for critical infrastructure facilities, (2) prioritization of certain geographical areas based on the probability of storm damage, and (3) funding mechanisms to pay for microgrid projects.	A.B. 6134 (I)
	Rate Reform	In May 2017, as part of the Public Service Commission's (PSC) Reforming the Energy Vision Track Two order, the PSC directed the staff to publish a report regarding scope, feasibility, and deliverables on an analytical approach to examining bill impacts of a range of opt-out variable rate scenarios (i.e. time-varying rates, demand charges, coincident-peak demand charges) for residential and commercial customers. In October 2017, the staff published its scope of a study to examine bill impacts. The staff will consider rate design structures, billing determinants, and calculate revenue-neutral rates based on the PSC's rate design principles. The PSC is seeking public comments until December 2017.	Docket No. 17-01277
OH	Grid Modernization	The Public Utilities Commission of Ohio (PUCO) announced the launch of its PowerForward grid modernization investigation in March 2017. PUCO intends to use the study to chart a path forward for future grid modernization projects and innovative regulations that can improve the consumer experience. PowerForward is scheduled to occur in three phases, with Phase 1 beginning in April 2017 with a three-day "Glimpse of the Future" speaker series. The investigation continued in July 2017 with Phase 2: Exploring Technologies, and will continue in Q1 2018 with Ratemaking and Regulation.	PowerForward Website
OR	Grid Modernization, Utility Business Model	S.B. 978 requires the Public Utility Commission to establish a public process to investigate the impact of developing industry trends, technologies, and policy drivers on the existing regulatory system and utility incentives. The bill directs the Commission to investigate many specific topics, including the increasing presence and cost-effectiveness of DERs, customer desire for energy service options and management tools, transportation electrification, regional transmission markets, advances in distribution system communication and control technologies, the replacement of aging distribution system equipment, and performance-based incentives.	S.B. 978 (E)

		The Governor signed the bill in August 2017, with an effective date of January 1, 2018.	
PA	Rate Reform	In December 2015, the Pennsylvania Public Utility Commission (PUC) opened a proceeding to investigate alternative ratemaking methodologies. A hearing was held in March 2016, and the PUC issued an order in March 2017 requesting further input from stakeholders on their experiences with different types of alternative rate methodologies, including decoupling, lost revenue adjustment mechanisms, straight fixed/variable pricing, surcharges and riders, choice of test years, multi-year rate plans, demand charges, standby and backup charges, and demand-side management performance incentives. The PUC is also requesting comments regarding whether the Commission should adopt policy statements identifying preferred alternative rate methodologies or initiate rulemakings to require specific methodologies. Comments were accepted during Q2 and Q3 2017.	Docket No. M-2015-2518883
RI	Grid Modernization, Rate Reform	In January 2016, the Public Utilities Commission (PUC) approved National Grid's request to withdraw its proposed alternative rate design. However, the PUC determined that it was important to continue to review the issues raised in the proceeding. In March 2016, the PUC opened a docket to identify and measure the costs and benefits of net metering and DERs. The stakeholder group's was managed by a third-party consultant, and the group met nine times between May 2016 and March 2017. The group released a final draft of the report in late March, and submitted a complete final version in early April. The working group developed a detailed Benefit-Cost Framework that may be used to evaluate DG programs, alternative rate designs, and grid modernization projects. The working group organized technical sessions to review the stakeholder report during Q2 2017. In September 2017, the PUC accepted the stakeholder report and adopted several recommendations from the report into a guidance document for use in future rate cases. The guidance document does not have legal authority, but provides the PUC's framework for future decision-making. The guidance document includes (1) goals for the electric system, (2) rate design principles, and (3) a benefit-cost framework.	Docket No. 4600 Stakeholder Process Document Repository Final Working Group Report
	Grid Modernization,	In March 2017, the Governor of Rhode Island directed the Public Utilities Commission, Office of Energy Resources, and Division of Public Utilities	Power Sector Transformation Initiative

	Utility Business Model	and Carriers to design a new regulatory framework for Rhode Island's electric system. Work sessions on utility business models, grid connectivity and functionality, distribution system planning, and beneficial electrification were held during Q3 2017. In October 2017, the group published four document drafts titled (1) Beneficial Electrification Principles and Recommendations, (2) Grid Connectivity and Meter Functionality, (3) Distributed System Planning, and (4) Utility Business Model. The group is accepting public comments on the draft statements.	
VT	Energy Storage	In May 2017, the Governor signed Act 53 into law, which calls for a report on deploying energy storage on Vermont's transmission and distribution system to be conducted. Specifically, the report is to examine (1) state, regional, and national actions affecting energy storage deployment, (2) federal and state jurisdictional issues regarding energy storage, (3) opportunities for, benefits of, and barriers to energy storage deployment, (4) regulatory options and structures that can foster energy storage, and (5) potential methods for fostering the development of cost-effective energy storage and the benefit and cost impacts on ratepayers. The bill also authorized the use of Clean Energy Development Fund resources for energy storage projects that facilitate the use of renewables. The Public Service Department published a draft version of the report in early October 2017, and the final study is due by November 15th. The draft version does not include recommendations; these will be included in the final report.	Act 53 Public Service Department website Draft Study
	Grid Modernization, Utility Business Model	In June 2017, the Vermont Public Utility Commission (formerly the Public Service Board) opened an investigation into utility regulation in the state, following a request from the Department of Public Service. Specifically, the Commission is looking to reexamine Vermont's regulatory structure in response to recent transformations in technology, state policy, and other areas. The proceeding has been divided into four topic areas: (1) principles of rate regulation, (2) rate design, (3) grid impacts, and (4) municipal and cooperative utility issues. Two workshops were held in August and September 2017. The first workshop focused on the scope and framework for the proceeding, while the second workshop focused on non-traditional forms of regulation used outside of Vermont and variations in the way traditional regulation is used in other jurisdictions. A third workshop was held in early October, addressing	Docket No. 17-3142-PET Media Release

	the merits and disadvantages of traditional and alternative forms of regulation.	

Legislative Status Key: I = Introduced, P1 = Passed One Chamber, P2 = Passed Both Chambers, E = Enacted, D = Dead. Bill statuses are up to date as of early May 2017.

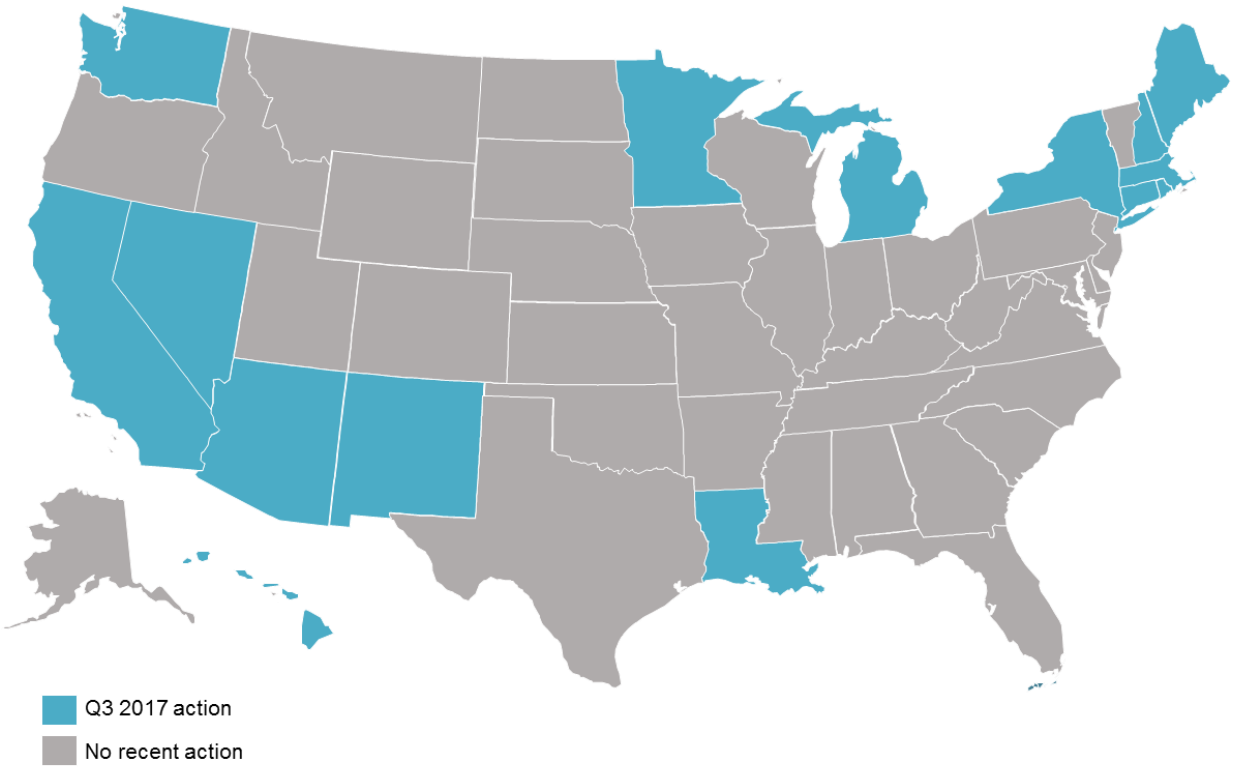
PLANNING AND MARKET ACCESS

Key Takeaways:

- In Q3 2017, 15 states considered changes to utility planning processes and state regulations enabling market access.
- Four ISOs/RTOs took action related to wholesale market rules for energy storage or demand response, and eight states considered changes to integrated resource planning rules.
- Regulators in Arizona, New Mexico, New Orleans, and Washington adopted amendments to their integrated resource planning processes, now explicitly requiring the evaluation of energy storage options.

As the role of energy storage and other distributed energy resources within our energy system grows more important, many are realizing that current utility planning methods do not adequately capture the full costs and benefits of these resources. For example, energy storage systems are capable of providing services on a sub-hourly basis, but traditional integrated resource planning evaluates options only on the basis of hourly or less frequent time intervals.

Figure 8. State Action on Planning and Market Access (Q3 2017)



In Q3 2017, 15 states considered changes to planning processes or market access rules related to grid modernization. Eight states – Arizona, California, Louisiana, Michigan,

Minnesota, Nevada, New Mexico, and Washington – saw activity related to integrated resource planning (IRP) processes. In Q3 2017, regulators in four states amended resource planning processes to require the evaluation of energy storage options.

Washington, New Mexico, APS, New Orleans Regulators in New Orleans, New Mexico, and Washington issued decisions in IRP proceedings, all now requiring the full evaluation of energy storage alongside traditional generation resources. As part of a settlement agreement in Arizona Public Service's (APS) general rate case, the Commission similarly directed APS to evaluate energy storage options before acquiring new resources. In the Arizona and Washington decisions, regulators also directed utilities to evaluate storage against transmission and distribution investments, aligning with a new trend of evaluating non-wires alternatives.

Other states are considering changes related to distribution system or grid modernization planning. As distribution-level resources increase, greater attention is being paid to planning and modernizing the electric distribution system, as well as making system data publicly accessible. Utilities in Connecticut are planning to develop public DER hosting capacity data and maps, while regulators in Rhode Island have also proposed the creation of a hosting capacity map. For an example of an existing hosting capacity map, see PEPCO's map.

Independent system operators are also examining market access and compensation for non-traditional resources, such as energy storage and demand response. MISO continues to investigate the role of storage in the wholesale market, while FERC recently approved ISO-NE's proposed tariff revision to fully incorporate demand response into the wholesale market, including the day-ahead and real-time markets, forward reserve market, and forward capacity market.

Table 3. Updates on Planning and Market Access (Q3 2017)

State/RTO	Sub-Topic	Description	Source
AZ	Integrated Resource Planning, Non-Wires Alternatives	As part of a decision in Arizona Public Service's (APS) general rate case, the Arizona Corporation Commission ordered that for any new resource acquisition or transmission/distribution upgrade, APS must show that it reasonably analyzed the full costs and benefits of an energy storage alternative. The decision notes that APS must analyze energy storage as an alternative to both baseload and non-baseload resources. The Commission issued its decision in August 2017.	Docket No. E-01345A-16-0036 Decision No. 76295
CA	Distribution System Planning	S.B. 801, as amended, requires the Los Angeles Department of Water & Power (LADWP) to make public any electrical grid data that would be helpful in enabling distributed energy resource providers to target solutions that support reliability in areas impacted by the gas leak at the Aliso Canyon natural gas storage facility. The bill also requires LADWP to maximize the use of demand response, renewable energy, and energy efficiency in the area impacted by the gas leak.	S.B. 801 (E)
	Integrated Resource Planning	S.B. 338, as amended, requires utilities to alter their IRP processes to consider the potential role for existing renewable generation, grid operational efficiencies, energy storage, and distributed energy resources (including efficiency) to meet peak demand needs. The Governor signed the bill into law in September 2017.	S.B. 338 (E)
CA / CAISO	Grid Modernization Planning	A working group consisting of California ISO, California's IOUs, and DER providers released a report in June 2017, which examines ways to improve coordination between transmission and distribution systems in preparation for higher penetrations of DERs. The report provides a variety of recommendations for addressing issues likely to arise in the near-term and mid-term. The working group will continue to meet throughout 2017 to further advance their transmission and distribution coordination framework.	More Than Smart Report
	Wholesale Market Rules	The California Public Utilities Commission (CPUC) is working to integrate demand response into the CAISO market, and is investigating whether a competitive procurement mechanism for supply-side resources outside of traditional utility programs is viable. An initial pilot auction was conducted in 2015 with delivery in 2016, and a second auction took place in 2016 with delivery expected in 2017. The CPUC later approved a third pilot auction in 2017. OhmConnect filed a request for the evaluation of the pilot programs	Docket No. R-13-09-011 Proposed Decision Alternate Proposed Decision

		to be expedited so the demand response auction mechanism could be made permanent by summer 2018. In April 2017, the CPUC issued a decision denying OhmConnect's request and the request of the joint demand response parties. However, the decision left the door open for an additional auction in 2018 with delivery in 2019. A proposed decision issued in September 2017 declined to approve an additional auction, but an alternate proposed decision also issued in September did authorize an additional pilot auction. The CPUC received comments on the two proposed decisions.	
CAISO	Wholesale Market Rules	California ISO's (CAISO) Energy Storage and Distributed Energy Phase 2 initiative is examining ways to enhance the ability of ISO-connected and distribution-connected resources to participate in the ISO market. Among the resources considered in this initiative are energy storage, plug-in electric vehicles, and demand response. Phase 2 of the initiative explored alternative baselines, distinguishing between charging energy and station power, and a net benefits test for demand response resources. Phase 3 was launched in September 2017 with the release of an Issue Paper, which outlines some of the concepts that will be discussed in the coming months. Phase 3 work will continue in Q4 2017 with a web conference in October and a workshop in November.	ESDER Initiative Website Draft Final Proposal Issue Paper
CT	Distribution System Planning	In June 2017, Connecticut Light and Power submitted its application before the Public Utilities Regulatory Authority for approval of its proposal to build (1) a DER customer portal and (2) a DER hosting capacity portal. This will provide a web-based graphical map of the company's distribution system, helping to identify locations on the grid that are already saturated with DERs and areas where DERs would benefit the grid. The company intends to participate in the Electric Power Research Institute's DRIVE (Distribution Resource Integration and Value Estimation) program which is a part of a nationwide effort to enable planners to evaluate the technical impacts of DERs on the grid. In October 2017, the PURA approved the utility's proposal to create a DER portal and DER hosting capacity map. The DER portal is a web-based software interface that will provide a platform for two-way communication. This will allow customers and developers to identify optimal locations for siting and interconnecting DERs. The DER hosting capacity map will leverage DER portal capabilities to produce a web-based graphical representation of its distribution system, allowing customers and developers to screen for potential sites that are cost-effective. The DER	Docket No. 17-06-02

		portal is expected to be completed by the end of December 2017 at a cost of $2 million. The hosting capacity map is expected to be completed by the end of December 2018 at a cost of $300,000.	
	Distribution System Planning	In June 2017, United Illuminating Company submitted its DER integration plan. The plan includes the following projects: (1) DER hosting capacity analysis and mapping, (2) DER and load forecasting, and (3) localized targeting of DERs. This proposal is submitted pursuant to Connecticut General Statutes § 16-244w, which requires the utilities to build grid-side system enhancements to integrate DERs.	Docket No. 17-06-03
HI	Microgrid Rules	H.B. 1248, as originally written, would have exempted any microgrid demonstration project (authorized by the legislature or the Public Utilities Commission) from regulation as a public utility. As amended, the provisions only apply to a microgrid demonstration project at the Natural Energy Laboratory of Hawaii. The bill, in its amended form, passed the House in March 2017. Bills may carry over from odd-numbered years to even-numbered years.	H.B. 1248 (P1)
ISO-NE	Wholesale Market Rules	In July 2017, ISO-New England (ISO-NE) filed revisions to Market Rule 1 in order to fully integrate demand response into the ISO-NE wholesale market beginning in June 2018. The proposal would allow demand response to participate in the day-ahead and real-time energy markets, provide operating reserve and participate in the forward reserve market, and receive obligations and compensation comparable to other dispatchable resources through the forward capacity market. In mid-October 2017, FERC accepted the proposed changes.	Filing Approval Letter
LA	Integrated Resource Planning	In January 2017, the New Orleans City Council opened a docket to consider proposed changes to the Council's integrated resource planning (IRP) process and requirements. Proposed changes were filed by late February 2017, and the Advisors filed a report in late April. The proceeding was not initiated explicitly or exclusively to consider changes related to DERs, but several comments propose making changes to ensure fair treatment and consideration of DERs and demand-side management. In July 2017, the City Council issued an order amending the IRP process. The amended rules require Entergy New Orleans to consider energy storage and other DERs as potential supply-side resources. The amended rules also require Entergy to evaluate the extent to which strategic deployment of DERs can improve the reliability of the distribution system. In August 2017, the Council adopted two additional amendments - an introductory statement and language related to	City Council Docket No. UD-17-01 Resolution No. 17-332 (Part 1) Resolution No. 17-332 (Part 2) Resolution No. 17-332 (Part 3) Resolution No. 17-429

		compliance with IRP requirements and approval of the IRP.	
MA	Grid Modernization Planning	H.B. 1725 would require distribution utilities to submit grid modernization plans every five years. These plans must include an evaluation of locational benefits and costs of local energy resources on the system. The plan must also identify optimal locations for local energy resources over the next ten years, additional spending necessary to integrate cost-effective local energy resources, and any barriers to deployment of local energy resources. Furthermore, the plans must propose or identify location-based incentives and other ways to deploy cost-effective local energy resources, as well as cost-effective ways to coordinate existing programs, incentives, and tariffs to maximize locational benefits and minimize incremental costs of these resources. Finally, the utilities would also be required to develop publicly accessible hosting capacity maps that are continually updated. The Department of Public Utilities would be required to initiate a proceeding by January 31, 2018 to establish a procedure for creating and filing these plans. The proceeding would also establish metrics and performance incentives to evaluate the distribution utilities' progress toward developing a system where local energy resources can be utilized to meet demand. The bill also creates a Grid Modernization Consumer Board to review utilities' grid modernization plans and budgets.	H.B. 1725 (I) S.B. 1875 (I)
	Non-Wires Alternatives	H.B. 1725 would require utilities to receive a "Determination of Wires" prior to constructing (or receiving a construction permit for) a transmission line, distribution line, or ancillary structure integral to the operation of a transmission or distribution line. As part of the application for this determination, the utility must describe alternatives to the facility and also include an investigation from an independent 3rd party of the ability for local energy resource alternatives to address or defer part or all of the wires investment. The investigation must include the total costs and benefits to ratepayers of both the wires project and the local alternatives. A Grid Modernization Consumer Board would be created by the bill, and this entity would be responsible for approving a Determination of Wires. The Board would be required to first consider whether any local energy resource alternatives, alone or in combination, could meet or defer the wires investment.	H.B. 1725 (I) S.B. 1875 (I)
ME	Microgrid Rules	H.B. 190 would establish rules to allow municipalities working together with electric utilities to create microgrids. The bill is currently a concept draft, and will address the following topics: (1) renewable	H.B. 190 (I)

		generators within the microgrid, (2) methods for adding storage and enabling the utility to manage charging and use of stored energy, (3) rates for generation and stored power usage, (4) credits for municipal utilization, and (5) compensation for scheduling or shedding of electrical load to reduce peak demand. The bill will be carried over to the next legislative session.	
	Non-Wires Alternatives	S.B. 516 directs the Public Utilities Commission (PUC) to appoint a Smart Grid Coordinator with demonstrated experience in developing, operating, and managing non-transmission alternatives. The Coordinator would work to develop, implement, and manage non-transmission alternatives approved by the PUC. Specifically, when a transmission project is proposed, the Coordinator would develop a non-transmission alternative; the costs of developing this alternative would be borne by the transmission project applicant. If the PUC determines it is in the public interest to proceed with the non-transmission alternative and it is a utility proposing the project, the bill states that the costs of this alternative would be just and reasonable for ratemaking purposes. The bill will be carried over to the next legislative session.	S.B. 516 (I)
	Non-Wires Alternatives	In April 2016, the Public Utilities Commission (PUC) opened an investigation into the designation of a Non-Transmission Alternative (NTA) Coordinator. The Smart Grid Policy Act authorized the PUC to designate a smart grid coordinator, and previous proceedings examined this possibility. The purpose of this proceeding is to develop a framework for selecting an NTA Coordinator, determine the scope of the NTA Coordinator's functions and duties, and determine whether a third party entity or transmission and distribution utilities should perform the NTA Coordinator functions. The end goal is to have the framework for an RFP or rate incentive, depending on whether a third party or utilities should hold the NTA Coordinator role. The PUC filed a strawman proposal when it opened the docket, leaving many aspects open for discussion. A revised process chart and preliminary issues list was filed in November 2016. A settlement conference was held in mid-September 2017.	Docket No. 2016-00049
MI	Distribution System Planning, Non-Wires Alternatives	As part of Consumers Energy’s draft five-year distribution investment and maintenance plan, the utility proposed investment in new system planning tools. The proposal would enable circuit-level system planning. Consumers Energy’s proposal also includes non-wires alternatives pilot projects.	Docket No. 17990 Draft Plan

	Integrated Resource Planning	Legislation passed in December 2016 requires the Public Service Commission (PSC) to set modeling parameters and assumptions for utilities to use in submitting integrated resource plans (which are required under the legislation). The PSC held stakeholder meetings in May and June 2017. In late July 2017, the PSC opened a docket initiating the 120-day IRP proceeding required by the legislation. In August 2017, PSC staff released a strawman proposal for IRP parameters, and three hearings were held in September for stakeholders to provide comments. In October 2017, the PSC opened a second docket to gather comments on draft IRP filing requirements.	Docket No. 18418 Docket No. 18461 S.B. 437 (2016) S.B. 438 (2016) Integrated Resource Plan Updates
	Integrated Resource Planning	In May 2017, the Public Service Commission (PSC) opened a docket to evaluate cost recovery options for demand response (DR) investments. In August 2017, the PSC staff issued recommendations on a regulatory framework for DR. Staff recommended using a three-phase plan for DR regulation. DR investments would be included in IRPs, and if approved, the costs would be recovered through general rate cases with a streamlined review process (as approval for investments would already take place in the IRP process). Lastly, annual reconciliation proceedings would take place to match actual costs to projections. The PSC issued an order adopting these recommendations in September 2017.	Docket No. 18369 Order Adopting Three-Phase Framework for DR
MISO	Wholesale Market Rules	In April 2017, DTE Electric submitted an Issue Submission Form to MISO requesting that tariffs for energy storage be updated. Current rules treat storage as a synchronous generator and do not recognize that storage acts as both a generator and a load, which results in sub-optimal use of the storage resource. This request references an ongoing review of this issue by FERC prompted by an Indianapolis Power & Light request in 2016. MISO held Common Issue Meetings on energy storage in July and August 2017. At the August meeting, instructions were given to various MISO subcommittees to investigate storage integration issues.	Energy Storage Resource Optimization Common Issue Meeting July 24 Common Issue Meeting August 24
MN	Integrated Resource Planning	A pair of bills introduced in February 2017 would require the economy, job growth, and job retention to be analyzed in the integrated resource planning process. Neither bill advanced before the end of the 2017 legislative session. However, legislation may carry over from an odd-numbered year to an even-numbered year.	H.B. 1309 (I) S.B. 1177 (I)
NH	Non-Wires Alternatives	As part of the New Hampshire Public Utilities Commission's (PUC) June 2017 net metering successor tariff decision, the PUC ordered the	Docket No. DE 16-576

		implementation of four pilot programs, including a non-wires alternatives pilot. The pilot would be focused on the installation of DG in lieu of distribution system upgrades. Each utility is to have at least one pilot program location, and Eversource is to have at least three. The order requires that the data from these pilot programs be made available to a broad range of stakeholders. A working group on the non-wires alternatives pilot is scheduled to meet November 6th.	Order No. 26,029
NM	Integrated Resource Planning	In February 2017, the New Mexico Public Regulation Commission initiated a rulemaking to amend the state's integrated resource planning (IRP) rules. The Commission is considering requiring utilities to consider energy storage resources on a comparable and consistent basis in IRPs alongside supply-side and demand-side resources. Stakeholders filed comments in April 2017, and a hearing was held in late May. In August 2017, the Commission issued an order amending the state's IRP rules to require the evaluation of energy storage resources. Energy storage resources are referred to separately from demand-side resources in the amended rules. The Commission declined to establish an energy storage benchmark or target at this time, but noted that this could be included in future amendments if determined to be in the public interest.	Docket No. 17-00022-UT Final Order
NV	Distribution System Planning	S.B. 146, signed into law in June 2017, requires NV Energy to submit a Distributed Resources Plan to the Public Utilities Commission of Nevada (PUCN) by April 1, 2019 as an addendum to its integrated resource plan due June 1, 2018. The plan must (1) evaluate the locational benefits and costs of DERs, (2) propose standard tariffs for the deployment of cost-effective DERs, (3) propose cost-effective methods of coordinating existing programs to maximize the locational benefits of DERs, (4) identify additional spending necessary to integrate distributed resources into distribution planning, and (5) identify barriers to the deployment of DERs. The PUCN opened an investigation and rulemaking docket in July 2017 to implement S.B. 146. The PUCN accepted comments through mid-October 2017 and will hold a workshop on November 7th.	S.B. 146 (E) Docket No. 17-08022
	Integrated Resource Planning	S.B. 65, enacted in June 2017, makes three changes to NV Energy's resource planning process. First, NV Energy must meet with personnel from the Commission and the Bureau of Consumer Protection in the Office of the Attorney General at least four months before filing a resource plan, and provide them with an overview of the plan. In considering resource plans, the bill requires the PUCN to give	S.B. 65 (E) Docket No. 17-07020

		preference to measures and sources of supply that provide the greatest economic and environmental benefits to the state, among other characteristics. Lastly, the bill requires the PUCN to include its justification for the preferences given to any resources. The PUCN opened a rulemaking docket in July 2017 to implement these changes and accepted comments through mid-October 2017. Two workshops were also scheduled for October.	
NY	Distribution System Planning, Non-Wires Alternatives	In March 2017, the Public Service Commission (PSC) published its order on the Distributed System Implementation Plans. In the order, the PSC provided guidance on hosting capacity, interconnection portals, non-wires alternatives, data privacy, and energy storage as being implemented as a part of the Reforming the Energy Vision process. The PSC directed the utilities to provide suitability criteria for non-wires alternatives to be included in utility planning procedures. In May 2017, the utilities filed additional details, describing the suitability criteria for non-wires alternatives as a part of utility capacity planning and budgeting. Each utility has filed its specific criteria, including information on how it will be applied and the solicitation process. In September 2017, the PSC issued an order seeking comments on the utilities' proposal for building energy management and benchmarking data standards. The utilities proposed a 4/50 privacy standard as the basis for utilities providing whole building aggregated data to building owners.	Docket No. 14-M-0101 Docket No.16-M-0411
	Grid Modernization Planning	The "New York Grid Modernization Act" (A.B. 7480) would require utilities to develop smart grid deployment plans if, following a study, it is determined that smart grid deployment is in the public interest. The program is to include many components, including transmission and distribution system improvements, low-income assistance and education, access to real-time pricing data, AMI opt-out, opportunities for the use of smart appliance and plug-in or hybrid vehicles.	A.B. 7480 (I)
	Grid Modernization Planning	A.B. 4223 requires utilities to develop and adopt smart grid system deployment plans by July 2018 and issue RFPs by October 2018. The smart grid would allow for a two-way communications system with real time monitoring, diagnostics, and control. Utilities would be allowed recovery of their costs.	A.B. 4223 (I)
PJM	Wholesale Market Rules	In April 2017, the Energy Storage Association filed a complaint against PJM before FERC, alleging that PJM unilaterally changed its frequency regulation market, discriminating against existing energy storage resources. The PJM frequency regulation market is	Docket No. EL17-64

		categorized into RegA (for traditional resources with limited ramp rates) and RegD (for resources with short ramp rates, including batteries). Previously, the RegD resources were energy neutral. However, in January 2017 PJM changed its rules that maintained energy neutrality and eliminated the provision for RegD resource use for short durations.	
RI	Distribution System Planning	In March 2017, the Governor of Rhode Island directed the Public Utilities Commission, Office of Energy Resources, and Division of Public Utilities and Carriers to design a new regulatory framework for Rhode Island's electric system. Distribution system planning is being considered as part of this effort. A meeting on distribution system planning was held in May 2017, and the Office of Energy Resources opened an inquiry into distribution system planning in June. A stakeholder discussion was held in August 2017. The initial proposal was released, and stakeholder comments were accepted until September. The initial proposal from the Office of Energy Resources and Division of Public Utilities and Carriers proposes five changes: (1) establish specifications and an updating process for a Rhode Island System Data Portal, which allows for public access to data, (2) develop a data access and governance policy, (3) create a road map for heat and hosting capacity maps, (4) include and review distribution system planning forecasts within applicable existing dockets, and (5) coordinate planning processes for the distribution system, capital investments, and non-wires alternatives in a way that considers DER options.	Power Sector Transformation Initiative – Distribution System Planning Initial DSP Proposal
	Non-Wires Alternatives	In December 2016, Rhode Island's Energy Efficiency and Resource Management Council (EERMC) filed changes to the state's System Reliability Procurement (SRP) Standards, along with the 2018-2020 energy efficiency savings targets. Proposed changes to the SRP standards include a new framework for comparing the costs and benefits of wires and non-wires alternatives, as well as new flexibility for non-wires alternatives screening criteria. A technical session was held in May 2017, and new standards were approved in July. The new standards require National Grid to consider non-wires alternatives in all distribution planning and capital investment decision-making.	Docket No. 4684
WA	Distribution System Planning, Integrated Resource Planning,	In May 2015, the Washington Utilities and Transportation Commission staff initiated a proceeding (UE-151069) to investigate the role of energy storage in utility planning and procurement. The Commission later initiated a rulemaking proceeding in September 2016 (U-161024) to	Docket No. UE-151069 Docket No. U-161024

Non-Wires Alternatives	consider changes to the integrated resource planning (IRP) process. The two proceedings overlap in certain areas. The Commission specifically seeks to evaluate how recent advances in the energy industry, such as the growth of DG and development of energy storage technologies, should be treated in the IRP. In March 2017, the Commission released a draft energy storage policy statement for comment in both dockets, and parties submitted comments until early April. The Commission's policy statement cites energy storage as a key enabling technology for utilities to comply with state energy policies, and that utilities should be diligently working to identify and pursue cost-effective energy storage opportunities. Other key items include: (1) Utilities seeking a prudence determination for new resource acquisitions must demonstrate that their analysis of resource options included a storage alternative, and that they have reasonably considered all of the costs and benefits; (2) A timeline for transitioning to sub-hourly IRP modeling will be discussed in the rulemaking proceeding (U-161024). In the meantime, a "net cost" method will be used within traditional hourly modeling, whereby utilities will use an external model to calculate sub-hourly benefits of energy storage and subtract these from costs in the IRP model; (3) Utilities are to rely on energy storage cost data from reliable, independent third parties; and (4) The Commission is willing to consider rate design proposals that reflect the cost of serving customers during high-demand periods, in order to provide tariffs with price signals to encourage behind-the-meter storage projects. In October 2017, the Commission issued its final report and policy statement on the treatment of energy storage technologies in IRPs and resource acquisition. The report identified a number of value streams for energy storage and that more work needs to be done to disaggregate them and incorporate them into some type of tariff design. The Commission invited the utilities to develop tariff proposals for this purpose.	Draft Policy Statement

Legislative Status Key: I = Introduced, P1 = Passed One Chamber, P2 = Passed Both Chambers, E = Enacted, D = Dead. Bill statuses are up to date as of early May 2017.

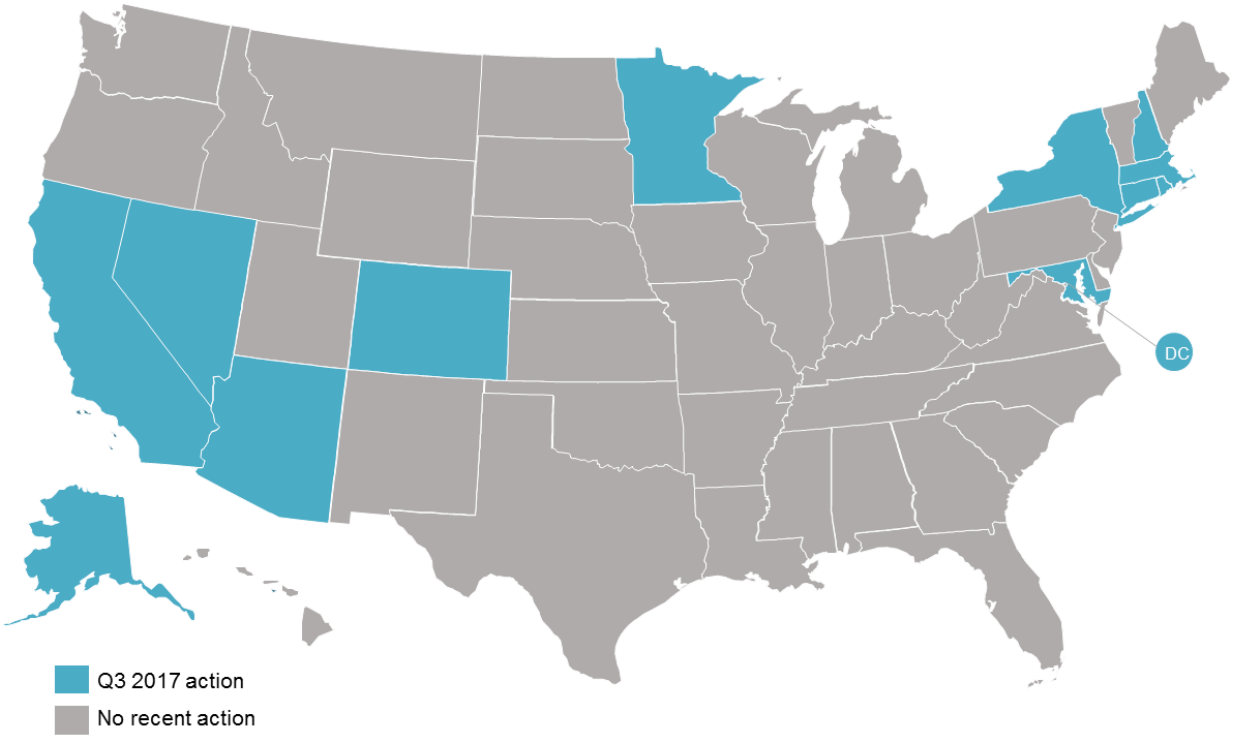
UTILITY BUSINESS MODEL AND RATE REFORMS

Key Takeaways:

- In Q3 2017, 12 states plus DC took 25 actions to reform rate designs, regulatory structures, or utility business models.
- Eight states took action on time-varying rates, while seven states and DC considered utility business model reforms.
- Utility business model reforms under consideration include decoupling, performance-based ratemaking, and deregulation.

While utility rate design for residential customers has typically consisted of a fixed customer charge, plus a flat per-kWh rate for energy consumed during the billing period, many utilities are considering significant changes to this traditional design, namely introducing time-varying rates that more accurately reflect the actual cost of electricity based on patterns of system load.

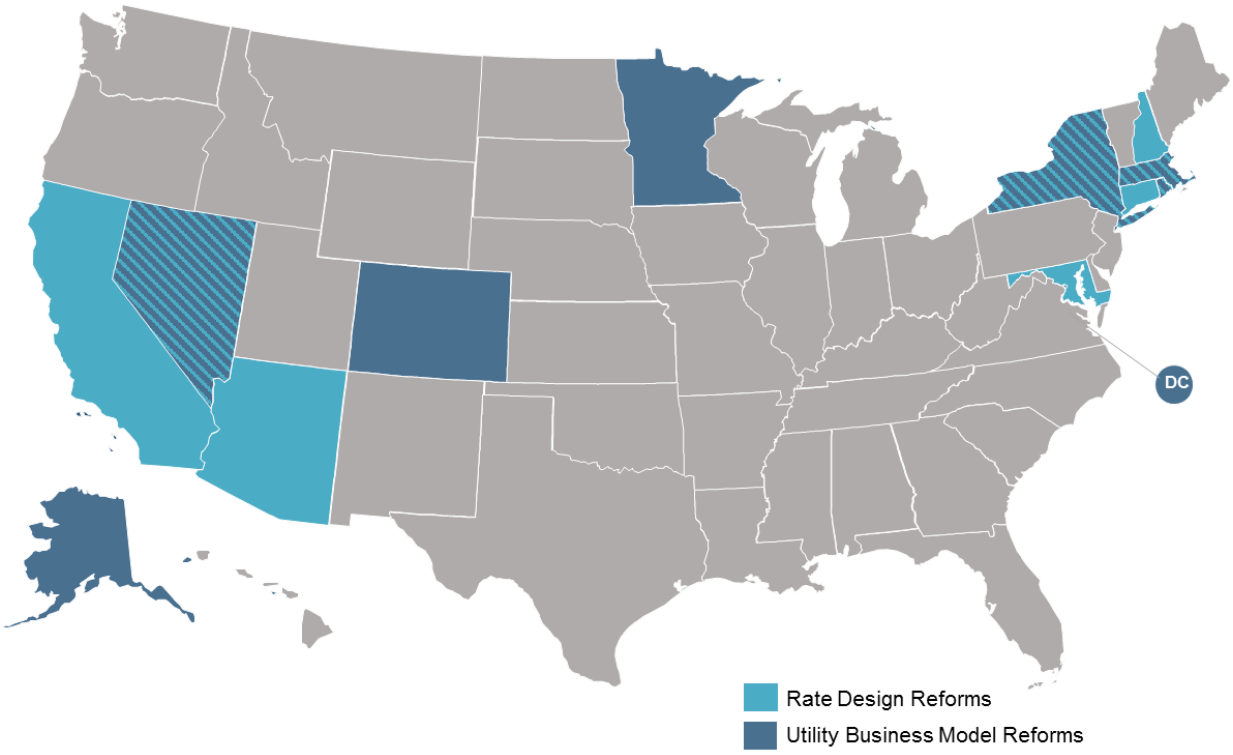
Figure 9. Action on Utility Business Model and Rate Reform (Q3 2017)



In Q3 2017, eight states took action related to time-varying rates. In Maryland, a working group on the topic developed a proposal for the planned time-varying rate pilot program. New Hampshire is also planning a time-varying rate pilot program, which a stakeholder working group is currently discussing as well. California is well along in its process of shifting to default time-varying rates, with these scheduled to go into effect in March 2018.

Dedicated rate tariffs for customers with energy storage systems are beginning to gain attention. In Arizona, APS was directed to develop an optional tariff for large commercial customers with storage systems, while legislation in Nevada requires utilities to file optional time-varying rates, including those for customers with energy storage.

Figure 10. Action on Rate Design and Utility Business Models (Q3 2017)



While utility business models are receiving significant attention nationwide, relatively few states and utilities have proposed specific changes to these business models. Decoupling remains a common business model adjustment, with several states and utilities already utilizing decoupling mechanisms. In Q3 2017, the Colorado Public Utilities Commission approved a decoupling mechanism for Xcel Energy. In Alaska, however, a pending settlement agreement would not adopt the utility's proposed decoupling mechanism.

Table 4. Updates on Utility Business Model and Rate Reform (Q3 2017)

State	Sub-Topic	Description	Source
AK	Decoupling	As part of its general rate case, Alaska Power Company proposed a decoupling mechanism. Each year, any difference between allowed revenue and actual revenue would be divided by the kWh sales to create a per-kWh Decoupling Rate Adjustment surcharge or credit. This adjustment would be applied to sales in the following year, and the adjustment would be limited to 5% in either direction. A stipulation was filed in September 2017, which excludes the proposed decoupling mechanism.	Docket No. TA857-2 Docket No. U-16-078 Stipulation
AZ	Demand Charges, Time-Varying Rates	In Arizona Public Service's (APS) June 2016 general rate case, the utility proposed mandatory time-varying rates and demand charges for all residential customers. In March 2017, a settlement agreement among 30 parties was filed, which includes several rate options for residential customers and residential DG customers, but does not make time-varying rates and demand charges mandatory. However, in May 2018, time-varying rates will become default for all APS customers. In May 2017, the Arizona Corporation Commission staff filed a brief concluding that the settlement should be adopted. The agreement was approved in August 2017.	Docket No. E-01345A-16-0036 Settlement Agreement Decision No. 76295
	Energy Storage Tariff	As part of Arizona Public Service's (APS) general rate case, the Arizona Corporation Commission (ACC) issued a decision in August 2017 on rates for large commercial customers, which were not a part of the settlement agreement approved in the same order. The Energy Freedom Coalition of America proposed a new option tariff that does not include a ratchet in order to better encourage energy storage adoption. APS offered an alternative proposal to encourage battery storage adoption, utilizing an upfront incentive. The ACC directed APS to propose a new, optional large commercial tariff to encourage energy storage adoption; the tariff is not to include a demand ratchet, off-peak demand charge, or declining block demand charge. The optional tariff will be capped at a total peak demand of 35,000 kW for installed storage systems. Once the program is 70% subscribed, APS is to evaluate the costs and benefits of the program and convene stakeholders to discuss the program's future. Customers participating in the optional storage tariff will remain eligible for net billing.	Docket No. E-01345A-16-0036 Decision No. 76295
	Energy Storage Tariff	As part of Tucson Electric Power's (TEP) ongoing proceeding addressing DG rate design, development of energy storage tariffs for residential and small commercial customers was discussed. TEP noted in its August 2017 testimony that it would propose a	Docket No. E-01933A-15-0322

		tariff design similar to its pilot tariff for large commercial customers with storage systems. This would include demand charges that are seasonally and temporally differentiated, TOU energy rates, and a 75% on-peak demand ratchet.	
	Energy Storage Tariff	As part of UNS Electric's ongoing proceeding addressing DG rate design, development of energy storage tariffs for residential and small commercial customers was discussed. UNS and Tucson Electric Power (TEP) noted in their August 2017 testimony that the companies would propose a tariff design similar to TEP's pilot tariff for large commercial customers with storage systems. This would include demand charges that are seasonally and temporally differentiated, TOU energy rates, and a 75% on-peak demand ratchet.	Docket No. E-04204A-15-0142
CA	Time-Varying Rates	California is in the process of shifting to default TOU rates for residential customers of investor-owned utilities. The California Public Utilities Commission (CPUC) issued a decision in 2015, establishing rules for the transition from tiered rates to default TOU rates, including a process for flattening the tiers in the interim. The decision also set a cap on the amount that Tier 1 rates could increase at any one time. The utilities filed a Petition for Modification of the decision in December 2016, arguing that they may need to exceed that cap in the future. The CPUC approved a proposed decision in July 2017, allowing the utilities to exceed the cap in certain circumstances. The CPUC issued another decision in October 2017, adopting findings about customer impacts, as required by the California Public Utilities Code. The decision finds that there is no basis to exclude senior citizens in hot climates from default TOU rates, but that economically vulnerable customers in hot climates should be excluded from the default TOU rates scheduled for March 2018.	Docket No. R-12-06-013 Decision
	Time-Varying Rates	This proceeding, separate from the proceeding examining the transition to default TOU rates, is examining the appropriate time periods for future TOU rates. In a January 2017 decision, the California Public Utilities Commission (CPUC) identified relevant principles and related data requirements at a broad level to assess TOU time periods. Among the provisions included in the decision were rules through which customers with existing PV systems, or nearly completed PV systems, could be grandfathered under the original TOU rates. Representatives of the solar industry filed a petition for modification in March 2017 to allow extra time for grandfathering to account for the period of uncertainty between the end of grandfathering and the final approval of TOU rates	Docket No. R-15-12-012 Proposed Decision Alternate Proposed Decision

		and time periods. The ALJ issued a proposed decision in September 2017, followed by an alternate proposed decision by a Commissioner a few days later, both of which grant a limited modification to the decision but otherwise denied the petition for modification. In both proposed decisions, schools were granted an extension of time for qualifying for grandfathering, but other customers with solar systems under development were not.	
CO	Decoupling	In July 2016, Public Service Company of Colorado d/b/a Xcel Energy filed a proposal to implement a revenue decoupling mechanism for residential and small commercial customers. The Commission approved a revenue decoupling mechanism in July 2017 at the recommendation of Commission Staff. The approved decoupling mechanism uses the "total revenues" rather than the "revenue per customer" approach; several parties, including the utility, the Colorado Energy Office, Vote Solar, and the Southwest Energy Efficiency Project preferred the revenue per customer approach and filed a petition for rehearing, which was denied in August 2017.	Docket No. 16A-0546E Decision No. C17-0557
CT	Rate Reform	In February 2016, the Public Utilities Regulatory Authority (PURA) opened a docket to conduct a full Cost of Service Study (COSS) and rate design review to establish a standardized methodology for electric distribution companies to use. The review will be conducted in two phases – Phase I addressing the COSS and Phase II addressing rate design. In early April 2017, PURA determined that questions regarding the cost of serving DG customers should be explored in a new, separate docket. This docket is temporarily suspended until completion of the new docket pertaining to DG rate issues.	Docket No. 16-02-30
DC	Utility Business Model Reform	As part of Pepco's latest general rate case, the utility requested permission to propose an alternative revenue recovery mechanism in its next rate case. Pepco presented two potential options: a fully forecasted test year and a multi-year rate plan. Pepco noted that it believes a multi-year rate plan would be the best option. In July 2017, the Public Service Commission issued its final decision, allowing Pepco to propose an alternative revenue recovery mechanism in its next general rate case in addition to a traditional test year filing.	Formal Case No. 1139 Final Order
MA	Fixed Charges, Time-Varying Rates	H.B. 1725 would prohibit the Department of Public Utilities from approving residential fixed charges that are higher than the sum of connection costs, billing, and provision of customer service.	H.B. 1725 (I) S.B. 1875 (I)

	Utility Business Model Reform	In Eversource's pending general rate case, filed in January 2017, the utility requested approval of a performance-based ratemaking mechanism, whereby rates would adjusted annually in accordance with a revenue-cap formula. This mechanism would replace the utility's current capital cost recovery mechanism, and Eversource suggests that it will help the utility pursue its clean energy goals and greater cost efficiency. An evidentiary hearing was held in September 2017, and initial rate design briefs were due in late September.	Docket No. 17-05
	Time-Varying Rates	H.B. 1725 would require each distribution company to offer customers a time-of-use rate option. The company would also be required to provide a summary of available rate options with expected bill impacts for the customer once per year. Customers opting in to time-of-use rates for the first time would be offered bill protection for at least one year, where the customer would not be required to pay more than they would have paid under their previous rate schedule.	H.B. 1725 (I) S.B. 1875 (I)
MD	Time-Varying Rates	As part of Maryland's grid modernization proceeding (Public Conference No. 44), utilities will develop pilot programs for time-varying rates. These are set to be developed between February and June 2017, with the pilot programs taking place between July 2017 and June 2018. The Commission also established a working group to develop a proposal that enables the utilities that have deployed AMI to institute a data sharing system. In August 2017, the Rate Design Working Group submitted its report. The group noted that although the working group members agreed on discrete elements, the group was unable to reach consensus on the design of the pilot program. The report recommends a pilot program that tries to best reflect the different viewpoints discussed in the group. The proposed pilot program would be available as the utility's Standard Offer Service and Retail Supplier option. The PSC accepted initial public comments and a hearing was held in mid-September 2017.	Public Conference No. 44 Working Group Report
MN	Utility Business Model Reform	Minnesota statutes allow utilities to establish multiyear rate plans for a period of up to five years. The same statutes provide that the Commission may require a utility operating under a multiyear rate plan to provide a set of reasonable performance measures and incentives that are quantifiable, verifiable, and consistent with state energy policies. The Commission noted that during Xcel's most recent rate case, the record was insufficient to determine the adequacy of its performance metrics. The	Docket No. 17-401

		Commission opened a new proceeding in September 2017 to reach an understanding of the combination of metrics and incentives that could appropriately align utility and ratepayer interests. The docket will proceed in two phases, with phase one collecting stakeholder input on the key goals for the electricity sector and how to measure its progress toward meeting those goals. The second phase will focus on how those performance measurements could be applied by the Commission. The initial comment period closes on December 1st, with reply comments due January 18th.	
NH	Time-Varying Rates	H.B. 401 directs the Public Utilities Commission to develop a process to implement time-varying rates as part of the active grid modernization proceeding. A hearing was held in late October 2017.	H.B. 401 (I)
	Time-Varying Rates	In the New Hampshire Public Utilities Commission's June 2017 net metering successor tariff order, the Commission ordered the implementation of four pilot programs, including one on TOU rates (Eversource and Unitil) and one on real-time pricing (Liberty Utilities / City of Lebanon). The TOU pilots will be open to both residential and small commercial customers. The order requires that the data from these pilot programs be made available to a broad range of stakeholders. A working group on TOU rate pilots met in mid-October 2017.	Docket No. DE 16-576 Order No. 26,029
NV	Energy Storage Tariff, Time-Varying Rates	A.B. 405, signed into law in June 2017, requires utilities to file a request with the Public Utilities Commission of Nevada (PUCN) to establish an optional time-variant rate schedule for customers, including customer-generators who deploy energy storage. NV Energy filed its application in July 2017, which covered this and many other provisions from A.B. 405, including major changes to net metering. The PUCN issued an order in September 2017, addressing the various provisions related to net metering, but not the optional time-variant rate schedule. Instead, the order stated that the PUCN will hold separate and/or future proceedings regarding the establishment of optional time-variant rate schedules. Nevada Power filed its revised time-variant rate schedule in its general rate case (17-06003) in September 2017. Various parties objected to this, arguing that time-variant rates required by A.B. 405 should be handled in the A.B. 405 docket (17-07026). In its reply comments, the Public Staff sided with Nevada Power.	A.B. 405 (E) Docket No. 17-07026 Docket No. 17-06003
	Utility Business Model Reform	Nevadans voted on a Constitutional Amendment in November 2016 to deregulate the electric utility industry. Seventy-two percent of voters voted in favor	The Energy Choice Initiative -

		of deregulation. However, Nevada law requires Constitutional Amendments to be approved in two even-numbered years. This amendment will need to be approved by voters again in 2018 before taking effect. At the request of the Governor's Committee on Energy Choice, the Public Utilities Commission of Nevada (PUCN) opened a docket in October 2017 to study the following issues: (1) a prospective timeline for implementing the initiative, (2) amendments or repeals of any current Nevada laws or regulations that may be necessary to establish a competitive market, (3) available options for designing a wholesale electricity market, and (4) available options for designing a competitive retail electric service market. The PUCN also committed to studying the potential short- and long-term financial benefits and risks to residents and businesses. The PUCN will be accepting comments through December 8th.	Constitutional Amendment Docket No. 17-10001
NY	Rate Reform	As a part of the Reforming the Energy Vision Track Two order, the Public Service Commission (PSC) required the utilities to provide in detail the cost allocation methodologies being used to calculate standby rates. The PSC also directed the utilities to file revisions to their standby service rates to implement offset tariff and reliability credit provisions for standby customers who are able to demonstrate that they are able to reduce their load below contract demand over consecutive summer periods. The utilities filed their tariff amendments in August 2016, which became effective on January 1, 2017 after including revisions ordered by the PSC. In July 2017, the PSC issued an order moving this proceeding into the Value of Distributed Energy Resources (VDER) proceeding's Rate Design Working Group (Matter No. 17-01277).	Docket No. 16-M-0430
	Rate Reform	In July 2017, the New York Public Service Commission (PSC) issued an order merging the standby rate design proceeding (16-M-0430) into the Value of DER proceeding that includes a number of working groups on rate design issues, including (1) commercial and industrial customer demand charges (Case No. 14-M-0101), (2) standby rate allocation matrix review (Case No. 16-M-0430), (3) opt-in rate design for voluntary mass market TOU rates, and (4) mass market default rate design. In Q3 2017, a number of working group meetings were held. In October 2017, the PSC staff published its scope of study to examine bill impacts. The staff will consider rate design structures, billing determinants, and calculate revenue-neutral rates based on the PSC's rate design principles. The PSC is accepting comments until December 2017.	Docket No: 17-01277

	Time-Varying Rates	S.B. 3093 would create a Real Time Smart Meter program to provide residential customers with greater ability to control and manage electricity usage. Customer electing to participate in the program would be charged based on electricity usage and time of usage and a flat fee incorporating a generation bid cost and service size cost. Utilities, subject to Public Service Commission agreement, may delay participation in the program for at least ten years. During this time, other providers would have the opportunity to provide meters. The bill also provides authority to the Commission to establish real time smart meter pilot programs.	S.B. 3093 (I)
	Utility Business Model Reform	In May 2016, as part of Track Two of New York's Reforming the Energy Vison proceeding, the Public Service Commission (PSC) directed the utilities to propose a DG interconnection survey process and Earning Adjustment Mechanism (EAM) metrics. The EAM will provide utilities with diverse, balanced financial incentives to implement REV outcomes. In September 2017, the utilities proposed EAM metrics, as well as specific targets and incentives to be developed. In March 2017, the PSC ordered the utilities to file a revised proposal with modifications provided by the PSC. In May 2017, the utilities published a revised EAM proposal. The proceeding continued in Q3.	Case No.16-01575/16-M-0429
RI	Time-Varying Rates	Companion bills H.B. 5642 and S.B. 553 would allow utilities to implement time-of-use rates for all residential customers. Currently, Rhode Island law does not allow time-of-use rates to be applied to residential customers, with the exception of pilot programs. Rhode Island's 2017 legislative session has ended, but bills may carry over from odd-numbered years to even-numbered years.	H.B. 5642 (P1) S.B. 553 (I)
	Utility Business Model Reform	In March 2017, the Governor of Rhode Island directed the Public Utilities Commission, Office of Energy Resources, and Division of Public Utilities and Carriers to design a new regulatory framework for Rhode Island's electric system. This broad proceeding includes evaluation of utility business models. A technical meeting on utility business models was held in April 2017, and in August, initial considerations for utility compensation were published. Another technical meeting was held in September 2017, and a straw proposal for performance incentive mechanisms was released.	Power Sector Transformation Initiative Utility Business Models

Legislative Status Key: I = Introduced, P1 = Passed One Chamber, P2 = Passed Both Chambers, E = Enacted, D = Dead. Bill statuses are up to date as of early May 2017.

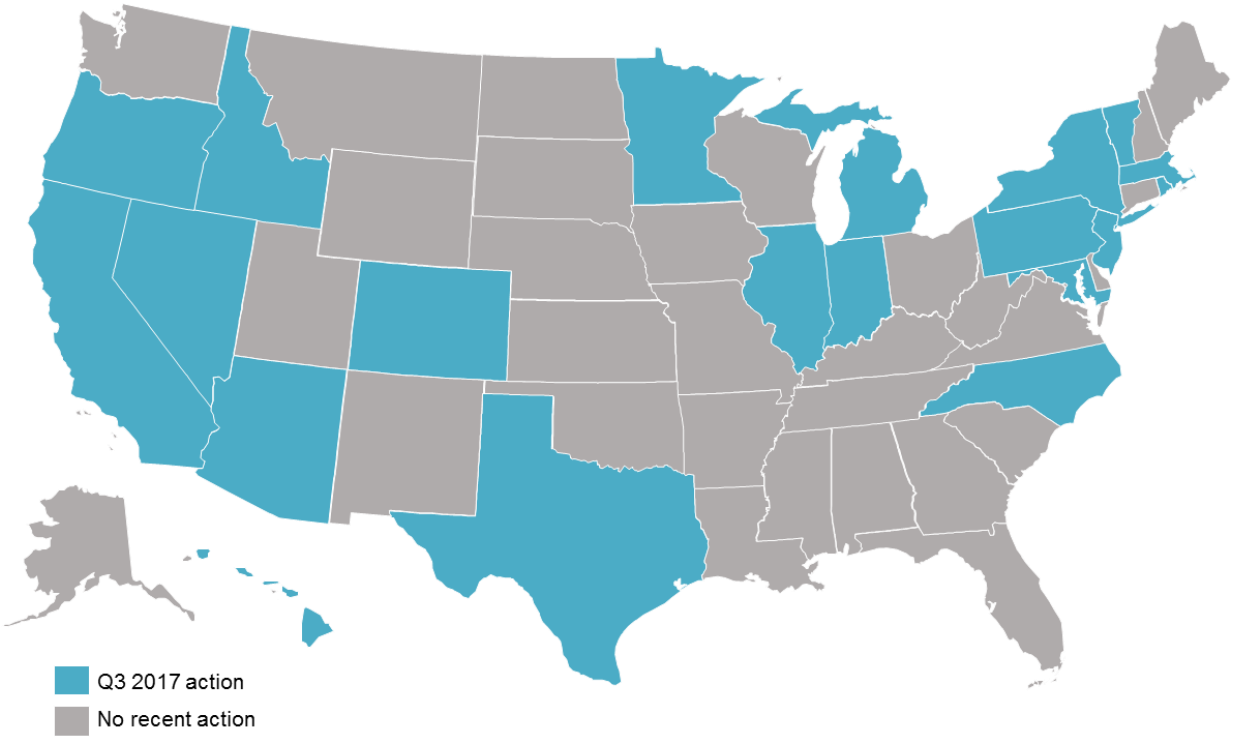
GRID MODERNIZATION POLICIES

Key Takeaways:

- In Q3 2017, 20 states took 40 actions on grid modernization policies, including energy storage targets, interconnection standards for energy storage, and state rules regarding advanced metering infrastructure.
- Seven states considered changes related to cost recovery, opt-out provisions, and cybersecurity of advanced metering infrastructure, while four states addressed compensation rules for behind-the-meter energy storage systems.
- Bills to adopt or expand energy storage targets remain pending in Massachusetts, New Jersey, New York, and Vermont.

There are many different ways in which states may regulate and encourage deployment of advanced grid technologies. In Q3 2017, 20 states took actions related to at least 12 different types of regulations and market development policies related to grid modernization.

Figure 11. Action on Grid Modernization Policies (Q3 2017)



Several states are currently considering mechanisms to grow the market for energy storage and other advanced grid technologies. During Q3 2017, seven states took action related to energy storage targets, with four states – Nevada, New Jersey, New York, and Vermont – considering the adoption of a new target. Massachusetts recently established an energy storage target and currently has pending legislation that would expand this target.

Compensation for behind-the-meter energy storage is an area garnering increased interest, with four states considering either new compensation programs for energy storage or if storage is eligible for existing programs, such as net metering. Companies recently filed requests for declaratory rulings in Massachusetts and Rhode Island regarding the eligibility of solar plus storage systems to participate in net metering. New York is considering how storage fits into its new VDER compensation structure, and Hawaii adopted a new smart export tariff for solar plus storage systems in early Q4 2017.

Box 3. A Note About Policies

Grid Modernization Policies is intended to be a broad category, capturing state-level policy actions related to grid modernization and the deployment of distributed energy resources (excluding solar-specific actions) that do not neatly fit into other categories in this report. The actions in this category are largely centered on market development policies, such as energy storage mandates, as well as regulatory procedures.

While states are increasingly looking at how to encourage the deployment of advanced technologies, states are also examining how these technologies fit into existing regulations and whether additional rules are needed. Seven states are currently considering provisions related to AMI opt-out, ownership, and data usage.

Customer data access is another area seeing increased attention. With AMI deployment comes more granular data on customer energy usage – data which may be utilized in many different ways by both utilities and third parties to help customers understand ways to save money and reduce or shift usage. Illinois, Maryland, Massachusetts, Minnesota, and Rhode Island considered issues related to customer and third party data access during Q3 2017.

Three states are examining how interconnection rules apply to smart inverters and energy storage systems. Arizona is currently considering its first statewide interconnection standards, and the latest draft rules (published in Q3 2017) include provisions related to both smart inverters and energy storage.

Table 5. Updates on Grid Modernization Policies (Q3 2017)

State	Policy Type	Description	Source
AZ	AMI Rules	As part of Arizona Public Service's general rate case, AMI opt-out provisions were addressed. A settlement agreement called for a $50 upfront fee and a monthly fee of $5. In the Arizona Corporation Commission's August 2017 decision, the Commission noted that the AMI opt-out provisions were heavily litigated, and therefore these will be bifurcated and addressed in a separate decision.	Docket No. E-01345A-16-0036 Settlement Agreement Decision No. 76295
	Interconnection	Arizona is currently in the process of developing statewide interconnection rules (Arizona does not currently have statewide interconnection standards). Multiple comments received during Q2 2017 recommended that the rules explicitly address energy storage, as well as advanced inverters. In September 2017, the Arizona Corporation Commission staff published a revised draft of the statewide interconnection rules, which includes new sections on energy storage system and advanced inverter requirements. The staff is requested comments on the draft rules, including in particular, the energy storage and advanced inverter requirements. The draft rules would not require non-exporting energy storage systems to comply with the requirements. Storage systems connecting directly to the utility's distribution system would be required to have the capability to operate in Power Factor Control mode, at any fixed reactive power output, and in Automatic Voltage Regulating mode. Comments were due in early October 2017, and a stakeholder workshop is scheduled for November 6th.	Docket No. RE-00000A-07-0609 Revised Draft Rules
	Renewable Portfolio Standard	In August 2016, Arizona Corporation Commission Chairman Little opened a docket to review, modernize, and expand Arizona's renewable portfolio standard (RPS). At the end of November, the Residential Utility Consumer Office filed a proposal to add a Clean Peak Standard to Arizona's RPS. The Clean Peak Standard would require a certain percentage of energy used to meet peak load hours to be derived from clean sources. A planned June 2017 workshop was canceled and is to be rescheduled following the Commission staff's report on net metering.	Docket No. E-00000Q-16-0289 RUCO Comments

CA	AMI Rules	PacifiCorp plans to install 47,000 smart meters in its California service territory. PacifiCorp is delaying its application to recover costs associated with AMI deployment until it files its next rate case application in 2018. However, PacifiCorp applied in August 2017 for an expedited order authorizing special charges and tariffs for its customers who opt out of receiving a smart meter. Its proposal includes an initial opt-out fee of $75 and a monthly meter reading fee of $20, with discounts for income-qualified customers. The Office of Ratepayer Advocates filed a protest to the application in September 2017, arguing that the Commission should set a schedule that provides adequate opportunity for discovery, analyses, testimony, and evidentiary hearings.	Docket No. A-17-08-016
	Energy Storage Target	Guided by Assembly Bill 2514 of 2010, the California Public Utilities Commission (CPUC) adopted an energy storage mandate in 2013, which requires the IOUs to collectively procure 1,325 MW of energy storage by 2020. The CPUC has an ongoing proceeding, split into two tracks, examining this mandate and other issues surrounding the deployment of energy storage. Track 1 dealt with more near-term issues and was resolved through a CPUC decision in January 2016. The CPUC issued a decision in April 2017 related to various Track 2 issues, including revisions to the energy storage procurement targets, station power, and community storage. Notably, the CPUC decision declined to increase the 1,325 MW storage requirement, but did set forth the process for implementing Assembly Bill 2868 of 2016, which requires the utilities to propose programs and investment for up to 500 MW of additional distributed energy storage resources. The statutory deadline for this proceeding was extended by the CPUC to April 2018 for further consideration of issues related to energy storage systems that serve multiple purposes.	Docket No R. 15-03-011 Decision No. 17-04-039
	Permitting	A.B. 546, signed into law in September 2017, requires local governments with at least 200,000 residents to make all documents and forms associated advanced energy storage permitting public accessible online by September 30, 2018. Local governments with fewer than 200,000 residents would have to	A.B. 546 (E)

		meet this requirement by January 31, 2019. This bill further states that permitting and inspection fees should be based only on the cost to issue the permit and complete the inspection, and not on the value of the installation. The bill also directs the Governor's Office of Planning and Research to create a California Energy Storage Permitting Guidebook by January 2020.	
	Renewable Portfolio Standard	A.B. 1405, introduced in February 2017 would require an unspecified percentage of peak-load electricity to come from clean peak resources, such as energy storage. The bill would require the California Public Utilities Commission to determine the actual percentage of kilowatt-hours delivered by each load-serving entity during peak hours. The Assembly passed the bill in June 2017. The bill was amended by the Senate during Q3 2017, removing all language regarding the clean peak resources requirement.	A.B. 1405 (P1)
CO	Interconnection	In March 2017, several solar groups filed a petition to modify current DG interconnection rules. The groups have requested that energy storage be added to the interconnection rules, and to investigate metering needs for solar-plus-storage systems. In May 2017, the Commission issued a decision granting the request in part; the interconnection rules will be examined as part of an upcoming rulemaking regarding Electric Resource Planning and Renewable Energy Standard rules. A petition for rehearing was denied in June 2017.	Docket No. 17M-0131E Docket No. 16A-0396E
HI	Energy Storage Compensation	Hawaii phased out traditional net metering in 2015, adopting new interim tariffs and initiating a discussion on successors to these tariffs. The Public Utilities Commission issued a decision and order in October 2017 adopting new tariff options for customers with on-site generation, and in some cases, energy storage systems. The new Smart Export Program targets customers with solar PV and battery storage, with storage systems recharging the battery during the day and discharging in the evening. Customers may power their homes with the battery in the evening or export to the grid in exchange for a monetary credit on their electricity bill. The credit rates range from $0.11 per kWh to $0.21 per kWh, depending on the island.	Docket No. 2014-0192 Order No. 34924

ID	PURPA	In February 2017, Idaho Power filed a petition with the Public Utilities Commission for a declaratory order determining the appropriate contract terms, conditions, and avoided cost rates for PURPA contracts requested by battery storage facilities. Idaho Power suggested that facilities up to 100 kW should be entitled to published avoided cost rates and a 20-year term, while facilities larger than 100 kW may receive negotiated avoided cost rates and a two-year term. In July 2017, the Public Utilities Commission published an order, declaring that the particular project at issue, having storage facilities greater than 100 kW and solar as the primary energy source, is eligible for a two-year negotiated contract. A petition for rehearing was filed in August 2017, which the Commission later denied.	Docket No. IPC-E-17-01 Order No. 33785 Order No. 33858
	Smart Inverters	In July 2017, Idaho Power proposed changes to its net metering program, as well as a requirement for new customer-owned generators to install smart inverters. This would take effect within 60 days of the Institute of Electrical and Electronic Engineers (IEEE) adopting an industry standard definition of a smart inverter. A hearing is scheduled for March 2018.	Docket No. IPC-E-17-13
IL	Data Access	A docket was opened in August 2014 to consider the adoption of guidelines for utility customer data. In July 2017, the Illinois Commerce Commission finalized the Open Data Access Framework, which will govern access to utility customer energy usage data. Commonwealth Edison and Ameren (two major IOUs in Illinois) have begun to address the framework requirements by creating "data roadmaps" for customer data access.	Docket No. 14-0507
	Data Access	In March 2017, the Illinois Commerce Commission opened a docket to investigate the creation of a third-party warrant process for access to customer AMI data. The issue had earlier been dismissed from Docket No. 14-0507 for consideration in a separate docket. Two motions to dismiss the proceeding were filed in October 2017 (one by the Illinois Attorney General, another by the Illinois Competitive Energy Association). These motions would result in no third-party warrant process being created. Responses to these motions are due by November 17th.	Docket No. 17-0123

IN	AMI Rules	In July 2017, Duke Energy Indiana submitted a petition for approval of a new tariff (for small commercial and residential customers) that would be applied to customers opting out of AMI equipment installation. The tariff would include a one-time setup fee of $104.96 and a monthly charge of $28.59. The additional charges are intended to cover the cost of manual meter-reading, which is not required if using AMI equipment. The tariff would not be available for customers using TOU rates or participating in net metering, and customers on this tariff would not be eligible for participation in any new services that require the use of smart meters. A hearing is scheduled for November 16th.	Docket No. 44963
MA	Data Access	A pair of bills introduced in 2017 would increase the availability of energy data in the state. The bills would require the state's investor-owned utilities to provide access, upon request by a municipal official, to aggregate annual energy consumption data by sector for up to five prior years, as well as anonymized annual energy consumption data by household, daily 15-minute peak demand data for commercial and municipal buildings for up to one prior year, and aggregate daily 15-minute peak demand data for the residential sector.	H.B. 3386 (I) S.B. 1858 (I)
	Energy Storage Target	Companion bills introduced in Massachusetts would direct the Department of Energy Resources (DOER) to establish a statewide deployment target of 1,766 MW of cost-effective energy storage to be developed by January 1, 2025. The proposed legislation would also directs DOER to set a subsequent deployment target on or before December 31, 2020 to be achieved by January 1, 2030. The targets are to include both minimum and maximum limits on the amount of storage that may be owned by load-serving entities and are to be reevaluated every three years. The legislation also permits DOER to consider policies to encourage storage deployment.	H.B. 1746 (I) S.B. 1874 (I)
	Energy Storage Compensation	In July 2016, Genbright LLC requested a declaratory ruling as to whether National Grid was acting in a commercially reasonable manner in obtaining payments for capacity of net-metered solar facilities. In November 2016, Genbright amended its petition to also request a declaratory ruling that battery storage systems are not subject to net	Docket No. 16-116

		metering rules. The Department of Public Utilities issued an order in September 2017, determining that the stakeholder interest and complexity surrounding these issues warrants a separate inquiry, initiated by the Department. The Department suspended Genbright's petition until the inquiry is complete, and the inquiry was opened in early October 2017.	
	Energy Storage Compensation	In May 2017, Tesla filed a petition for emergency declaratory relief or an advisory ruling on the eligibility of solar-plus-systems for net metering. Specifically, Tesla requested clarification for solar systems that are paired with battery storage systems, where the battery does not export energy to the grid and is only charged with solar energy. The Department of Public Utilities (DPU) published an order in September 2017, issuing an advisory opinion that the general net metering eligibility of solar-plus-storage systems requires further investigation, but in the interim, these systems should be eligible to net meter. The advisory opinion is generally applicable to all net-metered solar-plus-storage facilities; however, the DPU notes that further investigation could change its opinion on the issue. In early October 2017, the DPU opened a general inquiry into net metering eligibility for solar-plus-storage systems.	Docket No. 17-105 DPU Order
MD	Data Access	In September 2016, the Maryland Public Service Commission (PSC), as part of the Exelon-PHI merger condition, initiated a grid modernization proceeding to make sure that the electric distribution system in Maryland is customer-centric, affordable, reliable, and environmentally sustainable. A working group to examine competitive protections and customer choice has been established as part of this process, and in late June 2017, the group filed a request to seek comments and hold a hearing to support the development of regulations pertaining to customer interval data access.	Public Conference No. 44
MI	AMI Rules	H.B. 4220, introduced in February 2017, would allow utility customers to opt out of having an advanced meter installed; utilities would only be able to install advanced meters if the customer did not opt out and choose to retain a traditional meter. This bill would apply to both IOUs and municipal utilities.	H.B. 4220 (I)

MN	Data Access	The Minnesota Public Utilities Commission convened a working group to examine issues around privacy and customer data access in 2013. The Commission accepted comments regarding a potential customer energy use data release consent form in the first part of 2017, and issued an order in June 2017, approving a standard customer energy use data consent form. Utilities must honor customer data access requests from third parties as long as the third parties utilize the approved consent form. The utilities filed their consent forms during Q3 2017.	Docket No. 12-1344
NC	AMI Rules	Duke Energy Carolinas has deployed smart meters to about 25% of its customers in North Carolina and South Carolina and plans to deploy more. Some customers eligible to receive smart meters have asked to keep their traditional meters. Duke Energy Carolinas has proposed charging these opt-out customers an initial $150 set-up fee and a monthly fee of $11.75 to cover expenses related to sending out meter readers. An April 2017 decision from the Utilities Commission requires Duke Energy to work with the Public Staff to design three alternatives for dealing with opt-out customers. The order also includes a series of questions related to Duke's AMI program, which the Commission asked Duke to answer. Duke replied to the NCUC's questions, and in August, the NCUC issued another order with additional questions for Duke, which Duke also answered. The case remains open and unresolved.	Docket No. E-7 Sub 1115
	Interconnection	Following the adoption of revised interconnection standards in 2015, the North Carolina Utilities Commission directed the Public Staff to convene stakeholders in two years to discuss the functioning of the new standards. Advanced Energy, the entity assigned by the public staff to facilitate the stakeholder process created four working groups during Q2 2017. One of the working groups will be examining new technologies, including energy storage. The working groups held multiple stakeholder meetings during Q3 2017, and in September, the Public Staff requested an extension of time for delivering its final report. The NCUC granted the request. The Public Staff plans to hold additional stakeholder meetings during Q4 2017 and aims to have a completed report to the NCUC by December 15th.	Docket No. E-1 Sub 101

NJ	Building Requirements	A.B. 4861, introduced in May 2017, would require all new state buildings that are greater than 15,000 square feet to install distributed energy resources (DERs). Any existing buildings of similar size would also be required to consider installing DERs during any retrofitting. The definition of DERs includes energy storage.	A.B. 4861 (I)
	Energy Storage Target	S.B. 3434 requires each electric power generator in New Jersey to deploy 600 MW of energy storage capacity by 2021 and 2,000 by 2030.	S.B. 3434 (I)
NV	Energy Storage Target	S.B. 204 would require the Public Utilities Commission of Nevada (PUCN) to determine whether it is in the public interest to adopt annual requirements for the procurement of energy storage by utilities. The bill was signed by the Governor in May 2017. The PUCN opened an investigatory and rulemaking docket in July 2017 to implement S.B. 204. A workshop is scheduled for November 9th.	S.B. 204 (E) Docket No. 17-07014
NY	AMI Rules	A.B. 3066 and A.B. 6464 would require AMI devices to meet certain performance and safety standards, and would allow customers the ability to opt-out of AMI installation at no penalty, fee, or service charge.	A.B. 3066 (I) A.B. 6464 (I)
	AMI Rules	S.B. 3093 would create a Real Time Smart Meter program, in which customers would have the option of continuing with their current metering system, as well as purchasing or renting a real time smart meter from a third party certified by the Public Service Commission.	S.B. 3093 (I)
	AMI Rules	The “New York Grid Modernization Act” (A.B. 7480) directs utilities to invest in smart grid deployment if, after a study on the matter is conducted, it is determined that doing so is in the public interest. The bill notes that as part of this deployment, utilities must allow any customer to decline AMI installation at no fee.	A.B. 7480 (I)
	Energy Storage Compensation	As part of New York’s Reforming the Energy Vision (REV) proceeding, the Public Service Commission (PSC) is developing a methodology for DER valuation that provides a more precise and complete accounting of the values and costs of DERs, including energy storage, than traditional net metering. While the PSC recognized that the development of an appropriate value and	Docket No. 15-02703/15-E-0751

compensation for DERs will be an ongoing process progressing in tandem with technical and market capabilities, it directed the public staff to develop recommendations on the value of DERs that could potentially lead to an alternative to net metering.

In March 2017, as part of the net metering transition order (Docket No. 15-E-0751), the PSC provided direction on how DERs should transition from net metering to a Value of Distributed Energy Resources (VDER) tariff that reflects the cost and benefits of DERs on the grid. The transition is to occur in phases. In Phase One, mass market projects will be interconnected under existing net metering rules with a 20-year contract term. Any on-site energy storage systems paired with renewable energy generation facilities will retain traditional net metering, and all projects interconnected before the order will be grandfathered. Projects that don't qualify for the Phase One net metering will be compensated based on Phase One Value Stack tariff.

The Value Stack tariff will be based on monetary crediting for net hourly electricity exported to the grid. Excess credit will be eligible for carry over to subsequent billing and annual periods. Projects eligible for the Value Stack will have a contract term of 25 years from their in-service date. The Value Stack for net hourly electricity exported to the grid will be calculated based on the value of – (1) an energy value based on day-ahead hourly zonal locational-based marginal price (LBMP), (2) capacity value, (3) environmental value, and (4) demand reduction value and locational system relief value.

The VDER Phase One order determined that storage paired with eligible generation would be eligible for net energy metering for mass market on-site projects or for value stack compensation. The PSC is currently considering various implementation issues. The utilities proposed a detailed plan to prevent non-renewable injections from receiving compensation for environmental value under the value stack. The PSC agreed with the utilities' proposal, but deferred final approval, noting that more analysis might be needed. Another issue yet to be resolved is an interconnection process for storage. The

		PSC directed Commission staff to work with the New York State Energy Research & Development Authority, utilities, and developers to form an interconnection policy working group and develop a proposal. The PSC staff is to file a proposal by December 20th.	
	Energy Storage Target	S.B. 2699 would require the Public Service Commission to initiate a proceeding to determine energy storage targets that can be achieved by 2021. The procurements targets would be established by December 2018.	S.B. 2699 (I)
	Energy Storage Target	Legislation introduced in 2017 would require the Public Service Commission to commence a proceeding to establish energy storage programs. The bills require the Commission by 2018 to set an energy storage target to be achieved by 2030.	A.B. 6571 (I) S.B. 5190 (I)
	Self-Directed Program	Legislation introduced in January 2017 requires the New York Public Service Commission to create a self-directed program for promoting renewable energy, microgrids, fuel fells, and energy storage technologies.	S.B. 1225 (P1) A.B. 1705 (I)
OR	Energy Storage Target	H.B. 2193 of 2015 directed utilities serving 25,000 or more residential customers to procure one or more energy storage systems with the capacity to store at least 5 MWh of electricity. The bill also directed the Public Utility Commission (PUC) to adopt guidelines for utilities to use in submitting an energy storage proposal. The PUC initiated a proceeding in September 2015, and issued an order adopting guidelines in December 2016. The guidelines cover various topic areas, including how utilities can design and select projects to propose, how utilities should submit their formal proposals, storage evaluation requirements, and competitive bidding requirements. The PUC order also directed the Public Staff to convene workshops to develop a framework for the utilities to use in conducting storage potential evaluations. The Public Staff submitted their recommendations in March 2017, which the PUC later approved. The PUC initially planned to hold a Special Public Meeting Workshop to receive stakeholder input on the utilities' draft evaluations. The Public Staff filed a motion in July 2017, asking the PUC to amend the process due to the technical nature of the draft evaluations. Instead, the	H.B. 2193 (2015) Docket No. UM 1751 PacifiCorp Draft Storage Potential Evaluation Portland General Electric Draft Storage Potential Evaluation

		Public Staff argued for each utility to hold a workshop for the Public Staff and stakeholders to explain its draft evaluation in mid-August, followed by a comment period, and then a presentation in September to the PUC from the Public Staff of the draft evaluations and stakeholder comments. The PUC approved the motion.	
PA	Energy Storage and Microgrid Rules	H.B 1412 would allow electric distribution companies to propose energy storage and microgrid pilot programs with the goals of facilitating the use of diverse electric supply options and enhancing electric distribution, resiliency, and operational flexibility. Within five years of approval of the first pilot program, the Commission is to initiate a rulemaking evaluate the circumstances where utility deployment of energy storage and microgrids is in the public interest and to develop regulations to further the deployment of energy storage and microgrids in the state. The bill specifically states that the rulemaking shall not require utilities to own, develop, or deploy energy storage or microgrids.	H.B. 1412 (I)
RI	Data Access	As part of Rhode Island's Power Sector Transformation Initiative, initiated in March 2017, the issue of distribution system planning is being considered. In August 2017, the Office of Energy Resources and Division of Public Utilities and Carriers released an initial proposal, which recommends the creation of a data access and governance policy to better provide access to both customer and system data. Comments on the initial proposal were accepted until September.	Power Sector Transformation Initiative – Distribution System Planning Initial DSP Proposal
	Energy Storage Compensation	In September 2017, Tesla and Sunrun petitioned the Public Utilities Commission (PUC) for a declaratory ruling on the net metering eligibility of solar systems paired with energy storage. The petition is specifically concerned with solar PV systems less than 25 kW with battery storage systems that are charged solely from the PV system, and for which the customer is not on a time-of-use rate. The accepted comments in October 2017.	Docket No. 4743
TX	AMI Rules	The Texas Public Utility Commission has an ongoing docket pertaining to Smart Meter Texas, a web portal allowing customers and authorized competitive service providers to	Docket. No. 46206

		access information from smart meters. The docket also addresses issues of smart meter governance and funding. In July 2017, PUC staff recommended opening a contested case proceeding regarding smart meter issues and closing the current docket. An open meeting was held in July 2017, and the dockets were closed in August.	Docket No. 46204
	AMI Rules	In August 2017, the Texas Public Utilities Commission opened this contested case proceeding to investigate possible changes to Smart Meter Texas, a data-sharing website used by several major Texas electric utilities to provide usage data to their customers. This docket was opened to cover issues raised in two earlier dockets, 46204 and 46206, which were then closed. A hearing is scheduled for December 4th.	Docket No. 47472
VT	Energy Storage Target	H.B. 501 directs the Department of Public Service to develop policy recommendations and targets for energy storage capacity in the state, particularly for systems storing electricity from intermittent sources. The full text of the bill is not yet available. The bill was not voted on during the 2017 legislative session. Legislation may carry over from an odd-numbered year to an even-numbered year.	H.B. 501 (I)

Legislative Status Key: I = Introduced, P1 = Passed One Chamber, P2 = Passed Both Chambers, E = Enacted, D = Dead. Bill statuses are up to date as of early May 2017.

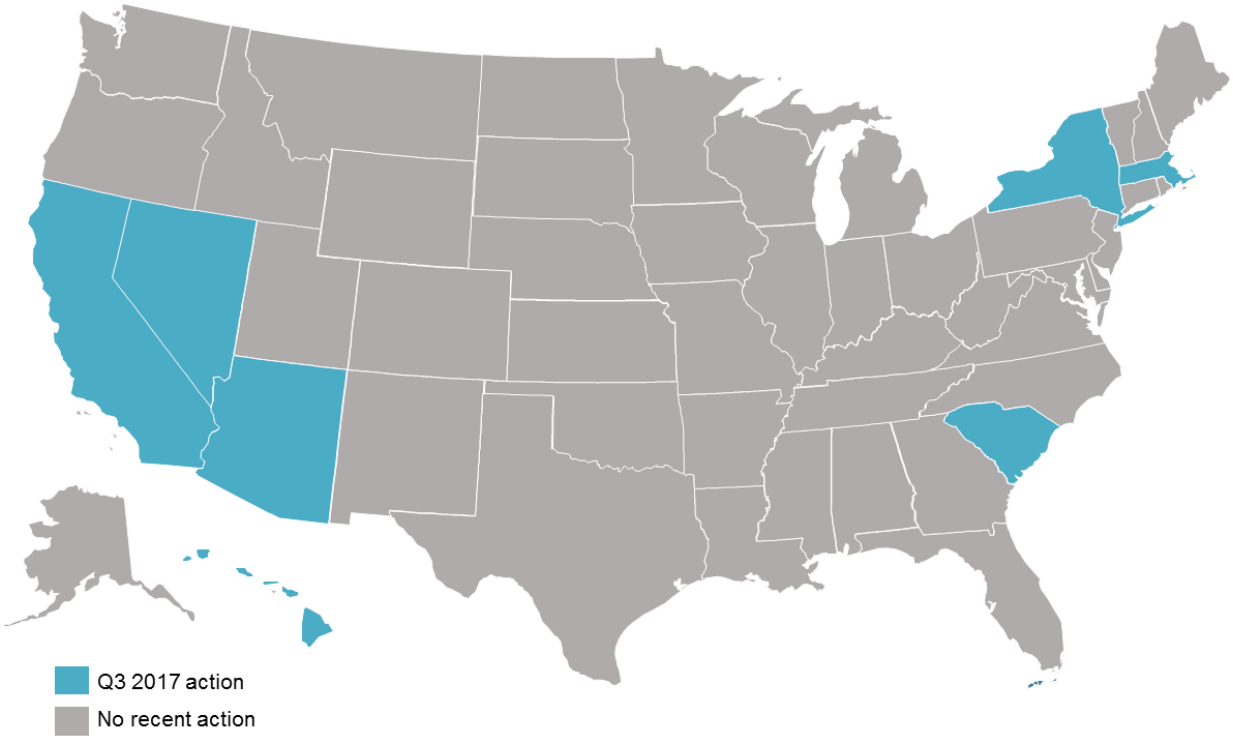
FINANCIAL INCENTIVES

Key Takeaways:

- In Q3 2017, there were 17 actions ongoing or under consideration in 7 states related to incentives for advanced grid technologies.
- Of these, 13 proposals were for energy storage incentives, while 4 were for microgrid incentives.
- While most state legislative sessions have ended, resulting in decreased action on incentives, a bill creating an investment tax credit for energy storage was introduced at the federal level.

In Q3 2017, there were 17 actions ongoing or under consideration in 7 states related to incentives for grid modernization. These actions include tax credits, property and sales tax exemptions, grant programs, rebate programs, loan programs, and property assessed clean energy (PACE) financing programs.

Figure 12. Action on Financial Incentives (Q3 2017)



Action on financial incentives decreased during Q3 2017, as incentives are often created through legislation and most state legislatures were out of session this quarter. However, multiple bills related to incentives that were not enacted during this year's legislative sessions will carry over to next year.

California and Nevada both passed legislation creating new incentives or extending existing incentives for energy storage during 2017. Nevada is beginning the process of developing the new utility-administered incentive program, while regulators in California are amending the existing Self-Generation Incentive Program to address issues that arose in earlier phases.

Box 4. Tax Incentives, Grants, Rebates, and Financing Programs

The term **tax incentives** covers a broad spectrum of incentives, including income **tax credits** and **deductions**; **property tax exemptions**, exclusions, abatements, and credits; and **sales tax exemptions** and refunds. **Performance-based incentives** are based on the energy production of a system. **Grant programs** are one-time monetary payments, typically awarded through a competitive process, while **rebate programs** provide cash incentives for equipment installations meeting program specifications. Finally, **loan programs** provide financing for the purchase of advanced grid technologies and **Property Assessed Clean Energy (PACE) financing** programs allow property owners to borrow money to pay for certain clean energy improvements and repay the amount via a special assessment on the property. Find incentives for renewable energy and energy efficiency with the Database of State Incentives for Renewables and Efficiency.

While the majority of state legislatures were not in session during Q3 2017, a federal bill – S.B. 1868 – introduced this quarter would create an investment tax credit for energy storage. While storage systems sometimes qualify for the existing energy investment tax credit when paired with solar projects, the proposed legislation would allow standalone storage systems to receive the 30% tax credit.

Figure 13. Action on Incentives by Incentive Type

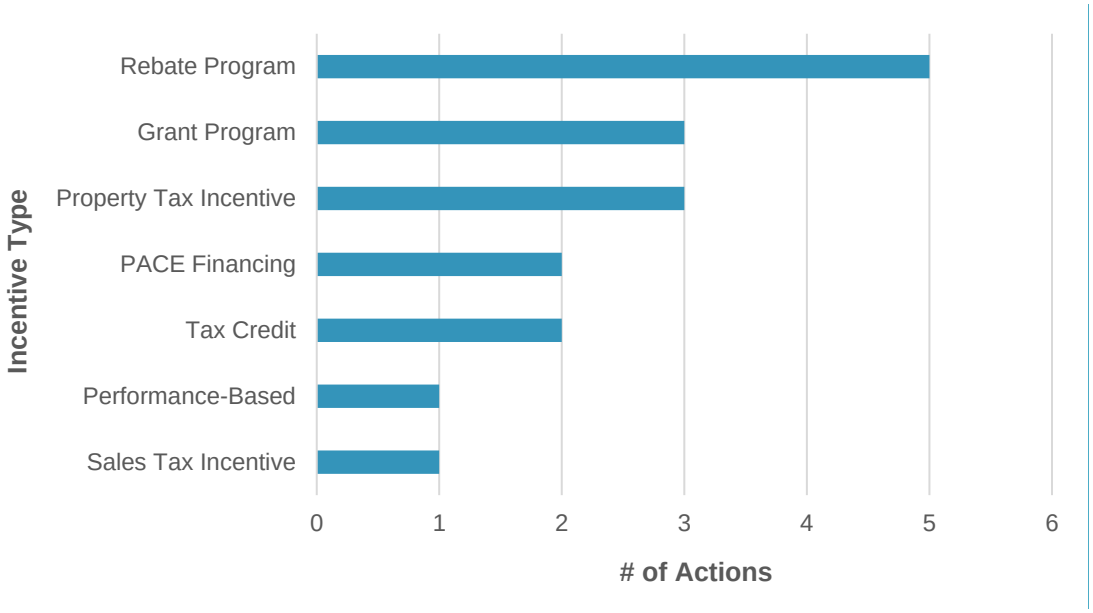


Table 6. Updates on Financial Incentives (Q3 2017)

State	Incentive Type	Description	Source
AZ	Rebate Program	In early September 2017, Arizona Public Service (APS) filed its application for approval of its 2018 demand-side management plan. As part of its plan, APS proposed a pilot incentive program for grid-connected water heating at residential homes. The incentive would equal about $200. APS has also proposed a pilot measure for free water heater timers to control the timing of electric water heating at residential homes and small businesses. Participants must be on a TOU or demand rate.	Docket No. E-01345A-17-0134
CA	Grant Program	The California Energy Commission issued a request for proposals for microgrid demonstration projects in August 2017. The total $44.7 million in funding will be divided between projects located at California military bases, ports, and Native American tribal lands ($22 million); disadvantaged communities ($11.7 million); and other locations ($11 million). The deadline to submit applications was October 31, 2017, and awards are expected to be announced in January 2018, with agreements starting in June 2018.	CEC Website
	Rebate Program	The Self-Generation Incentive Program (SGIP) provides rebates for energy storage systems. The California Public Utilities Commission, as required by 2016 legislation, approved a decision in April 2017 effectively doubling the budget for the program. The decision also sets aside 85% of the additional funding for energy storage, splitting it 90/10 between projects larger than 10 kW and residential projects equal to or less than 10 kW. Three parties filed a motion following the decision, expressing concern that storage projects coupled with solar would claim all the incentives and that no funding would be left for stand-alone storage projects. The Assigned Commissioner issued a ruling in June 2017, denying the parties' motion, but proposing additional requirements that would ensure storage projects would provide a grid benefit. The SGIP reopened at Step 1 for energy storage projects on May 1, 2017, and was fully subscribed after one week. Step 2 for energy storage applicants opened on June 5, 2017. An August 2017 proposed decision aims to protect low-income communities by creating an Equity Budget. The Equity Budget would reserve 25% of the energy storage incentive funds for low-income housing residents and take effect beginning with incentive Step 3.	Docket No. R-12-11-005 Proposed Decision
HI	Rebate Program	H.B. 1593 would create the Energy Savings Jump Start Program within the Hawaii Green Infrastructure	H.B. 1593 (P1)

		Authority. Among other things, the Energy Savings Jump Start Program would include a rebate program for residential, commercial, and utility-scale energy storage systems. The bill was passed by the House in March 2017. The House rejected amendments made by the Senate in April, and the bill was sent to conference committee. Bills may carry over from odd-numbered to even-numbered years.	
	Tax Credit	S.B. 665 would create a state tax credit for energy storage systems starting in 2018. The tax credit would be equal to 25% of costs, up to $5,000 for residential and $500,000 for commercial projects. The bill passed the Senate in March 2017. Bills may carry over from odd-numbered to even-numbered years.	S.B. 665 (P1)
MA	PACE Financing	H.B. 2687 allows microgrids as an eligible measure for commercial property assessed clean energy financing.	H.B. 2687 (I) S.B. 1825 (I)
	Performance-Based Incentive	As part of legislation enacted in April 2016, the Department of Energy Resources (DOER) was directed to develop a new solar incentive program to succeed the Solar Renewable Energy Credit II (SREC II) Program. DOER released its final program design at a stakeholder meeting on January 31, 2017. The new program takes the form of a performance-based incentive and includes an adder for solar + storage systems. The base adder is $0.045/kWh and will decrease by 4% with each block of installed solar capacity (amount of capacity per block will vary by utility territory.) This adder will vary based on the ratio of storage capacity to solar capacity, as well as the duration of the storage system. To be eligible, the nominal rated power capacity of the storage system must be at least 25% and the nominal useful energy capacity must be at least two hours, although the system will not receive credit for nominal useful energy capacity greater than six hours. The storage system must also have at least 65% roundtrip efficiency, must discharge at least 52 complete cycle equivalents per year, and the owner must be able to provide historical 15-minute interval performance data. In August 2017, DOER filed the final version of the regulation.	Development of the Next Solar Incentive 225 CMR 20.00
	Property Tax Incentive	H.B. 2600 would allow municipalities to exempt energy storage systems from property taxation.	H.B. 2600 (I)
	Rebate Program	H.B. 2600 directs the Department of Energy Resources to establish a rebate for Massachusetts-based companies installing and manufacturing energy storage systems.	H.B. 2600 (I)

	Sales Tax Incentive	H.B. 2600 would adopt a sales tax exemption for energy storage systems through 12/31/2025.	H.B. 2600 (I)
NV	Rebate Program	S.B. 145, as amended, creates a new incentive for energy storage systems, which is to be administered by NV Energy. The rules for the program, including the incentive structure, will be determined by the Public Utilities Commission of Nevada (PUCN). The bill was signed by the Governor in May 2017. The PUCN opened a docket in August 2017 to implement S.B. 145, and accepted initial comments.	S.B. 145 (E) Docket No. 17-08021
NY	Grant Program	S.B. 4490 requires the New York State Energy Research and Development Authority to create a grant program to provide incentives up to $150,000 per applicant to promote microgrids in the state.	S.B. 4490 (I)
	Grant Program	The "New York Microgrid Act" would establish a microgrid grant program within the New York State Energy Research and Development Authority (NYSERDA) to provide funding for microgrid projects that reduce utility rates and demand, and encourage the use of renewable energy resources.	A.B. 8212 (I)
	Property Tax Incentive	S.B. 6762 would expand the state's property tax exemption for renewable energy systems to include micro-hydro, fuel cells, combined heat and power, and electric energy storage equipment and systems.	S.B. 6762 (P1)
	Tax Credit	A.B. 6235 would create a state tax credit for residential energy storage systems equal to 25% of costs, up to $7,000.	A.B. 6235 (I)
SC	PACE Financing	S.B. 261 would establish a commercial PACE financing program in the state. Battery and thermal storage systems would be eligible under this program. South Carolina ended its session in May, and the bill remains in the House Committee on Labor, Commerce, and Industry. Bills may carry over from odd-numbered years to even-numbered years.	S.B. 261 (P1)
	Property Tax Incentive	S.B. 44 would adopt an 80% property tax exemption for distributed energy resources, including energy storage systems. South Carolina ended its session in May, and the bill remains in the House Committee on Ways and Means. Bills may carry over from odd-numbered years to even-numbered years.	S.B. 44 (P1) H.B. 3079 (I)

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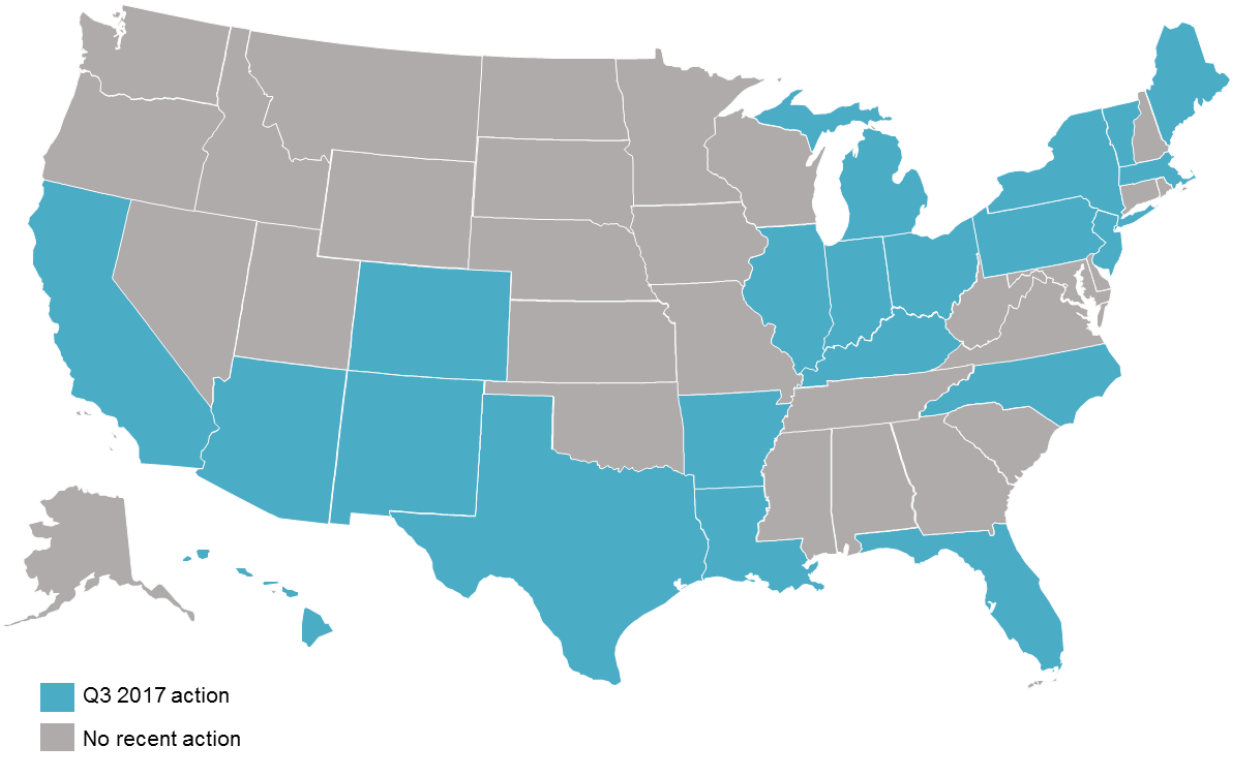
DEPLOYMENT OF ADVANCED GRID TECHNOLOGIES

Key Takeaways:

- In Q3 2017, there were 38 pending or decided proposals from state legislators or utilities across 21 states to deploy advanced grid technologies, such as advanced metering infrastructure (AMI), smart grid components, microgrids, and energy storage.
- Proposals to deploy advanced metering infrastructure (AMI) were the most common type of request, with 17 proceedings across 13 states related to AMI.
- Settlement agreements related to AMI deployment plans were reached in Arkansas, Colorado, Indiana, and Louisiana.

Grid modernization deployment plans are typically filed by electric utilities as standalone requests, as part of general rate cases, or as a component of dedicated grid modernization plans. Although utilities had deployed AMI to at least 50% of U.S. households by the end of 2015, with over 30 utilities having fully deployed AMI, AMI (or smart meter) deployment remains the most common type of grid modernization activity.[3]

Figure 14. Action on Advanced Grid Technology Deployment (Q3 2017)



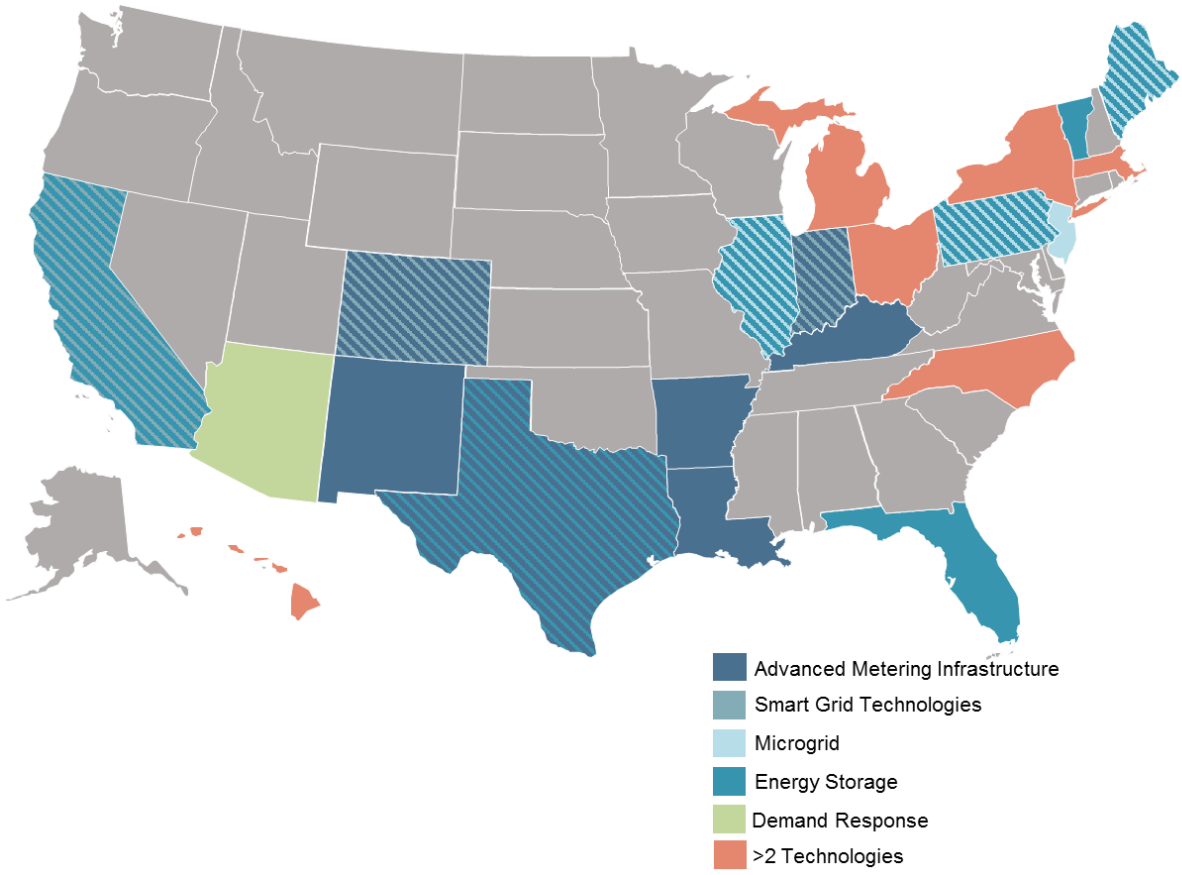
Advanced Metering Infrastructure

In Q2 2017, a total of 12 states had open proceedings related to AMI deployment, with three states opening new proceedings. Entergy Texas filed an application to replace all existing

electric and gas meters with AMI meters, while filings by Duke Energy in both its North Carolina (Carolinas) and Kentucky service territories request permission for cost recovery for AMI installation.

Proceedings continued in other states during Q3 2017 with notable progress. In Arkansas, parties reached a settlement on AMI deployment and cost recovery provisions. A similar settlement was reached in Public Service Company of Colorado's proposal to deploy AMI and smart grid technologies. Commissions in Indiana and Louisiana approved settlement agreements among parties on AMI deployment provisions.

Figure 15. Proposed Deployments by Technology Type (Q3 2017)



Smart Grid / Distribution System Modernization

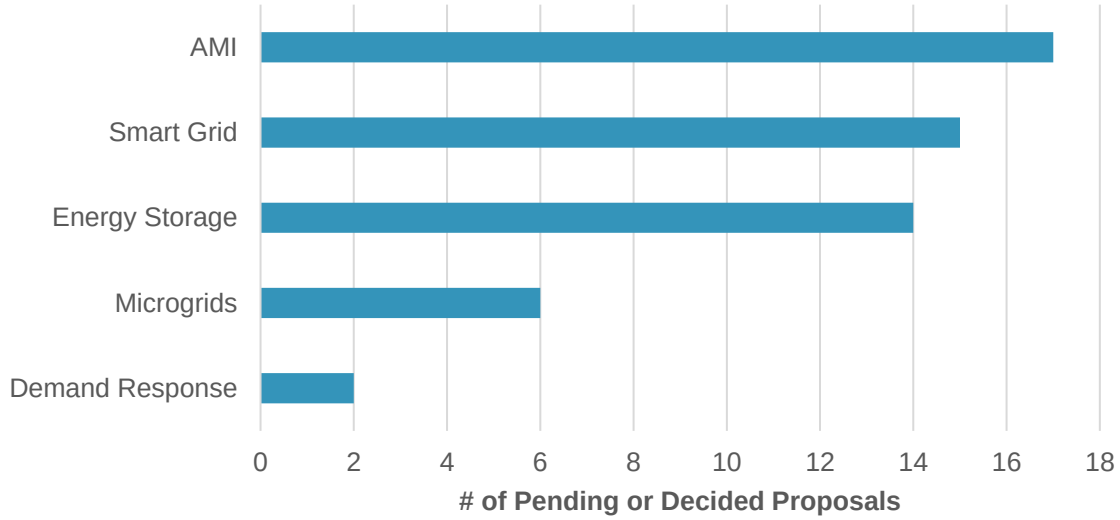
In Q3 2017, nine states had active proceedings regarding the deployment of technologies aimed at modernizing the distribution system. No new dockets related to smart grid deployment were initiated during Q3 2017.

Cost has been a major point of contention in grid modernization investment proposals. Notably, the Hawaii Public Utilities Commission rejected the utilities' initial grid modernization proposal in 2016, citing that the plan may not be cost-effective. The utilities subsequently filed a new

version of the grid modernization strategy, bringing the cost down from $340 million to $205 million.

Similarly, in Ohio, the Ohio Consumers Council (OCC) opposed Ohio Power Company's requested cost allocation for its gridSMART project, suggesting that residential customers be responsible for a smaller portion of project costs. The Commission sided with the OCC on the issue. Another Ohio utility, First Energy, is facing scrutiny regarding use of funds collected through the Distribution Modernization Rider.

Figure 16. Proposed Deployments by Technology Type (Q3 2017)



Energy Storage

In Q3 2017, 11 states had active proceedings or legislation related to energy storage deployment, with five new requests filed during the quarter. Duke Energy Florida proposed the deployment of 50 MW of battery storage in Q3 2017 as part of a settlement agreement related to the Levy Nuclear Plant, and Commonwealth Edison in Illinois filed for approval to deploy a microgrid including a 500 kW battery storage system. Green Mountain Power in Vermont also filed an advance notice of intent to deploy a battery storage project, and Consumers Energy in Michigan proposed battery storage pilots to examine non-wires alternatives as part of its draft distribution investment and maintenance plan.

Microgrids

Five states had active proceedings related to microgrid deployment in Q3 2017. Microgrid development has been primarily motivated by a desire to increase the resilience of the electric grid or service remote locations. In Q3 2017, microgrid deployment saw a setback in Maine, where parties determined that the project proposed by Emera Maine was not legally permissible. Electric utilities in Maine are prohibited from owning any generation assets.

Table 7. Updates on Advanced Grid Technology Deployment (Q3 2017)

State	Utility	Technology	Description	Source
AR	Entergy Arkansas	AMI	In September 2016, Entergy Arkansas submitted a proposal to replace existing meters with advanced meters. Entergy expects the deployment to provide a nominal net benefit of $431 million to customers. If approved, Entergy would begin deployment of the communications network in 2018 and meters in 2019. Entergy proposed recovering the AMI deployment costs through its Formula Rate Plan Rider. A settlement agreement (between Entergy, the Commission staff, and the Consumer Utilities Rate Advocacy Division of the Attorney General's Office) was filed in early August 2017, and a hearing regarding the settlement was held later in the month. The settlement approves the AMI deployment and cost recovery through the Formula Rate Plan Rider. The agreement also includes the development of a customer education plan and a residential TOU rate program. An AMI opt-out option will be provided to customers, and the settling parties will determine the opt-out charge.	Docket No. 16-060-U Settlement Agreement
AZ	Arizona Public Service	Reverse Demand Response	In early September 2017, Arizona Public Service (APS) filed its application for approval of its 2018 demand-side management plan. As part of its plan, APS proposed a new "reverse demand response" pilot program for non-residential customers with demand of at least 30 kW. This program would identify opportunities to dispatch loads in response to negative pricing events. Participation is limited to non-essential loads, which would receive no-cost energy during specified time periods. The proposed program would be limited to $200,000, and APS would deploy necessary sub-metering and communications infrastructure.	Docket No. E-01345A-17-0134
CA	Los Angeles Department of Water & Power (LADWP)	Energy Storage	S.B. 801, as amended, requires the Los Angeles Department of Water & Power (LADWP) to make public any electrical grid data that would be helpful in enabling distributed energy resource providers to target solutions that support reliability in areas impacted by the gas leak at the Aliso Canyon natural gas storage facility. The bill also requires LADWP to maximize	S.B. 801 (E)

			the use of demand response, renewable energy, and energy efficiency in the area impacted by the gas leak. Lastly, it also requires LADWP to determine the cost-effectiveness of deploying a minimum of 100 MW of energy storage, and to consider deploying those cost-effective solutions after June 1, 2018. The bill was signed into law in October 2017.	
	Southern California Edison	Smart Grid	In its latest rate case, Southern California Edison proposed an investment of $2.1 billion in capital expenditures from 2016 - 2020 for its Grid Modernization plan, which includes structural upgrades, automation for real-time monitoring and control, new telecommunications capabilities, and new software for system management. The case is ongoing.	Docket No. A-16-09-001 Southern California Edison Proposal
CO	Public Service Co. of Colorado d/b/a Xcel Energy	AMI, Smart Grid	In August 2016, Xcel Energy submitted an Advanced Grid Intelligence and Security proposal. This plan includes AMI deployment, as well as a Volt-VAR optimization program and components of an advanced communications network. An unopposed settlement agreement was filed in May 2017, and a hearing was also held in May. The settlement agreement was approved in July 2017.	Docket No. 16A-0588E
FL	Duke Energy Florida	Energy Storage	A proposed August 2017 settlement agreement primarily related to Duke Energy Florida's Levy Nuclear Plant also proposes the deployment of a 50 MW battery storage pilot program. Duke Energy Florida will determine the projects and locations offering the greatest benefits, and the cost of the projects is not to exceed $2,300 per kW. The settlement does not preclude parties from challenging the reasonableness of the costs incurred for the program. A hearing was held in late October 2017.	Docket No. 20170183 Settlement
HI	Hawaiian Electric Company (HECO), Hawaii Electric Light Company (HELCO), Maui Electric Company (MECO)	AMI, Smart Grid	In March 2016, Hawaii's IOUs submitted a proposal for a $340 million Smart Grid Foundation Project. In January 2017, the Public Utilities Commission (PUC) denied the utilities' request, noting that the project may not be cost-effective, it fails to address how customer-sited assets will be integrated, and it does not address the risk of obsolescence due to technological advancement. The Commission also	Docket No. 2016-0087 Grid Modernization Strategy

		directed each of the utilities to submit a comprehensive Grid Modernization Strategy by June 30, 2017, which will be vetted through a stakeholder process. The utilities filed their draft Grid Modernization Strategy on June 30, 2017 and their final Grid Modernization Strategy in August 2017. The PUC opened a new docket (No. 2017-0226) in August to serve as a repository for the final grid modernization strategy. The final version of the strategy includes the same dollar figure as the draft ($205 million), down from the initial $340 million plan the PUC rejected. Various parties filed comments on the strategy during Q3 2017.	
Maui Electric Company (MECO)	Demand Response	In September 2016, Maui Electric Company (MECO) filed an application for an expansion of its Fast Demand Response program from its current 0.2 MW total load to 5 MW. In March 2017, the Consumer Advocate recommended approving an expansion of just 1 MW for 2017. MECO replied in March, asserting that the load total of 5 MW is necessary to meet an anticipated reserve capacity shortfall. In a July 2017 order, the Commission ruled in favor of MECO, allowing it to expand its Fast Demand Response program to 5 MW.	Docket No. 2016-0232 Final Order
Hawaiian Electric Company (HECO), Hawaii Electric Light Company (HELCO), Maui Electric Company (MECO)	Energy Storage	Hawaiian Electric filed its updated Power Supply Improvement Plan (PSIP) with the Public Utilities Commission (PUC) in April 2016, covering years 2017-2022. After multiple rounds of comments and technical conferences, the PUC approved the updated PSIP in July 2017. The PSIP includes a plan to deploy a total of 220 MW of energy storage. While the PUC approved the PSIP, the order clarifies that the utilities will still need approval to implement the individual pieces of the plan. Additionally, the utilities will need to file a report that details its planning approach and schedule for the next round of integrated planning by March 1, 2018.	Docket No. 2014-0183
N/A	Microgrid	H.B. 848 would require the University of Hawaii to develop a plan for a microgrid project on its campus and to submit the plan to the legislature prior to convening the regular session of 2019. The bill passed the House in March 2017. The	H.B. 848 (P1)

			Senate made amendments to the bill, passed it, and sent it back to the House in April 2017. The House rejected the Senate amendments, and the bill was sent to conference committee later in April. Bills may carry over from odd-numbered years to even-numbered years.	
IL	Commonwealth Edison	Energy Storage, Microgrid	In July 2017, Commonwealth Edison filed a petition for approval of a distribution microgrid pilot project, including 500 kW in battery storage capacity in the first phase. An evidentiary hearing is scheduled for November 30th.	Docket No. 17-0331
IN	Southern Indiana Gas & Electric d/b/a Vectren	AMI, Smart Grid	In February 2017, Southern Indiana Gas & Electric filed a $500 million, seven-year transmission and distribution modernization plan. The plan includes deployment of AMI. An evidentiary hearing was held in June 2017, and in early July, the utility submitted a proposed order with the agreement of the Indiana Office of the Utility Consumer Counselor, which would approve the plan. The Commission approved the settlement agreement in September 2017.	Docket No. 44910 Final Order
KY	Duke Energy Kentucky	AMI	In September 2017, Duke Energy Kentucky filed for a general rate increase. The rate increase includes cost recovery for AMI installation. Intervenor testimony is due by December 29th.	Docket No. 2017-00321
LA	Entergy Louisiana	AMI	In November 2016, Entergy Louisiana submitted a proposal to deploy an advanced metering system, including advanced electric and gas meters and a communications network supporting two-way data communications. Entergy's plan would deploy AMI in phases, resulting in full implementation by 2022. Communications network deployment would begin in 2018, with meter deployment beginning in 2019. Entergy estimates the nominal net benefit to customers to be $607 million ($190 million NPV). Entergy is also proposing an Advanced Metering System (AMS) Customer Charge be implemented to recover costs beginning in April 2019. The per-customer AMS charge is estimated to be $2.22 in Year 1, $2.74 in Year 2, $3.08 in Year 3, and $2.88 as the final charge. An uncontested stipulated settlement was	Docket No. U-34320 Final Order

			filed at the end of June 2017, which the Commission approved in late July 2017. The settlement approves the proposed AMI deployment and the AMS Customer Charge. The settlement also calls for Entergy to study the implementation of demand response programs and potential incentives for its customers. A report is due within 12 months of completion of AMI deployment.	
	Entergy New Orleans	AMI	In October 2016, Entergy New Orleans filed a proposal to deploy AMI throughout its service territory, as well as an advanced communications network, a distribution management system, meter data management system, outage management system, and supporting infrastructure. A status conference was held in August 2017.	City Council Docket No. UD-16-04
MA	Eversource	AMI, Energy Storage, Smart Grid	In accordance with the Department of Public Utilities' June 2014 order on grid modernization plans, Eversource filed its grid modernization plan in August 2015. Eversource has proposed investments in advanced sensing technology, next generation remote faulted circuit indication, a distribution management system, network load flow, predictive outage detection, automated feeder reconfiguration, voltage optimization, integrated planning tracking for DERs, energy storage, adaptive protection/two-way power flow, resiliency improvements, opt-in time-varying rates and related infrastructure, cybersecurity, communications, and a customer education and outreach plan. Evidentiary hearings were held in May 2017, and intervenor briefs were due in mid-July. Eversource submitted its brief in late July, and reply briefs were filed by Eversource and intervenors in August.	Docket No. 15-122
	Eversource	Energy Storage, Smart Grid	As part of its general rate case filed in January 2017, Eversource has proposed a Grid Modernization Base Commitment, which includes several investments to modernize the grid. These investments include creation of a distribution system network operator ($44 million), distribution system automation ($84 million), foundational technology for demand-side management ($111 million), energy	Docket No. 17-05

		storage research and demonstration projects ($100 million), customer tools for DER integration ($15 million), and electric vehicle infrastructure and vehicle conversions ($45 million). Three public hearings were held in July.	
Fitchburg Gas and Electric Light Company d/b/a Unitil	Smart Grid	In accordance with the Department of Public Utilities' June 2014 order on grid modernization plans, Unitil filed its grid modernization plan in August 2015. Unitil's proposed plan includes five programs: (1) DER enablement, (2) grid reliability, (3) distribution automation, (4) customer empowerment, and (5) workforce and asset management encompassing 16 capital investment projects. Evidentiary hearings were held in May 2017, and intervenor briefs were due in mid-July. Unitil submitted its brief in late July, and reply briefs were filed by Unitil and intervenors in August.	Docket No. 15-121
Massachusetts Electric Company and Nantucket Electric Company d/b/a National Grid	AMI, Smart Grid	In accordance with the Department of Public Utilities' June 2014 order on grid modernization plans, National Grid filed its grid modernization plan in August 2015. National Grid proposed four different scenarios (Balanced Plan Scenario, AMI-Focused Scenario, Grid-Focused Scenario, and Opt-In Scenario) which provide a different portfolio of investments. The plans include investments in the following: AMI, customer load management devices, voltage optimization and conservation voltage reduction technologies, advanced distribution automation, feeder monitors, an advanced communications network, an advanced distribution management system and distribution supervisory control and data acquisition system, information and operational technologies, cybersecurity infrastructure and protocol development, training and asset management, and marketing outreach and education surrounding these technologies and new proposed offerings. Evidentiary hearings were held in May 2017, and intervenor briefs were due in mid-July. National Grid submitted its brief in late July, and reply briefs were filed by National Grid and intervenors in August.	Docket No. 15-120

ME	Emera Maine	Energy Storage, Microgrid	In February 2017, Emera Maine filed a petition for approval of a microgrid project at its Hampden Operations Center. The project is intended to provide electric supply, storm back-up, and reduction of energy operating cost at the Center. The proposed microgrid would consist of a 600 kW solar PV system, a 500 kW/950 kWh Tesla Powerpack battery, an existing diesel generator, and an electric vehicle charger. At issue is whether Emera is legally permitted to own the microgrid generation. Under Maine's Electric Utility Restructuring Act, investor-owned transmission and distribution (T&D) utilities were prohibited from owning generation. However, the Public Utilities Commission (PUC) may approve an exception if the ownership interest is necessary for the utility to perform its obligations as a T&D utility. In June 2017, the PUC issued an order, finding that it cannot conclude whether Emera's ownership of the project is permitted or not, and directed the Hearing Examiner to establish a litigation schedule to more fully develop the record. Settlement conferences were held in July and August 2017. At the August settlement conference, the Commission Staff and intervenors determined that the project is not legally permissible. Subsequently, Emera Maine withdrew its petition.	Docket No. 2017-00027
MI	Consumers Energy	Demand Response, Energy Storage, Smart Grid	As part of the Public Service Commission's February 2017 order in Consumers Energy's general rate case, the Commission directed Consumers Energy Company to submit a draft five-year (2018-2022) distribution investment and maintenance plan by August 1, 2017. The draft plan, submitted August 1st, includes an investment in new demand response programs (with the amount to be determined in the final plan) and two battery storage projects as part of a non-wires alternative pilot. The plan also includes investment in an advanced communications network, substation and line automation, a unified system control center, an advanced distribution management system, a communications device management system, and a data management system. In October 2017, the Commission issued an order	Docket No. 17990 Draft Plan

			establishing a January 31, 2018 deadline for the final plan to be submitted. The October order asks the utility to focus on reliability and safety of existing infrastructure, as the draft plan indicated that addressing existing grid problems is more important than any deploying new technology.	
	DTE Electric	AMI, Smart Grid	As part of the Public Service Commission's January 2017 order in DTE Electric's general rate case, the Commission directed DTE to submit a draft five-year (2018-2022) distribution investment and maintenance plan by July 1, 2017. A final plan is due by December 31, 2017. DTE's draft plan includes an advanced distribution management system, non-wire alternatives demonstration projects, AMI system upgrades, and substation and distribution automation. Costs and projected benefits will be included in the final plan.	Docket No. 18014 Draft Distribution Investment Plan
NC	Duke Energy Carolinas	AMI, Smart Grid	In Duke Energy Carolinas' latest general rate case, filed in August 2017, the utility requested cost recovery for certain grid investments as part of its 10-year, $13 billion Power/Forward Carolinas plan. These investments include AMI, a distribution management system, automated switches, and communications network upgrades. Across Duke Energy Carolinas and Duke Energy Progress, these four investment categories are expected to total approximately $2.4 billion. Duke Energy Progress has not yet filed for cost recovery for its portion of the Power/Forward plan.	Docket No. E-7 Sub 1146 Power/Forward Carolinas
	Dominion NC Power, Duke Energy Carolinas, Duke Energy Progress	AMI, Microgrid, Smart Grid	As part of the 2016 Biennial IRP and REPS Compliance proceeding, the IOUs were required to submit their 5-year Smart Grid Technology Plans. The plans vary and include a wide mix of smart grid technologies, including AMI deployment and, in Dominion's case, a microgrid project. The Utilities Commission approved the utilities' plans in March 2017, but also requested that the utilities, the Public Staff, and all interested parties continue discussing potential rule changes for customer data access. Duke Energy submitted its 2017 Smart Grid Technology Plan in October 2017.	Docket No. E-100 Sub 147

NJ	N/A	Microgrid	S.B. 881 and A.B. 2756 would require the Board of Public Utilities to establish a microgrid pilot project for municipalities to equip critical facilities.	S.B. 881 (I) A.B. 2756 (I)
NM	Public Service Company of New Mexico (PNM)	AMI	In February 2016, Public Service Company of New Mexico (PNM) submitted a proposal to deploy advanced metering infrastructure throughout its service territory. The cost of the project would be $87.2 million, and PNM expects installation to be completed by June 2019. PNM estimates the net benefit of the project to customers to be $20.9 million over 20 years (net present value). PNM also proposes an opt-out option with a surcharge. Hearings were held in February and March 2017. It was determined that PNM's selected vendor to install the proposed AMI does not have the appropriate license to do so. Therefore, PNM will issue a new RFP and update its cost-benefit analysis based upon its new selected quote. A hearing was held in late October 2017.	Docket No. 15-00312-UT
NY	New York State Electric & Gas, Rochester Gas & Electric	AMI	In December 2016, New York State Electric & Gas and Rochester Gas & Electric filed a petition seeking authorization for full deployment of AMI and to establish surcharge for recovery of the costs. In March 2017, the Public Service Commission (PSC) held a procedural conference where procedural issues were discussed, including party status, litigation schedule, and other topics. In October 2017, the PSC granted the staff request for postponement until December 29th to reach consensus on litigation and settlement schedules.	Docket No. 17-E-0058
	Orange and Rockland Utilities	AMI	In February 2017, Orange and Rockland Utilities filed a petition for full deployment of AMI, an AMI rate pilot program, and implementation of Non-Wires Alternative (NWA) projects and cost recovery of these programs. The Public Service Commission previously authorized the first phase of the AMI rollout program; this is the second phase of the program completing full deployment of AMI in the utility's service area.	Docket No. 17-M-0178
	National Grid	Energy Storage	In April 2017, Li Energy Storage System LLC, a joint venture between National Grid	Docket No. 17-M-0422

			and Next Era, filed an application to install 5 MW/40MWh of storage on Long Island.	
	National Grid	Smart Grid	National Grid, as part of its general rate case proceeding, filed its testimony on Electric Infrastructure and Operational Panel Exhibits. The filings describe the utility's capital investment plan, including the status of transmission and distribution system investments, as well as research, development, and demonstration programs.	Matter/Case no. 17-00889/ 17-G-0239
OH	Duke Energy Ohio	Energy Storage	Duke Energy Ohio filed its Electric Security Plan in June 2017. Part of its plan includes a proposal for a 10 MW pilot distribution battery storage system to be located in its southwest Ohio service territory. An evidentiary hearing is scheduled for November 6th.	Docket No. 17-1263-EL-SSO
	Ohio Edison d/b/a First Energy	Smart Grid	In October 2016, the Public Utilities Commission of Ohio (PUCO) ordered First Energy to file a Distribution Modernization Rider (DMR), which would collect $600 million over three years to fund modernization of the distribution grid. First Energy filed its tariff in November 2016, and in December the Public Staff recommended its approval. The Ohio Consumers' Counsel (OCC) and the Ohio Manufacturers' Association Energy Group (OMAEG) then filed a joint motion to reject the DMR tariff. PUCO denied the consumer groups' motion and approved the DMR tariff in December 2016. The OCC filed an additional application for rehearing in January 2017, which PUCO denied in February 2017. PUCO issued its Eighth Entry for Rehearing in August 2017, which directs staff to work with a consultant to review how FirstEnergy uses the money collected under the DMR tariff. FirstEnergy filed an application for rehearing, arguing that the additional review is not necessary. In an October 2017 order, PUCO denied FirstEnergy's application for rehearing.	Docket No. 14-1297-EL-SSO
	Ohio Power Company d/b/a AEP	AMI, Smart Grid	In February 2017, the Public Utilities Commission of Ohio (PUCO) approved a stipulation for AEP to implement Phase 2 of its gridSMART Project. The gridSMART Project includes a deployment of smart meters to 894,000 additional customers, a	Docket No. 13-1939-EL-RDR

			transition to time-differentiated pricing, and other smart grid investments and studies. The Office of the Ohio Consumers' Council (OCC) initially opposed the settlement and issued an application for rehearing in March 2017. The OCC noted that it would back the settlement on the condition that residential customers pay just 45% of the gridSMART Phase 2 costs, instead of the 62.4% included in the settlement. PUCO addressed the issue, siding with the OCC, and the OCC withdrew its application for rehearing in April 2017.	
PA	N/A	Energy Storage, Microgrid	H.B. 1412 would establish a pilot program for microgrids and energy storage projects with the goal of facilitating the use of a diverse electric supply and enhancing electric distribution, resiliency, and operational flexibility.	H.B. 1412 (I)
TX	Entergy Texas	AMI	In July 2017, Entergy Texas filed an application for deployment of an advanced metering system, which would replace all existing meters for both electric and natural gas service with new two-way meters, enabling data communication between the utility and customers. A settlement agreement is being worked out; the case's procedural schedule is suspended as a result. As of mid-October 2017, the parties continue to work on the settlement agreement.	Docket No. 47416
	American Electric Power Texas North Company	Energy Storage	In September 2016, AEP Texas North Company filed a proposal to install two utility-scale lithium-ion batteries in its distribution system. In Texas' restructured electricity market, distribution utilities are normally not permitted to own energy storage systems used to sell electricity into the wholesale market. The utility in this case is seeking to classify the battery systems as distribution assets, rather than generation assets. In July 2017, the Commission staff submitted a brief recommending against approval of the proposal. However, in October 2017, an ALJ issued a proposed decision that would approve the project, although the ALJ stated that there are good reasons both for allowing and disallowing the project. The proposed decision will be	Docket No. 46368 Proposal for Decision

			considered by the Commission at an open meeting on December 6th.	
VT	Green Mountain Power	Energy Storage	In April 2017, Green Mountain Power (GMP) filed a request for a Certificate of Public Good for its proposed Panton Battery Storage Project. The project would be a 1 MW/4MWh Tesla Powerpack 2.0 battery system and located on the site of its existing 4.9 MW Solar Panton Project. GMP plans to stack values that the battery project can provide, with the primary values being peak shaving and regulation. GMP estimates the total net present value of the project to be $3.8 million. In August 2017, the Public Utilities Commission issued an order, finding that the petition lacks sufficient information. The Commission scheduled a technical hearing for December 4th to further develop the evidentiary record.	Docket No. 17-2813-PET
	Green Mountain Power	Energy Storage	In August 2017, Green Mountain Power provided advance notice to the Public Utilities Commission of its intent to file an application for approval of a solar plus battery storage project in Milton, Vermont. The planned solar array is be 4.99 MW, and the battery system is 2 MW. The battery system would provide demand reduction and islanding capabilities.	Docket No. 17-3867-AN

Legislative Status Key: I = Introduced, P1 = Passed One Chamber, P2 = Passed Both Chambers, E = Enacted, D = Dead. Bill statuses are up to date as of early May 2017.

Q4 2017 OUTLOOK

At the end of Q3 2017, there were over 130 active bills and regulatory proceedings. Twenty-six states allow bills to carry over from 2017 to 2018, many of which have pending bills related to grid modernization.[4] **Massachusetts**, **New Jersey**, and **New York** remain in session and have several pieces of proposed energy storage and grid modernization legislation pending.

Legislators in some states are beginning to pre-file bills for the 2018 legislative session, and more are expected to be filed throughout Q4 2017. In **Maine**, a bill calling for an energy storage study was filed, while a bill to study microgrids was filed in **New Hampshire**.

A draft of **Vermont**'s energy storage study was released in early Q4 2017, and the final study is set to be published by November 15th. The fundraising deadline for **North Carolina**'s energy storage study is in Q4 2017, which will determine whether the study will progress or not.

An important proposal related to energy storage deployment will be addressed in **Texas** in December 2017, where the ALJ's proposed decision approving the project will be addressed. In **Arkansas**, a settlement agreement approving Entergy's proposed AMI roll-out was pending at the end of Q3 2017.

In **Hawaii**, the utilities' final grid modernization strategies will be considered during Q4 2017, and in early Q4, the Commission adopted a new compensation program for solar-plus-storage customers. The **Massachusetts** Department of Public Utilities opened an inquiry into net metering eligibility for solar-plus-storage facilities in early October 2017.

In early Q4 2017, the **California** Public Utilities Commission approved a proposed decision creating and equity budget for its Self-Generation Incentive Program, while applications for the state's microgrid funding opportunity are due in Q4 2017. Work to design **Nevada**'s new energy storage incentive will continue in Q4 2017.

Broad grid modernization proceedings will continue in several states, including **Illinois**, **Maryland**, **Minnesota**, **Ohio**, **Rhode Island**, and **Vermont**, while **Oregon** is likely to initiate its investigation into grid modernization and utility business models in the coming months.

While not typically covered in this report, public power utilities are also taking action on grid modernization and energy storage. Jacksonville Electric Authority in **Florida** announced a new rebate program for residential energy storage systems in early Q4 2017, while Fayetteville Public Works Commission in **North Carolina** is accepting responses to an RFQ for a planned community solar plus battery storage project until mid-November.

ENDNOTES

[1] Energy Storage Association, *Facts and Figures*, 2017, http://energystorage.org/energy-storage/facts-figures

[2] Adam Cooper, *Electric Company Smart Meter Deployments: Foundation for a Smart Grid*, The Edison Foundation Institute for Electric Innovation, October 2016, http://www.edisonfoundation.net/iei/publications/Documents/Final%20Electric%20Company%20Smart%20Meter%20Deployments-%20Foundation%20for%20A%20Smart%20Energy%20Grid.pdf

[3] Adam Cooper, *Electric Company Smart Meter Deployments: Foundation for a Smart Grid*, The Edison Foundation Institute for Electric Innovation, October 2016, http://www.edisonfoundation.net/iei/publications/Documents/Final%20Electric%20Company%20Smart%20Meter%20Deployments-%20Foundation%20for%20A%20Smart%20Energy%20Grid.pdf

[4] Session Schedules, StateScape, 2017, http://www.statescape.com/resources/legislative/session-schedules.aspx.