Executive Summary

Microgrids are a technology strategy uniquely tailored to the challenges of the modern, digital grid. They offer solutions across multiple policy objectives, providing resilience to vulnerable communities during moments when the grid is disrupted, while also utilizing innovative technologies to integrate clean energy resources connected to the grid. In these ways, microgrids provide resilience, equity and decarbonization benefits to customers and society as a whole.

In the decade since Superstorm Sandy and the many weather events that have followed, microgrids have emerged as an effective resilience strategy and innovative clean energy platform. Thousands of microgrids have been deployed across the United States, with many more in the planning or construction phases (as noted by our research partner, Wood Mackenzie). The technologies are proven. Policy stands as the limiting factor to microgrid deployment in the United States. Across the country, states vary widely in the steps they have taken to update microgrid policy to match the state of technology and the pressing social priorities we face. Many states have taken no specific actions to address inherent policy barriers. Others are developing tariffs and deployment programs. Still others are piloting programs and projects to address resilience needs with innovative technologies.

This assessment evaluates states based on actions its authorities have taken to advance microgrid markets and policy. The assessment scores each state based on activity within five evaluation criteria, each representing an area for microgrid market and policy growth:

1. Deployment
2. Policy Activity
3. Resilience
4. Grid Services
5. Equity

Based on the results, this assessment places states into four tiers, each representing stages of microgrid policy and market development. Tier 1 states demonstrate higher overall deployment and more proactive policy. Tier 2 states feature emerging policy and markets, with certain limited programs or policies. Tier 3 states feature early markets with policies or programs in topics related to microgrids. Finally, Tier 4 states do not exhibit any notable activity focused on microgrids.

The purpose of this assessment is simple: to provide visibility and insight about policy opportunities exist. Microgrid policy can take many forms, some more effective – and disruptive – than others. Think Microgrid offer this framework and assessment in a spirit of collaboration to work with leaders from around the country to create opportunities for microgrids to align with policy goals.

Who Is Think Microgrid?

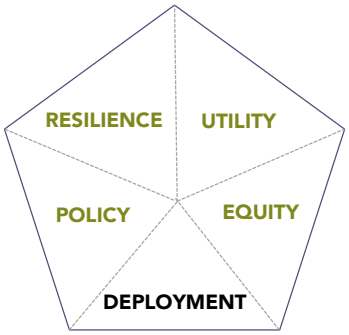
Think Microgrid is a coalition that serves as the unified voice for the microgrid industry, highlighting the role that microgrids can play at this unique moment in history. We collaborate with regulators and political leaders so that they understand how microgrid technologies work, what role they can play in achieving policy goals, and how regulatory reforms can proactively address barriers that exist today. Our coalition is dedicated to ensuring that communities are positioned to capture the resiliency, climate and equity benefits of microgrids.

Overview of Assessment Framework

In 2021, Think Microgrid published *Microgrids: An Immediate Climate Solution*, a vision paper intended to provide policymakers with an initial understanding of how microgrid technologies work, what role they can play in achieving policy goals and how regulatory reforms can proactively address barriers inherent in today's policy landscape. That vision paper – and this follow-on state assessment – are imbued with a spirit of collaboration. We know this information is incomplete, and we are eager to learn more from those with on-the-ground experience and expertise.

Think Microgrid has prepared this initial analytic framework and assessment of state microgrid activities to provide a foundation for state-specific conversations and to share information across jurisdictional boundaries. The five-part analysis framework outlined here provides the components for much-needed policy actions and innovations, centered on key questions along each of the framework:

1. *Deployment:* Is there a robust market consisting of all forms of microgrids, from simple single-customer applications to more complex community microgrids?
2. *Policy:* Are there proactive and comprehensive efforts to establish clear objectives, modernize rules and update regulatory frameworks?
3. *Resilience:* Is there a dedicated focus on practical opportunities to deploy microgrids that provide resiliency to customers, communities, and critical facilities?
4. *Grid Services:* Are there pathways to establish open markets, clear rules and other incentives so that investments from both utility ratepayers and private capital are properly supported and encouraged?
5. *Equity:* Are there mechanisms that advance social equity and environmental justice priorities?



Introduction

This is an assessment of key developments nationwide that characterize the current state of microgrid markets and the policy landscape for microgrid deployment. Beyond that, Think Microgrid prepared this overview to offer an evaluation framework that points to where new policies could be developed that will help support microgrid activity. In that regard, we hope this document may help provide a roadmap to action.

The dimensions of microgrid policy and development examined in this report offer opportunities for policymakers to support the policy innovation that is needed to realize the benefits of microgrids. As such, this assessment is not a comprehensive overview of any particular state policy or program, but rather a high-level review that will provoke further discussion and focus research efforts. The review for each state is based on several factors, including:

- The status of microgrid deployment
- The level of proactive policy development
- The prioritization of resilience
- Access to markets and programs to provide grid services
- The prioritization of energy equity and social justice

On the one hand, our assessment finds a great diversity of microgrid deployment and market structures across the United States. On the other hand, it paints a picture of a nascent market and policy landscape emerging quickly to address the pressing demands of our time. We offer this assessment as a way to help support these urgent and thoughtful discussions and collaborations.

Overview of Goals and Recent Developments

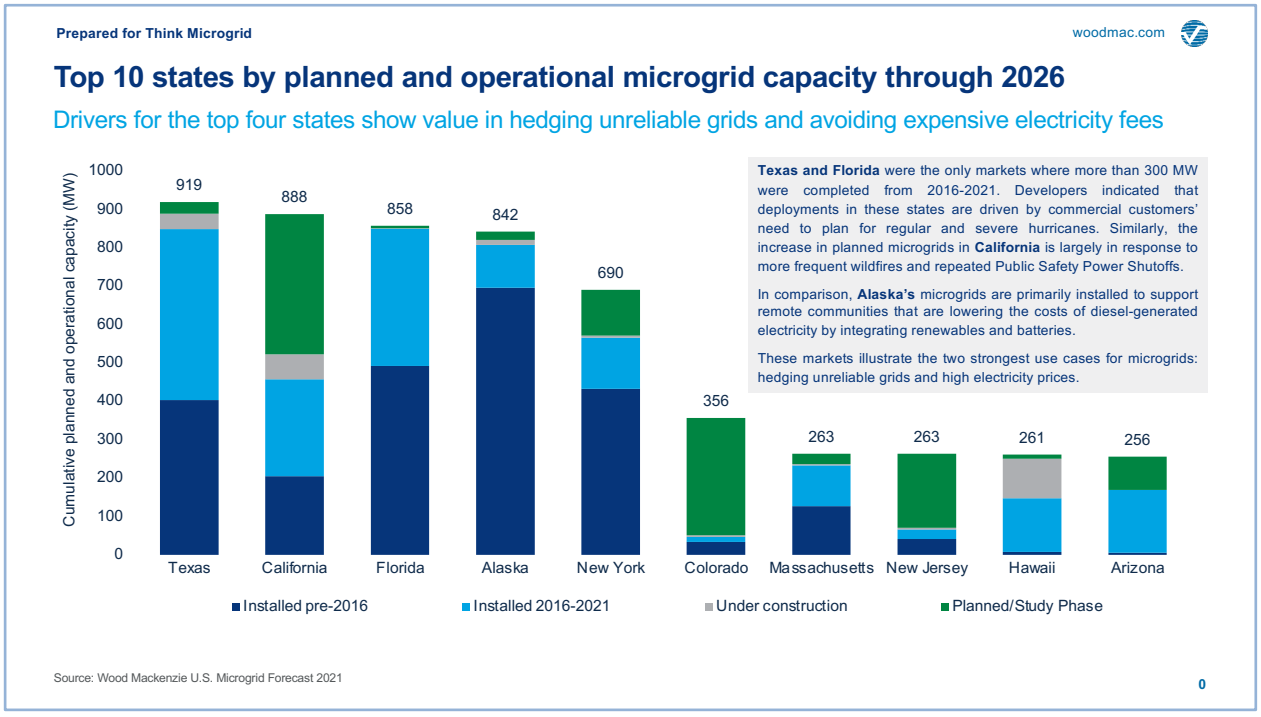
This overview highlights recent and ongoing activities before public utility commissions (PUCs) and state legislatures, as well as other policy initiatives led by state agencies and other organizations.

Microgrids provide a unique mix of direct customer and societal benefits, beginning with resiliency that is critically needed both locally and for the grid as a whole. The policy landscape for microgrid markets is far from monolithic, however. While some state utility commissions have focused their efforts on advancing tariffs and building regulatory frameworks, other states have focused on driving deployment through grant programs. Many states have taken few deliberate steps to promote microgrids, but they may have pilot programs underway. And, while market rules vary widely across the states, we see evidence of certain emerging trends within the policy community.

The resilience, equity, and decarbonization benefits of microgrids have emerged as key drivers. In the face of grid disruptions like extreme weather events (which are increasingly frequent and severe), microgrids provide energy security for vulnerable communities and critical facilities.. Across the microgrid market, these solutions are as aligned as ever: Wood Mackenzie reports that 80% of microgrids driven by reliability and resiliency goals currently incorporate advanced multi-DER

configurations like paired solar and energy storage, and that over half of today's microgrid projects are driven by resilience, reliability, and renewable integration goals. At the federal level, the Biden administration has emphasized microgrids as both a decarbonization and resilience solution. Congress, through the Infrastructure Investment and Jobs Act of 2021 (IIJA), established grants and tax credits for microgrid projects that demonstrate community resiliency, equity, and decarbonization benefits

Microgrids are poised for significant growth. In the ten states projected for the highest near-term microgrid deployment, 1,000 projects are under construction or plan to come online by 2026 (see figure below). Still, the fact remains that most states have only a small handful of microgrids, if any. This is going to change, which is why it is so important that regulators and policymakers begin to proactively consider how microgrids best fit within the unique policy environment of each state and jurisdiction.

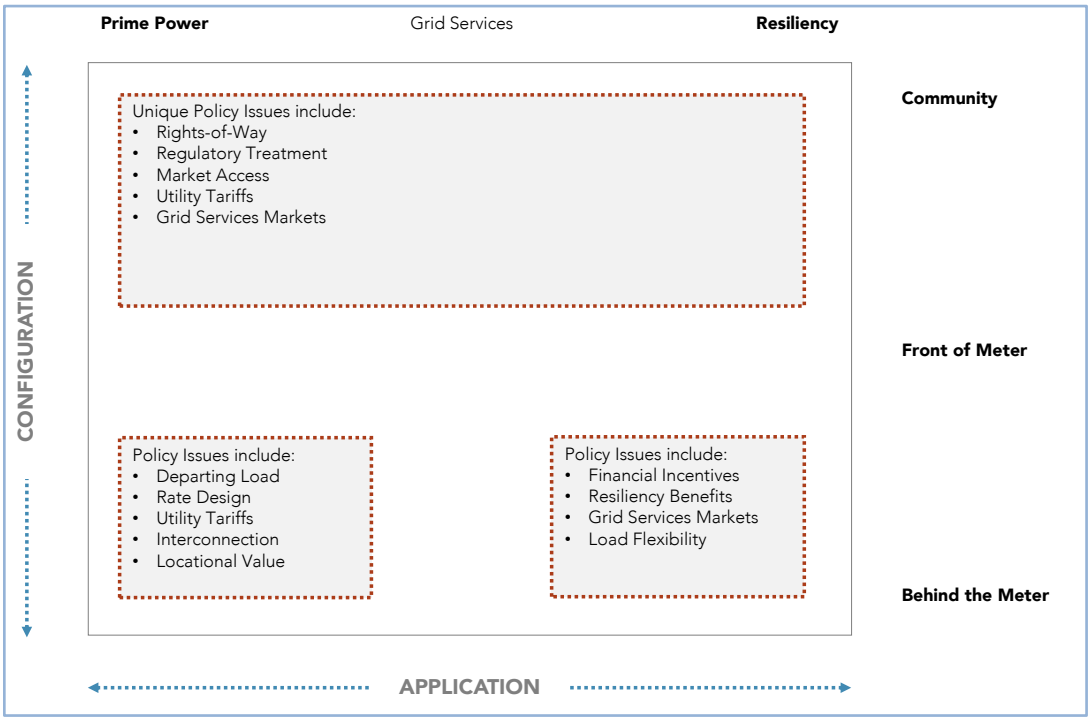


Policy Focus

Policy, not technology, is the critical factor in the deployment and scalability of microgrids. Supportive and well-considered state policies are the critical determinant for the overall outlook of the microgrid market in any given state and across the country as a whole. As our analysis highlights, in most states, microgrid policy remains nascent, even while deployment moves forward. Some states have more robust efforts underway to advance new policies, most of which have taken place in the past several years. As outlined in *Microgrids: An Immediate Climate Solution*, microgrid deployment depends on immediate attention to clarify and reform rules across a wide range of areas, including regulatory treatment of microgrids, rate design, tariff development, organized access to markets and

grid services, locational value, resilience value, right-of-way restrictions, and interconnection policy.

However, it is also critical to recognize that microgrids come in all shapes and sizes, with spanning applications that bring different benefits to customers, our energy system, and society at large (see figure below). While all of these issues exist on a continuum where there are not always clear and distinct boundaries, it is also valuable to recognize that certain policy issues are more relevant depending on the configuration of the microgrid and the applications it is designed to serve. Of particular relevance to utility regulators, different kinds of microgrids have very different implications concerning the use of ratepayer capital and how that is balanced against private capital that is eager to support microgrids.



While many policy issues are relevant for all microgrid deployment (e.g., interconnection), many others are unique to specific applications of microgrids. For example, behind-the-meter microgrids are not restricted by rights-of-way considerations, but community microgrids are. Microgrids funded with private capital and designed for resiliency have fewer implications for ratepayer capital. Multipurpose microgrids can provide grid services, if appropriate market access and tariffs are established.

Preliminary Assessments

This briefing document outlines a preliminary assessment scoring that incorporates key elements related to microgrid deployment, policy activities, resilience, and equity considerations. As noted earlier, these categorizations are no substitute for the detailed analysis of specific policies required to fully assess opportunities for microgrids. But they do show certain trends in the microgrid policy landscape and highlight opportunities to unlock untapped opportunities for microgrids.

Five primary criteria explain the characteristics of a robust policy environment for microgrid development. For each criterion, a high, medium or low score is assigned based on the guiding questions and defining characteristics highlighted in the table below. In our scoring methodology, the "Microgrid Deployment" and "Policy Activity" were given extra weight compared to the other criterion, reflecting Think Microgrid's analysis that deployment and policy activity are currently the primary drivers of microgrid markets.

It may be worth noting that this scoring methodology may be highly correlated, and in some cases self-reinforcing. For example, states with significant microgrid policy are more likely to also host resilience or equity policy action, and microgrid deployment may be driven by policy or utility programs. With that said, we believe that all five categories are relevant and intend to highlight more nuanced policy activity as states approach discussions tailored to specifically advancing resilience and equity goals.

Criteria	*Guiding Question and Scoring*
1. Microgrid Deployment	*How many and what kinds of microgrids are in operation?* 3: 30 or more microgrids 2: 6-20 microgrids 1: 5 or fewer microgrids
2. Policy Activity	*Are there recent or active proceedings addressing comprehensive microgrid policy? Is there legislation prioritizing microgrids, distributed energy, or other relevant technologies?* 3: Microgrid proceedings and/or legislation comprehensively addressing microgrid policies (including tariffs, deployment, multi-customer issues, etc.) 2: Isolated or single-topic policy proceedings or legislation 1: Limited to no activity
3. Resilience Activity	*Are microgrids prioritized as a resiliency solution? Has the state developed an inventory of microgrid opportunities?* 3: Feasibility study conducted, or funding opportunity identified 2: Prioritization established 1: Little to no activity
4. Grid Services	*Have utilities and other entities developed programs or tariffs that support third-party and public-private microgrid development? Are there pilot projects designed around the grid services of microgrids?* 3: Microgrid tariff or favorable programs active 2: Pilot programs or constrained activity 1: Little to no activity
5. Equity	*Are there specific mechanisms to ensure or prioritize equity and environmental justice with microgrids?* 3: Specific policies, directives, or programs established; funding opportunity identified 2: Prioritization established 1: Little to no activity

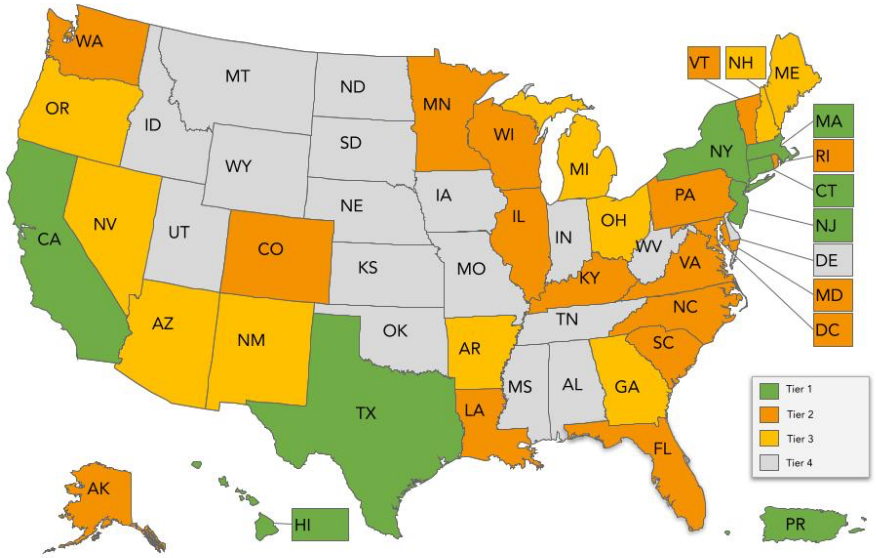
Findings

Scoring states according to the following five evaluation criteria, provided an initial categorization of states based on the maturity of their microgrid market and the development of thoughtful policy:

1. Microgrid deployment
2. Policy environment
3. Resilience
4. Grid Services
5. Equity

Three tiers of categorization highlight where activity is most robust and policy development most active. Tier 1 states demonstrate higher overall deployment, more proactive policy, more active utilities, and resilience and equity priorities playing a significant role in state planning. Tier 2 states are emerging policy markets with certain limited programs or policies, but little comprehensive activity. Tier 3 states are nascent markets with policies or programs that have the potential to lead to microgrid policy progress or development in microgrid-adjacent topics including distributed energy resources, energy storage, grid modernization, decarbonization, or resilience planning. Tier 4 states did not indicate significant signs of activity related to the evaluation criteria.

National Microgrid Action: Tier Map



It is also important to consider that progress in the various evaluation criteria may be best considered within the contexts of each state's unique characteristics. For example, it may be safe to expect that states with low populations and small energy markets may have lower overall microgrid deployment,

even when a small state may have strong policy directives. The table below sorts the results of the state assessment by market size.

National Microgrid Activity: By Market Size

State	State Size	Market Structure	Deployment	Policy Activity	Resilience	Grid Services	Equity	*Tariffs*	*Funding & Deployment*
CA	Large	Restructured	3	3	3	2	3	x	x
TX	Large	Restructured	3	2	2	3	1		
FL	Large	Integrated	3	2	1	3	1		
NY	Large	Restructured	3	2	3	3	2		x
PA	Large	Restructured	3	2	2	1	1		
OH	Large	Restructured	2	2	1	2	1		x
IL	Large	Restructured	2	2	2	3	2		
GA	Large	Integrated	3	1	1	2	1		
NC	Large	Integrated	3	2	2	2	1		
NJ	Large	Restructured	2	3	3	3	2		x
MI	Large	Restructured	2	2	2	1	1		
VA	Large	Integrated	3	2	2	2	1		x

State	State Size	Market Structure	Deployment	Policy Activity	Resilience	Grid Services	Equity	*Tariffs*	*Funding & Deployment*
MA	Medium	Restructured	3	2	3	2	2		x
SC	Medium	Integrated	3	2	2	2	1		
AZ	Medium	Integrated	2	2	1	2	1		
MD	Medium	Restructured	3	2	2	2	2		x
WI	Medium	Integrated	2	2	2	2	1		x
LA	Medium	Integrated	2	2	2	2	1		
KY	Medium	Integrated	2	2	3	1	1		
WA	Medium	Integrated	1	2	2	3	2		x
MN	Medium	Integrated	2	2	2	2	1		x
CT	Medium	Restructured	3	3	2	2	2		x
CO	Medium	Integrated	3	2	2	2	1		x
OR	Medium	Restructured	1	2	2	2	2		x
AR	Medium	Integrated	3	1	1	1	1		
NV	Medium	Integrated	1	2	1	1	2		
HI	Medium	Integrated	2	3	3	3	2	x	x

State	State Size	Market Structure	Deployment	Policy Activity	Resilience	Grid Services	Equity	*Tariffs*	*Funding & Deployment*
NM	Small	Integrated	1	2	2	2	1		
NH	Small	Restructured	1	2	1	2	1		
PR	Small	Integrated	2	3	3	3	2		x
DC	Small	Restructured	2	3	2	1	2	x	
ME	Small	Restructured	1	3	2	1	1		x
RI	Small	Restructured	1	2	3	2	2		
AK	Small	Integrated	2	2	2	1	2		x
VT	Small	Integrated	1	2	3	3	1		

The above tables reflect the results of Think Microgrid's assessment considering two key characteristics of state electricity markets, market size and utility structure. "Integrated" and "Restructured" represent the two primary state utility market structures: while vertically integrated states follow the traditional model in which utilities are regulated monopolies, restructured markets have introduced some amount of customer retail choice in electricity provider (state source: EPA). "Tariffs" and "Funding & Deployment" refer to two areas of microgrid policy development, further elaborated on in state profiles.

Moving Forward

This assessment is intended to serve as the foundation for deeper discovery and conversations about the current policy landscape for microgrids. Think Microgrid is committed to ensuring that the regulatory discussions surrounding microgrids are as informed as possible. In our view, better information leads to better policy. The stakeholders involved in these discussions – such as the membership of Think Microgrid – have a range of experience and perspectives about what will be the best policy prescriptions, but it is clear that microgrids have an important role to play going forward.

We offer this assessment in the spirit of collaboration and discussion. We hope that the information collected – and the analytic framework offered – provide a meaningful start to discussions about the specific conditions in various jurisdictions, models that can be replicated across the country, and how to develop deeper analysis that supports a rich and robust dialogue.

The following observations highlight certain trends we observed and may help start these discussions:

- Microgrid tariffs and deployment programs can facilitate market growth: Across Tier 1 and Tier 2 states, the development of policy tools including tariffs and deployment programs have coincided with microgrid market growth. Statewide microgrid tariffs, established or are in development) in California, Hawaii, and Washington D.C., begin to address the many complexities around valuing and integrating microgrids and lay the necessary groundwork for an independently functioning market. In several states, deployment programs have supported more nascent microgrid markets, often facilitating deployment of microgrids in communities or critical facilities.

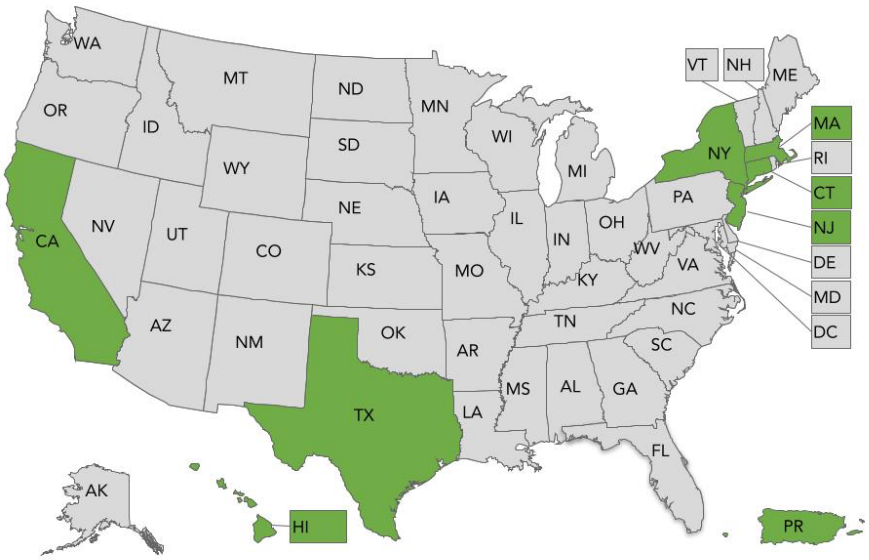
- The resilience and equity benefits of microgrids should be prioritized: In recent years, legislation, regulatory decisions, and state agency reports across the country have decisively connected microgrids and grid resilience. Especially in extreme weather-prone states such as Alaska, Hawaii, California, Puerto Rico, and others, these resilience benefits have been emphasized in official discourse and implemented in policy. In addition, state policy discussions have an opportunity to articulate the benefits of microgrids regarding equity and environmental justice priorities. We believe that planning around critical infrastructure and community microgrids can also prioritize vulnerable communities, whether that vulnerability is rooted in income, racial inequities, or extreme weather. Underinvestment in disadvantaged and vulnerable communities has led to disproportionate access to reliable and resilient infrastructure. Microgrid programs designed with equity as a priority can help provide communities with key resources to address these deeply rooted vulnerabilities, including technical support and grant funding.

- Deliberate policy can enhance and optimize ongoing microgrid development: For many critical applications, microgrids are thriving despite a lack of clear policy. However, developing coordinated support and clear objectives will help optimize how microgrids are deployed,

ensuring that they provide the highest value directly to customers but also confer benefits to the communities in which they operate. Microgrids offer inherent value that customers across the country are finding provide the most reliable and cost-effective solutions to their needs. But every state also faces unique grid reliability challenges that can be met with by coordinating how microgrids interact with market structures and grid operations.

This assessment offers place for interested stakeholders to begin dialogues about microgrids, and these conclusions present a foundation for growth and engagement. These findings are by no means rigid or all-encompassing. As microgrid markets grow– and the need for their decarbonization and resiliency benefits become increasingly urgent– so too will the policy and technical challenges that surround them.

Tier 1

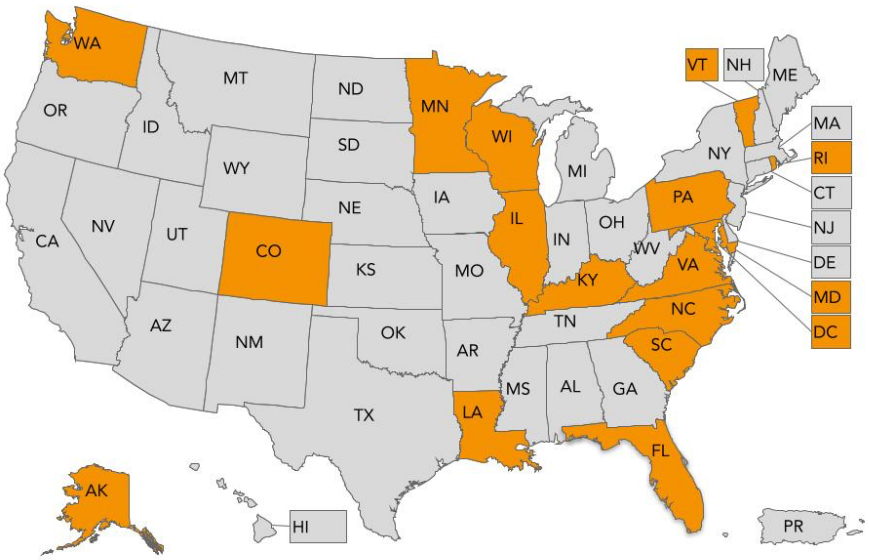


Tier 1 states and territories:

- California
- Hawaii
- New Jersey
- New York
- Puerto Rico
- Connecticut
- Massachusetts
- Texas

Overall, these states represent the jurisdictions that have taken policy action to advance microgrid markets. Hawaii, California, and Washington D.C. have developed commission-driven microgrid tariffs. New Jersey, New York, Connecticut and Massachusetts have established competitive microgrid grant programs. Puerto Rico requires microgrid deployment in utility resource planning. Texas and Florida have the largest deployment of commercial microgrids.

Tier 2

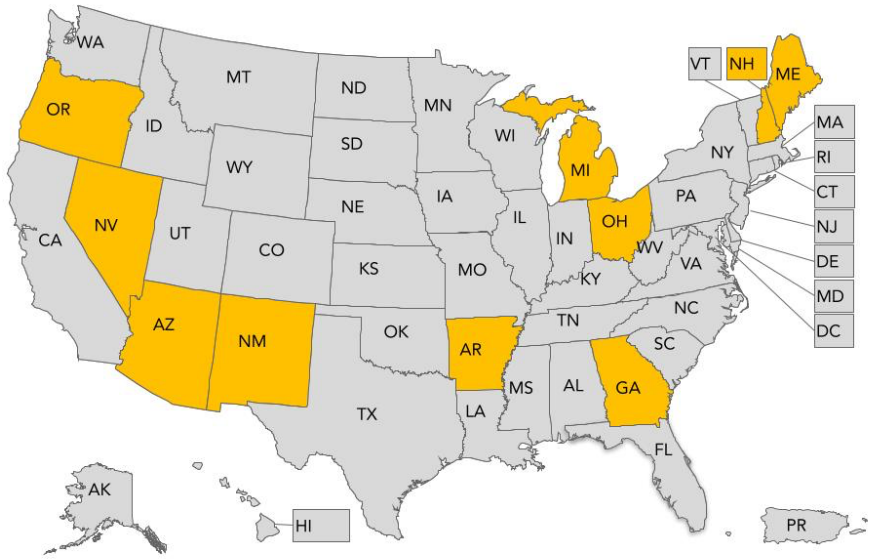


Tier 2 states and territories:

- Illinois
- Washington, D.C.
- Florida
- Colorado
- North Carolina
- Virginia
- South Carolina
- Maryland
- Pennsylvania
- Alaska
- Rhode Island
- Vermont
- Washington
- Louisiana
- Kentucky
- Wisconsin
- Minnesota

These states' characteristics include high deployment (FL, NC, VA, SC); microgrid grant programs (CO, WI, MN, MD); resilience policy (NC, LA); access to grid services (VT, WA); and microgrid feasibility studies (RI, KY).

Tier 3



Tier 3 states and territories:

- Maine
- Oregon
- Michigan
- Ohio
- Georgia
- Arizona
- New Mexico
- Arkansas
- New Hampshire
- Nevada

These states generally either have one standout microgrid or resilience policy among limited other activities (Maine) a patchwork of activity indirectly related to microgrid development (Michigan, Oregon, New Mexico), or high commercial microgrid deployment in the absence of other activity (Georgia, Arkansas).

STATE ASSESSMENT: TIER 1

California

Policy Activity: California's ongoing rulemaking on microgrids (Docket R-19-09-009) is developing microgrid tariffs and driving deployment. It was initiated in 2018 by California SB 1339, which directed the California Public Utility Commission (CPUC) and the California Independent System Operator (CAISO) to develop microgrid policies for the state. In January 2021, the CPUC issued an order finalizing a microgrid tariff and mandating that California utilities replace "at least one" site of diesel backup generation infrastructure with a clean microgrid and initiated the design of a $200M Microgrid Incentive Program. In December 2021, California's joint utilities filed a proposal within the program to develop multi-customer clean energy microgrids aiming to equity and resilience goals for low-income and extreme weather-vulnerable communities. The awards will evaluate community equity, resilience, and environmental benefits of microgrid projects, with a special priority to projects that can be completed quickly.

The Microgrid Incentive Program also responds to the requirements of Governor Newsom's July 2021 state of emergency declaration, which directed California utilities to submit information about planned microgrid projects ahead of the summers of 2022 and 2023. A December 2021 decision in the CPUC's Emergency OIR on Reliability proceeding (Docket No. R-20-11-003), also a response to Gov. Newsom's declaration, expanded compensation for resources qualifying for California's Emergency Load Reduction Program, expanded the state's EV-to-grid charging and dispatch, its demand response programs, energy storage deployment programs, and customer energy savings incentives.

California's OIR on Microgrids represents the most comprehensive venue for microgrid policy development in California, but several other recent investigations, pilot programs, and legislative efforts have driven DER and microgrid policy in 2022. In March 2022, the California Energy Commission (CEC) initiated a proceeding to further explore, collect information, conduct assessments, and support recommendations about the role of DERs in California's energy future. The investigation seeks to identify ways to maximize the decarbonization, resilience, affordability, and environmental justice and equity benefits for a broad range of DER applications. In April 2022, the California PUC proposed adopting three Pacific Gas & Electric (PG&E) vehicle-to-grid pilots, one of which is a $1.5M, 200 customer Vehicle-to-microgrid Public Safety Power Shutoff Microgrid Pilot. California's Community Energy Resilience Act of 2022 (SB 833), which passed Senate committee in March 2022, would designate the State Energy Resources Conservation and Development Commission to administer grants to local authorities to facilitate feasibility studies, planning, and implementation of resilience projects including microgrids. The outcome of California's NEM 3.0 proceeding (Docket No. R-2008020), in which the CPUC is revisiting a proposed decision to significantly reduce distributed solar compensation, will affect clean microgrids' ability to reap financial gain from exports to the grid. Previous relevant laws include SB 45 (2020) and SB 99 (2021), which offer grant opportunities for microgrid projects, and SB 1215 (2021) which directed the CPUC to identify and build a database of vulnerable, critical, and low-income potential microgrid sites.

Resilience: In California, microgrids have often been discussed by regulators and other officials as a key resilience solution. For one, the proposed Microgrid Incentive Program and the microgrid tariff proceeding, along with the new CEC DER investigation, explicitly frame microgrid development as a tool to improve resilience. The language of regulatory and legislative action highlighted above, especially Governor Newsom's July 2021 state of emergency declaration, emphasize that much of the state's microgrid policy has emerged in response to extreme weather events, especially drought and wildfires. For example, California's ongoing microgrid rulemaking includes a dedicated Resilience and Microgrids

Working Group, tasked with developing a standard valuation and scoring system for resilience benefits and seeks to prioritize resilience benefits in the state's pending Microgrid Incentive Program.

Grid Services: California utilities have in some cases taken steps to plan for DER penetration and microgrids, largely in response to the requirements of their policy environment. In other cases, they have received criticism for exhibiting the minimum effort to spur microgrid development. For example, in response to the January 2021 OIR on Microgrids decision mandating that utilities plan "at least one clean substation microgrid project as an alternative to diesel backup generation," Pacific Gas & Electric (PG&E) submitted a filing six months later claiming that it could not meet the cost cap established by the CPUC and therefore failed to provide a clean microgrid replacement project proposal. The CPUC dismissed PG&E's complaint and, in a September 2021 order, reaffirmed the utility's requirement to carry forward with at least one project. Separately, some advocates have cautioned that the Microgrid Incentive Program being developed would reserve too much power for the utilities over California's microgrid future. The program would allow PG&E, Southern California Edison, and San Diego Gas &Electric to recover $87.2M, $91.3M, and $12.5M respectively, while not taking any action to encourage third-party microgrid development.

Equity: California utilities' proposed Microgrid Incentive Program incorporates equity and environmental justice goals into their project selection criteria, and the CEC DER investigation is considering how to optimize the equity benefits of DER technologies including microgrids. 2021 legislation (SB 429) directed California utilities to submit annual plans detailing how they will increase their procurement of innovative assets, including renewable energy and smart grid projects, to benefit minority communities. Furthermore, a January 2021 order established the need for a scoring system for equity benefits to be utilized by the CPUC while evaluating potential projects. The scoring system is being developed by working groups in that same proceeding.

Hawaii

Policy Activity: Hawaii's most comprehensive venue for microgrid policy development is the Hawaii Public Utilities Commission's (HPUC) Investigation into Establishing a Microgrid Tariff (Docket No. 2018-0163). The investigation was initiated pursuant to 2018 legislation (HB 2110), which concluded that, "The use of microgrids would build energy resiliency into our communities, thereby increasing public safety and security." The proceeding concluded its first phase with a May 2021 final decision, which established a set of advanced tariff rules. The decision affirmed the viability of a variety of microgrid ownership structures, including customer-owned microgrids; established guidelines for billing and compensation among various parties, designed with the flexibility to accommodate microgrid island modes and peak energy demand; eliminated a program cap for Hawaiian microgrid deployment and decided against instituting a microgrid standby charge; established rules for interconnection; and established procedures for microgrid project applications. An April 2022 order further set the scope and priorities for the proceeding's second phase, which was scoped to conclude in the winter or early spring of 2023. Phase II was designed to investigate compensation mechanisms for microgrid and grid services, including harmonization with existing DER/DR compensation and the possibility of a new resilience tariff; mechanisms to fund microgrid development and avoid cross-subsidization from non-benefitting customers; customer protections in expanded microgrid deployment scenarios; cultivating efficient microgrid interconnection; and coordination across existing initiatives and programs to make Hawaiian microgrid development as universally beneficial and attractive as possible.

A November 2021 order in the HPUC's ongoing performance-based ratemaking proceeding (Docket No. 2018-0088) established a "Resilience and Innovative Reliability Approaches" collaboration area. The topic specifically highlights the need to test the state's microgrid tariffs, investigate incentives for utility resilience microgrid pilot programs, and develop resilience performance metrics. The HPUC also continues to develop DER policy in Docket No. 2019-0323, a proceeding that may have implications to relevant areas like DER compensation and interconnection.

Resilience: Hawaii's resilience strategy is distributed across many jurisdictions and policy areas, including the microgrid tariff proceeding; Hawaiian Electric Company (HECO) programs and planning; DER and grid modernization proceedings; and reports from each of the Hawaiian Islands. Part of phase II of Hawaii's microgrid tariff proceeding is dedicated to investigating options for valuing the resilience benefits microgrids bring to Hawaii's grid.

Grid Services: HECO, Hawaii's primary regulated utility, has undertaken several microgrid pilot projects. For example, the scope of its partnership with the U.S. Department of Energy (DOE) and Hawaiian Natural Energy Institute was to identify and map potential microgrid sites across the Hawaiian Islands. HECO's Grid Modernization proceeding (Docket No. 2019-0327), in its second phase, is further investigating DER integration and distribution system modernization. HECO's Resilience Working Group Report also highlights microgrid resilience benefits and proposes several recommendations to augment microgrid deployment.

Equity: The HECO-DOE partnership was designed so that microgrids can serve as critical backup power during extreme weather events or other grid disruptions in remote and low-income locations.

New Jersey

Policy Activity: New Jersey's landmark microgrid policy is its Town Center DER (TCDER) microgrid deployment program, facilitated by Board of Public Utilities (BPU) in Docket No. QO16100967. Thus far, the program has financed feasibility studies for over three dozen potential microgrid sites in New Jersey, some of which have been built. TCDER is currently in its second phase and third round of grants, which were distributed in 2021. The grants have been awarded to towns and municipalities with proposals for projects that increase resilience for community centers or critical facilities. The BPU evaluation parameters for project applications differentiate between single-customer, campus, and multi-customer microgrids. In addition, the New Jersey legislature passed a Property Assessed Clean Energy program in June 2021, opening a new funding opportunity for microgrid projects. New Jersey also has an energy storage deployment goal and is developing distributed generation solar incentives.

Resilience: In 2014, New Jersey was the first state in the country to establish a bank dedicated to investing in energy resilience projects, the Energy Resilience Bank. BPU Docket No. 0014060626 established the bank with an initial $200M to finance projects including microgrids and has so far financed at least one solar plus storage project. Resilience also serves as a major consideration for the BPU's TCDER program.

Grid Services: As part of its Clean Energy Future proceeding (Docket No. EO18101115), Public Service Enterprise Group (PSEG) designed a $25.7M pilot program to build five critical facility microgrids, along with 2 MW of microgrid infrastructure as part of a related Electric Vehicle Initiative. Atlantic City Electric, which has a planned 20 MW multi-customer microgrid on its distribution infrastructure, is developing a microgrid tariff as part of the TCDER Phase II proceeding.

Equity: The TCDER program aims to finance microgrids that have clear community benefits in municipalities of varying sizes and demographics. Several of the feasibility studies published through the program have highlighted the equity benefits of the proposed projects. Additionally, in the BPU's 2021 revision of the state's solar incentive program, the Successor Solar Incentive Program (Docket No. QO20020184), incorporated multiple workshops on equity and discussions of equitable DER compensation, though microgrids were not specifically addressed.

New York

Policy Activity: Many argue that New York's landmark microgrid program — the Department of Public Safety (DPS) and New York State Energy Research and Development Authority's (NYSERDA) NY Prize, an outgrowth of its Reforming Energy Vision (REV) initiative— currently stands as an unsuccessful effort because none of the projects examined were built. The prize was designed to finance feasibility studies and spur the development of public interest microgrids. It began in 2015 as part of New York's expansive grid modernization initiative, REV (Docket No. 18-E-0130), with tens of millions of dollars in funding and plans for three phases and dozens of awards. Many of the feasibility studies conducted in the prize's first and second stages highlighted themes of resilience and equity in their project missions. However, the program never progressed to Phase 3 – implementation and buildout – scheduled for 2019. However, there have been no new developments in this program since 2019.

Similarly, the benefits of New York's Value of Distributed Energy Resources (VDER) program (Dockets No. 15-E-0751 and 15-E-0082) are hindered by the fact that credits are only administered to grid-exporting facilities and that the state's lack of a behind-the-meter Renewable Energy Credit or financing mechanisms discourages microgrid deployment.

NYSERDA's January 2022 "State of the State" report articulated steps to advance green hydrogen microgrid regulation and technology. The report, ordered by Governor Hochul, directed NYSERDA to develop a regulatory framework evaluating green hydrogen by December; to develop, appropriate funds and facilitate a prize program for green hydrogen microgrids; and to coordinate with industry to establish best practices around green hydrogen. New York also has taken varied policy steps to advance the development of DERs, energy storage, and distribution infrastructure. The state has established targets, incentives, and regulatory changes to encourage DERs and storage, and the DPS' decision to change utilities' official role from distribution network operator to distribution system platform provider is part of a wider regulatory effort to encourage DER grid integration.

Resilience: Resilience was a major focus of the now-stalled REV NY Prize. Phases 1 and 2 of the program resulted in feasibility studies for 83 potential microgrid sites across New York, many of which included detailed analyses of certain projects' resilience benefits. Certain projects in New York are also often referenced as successful resilience microgrid case studies. For example, the Hunts Point microgrid provides backup power for a port area that controls the flow of critical goods including food and medicine and is especially vulnerable to extreme coastal events. Resilience themes are diffused across a broad range of New York grid modernization policies, programs and projects.

Grid Services: Utilities have been involved in much of the microgrid development and resilience infrastructure implementation in New York. Consolidated Edison (ConEd) has developed several nationally notable demonstration projects, such as the Hudson Yards microgrid, which introduced a hybrid microgrid system with innovative ownership models, islanding procedures, and interconnection infrastructure. ConEd has also implemented resilience infrastructure across the distribution system, as with the $1.5 billion grid modernization and hardening investments it made in summer 2021.

Equity: Several enacted bills and PSC orders have addressed energy equity, including the 2019 Climate Leadership and Community Protection Act (S 6599), various orders in the Clean Energy Standard docket (Docket No. 15-E-0302), and Clean Energy Fund docket (docket No. 14-M-0094). These policy goals apply to clean energy development but have only been applied to microgrids in limited cases. For example, New York hosts many low-income multifamily microgrids.

Puerto Rico

Policy Activity: The Puerto Rico Energy Bureau's (PREB) August 2020 decision in Docket No. CEPR-AP-2018-0001 mandated that its major utility, Puerto Rico Electric Power Authority (PREPA), incorporate microgrid planning into its IRP process. The decision found that "microgrids form a critical part of the resiliency solutions envisioned for the Commonwealth," and ordered PREPA to "directly incorporate promotion of microgrid resources into all of its transmission, distribution and resource planning exercises and all deployment actions taken in compliance with the modified Action Plan." PREPA has yet to file an IRP since the decision.

This decision followed two other major microgrid regulatory developments. CEPR-MI-2018 established rules and tariffs to facilitate microgrid interconnection, while Regulation 9028 required PREPA to promote microgrid development in Puerto Rico; enable customer choice and control over their electric service; increase system resiliency; foster energy efficiency; and environmentally sustainable initiatives and spur economic growth by creating a new and emerging market for microgrid services.

Resilience: The August 2020 Docket No. CEPR-AP-2018-0001 decision offers the "Framework for Resilience" as a tool for evaluating potential microgrid projects. This framework includes cost/benefit analysis for resilience investments, flexibility tailored to various classes of customers with varying access to critical infrastructure, and evaluation of value added by integrating DERs and DR. It elaborates on Regulation 9208's requirement for microgrids that improve system resiliency.

Grid Services: Considering the requirement that PREPA includes microgrids in its resource planning, as well as parameters designed to ensure community benefits and resilience, the PREB has delegated the utility significant authority to design Puerto Rico's microgrid deployment.

Equity: Many of the existing Puerto Rican microgrids serve public interest facilities in rural, lower-income communities for whom backup power is essential. The August 2020 PREB order emphasizes the importance of continued microgrid planning in such communities and provides guidelines to optimize community benefits, though "equity" itself was not discussed.

Connecticut

Policy Activity: Public Act 12-148, signed into law in 2012, created the original Connecticut Microgrid Grant and Loan Program, which has hosted four $15M rounds of funding for improvements and new construction of critical facility microgrids. Public Act 20-5, signed into law in 2020, amended and expanded the program, defining resilience as a goal and establishing it as a priority for project awards. In its 2021 Integrated Resource Plan, the Connecticut Department of Energy and Environmental Planning (DEEP) highlighted the objective of further expanding the program. In March 2022, the Public Utilities Regulatory Authority (PURA) also created the Innovative Energy Solutions (IES) program, which establishes a framework to fund and facilitate pilot projects incorporating energy storage, EVs, innovative rate design, and DSM, and potentially microgrids. 2022 law SB 93 also expanded Connecticut's Commercial Property Assessed Clean Energy (C-PACE) Program to authorize financing for microgrids and microgrid-related infrastructure.

In May 2022, Connecticut's legislature passed HB 5237, a bipartisan bill requiring pilot programs to investigate and demonstrate energy storage as a resilience solution, which Governor Ned Lamont is expected to sign into law. In July 2021, PURA Docket No. 17-12-03RE03 established an incentive structure for energy storage deployment in Connecticut (the grant and loan program require renewable generation plus storage for qualifying projects), mostly geared towards residential and small commercial battery installation. Several other open PURA proceedings – especially relating to PURA's broad distribution system planning effort – are examining potentially relevant grid modernization issues including non-wires alternatives, and performance-based ratemaking.

Resilience: PA 20-5 defined "resilience microgrids" and expanded Connecticut's Microgrid Grant and Loan Program to include resilience projects. In the PURA's ongoing Value of Distributed Resources proceeding (Docket No. 19-06-29), staff published a study in July 2020 detailing the community and utility resilience benefits of microgrids. In addition to identifying microgrid resilience benefits, the study examined methodologies employed by various jurisdictions attempting to quantify community resilience benefits. The report finds that none of the methodologies reviewed fully accomplish this goal, and it emphasizes PURA's need for continued work pursuing a non-qualitative resilience evaluation framework. In its 2021 Integrated Resource Plan, DEEP also highlighted the role of microgrids as "a critical tool in the climate resilience tool kit" and articulated the importance of maximizing resilience benefits in Connecticut microgrid policy. Docket No. 17-12-03RE08, part of PURA's suite of distribution system planning proceedings, is continuing to investigate issues pertaining to reliability and resilience. Lastly, PA 18-82 further defines resiliency in the climate change context.

Grid Services: Largely in response to requirements around DER, energy storage, and resilience established by regulatory and legislative action, Connecticut utilities have incorporated innovative technologies into their resource planning.

Equity: DEEP's 2021 Integrated Resource Plan emphasizes energy equity considerations across Connecticut's energy transition policy. PURA launched a dozen proceedings under its "equitable modern grid" initiative, many of which touch on microgrid use cases (Innovative Energy Solutions Docket No. 17-12-03RE05; resiliency and reliability, Docket No. 17-12-03RE08; energy storage, Docket No. 17-12-RE03; resource adequacy and clean electricity, Docket No. 17-12-03RE10, and others). Each of these proceedings underscores equity as a guiding principle in program design and execution. Additionally, Connecticut's energy storage incentive program provides higher rates for low-income communities to ensure equitable deployment.

Massachusetts

Policy Activity: Massachusetts does not have a comprehensive proceeding or law driving microgrid policy. However, the state has acted across a host of policy areas relevant to microgrids including DER deployment and interconnection, grid modernization, energy storage, and decarbonization. It's Solar Massachusetts Renewable Target (SMART) programs offer considerable incentives for the installation of DG solar and energy storage. Massachusetts has lagged in meeting its DER deployment targets, but Department of Public Utilities (DPU) interconnection proceeding (Docket No. 20-75) is examining the implications of interconnection on DER deployment. In 2018, the DPU required that Massachusetts utilities file grid modernization plans, which have included many relevant policy developments, and they are developing performance-based ratemaking metrics that could benefit microgrids. Massachusetts' 2050 Decarbonization Roadmap, a guiding document for implementing the state's net-zero by 2050 climate legislation, mentioned microgrids once but did not describe the role they will play in Massachusetts' energy transition.

Resilience: In 2018, Massachusetts' Clean Energy Center's (CEC) $1.05M Community Microgrid Program sponsored feasibility studies for 14 potential community microgrids across the state. The studies evaluated each project's potential for resilience and community benefits. The Community Microgrid Program's successor, the CLEAR program, is funded by the governor's $40M Community Clean Energy Resiliency Initiative and continues to grant awards for a broader spectrum of resiliency projects.

Grid Services: Several Massachusetts utilities feature microgrid pilot or demonstration projects. Both Eversource and National Grid address microgrids in their multiyear grid modernization plans: Eversource as an area of future consideration and development, and National Grid via a proposal for a pilot project.

Equity: Several of the grants awarded through the CEC's Community Microgrid and CLEAR programs addressed equity-driven use cases. The Governor's office, legislature, and DPU have prioritized equity broadly in other avenues, including the 2021 S 9 bill that required all agencies to consider environmental justice in decision-making.

Texas

Policy Environment: The state legislature and the Public Utility Commission of Texas (PUCT) have taken limited action to address microgrid development in the state, despite broad pro-microgrid advocacy efforts following the February 2021 Texas blackouts. Docket No. 52373, the PUCT's Review of Wholesale Market Design, asked in an opening memo, "What new ancillary service products or reliability services or changes to existing ancillary service products or reliability services should be developed or made to ensure reliability under a variety of extreme conditions?" The proceeding's "Blueprints for Wholesale Electric Market Design" did not address microgrids, but new activity suggests the proceeding may look more in depth at certain relevant DER topics. In March 2022, Commissioner Glotfelty issued a memorandum in that proceeding calling for a proceeding to design policy around distributed energy storage interconnection in Texas, while Commissioner McAdams issued a memorandum calling for an investigation into DER policy more broadly. In the summer of 2021, the Texas legislature passed two laws aimed at strengthening grid reliability, S.B. 2 and S.B. 3, but both were limited in scope, changing the Electric Reliability Council of Texas governance structure and authorizing grid weatherization improvements respectively.

Resilience: S.B. 2 and S.B. 3 represent Texas officials' initial response to the February 2021 blackouts. The bills employed the language of resilience, but they did not address microgrids as a potential resilience solution. Notably, the February 2021 storm and response mirror a similar storm in 2011 that resulted in rolling blackouts in 75% of the state. Recommendations made in a report from the Federal Energy Regulatory Commission and North American Electric Reliability Corporation after the 2011 storm were largely unaddressed, though some elements were included in S.B. 2 and S.B. 3. These two scenarios reflect resilience discourse across much of Texas' electric grid policy: addressing the need for resilience and reliability while failing to acknowledge microgrids as a potential solution.

Grid Services: In Docket No. 51575, Entergy Texas requested to develop a 75 MW fleet of small, primarily natural-gas fired distributed generation, including several customer-hosted microgrids. The proceeding spanned from December 2020 to June 2021 and, following the February 2021 blackouts, Entergy made its case largely on the need for grid reliability and resilience. In the proceeding, Entergy developed a proposed DG and microgrid tariff for its requested projects. The PUCT's June 2021 final decision dismissed Entergy's proposal, arguing that "the existing Commission rules do not provide much guidance to properly evaluate the proposed tariff" and determining that Entergy's docket was not the appropriate venue to evaluate a topic whose implications would have "an industry-wide impact." The decision suggested broader rulemaking to revise PUCT rules to accommodate DG, a proceeding that has yet to materialize.

Equity: Other than public officials addressing the need for reliability, as well as Texas' few dozen non-commercial operating microgrids with community benefits, there has been little focus on equity in the Texas microgrid landscape.

STATE ASSESSMENT: TIER 2

Washington, D.C.
The D.C. Public Service Commission (DCPSC) has taken steps to develop a microgrid tariff, but not produced anything conrete. The DCPSC's microgrid framework began to take form in its original PowerPath DC Vision proceeding, Docket No. 1130, which informed its more recent microgrid proceeding, Docket No. 1163. That proceeding was established in July 2020 to, "Investigate microgrid ownership and operation structures, business models and value propositions, benefits and costs of microgrids, and the different microgrid variances, which lead to appropriate microgrid classifications and regulatory treatments." Docket No. 1163's final order proposed a "light touch" approach to microgrid regulation, which offers several distinct regulatory pathways depending on the type/use case of a certain project. The light-touch approach also purposefully includes flexibility regarding what types of microgrids should and should not fall under DCPSC purview. D.C.'s Resilience Strategy report identifies microgrids as a resilience solution, highlights the priority to build microgrids at critical facilities, and plans to document lessons from a proposed microgrid pilot in the district.

Illinois
Illinois has hosted several notable utility demonstration projects and is developing DER policy in Illinois Commerce Commission (ICC) rulemakings related to the 2021 Climate and Equitable Jobs Act. Among ComEd's microgrids, the most famous is its 10 MW Bronzeville Community Microgrid, currently under development. The project was financed by ICC-approved rate recovery, has been accompanied by a first-of-its-kind tariff allowing non-utility actors to build microgrids on ComEd distribution systems, and will be uniquely 'linked' to another ComEd microgrid at the Illinois Institute of Technology. Ameren Illinois also has nationally recognized microgrids, like its 100% renewable project in Champaign. While Illinois lacks a comprehensive microgrid law or proceeding, the ICC's implementation of Illinois' 2021 Climate and Equitable Jobs Act (P.A. 102-1662) presents a potential avenue for microgrid policy activity with equitable design components. The ICC's energy storage deployment proceeding (Docket No. 22-0237) opened in March 2022 will investigate potential energy storage deployment targets and pilot projects related to compensation for pairing storage with both utility-scale and distributed storage, a comprehensive value of distributed storage proceeding, and utility-specific programs. Additionally, ComEd opened a performance metrics proceeding in January 2022 that proposed developing performance incentive metrics (PIMs) including a reliability, resiliency, and power quality incentive that could drive microgrid development in outage-prone communities and another that would reward timely DER interconnection.

Florida
In 2021, Florida Power & Light and Tampa Electric Co. (TECO) each moved forward with microgrid partnerships, with TECO gaining approval from the Florida Public Service Commission (PSC) for a four-year microgrid pilot program. TECO's pilot program was accompanied by an order established in Docket No. 20210181-EI requiring the utility to model depreciation rates for microgrids and other "innovative assets;" TECO's depreciation rate models have since been approved by the Public Service Commission (PSC). In April 2022, Florida's House and Senate approved legislation reforming the state's net metering laws to significantly reduce compensation for distributed generation, before Governor DeSantis vetoed the law.

Colorado
In 2020, the Colorado Public Utilities Commission (PUC) approved a 7-site, $23.4M Public Service Company of Colorado (PSCo) microgrid pilot as part of its Community Resilience Initiative (Docket No.

19A-0225E). The projects, which are under development in community or critical infrastructure sites including the Denver International Airport and National Western Center, represent the state's most substantial effort to drive microgrid development. In the past several years, Colorado has developed policy related to energy storage, DERs, interconnection, and other areas relevant to microgrid development. In March 2022, PSCo petitioned for the approval of a 'resiliency asset' offering for commercial and industrial customers to host backup generation, energy storage, or microgrid technology behind-the-meter for a monthly premium.

North Carolina

In North Carolina, Duke Energy's Climate Risk and Resilience Working Group, convened in 2020 between Duke Energy Carolinas, Duke Energy Progress, and Vote Solar, published its Climate Risk Assessment and Resilience Report. The report highlighted the resilience, community, and critical infrastructure benefits of microgrids, and established the goal of creating resilience metrics. Alongside this more tangential utility-led effort, the North Carolina State Energy Office is designing a resilience road map to integrate into utility IRP processes. More tangential to microgrid policy, North Carolina is developing performance-based ratemaking metrics in Docket No. E-100 Sub 178, and it adopted DER interconnection standards in Docket No. E-101 Sub 100B.

Virginia

In January 2022, the State Corporation Commission (SCC) approved Phase II of Dominion Energy Virginia's ten-year Grid Transformation Plan, which authorizes $666.5M of capital spending for a wide breadth of grid modernization and reliability projects. While the proceeding does not invest in microgrids specifically, the plan's final order specifies that the microgrids do qualify as "electric distribution grid transformation projects," thus qualifying them for rate recovery. Dominion Energy also identified the benefits of microgrids in its 2021 Climate Plan. SCC Docket No. PUR-2020-00120, charged with implementing the state's energy storage deployment goals, similarly identifies microgrids as a relevant energy storage use case but has not provided specific guidance on deployment. Lastly, the benefits of microgrids are identified in Virginia's 2020 Coastal Resilience Plan and the 2018 Virginia Solar Energy Development and Energy Storage Authority Microgrid and Energy Storage study.

South Carolina

The South Carolina Public Service Commission (SCPSC) and Duke Energy have each recently taken actions to address resilience and reliability. The SCPSC's grid reliability investigation (Docket No. 2021-66-A) final report recommends investigating DERs and microgrids for application as grid hardening solutions. The report also recommended that small electric utilities incorporate microgrids and several other grid hardening technologies into their planning, identifying such development as an "extreme weather best practice." Duke Energy's Climate Resilience Working Group (Docket 2021-197-E) was scheduled to commence in October 2021, but the proceeding has hosted very little activity since its initial filing.

Maryland

Beginning in 2020, Maryland's microgrid deployment program, facilitated by the Maryland Energy Administration (MEA) and funded through the Resilient Maryland program, awarded feasibility study funding for community and critical facility microgrids across the state, with goals including improved resilience and equity. The program funded 14 feasibility studies in its first round (2020) and received applications for its second round in March 2022. While the Maryland Public Service Commission (PSC) has rejected certain utility microgrid proposals, in the past decade it has approved Pepco and Delmarva "grid

resiliency charges" intended to recover rates to fund resiliency projects including microgrids. The PSC has also developed a performance-based ratemaking mechanism with performance incentive mechanisms (PIMs) for grid resilience and reliability, as well as energy storage development. Lastly, Maryland's Climate Solutions Now Act of 2022 became law in April 2022 provides provisions encouraging the adoption of DER and energy storage to increase grid reliability. A new working group (which will include three representatives from the "energy storage and backup industry") will explore methods to support DER and storage development that increases grid security, especially for critical facilities during power outages.

Pennsylvania

The Pennsylvania Public Utility Commission (PUC)'s Utilization of Storage Resources as Electric Distribution Assets proceeding (Docket No. M-2020-3022877) is in the process of receiving comments to questions about energy storage's potential as a resiliency and reliability asset and its regulatory treatment in ratemaking processes. In response to the PUC's inquiry about resilience and reliability, several intervening advocates have emphasized the application of energy storage to microgrid projects. Pennsylvania's Climate Action Plan briefly identifies the potential resilience benefits of microgrids, and some of Pennsylvania utilities' Long Term Infrastructure Investment Plans similarly address microgrids without providing a basis for facilitating development. Microgrids are also included as qualifying for the Alternative Energy Portfolio Standards renewable energy deployment mandates.

Alaska

Alaska has largely leveraged federal funding to build out its microgrid infrastructure, including grants from the Denali Commission, the Environmental Protection Agency, and the U.S. Economic Development Administration. The state has used these channels to finance projects and establish local organizations like the Alaska Microgrid Partnership and Alaska Center for Microgrid Technologies Commercialization. Compared to federal grants and the institutions established to facilitate them, the Alaskan legislature and regulatory commission have had limited roles in facilitating microgrid development. The commission peripherally addressed microgrids in Docket No. R-20-005, a proceeding addressing barriers to EV charging infrastructure in Alaska that also hosted some stakeholder comments regarding EV charging-microgrid synchronicities.

Rhode Island

In March 2021, Rhode Island's Office of Energy Resources (OER) published an assessment detailing potential statewide microgrid deployment, including specific feasibility studies. The OER's Rhode Island Resilient Microgrids for Critical Services report identifies critical infrastructure in the state, describes a methodology for potential facility/project evaluation, and makes policy recommendations – many designed to inform a potential microgrid funding program modeled from other states, and several addressing topics related to resilience and equity. Otherwise, in the Rhode Island Public Utility Commission's interconnection proceeding (Docket No. 5077), Narragansett Electric is in the process of consulting with local jurisdictions regarding potential microgrid interconnection rules.

Vermont

Green Mountain Power (GMP) is engaged in much of the state's efforts to develop microgrids and leverage their resilience benefits, planning microgrid development across several venues. GMP's October 2020 Resilience Plan identified "resiliency zones" that would serve as optimal microgrid development sites, a framework that has been harmonized with GMP's 2020 Climate Plan and is being implemented in

its 2021 IRP, currently under consideration by the Vermont PUC. A decision following the approval of GMP's Resilience Plan authorized $14M in recovery to construct resiliency microgrids.

Washington

Washington utilities' Clean Energy Implementation Plans (CEIP), which were submitted in response to the state's 2019 Clean Energy Transformation Act (CETA), address microgrid development. Washington's largest utility, Puget Sound Energy (PSE), included investments in public interest microgrids and supporting infrastructure in its proposed CEIP. PSE's DER and Microgrid Circuit Enablement Program will be focused on facilitating DER and microgrid deployment in vulnerable communities; its SCADA investment plan will facilitate the development of substations in vulnerable communities to support microgrid deployment; and the Resilience Enhancement Program will implement new technologies to improve grid reliability. In Avista's proposed CEIP, Washington's smallest investor-owned utility designed a $5M fund for distribution resilience efforts including microgrids and wildfire mitigation. The Washington Department of Commerce hosts a Clean Energy Fund that in August 2021 announced funding for 18 grid modernization projects, including nine microgrids. Washington has also established a suite of policies to support DER deployment and equity more broadly, and the WUTC is in the process of designing performance-based ratemaking mechanisms.

Louisiana

Docket No. R-36227, opened in December 2021, was designed to provide an assessment of Louisiana's current electric utility infrastructure's resilience and identify potential grid hardening options for future storm events. The opening memo issued by LPSC Chairman Green looked to, "Propose a plan of resiliency and hardening that could better prepare Louisiana's electric grid for future storms and interruptions," adding that the proceeding should consider "creative proposals that will solve Louisiana's specific infrastructure problems and allow Staff to explore all options from hardening to microgrids." In July 2021, Entergy Louisiana petitioned for updates to its Power Through program, which is using a resiliency-as-service model to finance the development of microgrids and other resiliency assets. If the program is approved by the PSC, customers receiving direct resiliency benefits from an Entergy microgrid would be charged for the price difference between that project and a natural gas generator of the same MW capacity. In some cases, Entergy has been criticized for its lack of proactive action on grid resilience and even specifically criticized for antagonism towards microgrids. Separately, the state's Commercial Property Assessed Clean Energy (C-PACE) Resilience Program offers loans to Louisiana communities for qualifying resiliency projects, which could potentially include microgrids.

Kentucky

Kentucky's Regional Microgrids for Resilience study prepared for its Office of Energy Policy (OEP) highlights 570 potential sites around the state that could receive resilience, reliability, economic, and equity benefits from specific microgrid projects, but no action has been taken to implement the report's recommendations. In addition, the Public Service Commission is investigating interconnection rules and net metering in Docket No. 2020-00302.

Wisconsin

Wisconsin's Energy Innovation Grant Program, facilitated in Docket No. 9709-FG-2020, was established in 2020 and has not yet directly financed any microgrid projects, but it could in subsequent rounds of awards. In the Northern States Power Wisconsin (NSPW) Resiliency Service Pilot Program facilitated in Docket No. 4220-TE-106, the Wisconsin Public Service Commission (WPSC) authorized NSPW to recover $17.4M to fund up to 22 NSPW owned and operated "resiliency assets" including microgrid projects that

will leverage distributed solar, diesel or gas-fired backup generators, combined heat and power units, energy storage systems and system controls. Aside from this program, the Wisconsin Governor's Task Force on Climate Change published a report recommending increased funding to the Public Service Commission of Wisconsin's Office of Energy Innovation to fund local communities to develop critical green energy infrastructure including microgrids, allocate an annual budget to support microgrid pilots, and establish a grant program to accelerate microgrid deployment. Wisconsin's Clean Energy Plan, published in April 2022, also proposed the establishment of an Innovative Technologies Initiative to fund projects that improve distribution system resilience, including microgrids.

Minnesota

Northern States Power's (NSP) Minnesota, the state's largest utility, filed a $33.4M Integrated Distribution Plan (IDP) in November 2021. The IDP will drive projects across Minneapolis aimed at bolstering resilience among low-income and disadvantaged communities, some of which will develop microgrid controls along with other DER technologies. Minnesota utilities are also required to submit distribution system planning reports, within which NSP and Minnesota Power have identified the benefits of microgrids but framed them as a "future (2025-2030)" development area (NSP) or a "potential reliability solution" (Minnesota Power) as markets evolve. The Minnesota Public Utilities Commission (PUC) has instituted strong DG interconnection rules and requires utilities to investigate grid technologies including microgrids in their multiyear rate plans. HF 2044, which stalled in legislative committee in April 2021, would have established a nonprofit corporation in the state to finance qualifying clean energy projects, including microgrids. In April 2022, NSP petitioned for the approval of a 'resiliency asset' offering for commercial and industrial customers to host backup generation, energy storage, or microgrid technology behind-the-meter for a monthly premium.

STATE ASSESSMENT: TIER 3

Maine

In June 2021, Maine's legislature passed LD 1053, An Act to Allow Microgrids That Are in the Public Interest. The law guides the Maine Public Utilities Commission's (PUC) to open a proceeding by 2023 to review microgrid project petitions and develop parameters as it sees fit. Maine's Community Resilience Initiative offers $5,000-$100,000 "Community Action" grants for which microgrid projects could qualify.

Oregon

HB 2021, Oregon's decarbonization law, authorized $50M in funding to "community renewable energy projects" including resilience-focused microgrids, though it is unclear how much of that funding will be allocated to microgrid projects. Oregon's Department of Energy's 2019 Local Resilience Guidebook emphasized the benefits of microgrids, offered case studies, and suggested paths for microgrid deployment. In its energy storage deployment proceeding (UM 1856), Portland General Electric proposed several microgrid projects.

Michigan

In January 2022, the Michigan Public Service Commission issued a final report in one of its MI Power Grid proceedings (Docket No. U-20898) titled New Technologies, Business Models, and Staff Recommendations, which included a chapter detailing the benefits of and barriers to microgrid adoption in Michigan. The chapter highlighted that in Michigan, the resilience benefits of microgrid are not fully recognized; microgrid funding mechanisms and interconnection tariffs are needed; microgrids are largely absent from utility resource planning; and current regulatory frameworks guiding project siting are not compatible with certain realities of microgrid operations. The PSC offered over two dozen recommendations to address these concerns and others– from establishing a consistent definition of microgrids to conducting locational feasibility studies to extending multi-metering tariffs to microgrids. Docket No. U-21122, the PSC's grid reliability proceeding, further addresses topics such as grid hardening, worst-case scenario troubleshooting, and evaluating long-term planning, but has thus far not directly addressed microgrids.

Ohio

Proceedings associated with the Public Utilities Commission of Ohio's (PUCO) PowerForward grid modernization initiative have led to microgrid deployment in Ohio. In 2018, PUCO approved $10.5M for AEP Ohio to establish a microgrid program, accepting applications for demonstration microgrids that would improve grid resilience and reliability and protect critical facilities. The projects were designed to feature third-party-owned energy generation and competitively bid construction and maintenance services. PUCO's PowerForward grid modernization initiative has thus far not directly addressed microgrid development, but issue areas like distribution system planning and expanding data access could have positive implications on Ohio's microgrid policy landscape.

Georgia

Georgia has limited relevant policy related to the compensation, deployment, or resilience and equity benefits of microgrids. The state has significant microgrid deployment, which is overwhelmingly characterized as single-customer commercial microgrids. Georgia Power owns a pilot university microgrid, and the state has a couple of military microgrids.

Arizona
Arizona's Energy Rules Modification proceeding (Docket No. RU-00000A-18-0284) may be the open proceeding most likely to impact microgrids. The proceeding mandates "regulated electric utilities to increase their use of clean and renewable energy technologies" and is developing steps to facilitate an energy transition in Arizona, although a net-zero by 2070 goal brought to the Arizona Corporation Commission (ACC) was struck down in January 2022. Microgrids were discussed in a 2014 staff report investigating innovation and technological developments (Docket No. E-00000J-13-0375), which recommended that they be included in IRP planning. APS minimally discussed microgrid development in its 2019 IRP.

New Mexico
New Mexico's 2020 Energy Grid Modernization Roadmap Act (HB 233) gave the PRC authority to authorize investments, incentives, and programs in line with grid modernization goals, and November 2021 order in the resulting proceeding (Docket No. 21-00177) expanded the rulemaking's scope to include, "Energy storage systems and microgrids that support circuit-level grid stability, power quality, reliability or resiliency or provide temporary backup energy supply." In response to HB 233, New Mexico's Energy, Minerals, and Natural Resources Department (EMNRD) published a 2020 grid modernization white paper that recommended creating legal and financial incentives for rural low-income community microgrids– a suggestion that never was implemented. HB 245, New Mexico's 2021 Utility Distribution System Hardening legislation, further strengthened the PRC's statutory basis for utilities to recover rates for grid modernization activities including microgrids and gave the Commission guidance for regulating the design of such utility projects. Otherwise, in November and December 2021, the NMPRC initiated rulemaking proceedings respectively addressing integrated resource planning (Docket No. 21-00128-UT) and interconnection (Docket No. 21-00266-UT). The former is looking toward ways to prioritize next-gen energy DER, energy efficiency, renewable energy, flexible energy, and transmission/distribution grid improvements in an equitable manner, while the latter will update interconnection policies to address energy storage systems, islanding, DER, and other requirements for compliance with IEEE standards.

Arkansas
Arkansas has limited relevant policy related to the compensation, deployment, or resilience and equity benefits of microgrids. The state has significant microgrid deployment, which is exclusively characterized as single-customer commercial microgrids.

New Hampshire
A January 2019 New Hampshire Public Utilities Commission (NHPUC) staff grid modernization report within Docket No. IR-15-296 identified the resilience benefits of microgrids and recommended several options to stimulate deployment in New Hampshire. Docket No. IR-20-166 is in the early stages of facilitating energy storage deployment in the state, and it could have potential implications for microgrid development.

Nevada
Nevada has limited relevant policy related to the compensation, deployment, or resilience and equity benefits of microgrids. Nevada has an energy storage deployment mandate, which it has, in part, implemented through the Public Utilities Commission and NV Energy-run deployment programs. Nevada is also developing performance-based ratemaking metrics that advocates are arguing should reward DER deployment, resilience, and equity.