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Bridging the Gap

How Emerging State Policies are Making Energy Storage Affordable and Accessible

Sandia National Laboratories

CleanEnergy States Alliance

ABOUT THIS REPORT

This report, prepared by Sandia National Laboratories (SNL) and the Clean Energy States Alliance (CESA), reviews emerging programs and policies states are adopting to make energy storage affordable and accessible to all. Its goal is to categorize and describe these emerging practices, report outcomes where possible, and provide a useful resource for state energy storage regulators and policymakers. The report is funded by the U.S. Department of Energy—Office of Electricity, through its Energy Storage Division.

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Executive Summary

As energy storage becomes an increasingly integral tool to deliver numerous benefits to communities and to the electric grid, the question of how to make this new technology broadly affordable and accessible becomes more urgent, particularly for state agencies tasked with meeting clean energy goals. This report compiles the results of independent research conducted by the Clean Energy States Alliance (CESA) and Sandia National Laboratories, providing a summary of emerging affordability and accessibility approaches in leading state energy storage programs.[1] The intent is to create a body of reference material that can be used in state energy storage policymaking across diverse geographical and regulatory jurisdictions.

National statistics indicate that about 50 million households, or 44 percent of the U.S. population, fall into the category of "underserved populations," also referred to as disadvantaged or low-income communities. These communities are often heavily populated by people of color. They have historically been most negatively impacted by severe weather associated with climate change,[2] and the associated electric grid outages; they have disproportionately suffered human health and environmental impacts from air pollution associated with fossil-fueled power plants, which are frequently sited in disadvantaged communities;[3] and they typically carry a greater energy cost burden than more affluent communities.[4]

In recent years, energy storage has emerged as a key technology that can address these issues. Energy storage can enable the deployment and integration of renewable energy, reduce local human health and climate impacts from fossil fueled generators, ease energy cost burdens, and increase community energy independence and resilience. In underserved communities, where the need is greatest, it is most urgent to enable widespread access to these benefits of energy storage.

Energy storage can enable the deployment and integration of renewable energy, reduce local human health and climate impacts from fossil fueled generators, ease energy cost burdens, and increase community energy independence and resilience.

1 State policy and program examples are provided in the text. Links to legislation, program guides and other foundational documents are provided in footnotes.

2 Alique G Berberian, David J X Gonzalez, and Lara J Cushing, "Racial Disparities in Climate Change-Related Health Effects in the United States," *Current Environmental Health Reports*, May 28, 2022, https://pmc.ncbi.nlm.nih.gov/articles/PMC9363288.

3 Rajat Shrestha and Devashree Saha, "Fossil Fuel-producing Communities Face a 'Cumulative Burden' of Pollution, Poor Health and Job Loss in the US," *wri.org*, December 11, 2023, https://www.wri.org/insights/disadvantaged-energy-communities-analysis.

4 American Council for an Energy-Efficient Economy, "Energy Burden Research," *aceee.org*, 2024, https://www.aceee.org/energy-burden.

As with other clean energy technologies, lower-income and underserved communities face many barriers to accessing the benefits of energy storage. But it is imperative that these barriers be overcome. While this is not an easy task, several leading state programs show that it can be done.

These programs have incorporated the following types of affordability and accessibility provisions:

1. **Capacity carve-outs** in incentive or procurement programs (i.e., a percentage of incentive budget or procurement capacity is set aside for projects benefiting underserved communities)
2. **Incentive adders** for income-eligible participants and those residing in historically underserved communities, or for commercial entities serving those communities
3. **Front-loaded incentive payments** for income-eligible participants
4. **Accessible financing** for income-eligible participants
5. **Pre-development technical assistance** to determine technical and economic feasibility and project optimization, and to support applications for funding
6. **Community benefits requirements** (i.e., a requirement that a commercial project qualifying for accessibility/affordability incentives or grants must show how the project will benefit the underserved community that hosts it)
7. Support for a **variety of ownership models**, for example incentive eligibility for both owned and leased systems

In addition to recommending that states consider the types of provisions listed above, this report makes three overarching observations that apply to all state clean energy policymaking, including but not limited to energy storage:

1. Whenever possible, consideration of affordability and accessibility provisions should take place when programs are designed, rather than as an add-on later in the process
2. The process of developing these provisions should incorporate input from a wide variety of stakeholders, including representatives of underserved communities and advocacy organizations
3. Once programming is in place, its effectiveness should be evaluated regularly, and provisions should be adjusted if they are found to be ineffective

Introduction

Underserved and low-income communities are most in need of the services energy storage can provide, including resilient power, energy cost savings, and local pollution reduction. They are also least able to access them.

The need for resilient power (backup power to carry critical loads through a grid outage) is rapidly increasing in many areas of the country. Data collected by the National Oceanic and Atmospheric Administration shows that major natural disaster events in the U.S. have steadily increased in both number and severity.[5] The disproportionate impacts of severe weather events and their accompanying power outages on low-income and underserved communities is well documented. These communities are hit hardest when winter storms, wildfires, hurricanes, or droughts cause grid outages, and because they have fewer resources, they also take longer to recover.[6] Clean power sources that can be strengthened and made more resilient through the addition of energy storage technologies are not merely a convenience in these communities. As has been demonstrated over and over—by Superstorm Sandy in the Northeast, Hurricane Maria in Puerto Rico, ice storms in Texas, and wildfires on the West Coast—the availability of reliable, clean backup power can be a matter of life or death.

The need for resilient power (backup power to carry critical loads through a grid outage) is rapidly increasing in many areas of the country.

Energy costs have also emerged as a burden felt disproportionately by the poorest communities. According to the U.S. Department of Energy (DOE), Office of Energy Efficiency and Renewable Energy, "low-income households face an energy burden three times higher than other households."[7] Because of this, poorer households are the most in need of technologies such as combined solar and storage, which can help to reduce energy cost burdens through solar self-consumption and net metering, and also generate revenues through the provision of grid services such as capacity and frequency regulation. Commercial facilities that provide community services can also benefit by using behind-the-meter (BTM) batteries to manage costly demand charges.[8]

5 National Centers for Environmental Information, "Billion-Dollar Weather and Climate Disasters," *ncei.noaa.gov*, 2024, https://www.ncei.noaa.gov/access/billions/time-series.

6 June Kim, "Increasing Power Outages Don't Hit Everyone Equally," *scientificamerican.com*, July 26, 2023, https://www.scientificamerican.com/article/increasing-power-outages-dont-hit-everyone-equally1; and N'dea Yancey-Bragg and Rick Jervis, "Texas' winter storm could make life worse for Black and Latino families hit hard by power outages," *usatoday.com*, February 20, 2021, https://www.usatoday.com/story/news/nation/2021/02/20/texas-ice-storm-blackouts-minorities-hardest-hit-recovery/4507638001; and Benjamin Hulac and ClimateWire, "Extreme Weather Hits Poorest Hardest," *scientificamerican.com*, July 28, 2014, https://www.scientificamerican.com/article/extreme-weather-hits-poorest-hardest.

7 U.S. Department of Energy, "Low-Income Household Energy Burden Varies Among States—Efficiency Can Help In All of Them," *energy.gov*, December 2018, https://www.energy.gov/sites/prod/files/2019/01/f58/WIP-Energy-Burden_final.pdf.

8 Approximately 25 percent of commercial customers across the country may be able to cost-effectively reduce their utility bills with battery storage for demand charge management; see: Seth Mullendore and Joyce McLaren, "Identifying Potential Markets for Behind-the-Meter Battery Energy Storage: A Survey of U.S. Demand Charges," *cleanegroup.org*, August 24, 2017, https://www.cleanegroup.org/publication/nrel-demand-charges-storage-market.

Human and environmental health benefits represent a third category of services energy storage can offer. For example, fossil-fueled peaker power plants are often sited in or near low-income communities, where their air emissions contribute to disproportionately high rates of asthma, heart disease, and other serious health impacts, as well as environmental damage, in the surrounding communities. Replacing dirty peaker plants with clean renewables and energy storage can reduce these environmental and human health impacts while increasing local ownership of energy resources.[9] Behind-the-meter energy storage can also support electricity-dependent home health equipment through a grid outage; this is essential to the well-being of millions of Americans who rely on in-home medical and mobility equipment such as respiratory aids, motorized wheelchairs and lifts, dialysis machines, and refrigerators for critical medication that must be kept cold. Providing reliable backup power in the home can enable these people to safely shelter in place during a natural disaster, rather than being evacuated or hospitalized.[10]

Behind-the-meter energy storage can support electricity-dependent home health equipment through a grid outage; this is essential to the well-being of millions of Americans who rely on in-home medical and mobility equipment.

Realizing these benefits at scale is no simple task. For example, in the case of Southern California Edison (SCE), one of the nation's largest electric utilities, 45 percent of residential households in its service territory are located in underserved or low-income communities.[11] Similarly, the electric utility PNM of New Mexico reports that approximately 40 percent of its residential customer base is qualified as low-income,[12] while of the more than 6 million residential customers Duke Energy serves in the Carolinas, Florida, Ohio and Indiana, more than 1.2 million, or about 20 percent, live in poverty[13] Numbers such as these make implementing affordable and accessible energy storage policies at scale a formidable challenge.

This report highlights emerging strategies used by the leading states to advance affordable and accessible adoption of energy storage. While the challenges are daunting, early results from at least some of these programs show that positive results can be achieved when states adopt a focused and long-term commitment.

9 For more information on energy storage for fossil fueled peaker plant replacement, see Clean Energy Group's Phase Out Peakers project at https://www.cleanegroup.org/initiatives/phase-out-peakers. In addition, CESA has conducted a cost-benefit analysis for energy storage replacing aging gas peakers in Maine, see: https://www.cesa.org/resource-library/resource/battery-storage-peaker-plant-replacement-maine.

10 Marriele Mango and Annie Shapiro, "Home Health Care in the Dark: Why Climate, Wildfires and Other Risks Call for New Resilient Energy Storage Solutions to Protect Medically Vulnerable Households From Power Outages," *cleanegroup.org*, June 3, 2019, https://www.cleanegroup.org/publication/battery-storage-home-healthcare.

11 Edison International Clean Energy Access Working Group, https://www.edison.com/community/cea-working-group.

12 Before the New Mexico Public Regulation Commission In The Matter of The Application of Public Service Company of New Mexico For Revision of Its Retail Electric Rates Pursuant to Advice Notice No. 625, "Direct Testimony of Heidi M. Pitts, Ph.D.," *pnmresources.com*, June 14, 2024, https://www.pnmresources.com/~/media/Files/P/PNM-Resources/rates-and-filings/2025%20Rate%20Request/13%20-%20Pitts%20Rate%20Design.pdf.

13 Grant Smith and Bill Walker, "Tone Deaf: The Facts Behind Duke Energy's Low-Income Programs," *ewg.org, June 3, 2020,* https://www.ewg.org/energy/tone-deaf-the-facts-behind-duke-energys-low-income-programs.

Bending the Trajectory of Adoption

Meeting the challenge of society-wide energy storage deployment will require states to adopt a focused and long-term policy commitment. In the absence of such a commitment, it is likely that adoption of energy storage will follow the same trajectory as other clean energy innovations—that is, the benefits will first become available to corporations and wealthy early adopters, and then to the middle class, while underserved communities are left behind. An example of this can be seen in the history of solar photovoltaic (PV) adoption in the U.S.

When solar PV was introduced commercially in 1956, the cost was $300/watt. By 1975, the cost had fallen to $100/watt,[14] but this was still far too expensive for any but wealthy early adopters. According to the New Energy Outlook 2018 report from Bloomberg's New Energy Finance group, the average price was $4 per watt in 2008; today, the price of PV has fallen to $0.24 per watt.[15] This precipitous price decline, combined with utility net metering programs, federal tax incentives, state subsidies, and developer lease options and financing offerings, has at last made solar PV broadly accessible to middle-income consumers.

However, even with these advances, solar PV is still not accessible to many low-income and underserved communities. According to the U.S. DOE Solar Energy Technologies Office, "Despite decreases in system costs, many U.S. households still lack access to affordable solar electricity.... While rooftop PV adoption has become more income-equitable over time, the Solar Futures Study finds that only 31% of solar adopters came from households that earned less than the area median income. In addition, census tracts with majority Black and Hispanic populations exhibit 30% and 69% less rooftop photovoltaic (PV) adoption as compared to the average census tract, respectively."[16] The federal government has stepped in to help states address the problem with new tax credit provisions and the U.S. Environmental Protection Agency's $7 billion Solar for All program.[17]

The 70-year history of solar PV adoption in the U.S. illustrates a failure of clean energy policymaking—one that should not be repeated. Underserved communities cannot afford to wait decades for help in accessing energy storage. Focused and specific policy action is needed now to deliver on the promise of energy storage at scale and across all socioeconomic sectors.

14 Everlight Solar, "A Brief History of Solar Power. How did it Come to Be?," *everlightsolar.com*, November 29, 2021, https://everlightsolar.com/a-brief-history-of-solar-power-how-did-it-come-to-be/#:%7E:text=SOLAR%20POWER%20IN%20TODAY%E2%80%99S%20.

15 Marian L. Tupy and Ronald Bailey, "Solar Power Ever Cheaper," *humanprogress.org*, March 1, 2023, https://humanprogress.org/trends/solar-power-ever-cheaper.

16 Office of Energy Efficiency and Renewable Energy, "Equitable Access to Solar Energy," *energy.gov/eere*, https://www.energy.gov/eere/solar/equitable-access-solar-energy (accessed November 2024).

17 United States Environmental Protection Agency, "Solar for All," *epa.gov*, https://www.epa.gov/greenhouse-gas-reduction-fund/solar-all (accessed November 2024).

Why Do It Now?

Even if it is possible for state policymakers to advance affordable and accessible energy storage programs and policies, why should they? Do states have a compelling interest in doing this now? Isn't simply advancing energy storage for those who can afford it challenging enough?

States that have adopted these types of energy storage policies have had many reasons for doing so. These include commitment to affordable and accessible energy policy overall, a belief in energy resilience/reliability as a right, the recognition that energy storage may at times be the most cost-effective and fastest solution to resolve recurring power outages, a need for widespread storage adoption to support larger state energy policy goals, and requirements attached to federal funding opportunities. Discussion of each of these follows.

Commitments to affordable and accessible energy policy

Many states have made a commitment to affordability and accessibility in their clean energy and decarbonization policies.

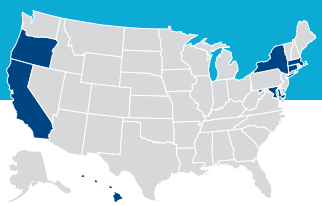
Many states have made a commitment to affordability and accessibility in their clean energy and decarbonization policies. A 2022 report prepared for the Clean Energy States Alliance's 100% Clean Energy Collaborative notes that such commitments "primarily revolve around recognizing the historical injustices that certain communities—particularly low-income communities and communities of color—have faced regarding the environmental, health, and economic impacts of energy generation."[18] To address this history, as well as to satisfy state goals and programmatic requirements, state energy agencies may conclude that it is important for clean energy solutions to be offered to the commu-nities that have been most negatively impacted. A few representative examples follow:

- The Michigan Healthy Climate Plan states that the "transition to a carbon neutral economy has the potential to help alleviate existing environmental injustices, address historical harms, and create new opportunities for Michiganders."[19]
- In 2016 Massachusetts adopted an overarching "Affordable Access to Clean and Efficient Energy Initiative," that "aims to help low- and moderate-income Massachusetts residents access cost-saving, clean and efficient energy technologies."[20] The

18 Charles Hua, "Advancing Equity through 100% Clean Energy," *cesa.org*, February 2023, https://www.cesa.org/wp-content/uploads/Advancing-Equity-through-100-Percent-Clean-Energy.pdf.

19 Examples of such statements of ethical responsibility in state energy plans are too numerous to list here. For a more expansive sampling, see Ibid.

20 Commonwealth of Massachusetts, "Affordable Access to Clean and Efficient Energy Initiative," *mass.gov*, 2024, https://www.mass.gov/info-details/affordable-access-to-clean-and-efficient-energy-initiative#:~:text=Lead%20by%20the%20Department%20of,cost%2Dsaving%2C%20clean%20and%20efficient.



Massachusetts 2050 Decarbonization Roadmap states, "for too long, too many people have disproportionately borne the environmental and health burdens associated with our current energy economy," and proposes actions to "dramatically reduce…on-going, location-specific environmental burdens" for overburdened communities.

- The Wisconsin Clean Energy Plan notes that "a long-standing reliance on fossil fuels, poor environmental policy decisions, and broader historical injustices have had a detrimental effect on various communities in the state."[21]

The Biden Administration has made environmental and energy justice policy commitments with its Justice40 Initiative, which established the goal that "40 percent of the overall benefits of certain Federal investments flow to disadvantaged communities that are marginalized, underserved, and overburdened by pollution." Categories of investment that fall under this initiative include "climate change, clean energy and energy efficiency, clean transit, affordable and sustainable housing, training and workforce development, remediation and reduction of legacy pollution, and the development of critical clean water and wastewater infrastructure."[22] This federal approach is beginning to be replicated at the state level, for example in Connecticut's Energy Storage Solutions program, which includes a Justice40 commitment in that 40 percent of the battery storage deployed under the program is to be directed toward low-income residences and underserved communities.[23]

Energy resilience/reliability as a right

The utility regulatory compact is generally held to be an unwritten agreement between utilities and regulators, whereby utilities are granted territorial monopoly and a guaranteed return on investment in exchange for their commitment to provide reliable, safe electricity to all customers within that territory at reasonable rates.[24] When utilities cannot guarantee a reasonable standard of grid reliability—with grid outages becoming both more frequent and more severe—it may become incumbent upon utilities and their state regulators to find alternate solutions to provide reliable electric power to all customers. And because low-income, remote, and underserved communities are hit more frequently with outages, utilities and regulators may prioritize solutions that will ensure resilient power access to these customers. Examples of this approach include the following:

When utilities cannot guarantee a reasonable standard of grid reliability . . . it may become incumbent upon utilities and their regulators to find alternate solutions.

- Green Mountain Power (GMP), Vermont's largest utility, has proposed a "Zero Outages Initiative." In its filing before the Vermont Public Utility Commission, GMP proposes providing behind-the-meter batteries to residential customers in remote rural locations where batteries offer a more cost-effective solution than traditional

21 Wisconsin Office of Sustainability and Clean Energy, Great Plains Institute, and Slipstream, Inc, "State of Wisconsin Clean Energy Plan," *osce.wi.gov*, April 2022, https://osce.wi.gov/Documents/SOW-CleanEnergyPlan2022.pdf.

22 The White House, "Justice40: A Whole-of-government Initiative," *whitehouse.gov*, https://www.whitehouse.gov/environmental-justice/justice40 (accessed November 2024).

23 State Of Connecticut Public Utilities Regulatory Authority, "PURA Investigation into Distribution System Planning of The Electric Distribution Companies – Electric Storage," *dpuc.state.ct.us*, July 28, 2021, https://www.dpuc.state.ct.us/2nddockcurr.nsf/8e6fc37a54110e3e852576190052b64d/6991ef77ba07bae185258752007994f7/$FILE/171203RE03-072821.pdf.

24 Kenneth Rose, "Electric Power: Traditional Monopoly Franchise Regulation and Rate Making," *sciencedirect.com*, 2004, https://www.sciencedirect.com/topics/engineering/regulatory-compact.

measures, such as undergrounding electric lines. In his testimony in support of the proposal, GMP Vice President and Chief Innovation Executive Josh Castonguay states,

"Equity is at the center in providing zero outages service to all customers. There is a very important geographic and financial equity component… all customers expect reliable, resilient electric service, regardless of income or location. This is more important now than ever before as customers use technology in their home for work, education, healthcare and more…. It is our responsibility to provide continuously reliable service to all our customers, regardless of location… Storage programs have, up to now, primarily been voluntary offerings paid for by customers…. There have been meaningful barriers to participating for many vulnerable customers. With this technology now tested and proven, we must distribute it more widely and with equity squarely in mind…. Storage should be a service that GMP provides to these customers to ensure no outages in an equitable manner, just as undergrounding, and hardened grid infrastructure in our more urban areas provides."[25]

- Although the California Supreme Court ruled that utility PG&E could not be sued by customers over safety-related power shutoffs,[26] the California Public Utilities Commission adjusted its Self-Generation Incentive Program to include two new, higher incentive categories: "Equity" and "Equity Resiliency." According to the program's website, "Both categories aim to ensure lower-income, medically vulnerable, and at-risk for fire communities are at the front of the line to receive competitive incentives for battery storage. The 'Equity' and 'Equity Resiliency' SGIP rebates lower the cost of energy storage technology to almost, if not completely, free of cost."[27]
- Colorado Senate Bill 9, which was passed into law in 2018, establishes the right of Colorado citizens to own and interconnect energy storage, stating that "(I) It is in the public interest to limit barriers to the installation, interconnection, and use of customer-sited energy storage facilities in Colorado; and (II) Colorado's consumers of electricity have a right to install, interconnect, and use energy storage systems on their property without the burden of unnecessary restrictions or regulations and without unfair or discriminatory rates or fees."[28] This kind of law illustrates how state "storage as a right" acts can address barriers such as utility interconnection fees that might otherwise deter or prevent customers from accessing behind-the-meter energy storage.

Storage as the fastest, low-cost solution

In some situations, energy storage may be the fastest and/or lowest cost solution for communities suffering from recurring power outages. Because low-income and historically

25 Pre-filed Direct Testimony of Josh Castonguay on Behalf of Green Mountain Power, October 9, 2023, State of Vermont Public Utility Commission, https://epuc.vermont.gov.

26 Kevin Rector, "California Supreme Court says PG&E can't be sued over safety-related power shutoffs," *latimes.com*, November 20, 2023, https://www.latimes.com/california/story/2023-11-20/california-supreme-court-says-pg-e-cant-be-sued-over-safety-related-power-shutoffs.

27 California Public Utilities Commission, "Participating in Self-Generation Incentive Program (SGIP)," *cpuc.ca.gov*, 2024, https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/demand-side-management/self-generation-incentive-program/participating-in-self-generation-incentive-program-sgip.

28 Colorado General Assembly, "SB18-009: Allow Electric Utility Customers Install Energy Storage Equipment," *leg.colorado.gov*, March 22, 2018, https://leg.colorado.gov/bills/sb18-009.

underserved communities are often hardest-hit by power outages, developing affordability- and accessibility-focused energy storage programs may make economic sense for these communities when traditional measures, such as undergrounding power lines, are not possible or not cost effective. Examples include the following:

In some situations, energy storage may be the fastest and/or lowest cost solution for communities suffering from recurring power outages.

- Under the Biden Administration, U.S. DOE has made numerous grants to Native American tribal communities for remote microgrid systems that include energy storage.[29] There are also examples of energy storage systems developed on islands, in cases where replacing undersea transmission lines would be cost-prohibitive.[30] Remote and underserved communities have also been provided technical assistance for energy storage projects through the U.S. DOE Office of Electricity's Energy Storage for Social Equity (ES4SE) program.[31] And the federal Energy Transitions Initiative Partnership Project, housed in the U.S. DOE Office of Energy Efficiency & Renewable Energy, supports similar projects in remote and island communities.[32]
- The Green Mountain Power proposal referenced above asserts that energy storage may, in some situations, be the most cost-effective solution to persistent power reliability problems. GMP's filing before the Vermont Public Utilities Commission states, "GMP's Zero Outages Initiative…is driven by a focus on equity. Achieving zero outages will support rural Vermont customers who should have the same reliability and resiliency as other parts of the state…. For many of these areas, where single phase rural lines are more difficult to storm harden or underground…storage-based solutions will be evaluated as a preferred solution to help customers ride through any storm events while restoration occurs."[33]
- In other cases, distributed battery storage combined with solar PV may be the fastest way to guarantee electric power to the most vulnerable communities following disasters, when rebuilding the grid could take much longer. For example, following Hurricane Maria in 2017, which caused months-long grid outages in Puerto Rico, microgrids and distributed energy storage were deployed to quickly restore power to critical infrastructure, such as health clinics.[34] More recently, U.S. DOE announced

29 U.S. Department of Energy, "DOE Awards $9 Million to Tribal Communities to Enhance Energy Security and Resilience," *energy.gov*, March 21, 2022, https://www.energy.gov/articles/doe-awards-9-million-tribal-communities-enhance-energy-security-and-resilience; and U.S. Department of Energy, "Energy Storage for Social Equity Initiative," *energy.gov*, 2021, https://www.energy.gov/oe/energy-storage-social-equity-initiative.

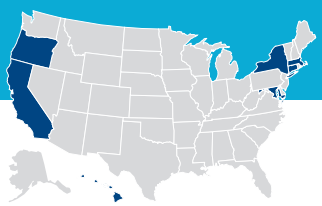
30 Peter Maloney, "Eversource Pushes Ahead with 14.7-MW Battery Project on Martha's Vineyard," *microgridknowledge.com*, February 15, 2019, https://www.microgridknowledge.com/distributed-energy/article/11429907/eversource-pushes-ahead-with-147-mw-battery-project-on-marthas-vineyard.

31 U.S. Department of Energy, "Energy Storage for Social Equity Initiative," *energy.gov*, 2021, https://www.energy.gov/oe/energy-storage-social-equity-initiative.

32 U.S. Department of Energy, "Energy Transitions Initiative Partnership Project," *energy.gov*, https://www.energy.gov/eere/energy-transitions-initiative-partnership-project.

33 Pre-filed Direct Testimony of Josh Castonguay on Behalf of Green Mountain Power, October 9, 2023, State of Vermont Public Utility Commission, https://epuc.vermont.gov.

34 Interstate Renewable Energy Council (IREC), "Solar Saves Lives," *irecusa.org*, 2024, https://irecusa.org/solar-saves-lives; and sonnen Inc., "sonnen Brings Solar + Storage to Clinic in Puerto Rico to Provide Urgent Healthcare Services to Remote Community," *sonnenusa.com*, April 5, 2018, https://sonnenusa.com/en/sonnen-brings-solar-storage-clinic-puerto-rico-provide-urgent-healthcare-services-remote-community; and Cathryn Jakicic, "Puerto Rico Healthcare Going Solar," *facilitiesnet.com*, March 11, 2019, https://www.facilitiesnet.com/powercommunication/tip/Puerto-Rico-Healthcare-Going-Solar--43426#:~:text=An%20integrated%20solar%20and%20battery%20system%20was%20installed.



$440 million for residential batteries and rooftop solar PV in Puerto Rico. The investment is targeted toward low-income households and those with electricity-dependent home health devices. The U.S. DOE announcement stated that the investment "will help lower energy bills for 30,000–40,000 single-family households in Puerto Rico, improve household energy resilience, and keep the lights on during extreme weather events."[35]

Affordable and accessible storage policy in support of state energy goals

One pragmatic reason states may want to consider affordability and accessibility provisions in energy storage programs and policies is because without widespread storage adoption, including in low-income and underserved communities, it may not be possible to realize ambitious state energy goals such as electrification of the building sector, an important component of many state decarbonization plans.

Without widespread storage adoption, including in low-income and underserved communities, it may not be possible to realize ambitious state energy goals.

At this writing, 24 states plus the District of Columbia and Puerto Rico have set 100 percent clean energy, net zero, or decarbonization goals.[36] While some of these goals focus only on the power sector, others extend into other sectors, seeking to decarbonize transportation, buildings, industry, and agriculture.

Such ambitious decarbonization plans will require participation by all strata of society. Currently, the poverty rate in the U.S. is about 12 percent, representing some 40 million people.[37] About 50 million have household incomes below 125 percent of the poverty level.[38] Any multi-sector, 100 percent decarbonization goal will necessarily require customer-focused solutions accessible to low-income communities.

This reality is recognized in both federal and state policymaking. For example, the 2023 U.S. DOE Office of Policy report "On the Path to 100% Clean Electricity" takes an "all-of-society" approach, asserting that "Achieving 100% clean electricity will require action and coordination from all levels of society."[39]

Similarly, some state clean energy plans recognize that participation by low-income and underserved communities is a requirement if states are to achieve their clean energy

35 U.S. Department of Energy, "DOE Announces Up to $440 Million to Install Rooftop Solar and Batteries in Puerto Rico's Most Vulnerable Communities," *energy.gov*, November 2, 2023, https://www.energy.gov/articles/doe-announces-440-million-install-rooftop-solar-and-batteries-puerto-ricos-most-vulnerable.

36 Clean Energy States Alliance, "100% Clean Energy Collaborative," *cesa.org*, https://www.cesa.org/projects/100-clean-energy-collaborative (accessed November 2024).

37 The exact number depends on whether the Official Poverty Measure or the Supplemental Poverty Measure is used. For more information see: Emily A. Shrider and John Creamer, "Poverty in the United States: 2022," *census.gov*, September 2023, https://www.census.gov/content/dam/Census/library/publications/2023/demo/p60-280.pdf.

38 In 2022, household incomes below 125% of poverty corresponded to annual incomes below $34,500 for a family of four or $17,500 for an individual. For more information, see: Legal Services Corporation, "The Justice Gap: Section 2: Today's Low-income America," *justicegap.lsc.gov*, 2024, https://justicegap.lsc.gov/resource/section-2-todays-low-income-america/#:~:text=About%2050%20million%20Americans%20have.

39 U.S. Department of Energy Office of Policy, "On the Path to 100% Clean Electricity," *energy.gov*, May 16, 2023, https://www.energy.gov/policy/articles/path-100-clean-electricity#:~:text=%E2%80%9COn%20the%20Path%20to%20100.

goals. For example, The North Carolina Clean Energy Plan: Transitioning to a 21st Century Electricity System states that "to successfully transition to a clean energy future, North Carolina must [create] an energy system that is clean, affordable, reliable, and equitable."[40] The Washington 2021 State Energy Strategy: Transitioning to an Equitable Clean Energy Future states that "a just and equitable state energy strategy is a necessary condition for success."[41] The California Air Resources Board states, "A successful building decarbonization transition must be an equitable one. This requires policy design that is responsive to the concerns, needs, and conditions of frontline communities."[42]

One example of affordable and accessible clean energy programming in support of a broader state climate plan is provided by the Michigan Roadmap to 2030, which is part of the state's Healthy Climate Plan. The Roadmap provides key recommendations to reach the state's 2030 goal of reducing greenhouse gas emissions by 52 percent from 2005 baselines, including ensuring that "At least 40 percent of state funding for climate-related and water infrastructure initiatives benefit Michigan's disadvantaged communities." Initiatives under this plan include cleaning the electric sector, electrifying the transportation sector, decarbonizing homes and businesses and driving clean innovation in industry.[43]

Federal funding requirements and guidelines

Some federal funding requirements stipulate that state clean energy grant proposals must include community benefits planning.

Some federal funding requirements stipulate that state clean energy grant proposals must include community benefits planning in order to qualify. For example, a Community Benefits Plan is required for all applications for Inflation Reduction Act (IRA) and Bipartisan Infrastructure Law (BIL) grants and loans. Community Benefits Plans are based on four core policy priorities: (1) investing in America's workforce; (2) engaging communities and labor; (3) advancing diversity, equity, inclusion, and accessibility; and (4) implementing Justice40.[44] In most cases, the Community Benefits Plan accounts for 20 percent of the technical merit score when grant proposals are reviewed, and becomes part of the contractual obligation for funding recipients.[45]

40 Century Electricity System," *files.nc.gov*, October 2019, https://files.nc.gov/ncdeq/climate-change/clean-energy-plan/NC_Clean_Energy_Plan_OCT_2019_.pdf.

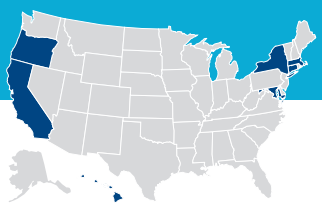
41 Washington State Department of Commerce, "Washington 2021 State Energy Strategy: Transitioning to an Equitable Clean Energy Future," *commerce.wa.gov*, December 2020, https://www.commerce.wa.gov/wp-content/uploads/2020/12/Washington-2021-State-Energy-Strategy-December-2020.pdf.

42 California Air Resources Board, "Equitable Building Decarbonization: Implementation Approaches," *ww2.arb.ca.gov*, 2024, https://ww2.arb.ca.gov/our-work/programs/sustainable-communities-program/research-solicitations/equitable-building-decarb-approaches#:~:text=A%20successful%20building%20decarbonization%20transitions.

43 The MI Healthy Climate Plan was established under Executive Directive 2020-10. See: Michigan Department of Environment, Great Lakes, and Energy (EGLE), "MI Healthy Climate Plan," *michigan.gov*, April 2022, https://www.michigan.gov/egle/about/organization/climate-and-energy/mi-healthy-climate-plan.

44 Under Executive Order 14008, the U.S. Federal Government has made it a goal that 40 percent of the overall benefits of certain Federal investments flow to disadvantaged communities that are marginalized, underserved, and overburdened by pollution. For more information on Justice40, see: The White House, "Justice40: A Whole-of-government Initiative," *whitehouse.gov*, https://www.whitehouse.gov/environmentaljustice/justice40/ (accessed November 2024).

45 For more information on Community Benefit Plans and planning, see: U.S. Department of Energy, "About Community Benefits Plans," *energy.gov*, https://www.energy.gov/infrastructure/about-community-benefits-plans#:~:text=Community%20Benefit%20 (accessed November 2024).



Broader requirements for federal programs are provided by the Justice40 Initiative, established by the Biden Administration under Executive Order 1408. Justice40 requires that 40 percent of the overall benefits of certain federal investments in clean energy programs, including energy storage offerings, must flow to disadvantaged communities. The Justice40 Initiative applies to over 145 U.S. Department of Energy programs, including much of the $62 billion investment under the Bipartisan Infrastructure Law, and drives fundamental goals that include the following:

- Improving affordability and access to the power grid
- Extending the financial benefits from investments in research and development to more sectors of society
- Designing equitable systems, technology, and programs that increase value of those investments to more communities
- Prioritizing solutions that mitigate direct or systemic environmental impacts on disadvantaged communities

Justice40 requires that 40 percent of the overall benefits of certain federal investments in clean energy programs, including energy storage offerings, must flow to disadvantaged communities.

Underlying the Justice40 Initiative, and increasingly underlying state-level initiatives, are the four core tenets of energy justice, as established and defined by U.S. DOE: distributive justice, recognition justice, procedural justice, and restorative justice.[46] These four tenets are summarized briefly here:

- **Distributive Justice:** seeking to ensure that clean energy systems and services are available and affordable to all
- **Recognition Justice:** focusing on those in society who have been historically ignored or misrepresented in the energy system, and determining whether proposed projects or programs would create additional social or environmental impacts within the communities being served
- **Procedural Justice:** increasing public participation through transparency, accountability, and due process
- **Restorative Justice:** seeking to reverse and repair the harms done by legacy programs through the creation of improved environmental and social conditions within communities, including job and enterprise creation, as well as remediation of legacy pollution from fossil-fueled power plants

46 B. Tarekegne, R. O'Neil R, and J. Twitchell, "Energy Storage as an Equity Asset." Curr Sustainable Renewable Energy Rep. 2021;8(3):149–55. doi: 10.1007/s40518-021-00184-6. Epub 2021 May 20. PMCID: PMC8134812. https://link.springer.com/article/10.1007/s40518-021-00184-6.

Affordability and Accessibility Provisions in State Energy Storage Programs

Research by Pacific Northwest National Laboratories (PNNL) found that almost half of U.S. states (22 states + D.C.) have taken some form of action on energy equity.[47] Research for this report reveals that far fewer have taken such actions on energy storage.

States have developed programs, policies, and regulations addressing access to clean energy resources.

As more states begin to consider affordability and accessibility in energy storage programs, various approaches will emerge, including legislative, executive, and regulatory actions (or combinations of these). Variations will likely result from several factors including unique regional dynamics; the extent to which policymakers have embraced decarbonization and have begun taking steps to restructure legacy, fossil-fuel-based infrastructure; penetration levels of renewable energy resources; whether the state is served by vertically integrated or restructured electric utilities; and whether the state is part of an ISO/RTO market.

Against this varied background, states have developed programs, policies, and regulations addressing access to clean energy resources. Some of these initiatives specifically address energy storage, while others apply broadly to clean energy policies but do not call out specific technologies. Examples of these programs are summarized below.

Executive Orders and initiatives

- **Connecticut:** Governor Ned Lamont's Executive Order No. 3 (2019)[48] required that the Governor's Council on Climate Change prioritize equity and environmental justice. As a result, the Equity and Environmental Justice Working Group was formed to develop plans and guidelines for engaging diverse stakeholders in the process of integrating equity and environmental justice in decision-making processes.
- **Maryland: I**n 2020, then-Governor Larry Hogan, through Executive Order 2019.09, established the Task Force on Renewable Energy Development and Siting,[49] which encourages the responsible siting of clean and renewable energy projects, such as

47 Elsie Puig-Santana, "Database Reveals Energy Equity Policy Activities Across States," *pnnl.gov*, April 19, 2023, https://www.pnnl.gov/publications/database-reveals-energy-equity-policy-activities-across-states.

48 State of Connecticut Executive Order No. 3, 2019, https://portal.ct.gov/-/media/office-of-the-governor/executive-orders/lamont-executive-orders/executive-order-no-3.pdf?la=en&hash=F836ED64F1BB49A5424AB4C7493A3AE3.

49 Governor's Task Force on Renewable Energy Development and Siting Final Report, 2020, https://planning.maryland.gov/Documents/OurWork/envr-planning/Renewable_Energy_Final_Report.pdf.

wind and solar, in Maryland and makes consensus-based recommendations for accelerating the siting of renewable energy projects, minimizing the impact of these projects on agriculturally or ecologically sensitive areas, and identifying specific changes to state law, policies, procedure, and other means of support.

- **Massachusetts:** In 2016, then-Governor Charlie Baker announced the Affordable Access to Clean and Efficient Energy Initiative,[50] an inter-secretariat Initiative led by the Executive Offices of Energy and Environmental Affairs and Housing and Economic Development. The Initiative resulted in a report and numerous programs, including an income-based adder for clean heating and cooling programs, the Affordable Clean Residential Energy program (renewable thermal paired with solar for income-eligible homes), the Zero-Energy Modular Affordable Housing Initiative, and others. The Solar Massachusetts Renewable Target (SMART) solar program, which features an incentive adder for energy storage paired with solar, also offers an incentive adder for low-income participants. Another model for affordable and accessible energy storage has been advanced through the Cape & Vineyard Electrification Offering.[51]
- **New Mexico:** In 2019, Governor Lujan Grisham issued Executive Order 2019-003 on Climate Change and Waste Prevention[52] to create the state Interagency Climate Change Task Force, which adopted Climate Equity Guiding Principles including, among other things, prioritizing utility services and reducing energy burdens for overly burdened and low-income communities.[53]
- **North Carolina:** In 2022, North Carolina Governor Roy Cooper signed Executive Order No. 246, North Carolina's Transformation to a Clean, Equitable Economy,[54] establishing pollution reduction and net-zero emissions goals while prioritizing communities overburdened by pollution. The executive order directs cabinet agencies to consider environmental justice when taking actions related to climate change, resilience, and clean energy and identifies an Environmental Justice (EJ) and Equity Lead in each cabinet agency to support energy transition efforts. Some of the duties required of the EJ Lead include increasing awareness among agency leadership and staff of the history and current impacts of environmental, economic, and racial inequities, as well as developing and implementing the Public Participation Plan and Limited English Proficiency Plan.[55]

50 Commonwealth of Massachusetts, "Affordable Access to Clean and Efficient Energy Initiative," https://www.mass.gov/info-details/affordable-access-to-clean-and-efficient-energy-initiative.

51 Massachusetts Energy Storage Initiative, 2015, https://www.mass.gov/energy-storage-initiative.

52 For a detailed assessment of equity in the Massachusetts energy storage-supporting programs, see: Applied Economics Clinic and Clean Energy Group, "Energy Storage Equity: An Assessment of Three Massachusetts Programs," *cleanegroup.org*, September 18, 2024, https://www.cleanegroup.org/publication/energy-storage-equity-massachusetts.

53 New Mexico, 2019, Executive Order on Addressing Climate Change and Energy Waste Prevention, https://www.governor.state.nm.us/wp-content/uploads/2019/01/EO_2019-003.pdf.

54 North Carolina Executive Order Number 246, 2022, https://governor.nc.gov/news/press-releases/2022/01/07/governor-cooper-signs-executive-order-detailing-next-steps-path-clean-energy-and-equitable-economy.

55 Duke Energy has initiated a customer battery pilot in its North Carolina territory. For a more in-depth assessment of the opportunity for distributed energy storage in North Carolina, see: Applied Economics Clinic and Clean Energy Group, "Distributed Energy Storage: The Missing Piece in North Carolina's Decarbonization Efforts," *cleanegroup.org*, December 12, 2023, https://www.cleanegroup.org/publication/distributed-energy-storage-the-missing-piece-in-north-carolinas-decarbonization-efforts.

Legislation

- **Colorado:** Legislation passed in 2024 (Senate Bill 24-207, "Access to Distributed Generation")[56] expanded access to community solar gardens by guaranteeing 51 percent of solar gardens built after 2026 are reserved for income-qualified customers. The law further required that the community solar capacity investor-owned electric utilities make available to customers must be paired with energy storage; and it required investor-owned electric utilities with more than 500,000 customers to make at least 50 megawatts (MW) of stand-alone community solar capacity available, and investor-owned utilities with 500,000 or fewer customers to make at least 3.5 MW of inclusive community solar available.
- **Illinois:** The Climate and Equitable Jobs Act of 2021[57] directed the Illinois Power Agency and Department of Commerce and Economic Opportunity to expand "priority access to the clean energy economy for businesses and workers from communities that have been excluded from economic opportunities in the energy sector, have been subject to disproportionate levels of pollution, and have disproportionately experienced negative public health outcomes." Among other things, the Act established an accountability system that includes minimum accessibility standards, a new category for "equity eligible contractors," and monitoring, eporting, and training requirements.
- **Washington:** The Clean Energy Transformation Act,[58] signed into law in 2019, commits Washington to an electricity supply free of greenhouse gas emissions by 2045. Among other provisions, the law requires an equitable distribution of the benefits from the transition to clean energy for all utility customers and adds and expands energy assistance programs for low-income customers.

Regulations, tariffs, and rates

- **California:** In 2022, the California Public Utilities Commission issued a revised tariff for net energy metering (NEM),[59] a program that allows customers with behind-the-meter clean generation resources to receive credit on their electricity bills for the energy they export to the grid. The order restructures NEM pricing to incentivize solar plus storage systems and other home electrification measures while making rates more affordable for all. The tariff provides low-income customers, residents living in disadvantaged communities, and residents living in California Indian Country more than double the usual number of bill credits.
- **Minnesota:** As part of the 2023 proceeding that led to a rate increase approved for Xcel Energy by the Minnesota Public Utilities Commission (PUC), the Just Solar Coalition, a group of nonprofits and cooperatives, emerged as a new voice lobbying for low-income households and ratepayers of color. Their involvement resulted

56 Colorado Senate Bill 24-207, 2024, https://leg.colorado.gov/bills/sb24-207.

57 Illinois Climate and Equitable Jobs Act, 2021, see https://epa.illinois.gov/content/dam/soi/en/web/epa/topics/ceja/documents/102-0662.pdf.

58 Washington Clean Energy Transformation Act, 2019, see https://www.utc.wa.gov/regulated-industries/utilities/energy/conservation-and-renewable-energy-overview/clean-energy-transformation-act.

59 California Public Utilities Commission, "CPUC Modernizes Solar Tariff To Support Reliability and Decarbonization," 2022, see https://www.cpuc.ca.gov/news-and-updates/all-news/cpuc-modernizes-solar-tariff-to-support-reliability-and-decarbonization.

in regulators adopting for the first time a provision acknowledging that the concept of energy justice is relevant to setting electricity rates. According to local news coverage of the proceedings, the Minnesota PUC granted Xcel Energy a much smaller electricity rate increase than it sought after hearing testimony from the Coalition's advocates.[60] Specifically, Xcel's initial proposal called for a 21 percent rate increase, but was lowered to a 15 percent ask through docket negotiations. The PUC also included in its order two provisions that could reduce bills for some ratepayers.

- **New York:** In 2023, the New York State Public Service Commission (PSC) addressed Case 18-E-0130–In the Matter of Energy Storage Deployment Program.[61] The Commission's Order Establishing Updated Energy Storage Goal and Deployment Policy applied a 35 percent carve-out for disadvantaged communities to the State's procurement of its 6 gigawatts (GW) energy storage target, to be attained by 2030. The carve-out applied both to bulk and distributed energy storage procurement. Specifically, the PSC directed allocation of a minimum of 35 percent of program funding for energy storage projects in areas of the state that will most benefit disadvantaged communities and reduce reliance on high-emitting peaking plants. For bulk power storage, the Commission identified specific geographic capacity zones that should be prioritized for hosting large-scale energy storage projects, to provide the greatest benefit to disadvantaged communities. The Commission further ordered that at least 35 percent of procured energy storage projects be located within disadvantaged communities. Lastly, the Commission directed the New York State Energy Research and Development Authority (NYSERDA) to incorporate considerations for disadvantaged communities and their participation within its implementation plans.
- **Oregon:** In 2020, the Oregon Public Utility Commission responded to Oregon then-Governor Kate Brown's recommendations within Executive Order 20-04 to address affordability and environmental justice concerns.[62] In collaboration with Oregon Housing and Community Services, the Oregon PUC established a public process to address and mitigate energy burdens through rate design and other programs.

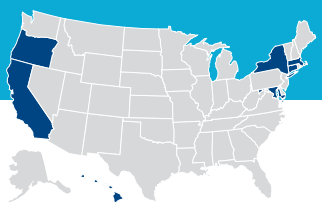
Incentive programs

- **California:** The California Public Utilities Commission (CPUC) administers the California Self-Generation Incentive Program (SGIP), which offers energy storage rebates for homes, apartments, and critical facilities. SGIP launched in 2001 as a response to the 2000-2001 California Energy Crisis and its associated grid outages. In 2016 it was modified to assign 75 percent of the total incentive budget to energy storage. The SGIP Equity Budget, a 25 percent carve-out of the program's funds reserved for projects in disadvantaged and low-income communities, was created in 2017, and further modifications in 2018 carved out funding for vulnerable households in fire-prone areas, critical service providers serving those districts, and customers located in those districts that participate in the state's low-income solar generation programs.

60 Sahan Journal, "Energy equity advocates help keep Xcel Energy's rate hike to a minimum," 2023, https://sahanjournal.com/climate-environment/xcel-rate-case-minnesota.

61 New York Public Service Commission, "New York State Case No. 18-E-0130. 2024;In the Matter of Energy Storage Deployment Program," https://www.nysrc.org/wp-content/uploads/2024/07/9.1-NY-PSC-Storage-Order-6-20-2024-Attachment-9.1.pdf.

62 Oregon State Legislature, "Report on Executive Order 20-04," 2020, https://olis.oregonlegislature.gov/liz/2019I1/Downloads/CommitteeMeetingDocument/222332.



The CPUC authorized $1 billion in funding for SGIP through 2024, with prioritization for low-income and medically vulnerable customers. In 2022, provisions were added to provide higher rebates under the categories of "Equity" and "Equity Resiliency," lowering the cost of energy storage almost to zero for low-income households.[63]

Equity budget incentive rates were initially set at $0.35 per watt-hour, but after more than a year, none of the $72 million in available funds had been allocated toward an energy storage project in California's underserved communities. In 2019, the CPUC increased the equity budget incentive level to $0.85/watt-hour and made other changes, such as stipulating that no developer cap should be applied to the resiliency budget.[64] When the higher equity incentives became available in May 2020, the equity budget was fully subscribed in numerous utility territories within three days.[65]

- **Connecticut:** Connecticut's Energy Storage Solutions program,[66] launched in 2022, combines an up-front rebate with performance incentives for residential and commercial battery customers. Qualifying for the up-front rebate requires enrolling the battery in a passive dispatch program. There is no performance incentive associated with passive dispatch, but there is an active dispatch program that does offer performance incentives. The active dispatch program takes precedence when called over the passive dispatch schedule. A residential equity rebate doubles the up-front incentive for qualifying customers. Other provisions include low-cost financing from the Connecticut Green Bank (a co-administrator of the program), a direct payment option to de-risk loans, and a Justice40 commitment (40 percent of the systems installed under the program are to be located in underserved communities).

  In the first year of implementation, the program was very successful on the commercial side, becoming fully subscribed shortly after its launch, but the residential program was less successful. To address this, the Connecticut Green Bank revised the residential program, allowing residential customers to qualify for as much as $16,000 in upfront incentives—up from the previous maximum of $7,500—while low-income customers' upfront incentives were raised from $400/kilowatt-hour (kWh) to $600/kWh. Customers in underserved communities now have access to upfront incentives of $450/kWh, up from the previous $300/kWh. The program also extends added affordability incentives to multi-family affordable housing properties by allowing them to qualify for the residential low-income incentive rate, which is higher than the commercial rate.[67]

63 Pacific Gas and Electric Company SGIP Working Group, 2022, "2021 SGIP Energy Storage Market Assessment Study," https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/self-generation-incentive-program/sgip-2021-market-assessment-study.pdf.

64 Public Utilities Commission of The State of California, "Decision Establishing A Self-Generation Incentive Program Equity Resiliency Budget, Modifying Existing Equity Budget Incentives, Approving Carry-Over Of Accumulated Unspent Funds, and Approving $10 Million To Support The San Joaquin Valley Disadvantaged Community Pilot Projects, *docs.cpuc.ca.gov*, September 12, 2019, https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M313/K975/313975481.PDF.

65 State of California and the Self-Generation Incentive Program, "Self-Generation Incentive Program," *selfgenca.com*, 2015, https://www.selfgenca.com/home/about.

66 Connecticut Public Utilities Regulatory Authority, "Energy Storage Solutions," https://portal.ct.gov/pura/electric/office-of-technical-and-regulatory-analysis/clean-energy-programs/energy-storage-solutions-program.

67 More information about the Connecticut Energy Storage Solutions program is available at: State of Connecticut Public Utilities Regulatory Authority, "Docket No. 17-12-03re03 Pura Investigation into DistributionSystem Planning of The Electric Distribution Companies—Electric Storage," *portal.ct.gov*, July 28, 2021, https://portal.ct.gov/-/media/PURA/electric/Final-Decision-17-12-03RE03.pdf.

- **Hawaii:** The Hawaii Bring Your Own Device (BYOD) program, a successor to the previous Battery Bonus program, offers customers incentives for installing a new battery and dispatching it during periods of high electric demand. Incentive rates are $100 per kilowatt (kW) upfront incentive, with a cap at $500, plus a Low-Moderate Income Adder that provides an additional upfront incentive of $100 per kW, and that also caps at $500; a monthly capacity performance incentive of $5 per kW; and a monthly export credit, which is calculated based on an assumed exported amount to the grid.[68]
- **Maryland:** The Maryland Energy Administration (MEA) has created the Resilient Maryland Program, a competitive grant program that provides funds to help offset the costs of analyzing, planning, and designing clean and resilient Distributed Energy Resource (DER) systems, such as microgrids and resiliency hubs that benefit Maryland's under-resourced communities. The program awards grants in three areas: preconstruction planning, capital support, and resiliency hubs.[69]
- **Massachusetts:** Massachusetts' SMART solar incentive program includes an incentive adder for energy storage installed with solar. Originally, a community solar system serving at least 50 percent low-income customers received an added 6 cents/kWh, while low-income, behind-the-meter projects that were less than 25 kW received 230 percent of the base compensation rate. Later program revisions expanded the definition of "low-income customer" to include any customer who qualified for a low-income discounted electric rate or lived in a neighborhood with average household income equal to or less than 65 percent of the statewide median income. Additionally, a percentage of each capacity block was reserved for income-eligible customers.[70]
- **Oregon:** The Oregon Solar + Storage Rebate Program[71] issued rebates for paired solar and storage systems, with a carve-out for low- and moderate-income residential customers as well as low-income service providers. LMI residential customers also received a larger rebate than non-income-eligible customers, with rebates calculated based on installed capacity. Low-income service providers were defined as 1) developers/owners of affordable multifamily housing, 2) community service organizations (public, tribal, or nonprofit) whose primary purpose is to offer assistive services to low-income households, and 3) tribal or local government entities that use public buildings to provide LMI or emergency services to the community. Rebates were issued to approved contractors, who then passed the savings on to their customers. The program is fully subscribed and not taking applications at this time.

68 Hawaiian Electric, "Customer Incentive Programs: Bring Your Own Device," *hawaiianelectric.com*, 2024, https://www.hawaiianelectric.com/products-and-services/customer-incentive-programs/bring-your-own-device.

69 Maryland Energy Administration, "FY25 Resilient Maryland Program," *maryland.gov*, 2024, https://energy.maryland.gov/business/pages/ResilientMaryland.aspx.

70 For more information on equity in the Massachusetts energy storage incentive programs, see: Applied Economics Clinic and Clean Energy Group, Energy Storage Equity: An Assessment of Three Massachusetts Programs," *cleanegroup.org*, September 18, 2024, https://www.cleanegroup.org/publication/energy-storage-equity-massachusetts.

71 Oregon Department of Energy, Oregon Solar+Storage Rebate Program, https://www.oregon.gov/energy/Incentives/Pages/Solar-Storage-Rebate-Program.aspx.

Utility planning requirements

- **Michigan:** Governor Gretchen Whitmer's Executive Directive 2020-10[72] requires the Michigan Department of Environment, Great Lakes, and Energy (EGLE) to expand the environmental advisory opinion it provides to the Michigan Public Service Commission to include climate and environmental justice impacts. The Michigan PSC incorporates these opinions into its Integrated Resource Planning.
- **Oregon:** The Oregon PUC adopted utility distribution system planning (DSP) guidelines through a cooperative process with utilities and stakeholders in December 2020. Included in Order 20-485,[73] these guidelines included a goal to align DSP initiatives with state and local equity goals and incorporate these considerations into distribution system investments.

Energy efficiency and electrification

Energy efficiency and electrification represent two new areas of clean energy policy where states are beginning to integrate energy storage into existing programs. In both cases, examples come from Massachusetts.

- **Energy Efficiency:** In 2019, Massachusetts incorporated battery storage into ConnectedSolutions,[74] an active demand management program administered by utilities as part of the Commonwealth's three-year energy efficiency program. ConnectedSolutions was designed as a customer performance-based incentive; those customers who enrolled their residential or commercial battery systems received a five-year contract with the utility, under which they were compensated for allowing their batteries to be dispatched to reduce loads during peak demand hours. The utilities have not developed an income-eligible tier of the program; however, because they are now considered an energy efficiency measure, home battery purchases are eligible for the same zero-interest Mass Save HEAT loan for which other efficiency measures qualify. The ConnectedSolutions battery program has been extended to Rhode Island, Connecticut, and New Hampshire, which are served in part by the same investor-owned utilities that serve Massachusetts, and its design has been emulated in other states.[75]
- **Electrification:** The Cape & Vineyard Electrification Offering (CVEO), approved by the Massachusetts Department of Public Utilities in 2023,[76] is a $6 million pilot program offering combined solar, battery storage, and heat pump systems to low- and moderate-income residential customers served by the Cape Light Compact. The pilot targets 100 households, 80 of which will be below the 60 percent Area Median Income (AMI) threshold, and 20 of which will be between 60-80 percent

72 State of Michigan Office of the Governor, 2020, "Executive Directive 2020-10," https://content.govdelivery.com/attachments/MIEOG/2020/09/23/file_attachments/1553296/ED%202020-10%20Carbon_Neutral_Goal.pdf.

73 Oregon Public Utility Commission, "Order 20-485," 2020, https://apps.puc.state.or.us/orders/2020ords/20-485.pdf.

74 Mass Save, "ConnectedSolutions," https://www.masssave.com/residential/programs-and-services/connectedsolutions.

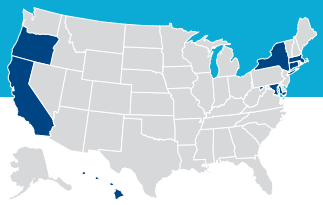
75 For more information about ConnectedSolutions, see the CESA ConnectedSolutions resource page at: Clean Energy Group, "ConnectedSolutions Resource Page," *cleanegroup.org*, www.cleanegroup.org/initiatives/energy-storage-policy-and-regulation/connectedsolutions (accessed November 2024).

76 Gabe Epstein and Todd Olinsky-Paul, "Innovative low-income battery pilot finally wins approval in Massachusetts," *renewableenergyworld.com*, April 10, 2023, https://www.renewableenergyworld.com/solar/innovative-low-income-battery-pilot-finally-wins-approval-in-massachusetts/#gref.

AMI. The low-income households will receive rooftop solar and heat pumps free of charge, while the median-income households will be required to pay 20 percent of the costs. They will also have access to HEAT loans that provide interest-free financing. Twenty-five households will also receive battery storage, with low-income customers receiving two batteries for free, while median-income customers will receive a $15,000 incentive for battery systems (and access to HEAT loans to help cover remaining costs). Households receiving battery storage will be automatically enrolled in Massachusetts' ConnectedSolutions program, but to avoid double-dipping, the ConnectedSolutions performance payments will be paid back to Cape Light Compact to offset program costs. To participate in the program, income-eligible customers must have had a home energy efficiency audit within the previous two years, and have implemented all recommended upgrades, including replacing fossil fuel appliances (i.e. they must have fully decarbonized homes).

A second, similar pilot program, funded by a $50 million U.S. DOE grant awarded to Generac Grid Services, will support a battery+heat pump offering to 2,000 low- and moderate-income customers across the Commonwealth.[77]

77 Miriam Wasser, "Pilot program will install batteries in 2,000 Mass. homes to reduce energy demand on the grid," *wbur.org*, November 15, 2023, https://www.wbur.org/news/2023/11/15/generac-mass-save-battery-shave-peak-demand-pilot and U.S. Department of Energy's Grid Deployment Office, "Fact Sheet: Grid Resilience and Innovation Partnerships Program," *media.wbur.org*, October 2023, https://media.wbur.org/wp/2023/11/DOE-GRIP-Generac-Grid-Services.pdf.



Recommendations

Based on the emerging strategies summarized in this report, states should consider the following types of affordability and accessibility provisions (listed in no particular order) when developing energy storage programs and policy:

1. **Capacity carve-out** in an incentive or procurement program (a percentage of incentive budget or procurement capacity is set aside for projects benefiting underserved communities)
2. **Incentive adder** for income-eligible participants, those residing in historically underserved communities, and commercial entities serving those communities
3. **Front-loaded incentive payments** for income-eligible participants
4. **Accessible financing** for income-eligible participants
5. **Pre-development technical assistance** to determine technical and economic feasibility and project optimization, and to support funding applications
6. **Community benefits requirement**, for example, a requirement that commercial projects qualifying for affordability and accessibility incentive adders show how the project will benefit the underserved community
7. **Support for a variety of ownership models**, for example incentive eligibility for both customer-owned and leased systems

Additionally, three overarching precepts apply when developing energy storage programs:

1. Whenever possible, consideration of affordability and accessibility provisions should take place when programs are designed, rather than as a later add-on
2. The process of developing these provisions should incorporate input from a wide variety of stakeholders, including representatives of underserved communities and advocacy organizations
3. Once programming is in place, its effectiveness should be evaluated regularly, and provisions should be adjusted if they are found to be ineffective

Discussion of the above-listed seven types of provisions follows.

1. Capacity carve-outs

A program capacity carve-out can help ensure that qualifying customers and communities have the opportunity to participate in a program. Without a carve-out, there is a risk that incentives, grants or procurement targets will be fully subscribed by more advantaged customers before overburdened communities are able to access them. For example, the

California Energy Storage Initiative (SB 700) was designed to integrate revenue-generating systems in low-income and underserved communities; it includes a carve-out that requires utilities to use 25 percent of the energy storage systems money they receive in low-income neighborhoods and housing. Different states have adopted different percentage carve-outs. The federal Justice40 initiative establishes that 40 percent of federal investments in various areas, including clean energy, must flow to disadvantaged communities.[78]

2. Incentive adders

A carve-out, while important, will likely not by itself be sufficient to overcome the additional cost, risk, and difficulty associated with developing energy storage in low-income and historically underserved communities. These projects can be relatively more expensive and difficult than similar projects in wealthier communities due to multiple factors including higher upfront costs, limited access to financing, information barriers, challenges related to property ownership and split incentives, aging or inadequate infrastructure, higher land acquisition costs, complex permitting processes, lack of community engagement and support, and a higher need for community outreach.[79]

The California SGIP program provides an example of the need for incentive adders. Initially, SGIP included a carve-out for low-income communities; but there was no uptake[80] until California instituted low-income incentive adders, after which the LMI budget quickly became fully subscribed. California also illustrates how different adders can be offered for different classes of customers; for example, the equity adder is $0.85/Wh, while the equity resilience adder is $1.00/Wh (see Table 1).

States should consider adopting both a separate, reserved capacity block and an additional incentive adder for overburdened communities. Adders can be directed to income-eligible customers or those residing in underserved or overburdened communities; or they can be directed toward organizations that provide public services to underserved communities.

TABLE 1

California SGIP—Equity and Equity Resiliency Energy Storage Incentive adders per Watt-hour (Wh)

Budget Categories	Incentive Rate $/Wh
Equity	$0.85
Equity Resiliency	$1.00

Source: San Diego Gas & Electric. See https://sgipsd.org/incentives.

3. Front-loaded payments

Up-front or front-loaded incentives are important to help offset the initial capital investment needed to develop energy storage in low-income and historically overburdened communities. This is because the initial cost barrier can be

78 Federal Register, "Tackling the Climate Crisis at Home and Abroad," Executive Order 14008 of January 27, 2021. https://www.federalregister.gov/documents/2021/02/01/2021-02177/tackling-the-climate-crisis-at-home-and-abroad

79 There are numerous studies on these and other barriers to developing distributed generation, energy storage and energy efficiency in low-income and historically underserved communities. See California Energy Commission, "Low-Income Barriers Study, Part A: Overcoming Barriers to Energy Efficiency and Renewables for Low-Income Customers and Small Business Contracting Opportunities in Disadvantaged Communities," 2016, https://www.energy.ca.gov/rules-and-regulations/energy-suppliers-reporting/clean-energy-and-pollution-reduction-act-sb-350-3; and Clean Energy Group, "Overcoming Barriers to Solar+Storage in Affordable Housing: A Survey of Multifamily Affordable Housing Developers," https://www.cesa.org/wp-content/uploads/Overcoming-Barriers-to-SolarStorage-in-Affordable-Housing.pdf.

80 Seth Mullendore and Lewis Milford, "California Aims to Fix Low-Income Storage Program and Deliver New Resilience Incentives," *cleanegroup.org*, September 4, 2019, https://www.cleanegroup.org/california-aims-to-fix-low-income-storage-program-and-deliver-new-resilience-incentives.

difficult or impossible to overcome where incomes and credit ratings are low, even if the project would pay for itself over time. Annual or performance-based incentive payments can still be important, for example, to link battery dispatch with program goals such as peak demand reduction; but this type of incentive structure requires a greater initial investment and the ability to wait a number of years to recoup costs. Note also that the net present value of an incentive is greater when offered up front than when paid out in a series of installments over time. Additionally, financiers tend to view future revenues as riskier, and therefore less bankable, than present payments.

Up-front or front-loaded incentives are important to help offset the initial capital investment needed to develop energy storage.

An example of an up-front incentive adder is the Connecticut Energy Storage Solutions program (see Table 2).

States should consider providing front-loaded/up-front incentives, and/or providing an up-front incentive adder to reduce the initial cost barrier for low-income and historically underserved communities.

TABLE 2
Connecticut Energy Storage Solutions Equity Adders

Incentive Step	Estimated Number of Participants	Capacity Block (MW)	Non-LMI (low- to moderate-income) Upfront Incentive ($kWh)	Underserved Communities Effective Upfront Incentive ($/kWh)	Low-Income Household Effective Upfront Incentive ($/kWh)
1	1,400	10.0	$250.00	$450	$600
2	2,800	15.0	$212.50	$450	$600
3	5,800	25.0	$162.50	$450	$600
Total	**10,000**	**50.0**			

Source: Energy Storage Solutions at https://energystoragect.com/ufaq/what-is-the-upfront-incentive-and-how-does-it-work-for-residential-customers.

4. Accessible financing

Some energy storage incentive programs offer low- or no-cost financing, which can help customers with low incomes or low credit scores obtain a loan. Examples include the Massachusetts ConnectedSolutions program, which is housed within the state's energy efficiency plan and offers access to interest-free Mass Save HEAT loans, and the Connecticut Energy Storage Solutions program, which is co-administered by the Connecticut Green Bank and offers low-interest Smart-e loans. Each of these programs partners with outside lenders. For more information, see the links below.

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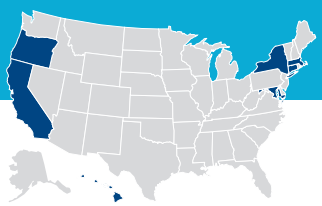


- **Mass Save HEAT Loans Program:** https://www.masssave.com/-/media/Files/PDFs/Save/Residential/rebate-forms/Mass-Save---HEAT-LOAN-Packet.pdf
- **Connecticut Smart-e Loans Program:** https://www.ctgreenbank.com/home-solutions/smart-e-loans

A low- or no-interest loan program essentially buys down the cost of capital for approved borrowers. This may be the simplest way to make financing more accessible, but it is not the only way. Other strategies include on-bill financing or payments,[81] property assessed clean energy (PACE) loans,[82] loan loss reserves,[83] and aggregated financing.[84]

Many energy storage developers offer private financing to their customers. However, states seeking to advance affordable and accessible to energy storage programs should consider the advantages of providing alternate financing options that do not require high credit scores to qualify.

Pre-development, technical-economic project analysis can be provided to commercial and municipal customers through small grants or by direct services contracted by the state.

5. Technical assistance

Pre-development, technical-economic project analysis can be provided to commercial and municipal customers through small grants or by direct services contracted by the state. This kind of project support allows potential project developers to determine 1) whether the project makes sense, and 2) how to design the system to optimally provide benefits that are important to the customer and the community. It can also be useful in helping communities that lack expertise or resources to create a viable application for project funding.

For example, Connecticut Green Bank partnered with the nonprofit Clean Energy Group (CEG) to provide free, project-specific, technical assistance for multifamily affordable housing facilities contemplating applying to the Connecticut Energy Storage Solutions program. Assistance included weatherization audits and solar+storage feasibility assessments, informed by the actual experience of electricity-dependent affordable housing residents through a research and survey initiative led by the Yale Center on Climate Change and Health and Operation Fuel.[85] The CEG Technical Assistance Fund has provided similar assistance to hundreds of solar+storage resilience projects in underserved communities across the country.[86] Similarly, U.S. DOE Office of Electricity's Energy Storage for Social

81 U.S. Department of Energy's Office of State and Community Energy Programs, "On-Bill Financing and Repayment Programs," *energy.gov*, https://www.energy.gov/scep/slsc/bill-financing-and-repayment-programs (accessed November 2024).

82 U.S. Department of Energy's Office of State and Community Energy Programs, "Property Assessed Clean Energy Programs," *energy.gov*, https://www.energy.gov/scep/slsc/property-assessed-clean-energy-programs (accessed November 2024).

83 U.S. Department of Energy's Office of State and Community Energy Programs, "Loan Loss Reserve Funds," *energy.gov*, https://www.energy.gov/scep/slsc/loan-loss-reserve-funds#:~:text=Loan%20loss%20reserve%20(LLR)%20funds,better%20terms%20of%20debt%20repayment (accessed November 2024).

84 Robert G. Sanders, "Ramp Up Resilient Power Finance," *cleanegroup.org*, January 2015, https://www.cleanegroup.org/wp-content/uploads/RPP-Concept-Paper-Warehouse-Credit.pdf.

85 Clean Energy Group, "Connecticut Health Resilience," *cleanegroup.org*, https://www.cleanegroup.org/initiatives/connecticut-health-resilience (accessed November 2024).

86 Clean Energy Group, "Technical Assistance Fund," *cleanegroup.org*, https://www.cleanegroup.org/initiatives/technical-assistance-fund (accessed November 2024).

Equity (ES4SE) program provides pre-development technical assistance to underserved communities as part of a comprehensive suite of project support that includes funding and engineering for project deployment.[87]

States should consider offering pre-development technical assistance as part of an energy storage incentive or grant program, especially for commercial and municipal applicants in underserved and income-eligible communities.

States should consider requiring commercial recipients of underserved community grants or incentives to demonstrate how their project will benefit residents of the host community.

6. Community benefits requirement

When awarding incentives or project grants to entities serving underserved communities, some states (e.g., California, Maine, Maryland) are beginning to require evidence that the projects will provide real benefits to the communities (and not just to the project owners). Similarly, some states (e.g., Connecticut) make funding for energy storage installations at multifamily affordable housing facilities contingent on project benefits being shared with residents of the host facility. This approach has also emerged at the federal level: for example, U.S. DOE requires Community Benefits Plans be included in nearly all BIL and IRA funding and loan applications.[88]

States should consider requiring commercial recipients of underserved community grants or incentives to demonstrate how their project will benefit residents of the host community. But note that community benefits need not be monetary in nature, and in fact, they sometimes cannot be (because monetary benefits may negatively impact other benefits such as housing subsidies). Benefits such as increased energy independence, critical facility resilience, increased deployment of distributed solar PV, and the retirement of polluting fossil-fuel generators can all be important non-monetary benefits to historically underserved communities. For multifamily affordable housing, resident benefits have sometimes taken innovative forms, such as offering free Wi-Fi or upgraded facilities to residents.[89]

7. Support for various ownership models

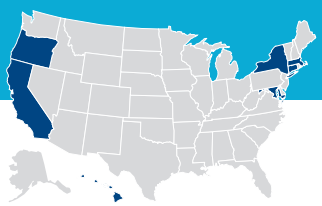
Ownership of clean energy resources can be an important benefit in some communities. Ownership increases property values and investment in the community, as well as contributing to greater energy independence. For these reasons, affordable and accessible energy storage program design should include provisions (such as low- or no-cost financing) that would help income-eligible customers to purchase and own battery storage.

On the other hand, it can be very helpful for some customers to have the option of participating in leasing or power purchase agreements (PPAs) with third-party owners. Solar

87 Department of Energy's Office of Electricity, "Energy Storage for Social Equity Initiative," *energy.gov*, 2021, https://www.energy.gov/oe/energy-storage-social-equity-initiative.

88 U.S. Department of Energy, Clean Energy Infrastructure, "Community Benefits Plan FAQs," https://www.energy.gov/infrastructure/community-benefits-plan-faqs#:~:text=The%20Department%20of%20Energy%20(DOE,(FOAs)%20and%20loan%20applications (accessed November 2024).

89 In 2023, the U.S. Department of Housing and Urban Development (HUD) released a memo that lists nonmonetary benefits that do not conflict with or jeopardize other financial assistance received by master-metered tenants. These benefits include job training, additional support staff, facility upgrades, free or reduced cost high-speed internet service, shuttle service, *resilience center*, gift cards, and others. See: U.S. Department of Housing and Urban Development, "Treatment of Financial Benefits to HUD-Assisted Tenants Resulting from Participation in Solar Programs," *hud.gov*, August 3, 2023, https://www.hud.gov/sites/dfiles/OCHCO/documents/2023-09hsgn.pdf.



leasing and PPAs have played a significant role in scaling up solar PV; for example, according to an industry report, third-party ownership accounted for 23 percent of the residential solar market in 2023, and that rate is expected to rise as higher interest rates make loans less attractive to consumers.[90] It is likely that third-party ownership is playing a similar role with distributed energy storage in markets where these options are available, especially since residential solar and storage are often marketed together.[91]

There is also a range of alternative ownership structures such as lease-to-own and ownership-flip arrangements; community storage; and utility-owned, behind-the-meter storage, which may be aggregated to form virtual power plants.

There is also a range of alternative ownership structures such as lease-to-own and ownership-flip arrangements; community storage; and utility-owned, behind-the-meter storage, which may be aggregated to form virtual power plants.

To provide the broadest set of options and make battery storage accessible to the most customers, it makes sense to provide incentives for both customer-owned and third-party-owned systems. Policymakers may also want to consider encouraging the participation of developers and aggregators, who will bring their own ownership and financing options to the market and may play a significant role in enrolling customers.

DISTRIBUTED VS. BULK STORAGE PROGRAMS

Many of the preceding recommendations are most readily applied to programs supporting the deployment of energy storage behind the meter or on the distribution system, as opposed to larger energy storage facilities on the transmission grid, which would likely be owned by or provide services to utilities or grid operators.

One reason for this is that local community benefits, which can advance community energy resilience and environmental quality, are more readily obtained when energy storage is sited close to load—in other words, in the communities where the services are most needed.[92] States may therefore find it easier to design affordable and accessible energy storage programs that support behind-the-meter deployment, such as customer incentive programs.

However, this does not mean that affordability and accessibility cannot or should not be goals of state energy storage procurement targets, utility IRP processes, and public utility regulations—all of which guide how and when utilities procure large-scale energy storage. An example of this is New York's energy storage procurement program, which includes a 35 percent underserved communities carve-out for both distributed and bulk power energy storage and identifies capacity zones of the state that should be prioritized for hosting large-scale energy storage projects to provide the greatest benefit to disadvantaged communities. Such requirements in bulk energy storage procurement programs are not common, so this represents an area of opportunity that should be advanced by states that have adopted, or are considering adopting, an energy storage procurement program.

90 Zoë Gaston, "US residential solar: cloudy skies will lead to a market reset in 2024," *woodmac.com*, April 29, 2024, https://www.woodmac.com/news/opinion/us-residential-solar-cloudy-skies-will-lead-to-a-market-reset-in-2024.

91 Even in communities that might be able to afford a solar purchase, there is evidence that third party ownership can be attractive. For example, the vast majority of the 4,800 residential batteries enrolled in Green Mountain Power's customer battery programs are owned by the utility, with the customer paying a monthly fee to host the battery in their home.

92 Garrett Fitzgerald, James Mandel, Jesse Morris, Hervé Touati, "The Economics ofBattery Energy Storage," *rmi.org*, October 2015, https://rmi.org/insight/economics-battery-energy-storage

Conclusion

State energy storage policy remains nascent in many areas of the US; within this broader arena, the subset of state policies that address affordable and accessible storage is even smaller. However, affordability and accessibility commitments increasingly crosscut state energy and environmental policy, as well as related areas such as grid modernization and urban planning. As states advance energy storage policy to support progress in these areas, we would expect to see a concurrent increase in affordable and accessible storage programming.

There has never been a better time for states to advance affordable and accessible energy storage programs and policy.

Fortunately, there has never been a better time for states to advance affordable and accessible energy storage programs and policy. By aligning state-level policy goals with federal objectives through clean energy and infrastructure funding opportunities, the federal government has set the stage for a substantive and significant increase in state community benefits programming, including around energy storage. By adopting expansive clean energy and decarbonization goals, states have committed themselves to a scenario in which broad adoption of energy storage, including in low-income communities, will be critical for success. And industry and regulatory advances—including the continuing decrease in battery prices, and the opening of regional wholesale energy markets to distributed resources due to FERC orders—have created conditions favorable to improving the affordability of energy storage for all.

Yet, there is no one-size-fits-all solution. In order to support states in various markets and with different regulatory structures and energy and environmental goals, more work needs to be done to create new policy models that can be adapted to these varying markets, regulatory structures, and goals. The emerging practices identified in this report—developed by states that are among the early adopters of energy storage policy and programs—should provide a basis and a guide for this evolution going forward.

Bridging the Gap

How Emerging State Policies are Making Energy Storage Affordable and Accessible

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