ENERGY STORAGE
ISSUE BRIEF

Energy Storage Program Design for Peak Demand Reduction

Clean Energy Group
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Executive Summary

As states work to achieve clean energy, grid modernization, and electrification goals, energy storage has become an integral tool to reduce electric peak demand and provide capacity when needed. But energy storage programs must be strategically and intentionally designed to achieve peak demand reduction; otherwise, battery usage may not effectively lower demand peaks and may even increase peaks and/or greenhouse gas emissions in some circumstances. This issue brief provides best practices and lessons learned for state policymakers and regulators engaged in developing and administering energy storage peak demand reduction programs.

Electricity generation called on to meet peak electric demand is typically the costliest power on the grid, and often highly polluting as well. For these reasons, reducing peak demand can provide many direct benefits to ratepayers, as well as support state clean energy and decarbonization goals. Commercialized energy storage technologies (primarily lithium-ion batteries) are well suited to peak demand reduction applications, but there are many factors to be considered when designing energy storage procurement and incentive programs for this purpose. These factors include the following.

- **Ownership:** States need to determine which battery ownership structures to implement. Utility ownership, customer ownership, and third-party ownership with leasing or power purchase agreements are all options when designing a battery program. Enabling a range of different ownership models can help prevent monopolization or homogenization of the storage market and encourage deployment across different grid tiers (i.e., transmission, distribution, and customer-sited). However, utility ownership may not be an option in some restructured states, while the absence of regional wholesale energy markets in other states may make it difficult for non-utility owners to monetize battery services.

- **Incentives and Procurement Targets:** To encourage battery storage adoption, many states have employed customer incentives, which can come in the form of rebates, performance incentives, tax incentives, and adders/multipliers in other programs. Utility procurement targets or mandates are another popular program type, with associated use requirements or incentives. To select the most appropriate program structures, states need to consider the desired outcomes and how to best support state policy goals, as well as market opportunities for remuneration to storage owners providing peak capacity to the grid.

- **Dispatch and Control:** States must also consider how batteries will be dispatched to achieve peak demand reductions. Some programs rely on non-utility battery owners or aggregators to dispatch batteries during peak periods, while others allow utilities, utility contractors, or state agencies to dispatch batteries in response to a signal or at defined peak and off-peak hours. Others give customers the option to choose manual dispatch of behind-the-meter (BTM) batteries.

- **Load Reduction and Power Export:** States may also want to consider whether it is optimal for BTM batteries to be discharged only to reduce building load or to also export power to the grid during peak demand periods. Power export from BTM batteries may require time-consuming interconnection studies and/or costly grid upgrades, which can increase costs and delays for storage owners. On the other hand, load reduction-only programs can significantly limit the value of BTM storage, both to the storage owner and to the grid.

Based on our review of existing state and utility programs, CEG/CESA recommends that states consider the following best practices for using energy storage for peak demand reduction:

- Where possible, utilities should be allowed to own storage and also be required to procure customer- and third party-owned storage (where utility procurement programs are adopted). States may want to limit a portion of the procurement target that can be met by utility-owned storage in order to encourage a more diverse market. Other utility ownership guardrails can help to level the playing field for customer-owned and third party-owned storage.
- Customer storage procurement carve-outs should be paired with an incentive program to help lower capital costs for participating customers.
- Performance-based incentive programs should reward the use of batteries to shift demand away from peak hours.
- Performance-based incentive programs should allow utilities to dispatch enrolled energy storage systems during peak hours, either directly or through a third party.
- Power export should be allowed, if possible, and incentivized at the same rate as load reduction.
- Marginal generating units should be considered if the program is primarily intended to reduce air emissions. Emissions reduction will not be optimal if batteries charge from the grid during periods when fossil fuels are on the margin. (More information on emissions reduction can be found below.)
- Equity provisions such as budget carve-outs, incentive adders, and no- or low-cost financing should be considered. This is important to enable low-income and historically underserved communities to access programs.[1]

Elements of energy storage program design and recommended best practices are discussed below in greater detail. Example programs are cited, and links to the programs can be found in the Appendix (p. 14).

1 CEG/CESA has published other reports on state energy storage policy and programs, including equity programs, incentive rate setting, resilience and other topics. See https://www.cesa.org/projects/energy-storage-policy-for-states/resources.

Key Elements of Program Design

BATTERY OWNERSHIP STRUCTURES

Customer or Merchant Ownership

Most distributed battery programs rely on customer- or merchant-owned batteries (or leasing from a third party). Examples include ConnectedSolutions in Massachusetts, Rhode Island and Connecticut; Connecticut Energy Storage Solutions; the Hawaii Bring Your Own Device program; and California's Self Generation Incentive Program (SGIP). Under these types of programs, customers or third parties generally contract batteries into a utility-administered program for a set term, which varies from program to program (Note: longer terms are favored by the industry and customers, because they provide more bankable/financeable income streams). The contract allows the utility to dispatch the customer's battery during peak demand hours, and in exchange the customer is paid (typically through an electric bill credit or seasonal performance payment). Payments are generally based on actual performance. Allowing leased systems to be eligible for this type of program can make the program more accessible to a wider range of customers.

Utility Ownership of BTM Batteries

Some residential storage programs have been based on a utility-ownership model. Examples include Green Mountain Power's (GMP) residential Powerwall program in Vermont and Liberty Utilities' residential battery pilot in New Hampshire. This type of ownership structure reduces risk for utilities and can be popular with customers who prefer resiliency as a subscription service rather than taking on the costs and responsibilities of battery ownership. Utility ownership typically means customers can make monthly payments instead of a large up-front investment. In exchange for the monthly payment, the customer gets a resilient system that can support the home's electric load during grid outages. However, this may not be a viable model in states that prohibit utility ownership of energy storage. For reference, the Liberty Utilities program charges customers $50/month for two batteries, while the GMP program charges customers $55/month for two batteries. Both are whole-house resilience programs, offering enough storage capacity to carry all home circuits through an outage. The GMP program has been very successful, with some 4,000 customers enrolled and more on a waiting list (the Vermont Public Utilities Commission [PUC] recently lifted a cap on the program, meaning the utility can now enroll additional customers). The Liberty Utilities pilot has also been successful, and the New Hampshire PUC has ordered its expansion.

Developer/Aggregator Ownership

Some state programs allow developers/aggregators to lease batteries to customers and contract these leased batteries into a performance-based utility program. The advantages of ownership by developers/aggregators can include reduced financial risk to customers, leveraging of private financing, enhanced program marketing to customers, reduced investment and staff time on the part of the utility, and more accurate battery dispatch. However, involving a third party will also mean sharing monetary benefits with the third party, which can make economically marginal programs less attractive.

Utility-Owned and Utility-Contracted Energy Storage

Some states that allow utility ownership of energy storage have combined small, distributed, customer-owned storage incentives with utility ownership of larger storage systems. For example, Massachusetts is a leader in customer storage incentive programs such as ConnectedSolutions and the SMART solar rebate program (which has a storage adder), but it also allows utilities to own storage (and requires storage be installed with utility-scale solar under the SMART program). Both utility-owned and utility-contracted storage should contribute toward fulfillment of the state's energy storage procurement target and other policy goals.

Some states have required utilities to procure storage capacity from installations of different sizes, located on different areas of the grid. For example, the California energy storage procurement requirement specifies that each regulated utility must procure a set amount of storage capacity on the transmission grid, a set amount on the distribution grid, and a set amount behind customer meters (see Table 1). This helps to ensure that energy storage serves a variety of applications, creates a diverse market, and also helps to prevent any potential utility monopoly of energy storage resources. The California procurement further excludes large-scale pumped hydro storage in order to promote the development of other technologies, encourage market development, and prevent the entire procurement target being fulfilled by a single large-scale installation.

Table 1

California Energy Storage Procurement Targets (in megawatts)

Storage Grid Domain	2014	2016	2018	2020	Total
Southern California Edison					
Transmission	50	65	85	110	310
Distribution	30	40	50	65	185
Customer	10	15	25	35	85
Subtotal SCE	**90**	**120**	**160**	**210**	**580**
Pacific Gas and Electric					
Transmission	50	65	85	110	310
Distribution	0	40	50	65	185
Customer	10	15	25	35	85
Subtotal PG & E	**90**	**120**	**160**	**210**	**580**
San Diego Gas & Electric					
Transmission	10	15	22	33	80
Distribution	7	10	15	23	55
Customer	3	5	8	14	30
Subtotal SDG&E	**20**	**30**	**45**	**70**	**165**
Total (all three utilities)	**200**	**270**	**365**	**490**	**1,325**

Source: California Public Utilities Commission

Guardrails for Utility Ownership

Utility ownership of storage can be a powerful tool to increase deployment and achieve peak demand reductions, but there is also a risk that utilities may out-compete customers and third parties or erect unreasonable barriers to non-utility storage interconnection—leading to a less diverse market and reduced customer and community benefits. To mitigate this risk, some states have adopted policies that limit utility ownership and/or support customer and third-party ownership. The three-tiered capacity requirement of the California procurement mandate discussed above is one example.

Examples from other states include:

- Colorado Senate Bill 9, adopted in 2018, establishes a right of 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."[2] This sort of law prevents utilities from restricting or levying unreasonable fees on behind-the-meter energy storage.
- After lengthy utility interconnection studies unreasonably delayed 900 megawatts (MW) of solar and storage enrolled in the Massachusetts SMART program, the Massachusetts Department of Public Utilities opened an investigation that ultimately led to the adoption of new utility planning and interconnection processes meant to speed distributed energy resource (DER) interconnection studies, shorten interconnection queues, proactively plan for distribution system upgrades, and spread the cost burden of interconnection-related distribution system upgrades more broadly.[3] While utilities are allowed to own energy storage in Massachusetts, these regulatory reforms make it easier for non-utility storage owners to interconnect with the grid and access markets.
- New York regulations[4] allow utilities to own storage only under four specific conditions where it is deemed necessary:
    1. Energy storage is needed to meet a system need, and the utility has demonstrated that non-utility parties are not a viable or economic alternative
    2. Energy storage needs to be integrated into distribution system architecture

2 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.

3 Mass.gov, Electric Sector Modernization Plans (ESMPs) Information and Recommendations, https://www.mass.gov/info-details/electric-sector-modernization-plans-esmps-information-and-recommendations#final-observations-and-recommendations-of-the-gmac-.

4 State Of New York Public Service Commission Case 18-E-0130 - In the Matter of Energy Storage Deployment Program, "Order Establishing Updated Energy Storage Goal and Deployment Policy," 2024, https://www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Programs/Energy-Storage/2024-06-6GW-Energy-Storage-Order.pdf.

3. The proposed energy storage project will enable low- or moderate-income residential customers to benefit in a way that markets are unlikely to achieve

4. The energy storage project is proposed for demonstration purposes

These types of guardrails can take advantage of the ability of utilities to effectively use energy storage for peak demand reduction, while preventing them from monopolizing the energy storage market.

INCENTIVE STRUCTURES

Incentives vs. Market-based Programs

Many energy storage programs use incentives to encourage and enable energy storage deployment and/or use. Examples of incentives include rebates, performance incentives, tax incentives, and adders/multipliers in other programs (such as storage adders in a solar incentive program or in a Renewable Portfolio Standard). Incentive rates may change over time in a predetermined way (as with step-down incentive blocks) or may be adjusted periodically as a result of program review. The California Self-Generation Incentive Program (SGIP) and Connecticut Energy Storage Solutions programs are examples of programs that use incentives.

Some programs are market-based, meaning incentive rates are set at least in part by market pricing. An example of this is the Massachusetts Clean Peak Energy Standard, which requires utilities to procure clean peak power credits. An alternative compliance payment (ACP) sets a ceiling on credit prices in this program, but there is no mechanism to set a price floor, so prices may fall well below the ACP rate if supply outstrips demand.

Performance vs. Prescriptive/Rebate Payments

In most peak-reducing programs, payments are performance based. This is because performance payments link battery use with the desired outcome of reduced or shifted peak demand. By contrast, a grant or rebate structure rewards battery installation but doesn't require battery use to support state policy goals or provide grid services. Performance payments are generally calculated based on battery discharge during predefined peak demand hours (as in the Massachusetts Clean Peak Energy Standard) or in response to utility signals (as in the ConnectedSolutions programs). Some programs also use some form of baselining to establish average host-facility load, and thereby calculate the reduction of facility load during peak demand events. However, baselining can be complicated and typically requires annual re-calculations of the host facility's peak load to remain up to date. Most energy storage industry representatives prefer to avoid baselining in favor of simply measuring battery discharge during peak events.

A few programs have experimented with rebates, sometimes combined with prescriptive performance requirements. For example, the Massachusetts SMART solar program offers a battery adder, with the requirement that batteries be cycled at least 52 times per year (although this requirement is waived if the storage system is enrolled in a performance-based program such as Connected-Solutions). The California SGIP program initially offered a customer storage rebate with no prescriptive dispatch requirements, but this approach failed to achieve the program's greenhouse gas (GHG) emissions reduction objectives, since there were no emissions-related price signals for customers to follow in dispatching batteries. California subsequently changed to a split incentive structure under which enrolled customers receive half the incentive as an upfront rebate, and half based on GHG emissions-reducing battery cycling in response to a signal from the California Independent System Operator (ISO). This change has resulted in achieving GHG emissions reductions. The Connecticut Energy Storage Solutions program similarly offers both an upfront rebate and a performance payment, with a 2x multiplier of the rebate for qualifying low-income residential customers.

DISPATCH METHODS

Customer Dispatch

Some peak-reducing battery programs rely on customers or aggregators to dispatch batteries during peak demand periods. This can be accomplished in several ways.

- **Batteries can be dispatched in response to a signal from the utility.** In Vermont, Green Mountain Power's Bring Your Own Device (BYOD) program[5] offers customers the option to operate their batteries in "self-consumption mode" in exchange for a one-time incentive payment. Customers choosing this option can program their inverter to prioritize battery power over grid power to support house loads during peak demand periods. Customers who do not choose this option agree to allow GMP to remotely dispatch their batteries, although they do have the ability to opt out of specific dispatch events.
- **Batteries can be dispatched during predefined peak demand hours.** The Massachusetts Clean Peak Standard program requires eligible energy storage resources to charge and discharge during predefined hours. Program materials state, "The Seasonal Peak Periods shall not be less than one hour and not longer than four hours each Business Day in any Clean Peak Season; will be determined on a prospective basis no later than six months prior to the next Compliance Year; shall be revised no more than once every three years."[6] Similarly, the former Hawaii Battery Bonus program (now replaced by the Hawaii BYOD program) required customers to "use and/or export electricity from a new battery at a committed kW amount for a duration of two consecutive hours set by Hawaiian Electric between 6–8:30 p.m. daily."[7]

5 Green Mountain Power, Bring Your Own Device, https://greenmountainpower.com/rebates-programs/home-energy-storage/bring-your-own-device.

6 Massachusetts Department of Energy Resources, 225 CMR 21.00: Clean Peak Energy Portfolio Standard (CPS), https://www.mass.gov/regulations/225-CMR-2100-clean-peak-energy-portfolio-standard-cps.

7 Hawaiian Electric, Customer Renewable Programs, https://www.hawaiianelectric.com/products-and-services/customer-incentive-programs/battery-bonus.

- **Batteries can be dispatched whenever the battery operator believes is most likely to be the peak demand period.** For example, the Program Opportunity Notice (PON) for the Maine Energy Storage System (ESS) Program states, "The Trust will require a minimum of fifteen (15) three-hour ESS dispatches per summer season when electricity demand on the ISO New England grid is at peak demand conditions. Timing of the ESS dispatch events are the sole responsibility of the participant."[8] Maine defines peak demand conditions as those times when ISO New England load is within 15 percent of its peak summer load.

Utility dispatch

Other programs allow utilities, utility contractors, or other agencies to remotely dispatch customer- or third party-owned batteries. This approach is generally preferred by utilities as being more likely to result in accurate, reliable, and timely battery dispatch; however, it also entails added cost for the utility, which must invest in DERMS (Distributed Energy Resource Management Systems) and predict regional demand peaks, or contract with third-party dispatchers. Again, most programs allow customers to opt out of dispatch events without penalty, although missing dispatch calls typically lowers the customer's incentive payment at the end of the season.

- The Massachusetts ConnectedSolutions program allows utilities to remotely dispatch customer batteries if the customer has not opted out. National Grid's Massachusetts ConnectedSolutions program materials state "Notification of discharge events will be sent directly to the customer's inverter which controls their battery storage system. The customer normally does not need to take any action for their battery system to respond to a discharge event During a demand response event, the battery will be remotely discharged without the customer's active participation."[9] To achieve this, customers must install inverters from a pre-approved list, ensuring that their equipment can receive utility signals.
- Maryland's Elk Neck Battery Pilot program is an example of a third-party contractor-managed program. Residential batteries are owned and dispatched by Sunverge in collaboration with the local utility, Delmarva Power.

Either/Or

Some programs, such as Idaho Power's Flex Peak program, give customers the option to either choose manual dispatch or automatic (remote) dispatch.

8 Maine Energy Storage System Program Opportunity Notice, https://www.efficiencymaine.com/docs/PON-EM-003-2025-ESS-V1.pdf.

9 National Grid, "Program Materials for ConnectedSolutions for Small Scale Batteries," https://www.nationalgridus.com/media/pdfs/resi-ways-to-save/ma_resi_battery_program_materials.pdf.

LOAD REDUCTION VS. POWER EXPORT

There are two ways energy storage can be used effectively to reduce or shift peak demand. One way is by reducing load behind the meter, and the other way is by exporting power from storage located behind the meter onto the grid. From the point of view of grid balancing, load reduction and power export amount to the same thing; but for a utility, handling power export can be a very different proposition than handling load reduction and may even require costly grid upgrades. From the perspective of the storage owner, load reduction-only programs can significantly limit the value of energy storage and may effectively prohibit the installation of larger batteries behind customer meters.

Incentivizing power export is important for project economics where host facilities have low peak loads, such as residential homes and small commercial customers, or peak loads that are not coincident with regional peak demand. In these situations, offering incentives for load reduction can result in stranded power that the battery could otherwise have provided to the grid after the host load is reduced to zero, meaning potential additional incentive payments cannot be realized (and potential additional peak reduction cannot be delivered). Furthermore, this type of incentive can discourage customer efficiency improvements, since these would reduce the facility load and thereby reduce potential revenues. To avoid perverse incentives and optimize energy storage economics for home and small commercial loads, allowing for power export may be necessary.

Power export ensures that the maximum value from BTM batteries is available for grid balancing; however, if exported at the wrong time, battery power could cause problems for the local distribution grid. With this in mind, California regulations were amended recently to allow BTM batteries to export power through a “Limited Generation Profile option,” which determines how solar and battery systems interact with the lower-voltage grids operated by California’s regulated utilities. Prior to this change, BTM batteries were unable to export power to the California grid when capacity was desperately needed to serve high demand. The new regulations are expected to avoid some costly grid upgrades by defining when and how much power can be exported.

In Massachusetts, the ConnectedSolutions program incentivizes both load reduction and power export from BTM storage. However, the program administrators (utilities) are now limiting power export to 150 percent of the host facility’s peak load (based on the prior year average). This change was initiated because some battery owners were attempting to enroll batteries with capacity much larger than the host facility peak load, essentially creating BTM peaker plants, which the program was not designed to support.

It is important to understand that although power export can benefit both customers and grid operators, it may be challenging for utilities due to limited hosting capacity, and this in turn can drive up interconnection costs and lead to lengthy delays while proposed BTM projects are studied.[10] Efforts are underway in several states to find new ways to address this problem.

Peak Demand Reduction vs. Emissions Reduction Programs

It may seem, at first glance, that peak demand reductions will result in emissions reductions. However, this is not necessarily the case.

To understand why, it may be helpful to consider the Massachusetts Clean Peak Energy Standard (CPS). This is a first-of-its-kind program that requires electric utilities to procure a specified amount of clean energy during peak demand periods. The program is structured like a Renewable Portfolio Standard but focuses on peak periods rather than the overall generation portfolio. Utilities are required to purchase clean peak credits, which are created when renewable power is added to the generation mix during predefined peak demand hours. Because intermittent renewables like solar and wind alone cannot be reliably dispatched at specific hours, energy storage is an essential technology for generating clean peak credits, and this creates a revenue stream for battery owners.

Some studies have concluded that the CPS is not optimally effective at reducing GHG and local pollutant emissions during peak demand hours. In fact, one study found that a $30 Clean Peak Certificate price provides roughly the same emissions reduction as a $1 carbon tax.[11] This is largely because the CPS fails to account for what type of generation is on the margin when enrolled batteries are charging and discharging. The program requires batteries not directly tied to renewables to charge during low-demand periods when there are high levels of renewable power on the grid; this has the effect of increasing the demand for power at a time when the marginal generators tend to be natural gas. Similarly, gas generators are typically the marginal resources displaced when batteries discharge during the peak hours defined by the CPS. Since gas is on the margin in both the charging and discharging cycles, emissions benefits are limited; in this scenario, batteries end up largely shifting gas generation from one time to another, and this, combined with round-trip efficiency losses, drives down the emission-reduction effectiveness of the CPS program model. (Note that this effect is the result of natural gas tending to be on the margin at most hours in ISO-New England. This is not necessarily the case for other areas of the country.)

Some researchers have concluded that the CPS could be made more effective by redesigning it so that incentives depend on which generation resources are on the margin during battery charging

10 For more information on this, see CEG's report, "The Interconnection Bottleneck," at https://www.cleanegroup.org/publication/the-interconnection-bottleneck-why-most-energy-storage-projects-never-get-built.

11 Yale Clean Energy Forum, "Explainer: Can Clean Peak Standards Make Energy Economics Meet Energy Justice?" https://cleanenergyforum.yale.edu/2022/03/29/explainer-can-clean-peak-standards-make-energy-economics-meet-energy-justice#:~:text=The%20Massachusetts%20Clean%20Peak%20Energy.

and discharging, or cycling batteries based on a real-time emissions signal rather than pre-defined charging and discharging periods (similar to California's SGIP program). However, such real-time emissions or market signals may not be available.[12]

Although the CPS may not optimize emissions reductions over the short term, it may still be effective at achieving other benefits. By creating a revenue stream for batteries, the CPS may be supporting the deployment of battery systems that increase community energy resilience, increase the value of renewables, help to integrate renewables on the grid, reduce utility capacity and transmission costs, reduce commercial demand charge costs, and enable fossil-fuel peaker plant closures that result in reduction of local pollutant emissions. And over time, peak-shifting programs should have the effect of flattening the regional demand curve, thereby reducing the future need for peaking power plants, which tend to be both expensive and highly polluting. A flatter demand curve should also reduce the need to overbuild other grid resources, such as transmission and distribution capacity.

Recommendations

Based on experience to date with behind-the-meter energy storage programs for peak demand reduction, states may want to consider the following best practices.

- Consider allowing utilities to own storage as well as requiring them to procure customer and third party-owned storage. However, this does not mean that utilities should be allowed to monopolize the energy storage market. An approach that specifies a distribution of storage resource procurement among different grid tiers would help prevent such a monopoly from occurring. If a customer and third party-owned storage carve-out is included, consider implementing an incentive program.
- Consider a performance-based incentive program that rewards the use of batteries to mitigate regional peak electricity demand (by reducing BTM loads or by exporting power to the grid during peak demand hours). Time-of-day dispatch is likely to be less effective than dispatch performed in response to a utility or ISO signal.
- In addition to performance incentives, it is a good idea to consider an upfront rebate to help reduce cost barriers, especially as part of an equity tier serving income-eligible customers or those residing in historically underserved communities. Low- or no-cost financing can also be very helpful to these customers.
- Consider a program that allows utilities to dispatch enrolled energy storage systems, either directly or through a third party. This lowers the risk for utilities and relieves customers

12 For more information about the Massachusetts Clean Peak Energy Standard, see the following resources: https://www.cleanenergyfinanceforum.com/2022/03/29/explainer-can-clean-peak-standards-make-energy-economics-meet-energy-justice#:~:text=The%20Massachusetts%20Clean%20Peak%20Energy,found%20could%20hamper%20its%20effectiveness; https://www.sciencedirect.com/science/article/abs/pii/S0360544221003649?via%3Dihub; https://www.pnas.org/doi/full/10.1073/pnas.2116632119.

of the responsibility and risk of predicting regional peak demand hours and dispatching systems (or contracting with a third party to do so, which can be uneconomic). Enrollees should have the ability to opt out of dispatch events without penalty.

- Consider allowing power export and incentivizing power export at the same rate as BTM load reduction. This can allow storage owners to provide more grid services and realize greater revenue opportunities. It may make sense to limit incentives for exported power relative to the host facility peak load, and/or to set a per-project export incentive cap.
- Interconnection of BTM energy storage can be costly and time-consuming. This is due to long wait times in interconnection queues, lengthy utility studies of the project, and potentially expensive grid upgrades—the cost of which typically falls upon the project that causes the need for the upgrade (the "cost-causation" model). States may need to find ways to address these interconnection bottlenecks, which can impede energy storage deployment and market growth.
- Consider designing a battery incentive program around a strong commitment to equitable access, including effective provisions such as equity adders, carve-outs, and low-cost financing. The effectiveness of equity provisions should be assessed regularly, and the provisions should be adjusted if they are found to be ineffective at encouraging deployment in historically underserved communities.
- Consider taking marginal generating units or real-time emissios signals into account if the storage program is intended to achieve emissions reductions. However, if peak demand reduction, ratepayer cost savings, improved resilience, or other benefits are of equal or greater importance, marginal generating units and emissios signals may not need to be central to program design.

Appendix: Additional Resources and Program Links

California Self-Generation Incentive Program
https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/demand-side-management/self-generation-incentive-program/participating-in-self-generation-incentive-program-sgip

Clean Energy Group - Technical Assistance Fund
https://www.cleanegroup.org/initiatives/technical-assistance-fund

Connecticut ConnectedSolutions
https://www.eversource.com/content/residential/save-money-energy/energy-efficiency-programs/demand-response/battery-storage-demand-response

Connecticut Energy Storage Solutions
https://energystoragect.com

Green Mountain Power Residential Powerwall
https://greenmountainpower.com/rebates-programs/home-energy-storage/powerwall

Green Mountain Power Bring Your Own Device Program
https://greenmountainpower.com/rebates-programs/home-energy-storage/bring-your-own-device

Hawaii Bring Your Own Device Program
https://www.hawaiianelectric.com/products-and-services/customer-incentive-programs/bring-your-own-device

Idaho Power Flex Peak Program
https://www.idahopower.com/energy-environment/ways-to-save/savings-for-your-business/flex-peak/

Maine Energy Storage Systems Program Opportunity Notice
https://www.efficiencymaine.com/docs/PON-EM-005-2024_ESS_V2.pdf

Maryland Elk Neck Pilot Program
https://www.pjm.com/-/media/committees-groups/forums/emerging-tech/2022/20220317/20220317-item-03-der-elk-neck-virtual-powerplant.ashx

Massachusetts Clean Peak Energy Standard
https://www.mass.gov/clean-peak-energy-standard

Massachusetts SMART Solar Program:
https://www.mass.gov/solar-massachusetts-renewable-target-smart

https://www.eversource.com/content/residential/save-money-energy/clean-energy-options/solar-energy/smart-program

Massachusetts ConnectedSolutions
https://www.nationalgridus.com/MA-Home/Connected-Solutions/BatteryProgram

National Grid ConnectedSolutions
https://www.nationalgridus.com/connectedsolutions

New Hampshire Liberty Utilities Residential Battery Pilot
https://new-hampshire.libertyutilities.com/bath/residential/smart-energy-use/electric/battery-storage.html

Rhode Island ConnectedSolutions
https://www.rienergy.com/RI-Home/ConnectedSolutions/BatteryProgram

Clean Energy Group (CEG) is a national nonprofit advocacy organization working to accelerate an equitable and inclusive transition to a resilient, sustainable, clean energy future. CEG fills a critical resource gap by advancing new clean energy initiatives and serving as a trusted source of technical expertise and independent analysis in support of underserved communities, nonprofit advocates, and government leaders working on the frontlines of climate change and the clean energy transition. We collaborate with partners across the private, public, and nonprofit sectors to accelerate the equitable deployment of clean energy technologies and the development of inclusive clean energy programs, policies, and finance tools.

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The Clean Energy States Alliance (CESA) is a leading US coalition of state energy organizations working together to advance the rapid expansion of clean energy technologies and bring the benefits of clean energy to all. Established in 2002, CESA is a national, member-supported nonprofit that works with its members to develop and implement effective clean energy policies and programs. CESA's members—primarily state energy agencies representing 19 states and the District of Columbia —include many of the nation's most innovative, successful, and influential implementers of clean energy policies. Together, CESA and its members perform an essential role in moving the nation from fossil-fueled electricity generation to affordable clean energy.

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