



# An Assessment of Equity in Massachusetts' Energy Storage Programs

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October 8, 2024

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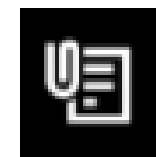
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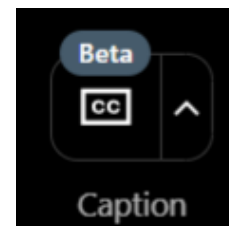
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# Energy Storage Equity

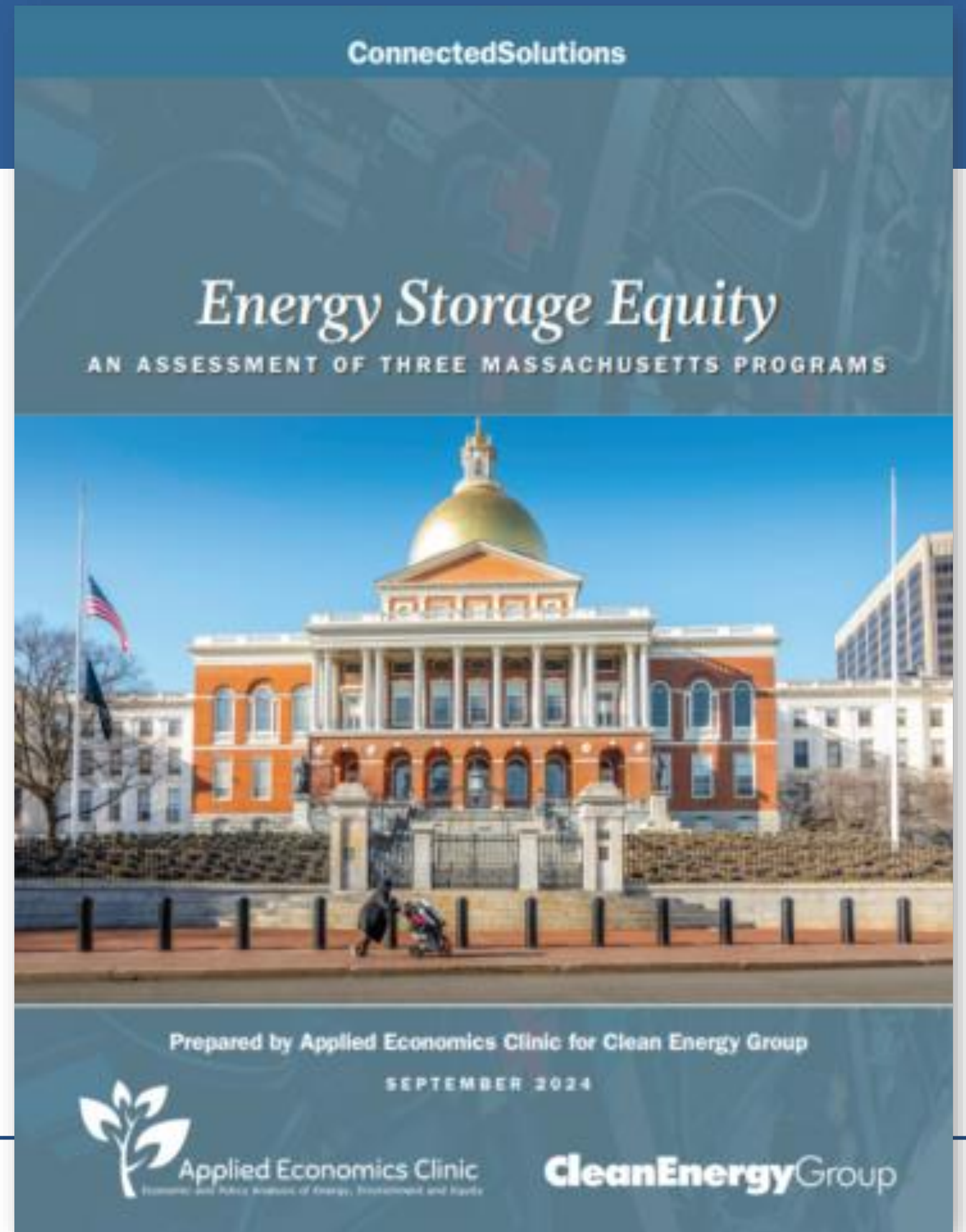
An Assessment of Three Massachusetts Programs

*Applied Economics Clinic | Clean Energy Group*

Available at:

[www.cleaneenergy.org/publication/energy-storage-equity-massachusetts/](http://www.cleaneenergy.org/publication/energy-storage-equity-massachusetts/)

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# Context: A Decade of Work Supporting Distributed Energy Storage in Massachusetts

For more than 10 years, Clean Energy Group has provided energy storage support in Massachusetts. This includes:

- Technical support for projects
- Direct policy and program development support
- Stakeholder engagement
- Independent analysis
- Knowledge sharing through reports, webinars, case studies and conference presentations

All material is free to download

<https://www.cleangroup.org/initiatives/energy-storage-policy-and-regulation/connectedsolutions/>

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Home > Initiatives > Energy Storage Policy and Regulation > ConnectedSolutions Resource Page

## CONNECTEDSOLUTIONS RESOURCE PAGE

ConnectedSolutions is an innovative battery funding program that offers incentives to residential and commercial electric customers in exchange for allowing their electric utility to draw on the energy stored in their grid-connected behind-the-meter batteries at times of peak electric demand. The program uses multi-year contracts between the utility and customer to create a virtual power plant that can be called upon to provide valuable grid services, while providing revenue and back-up power to battery owners. It is frequently, but not always, run through state energy efficiency programs.

The ConnectedSolutions model was developed and implemented in Massachusetts with analytic support from Clean Energy Group, and has now been adopted by other states in the Northeast. CEG's reports on this program model are below, along with links to relevant state programs, articles and blogs.

**CONNECTEDSOLUTIONS REPORTS**

- Energy Storage Equity: An Assessment of Three Massachusetts Programs (September 2024)
- Energy Storage for Winter Grid Reliability: How Batteries Became the Low-Cost Solution for Power Assurance in Massachusetts (December 2021)
- ConnectedSolutions: An Assessment for Massachusetts (September 2021)
- ConnectedSolutions: A New State Funding Mechanism to Make Battery Storage Accessible to All (February 2021)
- ConnectedSolutions: The New Economics of Solar+Storage for Affordable Housing in Massachusetts (February 2021)
- Energy Storage: The New Efficiency — How States Can Use Efficiency Funds to Support Battery Storage and Flatten Costly Demand Peaks (April 2019)

**CONNECTEDSOLUTIONS WEBINARS**

- An Assessment of Equity in Massachusetts' Energy Storage Programs (October 2024)
- Evaluating Massachusetts' ConnectedSolutions Program: Strengths and Weaknesses from the First Program Cycle (October 2021)
- ConnectedSolutions: How a New Program Improves the Economics and Social Benefits of Solar+Storage in Massachusetts and Beyond (March 2021)

**CONNECTEDSOLUTIONS BLOG POSTS AND ARTICLES**

- Innovative Massachusetts Low-Income Battery Pilot Finally Wins Approval (For Now...) (March 2023)
- With Forward Capacity Auction Success, Batteries are Winning in New England (September 2021)
- Connecticut Powers into the Lead with Breakthrough Customer Battery Program (August 2021)
- The Lesson of Texas - and a New Program States Can Use to Quickly Fund the Distributed Energy Storage Solution (February 2021)
- Battery Storage is Coming to Affordable Housing Thanks to Efficiency Program (August 2020)
- Massachusetts and Vermont crack the code on distributed energy storage (July 2020)
- ConnectedSolutions First Results: Massachusetts' groundbreaking efficiency program for customer batteries receives its first report card (July 2020)
- Energy Storage Is the New Efficiency (April 2019)
- Massachusetts becomes first in the nation to make battery storage eligible for energy efficiency incentives (February 2019)

**COMMENTS SUBMITTED IN REGULATORY DOCKETS**

- Comments to the Massachusetts EEAC regarding ConnectedSolutions Program Expansion and Revision for 2022-2024 (June 2021)

**CONNECTEDSOLUTIONS STATE PROGRAM DOCUMENTS**

Below are links to resources for state policymakers and regulators who are considering adopting a ConnectedSolutions model program.

- **Arizona** Corporation Commission battery rebate and BYOD program (proposed)
- **California** PUC staff proposal to allow BTM batteries to export power during grid emergencies
- **California** Southern California Edison customer battery program

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# Webinar Speakers

*An Assessment of Equity in Massachusetts' Energy Storage Programs*



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Thank You



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# Upcoming Webinars

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Sharing Solar Benefits with Multifamily Renters: A Mississippi Case Study (10/30)

Expanding Clean Energy Access and Benefits: Award-Winning Programs in Connecticut and Maryland (11/14)

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# Energy Storage Equity: An Assessment of Three Massachusetts Programs

**Applied Economics Clinic**

**Prepared on behalf of Clean Energy Group**

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**September 2024**



**Applied Economics Clinic**  
Economic and Policy Analysis of Energy, Environment and Equity

# About the Applied Economics Clinic

- AEC is a mission-based non-profit consulting group providing services (e.g., analysis, modeling, testimony, public reports, etc.) in the areas of energy, climate, environment, and social equity.
- AEC also offers services on a pro bono basis to environmental justice-focused community-based organizations.
- Our clients are primarily public interest groups—non-profits, government agencies, and green business associations.
- AEC works proactively to support and promote diversity in our areas of work by providing applied, on-the-job learning experiences to graduate students.
- For more information, please visit: <https://aeclinic.org/>

# Presentation Outline

- Setting the stage: Massachusetts policies and programs to expand energy storage
- Equity in Massachusetts programs that incentivize energy storage deployment
- New and proposed programs in the Commonwealth
- Findings and recommendations to improve equity performance

# Energy storage systems enable the expansion of renewable energy, supporting Massachusetts in achieving its climate goals

- Massachusetts aims to achieve net-zero greenhouse gas emissions by 2050, with direct emissions at least 85 percent below 1990 levels by 2050.
- Renewable Portfolio Standard requires 40 percent of the Commonwealth's electric sales to be derived from renewable energy sources by 2030 and 60 percent by 2050.
- Clean Energy Standard requires 60 percent of electric sales be derived from clean energy sources by 2030 and 80 percent by 2050.
  - Compliance with CES can be achieved using energy storage systems that primarily store and discharge renewable energy like wind and solar.



# Energy storage systems enable the expansion of renewable energy, supporting Massachusetts in achieving its climate goals

- In 2015, in support of the Commonwealth's clean energy goals and emission reduction targets, former Massachusetts Governor Charlie Baker launched the Energy Storage Initiative to expand energy storage in the Commonwealth.
- As part of the initiative, the *Act to Advance Clean Energy* was signed into law in August 2018 with a goal of achieving 1,000 megawatt-hours (MWh) of energy storage by the end of 2025 (570 MWh has been installed as of February 2024).
- In 2022, former Governor Baker signed the *Act Driving Clean Energy and Offshore Wind* to support the development of offshore wind, solar power, battery storage, and electrification of the transportation and building sectors.

# Massachusetts' Clean Energy and Climate Plan for 2025 and 2030 lays out a commitment to an equitable clean energy transition

- The 2025/2030 CECP presents the Commonwealth's plans to achieve its emissions reduction goals for 2025 and 2030, including “strategies to promote equity and reduce emissions in overburdened EJ communities.”
- The 2025/2030 CECP emphasizes the importance that “all Massachusetts residents can fully access and participate in the transition to a low-carbon economy” and that “differences in income-level, location, English proficiency, and previous marginalization” must not prevent anyone from participating in the benefits created by a new, low-carbon economy.



# There are a couple of statewide provisions to promote an equitable clean energy transition

- The 2016 Affordable Access to Clean and Efficient Energy Initiative was designed to help LMI residents access clean energy technologies by creating an Affordable Access Working Group to address barriers to clean energy investment for LMI households.
- The 2022 Act Driving Clean Energy and Offshore Wind requires the Massachusetts Clean Energy Center to offer a clean energy equity workforce and market development program to underrepresented businesses and individuals—particularly those located in EJ or low-income communities.

# It is important that initiatives to support the Commonwealth's clean energy transition are designed equitably

- This report assesses equity-supporting provisions in three statewide programs that facilitate the development of energy storage resources in Massachusetts.
  - **Solar Massachusetts Renewable Target program:** supports a variety of solar and storage projects and provides additional incentives and adders for LMI customers.
  - **Clean Peak Energy Standard (CPS):** provides certificates to qualifying clean energy generators and energy storage resources that supply electricity to the grid during seasonal peak demand periods.
  - **ConnectedSolutions:** allows utilities to provide incentives in exchange for being able to draw on the energy stored in customer-sited batteries and/or curtail customer energy use to lower the costs of meeting peak electric demand.





# Equity in Massachusetts' Energy Storage Programs

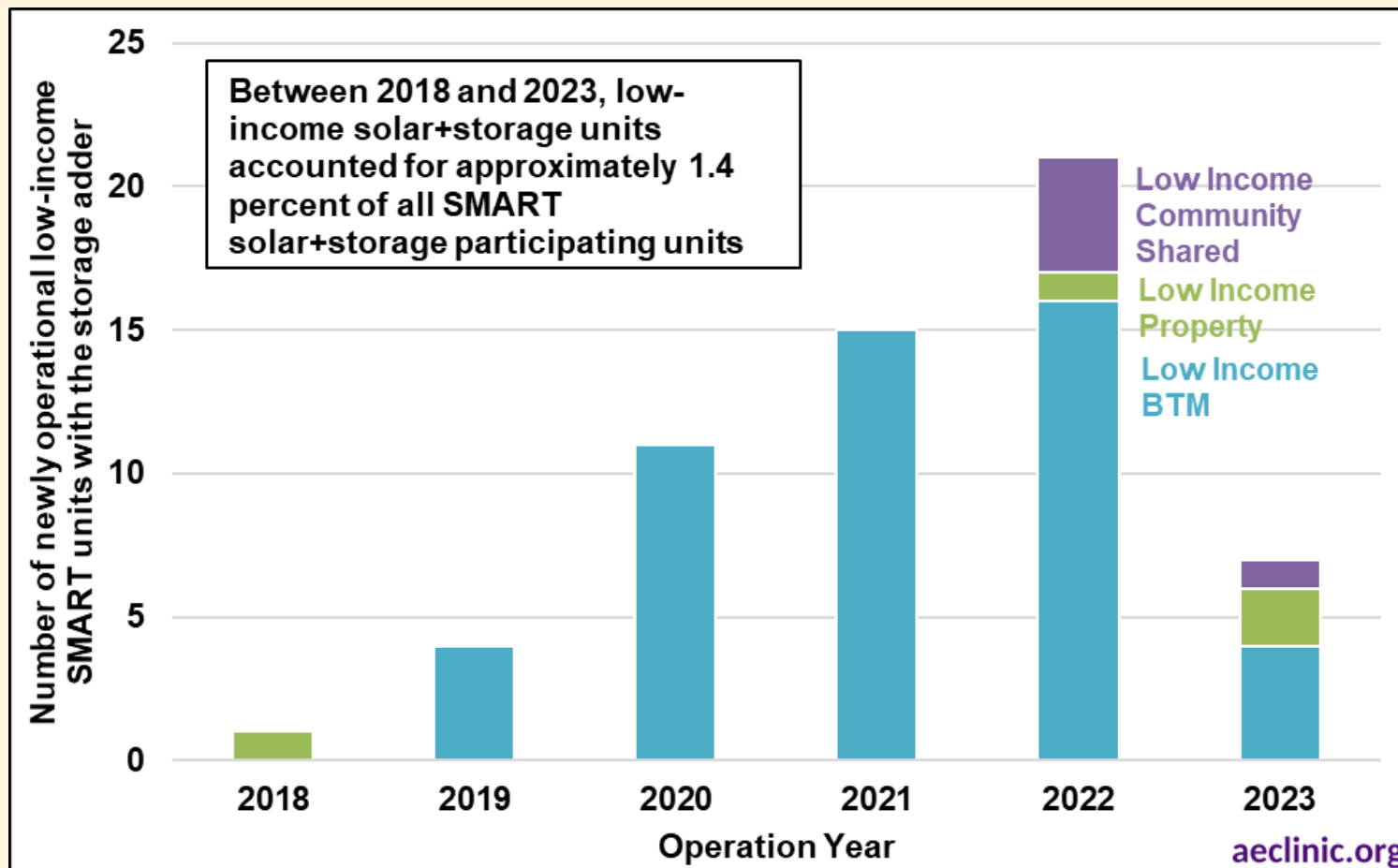


# SMART, CPS, and Connected Solutions lack equity provisions that go above and beyond income-eligibility, or lack equity provisions entirely

Program	Description	Equity Provisions
<b>Solar Massachusetts Renewable Target (SMART)</b>	Supports solar and solar+storage resources to reduce peak demand, distribution congestion, and system losses	<p>SMART program recently expanded to increase the number of low-income eligible customers</p> <p>Minimum of 5 percent of total capacity must be allocated to low-income communities</p> <p>Projects servicing low-income customers must demonstrate that the customer will receive net savings</p> <p>Low-income behind-the-meter units have the highest base compensation rate factor</p> <p>SMART program adders are differentiated such that low-income projects receive higher adders</p>
<b>Clean Peak Energy Standard</b>	Incentivizes the use of clean energy resources, including energy storage resources, to meet peak demand by requiring increasing shares of clean peak-certified retail electric sales	No equity provisions
<b>ConnectedSolutions</b>	Incentivizes household energy use reduction to reduce peak demand by drawing on customer-sited energy storage resources	No equity provisions



# SMART program low-income solar + storage units account for less than 2 percent of all SMART units



# New and Proposed Programs



# There are a handful of new federally-funded programs to support equitable deployment of energy storage resources in Massachusetts

- U.S. Department of Energy (DOE) Grid Resilience and Innovation Partnerships (GRIP) program to enhance reliability and flexibility of the electric grid. Two Massachusetts programs have received GRIP funding:
  - Generac Grid Services pilot program aims to achieve cost savings for low-income customers through electrification upgrades
    - About 2,000 income-eligible participants will receive home battery systems from Generac.
  - The Future Grid Project was granted \$50 million in GRIP funding and will be administered by National Grid.
    - The project will deploy digital technology solutions to improve the value of distributed energy resources, including energy storage, with a particular focus on targeting disadvantaged communities.



# Funded by the U.S. Department of Energy, Open Market ESCO project will provide energy saving and flexible technologies for underserved communities in Lowell, MA

- Open Market ESCO LLC, together with multiple partners, including Clean Energy Group, SunRun, and Massachusetts Department of Housing and Community Development, was awarded \$6.56 million to improve energy efficiency in up to 20 underserved low to moderate-income renter communities in Lowell, Massachusetts (approximately 2,000 homes).
- The project aims to achieve energy savings of 30 percent by retrofitting homes to install and manage battery storage, renewable generation, energy efficiency, and demand response technologies.

# Massachusetts has also applied for funding through the U.S. Environmental Protection Agency Solar for All competition and National Clean Investment Fund

- In June 2023, the U.S. Environmental Protection Agency (EPA) launched the Solar for All competition
  - The competition will award \$7 billion in grant funding to projects that seek to expand residential solar energy in low-income and affordable communities, including those that interconnect energy storage systems in conjunction with solar energy systems.
- In October 2023, MassCEC, MassHousing, Boston Housing Authority, and DOER submitted a \$250 million proposal to the Solar for All program to make clean energy investments in up to 48,500 low-income and affordable homes.

# Massachusetts has also applied for funding through the U.S. Environmental Protection Agency Solar for All competition and National Clean Investment Fund

- In July 2023, the U.S. EPA announced the \$14 billion National Clean Investment Fund (NCIF), which will provide funding to nonprofit clean financing institutions to provide accessible, affordable financing for clean technology projects across the country, of which approximately 20 percent is dedicated to distributed energy generation and storage.
- The Massachusetts Community Climate Bank—along with a consortium of five non-profit organizations, each with their own proposed investment program—submitted a proposal to the NCIF that would fund decarbonization measures for an additional 28,000 affordable renter homes over the next five years.



# Massachusetts Clean Energy Center (MassCEC) InnovateMass program provides grant funding and technical support

- MassCEC InnovateMass program provides up to \$350,000 in grant funding and technical support to applicants.
- InnovateMass provides funding to projects that support the deployment of new and innovative clean energy technologies that address the Commonwealth's energy challenges, thereby growing the Massachusetts' clean energy economy.
- In 2020, a \$194,700 InnovateMass grant was allocated to fund a solar and storage pilot program in Norwood, Massachusetts:
  - Administered by Alternate Power Source, the pilot program will provide small home battery and solar PV systems to residential customers in Norwood, including 15 LMI customers with critical home health needs who will receive larger batteries for longer duration backup power. Clean Energy Group has provided a small additional grant to support expanded resilience for the 15 LMI customers.



# Findings and Recommendations



# AEC's assessment of the three energy storage programs currently being administered in Massachusetts yields five main findings

- The three energy storage programs assessed lack mandates, targets and reporting requirements to support the Commonwealth's commitment to equitable access to clean and efficient energy.
- ConnectedSolutions and the Clean Peak Standard have no equity provisions or reporting on equity participation.
- Low-income participation in SMART is minimal even after the program was revised to improve equity participation.
- SMART lacks specific incentives for vulnerable populations outside of income-eligibility.
- Cape Light Compact and Generac (a private firm) have initiated two equity-focused customer energy storage incentive programs in the Commonwealth. While constrained in scale and budget, these programs may serve as models for the Massachusetts agencies and utilities to apply in their programs.



# AEC makes eight recommendations for Massachusetts programs to improve their equity performance, three of which involve establishing metrics used to set targets, track progress, and ensure community involvement

## Equity Performance Metrics

1. Require participation data for energy storage programs to be publicly available online together with detailed information regarding the income status of the households served, and the quantity and capacity of resources supported through the program.
2. Develop specific income-eligible enrollment and capacity targets for energy storage programs and require detailed data on each program's progress towards these targets to be easily accessible and publicly available online.
3. Create a stakeholder-informed outreach and enrollment plan for addressing low participation in EJ and/or low-income areas and launch targeted utility EJ community and low-income customer outreach and education programs.



# AEC makes eight recommendations for Massachusetts programs to improve their equity performance, four of which aim to expand and increase existing equity incentives

## Expanded and Increased Equity Incentives

4. Add Clean Peak Energy Standard financial incentives for retail electric suppliers supplying energy (or offsetting load) from qualifying clean peak resources in income-eligible areas.
5. Increase the incentive rates for income-eligible customers enrolled in the ConnectedSolutions and SMART programs and offer up-front rebates and/or on-bill payments to increase low-income participation.
6. Add financial incentives for other vulnerable households such as households that rely on uninterrupted electric supply to power life-saving medical devices and critical facilities serving state-designated EJ communities.
7. Add an additional SMART resiliency adder for sustainable community microgrids serving state-designated EJ communities and/or low-income households.
8. Add an additional SMART fossil fuel replacement adder for SMART solar plus storage units installed to replace existing fossil fuel plants located within Massachusetts EJ communities.



# Thank you!

## Questions?

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# Appendix: SMART, CPS, and ConnectedSolutions



# Solar Massachusetts Renewable Target (SMART) program includes several income-related equity provisions

- To support energy storage, the SMART program provides an energy storage adder—in other words, a higher dollar-per-kilowatt-hour (kWh) incentive—to solar units co-located with an energy storage system.
- Low-income customers are end-use customers that reside in low-income eligible areas, or customers that receive a low-income discounted rate from an electric distribution company.
- The SMART program includes a 5 percent capacity carve out for *Low Income Community Shared* and *Low Income Property* units, requires a demonstration of net savings for solar units servicing low-income customers, and offers additional adders for BTM Low Income, Low Income Community Shared, or Low Income Property units.





# Massachusetts Department of Environmental Resources proposed several changes to the low-income definitions and available adders

- Combine the adders and eligibility criteria for Community Shared Solar and Low-Income Community Shared Solar, wherein each project type would receive the same \$0.07 per kWh adder (an increase of \$0.02 per kWh for Community Shared and an increase of \$0.01 per kWh for Low-Income Community Shared) with the caveat that all Community Shared solar projects must enroll a minimum of 40 percent low-income customers
- Expand the definition of low-income property to include other forms of housing serving Low-Income Customers, such as homeless shelters and deed-restricted condominiums, among others

# Massachusetts Department of Environmental Resources proposed several changes to the low-income definitions and available adders

- Expand the Low-Income Customer definition to allow customers to qualify based on participation in other needs-based programs and self-attestation of meeting low-income requirements
- Expand the definition of low-income property to include units that allocate all energy output to qualified affordable housing, either through electricity or bill credits
- Remove the energy storage adder for small projects (less than 25 kW of solar capacity)
- Increase the project size required to co-locate with energy storage from 500 kW to 1 MW solar capacity

## Clean Peak Energy Standard (CPS) incentivizes energy storage deployment but lacks any equity provisions or performance data for evaluation

- CPS was designed to increase the use of clean energy technologies when electric demand is at its highest, as well as reduce demand during these periods (which are defined by the DOER).
- CPS requires electric suppliers to meet a certain share of their energy sales to Massachusetts end-use customers with energy from qualified clean peak energy resources during these defined periods, starting at 1.5 percent in 2020 and increasing 1.5 percent each subsequent year, until reaching 46.5 percent in 2050.
- Interconnected energy storage systems that store renewable energy that will offset load that would otherwise be served by the grid are eligible for the CPS.



## Customers with energy storage systems can receive additional financial incentives through the ConnectedSolutions program but the program lacks any equity provisions or performance data for evaluation

- ConnectedSolutions offers customers incentives in exchange for allowing the electric distribution company to (1) draw on the energy stored in customer-sited batteries, (2) curtail customer energy use via smart thermostats, and (3) delay electric vehicle charging during times when demand on the electric grid is at its peak.
- Qualifying battery customers enrolled in the program may also receive CPS incentives and SMART program incentives (which, as described previously, include an energy storage adder).



# Appendix: Equitable Energy Storage Programs in Other States



# California Self-Generation Incentive Program is the best-funded and longest-running energy storage customer incentive program in the U.S.

- The best-funded and longest-running energy storage customer incentive program in the country, SGIP launched in 2001 in response to grid outages associated with the 2000-2001 California Energy Crisis.
- In 2017, the California Public Utilities Commission (CPUC) created the SGIP Equity Resiliency Budget, which reserved 25 percent of program funds for projects in disadvantaged and low-income communities.



## Connecticut Energy Storage Solutions Program offers up-front rebates coupled with a performance-based incentive

- Launched in 2022, Connecticut’s Energy Storage Solutions program combines an up-front rebate with a performance incentive. The Program offers a 2-times rebate multiplier for income-eligible residential participants (for purposes of this Program, multifamily affordable housing facilities are considered “residential” and thus qualify for the residential incentive).
- Other equity provisions include low-cost financing from the Connecticut Green Bank (a co-administrator of the program), an on-bill payment option, and a Justice40 commitment (meaning that 40 percent of the systems installed under the Program are to be installed in historically underserved communities).

# New York Energy Storage Procurement includes a 35 percent equity carve-out for 2030

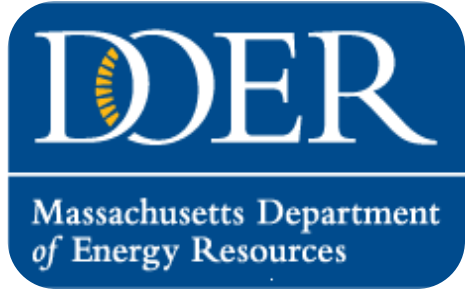
- The New York State Public Service Commission's *Order Establishing Updated Energy Storage Goal and Deployment Policy* states that a 35 percent equity carve-out must be applied to the State's procurement of its 6 GW energy storage target, to be attained by 2030.
- Energy storage projects in areas of the state that will most benefit disadvantaged communities and reduce reliance on high-emitting peaking plants qualify for this carve-out.
- The Commission specifies which capacity zones of the state should be prioritized for hosting large-scale energy storage projects to provide the greatest benefit to disadvantaged communities.



# Oregon Solar + Storage Rebate Program provides increased rebates for lower income customers and for the organizations that support them

- Through the Solar + Storage Rebate Program, Oregon homeowners can receive a rebate of up to \$5,000 for a solar electric system and up to \$2,500 for an energy storage system.
- The program offers income-defined tiers of incentives, with LMI customers receiving \$1.80 per watt (DC) of installed capacity up to 60 percent of the net cost, while customers not considered LMI receive \$0.50 per watt (DC) of installed capacity up to 40 percent of the net cost.
- In addition, organizations that provide services to Oregonians with low- and moderate-incomes can receive a rebate of up to \$30,000 for a solar electric system and up to \$15,000 for an energy storage system.





# Updates from DOER

# Ongoing Energy Storage Work

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## Incentives and Metrics Development:

- [CPS Programmatic Review](#)
- [SMART Programmatic Review](#)
- [Three-Year Plan Development and Connected Solutions](#)

## Additional Workstreams:

- Energy Storage Grants
- Renewable Energy Siting Guidance
  - DOER Siting and Permitting Division
  - Municipal Guidance

## Contact Information

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