Equitable Solar Communities of Practice Webinar Series

National Community Solar Partnership+

Solar Energy Technologies Office

U.S. Department of Energy

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Today's Webinar Speakers

Alexandria Robins

SETO Task Lead (CONTR),
U.S. Department of Energy

Marriele Mango

Project Director,
Clean Energy Group

Solar Energy Technologies Office (SETO) Overview

MISSION

We accelerate the **advancement** and **deployment of solar technology** in support of an **equitable** transition to a **decarbonized economy no later than 2050**, starting with a decarbonized power sector by 2035.

WHAT WE DO

Drive innovation in technology and soft cost reduction to make solar **affordable** and **accessible** for all Americans

Enable solar energy to support the **reliability**, **resilience**, and **security** of the grid

Support **job growth**, **manufacturing**, and the **circular economy** in a wide range of applications

The National Community Solar Partnership+

NCSP+ is a coalition of stakeholders working to expand access to affordable, distributed solar to every U.S. household

NCSP+ Supports:

- Community Solar
- Community-benefitting commercial solar
- LMI residential rooftop solar + storage
- Microgrids
- Distributed solar + storage aggregations such as Virtual Power Plants

NCSP+ Provides Participants:

- No-cost technical assistance
- Funding opportunities
- Research and analysis
- Peer-to-peer networking
- Online courses and training
- Tools and resources to support equitable scaling

The Meaningful Benefits of Solar

These meaningful benefits are embedded in all NCSP+ activities and initiatives:

Equitable Access and Consumer Protections

Meaningful Household Savings

Resilience, Storage, and Grid Benefits

Community-led Economic Development

Solar Workforce

Equitable Solar Communities of Practice

Project Overview:

- Officially launched in early 2024
- Supporting the expansion of equitable benefits of solar through stakeholder-led process
- Landscape and gap analysis
- Public convening over the summer
- Report to be published this fall

Solar United Neighbors
Equitable Access and Consumer Protections

Clean Energy States Alliance
Meaningful Household Savings

Clean Energy Group
Resilience, Storage, and Grid Benefits

Cooperative Energy Futures
Community-led Economic Development

Midwest Renewable Energy Association
Solar Workforce

Learn more at https://www.energy.gov/communitysolar/equitable-solar-communities-practice

Equitable Solar Communities of Practice:
Resilience, Storage, and Grid Benefits

October 8, 2024

Clean Energy Group

Affordable, reliable, clean energy for all.

Climate Resilience and Community Health

Distributed Energy Access and Equity

Energy Storage and Flexible Demand

Fossil Fuel Replacement

CleanEnergyGroup

Resilient Power Project

Building the foundation for energy resilient communities.

USDN urban sustainability directors network

footprintproject.org

AMERICAN MICROGRID SOLUTIONS

ELEVATE

GEMINI ENERGY SOLUTIONS

Rooftop solar installation in Dorchester, MA. Credit: Resonant Energy

www.resilient-power.org

AGENDA

Program Overview

Community of Practice: Resilience, Storage & Grid Benefits

Results of Landscape Analysis and Community Convening

Pathways Forward

Program Performance Metrics

Equitable Solar Communities of Practice Program Overview

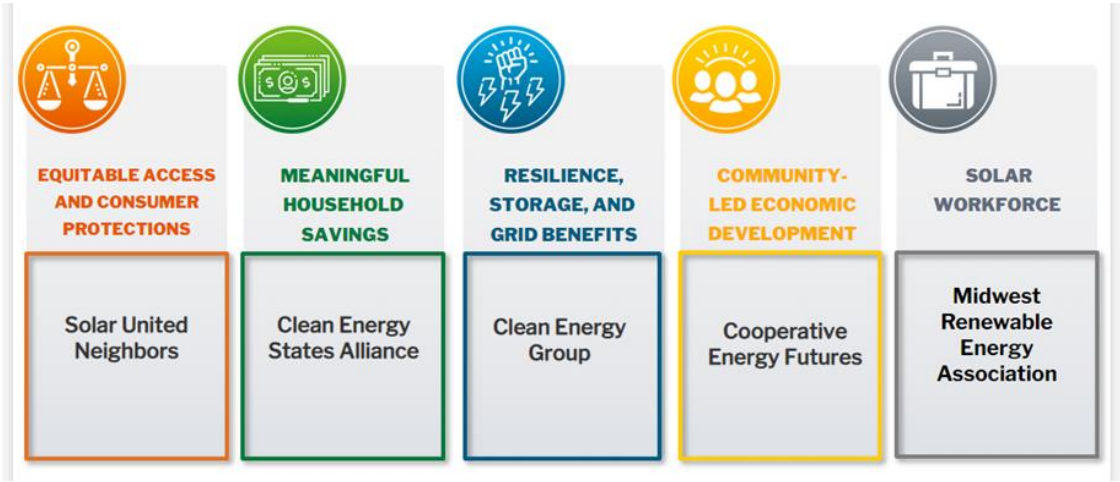
Battery installation at a fire station supported by Solar Responders in Puerto Rico.
Credit: Solar Responders

Background

In 2024, the Department of Energy Solar Energy Technologies Office announced **five** organizations to lead the newly launched Equitable Solar Communities of Practice program. Each Community of Practice built **a six-member Core Team** from mission-aligned organizations.

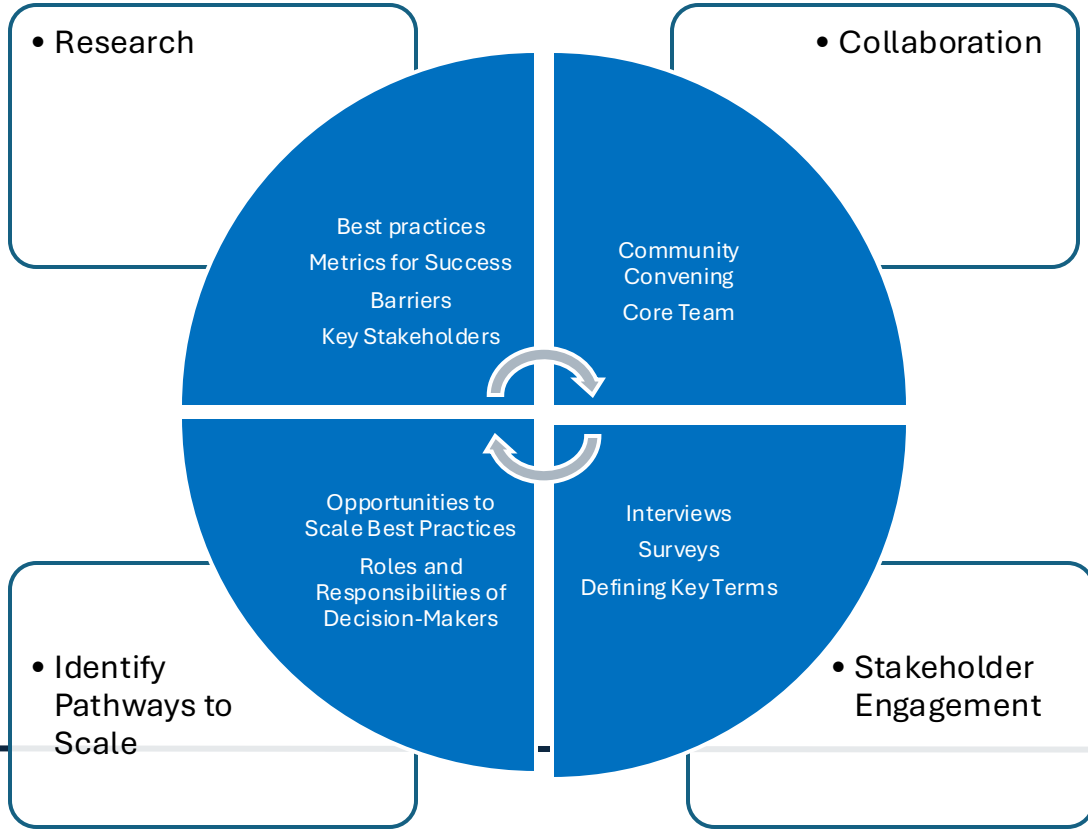
Clean Energy Group leads the **"Resilience, Storage and Grid Benefits"** Community of Practice.

Communities of Practice by Topic Area and Lead Organization

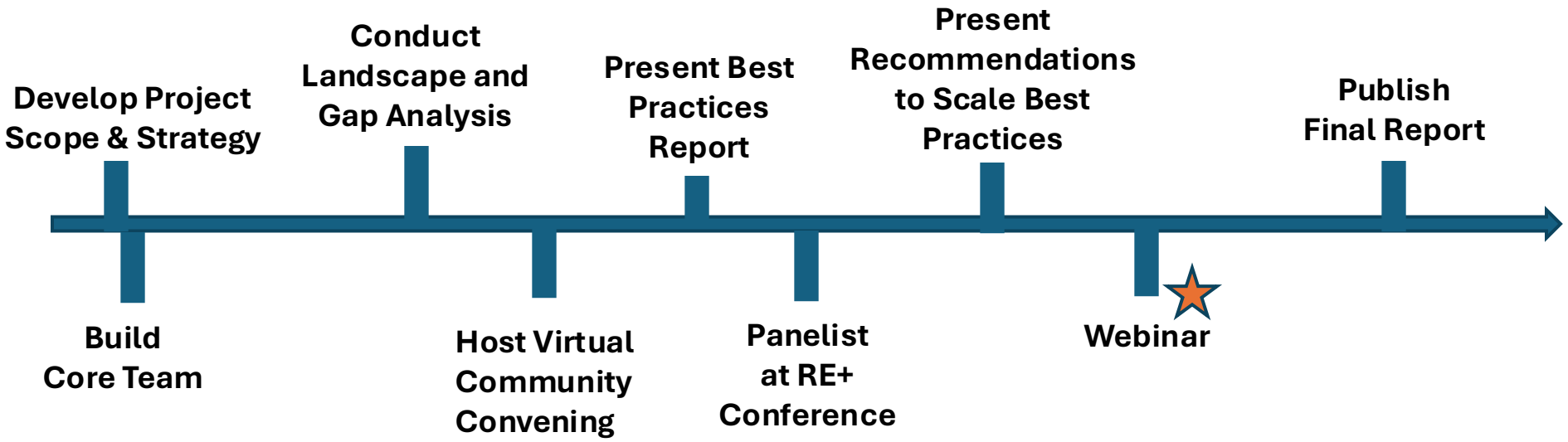


Source: U.S. Department of Energy (2024). *Equitable Solar Communities of Practice, Lead Organization Kick-Off Meeting* [PowerPoint slide

Model


• Research
• Collaboration
Best practices
Metrics for Success
Barriers
Key Stakeholders
Community Convening
Core Team
Opportunities to Scale Best Practices
Roles and Responsibilities of Decision-Makers
Interviews
Surveys
Defining Key Terms
• Identify Pathways to Scale
• Stakeholder Engagement

Timeline


Develop Project Scope & Strategy
Conduct Landscape and Gap Analysis
Present Best Practices Report
Present Recommendations to Scale Best Practices
Publish Final Report
Build Core Team
Host Virtual Community Convening
Panelist at RE+ Conference
Webinar

Goal

Publish materials accessible to a wide audience on:

Opportunities for solar+storage to improve health, build resilience, and financially benefit historically marginalized communities.

Barriers to access

Research gaps

Educate

Promote early adopter programs that are:

Overcoming barriers

Achieving equity-based goals

Sharing lessons learned

Models to measure success

Amplify

Recommend to key stakeholders' practical program and policy next steps to advance equitable access to solar and battery storage technologies

Replicate

Equitable Solar Communities of Practice Topic:

Resilience, Storage and Grid Benefits

A.B. Ford Resilience Hub Solar Array in Detroit, MI
Credit: Clean Energy Group

Purpose

The equitable distribution of solar paired with battery storage (solar+storage) resources is integral to **public health, reducing energy burdens, and improving grid resilience.**

Benefit: Health

Over 3 million people in the United States rely on electricity for medical equipment.

Carbon Monoxide poisonings skyrocket after power outages due to improperly operated diesel generators.

Other than hospitals and select housing institutions, critical community facilities are not required to have backup power.

Residents must leave their community to find public facilities with reliable backup power resources. Others may require emergency support if they wait out the outage.

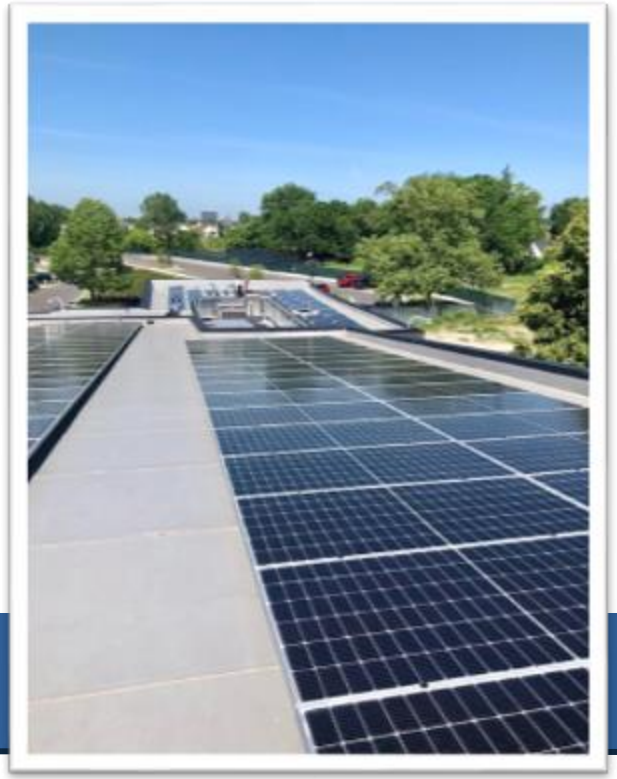
Solar+storage can provide reliable and renewable backup power.

Benefit: Reduced Energy Burdens

Low-income households face an energy burden 3x higher than other households.

Households in communities of color experience energy poverty at a rate 60% greater than those in white communities.

Rural households spend over 30% more on utility costs than the national average.



Solar array at A.B. Ford Resilience Hub.
Credit: Clean Energy Group

Solar+storage can help to reduce energy burdens and even generate revenue through grid services program.

Benefit: Improved Grid Resilience

Grid services programs:

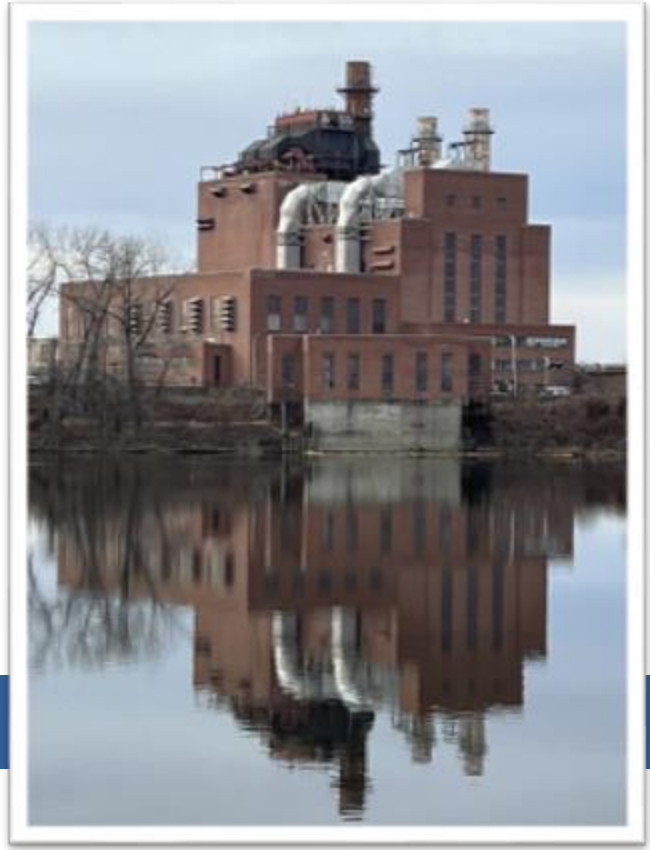
Avoid or reduce utility cost increases by providing energy during times of peak demand.

Reduce blackouts and brownouts.

Offset or avoid investments in centralized, fossil-fuel reliant centralized power infrastructure.

Renewable and community-benefiting alternative (or companion) to traditional grid hardening measures.

Distributed solar+storage benefits all ratepayers.

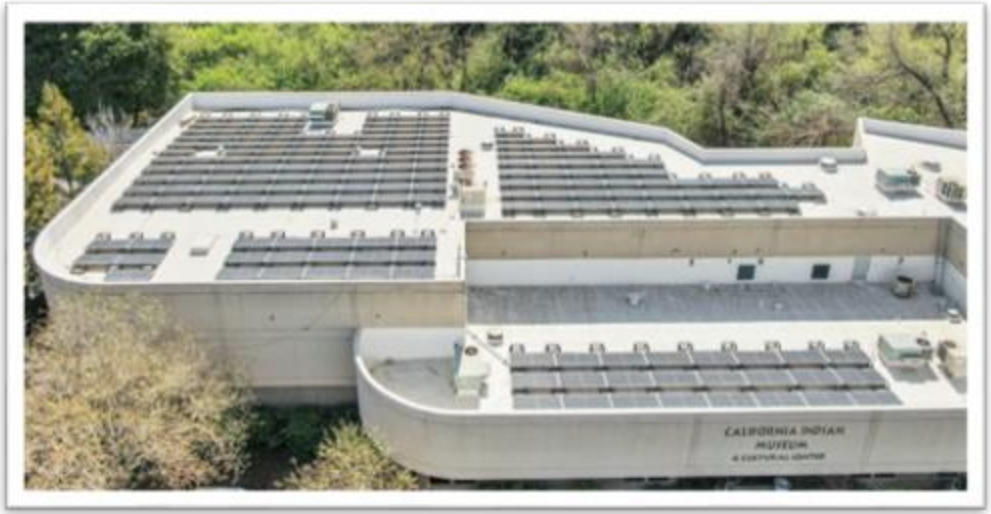


Peaker Power Plant, West Springfield, MA.
Credit: Shelley Robbins, Clean Energy Group

Project Scope

The “**Resilience, Storage and Grid Benefits**” Community of Practice aimed to:

1) Advance household and community-level resilience
2) Build grid resilience
3) Improve health outcomes through reduced power outages



Solar array at California Indian Museum and Cultural Center. CIMCC was a TAF awardee.
Credit: CIMCC

Project Scope

To **focus** the Community of Practice further, the scope was refined to:

1) Behind-the-meter solar paired with battery storage systems (solar+storage)

installed in

2) Residential (including affordable housing) and critical community-serving facilities

that are

3) Located in and serving historically marginalized communities.

Introducing the Core Team

Together Louisiana is a statewide network of more than 250 religious congregations and civic organizations across Louisiana, representing more than 200,000 people. The mission of Together Louisiana is to give faith and community-based organizations an opportunity to develop the leadership capacity of their members and affect change on a larger scale than they could alone.

Appalachian Voices brings people together to protect the land, air and water of Central and Southern Appalachia and advance a just transition to a generative and equitable clean energy economy.

ReVision Energy is a mission-driven, employee-owned solar company operating in Northern New England. Revision is a certified B Corp and Employee-Owned company, with a commitment to Justice and Equity.

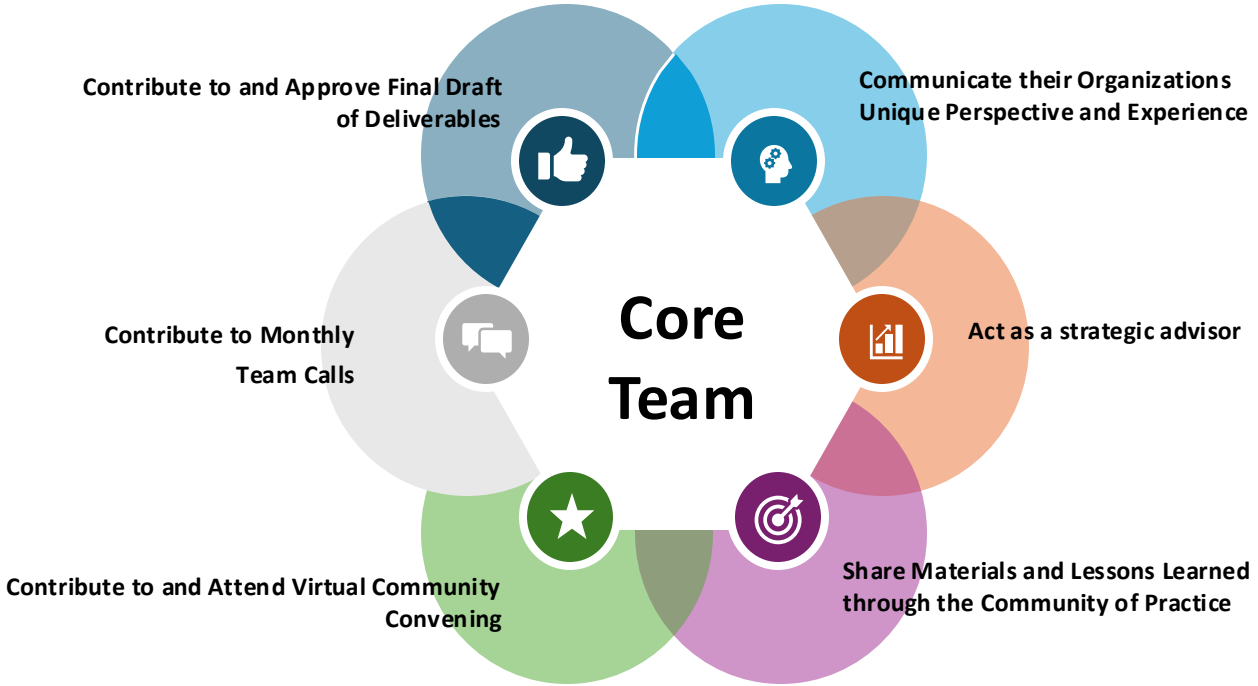
Introducing the Core Team

As a Home rule regional government, the **Northwest Arctic Borough** provides essential programs and services to improve the quality of life for all residents. The Northwest Arctic Borough (NAB) is the second largest borough in Alaska, comprising approximately 36,000 square miles.

The **Massachusetts Clean Energy Center (MassCEC)** is a state economic development agency dedicated to accelerating the growth of the clean energy sector across the Commonwealth to spur job creation, deliver statewide environmental benefits and to secure long-term economic growth for the people of Massachusetts.

The **Smart Electric Power Alliance (SEPA)** is a nonprofit organization that envisions a carbon-free energy system that is safe, affordable, reliable, resilient and equitable. SEPAs mission is to accelerate the electric power industry's transformation to a modern energy future through education, research, standards, and collaboration.

Core Team: Roles and Responsibilities



Research and Engagement:
Results of Landscape Analysis and Community Convening

Solar array at Harley Nature Center in Duluth, MN
Credit: Ecolibrium3

Key Terms

Takeaway: There is no consensus on “key terms” for energy resilience.

Energy Resilience is…

the ability of the grid, buildings, and communities to withstand and rapidly recover from power outages and continue operating with electricity, heating, cooling, ventilation, and other energy-dependent services. Department of Energy, Office of Energy Efficiency & Renewable Energy

a facility’s ability to withstand low-frequency high-impact disasters efficiently while ensuring the least possible interruption in the supply of electricity, sustain critical social services, and enabling a quick recovery and restoration to the normal operation state. Sustainability Journal.

a resilient power grid withstands, responds to, and recovers rapidly from major power disruptions as its designers, planners, and operators anticipate, prepare for, and adapt to changing grid conditions. National Renewable Energy Laboratory.

Key Terms

Takeaway: The term “energy resilience”, in general, does not accurately define community-led resilience projects. Rather, energy resilience is one component of “Community-Centered Energy Resilience”.

Community-Centered Energy Resilience…

adheres to energy justice principles when developing individual projects. Initiative for Energy Justice.

deliberately and meaningfully involves communities, either by local people owning the means for` generating the energy or by them benefiting directly from its production. 350.org

consists of reliable and renewable energy systems that improve the health and safety, and generate economic benefits for the most at-risk populations, such as medically vulnerable households, environmental justice communities, and communities of color. Clean Energy Group.

ensures that the benefits of clean, safe, affordable, and reliable energy are shared by all, particularly those in tribal, disadvantaged, and low-income communities. California Energy Commission.

Community Convening Results: Key Terms

Mentimeter

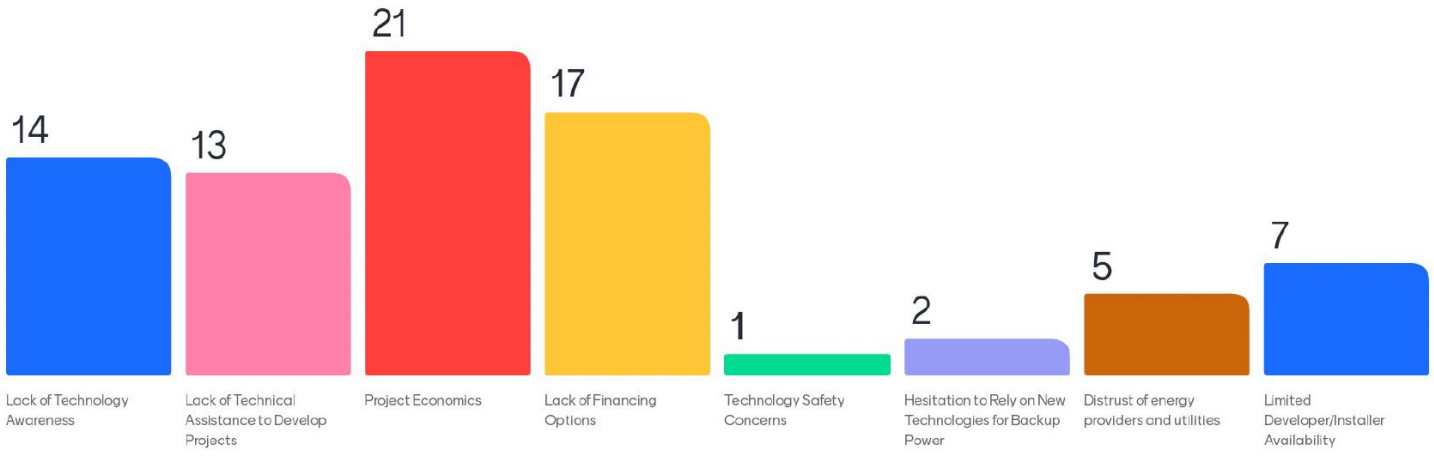
Community-Centered Energy Resilience in the communities I work with/serve includes...

45 responses

Community Convening Results:
Barriers to Equitable Access are Numerous

Mentimeter

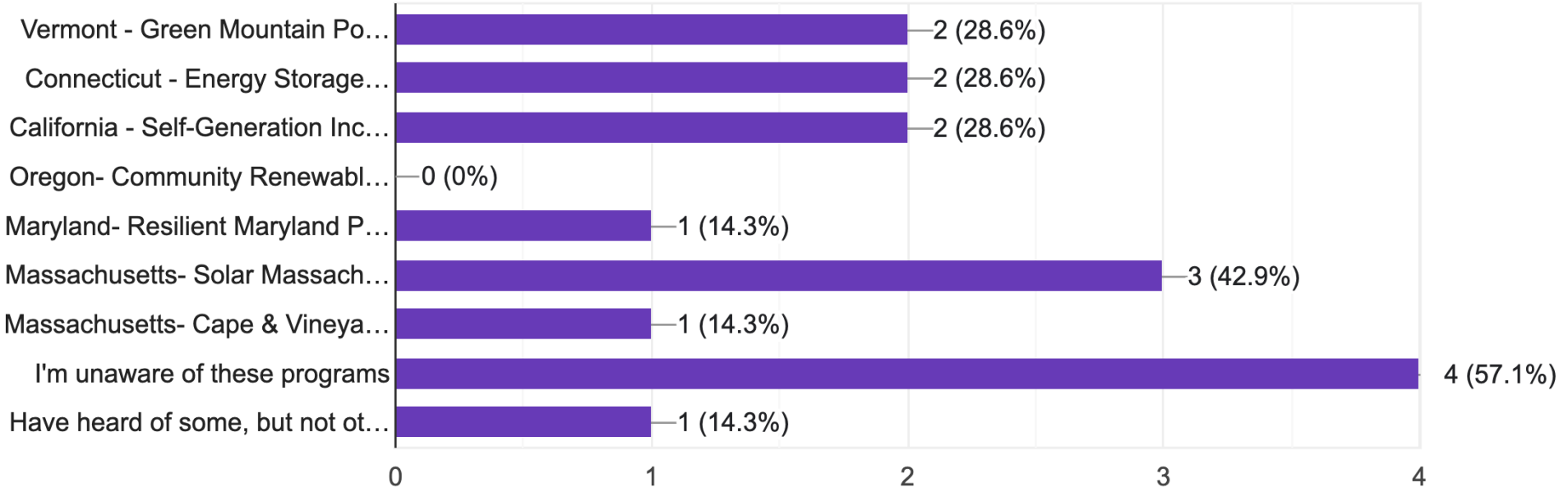
What are the main barriers for underserved communities in accessing battery storage technologies? Select top 3.



Best Practice Awareness

5. What is another state's battery storage initiative that you think highlights best practices in equitable battery storage deployment?

7 responses



The Value of Resilience…

is **more than conventional economic benefits**, such as utility bill savings and potential for revenue generation. National Renewable Energy Laboratory and Clean Energy Group.

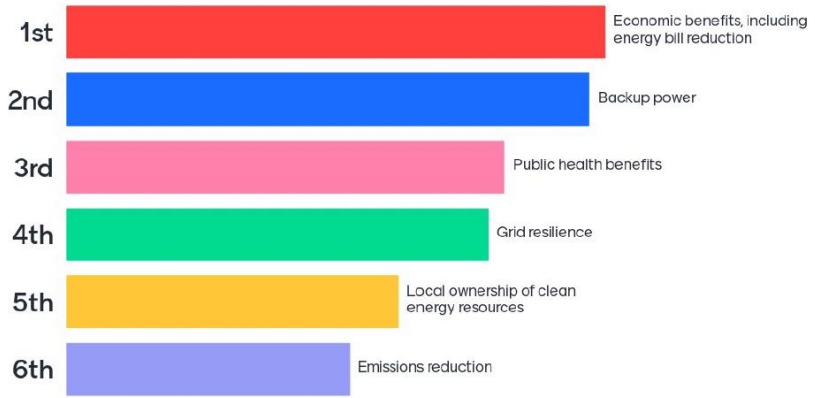
includes **avoided outage costs**, which represents the value of losses that would be incurred if a facility were to experience a power outage without a backup source of energy generation. Clean Energy Group.

includes considerations of **public safety, health, and environmental sustainability**. Strategen.

include the benefits of **reducing emissions** of greenhouse gases and other pollutants. The Electricity Journal.

Mentimeter

What are the most important "values of resilience" when considering how a resilient power project will benefit the community?



Research Gaps

Value of Resilience. Limited comprehensive resources related to monetizing the different benefits of resilient power.

Innovative Approaches to Measuring Success. Beyond standard program metrics, possible approaches to measuring a program or policies "success", including those that are non-monetary.

Health Analysis. There exist few resources that dive deeper into the impacts that power outages and solar paired with battery storage development could have on public health across the country.

Standardized permitting processes for clean energy projects. Interconnection and permitting remain top issues in project development.

Incorporating energy resilience (battery storage) into community and shared solar projects. Battery storage is not incorporated into existing community solar programs. How battery storage could participate in these programs requires further exploration.

Pathways Forward:
Scalable Solutions from Best Practices

Solar array at Rincon fire station in Puerto Rico.
Credit: Solar Responders

Overcoming Capacity Limitations: Technical Assistance

Problem: Most organizations do not have the in-house expertise to address highly technical energy issues or research/access the financial resources needed to navigate the predevelopment process.

Solution: Provide predevelopment grants that cover the cost of engaging third-party expertise to perform solar+storage technical and economic feasibility studies for a specific property or for a portfolio of properties. Include implementation funding and/or next-step grant application support.

Best Practice Examples:

Washington State Department of Commerce, Solar plus Storage for Resilience Communities Program: Grants support installation as well as planning work for solar+storage at community buildings. Technical assistance to help communities prepare to apply for future grant funding opportunities.

Southface, GoodUse: Program that helps nonprofits reduce utility costs and reinvest those savings into their programming through granted dollars and technical expertise.

Overcome Capacity Limitations: Amplify Best Practices

Problem: Even mission-driven states, utilities, and municipalities face challenges in developing battery storage programs, especially those that prioritize equity.

Solution: Organize and facilitate state, municipal, and utility learning cohorts to build capacity related to solar+storage grid services and incentive programs. Host learning sessions with guest speakers from existing grid services and state incentive programs to overview their programs, obstacles, and lessons learned, as well as CBOs that can speak to obstacles to development and opportunities for collaboration on marketing and outreach.

Best Practice Examples:
Pennsylvania Department of Environmental Protection Keystone State Microgrid Study: Coalition effort to provide stakeholders in Pennsylvania with a statewide microgrid deployment strategy, outlining prioritized customer and community sites along with microgrid use cases to enhance customer and grid resilience.

Overcoming Piecemeal Solutions: Comprehensive models that include incentives, capacity building, finance, and health considerations

Problem: Community-serving institutions with limited financial resources find the long road to solar+storage development complicated, expensive, and arduous.
Solution: Develop state and utility programs that support battery storage development that build capacity, define health benefits, and improve project economics for community institutions serving vulnerable populations and finance the balance through competitive financing.

Best Practice Example:
Climate Smart Technology and Home Medical Devices for Affordable Housing: Green Bank and foundation-funded program in CT to understand the investment needed in Climate Smart Technologies in affordable housing, including backup power. Program includes:

- Tailored technical assistance, including no-cost solar+storage feasibility assessment and weatherization audit.
- Grid services performance incentive through Energy Storage Solutions Program, allowing customers to receive payments based on their battery discharge during periods of high electricity demand on the grid.
- Affordable housing providers receive high incentives – approximately 50% of battery is covered through ESS program, before any federal tax incentives or state solar opportunities are factored in.
- CT Green Bank provides financing tailored to support solar+storage at affordable housing

Overcoming Piecemeal Solutions: Incentivize Storage, Generate Revenue, and **Support Health Considerations**

Health Rubric Indicates….

Potential for in-unit/red plug and resilience hub solar+storage system design.

Health critical loads include elevator, refrigeration, outlets for charging medical equipment.

Occupant Needs	
Mobility-impaired residents on upper floors?	Yes
Temperature-sensitive medical conditions?	Yes
Temperature-sensitive medications?	Yes
Medically dependent on electricity?	Yes
Alternative arrangements (hours)?	Indefinite
Building Attributes	
Common area gathering space?	Yes
Common area refrigeration?	Yes
Common corridor space?	Yes
Outlets in corridors?	Yes
Common HVAC supply?	Partial
Master metered?	Only Tower One

Measuring Success:
Program Performance Metrics

Vieques Emergency Management Trailer in Vieques, Puerto Rico. Credit: Footprint Project

Measuring Success: Carve-Outs and Capacity Targets

Carve-Out

Example: Community Solar Gardens Low-Income Carve-Out, Colorado

Capacity Target

Example: Energy Storage Solutions Program, Connecticut

Source: Katie Sikora, Feed The Second Line

Measuring Success: Monetizable and Harder- to-Monetize Metrics

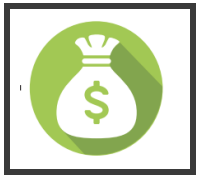
MONETIZABLE

Utility Bill Savings

Example: Residential Renewable Energy Solutions Program, Connecticut

Grid Services

Example: Clean Peak Standard, Massachusetts



Avoided Outages Costs

Example: Report, Resilient Southeast Exploring Opportunities for Solar+Storage in Five Southeastern Cities

HARDER-TO-MONETIZE

Health

Example: Self-Generation Incentive Program, California

Grid Resilience

Example: Green Mountain Power Home Energy Storage Program, Vermont

Emissions

Example. Mass Save Energy Efficiency Program, Massachusetts

Case Study: Boulder Housing Partners

How to Value Solar+Storage Benefits

CASE STUDY: **Boulder Housing Partners**
LOCATION: **Boulder, Colorado**

SUMMARY: In addition to being a leading affordable housing developer and the housing authority for the City of Boulder, Boulder Housing Partners (BHP) also provides command-post services to over 3,000 low-income residents during emergencies. BHP explored solar+storage as an option for its North Boulder headquarters, with the goal of remaining open and operational through a power outage.

The total cost of the solar+storage installation was $143,476. After factoring in various value streams, the estimated payback was approximately 19 years.

The items listed below highlight the value streams BHP considered when evaluating the benefits of solar+storage. Some benefits had a monetizable value, while others did not.

More information and resources related to the BHP solar+storage project are contained in an extensive case study, found at https://www.cleanegroup.org/initiatives/technical-assistance-fund/featured-installations/boulder-housing-partners.

Monetizable Benefits

Utility bill savings from solar
$1,145 in electric bill savings annually

Utility bill savings from battery storage and smart control system
Demand charge electric utility savings of $456 for a single month

Avoided cost of outages
Estimated $6,295 saved each year by maintaining services, rather than having to cease operations during an outage

Nonmonetizable Benefits

Emissions reduction
Solar+storage offset 40,000 pounds of CO_2 emissions over the life of the system

Resilience
Reliable and automatic backup power in the event of an outage

Avoided emissions
BHP was able to install a smaller gas generator that runs less often by prioritizing solar+storage

Thank You

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