



Overcoming Barriers to Solar+Storage in Critical Facilities Serving Low-Income Communities

A Survey of Service Providers
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Introduction

The combination of solar photovoltaics and battery storage (solar+storage) is increasingly being explored by municipalities, community institutions, and affordable housing providers as a solution to achieve economic returns and energy resilience benefits. While many institutions have already pursued solar for their properties, battery storage is now emerging as a solution to preserve the value of solar under evolving electricity rates and solar policies, to generate revenue through participation in new market opportunities, and to provide reliable backup power to essential services for residents during grid outages.

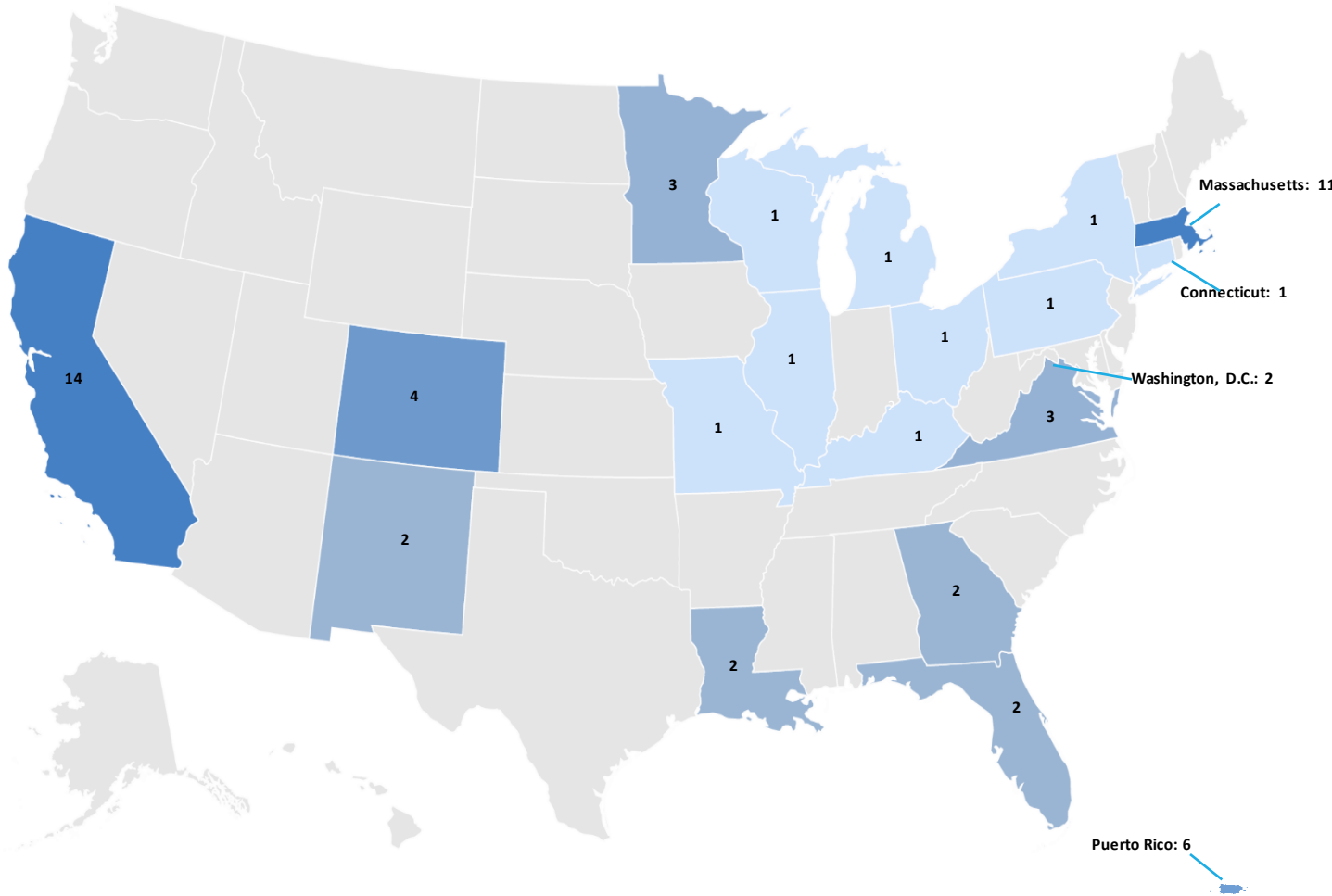
Despite these proven benefits, battery storage adoption remains low among community-serving entities. This is especially true for facilities serving low-income communities. To assess the current landscape of barriers facing solar+storage projects in this sector, [Clean Energy Group](#) (CEG) conducted a survey of municipalities, community organizations, affordable housing developers, and technical service providers who have been involved in developing solar+storage projects. In January 2021, CEG released a report, [Overcoming Barriers to Solar and Storage in Affordable Housing](#), that explores the results of this survey that pertained specifically to affordable housing developers.

This report expands beyond the responses of affordable housing providers to include community facilities, commercial developers, municipalities, emergency service facilities, and schools. Most respondents were developing solar+storage projects at facilities that serve low-income or otherwise vulnerable communities. This report summarizes the results of the survey, explores variations in responses between affordable housing and community services providers, and suggests multiple actions to help overcome the barriers to solar+storage development in low-income communities.

Survey Methodology

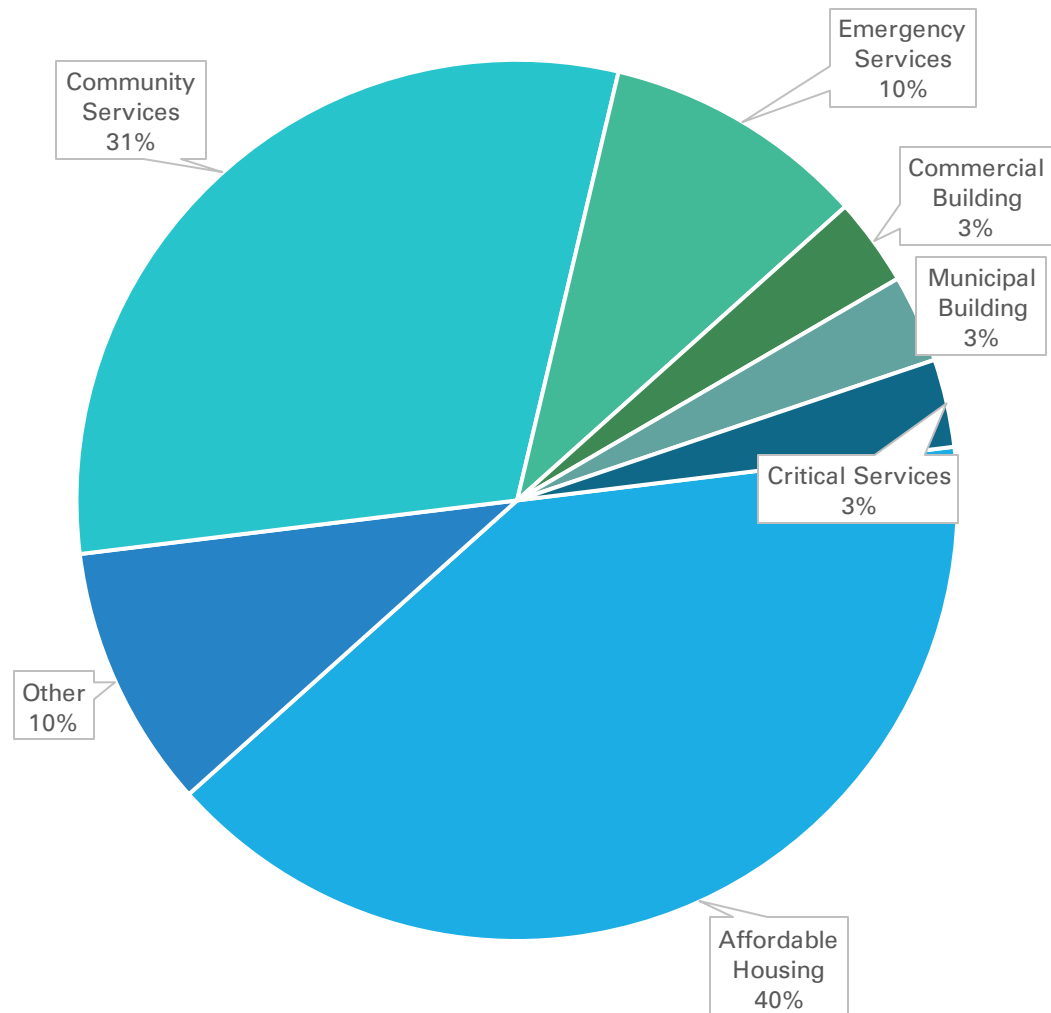
Clean Energy Group prepared a brief survey containing multiple-choice and short-answer questions regarding the development of solar+storage installations benefiting low- and moderate-income (LMI) communities. Between July and October 2020, the survey was circulated to a network of community-based organizations, municipalities, affordable housing developers, and technical service providers that were planning, developing, or recently completed solar+storage projects. The findings detailed here reflect data from all 60 responses received.

Geography



Most survey responses were from affordable housing and community service providers. Solar+storage projects were primarily in California (14), Massachusetts (11), and Puerto Rico (6). The remaining 29 projects were dispersed across 16 states and the District of Columbia. Colorado had 4 projects. Minnesota and Virginia each had 3 projects, and the District of Columbia, Florida, New Mexico, and Georgia each had 2 projects. The remaining states – Connecticut, Illinois, Kentucky, Michigan, Missouri, New York, Ohio, Pennsylvania, and Wisconsin – each had one project.

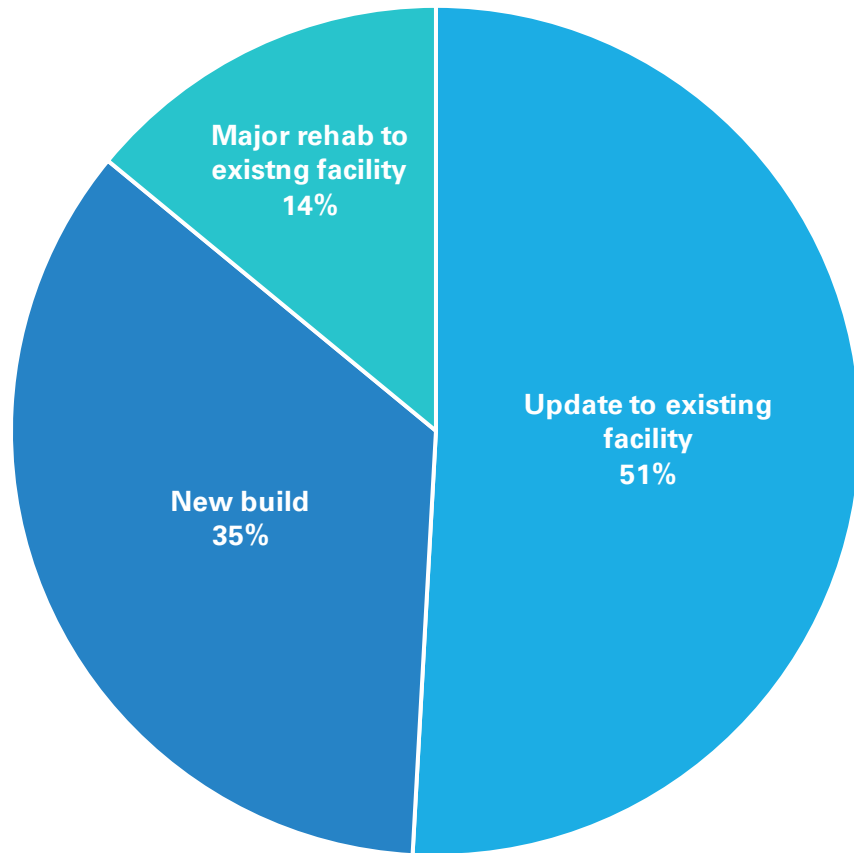
The concentration of projects in certain regions reflects the strong regulatory environment and incentive support for solar+storage in some states, including the [ConnectedSolutions](#) program in Massachusetts and [Self-Generation Incentive Program](#) (SGIP) in California.



Sectors

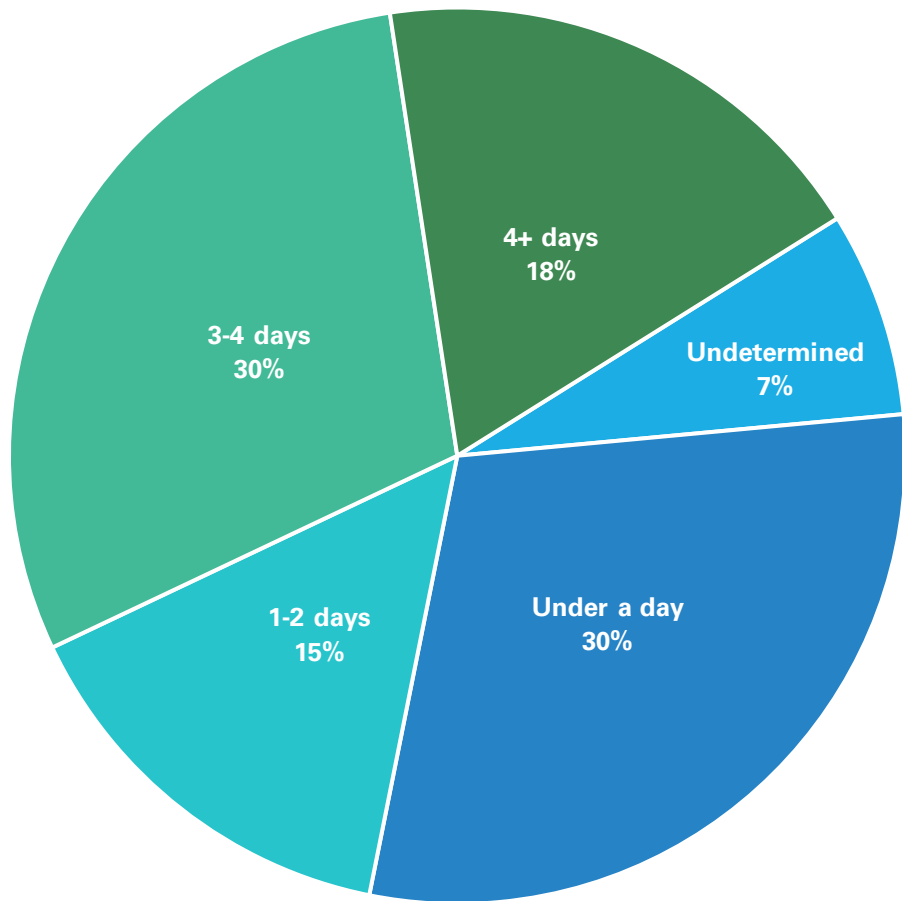
Most respondents were from affordable housing (40%), community services (e.g., resilience hubs and community centers) (31%), emergency services (e.g., emergency operations centers and fire stations), and critical services (e.g., wastewater treatment and health clinics). The “Other” category consisted of primarily residential and industrial projects.

This report focuses on the results of the entire survey, as well as comparing the responses between affordable housing and community services providers.



Project Type

Most respondents' projects were either new builds or updates to existing facilities. Few respondents were considering including solar+storage as part of a major rehab project.



Resilience Goals

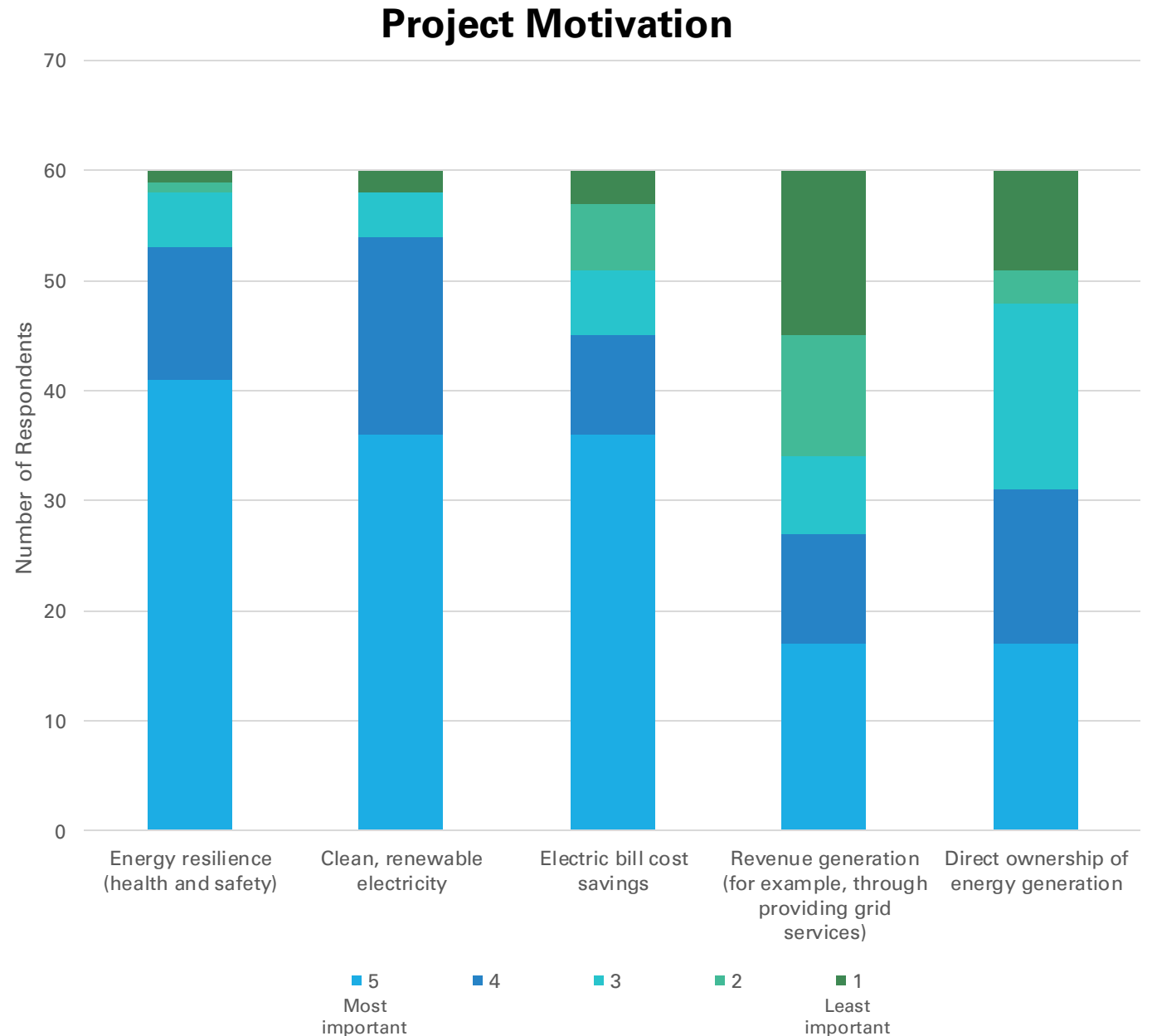
Of the respondents that indicated resilience as the primary goal of the project, 75% aimed for solar+storage to provide backup power for 4 days or less, with 30% of projects targeting durations of less than 24-hours.

Project Motivation

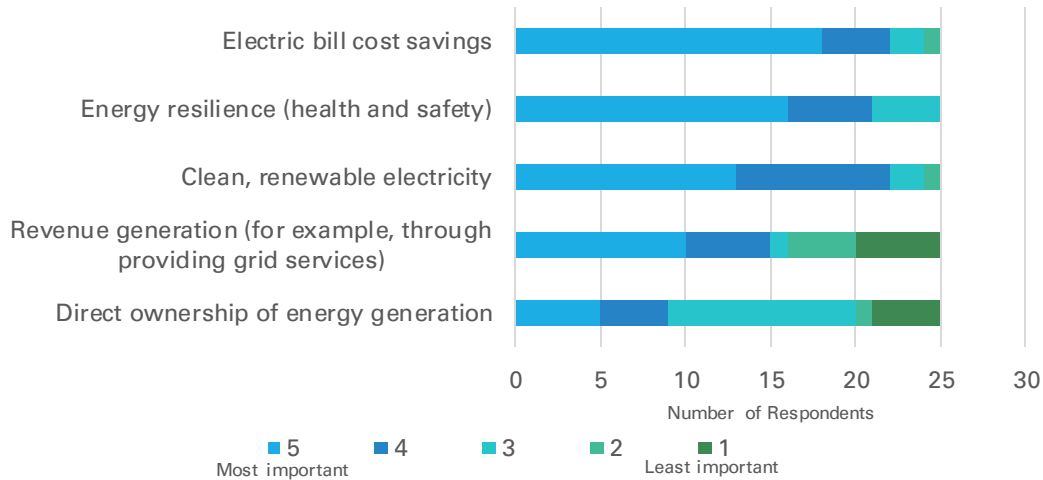
Project motivation to install solar+storage was ranked on a scale from 1 to 5, with 5 as the most important and 1 as the least important.

Energy resilience was ranked as the number one motivation for pursuing solar+storage among all respondents.

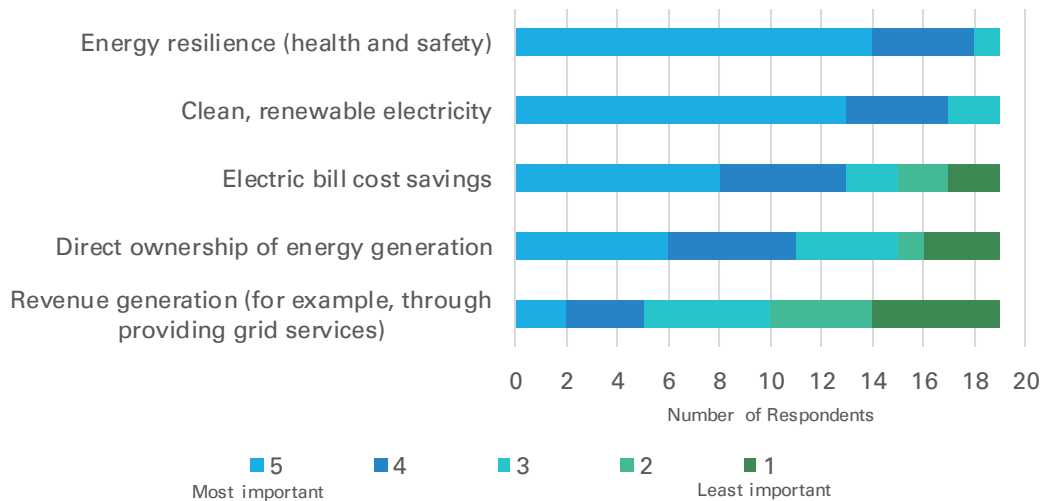
Clean, renewable electricity and electric bill cost savings were tied for second highest motivation.



Energy Resilience: Affordable Housing



Energy Resilience: Community Services



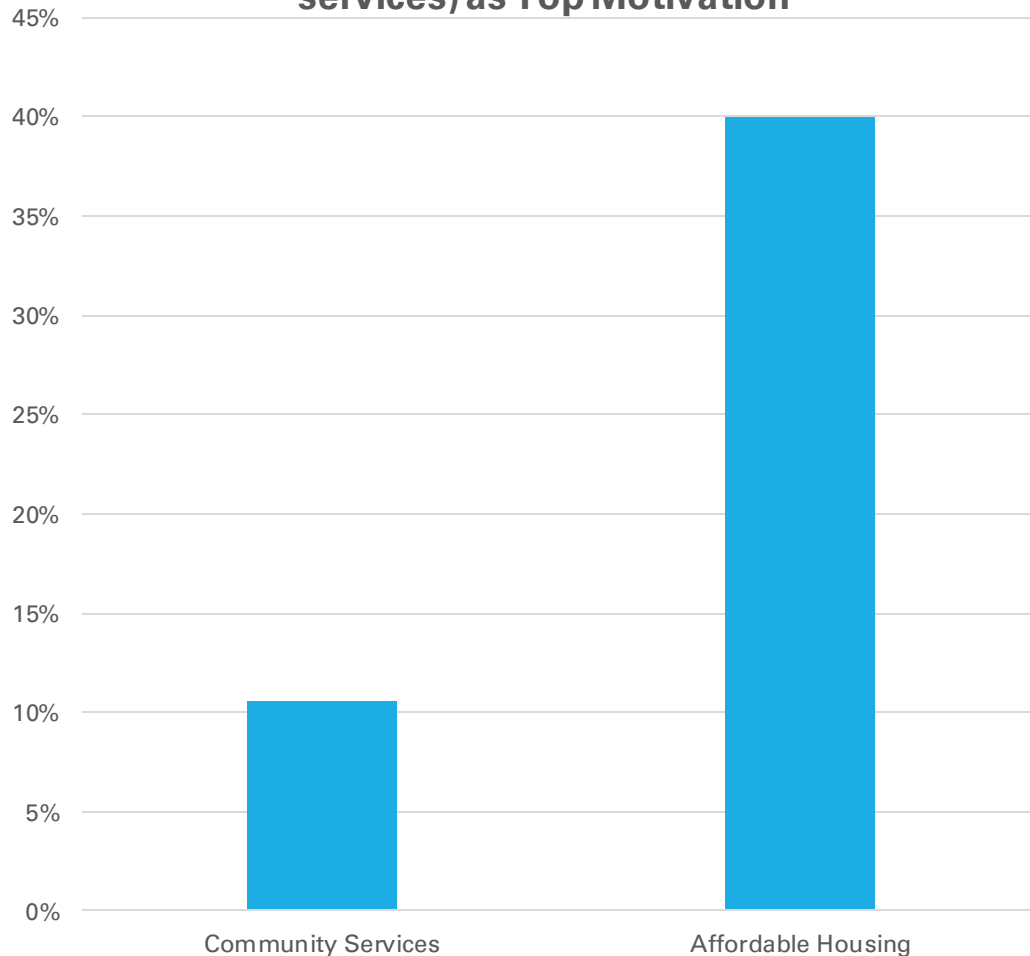
Project Motivation: Energy Resilience

Energy resilience in this context refers to the ability for a site to operate through a power outage and continue to offer services to residents, such as refrigeration, heating/cooling, or cell phone charging.

One major difference between affordable housing developers and community service providers was the ranking of energy resilience. Community service providers ranked energy resilience as their number one motivation for pursuing solar+storage. Affordable housing developers ranked electric bill cost savings as number one, followed by energy resilience. Community service providers, on the other hand, ranked electric bill cost savings third, after access to clean electricity.

This highlights the different financial context in which these two groups operate. While affordable housing developers are often managing a portfolio of sites and must justify the economic case for solar+storage within this portfolio, many community service providers may only manage one site, with providing essential services being the primary function of the facility.

Percentage of Respondents Who Ranked Revenue Generation (e.g., providing grid services) as Top Motivation



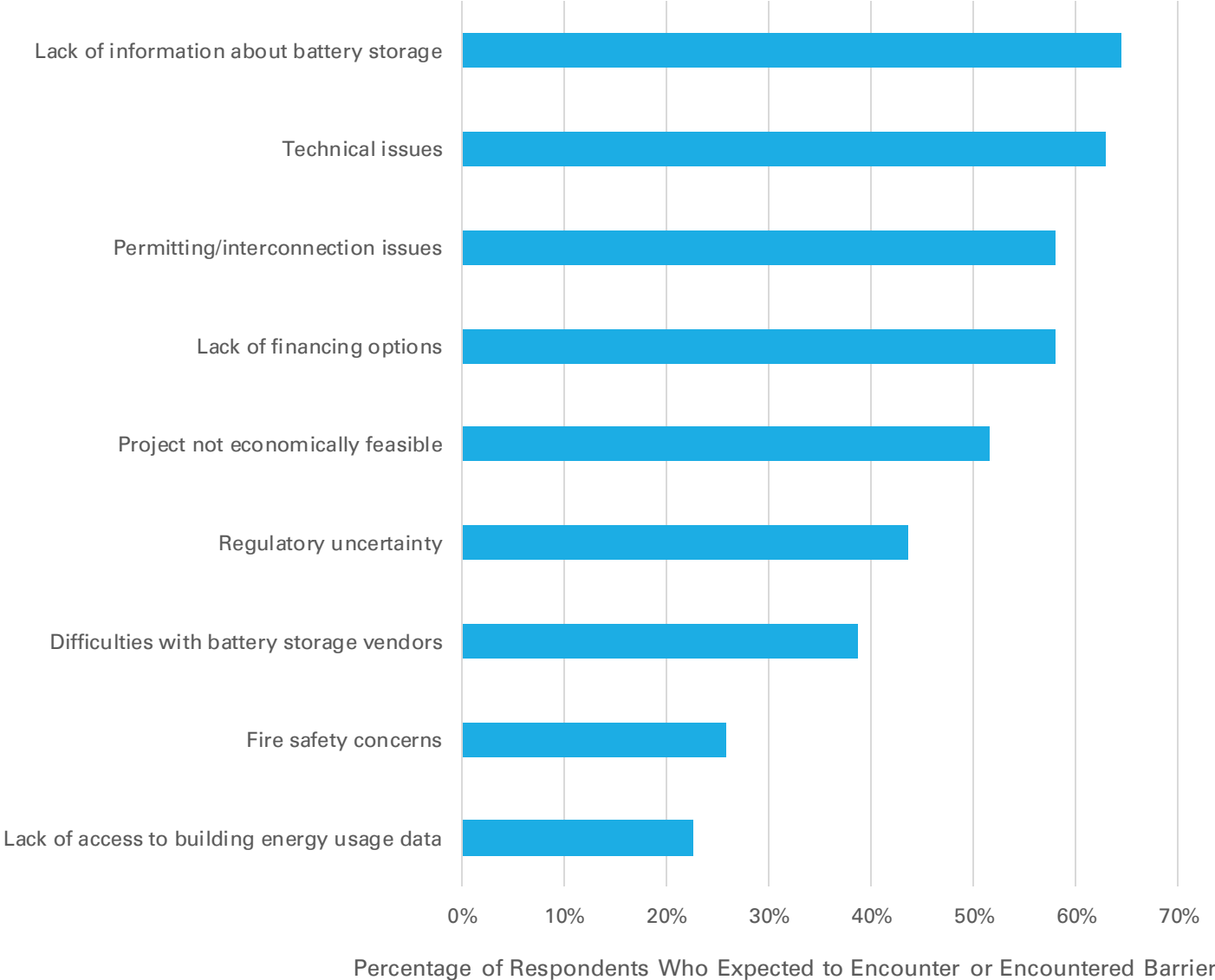
Project Motivation: Revenue Generation

Another notable difference in motivation is the gap between affordable housing developers and community service providers who ranked revenue generation as their top motivation. 40% of affordable housing developers ranked revenue generation as their top motivation, whereas only 11% of community service providers gave revenue generation the same ranking.

This finding points to several factors. Affordable housing developers often need to justify the economic case for resilience within a larger portfolio of properties, while community service providers can often justify clean energy usage and community resilience as part of their broader mission parameters. Community service providers also often do not have the staff capacity to pursue complex revenue generation opportunities. Alternatively, larger affordable housing developers may have specialized energy staff who are more familiar with solar and storage technologies and/or able to dedicate more resources toward exploring revenue options.

Barriers

65% respondents either expected to encounter or had encountered a lack of information about battery storage, the highest percentage of all barriers. Technical issues ranked as a close second.



Barriers: Overview

Lack of information about battery storage: Battery storage is still relatively new technology for buildings, and most organizations remain unfamiliar with energy storage. Information gaps include the amount of backup power batteries can provide over time, potential for utility bill savings, system costs, and availability of incentives to improve project economics. Lack of information is especially pervasive in low-income communities where developers are less likely to market their services.

Technical Issues: There are a wide range of issues that can arise when incorporating solar+storage into a project, from limited viable roof space for solar panels to the isolation of critical loads for a resilient system. These issues can be time consuming and/or expensive to remedy.

Permitting/Interconnection Issues: The process of connecting solar PV and battery storage to the grid can be complicated, time consuming, and expensive. In some cases, utilities may mandate an interconnection review in order to ensure that the proposed system will have no negative impacts on the grid (especially for larger projects). Utilities that are less experienced with storage can have longer processing times and may be more difficult to coordinate with.

Lack of financing options: Most solar+storage projects require cash reserves or financing to pay for upfront costs. In regions where savings and revenue opportunities are not strong enough to offset project costs, securing financing can be even more challenging. Yet, there are a few states, utilities, banks, or developers that offer solar+storage financing, but even fewer allow for flexibility in terms, interest rates, and underwriting criteria - all of which are necessary to encourage low-income community participation.

Project not economically feasible: Whether due to the design of utility rate tariffs, unfavorable net metering policies, lack of incentives and revenue opportunities, or site-specific condition, solar+storage may not be a cost-effective solution for some facilities.

Barriers: Overview continued

Regulatory uncertainty: Regulatory uncertainty builds upon the permitting/interconnection barrier outlined above. Limited solar+storage revenue and incentive opportunities typically equate to longer payback periods and more difficulty to finance projects. This, combined with a changing policy landscape and limited guidelines from utilities, only heightens the regulatory burden for organizations interested in solar+storage.

Difficulties with battery storage vendors: Despite recent market developments, battery storage remains a niche market. Not all solar installers, for instance, offer battery storage or are even familiar with the technology. There is also a lack of battery storage products available to meet the needs of multifamily affordable housing properties, which typically have energy usage profiles with a mix of commercial and residential characteristics, and to meet the needs of smaller community facilities.

Fire safety concerns: Most safety concerns associated with battery storage systems are related to fire risks. Although rare, a malfunctioning or incorrectly installed battery can potentially ignite and start a fire. Fire safety concerns can be especially problematic for affordable housing developers, who oftentimes have more regulations around the types of power generation that can be used to provide backup emergency power. Battery codes and standards, as well as fire fighter trainings related to fire containment, suppression, and safety, have been designed to minimize any safety risks by providing guidance for best practices when siting and installing a storage system.

Lack of access to building energy usage data: Building energy usage data, often a critical component for properly sizing a battery storage system, can be difficult to access depending on the utility. Some utilities provide usage data through an online portal, which can expedite the process. Others may require calling or filing out certain form to gain access to data. In many cases, detailed energy usage data beyond monthly electric bills is not available. This process can be confusing and time consuming, especially for smaller facilities without a facilities or energy manager.

Barriers: Finance Limitations

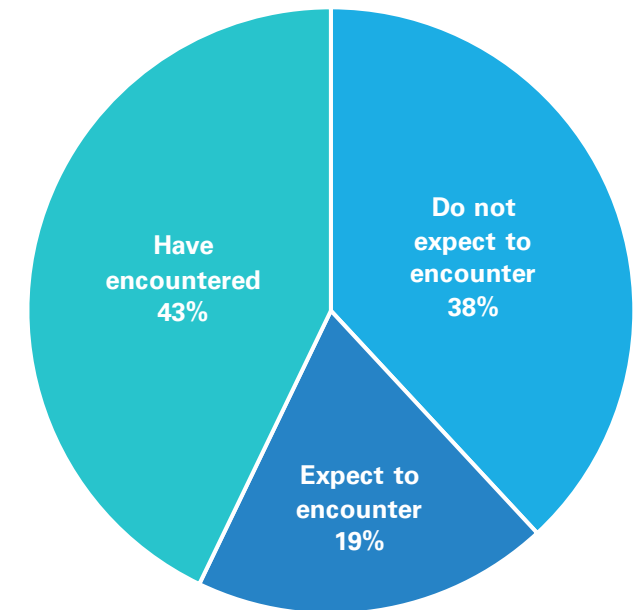
Finance limitations was a leading barrier across all sectors, with 62% of respondents stating that they either have encountered or expected to encounter financing issues.

When asked “Do you expect any of these factors to prevent the project from moving forward?” many respondents responded with finance related issues. One stated, “Financing is the main barrier. Other barriers I think we can overcome.” Another added, “it is very possible that cost will prohibit us from including storage in this project.”

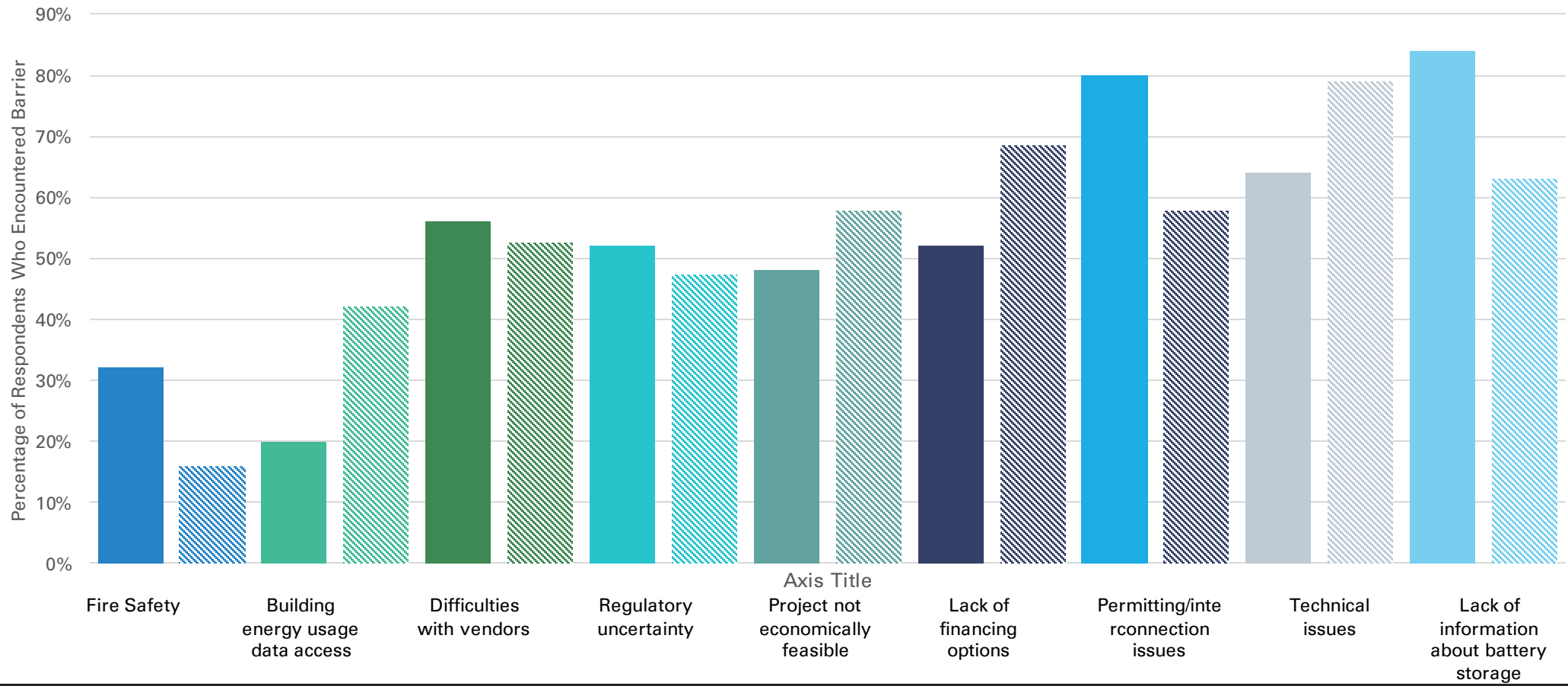
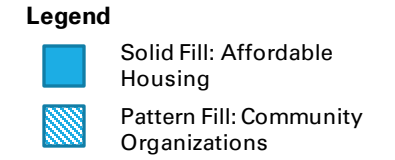
Solar benefits from multiple incentives and a developed market. Many finance institutions are now familiar with solar, have funded projects, and understand how to incorporate incentives like the federal tax credit. Battery storage does not yet benefit from the same advantages as solar. Financing projects that include storage remain difficult. Battery storage is a much newer technology with more complicated economic benefits than solar. Furthermore, while costs have dropped dramatically, battery storage remains expensive. Many developers and financial institutions do not have experience valuing battery storage, resulting in a learning curve that can make project development difficult and time consuming. Battery storage economics are also very dependent on the state and utility territory. Financial institutions serving multiple states will have to juggle different storage regulatory environments and incentive offerings depending on a project’s location.

These barriers can make it difficult and costly to finance a battery storage project. While incorporating storage with solar can improve system economics in some cases, this may not be enough to overcome the learning curve that many developers and financial institutions face when understanding how to incorporate battery storage into a project.

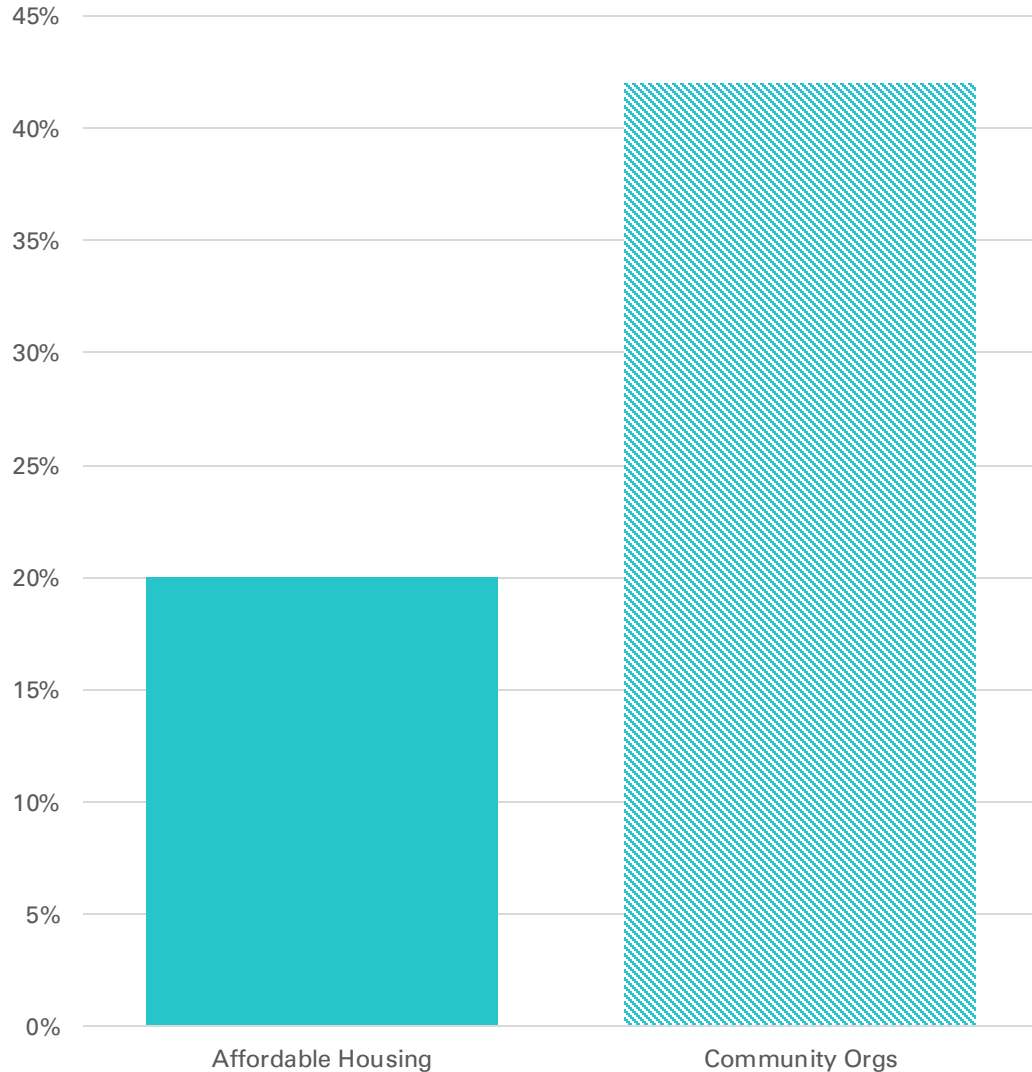
Lack of financing options



Barriers: Differences Between Affordable Housing and Community Services



Percentage of Respondents Who Encountered Difficulties with Building Energy Usage Data Access

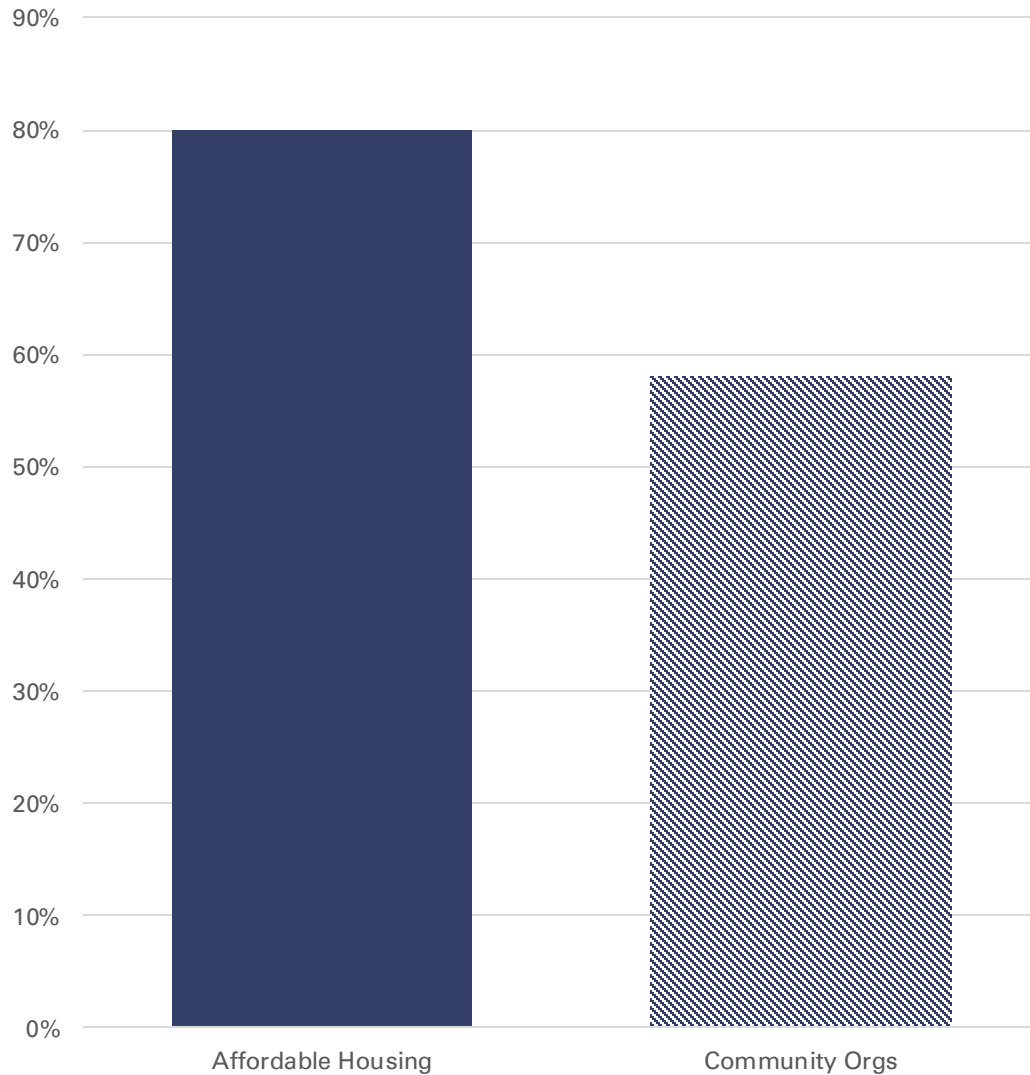


Differences in Barriers Between Affordable Housing and Community Service Providers: Building Energy Usage Data Access

Building energy usage data was one of the only barriers that community organizations ranked higher than affordable housing developers. 42% of community organizations expected to encounter or had encountered this issue. This may again speak to the difference in capacity between affordable housing developers and community organizations – many community organizations, particularly if they are new to solar+storage or have limited staff resources, may find it challenging to gain access to energy usage data.

Furthermore, larger facilities are more likely to have smart meters installed that record detailed energy usage data. Affordable housing developers, which often operate larger facilities, may therefore have difficulty accessing data because electricity consumption at their properties are more likely to be monitored by smart meters.

Percentage of Respondents Who Encountered Permitting/Interconnection Issues

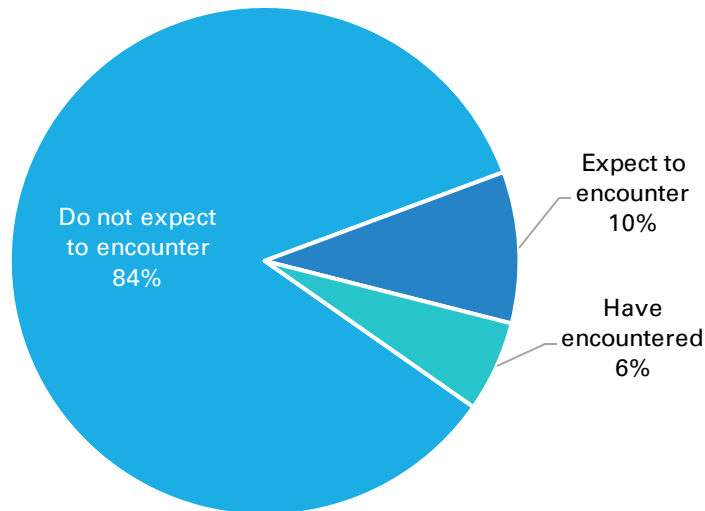
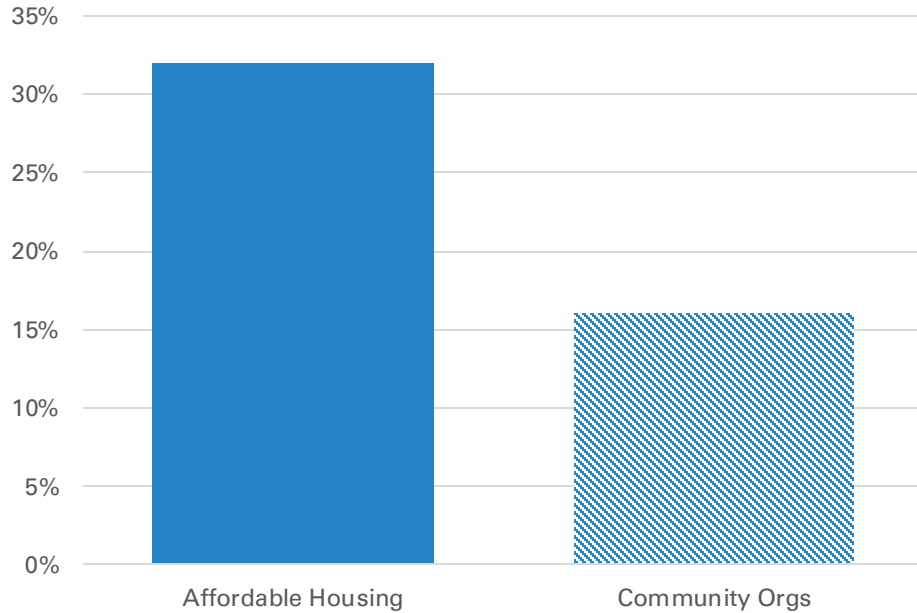


Differences in Barriers Between Affordable Housing and Community Service Providers: Permitting/Interconnection Issues

There are several reasons why affordable housing developers may have indicated that interconnection was a greater barrier than community facilities. One possibility is that affordable housing owners with multiple facilities may have already encountered interconnection issues in pursuing previous solar projects, whereas community facilities may be exploring both solar and storage for the first time.

Affordable housing solar+storage projects may also include large systems, depending on the size of the property, that are therefore more likely to trigger interconnection study requirements and other costly delays than smaller-scale installations. One developer that identified utility and permitting delays as the most significant roadblock in the development process, stated that their project would benefit from a clearer permitting and interconnection process and “similar programs and campaigns that were done by DOE, NREL, Solar Foundation to streamline solar permitting and interconnection and barriers, but focused on energy storage.”

Percentage of Respondents Who Encountered Fire Safety Concerns



Differences in Barriers Between Affordable Housing and Community Service Providers: Fire Safety

Across all sectors, respondents were least concerned about barriers related to fire safety. 84% indicated they do not expect to encounter fire safety as an issue, while only 16% either expected to or have encountered fire safety related issues.

It is worth noting that affordable housing providers (67% did not expect to encounter) responded with more concern than community service providers (83% did not expect to encounter) regarding fire safety. There may be heightened safety concerns among affordable housing providers due to the fact that solar+storage projects would be located in buildings that serve as primary residences for potentially hundreds or thousands of people.

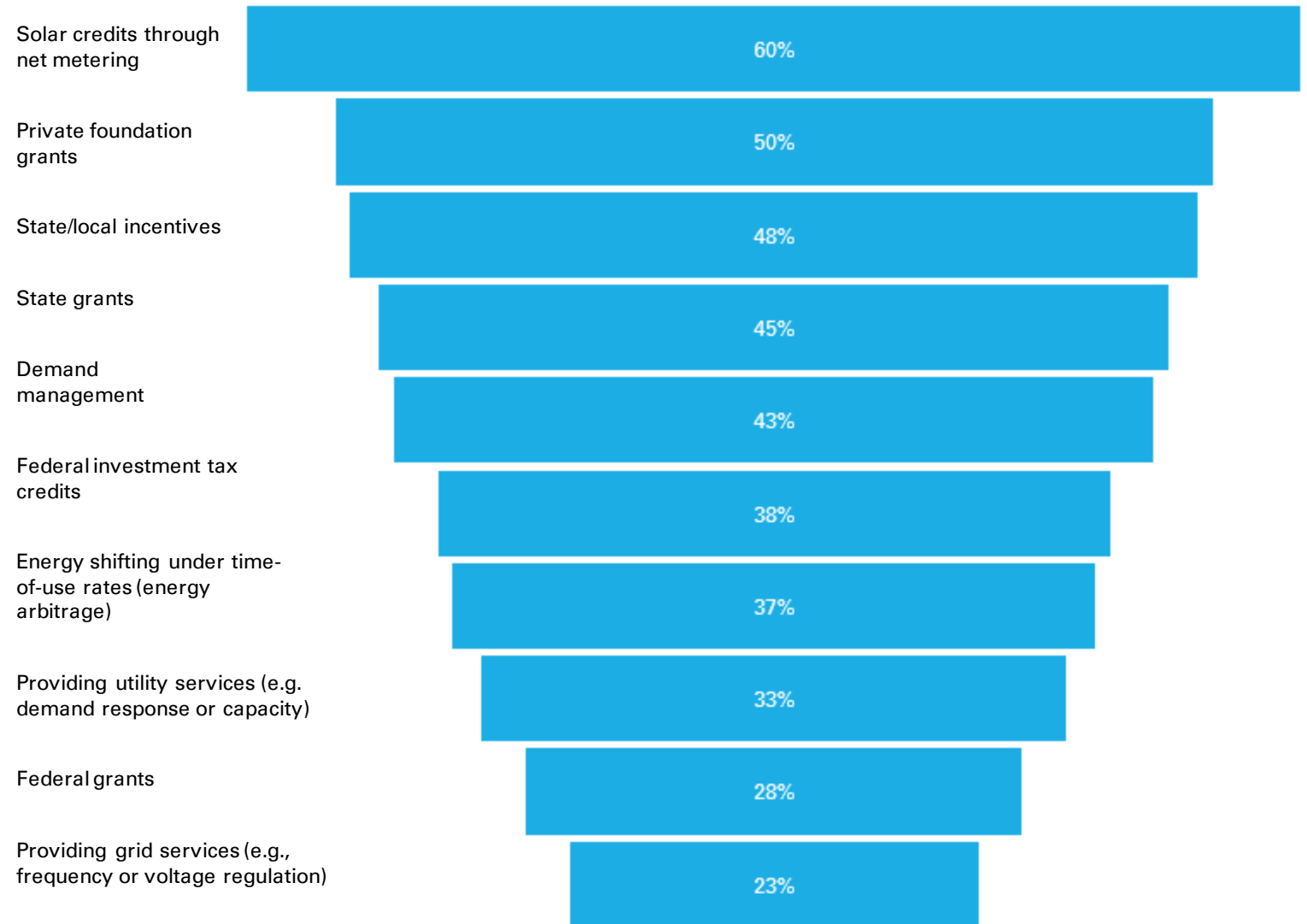
Economic Factors and Funding Considerations

Survey respondents were presented with several potential economic considerations for their projects and asked to select as many as they thought were relevant for their project.

Solar net metering was the leading economic factor. State and local incentives, as well as demand management, were also prioritized. This highlights the importance of a supportive policy and regulatory environment in developing solar+storage projects.

Private foundations were the most common grant funding source, followed by state grant opportunities.

Economic Factors and Funding Considerations: All Sectors



Percentage of Respondents Considering Financing Option

Economic Factors and Funding Considerations: Overview

Solar credits through net metering: Solar net metering is a billing mechanism that allows consumers to earn utility bill credits for the electricity they generate from their solar array that is not directly consumed onsite. These credit can be used to offset future energy consumption.

Private foundation grants: Some foundations provide technical assistance grants to defray the cost of feasibility analyses, installation, or operation and maintenance costs. Other foundations provide grants to directly offset the cost of installing a solar and/or battery storage system.

State/local incentives: State and local programs, such as the Self-Generation Incentive Program in California, provide incentives that can improve the financial calculus of solar+storage projects.

State grants: State programs, like the New York Affordable Solar Predevelopment and Technical Assistance program, offer funding to address resource gaps and solve market barriers that may prevent projects in low- and moderate-income communities from moving forward.

Demand management: Depending on a facility's utility rate tariff, organizations may be able to realize substantial bill savings from a solar+storage system's ability to reduce grid electricity usage during times of high onsite demand, a process know as peak shaving.

Federal investment tax credit: The federal solar Investment Tax Credit (ITC) allows organizations to deduct 26 percent of the cost of installing a solar energy system from federal taxes. Battery storage systems primarily charged by onsite solar can be eligible for the ITC and included the installed cost of a solar energy system

Energy shifting under time-of-use rates: Under time-of-use rates, the price of electricity varies depending on the time of day, with higher priced peak periods and lower priced off-peak periods. Shifting solar consumption to peak periods and grid consumption to off-peak periods can generate additional savings.

Providing utility services: Programs like ConnectedSolutions in Massachusetts allow battery storage owners to generate revenue through providing valuable services to the grid, such as demand response to reduce system-wide peak demand.

Federal grants: The federal government offers various grant opportunities to defray the cost of solar and/or storage installations. One example is the U.S. Department of Agriculture's Renewable Energy Development Assistance grant program, which offers renewable energy project development assistance to organizations in rural areas.

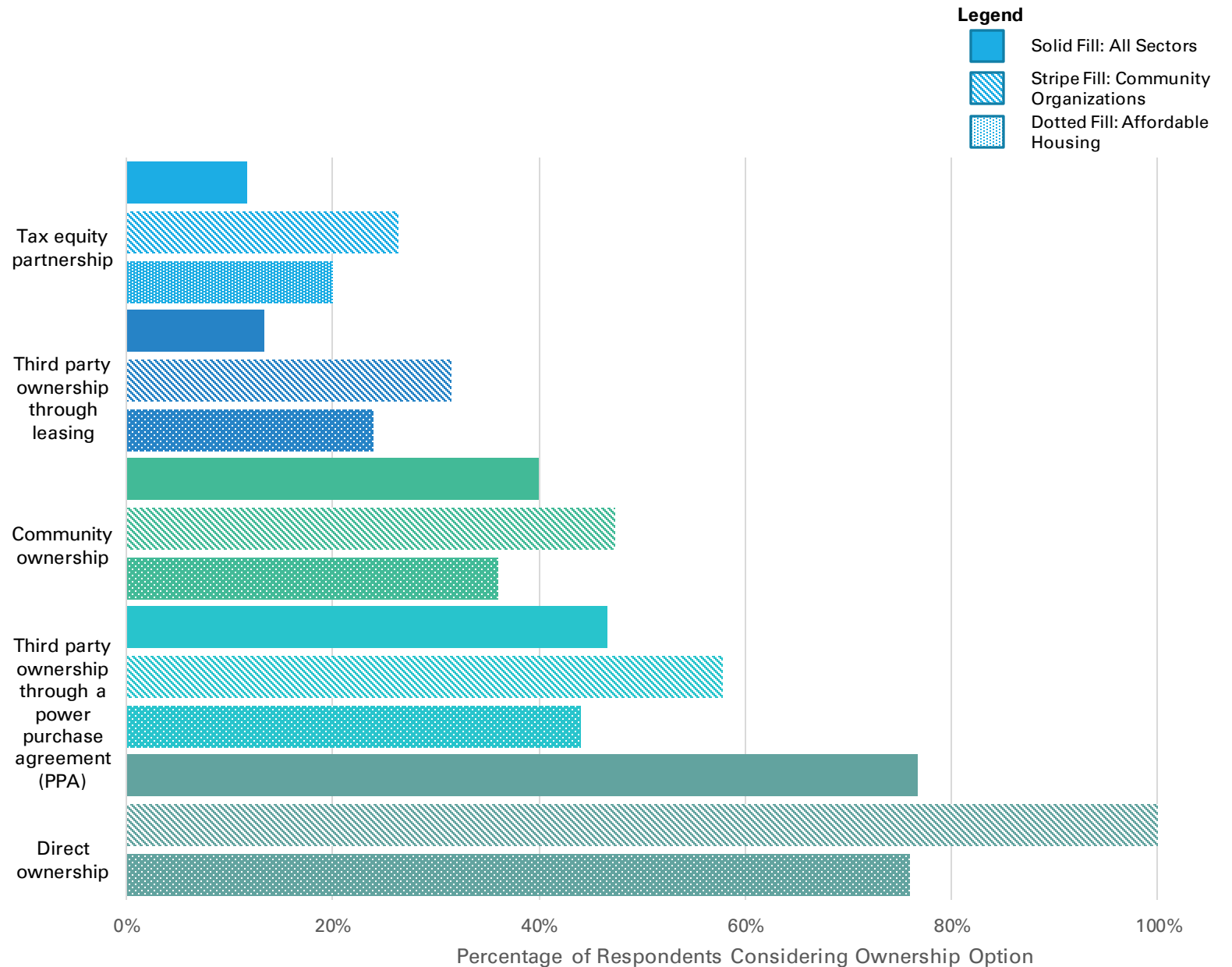
Providing grid services: Depending on the regulatory context a project is developed in, providing grid services like frequency regulation can improve the financial feasibility of a project.

Ownership Preferences

The top three ownership options considered across all sectors were 1) Direct ownership, 2) Third party ownership and 3) Community ownership. This ranking was also true for community services respondents. However, compared to both all sectors and community organizations, a smaller proportion of affordable housing providers ranked community ownership as a preferred ownership model.

Based on Clean Energy Group’s experience working with community-based organizations (CBOs), this discrepancy is likely attributed to CBOs holistic view of resilience. CBO projects often prioritize community ownership as necessary to building community resilience through local ownership and wealth creation, rather than allowing the ownership and investment to go to a third-party/outside entity.

One organization that responded to the survey highlighted the importance and difficulties in implementing community-owned solar+storage resources, stating “Storage is the key missing step for more independence from the grid. Since community owned energy resources is one of our values, we will continue to look at solar + storage until we can figure out a way to implement it.”



Recommendations

The survey results point to several common barriers in pursuing solar+storage for low-income community facilities. Although affordable housing developers and community services providers had varying responses as to barriers to project development, both sectors shared commonalities regarding issues related to solar+storage education, resources, and project economics.

Based on the results of this survey, this report highlights the following as necessary to improving solar+storage development, especially in underserved communities:

- **Increase Awareness of Battery Storage**
- **Create Opportunities for Capacity Building**
- **Provide Technical Assistance Support**
- **Develop Innovative Incentive and Finance Options**
- **Establish a Monetary Value for Resilience**

Recommendation 1: Increase Awareness of Battery Storage

Lack of information about battery storage technologies was the number one barrier identified by respondents from all sectors. Freely available educational materials such as case studies, sample building analyses, and accessible resources explaining the economic and resilience benefits of battery storage can be extremely valuable for all organizations exploring solar+storage for their properties.

CEG has produced and compiled a collection of such informational resources, including [case studies](#), [webinars](#), and [publications](#). Many of these resources are cataloged in our [Resilient Power Project Toolkit](#). CEG's publication, [Understanding Solar+Storage](#), addresses commonly asked questions about pairing solar with battery storage to create a foundation of knowledge for individuals and organizations interested in developing these technologies.

In addition to increasing awareness about solar+storage, organizations can benefit from additional regulatory and industry tools and resources. Easy to use modeling and mapping platforms can help organizations with dedicated energy and sustainability staff grow in-house expertise for identifying good sites and spotting issues before they develop. The [REopt Lite](#) optimization tool developed by the National Renewable Energy Laboratory is a good example of a publicly available tool to perform a first-pass assessment of the feasibility of a solar+storage project.

Recommendation 2: Create Opportunities for Capacity Building

Both affordable housing providers and community organizations ranked technical issues and lack of information about battery storage as their most encountered or most expected to be experienced barrier. However, affordable housing developers and community organizations encounter those barriers from very different contexts. Many community organizations already struggle with limited staff time and resources, equating to a larger learning curve and time commitment from the start. Educational resources and financial incentives require staff capacity to identify and understand those offerings. Local governments also face similar resource constraints, in addition to inherent bureaucratic constraints, which can limit their capacity to develop resilient energy projects, particularly in under-resourced communities. For these reasons, programs that support internal capacity building can play a valuable role in improving successful solar+storage outcomes for community organizations and municipalities. The following two programs focus on supporting internal capacity building among municipalities and community organizations:

Clean Energy Group's [Resilient Power Leadership Initiative \(RPLI\)](#). RPLI funds are awarded to nonprofit organizations active in environmental justice, low-income, and Black, Indigenous, and People of Color (BIPOC) communities to facilitate a deeper understanding of the benefits of solar+storage and support their ability to move resilient power projects forward. CEG supports RPLI grantees in their efforts to develop reliable, clean energy projects that strengthen community resiliency, through improved energy resilience and reduced energy burdens, among vulnerable populations.

Urban Sustainability Directors Network's (USDN) [Innovation Fund](#). USDN's Innovation Fund provides training tools for local governments and their partners to train staff and engage communities in efforts to support community resilience initiatives. The toolkit includes a guidebook for equitable clean energy program design, an inventory of best practices, and in-depth case studies. These tools were developed by USDN municipal member communities to educate city staff on the effects of climate change and its impact on city assets and operations, so they are designed with municipal needs in mind. They offer implementation strategies to support cities in translating tools and trainings into practical plans, projects, and infrastructure investments.

Recommendation 3: Provide Technical Assistance Support

Lack of information was closely followed by technical issues as the solar+storage barrier that projects were most likely to experience. Without access to trusted technical expertise, these types of challenges could easily prevent a project from reaching development. Unfortunately, most organizations do not have the in-house expertise to address highly technical energy issues and may not be able to access the financial resources needed to engage an experienced engineering partner during the predevelopment process. This is especially true of community organizations and service providers located in and serving low-income communities.

Technical assistance programs support organizations in taking the first step toward solar+storage development: conducting a solar+storage assessment at a specific property. Particularly for organizations without extensive experience in solar+storage, a feasibility assessment can provide a valuable framing of the economic and resiliency potential of a solar+storage project. The organizations providing these technical assistance programs also often offer valuable independent guidance as the project progresses. For many resource-strapped organizations, this support can mean the difference between a project moving forward and getting stymied by the first obstacle it encounters.

The following slide gives an overview of technical assistance programs available to advance community solar+storage projects.

Recommendation 3 : Provide Technical Assistance Support

Example: Technical Assistance Programs

Technical assistance funds can provide critical support to help overcome barriers throughout the solar+storage development cycle. Examples of technical assistance programs include:

Clean Energy Group's Technical Assistance Fund (TAF). The Technical Assistance Fund is a national program that provides small predevelopment grants to organizations exploring solar+storage projects serving low-income communities. The grants 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. Through the TAF, CEG has supported solar+storage feasibility assessments for more than two-hundred [facilities](#), providing organizations with the insights and information to address barriers early in the development process. The feasibility studies help demystify the solar+storage development process by identifying potential problem areas ahead of time, before significant resources have been invested in the project. The assessment process also establishes a valuable connection to an experienced expert who has a working knowledge of solar+storage incentive programs, policies, and regulatory structures specific to each project. This relationship can continue into the development stage, assisting organizations as they begin to engage project developers and work with solar and storage vendors.

Southface Institute's [GoodUse Program](#): The GoodUse program provides technical assistance, educational resources, and project implementation grants to nonprofit organizations in the Southeast. The GoodUse program is intended to help nonprofit community organizations who operate in energy and water inefficient buildings gain back the funds currently spent on utility expenses. The program connects grantees with Southface engineers who identify areas for high-impact energy savings, assist with project implementation, and ensure that building upgrades deliver the intended savings. The expertise GoodUse provides, along with project implementation funding, greatly reduces the burden of pursuing solar+storage, or other energy efficiency upgrades, for nonprofit organizations.

Recommendation 4: Develop Innovative Incentive and Financing Options

56 percent of survey respondents expected to encounter or have encountered a lack of project financing options. Solar+storage is still a relatively new area of investment for many financial institutions, which can make securing financing a challenge even for larger organizations. Although prices have dramatically dropped over the last decade, battery storage technologies remain costly. Incentive programs that reduce upfront costs and monetize the grid services that batteries provide can support project finance by improving system economics.

Furthermore, finance and incentive programs that are tailored to support the development of solar+storage systems in low-income communities are necessary to ensure that organizations who can't afford the upfront costs of a system still have the ability to access resilient power technologies.

The following slides overview innovative financing and incentive programs offered throughout the country.

Recommendation 4 : Develop Innovative Incentive and Financing Options

Example: Tailored Incentive Programs for Vulnerable Populations

The following programs aim to improve access to resilient power technologies for vulnerable populations by providing tailored incentive programs:

Maryland Resiliency Hub and Resilient Maryland Programs. Maryland offers two programs to support the development of community resiliency hubs in high density, low-income communities. The Resilient Maryland Program aims to offset the costs associated with the planning and design of distributed energy systems at critical facilities, including community resiliency hubs. The Resiliency Hub program awards grants to develop and construct resiliency hubs in community/public buildings in Maryland.

California Self-Generation Incentive Program (SGIP). SGIP provides different rebate compensation levels for battery storage based on certain criteria, primarily income and proximity to high wildfire risk areas. The program is split into three main incentive categories: Base, Equity, and Equity Resiliency. The Equity and Equity Resiliency battery storage incentives are specifically designed for low-income and high-risk communities. Critical facilities and residences in low-income communities and state-defined disadvantaged communities throughout California are eligible for the Equity incentive, which covers approximately 80 percent of the cost to install a battery storage system. The Equity Resilience incentive offers the highest compensation rate (\$1,000/kilowatt-hour), enough to typically offset the entire installed cost of a battery storage system. This incentive is specifically for low-income, disadvantaged, and medically vulnerable customers living in high wildfire threat zones or in areas that have experienced multiple power outages due to wildfire-related utility power shutoffs.

Recommendation 4 : Develop Innovative Incentive and Financing Options

Example: Innovative Finance and Compensation Programs

The following programs focus on improving access to resilient power technologies for low-income populations by innovative finance options and compensation programs:

The Kresge Foundation [Financing Resilient Power Initiative](#). This \$3 million initiative uses a loan guarantee that provides the participating lender with a 50 percent payment guarantee for loans made to solar+storage projects in low-income communities – meaning that if a project can't cover a loan payment for any reason, The Kresge Foundation will pay up to 50 percent of the project debt service to prevent the project from defaulting. This significantly reduces the risk of a default to the lender, allowing for more leeway in considering solar+storage project financing and the ability to offer better terms.

[ConnectedSolutions](#). ConnectedSolutions is a utility-run battery storage program currently available in Connecticut, New Hampshire, Massachusetts, and Rhode Island. ConnectedSolutions creates an opportunity for customers to [monetize](#) the grid services battery storage can provide. Customers opt into a multi-year contract with their utility where they receive payments based on their battery system's response to signals to discharge during periods of high electricity demand on the grid. The program is equally available to all types of facilities, from large affordable housing properties to smaller community facilities. Not every state that offers ConnectedSolutions includes a specific incentive to prioritize battery storage in low-income communities as part of the program, however, the program proposed in Connecticut would include higher incentives for customers in low-income and/or environmental justice communities, as well as those with medical hardships.

In response to our survey, one developer indicated that their projects would greatly benefit from “utilities offering residential rebates for peak summer demand reduction” and highlighted that “Mass ConnectedSolutions is a good example.”

Recommendation 5: Establish a Monetary Value for Resilience

Project economics for solar+storage heavily rely on expected utility bill savings and potential revenue associated with the system. While assigning a [value](#) to the improved resilience associated with solar+storage is much more challenging, it should nevertheless be a factor as facilities weigh the economic benefits of resilient power.

Efforts to monetize the value of resilience have included calculating the avoided cost of outages. These avoided outage costs represent the value of losses that would be incurred if a facility were to experience a power outage without a backup source of energy generation. For a business, this could include lost workforce productivity or losses due to interruption of services. For critical community facilities, outage-related costs could range from lost communications due to lack of cell phone charging or wireless connections, to loss of life due to lack of medical care or disaster response services. By combining avoided cost of outage estimates with data available about the average length and frequency of outages in a community, organizations can estimate how much a resilient energy system would save each year in avoided outage costs. This figure could then be used to more accurately predict the economic benefits of a solar+storage system over time.

A CEG report, [Resilient Southeast: Exploring Opportunities for Solar+Storage in Five Cities](#), found that incorporating the avoided cost of outages improved project economics for all community facility types analyzed (school, fire station, nursing home, and multifamily housing) in every city (New Orleans LA, Wilmington NC, Miami FL, Atlanta GA, and Charleston SC). In one instance, for the city of New Orleans, solar+storage was only found to be economical when the avoided cost of outages was factored in.

Conclusion

Solar+storage has come a long way in becoming accessible to markets serving low-to-moderate income communities, but significantly more work needs to be done to accelerate widespread adoption. Changes on a macro level such as state incentive programs for solar and battery storage and more favorable utility regulations will be needed to ensure equitable distribution of the benefits of solar+storage to under-served communities. While these changes may take time to fully develop, micro-level interventions such as technical assistance funds and targeted innovative financing programs can begin to fill in the gaps.

All these developments need to consider the differing needs of low-income service providers. As presented in this report, community service providers and affordable housing developers often have different priorities and concerns around solar+storage development, and tailored responses to those needs are going to be the most effective. Meeting these organizations where they are is the best way to provide the assistance that under-resourced communities need to achieve their resilience, equity, and sustainability goals.

About Clean Energy Group



Clean Energy Group (CEG), a leading national, nonprofit advocacy organization, advances innovative policy, technology, and finance programs in the areas of clean energy and climate change. CEG promotes effective clean energy policies, develops low-carbon technology innovation strategies, and works on new financial tools to advance clean energy markets and an equitable clean energy transition. CEG's projects concentrate on climate and clean energy issues at the local, state, national, and international levels as we work with stakeholders from communities, governments, and the private and nonprofit sectors. CEG created and manages the Resilient Power Project (www.resilient-power.org) to accelerate market development of resilient, clean energy solutions in low-income and underserved communities to further clean energy equity by ensuring that all communities have access to the economic, health, and resiliency benefits that solar+storage can provide. Clean Energy Group is headquartered in Montpelier, VT and funded by major foundations, as well as state and federal energy agencies.

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