



Community Solar and Community Solar+Storage: A Roadmap of Barriers and Solutions for Commercial Systems in NYC

Tria Case, Daniella Leifer, Laurie Reilly, Ronald Reisman, and Emily Sweeney

Sustainable City University of New York

NREL Technical Monitor: Sara Farrar

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COMMUNITY SOLAR AND COMMUNITY SOLAR+STORAGE

Sustainable CUNY
City University of New York
May 2021

A Roadmap of
Barriers and
Solutions for
Commercial
Systems in NYC



Introduction

Sustainable CUNY worked with decision makers and subject matter experts (SME’s) to identify the barriers to and solutions for advancing commercial Community Solar (CS) and CS+Storage (CS+S) in urban areas. This roadmap captures the key challenges and solutions identified by New York City (NYC) stakeholders, including the Real Estate Board of New York (REBNY), through a collaborative process.

Solar, as well as storage, are among the fastest growing energy segments in the United States, with CS, also known as Community Distributed Generation (CDG), gaining popularity with those who may not own or have access to a viable roof. Urban areas like NYC, which have a large population of renters, are particularly well suited for CS projects where credits from the power produced by a large remote installation are offered on a subscription basis to residents or businesses in the community. However, CS and CS+S projects have stalled at the doorstep of many cities. Host site owners, particularly those with large rooftops, have been slow to commit to installing CS due to competing rooftop usage and programs, limited knowledge about incentives, lack of economic data, and a complicated implementation process.

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State of the Market

Solar installations have continued to grow exponentially over the last decade. However, the vast majority of the US population has been unable to enjoy the benefits of solar because their roofs are unsuitable for solar due to limited usable space, shading, other factors, or because they are renters who do not have control over the use of their building's roof. Community Solar (CS) was created so that utility customers who were not in a position to install solar on their own rooftop can share in a system on someone else's rooftop. As of 2021 Q1, 19 states and the District of Columbia¹ have adopted policies that enable community solar with each state determining its own regulations and programs regarding compensation, incentives, and subscriber requirements.

New York State

New York State (NYS) launched community solar in 2015 as part of its Shared Renewables Program, an initiative to help make clean, affordable energy accessible for all New Yorkers. The following are signature features of NYS CS:

- System owners are compensated under the Value of Distributed Energy Resources (VDER), a mechanism approved by the Public Service Commission (PSC) in 2017 to more accurately reflect the 'value of distributed generation' to both the environment and the grid. A "value stack" of five different elements², based largely on the time and location of the generation, determines the price per kilowatt-hour that subscribers receive from the local utility.
- In addition to the compensation offered by VDER, CS systems may be eligible for financial incentives from the New York State Energy Research and Development Authority's (NYSERDA) NY-Sun program. NY-Sun offers a base incentive for CS, with adders available for systems installed on affordable housing or serving low-to-moderate income (LMI) subscribers.
- Each CS system must have a minimum of 10 subscribers, although there is an exception for systems limited to serving the residents or tenants of the building on which it is installed. No single subscriber can account for more than 40% of the system's capacity.
- Subscribers must be in the same utility zone as the CS system to which they subscribe. You can locate your utility zone on the [nysolarmap](#) by choosing 'NY Utility Service Territories' on the map layers.

¹ [SEIA](#)

² [NYS Value of Distributed Energy Resources](#)

New York City

New York City has more than one million rooftops³ and two-thirds of its eight million residents are renters⁴ -- a seemingly ideal scenario for CS.

Currently the compensation formula for CS in NYC includes:

- the Community Credit in [Con Edison's service territory](#) at 12 cents/kWh
- the availability of adders to further incentivize systems built on affordable housing and/or serving LMI subscribers
- a significant Property Tax Abatement for host sites

Despite the compensation and incentives, a plethora of potential host sites and no shortage of potential subscribers, CS development in the city has thus far failed to live up to expectations.

As of 3/1/2021, there was 10.6 MW of CS in NYC. This represented only 1.9% percent of the statewide CS installed capacity of 548 MW⁵, even though NYC accounts for nearly half of NYS's population.

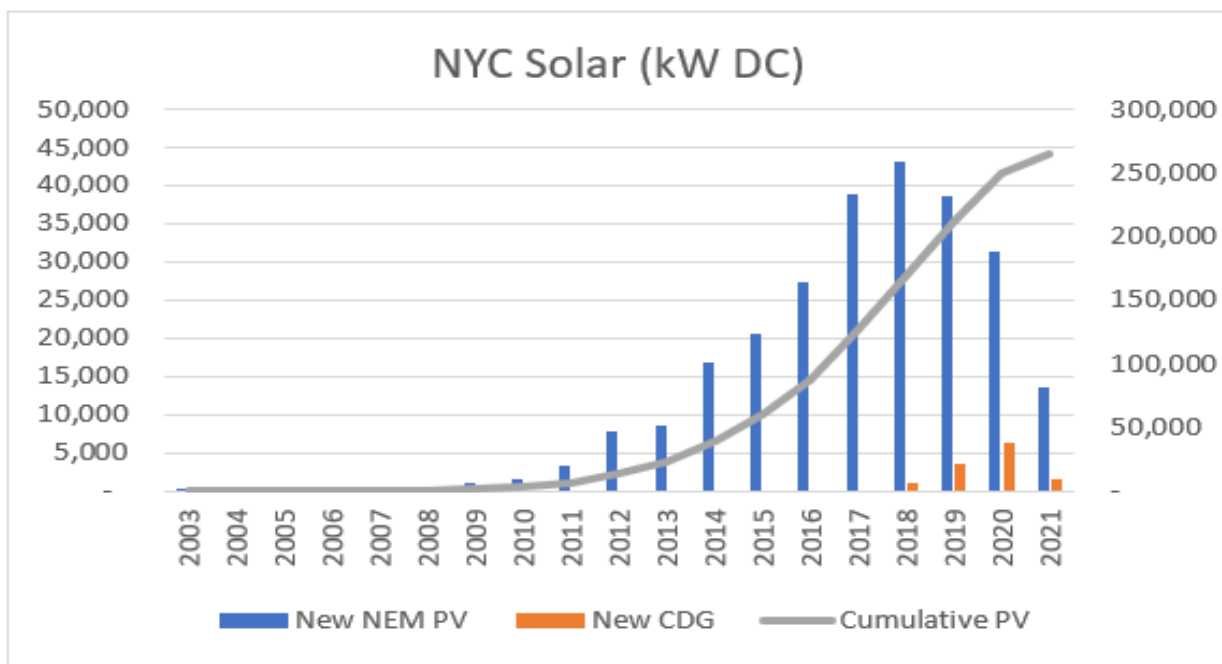


Figure 1- Growth in NYC Solar Market

³ [NYC Department of Buildings](#)

⁴ [US Census, NYC](#)

⁵ [NYSEIA: Realizing the Potential for Community Solar in NYS April 2021](#)

Sustainable CUNY

As a trusted public entity, Sustainable CUNY of the City University of New York established a partnership with the Mayor's Office of NYC in 2006 to address the barriers to solar grid integration. This collaborative effort was expanded to include energy storage systems (ESS) in 2013 and has been formalized as the [Smart DG Hub](#). Today, the Smart DG Hub's dedicated and knowledgeable Ombudsmen provide support to the solar and storage industries as well as NYC agency staff who are tasked with creating new solar and energy storage regulatory structures. The Smart DG Hub platform has played a key role in supporting the growth of solar in NYC and is positioned to help facilitate a similar growth trajectory for ESS. Participation in the [Solar Energy Innovation Network \(SEIN\)](#) offered Sustainable CUNY the opportunity to examine the reasons behind the relative lack of activity in CS development, identify the barriers that are preventing more robust deployment of CS and CS+Storage on commercial buildings, and find solutions for overcoming those barriers.

Acknowledgements

The Smart DG Hub partnered with a team of Subject Matter Experts (SMEs) from highly respected organizations, including Con Edison, the New York Power Authority (NYPA), the Electric Power Research Institute (EPRI), Underwriters Laboratories (UL), and the Real Estate Board of New York (REBNY) to analyze the CS and CS+S markets. Additional technical support was provided by the SEIN team, including the National Renewable Energy Laboratory (NREL), the Lawrence Berkeley National Laboratory (LBNL), and the Rocky Mountain Institute (RMI).

Process

The Smart DG Hub convened multiple workshops with REBNY to catalog the real and perceived barriers to CS and CS+Storage deployment. The Hub successfully utilized a unique interactive fast paced process to capture detailed responses from time-constrained executives. Participants were representative of the decision makers that can advance CS and CS+Storage: commercial, residential, and institutional property owners; builders and managers; as well as banks, financial service companies, attorneys, architects, and contractors. Identified barriers fell into four key challenge areas:

- I. Policy & Regulatory**
- II. Economics & Value Streams**
- III. Liability & Risk Management**
- IV. Education & Outreach**

Working with the SME's, the team developed proposed solutions for NYC and noted replicable paths for other urban areas. What follows are overviews of each key challenge area, along with their top five high impact challenges and associated solutions that, when addressed by the suggested integral partners together with the Smart DG Hub, can help advance CS and CS+Storage in NYC.

Challenges & Key Findings

I. Policy & Regulatory

Challenge Area Overview

The policy and regulatory landscape has significant impacts on the deployment of CS and CS+S in both NYC and New York State (NYS). As authorized in a July 2015 Order of the NYS Public Service Commission ([Case 15-E-0082](#)) for implementation the following year, CS is intended “to open opportunities for participation in solar and other forms of clean distributed generation to utility customers that would not otherwise be able to access that generation directly.” The Order creates the regulatory framework to allow utility customers who are not in a position to install solar on their own rooftop to share in a system on another’s property within the same utility zone. In tandem, NYSEERDA’s NY-Sun incentive program has developed innovative incentive adders to support the deployment of projects that help meet certain state goals, like LMI participation or brownfield projects.

Notably, the deployment of CS and CS+S helps support NYS and NYC climate goals established through two key pieces of legislation passed in 2019, the [Climate Leadership and Community Protection Act \(CLCPA\)](#) and [Climate Mobilization Act \(CMA\)](#), respectively. As part of the CMA, CS and CS+S are potentially attractive compliance options for NYC Local Law 97 (LL97) of 2019, which requires building owners to inventory, track, and reduce their carbon impact based on a set of guidelines with increasingly aggressive targets over time.

NYC’s dense urban landscape presents unique challenges for permitting CS and CS+S systems. Sustainable CUNY’s continued work through its Smart DG Hub, including the development of permitting guides and ongoing technical assistance, has largely reduced permitting barriers for traditional solar and CS projects in NYC. The Smart DG Hub recognizes the need to further clarify the processes and procedures required to permit a storage installation in NYC and continues to develop guidance as the process is established.

Policy & Regulatory Key Challenges	Integral Partners *
Long-term and reliable city and state climate policies	NYC & NYS Government
Stable and reliable incentive programs	NYSERDA, NYS PSC
A streamlined permitting process to enable adding storage to CS projects	FDNY, NYC DOB, NYC DCP.
Technical and policy solutions that allow CS & CS+S to provide host site resiliency	NYS PSC
Allowing Solar+Storage to satisfy code requirements for Emergency Power backup systems	NYC DOB

*See Glossary Below

Key Findings

Current legislative and regulatory policies shape the configurations and deployment of CS and CS+S in NYC. Building stakeholders highlighted the need for clear, consistent, and predictable guidelines to enforce climate regulations, such as the greenhouse gas (GHG) emissions caps and compliance options under NYC Local Law 97. There is concern that compliance with these policies takes considerable financial and planning resources and could be further altered by subsequent legislation or administrations. Significantly, stakeholders identified the desire to explore ways to utilize storage, paired with a CS system, for host site resiliency and to meet [NYC Emergency Backup Power requirements](#). Stakeholders indicated that clear siting and permitting guidelines are required to increase installation of energy storage in NYC. Increasing certainty in permitting and siting requirements is anticipated to reduce soft costs associated with installing storage systems in NYC, which should enable the deployment of more standalone storage and CS+S, consistent with established NYC and NYS storage goals.

[Link To Detailed Policy & Regulatory Solutions](#)

II. Economics & Value Streams

Challenge Area Overview

In Commercial Real Estate, like most businesses, decisions are generally based on the financial bottom line. CS projects have a multitude of revenue streams to evaluate and can be tricky to analyze. The Smart DG Hub [Evaluating Distributed Generation Economics \(EDGE\)](#) modeling tool developed in partnership with the SEIN team and adapted work by Elevate, helps building owners determine the financial aspects of the various use cases for CS. Digging deeper requires an understanding of available incentives, billing structures for CS hosts and subscribers, and operating costs associated with building and operating the system, and the subscriber acquisition and management process.

In NYC, CS systems are compensated under the NYS [Value of Distributed Energy Resources](#) (VDER), a mechanism approved by the PSC in 2017 to more accurately reflect the value of distributed generation to both the environment and the grid. A “value stack” of five different elements, based largely on the time and location of the generation, determines the value the subscriber receives from the local utility. The value of the generated solar power is calculated, and the value is calculated as a dollar amount that is distributed to the subscribers of the system. The amount that each subscriber is credited each month is determined by the amount of energy produced by the system during that month, which varies throughout the year depending on weather conditions, multiplied by the VDER value. CS installations in NYC currently qualify for the [Community Credit as part of VDER](#). Adding storage to a CS installation has the potential to further increase the value of the power generated. The subscribers see a credit on their bill and the system owner is paid a percentage of that amount. Subscribers are currently responsible for paying the system owner directly, however, once implemented, Consolidated Billing will result in the subscribers receiving a single bill.

Developing and communicating a transparent, clear business model is critical to empowering customers so they can make informed financial decisions. The most common approach to CS in NYC is where the subscriber is credited with a portion of the power generated, rather than owning a share of the project itself. Although other options are available, this document focuses on this subscription model.

Economics & Value Streams Key Challenges	Integral Partners
Complexity of revenue streams	Building Owners & Real Estate Industry
Stable and reliable incentives for the lifetime of the system	NYSERDA & Utility
Easier eligibility process for LMI subscribers to support meeting requirements for NYSEERDA's LMI adder	NYSEERDA, Utility, PSC, Industry
An alternative incentive for buildings that do not qualify for the NYC Property Tax Abatement (PTA)	NYC, NYS
Transparent and simplified CS utility billing for subscribers and owners to verify economic modeling projections	Industry & Utility

Key Findings

The current program for CS in NYS requires a subscriber to handle two bills: one from the utility on which the subscriber sees credits for the solar power generated and the remainder of their utility bill; and a separate bill from the project owner/operator for the subscriber’s portion of the CS subscription. This creates a burdensome complication and a lack of transparency in the process as the time period for both bills may not match, making it hard to convert the CS-generated kWh into dollars for that period. In addition, some of the value stack components are locked in for 5 or 10 years—shorter than the project and equipment lifetimes. As a result, it is challenging for owners/developers to predict the eventual operating income of the project. Predictability is a key driver of bankability, which is, in turn, crucial for 3rd party financing entities to be willing to participate in financing CS projects.

Some buildings are not eligible for the NYC PTA because the owners either do not pay property taxes (such as churches and other non-profits) or they may have already taken a different type of tax abatement, which excludes them from the Solar PTA.

The process of verifying eligibility for LMI subscribers can be difficult for the subscription managers, increasing the overhead cost to manage each participant.

[Link to Detailed Economic & Value Streams Solutions](#)

III. Liability & Risk Management

Challenge Area Overview

Although building owners are primarily focused on the financial implications of any decisions they make regarding their properties, they are also concerned about other potential risks that may be inherent in those decisions. Discussions with building owners, managers, and attorneys revealed a number of liability and risk management issues that pose possible barriers to the acceptance of a rooftop CS system; issues that are magnified when energy storage is coupled with that system.

Liability and Risk Management cannot be completely divorced from economics since every risk carries its own financial consequences. In fact, each of the identified liability and risk management challenges identified by the REBNY working group has the potential to have significant economic impact on the integral partners involved, if the outcome is not favorable. The issue at hand is finding solutions that can help mitigate risk and liability and translating them into economic terms. In doing so, the balance of risk and reward can be made clearer to landlords considering the role of site host.

Liability & Risk Management Key Challenges	Integral Partners
Length of lease agreement	Site Host, Developer
Roof access to equipment for O&M	Site Host, Developer
Insurance implications	Site Host, Developer, Insurance Industry
Long-term financial stability of system owner	NYSERDA, NYS PSC, Industry
Equipment security concerns	Site Host, Developer

Key Findings

The Liability and Risk Management issues identified by the working group can be divided into three distinct categories: Security; Insurance Implications; and Long-term Agreements.

The first category deals with the security of the building and its tenants. Landlords expressed concern over the possibility that the visible presence of high-value equipment on the rooftops of their buildings could make them an attractive target for theft. Unwanted visitors may also pose a liability risk if they are injured while on the property. Security comes into play even with authorized visitors, like those who maintain or repair the CS system. Lease agreements must allow reasonable access to the system for workers performing both scheduled maintenance and emergency repairs, while respecting the security and privacy of the building and its tenants.

The second category involves landlords' uncertainty as to how adding CS or CS+S might impact their insurance policies and premiums. There does not appear to be a standardized insurance industry approach for treating solar and storage equipment. Consequently, building owners are concerned as to how these installations may affect their coverage and/or increase their premiums.

The third category involves a different kind of risk—one inherent in being party to any type of long-term agreement. Some landlords are hesitant to enter into a 25-year commitment because of concerns that the length of the contract will prevent them from converting their building to a more lucrative use if it is re-zoned. Landlords also worry about the long-term financial viability of the system owners they are contracting with and seek protection from the possibility of financial or other defaults by those owners.

[**Link to Detailed Liability & Risk Management Solutions**](#)

IV. Outreach & Education

Challenge Area Overview

CS and CS+S are fairly recent market innovations with novel business structures. As such, building owners have a low baseline understanding of CS and CS+S—what they are, how they differ from traditional (e.g., behind-the-meter, net-metered) solar and solar+storage installations, and what benefits and capabilities they can and cannot provide. Furthermore, building owners have a high bar when it comes to information sources they deem trustworthy. They are inundated with marketing pitches and have significant concerns about their veracity and potential bias. Finally, because building owners have dozens of day-to-day concerns surrounding property ownership and operation, energy management does not always stand out. These factors highlight a need for targeted and focused education and outreach that is based on real-world CS and CS+S projects, and provides accurate, unvarnished information and data.

Outreach & Education Key Challenges	Integral Partners
Targeted Education: 1) Policy/Compliance 2) CS Use Cases	Real Estate Industry & Affiliates, Non-profit Educational Entities
Peer-to-peer communication and case studies	Real Estate Industry & Affiliates
Raising the priority level of energy issues for building owners	Real Estate Industry & Affiliates, NYC & NYS Government

Key Findings

Focused educational effort(s) will be a critical part of growing the CS and CS+S markets. Educational materials must be carefully considered, as trustworthiness of information is seen as key, with building owners citing peer-based sources as the most trustworthy and unbiased. Energy issues may not be a high priority for many building owners but should be included as part of educational efforts and presented in contexts that can help raise the profile of energy issues as these relate to other important aspects of owning and operating a building (e.g., compliance with other mandates, tenant relations, and marketing appeal).

[Link to Detailed Outreach & Education Solutions](#)

Findings and Solutions Charts

Solutions: I. Policy & Regulatory

CHALLENGE: Long-Term and Reliable State & City Climate Policies

Background: Passed in 2019 as part of NYC’s Climate Mobilization Act, Local Law 97 requires building owners to inventory, track, and reduce their GHG emissions based on a set of guidelines with increasingly aggressive targets over time. Compliance mechanisms are still somewhat unclear and have not been sufficiently spelled out for building owners to confidently invest in decarbonization strategies. **CS+S specific note:** The permitting and technology landscape is changing quickly which may make more projects viable in the future.

Solution: Provide clearer guidance from relevant agencies regarding opportunities and benefits. Owners need education on the value and benefits of CS investments. Policies should be structured over long-term timelines and the paths for compliance should be outlined in ways that allow for building owners to assess and follow through on compliance approaches. CS could be an attractive compliance mechanism if it is allowable and well understood. Even though NYSERDA-supported projects do not retain Renewable Energy Credit (REC) ownership, this should not impact their ability to address Local Law 97 compliance. State policy and NYC mandates could be aligned and open more pathways for REC ownership under CS to address compliance.

CHALLENGE: Stable and Reliable Incentive Programs

Background: Solar incentive programs, like NYSERDA’s NY-Sun incentive program, are often designed to slowly decrease over time. It can be hard to predict how quickly an incentive budget will be consumed. This can create boom and bust cycles in the market rather than a sustainable marketplace. This instability of incentive availability could impact decision-making regarding CS and CS+S installations that may have a lengthy development timeline.

Solution: Create longer-term incentive structures, especially for energy storage projects. For example, NYSERDA’s NY-Sun MW Block incentive structure allows for a degree of predictability as developers can anticipate changing incentive levels and know what the next compensation level is. Most of NYSERDA’s incentives for storage projects do not currently have the same gradual step-down structure—incentive pools are unavailable once fully committed. Periodic assessments of incentive programs should be part of the process so that adjustments can be made to ensure the success of the program. In addition, maintaining the Community Credit for CS projects would ensure projects’ economic viability and greater deployment of in-City clean energy generation, further supporting the climate goals of NYC and NYS .

POLICY & REGULATORY

CHALLENGE: A Streamlined Permitting Process to Enable Adding Storage to CS Projects

Background: Initial permitting guidelines for ESS have been based on highly site-specific review which is more costly, uncertain, and time-intensive than a more standardized process based on prescriptive requirements.

Solution: Continuation of work by Sustainable CUNY’s Smart DG Hub such as efforts under NYSERDA’s Reducing Energy Storage Soft Costs initiative. FDNY and NYC Department of Buildings (DOB) are in the process of updating the fire and building codes to establish more standardized installation requirements for ESS. Additionally, market developments “upstream”, including wider availability of large-scale burn testing, are helping to facilitate more scalable and replicable deployments which will reduce the site-specificity of ESS project approvals.

CHALLENGE: Development of Technical and Policy Solutions that Allow CS and CS+S to Provide Host Site Resiliency

Background: Although storage offers the potential to provide both grid- and site-level resiliency support, current interconnection policy requires CS/CS+S projects to be metered separately from the building and its loads (i.e., “front of the meter”), thus preventing the battery from providing site-level resiliency.

Solution: Further investigate the technological and policy factors impacting the feasibility of installing CS+S systems to provide for islanding mode. This would allow for buildings to operate during a blackout, essentially making the building a small microgrid. There is also a key educational component - storage has numerous potential benefits and value streams. Access to site-level resiliency is an additional attractive component for some building owners but may not be necessary to ensure project viability.

CHALLENGE: Allowing Solar+Storage to Satisfy Code Requirements for Emergency Power Backup Systems

Background: NYC building code requires certain building types to have standby power, supplied by gas or diesel generators. Battery systems are currently limited to supplying a small component of emergency power. Allowing solar+storage, including CS+S, as emergency power backup within the code would increase opportunities for these systems as either a replacement or augmentation to existing generators.

Solution: Update the building and fire codes to allow solar+storage to be utilized in addition to fossil fuel generators to satisfy Emergency & Standby Power Requirements.

Solutions:II. Economics & Value Streams

CHALLENGE: Complexity of Revenue Streams

Background: Investment returns and revenue streams for hosting CS and CS+S projects are not immediately clear for building owners. Incentives and value streams are complex and may vary from project to project and over time. Building owners need data that helps them identify if CS, and specific use cases, may make sense for them. For example, a [DOE Better Buildings study](#) notes that "...When looking at all the building's revenue streams, solar helps to diversify revenue streams and can reduce the overall volatility of the property's income."

Solution: Initially, identify ideal site characteristics to help with preliminary assessment. Case studies and the Smart DG Hub [Evaluating Distributed Generation Economics \(EDGE\)](#) financial modeling tool can serve as a screening tool to help building owners and decision makers determine whether a project can help a building meet its financial goals. Other resources to calculate VDER rates include [EPRI's DER-VET](#) (Value Estimated Tool) and [NYSERDA's VDER](#) calculator. If the estimated financial returns are favorable, then further evaluation is the next step. An independent source, such as Sustainable CUNY, can develop resources that address coupling incentives and value streams. Developing additional case studies can also help building owners understand potential revenue streams.

CS+S Specific note: Storage might need to be evaluated separately from CS economics and is not currently included in the EDGE tool. Adding storage to a CS project may positively impact certain VDER compensation components, which could enhance project financials.

CHALLENGE: Easier Eligibility Process for LMI Subscribers to Support Meeting and Maintaining Income Requirements for LMI Adder.

Background: NYS is planning to offer additional incentives, on top of the existing [MW Block](#), for systems that serve a certain percentage of LMI subscribers. Stakeholders reported a higher customer acquisition and management cost for verifying LMI subscribers, as required by NYSERDA NY-Sun incentive programs. Additionally, they noted, financing can be dependent on the strength of subscriber credit ratings, and a larger percentage of LMI customers may impact the financeability. These utility customers, often renters with no control of their rooftop, pay into the same programs that support solar incentives, and CS allows them to realize the benefits and savings of these installations.

Solutions: Ensure incentive levels cover additional project costs. Recent changes to the NYSERDA LMI adder program were designed to address these challenges, and the

market impact is still unclear. Additionally, simplifying the process for verification of subscriber eligibility as low income should help decrease subscriber management costs.

CHALLENGE: An alternative incentive for buildings that do not qualify for the NYC Property Tax Abatement (PTA)

Background: The PTA may not be available to all property owners, including those that are exempt from property taxes, like houses of worship or public buildings, or those that have received other abatements from city programs.

Solution: Develop substitute incentives for building owners who do not qualify for the PTA, such as a cash grant that is an alternative for system owners that are not eligible for tax credits or do not have the tax appetite.

CHALLENGE: Transparent and Simplified CS Utility Billing for Subscribers and Owners to Verify Economic Modeling Projections

Background: Solar developers, CS subscribers, and building stakeholders all indicated current CS billing and crediting is confusing. There is limited transparency into the calculations used by the utility to calculate VDER value for CS projects. The system owner and subscribers receive a statement of the monetary credit each billing cycle but no detailed calculations of the value stack compensation formula. Currently CS subscribers in NYC receive two bills, one from Con Edison, and another from the system owner/subscriber manager. Utilities publish monthly statements of the value of DER value stack credits, but those values are not shown in any calculations shared with the owner or subscribers.

Solution: Implement Consolidated Billing, which has been ordered by the PSC. Con Edison is currently implementing IT enhancements and expects to open up enrollment in the early fall. This would involve the customer receiving one bill, from either the utility or the system owner/subscriber manager, that shows both the customer's CS credits and charges for additional energy usage. Utilities and stakeholders should continue to work with building owners and subscribers to understand where confusion exists to create simplified and transparent billing statements.

Solutions: III. Liability & Risk Management

CHALLENGE: Length of Lease Agreement

Background: Real estate industry representatives indicated that building owners are hesitant to sign a 25-year lease for their rooftop. If a district is re-zoned, the property may not as easily be converted to a more lucrative use during the contract period.

Solution: Flexible lease agreements between solar developers and building owners that create options for different scenarios. Stakeholders may find value in reviewing best practice example contracts or consider terms more similar to other leases (i.e., telecommunications equipment) with which they are more comfortable.

CS+S specific note: Equipment lifespans for ESS are often shorter than for PV. Rooftop lease agreements should reflect these differences in equipment lifespan.

CHALLENGE: Roof Access to Solar Equipment for O&M

Background: Real estate representatives indicated the need for a clearly defined O&M plan for CS installations. Providing site access for O&M can conflict with privacy and security concerns at properties. Since both CS and CS+S project revenues are tied to system production, there is a need to provide access for both regularly scheduled O&M, as well as unscheduled maintenance.

Solution: Reasonable time frames should be established in the contracts for both scheduled and unscheduled site access. Expectations must be set for access within an agreed upon length of notice. Periodic inspections and preventative maintenance can minimize system downtime. A contact list for site access should be updated and kept on file by all parties.

CS+S specific note: ESS installations in NYC are required by local rules to allow a Certificate of Fitness (COF) holder immediate access to the system during an emergency situation. This need for 24/7 site access must be accommodated in system contracts.

CHALLENGE: Insurance Implications of Hosting CS

Background: Real estate stakeholders expressed uncertainty as to how adding CS or CS+S would impact their insurance premiums and policies. The insurance industry has not universally standardized its approach to solar equipment, and especially CS, making building owners concerned about how these installations may increase their premiums and/or impact their coverage.

Solution: Educate building stakeholders about how CS and CS+S impact insurance policies. Undertake additional work with the insurance industry to standardize insurance coverage options for buildings hosting CS and CS+S installations.

CS+S specific note: The storage component of CS+S installations may require additional insurance considerations, and coverage for storage in general may be more challenging to standardize.

CHALLENGE: Long-Term Financial Viability of System Owner

Background: Building owners are concerned about the long-term financial viability of system owners. One potential issue is the stability of the project's financial operations, such as lease payments to the site host. Another is the management of equipment, especially at end of life and decommissioning. The process of dismantling and removing the rooftop equipment and patching any rooftop penetrations is labor intensive, resulting in significant costs.

Solution: Structure agreements to include terms that protect building owners from the possibility of financial or other defaults by the system owner—for example, inclusion of a decommissioning bond or escrow fund. NYSERDA could make proper disposal and decommissioning procedures a requirement through its incentive program. Additional research could explore if these risks may be mitigated through insurance coverage.

CS+S specific note: ESS system developers are required to file decommissioning plans with their project applications, as per the National Fire Protection Association (NFPA) 855 standard.

CHALLENGE: Equipment Security Concerns

Background: Building owners expressed concerns that solar equipment may present an attractive target for theft or vandalism. Additionally, stakeholders indicated that high-voltage ESS equipment could be a safety hazard for unauthorized persons and access must be limited.

Solution: Install fencing, security lights, cameras and/or specialized anti-theft hardware to mitigate these concerns. Additionally, signage can be used to provide warnings about equipment hazards. Real-time solar monitoring data can alert the asset owner of any irregularities. These responsibilities and mitigation measures should be included in any site agreements.

Solutions: iV.Outreach & Education

Challenge: Targeted Education

Background: Owners expressed confusion about the values and benefits of CS investments in two key areas:

- 1) Policy/Compliance - Recent state and city climate policies are mandating investments in sustainability and GHG reductions. Building owners need to understand compliance requirements and options.
- 2) CS use cases
 - a) Technical - Building owners need a clear understanding of all the dynamics involved in system configurations, including their benefits and limitations.
 - b) Financial structures - Building owners have multiple options for participating in a CS/CS+S project. For example, they can participate as a site host only, be a subscriber, and/or assume partial or full ownership of the system itself. Each of these options comes with its own set of opportunities and limitations. A thorough analysis is required for site owner decision making on risk/participation appetite and best “value stream package” for a given site.

Solution: Develop materials that provide clear and straightforward information about the two areas described above. Information should come from trusted sources who do not have a stake in the outcome. Additionally, the Smart DG Hub EDGE model can be incorporated into educational efforts. It provides a new avenue for gaining insight into the value propositions and revenue streams for different use cases.

Educational outreach could also include publicly available webinars. Additionally, incorporating this information into existing offerings through established real estate educational/certification entities can broaden the audience.

CHALLENGE: Peer-To-Peer Communication and Case Studies

Background: Building owners rely heavily on the experiences of their peers. Stakeholders indicated they wanted to see more case studies from their peers. However, the relative newness of CS means that there are not yet many building owners who can offer testimonials to the benefits of being a site host. To evaluate proposals from solar developers, building owners want reliable unbiased information to reference, such as detailed examples of verifiable project economics.

Solution: Building owners were clear that involving a trusted industry association like REBNY to help capture testimonials from market segment peers will help encourage similarly situated building owners to consider becoming site hosts. Case studies should

explore the different use case options and their respective benefits and be made publicly available via the Sustainable CUNY NY Solar Map resources library. Other real estate and industry associations that represent different market segments could be enlisted in similar efforts for their members. REBNY members highlighted the value of audited financial information that captures asset grade data from CS and CS+Storage to substantiate the performance and value streams.

CHALLENGE: Raising the Priority Level of Energy Issues for Building Owners

Background: Building owners have many issues to consider, from insurance to property taxes to tenant occupancy. Thus, energy issues may not be a high priority for many building owners.

Solution: Similar to the solutions to other barriers, building owners are more likely to be motivated by the revenue potential of an investment in their building than anything else. Rules are still being established, but if hosting CS systems becomes an acceptable compliance pathway for the new Local Law 97, that combination of revenue and compliance may aid CS (and possibly CS+S) in raising energy issues to the front burner for building owners. Educational campaign(s) targeted to the real estate community, emphasizing compliance potential for the Local Law and other requirements can provide added impetus to consider CS/CS+S.

Glossary of Acronyms

CDG	Community Distributed Generation
CS	Community Solar
CS+S	Community Solar + Storage
DG	Distributed Generation
DOE	Department of Energy
EDGE	Evaluating Distributed Generation Economics (Smart DG Hub Tool)
EPRI	Electric Power Research Institute
FDNY	Fire Department of New York City
LBLN	Lawrence Berkeley National Laboratory
LMI	Low and Moderate Income
NREL	National Renewable Energy Laboratory
NYC	New York City
NYC DOB	New York City Department of Buildings
NYPA	New York Power Authority
NYS PSC	New York State Public Service Commission
NYSERDA	New York State Energy Research and Development Authority
REBNY	Real Estate Board of New York
RMI	Rocky Mountain Institute
SEIN	Solar Energy Innovation Network
SME	Subject Matter Expert
VDER	Value of Distributed Energy Resources