NYSEIA solar research

Realizing the Potential for Community Solar in New York State

Benefits, Barriers, and Solutions

NEW YORK SOLAR ENERGY INDUSTRIES ASSOCIATION
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Acknowledgments

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1. Executive Summary

1. The Community Solar Model: Community solar allows individuals and organizations to reap the benefits of solar energy without needing to install it on their home or building. Members sign up for a specific allocation of the energy output of a solar project, and the energy produced by their share of the system will be credited to lower their electric bill.

2. Benefits of Community Solar: Community solar provides multidimensional benefits in terms of: (i) expanded and equitable access to clean energy for individuals and organizations unable to install residential or commercial solar on-site due to technical, ownership, or financial barriers; (ii) economic benefits by means of subscriber bill credit discounts, community economic development, distribution grid enhancements, and avoided grid upgrade costs; (iii) environmental benefits through avoided greenhouse gas and particulate emissions, the elimination of environmentally invasive practices associated with fossil fuel extraction, and ecosystem benefits including soil formation and habit preservation; (iv) helping to alleviate historical environmental inequities stemming from local fossil fuel generation; and (v) helping to realize New York's targets for distributed solar deployment and electric sector decarbonization as mandated by the 2019 Climate Leadership and Community Protection Act (CLCPA).

3. Community Solar in New York State: New York's community solar market was established in July 2015 with the issuance of an Order from the state Public Service Commission, which set forth conditions and requirements for structuring a technology-agnostic "Community Distributed Generation" (CDG) program with regard to several elements, including eligibility requirements for generating facilities, compensation schema, membership practices, project sponsor responsibilities, and the role of electric utilities. Since then, the PSC has issued additional rulings that have clarified and revised aspects of its 2015 Order on items such as the size of qualifying facilities, compensation, and the implementation of consolidated billing.

4. Historical Deployments and Pipeline: At the end of 2020, there were 371 operating community solar projects in New York, comprising installed capacity of 497 MW-AC, enough to power approximately 100,000 homes. 89 percent of currently operating capacity was installed in 2019 and 2020. Annual deployments increased from 2 MW-AC in 2016 (1 percent of all solar installations) to 266 MW-DC in 2020 (63 percent). At the national level, New York was the country's largest community solar market in terms of 2020 installations and the second largest state market (after Minnesota) in terms of cumulative deployments. The utility interconnection pipeline for community solar projects still under development stood at 5,117 MW-AC as of the end of 2020. Due to

the expiration of the Upstate Community Adder incentive in February 2021, most pipeline projects require additional funding support through incentive replenishment and/or compensation improvement to be able to move forward.

5. Geographical Disparities in Penetration: The dominant majority of both operational and pipeline community solar project capacity in New York is concentrated in Upstate and Western New York, which constituted 78 percent and 90 percent of operational and pipeline capacity respectively at the end of 2020. In contrast, the equivalent figures in Downstate territories, where a majority of the state's population resides, stood at 4 percent and 5 percent respectively. This is primarily due to the lack of siting potential for ground-mounted projects in the Downstate region. Overall, there is a vast asymmetry between the Upstate and Downstate regions with regard to community solar penetration and access to date: only 1 percent of Con Edison's 3.4 million customers would be served by operational and pipeline projects, compared to 33 percent in National Grid and 17 percent in NYSEG-RGE. This indicates that community solar has and will continue to struggle to reach the vast majority of Downstate New Yorkers if membership continues to be restricted to projects located in the same service territory as the subscriber.

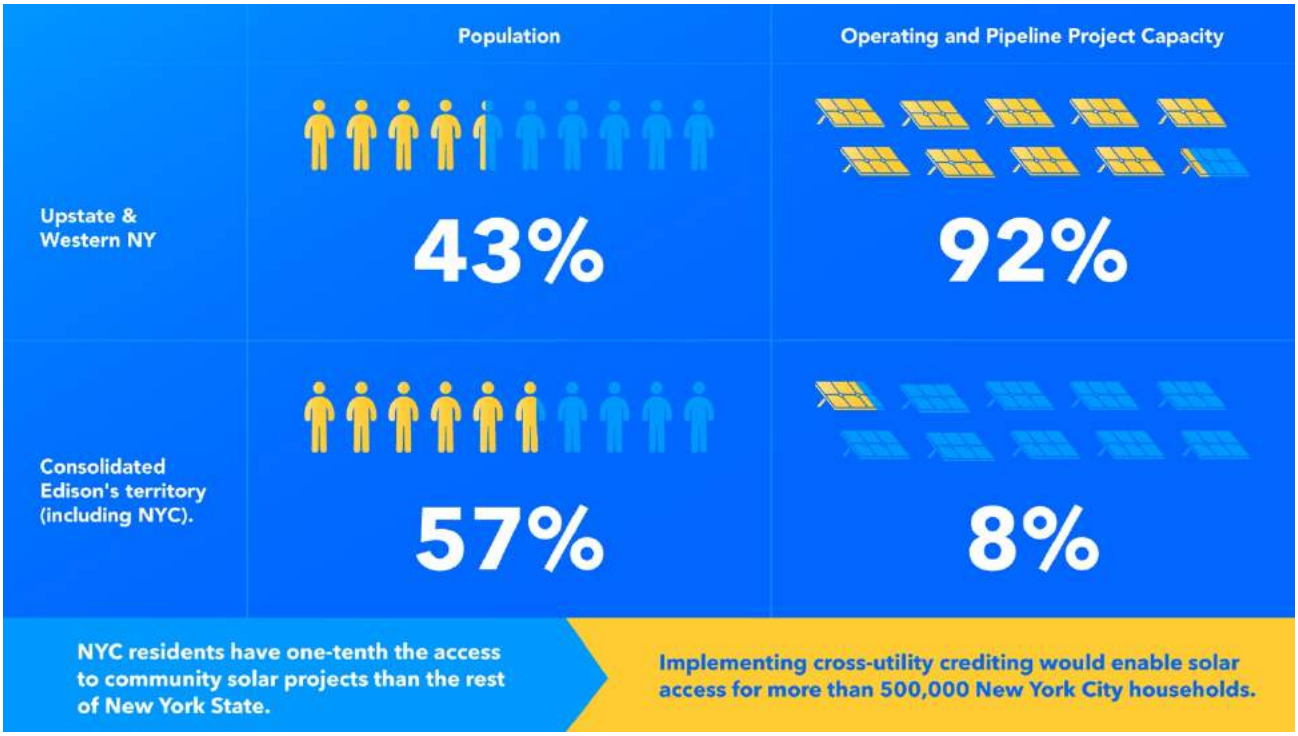
5. Barriers to Future Growth: Statewide barriers to community solar development and deployment include: (i) local community resistance to siting ground-mounted systems; (ii) interconnection hosting capacity constraints and the associated costs to upgrade the distribution grid; (iii) interconnection timelines; (iv) incentive pullbacks and uncertainty related to compensation; and (v) lack of customer education about community solar and its benefits. Barriers specific to the Downstate region include: (i) rooftop permitting complexity and timelines; (ii) siting constraints; and (iii) regulatory barriers restricting community solar membership to projects located in the same utility territory as the subscriber.

6. Policy Recommendations: Key recommendations to address the above-mentioned barriers facing future development and deployment of community solar include: (i) accelerated investment in distribution-level infrastructure that enables DER hosting capacity expansion, and adoption of advanced technologies that can mitigate the need for expensive grid upgrades; (ii) updating the Value of Distributed Energy Resource (VDER) tariff under which community solar projects are compensated, specifically the Environmental Value (E-Value) and Demand Reduction Value (DRV), and introducing an additional component to reflect the avoided long-run transmission infrastructure costs associated with DER deployment; (iii) replenishing the Con Edison Community Credit for allocations previously made to natural gas fuel cells, and introducing a successor Community Credit on a phase-down basis; (iv) implementing a multi-year extension for

the Long Island Community Credit and Community Adder; (v) state-convened discussion forums in Upstate and Western New York to address local opposition to project siting and dedicated incentives for agricultural dual-use projects (agrivoltaics); (vi) programmatic initiatives to increase awareness of community solar benefits for local communities and address commonly held misconceptions surrounding environmental risks associated with solar energy; (vii) state- and utility-sponsored education initiatives to improve customer awareness and address negative perceptions regarding community solar; (viii) the adoption of "no-touch" permitting practices for rooftop projects to reduce permitting timelines and soft costs; and (ix) eliminating regulatory barriers limiting membership to projects sited in the same utility territory and implementing cross-utility crediting to enable transfer of bill credits across utilities.

7. The Need for Cross-Utility Crediting: Siting constraints in the New York City metropolitan region, coupled with the regulatory requirement that the customer and community solar project be located in the same utility territory, currently prevent millions of New Yorkers, particularly low-and-moderate income (LMI) communities, from accessing community solar. The simplest and most obvious solution for overcoming this barrier is to allow ratepayers to subscribe to community solar projects sited outside their own utility territory, which would require the implementation of an administrative system that would enable the transfer of bill credits from customers in one utility territory, referred to as cross-utility crediting. Addressing this arbitrary barrier could enable solar access for more than 500,000 New York City households, dramatically expand community solar penetration in LMI communities, and accelerate the state's ability to meet climate goals under the CLCPA by stimulating the development of almost four additional gigawatts of operating capacity.

Figure 1: Regional Disparities in Community Solar Access Across New York State



Source: U.S. Census Bureau and NYSERDA Statewide Solar Projects

2. Introduction to Community Solar

Solar energy is the fastest-growing form of renewable energy across New York State, with annual installed capacity increasing almost eighteen-fold (1,761 percent) from 2010 to 2020.[1] Thus far, most distribution-level solar systems have been installed "on-site" in residential or commercial settings. However, several constraints prevent individuals, organizations and communities from being able to install or access on-site solar. These can include siting-specific issues (e.g., suboptimal roof conditions or shading), ownership limitations (renting or living in a multi-family building), or financial constraints for low-and-moderate income communities, nonprofits, and small businesses.

The community solar model, the regulatory framework for which was implemented in New York in 2015, enables access to solar energy for individuals and entities otherwise prevented from doing so due to the aforementioned limitations. Community solar allows members or subscribers to reap the benefits of solar without needing to install it on their home or building. Members sign up for a specific allocation of the energy

[1] New York Department of Public Service SIR Inventory Data, December 2020.

output of a solar project, and the energy produced by their share of the system will be credited to lower their electric bill. Any individual or organization with an electric bill that is unable to install a solar system on their property could, in theory, be a subscriber to a community solar project.

2.A. The Benefits of Community Solar

I. Expanded and Equitable Access to Clean Energy

As discussed earlier, several varied constraints prevent individuals, organizations, and communities from being able to install or access solar at the site at which it would be consumed. A 2015 National Renewable Energy Laboratory (NREL) and U.S. Department of Energy analysis estimated that approximately 50 percent of U.S. households and businesses are unable to install rooftop solar on-site.[2] The roadblocks to rooftop or on-site solar fall under three broad categories as explained below.

- **Technical** roadblocks include issues with roofs rendering them "infeasible," such as incorrect angles for panels, not receiving enough sunlight, or not being sturdy enough to support a rooftop system.
- **Ownership** constraints result from renting one's place of residence or work and not being able to control or make modifications to the building in question, be it a single-family house, a multi-family home, or a multi-business building such as small-business storefronts in a large, shared building.
- **Financial** impediments are also a major roadblock to accessing on-site solar. Low-to Moderate-Income (LMI) households make up approximately 48 percent of households in New York State, with 2.3 million low-income households and 1.2 million moderate-income households.[3] This leaves a large percentage of the state likely unable to afford on-site solar, as the cost of owning or leasing a system over the course of its lifetime can be often be prohibitive.

Irrespective of which of the above three factors is at play in a given case, community solar significantly expands access to clean energy for individuals, communities, businesses and non-profits that would otherwise be prevented from doing so.

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[2] *Shared Solar: Current Landscape, Market Potential, and the Impact of Federal Securities Regulation*, December 2015, NREL and U.S. Department of Energy.

[3] NYSERDA Low-to-Moderate Income Market Characterization Report, February 2017, p.6.

II. Economic Benefits

In addition to simply expanding access to clean energy, community solar also provides multidimensional economic benefits to subscribers and local communities stemming from the following factors:

- **Bill Credit Discounts:** Community solar subscribers in New York typically receive bill credits on their electric bills of 5 to 10 percent, effectively lowering their electric bills. These savings are particularly relevant for low-income households, who typically spend twice the percentage of their income on energy compared to moderate- and high-income households.[4]
- **Economic Development:** The development, construction, operation, and customer acquisition and management of community solar projects generates increased investment, employment and tax revenue for individuals, communities, and businesses across the state. The development and construction of community solar projects also supports adjacent local industries such as landscape management, fence installation, electrical engineering, construction, and consulting for permitting, operations, and maintenance.
- **Electric grid enhancements and avoided costs**: New research suggests that robust investments in community and rooftop solar can save the U.S. $473 billion by 2050 compared to a clean electricity grid that does not expand local solar and storage.[5] In addition, community solar installations often require new distribution infrastructure such as poles and wires, which are paid for by the project sponsor but benefit the broader public at large.

III. Environmental Benefits

As a form of low-impact, distributed, renewable electricity generation, community solar provides a number of environmental benefits vis-à-vis centralized and fossil fuel–based generation, detailed below:

- Elimination of carbon dioxide and other airborne emissions;
- Elimination of water pollution such as leaks and spills from fossil fuel extraction and the runoff of wastewater from open-air pits and underground wells;
- Avoidance of mountain blasts, deforestation, strip mining, and drilling;
- Ecosystem benefits, including soil formation, habitat preservation, flood protection, carbon sequestration, and pollination, stemming from the non-

[4] Lifting the High Energy Burden in America's Largest Cities: How Energy Efficiency Can Improve Low Income and Underserved Communities, American Council for an Energy-Efficiency Economy, p.3.

[5] Why Local Solar For All Costs Less: A New Roadmap for the Lowest Cost Grid, Vibrant Clean Energy, December 2020.

invasive nature of solar energy system construction and installation, which does not destroy or significantly alter soil content, local biodiversity, or local ecosystems.

IV. Environmental Justice

The lack of access to renewable energy can have lasting detrimental impacts on communities residing near fossil fuel plants, which, more often than not, tend to be communities of color.[6] Such communities are disproportionately impacted by air pollutants and greenhouse gas emissions from fossil fuel plants[7] and have suffered the consequences in the form of higher rates of poverty, respiratory illness, cancer, and heart disease.[8] Community solar can help alleviate these historical environmental inequities by providing impacted communities with access to clean, carbon-free electricity and lowering the demand for, and therefore production from, dirty fossil-fuel electricity plants in their vicinities.

V. Realization of New York's CLCPA Decarbonization Targets

New York State's Climate Leadership and Community Protection Act (CLCPA), passed in 2019, sets targets for distributed solar deployment (six gigawatts by 2025), electric sector decarbonization (70 percent by 2030 and 100 percent by 2040), and economy-wide emissions reductions (at least 85 percent from 1990 levels by 2050), as well as requiring at least 35 percent of the benefits stemming from the realization of these targets to be directed to historically disadvantaged communities that have borne a disproportionate burden of climate change impacts. Most immediately, to meet its 2025 target for distributed solar, New York must deploy an average of 640 megawatts-direct current (MW-DC) every year from 2021 through 2025, roughly twice the annual average installation volume from 2016 through 2020. As a segment of distributed solar that expands equitable access to clean energy, particularly for LMI communities, community solar is a key vehicle to realize New York's CLCPA targets.

2.B. New York's Community Solar Model

The basic conceptual framework for the functioning of a community solar project in New York State (Figure 2) is outlined below:

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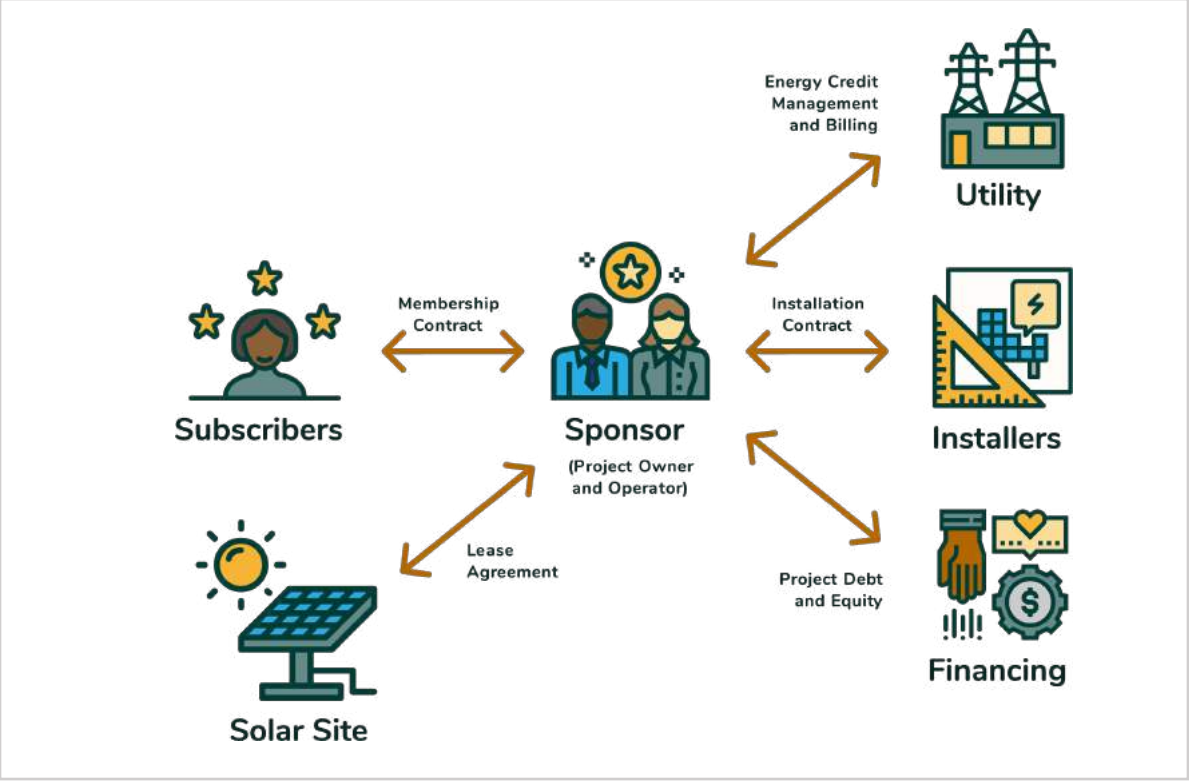
[6] "5 Things to Know About Communities of Color and Environmental Justice". Center for American Progress, April 2016.

[7] National Patterns in Environmental Injustice and Inequality: Outdoor NO2 Air Pollution in the United States. Clark LP, Millet DB, Marshall JD. PLoS ONE 9(4): e94431, April 2014.

[8] https://blog.ucsusa.org/science-blogger/climate-justice-and-the-debate-about-community-solar-on-farmland

- An entity termed as the **sponsor** is responsible for building the community solar facility, interconnecting it to the electricity grid, and owning and operating the site.[9] The sponsor may also enter into an agreement with an installer, who will assemble and construct the community solar unit. Community solar sites include open fields, agricultural lands, parking lots, or building rooftops. If the sponsor does not own the site for the project, it may enter into a lease agreement with the site or land owner.
- Utility customers wishing to join the community solar project will become **subscribers** or members. They will buy into the project through the sponsor, and receive energy credits on their bills from the utility.
- The utility will enter into an **agreement** with the sponsor, as it will receive the energy generated from the project, and will establish the magnitude of the credit and apply that credit to a subscriber's utility bill.

Figure 2: Program Design of New York's Community Distributed Generation Program Design



Source: Initiative for Energy Justice

[9] In practice, it is often not a single entity that performs all of the roles described as the responsibility of the sponsor. For example, it is common for the developer, owner/operator and entity responsible for customer acquisition and management to be separate companies.

3. History and Status of the New York Community Solar Market

3.A. U.S. Community Solar Market Development

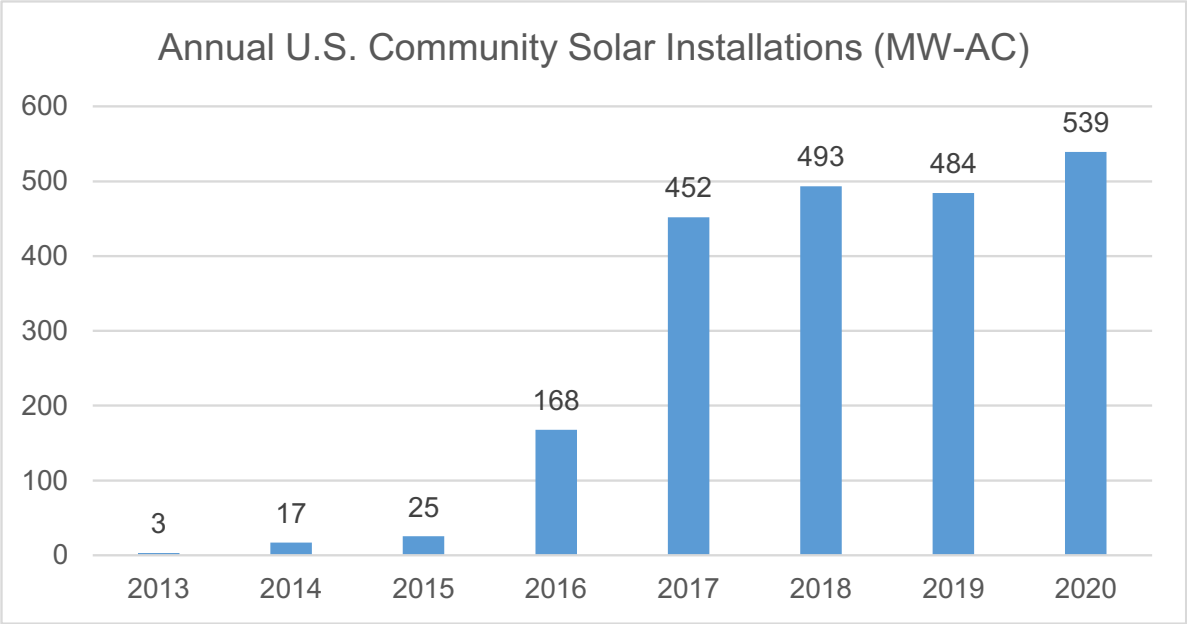
The origins of community solar can be traced back to 2007, when the Sacramento Municipal Utility District (SMUD) launched its Solar Shares Program. The Solar Shares program allowed residents in SMUD territory to pay a monthly fee for a 500-watt portion of a large solar PV system, in order to receive a bill credit based off the amount of energy generated in their share.[10]

As greater numbers of local utilities piloted community solar programs, this began to pave the way for state legislation. Colorado passed the first community solar–specific legislation in the country in 2010, known as the Community Solar Gardens Act. This led to the creation of the Solar* Rewards Community, the first major, state-wide community solar program, which allowed residents and businesses to receive energy credits from their utilities for participation in the program. Other states that emerged as leaders in advancing community solar programs include Minnesota (2013), Massachusetts (2013), and New York (2015).

As of June 2020, 20 states plus Washington, D.C. have introduced legislation or regulation advancing community solar, and 39 states plus Washington, D.C. have community solar projects under development or operation, demonstrating widespread recognition of its benefits. As of the end of 2020, a total of 2.25 gigawatts-AC (GW-AC) of community solar capacity had been installed in the U.S., with 2020 installations exceeding 500 MW-AC (Figure 3).

[10] https://web.archive.org/web/20120415060044/https:/www.smud.org/en/residential/environment/solar-for-your-home/solarshares/solarshares-FAQ.htm

Figure 3: Annual U.S. Community Solar Installations, 2013-2020



Source: SEIA/Wood Mackenzie Power & Renewables U.S. Solar Market Insight

3.B. New York Community Solar Market Establishment

New York State's community solar market was established in July 2015 with the issuance of an Order from the state Public Service Commission. The 2015 Order set forth conditions and requirements for structuring a technology-agnostic "Community Distributed Generation" (CDG) program with regard to several elements, including eligibility requirements for generating facilities, compensation schema, membership practices, project sponsor responsibilities, and the role of electric utilities.

Since then, the PSC has issued additional rulings that have clarified and revised aspects of the July 2015 Order on matters such as the size of qualifying facilities, the implementation of consolidated billing, and the ability to subscribe to a project outside a subscriber's electric load zone (interzonal crediting). Key features of New York's CDG market as they exist today are outlined in Section 3.C below.

3.C. Key Elements of New York's Community Solar Program

I. Qualifying Generating Facilities

The requirements for generating facilities for community solar are consistent with those for non-residential net-metered and remote-metered projects in conformance with Public Service Law (PSL) §66-j or §66-l. Since New York's program requirements are

technology-agnostic, a qualifying project can be one of several different technology types, including solar, standalone storage, and fuel cell–based. While project size was originally capped at 2 megawatts of alternating current (MW-AC), a subsequent PSC Order in February 2018[11] increased this cap to 5 MW-AC.

II. Membership

- Membership in CDG and community solar programs is restricted to individuals and entities that do not have on-site solar installed, and utilities may prohibit members from locating facilities on-site. Utilities also have the ability to prohibit members from receiving credits from more than one project.
- Members of a community solar project with average annual demand of up to 25 kilowatts (kW) are considered "small" members or subscribers and must make up at least 60 percent of the share of the project. Any demand-metered members with historical average demand of 25 kW or more are considered "large" members, or anchors, and may not make up more than 40 percent of the project. However, any entity that is on a purely volumetric rate (i.e., is not subject to demand charges) can qualify as a small customer, irrespective of its actual demand.
- Multi-unit buildings, if participating, would be considered "satellites" (another term for subscriber or member in a community solar project) and would fall under the 60 percent portion of the project, as each participating unit within the building would be separate participants in the project, accumulating their own credits.
- The 2015 PSC Order initiating New York's CDG program required a minimum of 10 subscribers (or members) for each project. After petitions that opposed that ruling, the PSC waived that requirement in 2017 for projects located on a property "serving multiple residential or non-residential customers," as these restrictions had made it difficult for residents of multi-unit buildings and various metering arrangements to take part in CDG projects.[12]
- Each member must take a percentage of credits amounting to at least 1,000 kilowatt-hours annually, with the caveat that they cannot take a percentage greater than their historical average annual consumption.

[11] http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7bD91A73CA-5B0A-442C-A939-CC050A91CFFF%7d

[12] http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={A292A989-C6FB-44F5-99D2-0F9A4327D7DF}

- Members are only allowed to subscribe to projects located in the same utility service territory. The ramifications of this constraint are discussed in further detail in Section 4.

III. Sponsor Roles and Responsibilities

The sponsor of a community solar project is broadly defined: It can be a single entity (e.g., a generation facility developer, or energy service company), a municipal entity (e.g., a town or village), a business, nonprofit corporation, a limited liability company, a partnership, or other forms of "business or civic association."

The sponsor carries a number of responsibilities, including building, owning, and operating the system, coordinating with the local utility, and liaising with subscribers.[13] Through this role, the sponsor is essentially the "go-between" for the utility and members, providing the utility with members' information in order for them to receive credits, dispersing credits from the utility to the members, and addressing any excess output that may come from the generation facility in each billing period.

IV. Billing and Crediting

Currently, community solar members receive their usual bill from their electric utility, and another bill from the project sponsor. While the credits for participation in community solar appear directly on the member's utility bill, the sponsor must also send the customer a separate bill for the subscription charge and have systems in place to collect that charge.

To lower customer management and project financing costs and improve process efficiency for the CDG market, the PSC passed an Order in December 2019 to allow for consolidated billing for CDG projects using a mechanism known as Net Crediting.[14] Under Net Crediting, the customer receives the savings associated with their subscription as set by the project sponsor as a credit on their utility bill. The remaining value of the bill credit, minus a fee to the utility, is then paid by the utility directly to the project sponsor. Net Crediting is expected to be implemented by all New York utilities, including the Long Island Power Authority, over the course of 2021.

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[13] As noted previously, it is often not a single entity that performs all of the roles described as the responsibility of the sponsor, with the developer, owner/operator and entity responsible for customer acquisition and management often being three separate companies.

[14] *Order Regarding Consolidated Billing for Community Distributed Generation*, New York Public Service Commission. December 9, 2019.

V. Compensation

When community solar was initially established in New York, project compensation was calculated pursuant to Net Energy Metering (NEM).[15] In 2017, the PSC approved a new compensation scheme for non-residential distributed generation projects, including community solar, referred to as the Value of Distributed Energy Resources (VDER) tariff, or the Value Stack, which compensates projects in the form of bill credits based on when and where they provide electricity to the grid. The components of the "stack"—i.e., energy, capacity, demand reduction, locational, and environmental—recognize the benefits that distributed generation provides to the grid and society, including avoided carbon emissions, cost savings to customers and utilities, and other savings from avoiding expensive capital investments.

For CDG projects, the Value Stack initially contained an additional stack element, known as the Market Transition Credit (MTC), available only to the mass market (small member) portion of the membership. The MTC was designed purely as a market incentive mechanism to bolster the initial Value Stack level to an amount closer to what projects would get under NEM. It was intended to make for a smooth transition from NEM to VDER and to be phased out over time as, theoretically, the CDG market took off and no longer required it. The MTC has since been replaced with the Community Credit, which both small and larger members are eligible to receive, which in turn was replaced with an upfront incentive known as the Community Adder in upstate New York utility territories starting in 2019.[16]

VI. Incentives

In addition to the MTC (later replaced by the Community Credit as explained above), the following incentives are available to community solar projects in New York:

- **MW-Block Incentive:** An upfront incentive available for all solar projects, as a part of the NY-Sun program. Incentives vary by market segment and region (Upstate, ConEdison territory, and Long Island), and step down based on cumulative allocations.

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[15] Net Energy Metering or Net Metering is a compensation scheme in which energy produced by a facility that is not immediately used, is injected back into the grid and results in compensation from the utility at the retail rate of electricity.

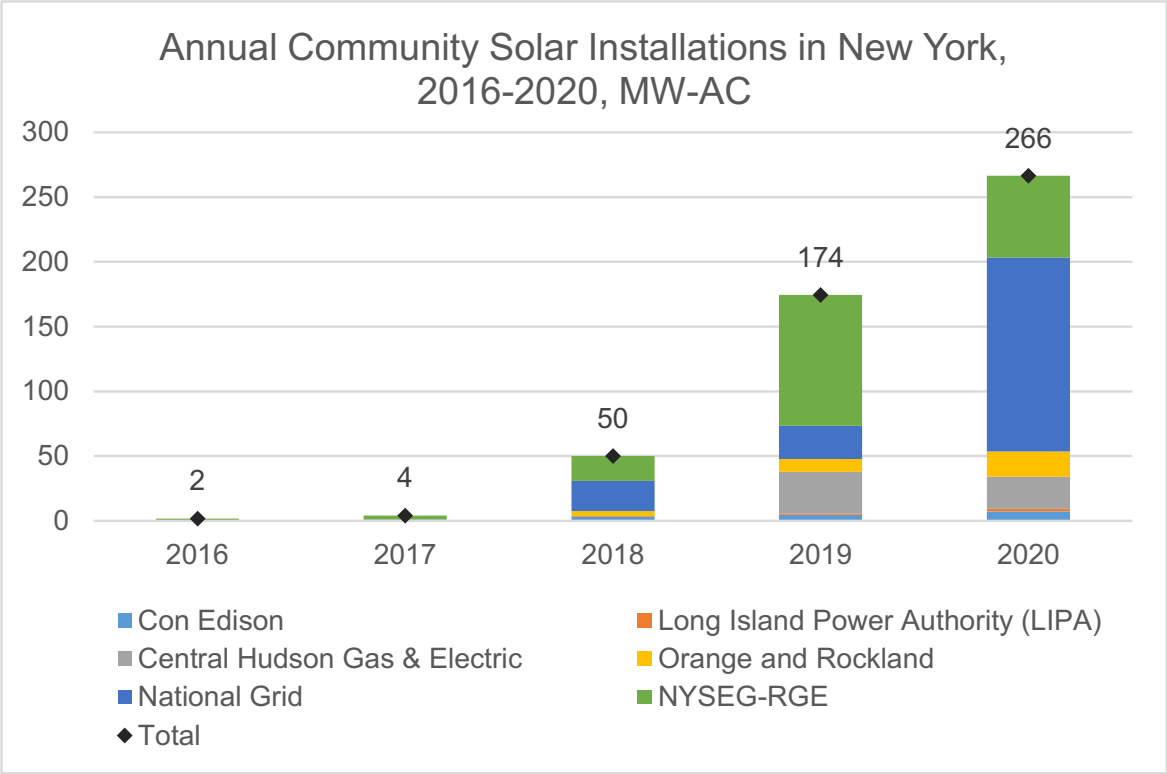
[16] The Community Credit continues to be provided as part of VDER compensation for projects sited in Con Edison and LIPA territory; however, as of March 1, 2021, less than 30 MW of Con Edison Community Credit capacity was available, and the extension of LIPA's Community Credit is subject to annual review (see below).

- **Community Adder:** An upfront incentive specific to CDG projects that replaced the Community Credit outside of Con Edison and LIPA territory, varying by utility territory. As of February 2021, the Community Adder is not available for projects sited in key Upstate territories (National Grid, NYSEG and RGE).
- **Brownfield/Landfill Adder:** Available to CDG projects sited on brownfields and landfills.
- **Affordable Housing Adder:** Available to community solar projects that serve affordable housing projects, subject to eligibility requirements.
- **Inclusive Community Adder:** An upcoming incentive available for the portion of a project's output serving LMI members, to be rolled out in Spring 2021.
- **Long Island Community Credit and Community Adder:** Since the Long Island Power Authority (LIPA) does not fall under the jurisdiction of the PSC, incentives provided to community solar projects sited in LIPA territory are specific to the region. Currently, these consist of a Community Credit Value Stack element available to all CDG projects, as well as a Community Adder incentive for projects under 750 kW in size, both first made available in 2020.

2.D. Historical Deployments and Project Pipeline

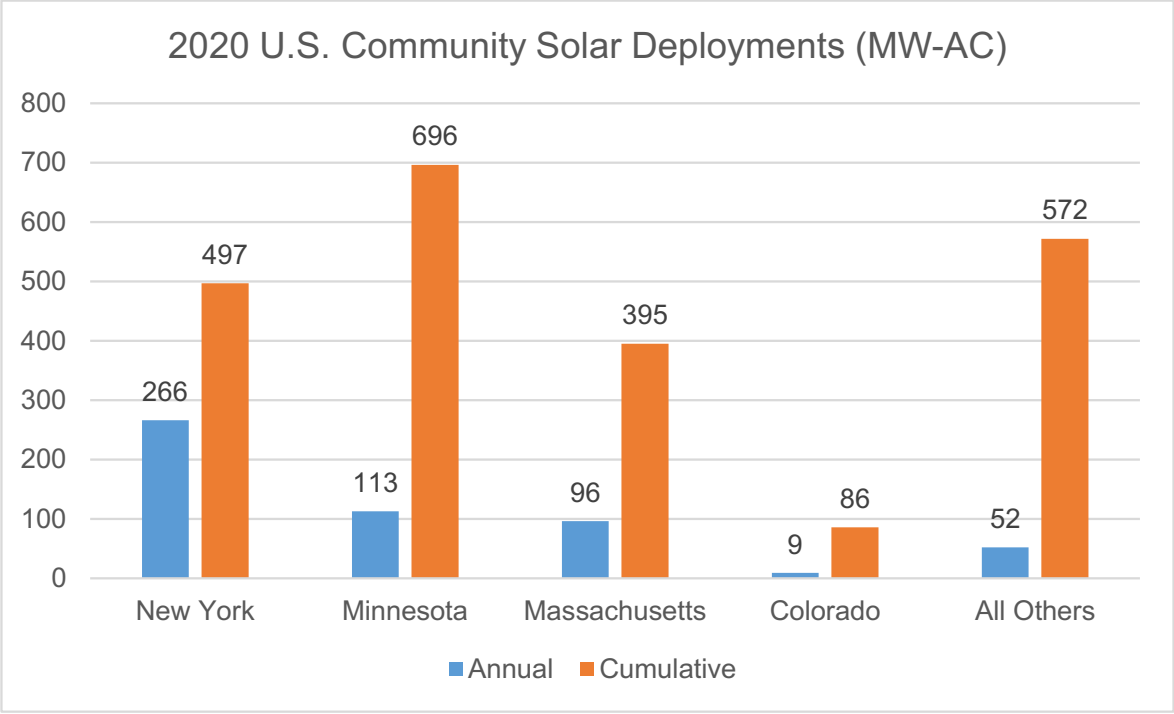
Figure 4 depicts annual community solar project deployments in New York from 2016 through 2020. As shown, annual deployments increased from 2 MW-AC in 2016 (1 percent of all solar installations) to 266 MW-DC in 2020 (63 percent), illustrating the rapid growth of this segment just a few years after its inception in 2015. At the end of 2020, total installed community solar capacity in New York stood at 497 MW-AC, representing 371 operating projects. 89 percent of currently operating capacity was installed in 2019 and 2020. At the national level, as shown in Figure 5, New York was the country's largest community solar market in terms of 2020 installations and the second largest (after Minnesota) in terms of cumulative deployments.

Figure 4: Annual Community Solar Installations in New York, 2016-2020



Source: NYS Department of Public Service (DPS)

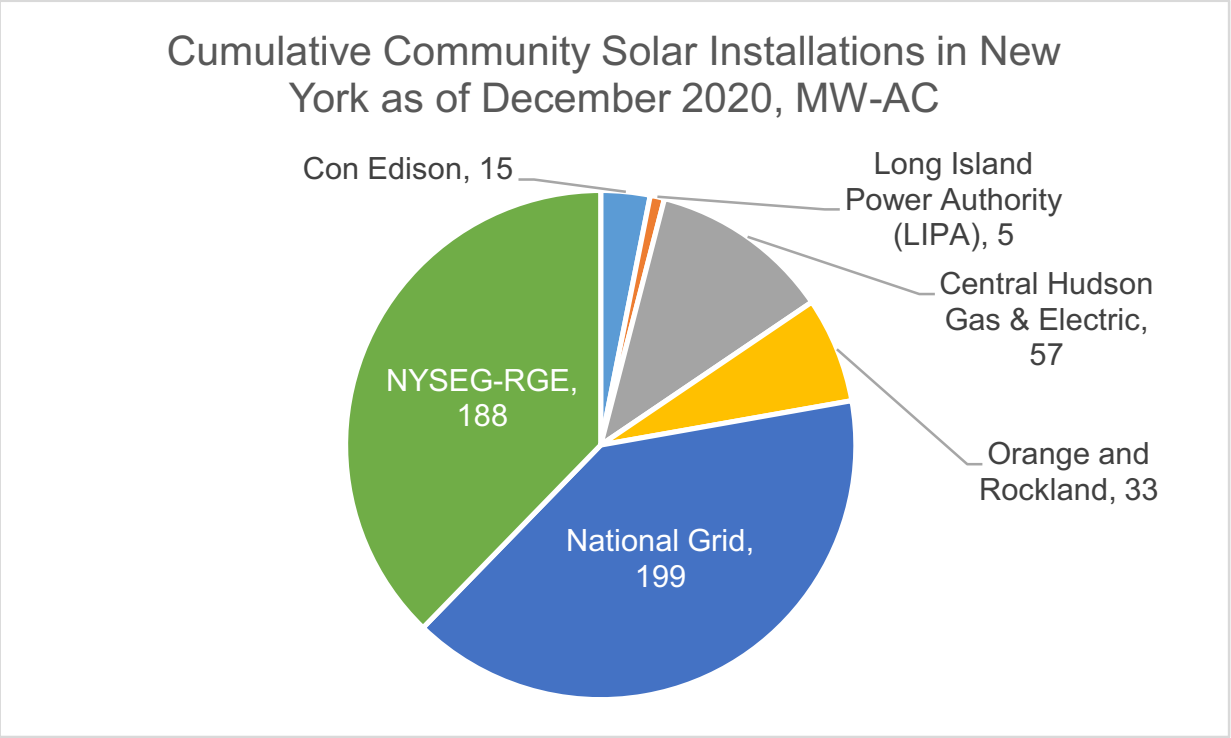
Figure 5: 2020 U.S. Community Solar Deployments



Source: SEIA/Wood Mackenzie Power & Renewables U.S. Solar Market Insight

Figure 6 depicts installed community solar capacity by utility territory as of the end of 2020. As shown, the majority of community solar capacity deployed so far is concentrated in Upstate and Western New York, with a combined 78 percent installed in National Grid, NYSEG and RGE territories, reflecting the availability of land for siting ground-mounted community solar systems. In contrast, Downstate territories (Con Edison and LIPA), where a majority of the state's population resides, made up only 4 percent total project deployments. Given the lack of siting potential for ground-mounted projects in the Downstate region, most community solar projects deployed and developed tend to be smaller rooftop systems less than one megawatt in size.

Figure 6: Cumulative Community Solar Installations in New York by Utility Territory as of December 2020

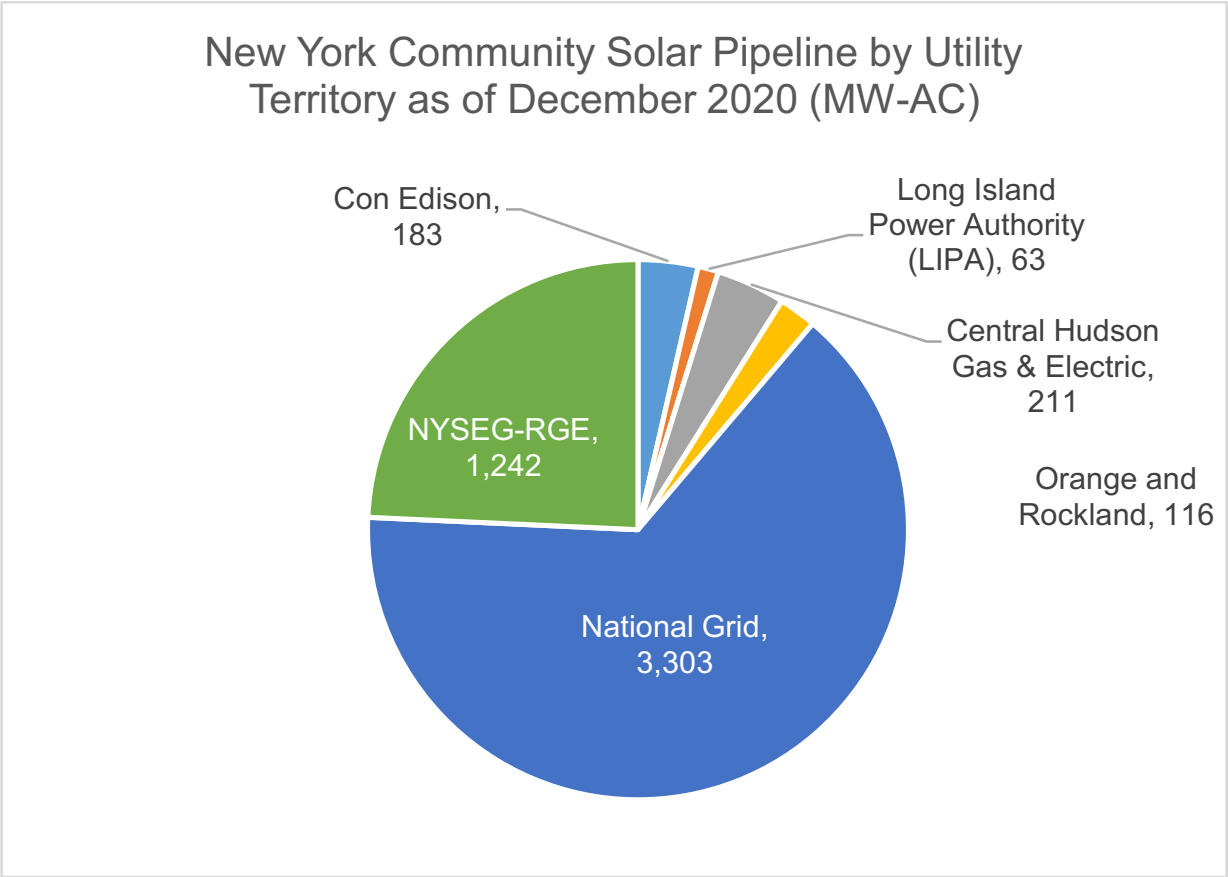


Source: NYS Department of Public Service (DPS)

Figure 7 depicts New York's utility interconnection pipeline for community solar projects still under development as of the end of 2020. Consistent with trends associated with projects already in operation, the dominant majority of the existing pipeline—almost 90 percent—is concentrated in Upstate and Western New York utility territories (National Grid, NYSEG and RGE), with downstate territories (Con Edison and LIPA) making up only 5 percent of the overall pipeline of 5,117 MW-AC. While this is an impressive figure, it should be noted that the majority of these projects have not

received the Community Adder incentive, meaning they are unlikely to move forward without additional incentive or compensation-related support (see Section 4.A).

Figure 7: New York Community Solar Pipeline by Utility Territory, December 2020

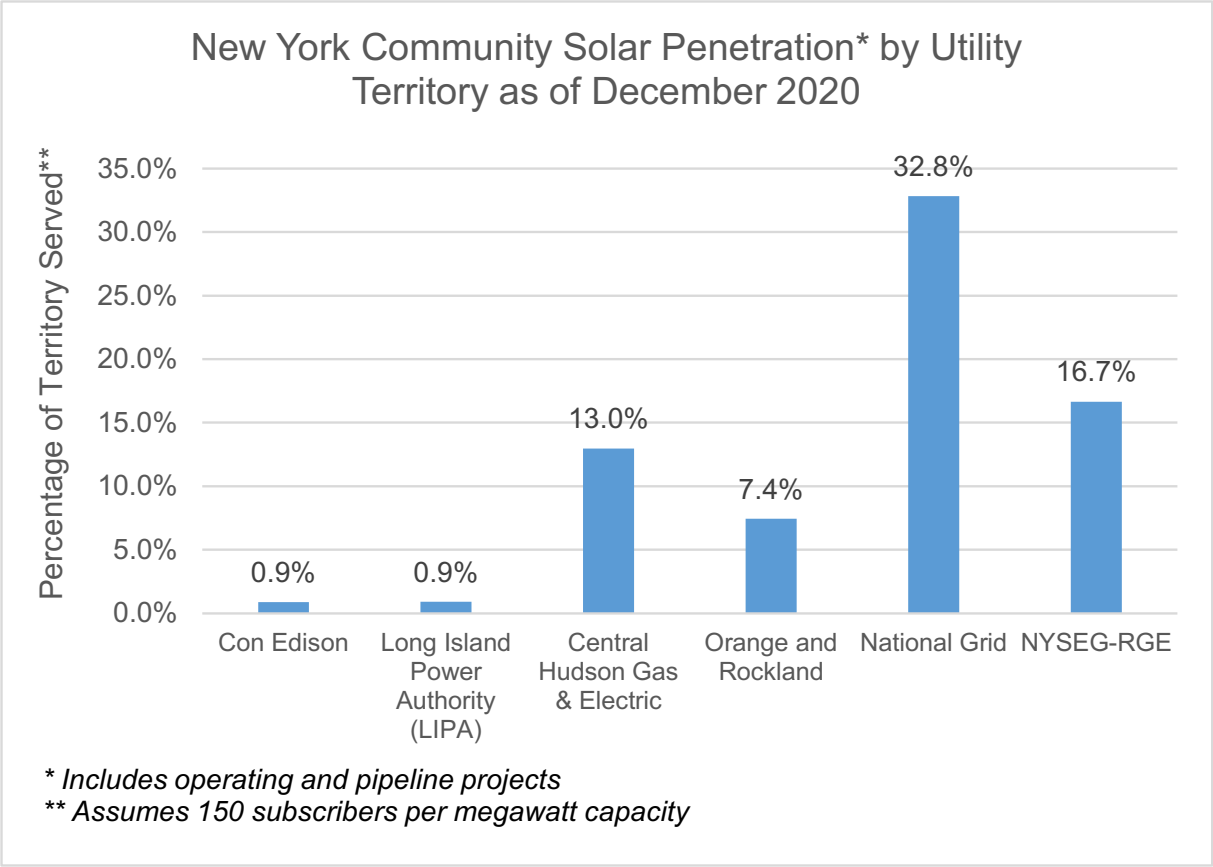


Source: NYS Department of Public Service (DPS)

2.E. Customer Penetration and Access

Since the customer base of utilities in New York varies significantly by territory, a more accurate portrait of community solar penetration across the state can be arrived at by normalizing operating and pipeline capacity in a given utility territory by the size of its customer base. This is displayed in Figure 8. As shown, there is a vast asymmetry between Upstate and Downstate regions: Con Edison, for example, serves 3.4 million electric customers, but has only 15 MW-AC of operating capacity and 183 MW-AC of pipeline capacity in its territory, implying penetration of less than 1 percent for operating and pipeline projects combined. This is in stark comparison to National Grid and NYSEG-RGE, where the equivalent figure stands at 32.8 percent and 16.7 percent respectively.

Figure 8: New York Community Solar Penetration by Utility Territory, December 2020



Source: NYS Department of Public Service (DPS), Joint Utilities of New York

Two concerning takeaways result from this analysis:

- Community solar has and will continue to struggle to reach the vast majority of Downstate New Yorkers if community solar membership is restricted to projects located in the same service territory as the member. New York City for example, is home to millions of residents who could greatly benefit from community solar, but its dense urban environment makes it extremely difficult to site community solar systems of any significant scale, and the base of locally sited community solar projects will likely fall far short of the scale required to serve most of its residents.
- The high pipeline-based capacity of community solar in Upstate and Western New York (over 1 megawatt per customer) means that many projects located in these regions will struggle to acquire a sufficiently large base of subscribers to be financially viable without being able to access the larger Downstate

population base. These challenges, and policy solutions for overcoming them, are discussed in more detail in Section 4.

4. Barriers and Solutions

While the community solar market has gotten off to a promising start in New York since its inception in 2015, several barriers threaten its continued growth going forward. These are discussed below.

4.A. Statewide Barriers

I. Local Resistance to Siting

Before any construction or further planning on a solar project can begin, it must first be approved by the authority having jurisdiction (AHJ), which is generally the town or city planning board. The buildout of ground-mounted community solar systems, particularly in Upstate and Western New York, has been accompanied by an increasing level of opposition over their siting in recent years from individuals, communities, and AHJs, resulting in a number of projects being denied approval and an increasing number of New York municipalities enacting moratoriums and/or highly restrictive zoning laws for solar projects.

While local opposition to renewable energy development (also known as NIMBYism, standing for “not in my backyard”) is a well-established phenomenon with regard to the development of large wind turbines, it is a relatively recent development in the context of solar energy in New York. Reasons for resistance to solar projects vary from concerns over obstruction of views, disruption of the natural environment, appropriation of land originally purposed for agriculture, improper disposal of the system after decommissioning, and largely unfounded fears about leaching or leakage from panels while in operation. Given the varied and multilayered nature of community dynamics in New York, simplistic, “one-size-fits-all” solutions are unlikely to succeed in tackling this challenge. The following recommendations serve as a starting point for advancement:

- Regional state-convened discussion forums between local communities and community solar stakeholder to facilitate dialogue and a mutual understanding of both groups’ perspectives;
- Dedicated incentives for dual-use solar plus agriculture projects (also known as agrivoltaics);

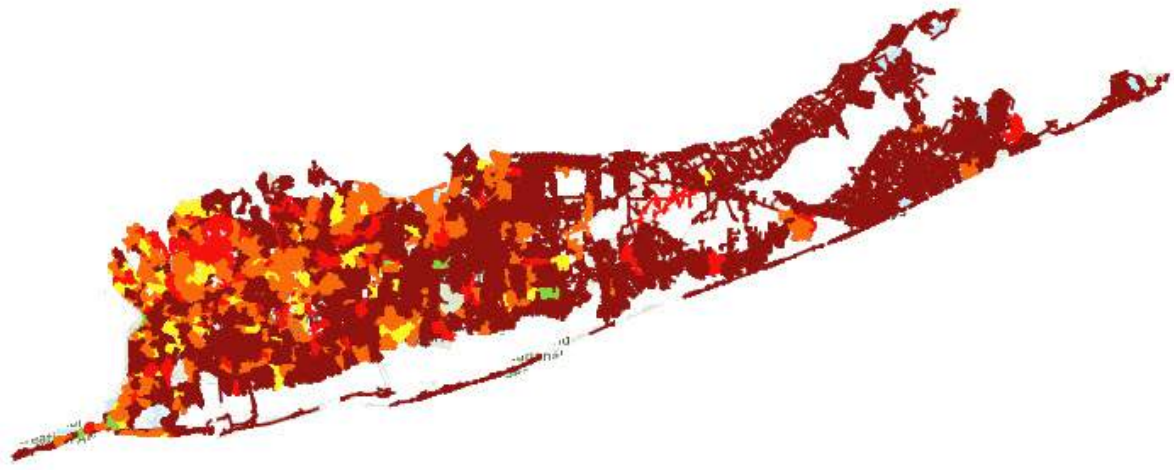
- Programmatic initiatives to increase awareness of the benefits of community solar for local communities and address commonly held misconceptions surrounding the environmental risks associated with solar energy systems (e.g., soil erosion, leaching, leakage, radioactivity, noise impacts).

II. Interconnection and Hosting Capacity Constraints

Interconnection refers to the physical and bureaucratic process by which an electric generating facility is allowed to connect to and supply the grid with power. Regardless of region or utility territory, interconnection creates bottlenecks for the growth of community solar in New York due to two primary factors:

- **Process Length:** The interconnection process for non-residential solar systems often serves as the ultimate gating factor to deployment, especially in utility territories with long queues for projects to be joined to the grid. For community solar projects in New York, interconnection timelines typically range from six months to as much as two years.
- **Hosting Capacity Constraints and Upgrade Costs:** Hosting capacity refers to the volume of generating facility capacity that the electric grid can accommodate at a specific location before resulting in impacts on power quality or grid reliability. If hosting capacity at a particular location is deemed to be insufficient, a solar project will be required to pay for the necessary upgrades to expand hosting capacity at that location. These costs can run into the millions of dollars, must be borne entirely by interconnecting projects, and in many cases, are so high that they render the project economically unviable. Figure 9 displays hosting capacity on Long Island as of 2020, with the preponderance of dark red shading indicative of unfavorable interconnection conditions in the region.

Figure 9: 2021 PSEG-Long Island Hosting Capacity Map



Source: PSEG Long Island

Key solutions to address interconnection and hosting capacity bottlenecks include the following:

- Accelerated investments in distribution-level infrastructure that would specifically enable hosting capacity expansion in line with New York's CLCPA goals.[17]
- Accelerated and widespread adoption of advanced technologies such as smart inverters and DERMS (Distributed Energy Resource Management Systems) that can enable interconnection without the need for expensive grid upgrades;
- A cost-allocation methodology where the burden of paying for hosting capacity upgrades is shared between generating facilities and ratepayers, as opposed to the current paradigm where triggering projects must bear 100 percent of the cost upfront;
- A dedicated interconnection process for smaller distributed generation systems with shorter timelines and a simplified process, that would enable a greater pace of interconnection for rooftop community solar projects in the Downstate region.

[17] It is important to note that while a regulatory proceeding to advance such a process has been initiated by the PSC (Case E-20-0197), it has to date focused primarily on transmission-level investment planning and requires greater input and participation from non-utility stakeholders to enable the realization of New York's CLCPA mandates.

III. Incentive and Compensation Uncertainty

Incentives for solar projects have supported the growth of community solar throughout New York State since its inception and have been critical to its success thus far, providing the "missing money" for economic viability while the market continues to increase in scale and lower costs. While required incentive levels have dropped sharply as the industry has matured in recent years, some level of incentive support is still necessary to mitigate the costs of customer acquisition, with anticipated cost reductions from the rollout of consolidated billing yet to be fully realized. However, the environment for continued incentive support across the state is fraught with uncertainty, casting a cloud over the economics of a significant volume of projects currently in the pipeline and those yet to be originated. Figure 10 details the current status of community solar incentives across New York along with proposed solutions to address their limitations.

Figure 10: Status of Community Solar Incentives in New York and Recommended Improvements

Region	Relevant Incentive(s)	Current Status	Proposed Solution/Improvement
Upstate and Western New York	Upstate Commercial/Industrial MW-Block (MWB), Community Adder (CA)	Upstate Community Adder exhausted as of Feb 2021; only 223 MW remaining in MWB	Implement permanent improvements to existing VDER stack components (E-Value, DRV); implement stack component reflecting avoided long-run transmission costs
New York City and Westchester	Con Edison Community Credit (CC)	Largely exhausted; only 46 MW CC remaining as of March 1, 2021. Approximately 180 MW lost due to program loophole resulting in allocations to natural gas fuel cells	Replenish tranche capacity that was lost due to fuel cells loophole and introduce successor Community Credit on phase-down basis specific to market sub-segments
Long Island	Community Credit (CC), Community Adder (CA)	Renewed on annual basis subject to LIPA Board discretion and VDER net revenue impacts	Implement multi-year extension to provide long-term market certainty

Source: NYSERDA, Con Edison, PSEG Long Island

IV. Consumer Perception

Despite gaining early traction and possessing the clear value proposition of clean energy access at a discount, community solar is still an unfamiliar concept to most residents of the state. Most firms marketing and selling community solar subscriptions do not yet possess brand recognition outside of industry circles, meaning that it can be a challenging sell for the uninitiated, a situation exacerbated by the COVID-19 pandemic. Compounding this issue further is the negative experience and perception

many New York residents hold with regard to private energy retailers (also known as energy service companies or ESCOs). Some New York ESCOs have previously engaged in deceptive marketing, aggressive sales, and predatory pricing schemes, which has had a knock-on effect on the perception of community solar providers.

To address these challenges, utilities and state agencies can invest in customer education initiatives, including the following:

- A state-sponsored marketing campaign featuring advertisements on billboards, traditional and digital radio, local television, print and digital news, and social media;
- The implementation of a diverse multichannel education and awareness campaign by utilities, including educational videos, infographics, social media advertisements, customer service representative referrals, and direct customer marketing engagement;
- Ongoing utility marketing campaigns including bill inserts, letters, emails, postcards, and newsletters sent to customers.

4.C. Downstate Barriers

I. Rooftop Permitting Complexity and Timelines

In contrast with Upstate and Western New York, most community solar projects sited in the Downstate region tend to be smaller rooftop systems ranging from 50kW to 750kW. While rooftop solar does not require the environmental permitting that is often necessary for ground-mounted installations, applying for and receiving a permit for a rooftop system is still a complex and time-consuming process, and can vary significantly from one jurisdiction to another, ultimately increasing soft costs related to installation and leading to a slower pace of deployment. Key recommendations to address permitting barriers and costs for rooftop community solar projects include the following:

- Acceptance of email or digital permitting applications, and acceptance of phone-based or online payment for application fees;
- Granting conditional building permits, which would allow credentialed installers to begin building the system after filing the application and paying the fee, as long as the system complies with all applicable rules and regulations;

- Conducting plan checks and inspections after installation, and allowing checks and inspections to be conducted by photographic submission or virtually via FaceTime, Skype, Zoom, or another videoconference platform;
- A simplified and streamlined permitting process for solar projects across jurisdictions statewide.

II. Siting Constraints

As discussed in Section 2.E, the densely populated and highly developed landscapes of New York City and Long Island severely limit their potential for siting ground-mounted community solar projects. As an indication of this constraint, the average size of operational community solar projects in Con Edison territory as of the end of 2020 was 115 kW, compared to 2.6 MW in National Grid and 2.1 MW in NYSEG-RGE. With two-thirds of the state's population, as well as a majority of its LMI population, residing in New York and Long Island, the lack of development sites in the Downstate region effectively prevents the majority of the state's population from participating in community solar.

III. Regulatory Barriers (Cross-Utility Crediting)

The lack of developable sites in the New York City metro region—coupled with the current requirement that the customer and community solar project be located in the same utility territory—is one of the largest hindrances to the development of community solar in the state. Addressing this arbitrary barrier would dramatically increase the addressable market, expand solar access to potentially millions of LMI customers and accelerate the state's ability to meet climate goals under the CLCPA.

The simplest and most obvious solution for overcoming this barrier is to allow ratepayers to subscribe to community solar projects sited outside their own utility territory. Eliminating this restriction would connect the vast demand for affordable clean power located in Con Edison and LIPA territories with the supply of community solar projects sited in the Upstate region. The process of having a project in one utility territory apply credits to the bill of a subscriber located in another territory is referred to as cross-utility crediting.

Allowing Downstate residents access to community solar projects in the Upstate region via the implementation of cross-utility crediting would create multidimensional benefits for New Yorkers:

- It would enable millions of Downstate residents to access the benefits of community solar, which they are effectively prevented from doing at present, but

for which they nevertheless pay to support through the statewide System Benefits Charge (SBC). As of 2019, New York City was home to 41 percent of the state's population, but only 7 percent of its solar generation.[18]

- It would significantly expand access to community solar for low-income customers, most of which reside in New York City. As estimated by NYSERDA, New York City was home to 44 percent of the state's moderate-income households, 43 percent of its low-income households, and 55 percent of its very low-income households from 2013 to 2015.[19]
- It would significantly expand the addressable market for the large pipeline of community solar projects sited in the Upstate region, and mitigate customer acquisition costs and risks associated with the development and deployment of these projects.
- It would play a significant role in helping New York realize its CLCPA-mandated targets pertaining to distributed solar deployment, electric sector decarbonization, and disadvantaged communities.

Figure 11: Regional Disparities in Community Solar Access Across New York State

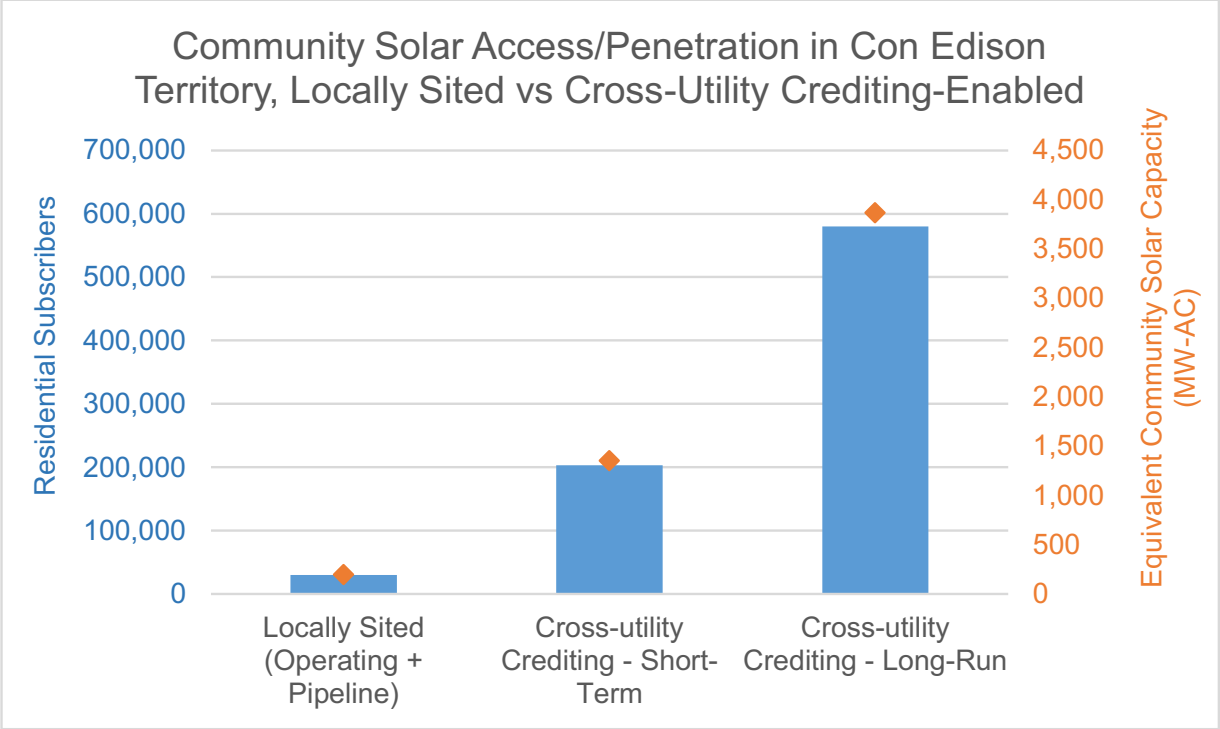
Source: U.S. Census Bureau and NYSERDA Statewide Solar Projects

[18] United States Census Bureau and NYSERDA Statewide Solar Projects. Accessed February 19, 2021.

[19] New York State Low- to Moderate-Income Census Population Analysis Tool. Accessed March 19, 2021.

Figure 12 displays short-run and long-run estimates for community solar access in Con Edison territory realized through the implementation of cross-utility crediting and compares them to penetration levels achieved solely through the realization of locally sited projects. In the short term (one to two years after implementation), we assume a penetration rate of 7 percent, consistent with that expected for National Grid territory in 2022, which would bring community solar to more than 200,000 residential customers in Con Edison territory, representing 1.31 GW-AC of generating capacity. In the long run, we project that community solar should be able to achieve a penetration level at least as high as the retail (ESCO) market, which is approximately 20 percent for residential customers in Con Edison, implying a total of 580,000 subscribers representing 3.9 GW in capacity. This is an order of magnitude higher than the 198 MW of operating and pipeline projects and roughly 30,000 customers that would be served from locally sited operating and pipeline projects.

Figure 12: Con Edison Community Solar Access, Locally Sited vs Cross-Utility Crediting-Enabled



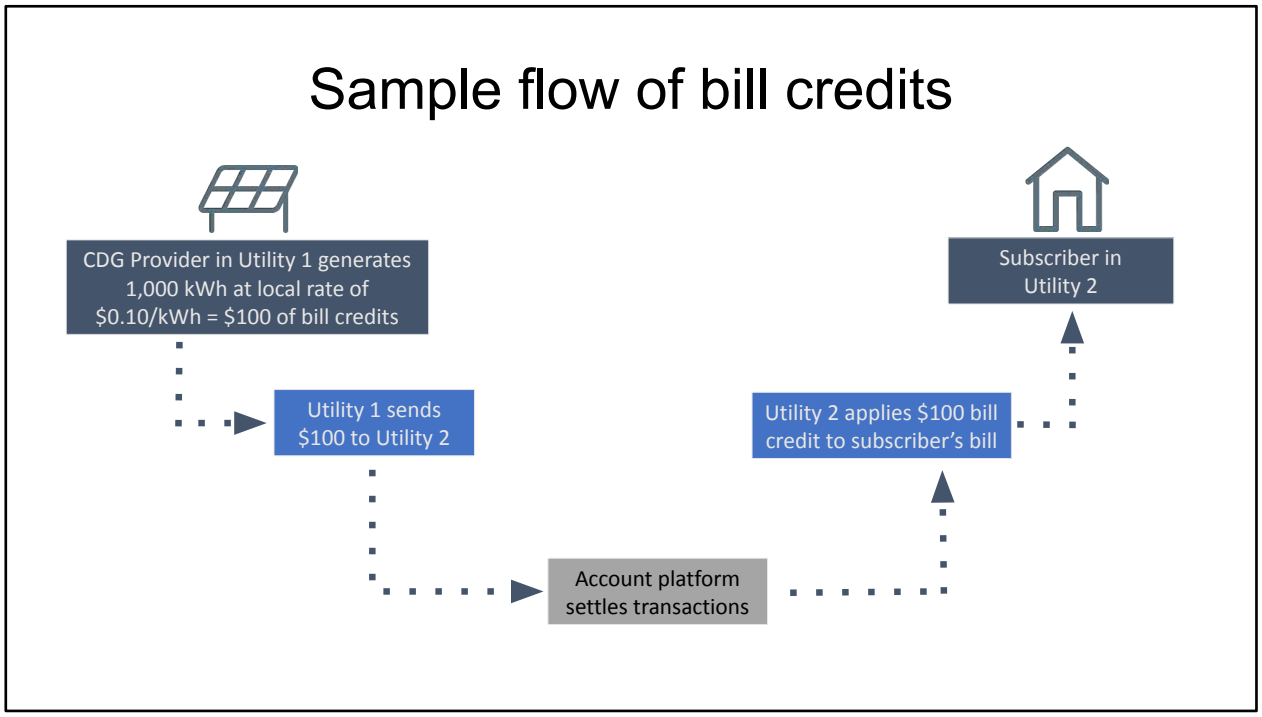
Source: Energy Information Administration (EIA), NYS DPS, NYSEIA

To the extent cross-utility crediting is implemented in New York, it is crucial that it does not undermine the development of viable local community solar projects in New York City and Long Island. It is important to note that in-city development will be aided by

the higher bill credit rate afforded to projects physically located in Con Edison territory; thus, customers will still have an economic incentive to subscribe to projects located in Con Edison territory rather than elsewhere under the cross-utility crediting model. Any rollout of cross-utility crediting should be accompanied by enhanced incentives for locally sited community solar projects, and prospective customers should be encouraged to subscribe to locally sited projects whenever possible. However, even with robust financial incentives and other regulatory barriers addressed, it is important to note that local development will remain limited in Con Edison even under the rosiest of scenarios.

Figure 13 depicts a functioning model for the flow of credits associated with cross-utility crediting for community solar, modeled on long-standing industries subject to Public Service Commission jurisdiction in New York such as ESCOs and the telecommunication sector. In this example, a community solar project is sited in Utility #1, which receives the value of solar associated with the community solar project and can offset energy and capacity purchases of its default service customers. End-use customer bill credits are valued at the VDER tariff rate in Utility #1. A residential customer subscribing to this project, who resides in the service territory of Utility #2, receives credits on their Utility #2 bill, which are provided at the VDER rate in Utility #1. An accounting platform then settles the financial transactions between Utility #1 and Utility #2.

Figure 13: Sample Flow of Bill Credits Under Cross-Utility Crediting for Community Solar



Source: Arcadia

4.C. Summary of Policy Recommendations

As indicated in Section 4.C, the continued growth and scaling up of community solar in New York is dependent on key regulatory, legislative, and programmatic policy improvements being implemented over the course of 2021. These are reiterated and summarized in Figure 14 below.

Figure 14: Summary of Key Policy Recommendations for New York Community Solar Market

Policy Area	Applicable Geographic Region(s)	Implementation Lead(s)	Recommendation(s)
Interconnection Hosting Capacity Expansion	Statewide	NY PSC/DPS	Accelerated investment in distribution-level infrastructure to enable DER hosting capacity expansion in line with CLCPA targets
			Accelerated and widespread adoption of advanced technologies (e.g. smart inverters, DERMS) that can mitigate the need for expensive grid upgrades
			Implementation of cost-allocation methodologies to share the burden of paying for hosting capacity upgrades across generating facilities and ratepayers
Value Stack (VDER) Compensation Improvements	Statewide	NY PSC/DPS	Adopt Department of Environmental Conservation (DEC) Social Cost of Carbon guidance into Environmental Value (E-Value)
			Updating Utility Marginal Cost of Service (MCoS) study methodologies to more accurately calculate Demand Reduction Value (DRV)
			Establish additional Value Stack component reflecting avoided long-run transmission infrastructure costs associated with DER deployment
Downstate Incentive Replenishment/ Extension	New York City Metro Area	NY PSC/DPS	Replenish Con Edison Community Credit tranche capacity lost due to natural gas fuel cell loophole; introduce successor Community Credit on phase-down basis
	Long Island	LIPA	Implement multi-year extension to Community Adder and Community Credit to provide long-term market certainty
Mitigating Local Siting Opposition	Upstate and Western NY	NYSERDA	Regional state-convened discussion forums between local communities and community solar stakeholder to facilitate dialogue/consensus
			Implement programmatic initiatives to increase awareness of community solar benefits for local communities and address commonly held misconceptions surrounding environmental risks associated with solar energy (e.g. soil erosion, leaching, leakage, radioactivity, noise impacts)
			Introduce dedicated incentives for dual-use solar/agriculture projects (agrivoltaics)
Improving Customer Awareness and Perception	Statewide	NYSERDA	State-sponsored marketing campaign featuring advertisements on billboards, traditional/digital radio, local television, print/digital news and social media
		Electric Utilities	Diverse multichannel education and awareness campaign by utilities (educational videos, infographics, social media advertisements, customer service representative referrals and direct customer marketing engagement)
		Electric Utilities	Ongoing utility marketing campaigns including bill inserts, letters, emails, postcards, and newsletters sent to customers
Rooftop Permitting Soft Cost Reduction	Long Island	Town/AHJ Building Departments	Accept email or digital permitting applications and phone-based or online payment for application fees
			Grant conditional building permits (allow credentialed installers to begin building the system after filing the application and paying the fee, as long as the system complies with all applicable rules and regulations)
			Conduct plan checks and inspections after installation; allow video conference/photo-based submissions for checks and inspections
Expand NYC and LMI Access	New York City Metro Area	NY PSC/DPS	Remove regulatory barrier limiting membership to projects sited in same utility territory; implement cross-utility crediting to enable transfer of bill credits across utilities

Source: NYSEIA

About NYSEIA

Founded in 1994, New York Solar Energy Industries Association (NYSEIA) is the only statewide membership and trade association dedicated solely to advancing solar energy deployment in New York State. NYSEIA proudly represents more than 125 businesses across New York that employ thousands of workers throughout the solar value chain. Led by an active Board of Directors, NYSEIA strives to achieve significant, long-term, and sustainable growth of solar energy in New York State.

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