Community-Owned Community Solar

Opportunities and Challenges

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Acknowledgments

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Church of the Brethren Community Solar, University Park, Maryland 2010. Courtesy of University Park Community Solar LLC)

Introduction

The premise of community-owned community solar is simple. A solar array is owned by community members or a community organization. Individuals or groups can purchase or subscribe to a portion of the array and receive benefits from that portion. The community decides ***how*** the solar project will be run, ***who*** will have access, ***where*** benefits will be distributed, and ***what*** benefits are most important. This report examines key decisions, tradeoffs, and options for building community-owned community solar.

Historically, the US energy system has relied on centralized power producing facilities, primarily run on fossil fuels. They have been owned and operated by wealthy individuals and corporations, with profit as the driving focus. Energy systems have also historically reinforced and exacerbated inequality, both economic and racial. While median-wealth U.S. households spend 2.3% of income on energy costs, households at or below twice the federal poverty level spend 8.1%, over three times as much. In terms of race, Black households spend 43% more of their income on energy bills than their white (non-Hispanic) counterparts while Hispanic households spend 20% more and Native American households spend 45% more.

As the devastation of climate change and other negative effects of fossil fuel consumption become more visible than ever, communities are pushing for a transition to low- and zero-carbon energy sources, including solar. However, despite its widespread societal and environmental benefits, renewable energy does not inherently promote equity. Traditionally, solar energy has been owned by either wealthy individuals or utility monopolies.[1] Now is the time to think creatively about improving the energy system more holistically, rather than just replicating long-standing problems with new technology.

Figure 1: Community Solar Community solar allows many people to share in the benefits of a single solar installation. Subscribers can purchase or lease solar panels and receive a credit on their monthly electric bill.

1 A 2022 Berkeley Lab found that "The median solar adopter income was about $115k/year in 2020, compared to a U.S. median of about $63k/year for all households and $79k/year for all owner-occupied households." However, this is an improvement from 2010 when the median income of solar adopter's was about $138k/year. https://eta.lbl.gov/publications/residential-solar-adopter-income-0

Community-owned community solar has the potential to be more equitable than other types of renewable energy because it provides the opportunity to own renewable energy systems. Communities can produce electricity rather than purchasing it from large utilities or meeting the requirements for rooftop solar (for example, home ownership, sufficient roof conditions and size, and the ability to pay high upfront costs). Community-owned community solar expands access to renewable energy, regardless of whether someone owns their home, and it puts communities in control of a portion of their energy. It can contribute to workforce development, building (financial) equity, home upgrades to improve energy efficiency, community investment and empowerment, and more benefits discussed below. While relatively new and comparatively small relative to other types of renewable energy, community-owned community solar has the potential to democratize the clean energy transition, deliver benefits to communities rather than individuals, and promote an equitable energy system.

The purpose of this report is to identify key concepts, lessons, and questions through examination of existing community-owned community solar projects. It draws on reports related to community ownership, community solar, and renewable energy in addition to 11 interviews with representatives of community-owned community solar projects as well as projects that are similar in spirit although they may not fit completely within the category.

By examining ownership models, benefits and their distribution, and barriers, this report is a resource for both **advocates** interested in furthering beneficial policies and **community organizations** who are potentially interested in investing in community-owned community solar projects. In other words, this report aims to thread the needle between two questions coming from each respective group:

1) What policy decisions will enable and support community-owned community solar?

2) What questions should groups interested in community-owned community solar ask before engaging in a project?

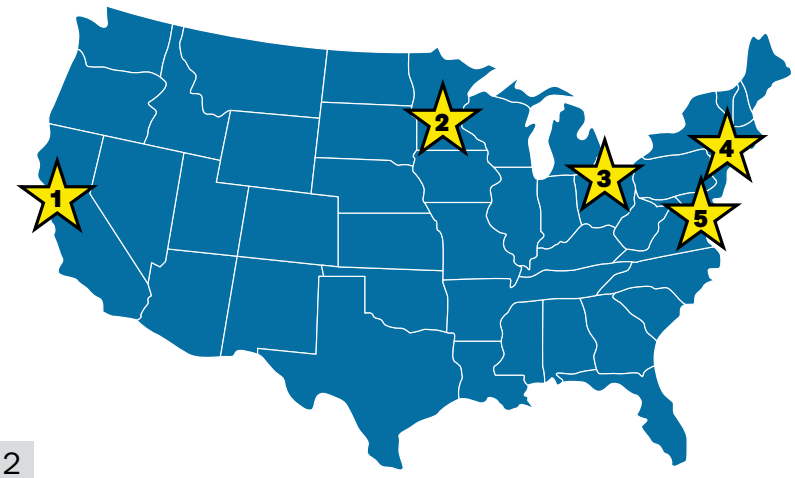
It is too early in the lifespan of community-owned community solar to provide definitive answers to almost any question posed herein. However, by clarifying key concepts, identifying barriers, and showcasing already existing examples, we can begin to evaluate—and advocate for—this alternative path within the clean energy transition.

What Do We Mean by Equity?

In financial contexts, such as the development of solar projects, equity refers to the value of a shareholder's stake in a company or project. In social contexts, equity, at its simplest, refers to fair and impartial practices.

For this report, the former use of equity will always include "financial" before equity (financial equity), while social equity will be referred to with just the word equity.

Figure 2: Map of Example Community-Owned Community Solar Projects and Organizations



1: People Power Solar Cooperative
Oakland, CA

2: Cooperative Energy Futures
Minneapolis, MN

3: Hough Block Club
Cleveland, OH

4: Co-Op Power
Northampton, MA

5: University Park Community Solar
University Park, MD

Table 1: Examples of Community-Owned Community Solar Projects and Organizations

Project/Organization[2]	Ownership type	Stage in development	Key policy drivers	Priority values
University Park Community Solar (University Park, MD)[3]	LLC	Partnership flip completed with host institution	Lack of policy drivers	Showing feasibility and profitability of community-owned community solar program
Cooperative Energy Futures (Minneapolis, MN)	Cooperative that owns multiple LLCs	Operational	Uncapped community solar program[4]	Renewable energy, community ownership, energy democracy
People Power Solar Cooperative (Oakland, CA)	Cooperative	Operational	2015 California Worker Cooperative Act	Energy democracy and sovereignty
Block Club/Cleveland Owns (Cleveland, OH)[5]	LLC	In development	Lack of policy drivers	Bill savings, community empowerment, equity
Co-Op Power (MA and NY)	Cooperative	Operational	Massachusetts' Mass Solar Loan program	Local ownership, control, and distribution of benefits

2 This column includes both stand-alone projects, such as University Park Community Solar, and organizations enabling projects, such as Cooperative Energy Futures.

3 University Park Community Solar no longer maintains a website. For an article examining the project, see "University Park Community Solar LLC – the first Community Solar Power Initiative."

4 For more information, see the Institute for Local Self-Reliance's article "Why Minnesota's Community Solar Program is the Best."

5 For more on this project, see the Block Club, Cleveland Owns, and this article.

What is Community-Owned Community Solar?

Community-owned community solar refers to both a specific type of solar project as well as a specific ownership type. Both *community-owned* and *community solar* can be used to describe very different phenomena. To understand what exactly community-owned community solar is, both terms must first be explained and defined.

Community Solar

The U.S. Department of Energy defines **community solar** as "any solar project or purchasing program, within a geographic area, in which the benefits of a solar project flow to multiple customers such as individuals, businesses, nonprofits, and other groups. In most cases, customers are benefitting from energy generated by solar panels at an off-site array." Community solar allows those without rooftop solar capability (renters, condo/apartment owners, homeowners without satisfactory roofs) to enjoy the benefits of solar.[6]

Contextualizing Community Solar

Community solar accounts for approximately **3.6%** of installed solar in the United States.[7]

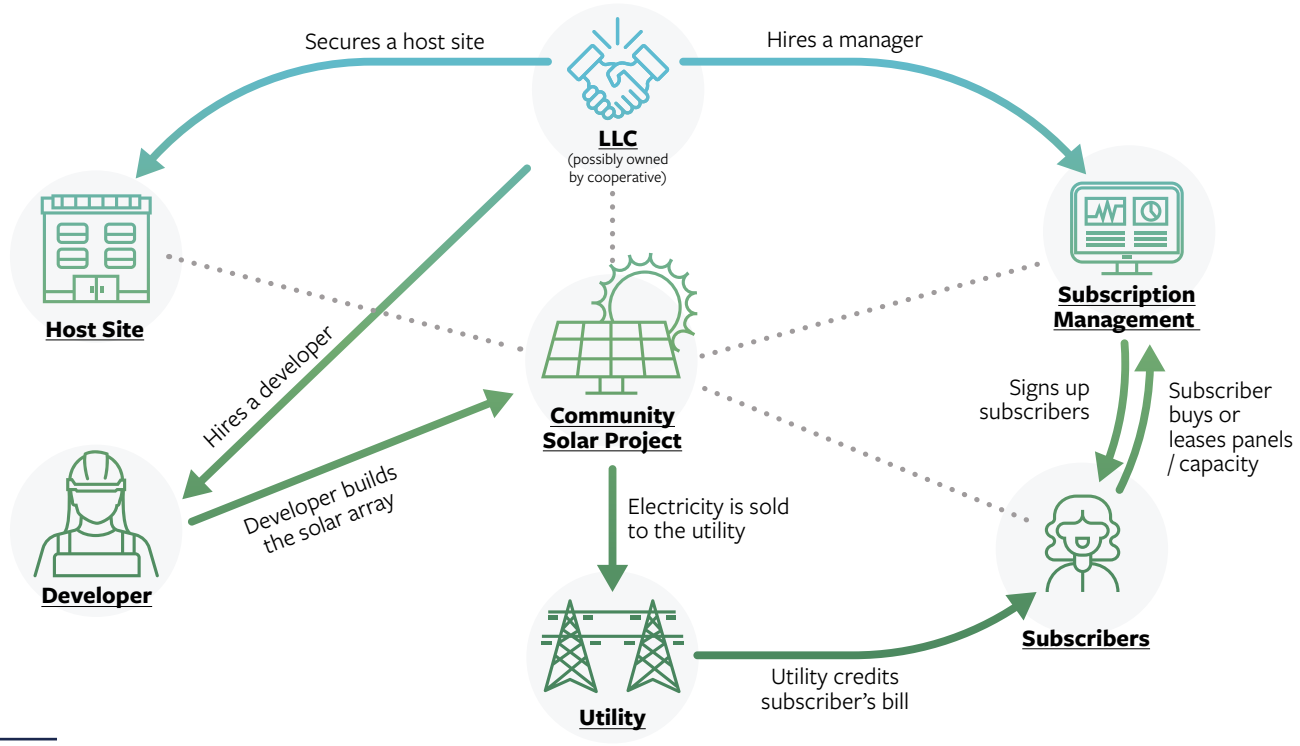
There is enough U.S. community solar as of 2021 to power **600,000** households.

The average residential community solar subscription in the US is 3 kW, or approximately enough to run most appliances in a small home with 2-3 occupants. It can save customers about **10% in utility costs** over the life of the subscription.[8]

The Department of Energy has a target of spurring enough community solar to power **5 million households** by 2025 and create $1 billion in energy savings.[9]

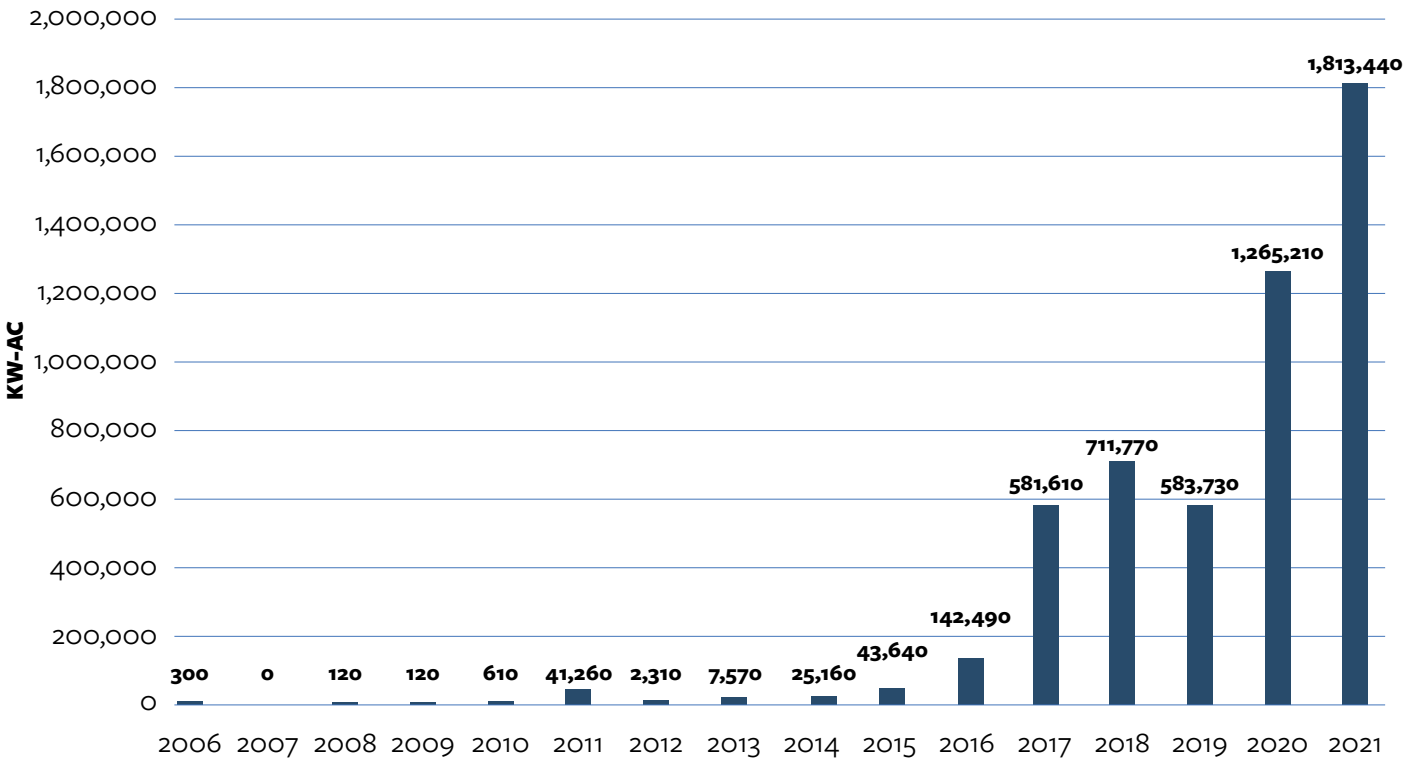
About **1/3 of states** have policies ranging from stepping stones to community solar programs.

Figure 3: How Solar Works, the Special Purpose Entity Model (Courtesy of SolSmart)



6 For a general guide to community solar, see Canary Media's "What is community solar? And how can you sign up?" For a discussion of community solar and its benefits for low- to moderate-income customers, see WRI's recent work.

Figure 4: Figure 3: U.S. Community Solar Growth 2006-2021 by Annual Capacity Additions (Courtesy of the National Renewable Energy Laboratory)



Bill Crediting and Community Solar

- With most community solar, a participant receives a monetary credit on their electricity bill for their share of the electricity generated from the community solar project. This **bill-crediting** arrangement is often the way the benefits of community solar are distributed to participants.
- Bill crediting is a generic term for this customer-billing process. **Net metering** refers to a specific bill crediting arrangement usually involving a 1:1 kWh bill offset (or the monetary equivalent) and has typically been used for rooftop solar. **Virtual net metering** expands the net metering mechanism to customers participating in an off-site solar project, such as community solar. A number of the largest community solar programs utilize a monetary bill credit based on a value-of-solar or other valuation methodology rather than virtual net metering. However, these terms are still sometimes used interchangeably.
- *Most* community solar has been developed in response to state policy-mandated bill crediting, but some utilities voluntarily provide bill crediting and some community solar projects have developed creative means to distribute benefits without bill crediting.

7 For more Community Solar data, see the Wood McKenzie report

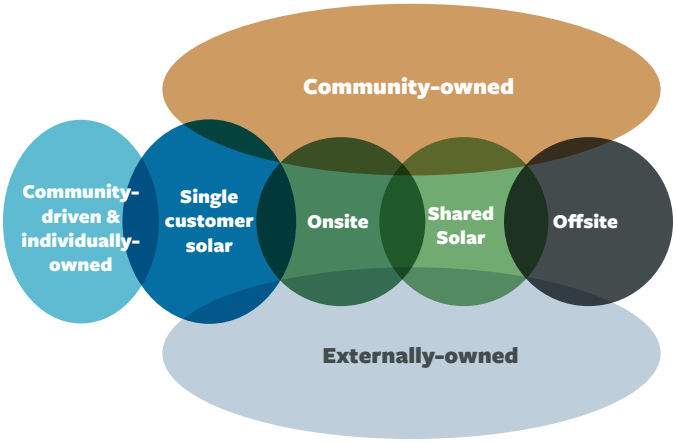
8 See National Renewable Energy Laboratory video

9 Department of Energy Press Release

Varieties of Community Solar

Community solar comes in many forms. Key variables that differentiate community solar projects are ownership, customer profile, location, size, and distribution of benefits. The diagram below focuses on ownership and location. Externally owned solar can be broken down further into third-party owned, where a solar company or other third party owns the project and participants are able to subscribe, or utility-owned in which participants may have a subscription or sign up for a green tariff or other utility rate.

Figure 5: Models within Community Solar (Courtesy of Subin DeVar)



Community Ownership

Under the broadest definition, a **community** is *a group of people living in the same place or having a particular characteristic in common*. Thus, it could mean people within a shared location, such as a neighborhood or a town, as well as geographically dispersed individuals with a shared identity, such as tribal members or members of an ethnicity, migrants, and others. Community is difficult to define, and there is debate over what can be called a community.

Community-owned community solar does not have strict demarcations and projects will define community in different ways. Community solar can also be owned by cities, municipalities, and other governmental entities. Assuming that these entities are democratically elected and representative of a community, their projects could be considered community-owned community solar. However, this report excludes these examples in favor of more grassroots projects that are not affiliated with government entities.

Community ownership promotes equity by putting communities in charge of at least some energy production and by giving them the opportunity to distribute the multiple benefits that accrue from that production as they see fit. Ownership can therefore serve to increase a community's relative power in relation to utilities and other power sector incumbents. Community ownership, if it is structured democratically, also promotes equity within communities. It can give everyone a voice in how the project is run, through an equitable process and an equitable distribution of outcomes and opportunities.

In its 2020 "Community-Ownership Models: Innovation Landscape Brief," the International Renewable Energy Agency (IRENA) defines **community ownership** as:

- "local stakeholders owning most of the project and voting rights and by control resting with a community-based organization"
- "the community owns, manages and takes the benefits of the project, while the main power grid operator and other parties have a secondary role."
- A community model includes at least two of the following characteristics (ownership structure, democratic governance, distribution of profits).

As Timothy DenHerder-Thomas, co-founder of Cooperative Energy Futures, stated in an interview "we need space and grace when defining community ownership." Community ownership is often subjective and requires evaluating how much control a community has compared to solar developers, utilities, and others involved in a community solar project. Often, it is easier to define what isn't community ownership than what is.

Ownership Models

"Ownership" in community-owned community solar usually refers to ownership of the solar panels and the electricity generated from them. The desire for ownership often comes from a desire for equity – financial and/or socioeconomic. Communities can advance equity further through ownership than by purchasing subscriptions to a community solar project owned externally by a utility or third party. Considerations of equity also play out internally within projects through decision-making regarding the type of ownership model. When considering ownership, it is important to distinguish between individual **projects** and **organizations**.

Today, in the United States, the majority of community-owned community solar projects are owned by a **Limited Liability Company (LLC)** some of which are in turn owned by **cooperatives**. Direct ownership of a project by a cooperative is hypothetically possible although rare in practice. Even non-profits that create projects typically form some combination of cooperatives or LLCs to own them. When community organizations plan to develop a single project, LLCs are often the simplest way to do so, while for organizations who plan to create multiple projects, cooperatives—which then own LLCs—are more common.

To reiterate, when it comes to ownership, it is important to differentiate between an individual community-owned community solar project and a community-owned community solar organization, which may own multiple individual projects. Due in large part to the importance of tax financing, most projects are be owned by an LLC. On the other hand, a community organization may take the form of an LLC or another structure, such as a non-profit or a cooperative. The organization may own one project (like University Park Community Solar) or it may own several projects (like Cooperative Energy Futures). In the latter case, if it is not already an LLC, the organization typically forms one or more LLCs for project-ownership purposes (again, like Cooperative Energy Futures).

Cooperatives

A cooperative is a member-owned and -controlled business that distributes benefits equitably to those members on the basis of use. Like other businesses, cooperatives incorporate under state law. Daily operations are handled by staff with policy direction and executive management provided by a member-elected board of directors. Where they differ from other businesses is in their purpose and principles, which include:

- **Service at cost** refers to the ability of cooperative members to receive the service provided by the cooperative at the lowest cost possible.

- **Proportional benefits and obligations** means that the more a member puts into the cooperative, the more benefits they should receive.

- **Limited returns on financial equity** means that the service provided by the cooperative is privileged over financial benefits. In other words, cooperatives are meant to be a means to procure a service or product at a lower cost, not to serve primarily as an investment opportunity.

- **Democratic control** means that every member has a voice either through direct or proportional voting.

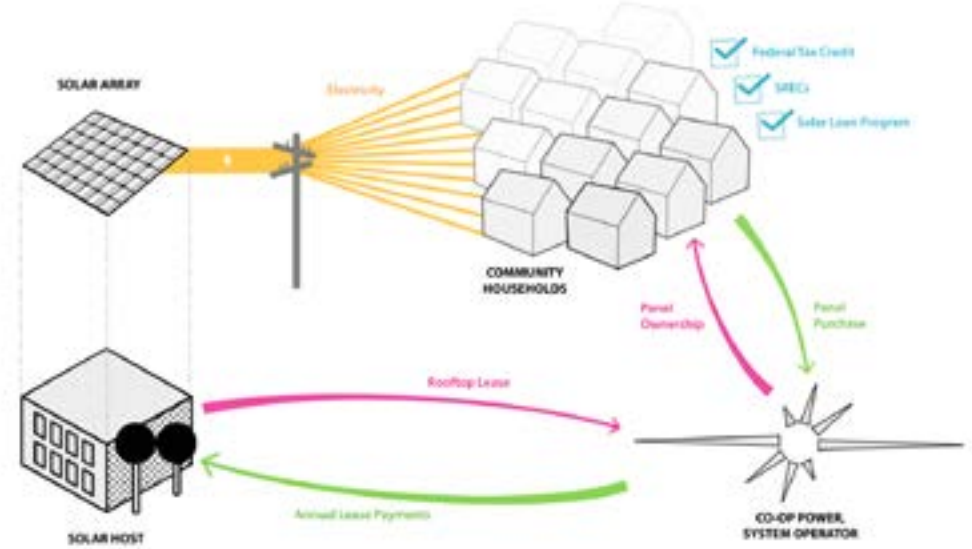
For example, in a community-owned community solar project, members will ideally receive credit on their electricity bill for the energy produced with the lowest additional costs—such as subscriber management fees, operations and management, and others—as possible (service at a cost). Since the project is owned by a cooperative, a third-party owner is not trying to make a profit off of these other costs. The more a cooperative member pays into the cooperative, the greater their electric bill reduction and/or other benefit (financial benefits and obligation proportional to use). While participants receive bill reductions, cash, or equity, the goal

of the project is not to maximize returns (limited return on equity capital). Finally, all cooperative members have a vote in how the cooperative is run (democratic control). Cooperatives are appealing for community-owned community solar because of their inherently democratic control and built-in structure for distributing benefits. Cooperatives can also help avoid the concerns associated with securities law and regulation that may arise with community solar (see below for more information). They are most commonly used as an ownership structure for organizations in conjunction with LLCs for individual projects.

Case Study 1: **Co-op Power**

- Incorporated in 2004, New England's Co-Op Power is one of the US's largest (4.5 MW as of 2020) and longest running community-owned community solar organizations. It offers both traditional subscription-based community solar as well as community-owned community solar.
- Co-Op Power is an organization with multiple projects. It is organized as a decentralized network of 7 Community Energy Co-Ops (CECs) that set their own agendas based on local energy priorities. CEC's priority is "to organize and educate people in their region and to facilitate the development of one or more community-owned, community-scale, clean energy businesses." Each CEC has one representative on the Co-Op Power board including veto power.
- Early on, Co-Op Power chose to focus on community solar rather than rooftop solar, recognizing that community solar provides more opportunities for low-income communities.
- Co-Op Power uses a cooperative ownership model and make decisions by consent rather than voting.
- A key enabling factor for Co-Op Power's growth was a Massachusetts's Mass Solar Loan program that allowed the co-op to monetize the federal investment tax credits rather than relying on tax equity partners.
- By acting as a federation of local cooperatives, Co-Op Power's community solar program has spread throughout Massachusetts and New York.
- In addition to electricity bill savings, Co-Op Power offers job training/workforce development, community education, and community strategic planning.
- The diagram below reflects Co-Op Power's community-owned community solar model. Participants purchase panels and co-locate them in a shared array. They pay monthly for system operations and management and will pay for the total cost of the panels in 7-8 years. In return, participants receive the federal tax credit and renewable energy credits as well as the electricity the panels generate for their lifespan of 20-25 years.

Figure 6: Co-Op Power's Rooftop Community-Owned Community Solar Model (Courtesy of Co-Op Power)



Limited Liability Companies (LLCs)

LLCs are businesses owned by members that can include individuals, corporations, other LLCs, and foreign entities. They allow community members or groups to own something—such as a solar array—without having personal liability associated with it. In other words, should anything go wrong with a community solar project, members of an LLC could only lose the money they have invested in the LLC—for example, paid towards the solar array—and would not risk any personal assets, such as any separate savings or other personal funds, or their house or car. LLCs are appealing for community-owned community solar projects because of the relative ease creating one and their compatibility with tax equity investors. An LLC can also be structured such that its members have democratic control similar to a cooperative. However, when not paired with a cooperative, an LLC may face requirements related to securities law and regulation, as discussed further below.

Community-Owned Community Solar and Community Institutions

Non-profits, houses of worship, and other community institutions are ideal hosts for community solar in that they often own land and/or structures that can accommodate relatively large arrays. They will also serve as the primary off-takers of the project; that is, the entity that purchases the majority of the electricity produced by the community solar array. These groups often (due to legal requirements) form a separate company (LLC or cooperative) to own a project.

Case Study 2: University Park Community Solar[10]

Maryland's University Park Community Solar, founded in 2010, is another example of an early community-owned community solar project. Initially community-owned and hosted on University Park Church of the Brethren, the 22.7 kW project was sold to the church in December 2021.

- The church signed a PPA (see text box) with University Park Community Solar and was the primary customer, often known as an "off-taker" (see Figure 5).
- Some people would not consider this community solar because of the lack of bill crediting for multiple offtakers. For the purposes of this report, it is considered within community solar due to community ownership and community distribution of benefits. People Power Solar Cooperative uses a similar model.
- The project started with 35 individuals who contributed between $1,000 and $7,000 to acquire and install the $135,000 solar plant; thus avoiding the need for external financing.
- In an interview with founding member Richard Scorza, he stated that the group chose an LLC ownership model due to its minimal paperwork, protection of individuals, and to "demonstrate that solar can create a profit incentive." The LLC paid no Maryland state taxes and was able to pass on tax liability to individual members.
- University Park Community Solar benefitted from the relative wealth, capacity, and connections of its membership. In the interview, the target demographic was described as "middle-class CD [certificate of deposit] holders" with "patience, lack of greed, tolerance for low returns, and already having some wealth," a group of individuals "more interested in the environment than making money." Participants included University of Maryland faculty and employees of various federal agencies.

10 University Park Community Solar no longer maintains a website. For an article examining the project, see "University Park Community Solar LLC – the first Community Solar Power Initiative."

To summarize, community organizations face a variety of options when choosing ownership models for a community-owned community solar project. This can take the form of LLCs, cooperatives, or a combination of the two.

- LLCs are the least complicated to form and are highly compatible with tax equity investors. However, they have the highest potential for securities regulation. LLCs are particularly well-suited for individual projects.

- Cooperatives make distributing benefits relatively simple and mitigate the potential for securities regulation. They also have a high potential for replication and scaling. However, they are not compatible with tax equity investors and may be complicated to form depending on a state's cooperative laws. A cooperative ownership structure can be used for both individual projects and community organizations.

- Cooperatives that own LLC(s) maintain LLCs' compatibility with tax equity investors while also maintaining cooperatives' potential for replicability/scalability and mitigated potential for securities regulation.

Power Purchase Agreements (PPAs)

The Solar Energy Industries Association defines Power Purchase Agreements as, "a financial agreement where a developer arranges for the design, permitting, financing and installation of a solar energy system on a customer's property at little to no cost. The developer sells the power generated to the host customer at a fixed rate that is typically lower than the local utility's retail rate. This lower electricity price serves to offset the customer's purchase of electricity from the grid while the developer receives the income from these sales of electricity as well as any tax credits and other incentives generated from the system."

PPAs are a critical financing tool for residential and small commercial solar by enabling third-party ownership and investment. PPAs also benefit non-profit and public sector entities who lack the tax burden necessary to monetize the investment tax credit. University Park Community Solar is an example of how community-owned solar projects can use PPAs to distribute cash payments rather than bill credits to owners.

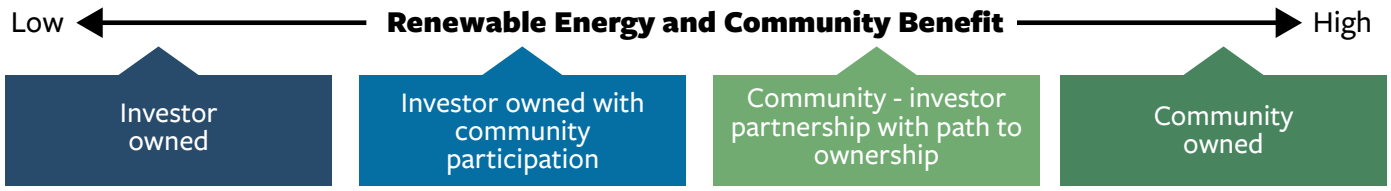
Shiloh Temple International Ministries Community Solar Garden, Minneapolis, Minnesota 2018. (Courtesy of Cooperative Energy Futures)

Benefits and their Distribution

The benefits of community-owned community solar range in scale from the individual (electricity bill savings) to the planetary (decarbonization benefits). They include relatively easy-to-quantify financial savings (again, electricity bills) to difficult-to-measure non-financial benefits such as community empowerment. Many low-income, environmental justice, and frontline communities have not benefited from renewable energy in the way wealthier communities have. Community-owned community solar opens the door for these communities to benefit and to make community solar more equitable. Different communities will interpret this in different ways. Some may care more about direct financial benefits while others may prioritize social and environmental benefits.

A key area of concern for community-owned community solar projects is *how to distribute benefits*? This section first provides an overview of different types of benefits before looking at the question of distribution.

Figure 7: Community Benefits of Renewable Energy



	Community originated	Community developed	Community managed	Community owned	Community Benefits
Investor owned	no	no	no	no	very little
Community participation	maybe	no	no	no	some
Community partnership	yes	yes	yes	within 10 years	significant
Community owned	yes	yes	yes	yes	all

Types of Benefits

- **Direct financial benefits** from community-owned community solar are the most obvious and easy to measure. They can include savings on electric bills, cash, and equity.

- **Indirect financial benefits** are benefits that can be assigned a monetary value but that do not flow directly to community member-owners. However, they do still benefit the community and may overlap with direct financial benefits and non-financial benefits. Examples of indirect financial benefits include energy efficiency funding, workforce development, job creation, and income to grassroots organizations for conducting outreach (e.g. finding more subscribers).

- **Non-financial benefits** are the most difficult to measure or quantify and for some organizations the most important part of community-owned community solar. Social benefits of community ownership include less resistance to renewable energy projects, community empowerment and education, increased energy and environmental consciousness, and environmental benefits such as cleaner air and reduced carbon emissions.

Benefits Without Ownership

Although the focus of this report is community-owned community solar, as Figure 7 points out, community partnership projects also have significant benefits for communities. In some cases, community impact and benefits may be both greater and more quickly reached through partnership than direct ownership.

Noah Ginsburg, Director of Here Comes Solar at Solar One, lists best practices for community partnership community solar as:

- Community organization involvement from the beginning of the project, possibly including verifiable metrics such as letters of support from elected officials, community organizations, and community members.
- Community organizations informing the vision and approach of the project.
- Workforce training/hiring requirements and priority hiring for local minority- and women-owned businesses.
- Conversations with community organizations around who is being served and what is the target benefit (bill savings, workforce development, or others).
- Setting aside a portion of all revenue for a community fund (for example, 5%).

States are also working to make community solar projects more accountable to communities even when ownership is not possible. For example, in Illinois the Illinois Power Agency is in the process of developing carveouts for community-driven community solar. These carveouts provide incentives for projects that meet criteria related to community engagement, but do not mandate community ownership. Programs like this are still in their infancy and it is too early to measure success or pinpoint best practices.

Distributing Benefits

- **Distribution** of benefits is one of the most important parts of community-owned community solar and one of the most difficult.
- When policy and regulatory frameworks (and/or utility policies) permit it, **bill crediting** is often the most direct and straightforward way to distribute benefits. Participants will receive a "credit" on their electricity bill for the electricity generated from their portion of the solar array and sold to their utility.
- Community-owned community solar projects may also distribute benefits through selling their electricity to off takers and making a profit. This profit can then be distributed as cash payments (if securities regulations permit) or invested in other projects (education, workforce development, marketing, and more).
- For **social and environmental benefits**, such as cleaner air or community empowerment, it is difficult to track how exactly they are distributed, but the final effects can be observed and sometimes measured. For example, a successful community-owned community solar project may spur a community to create other non-energy related cooperative projects or lead to less young people leaving a rural community.

Case Study 3: **Cooperative Energy Futures**

- Minnesota's Cooperative Energy Futures includes 6.9 MW of low-income accessible community-owned community solar and approximately 900 members.
- Cooperative Energy Futures uses a for-profit cooperative model (308B under Minnesota law), which makes it possible to distribute profits to members, reduces tax burdens, and provides an exemption from securities regulations. However, the cooperative model also presents a challenge as most small business financing is not intended for cooperatives.
- Direct financial benefits from Cooperative Energy Futures include bill savings and profits. Indirect financial benefits include home insulation and upgrades, pay for grassroots organizations to find more subscribers, and the use of 50% minority labor for all projects.
- Minnesota's uncapped and open-access community solar program is an enabling policy that has supported Cooperative Energy Futures. Challenges include interconnection queues and lack of sites.[11]

Case Study 4: **People Power Solar Cooperative**

- Oakland, California's People Power Solar Cooperative operates three community-owned community solar projects. They use a unique model where community solar arrays are located on individual residential homes, who serve as the primary off takers.
- People Power Solar Cooperative's goals include decentralizing, democratizing, and diversifying the energy system; all part of the larger goal of energy democracy.
- In an interview with Co-Founder and CEO Crystal Huang, she emphasized the importance of non-financial benefits such as utility bill literacy as well as knowledge of how to develop projects and of the energy system. For the cooperative, community power is more important than bill savings or decarbonization.
- People Power Solar Cooperative's work was made possible by their advocacy with the Sustainable Economies Law Center for the 2015 California Worker Cooperative Act, which made it possible to form the cooperative.

11 For more information, see the Institute for Local Self-Reliance's article "Why Minnesota's Community Solar Program is the Best."

Barriers

With the numerous benefits that come from community-owned community solar, it would make sense for there to be a proliferation of community-owned community solar projects across the US. Why isn't there? Community-owned community solar faces many barriers to deployment including regulatory, policy, and financial barriers as well as external structural factors.

Barriers are important to consider because by studying them it is possible to make changes to enable development. These changes take place in a variety of arenas from state and local policy-making, to federal tax codes, to international supply chains. Although not an exhaustive list, below are common barriers to community-owned community solar deployment.

Case Study 5: **Equitable Community-Owned Community Solar in Cleveland**[12]

- In Hough, The BC Block Club is a group of diverse, like-minded homeowners in Cleveland's urban Hough neighborhood. They have partnered with cooperative developer Cleveland Owns to build an 11-acre, ~4-megawatt ground mount community solar project that foregrounds equity.
- The BC is innovating on the traditional partnership-flip model to include residents as upfront investors.
- As Jonathan Welle of Cleveland Owns described in an interview, solar is a smart investment to build wealth. Tax policies like the investment tax credit make it easier for wealthy communities to invest in solar, while low-income communities like Hough must find creative ways to make investments to create intergenerational wealth in the existing biased policy environment.
- The BC intends to reinvest their returns in community building activities such as home weatherization, housing repairs, rooftop solar, education, and job creation.
- This project is hindered by the lack of a virtual net metering policy, which is crucial to the future of community solar in Ohio. The BC and Cleveland Owns are working to change that policy by building collaborative partnerships.

The People Power community celebrates the installation of the 1st cooperatively-owned solar project in California. (Courtesy of People Power Solar Cooperative)

Regulatory and Policy Barriers

State policies that enable **community solar** and **utility bill crediting** to multiple off-takers (e.g., virtual net metering) are not present in all states. Both are challenging to enact because they require leadership from state legislatures and public utility commissioners. Furthermore, once enacted, policies vary widely in regards to the value of electricity generated, fees and tariffs, and other details, such as carveouts or incentives for community-owned projects or lack thereof.

Where state-level enabling policy does not exist, community solar programs may still be present if there is voluntary utility collaboration, in particular with respect to bill crediting. While hypothetically possible, these instances are relatively rare.

The states with the most community solar are Florida, Minnesota, New York, and Massachusetts, although data does not yet exist for *community-owned* community solar rates in those states. As of December 2021, they represent 74% of the community solar market. Enabling community solar policy is usually necessary for community-owned community solar, but not sufficient on its own to create community-owned community solar.[13] Where state-level enabling policy does exist, community-owned community solar still often faces barriers due to **program and policy design issues**. Most state policy is focused on community solar as a whole rather than community-owned community solar. In many cases, equity is not a priority, leading to issues such as:

- Programs may be confusing and hard to navigate for communities without experienced partners.
- Programs may have a capacity cap that is quickly filled by wealthier, better-resourced participants before community-run projects can get in the door.
- Programs may favor large, usually commercial, participants through their lack of carve-outs or incentives for smaller participants or community-owned projects and/or lack of community, public, and/or non-profit input into program design. This further exacerbates structural inequities between large power sector incumbents and community organizations such as expertise and experience, capacity, and access to capital.

Community-Owned Community Solar and Securities Regulations

- Community-owned community solar may trigger state and federal securities regulations when participants get a profit from their share of the solar array. Generally, this is not an issue when utility bill crediting is used to distribute benefits, but it can quickly become an issue when financial benefits are distributed through other means, in particular cash payments.
- In general, cooperatives are less likely to trigger securities regulations than LLCs because distribution of profits from a cooperative are effectively refunds to the co-op's users.
- Regardless of ownership structure and other project details, however, all community-owned community solar project should be aware of securities laws and regulations, and how they may or may not impact the project.[14]

Financial Barriers

A lack of capital and access to capital are often the biggest barriers for community-owned community solar, particularly for low- to moderate-income communities. "Lack of capital" means that individuals and community institutions are not wealthy enough on their own to build a community array, whose costs include not just the physical panels and infrastructure, but also numerous associated costs, including permitting, legal, technical aid, and other costs. A lack of access to capital means that individuals and community institutions do not have access to grants, funders, loans, or other types of financing, often due to lack of credit, lack of knowledge about these options, and/or lack of relationships necessary to take advantage of them.

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12 For more on this project, see the Block Club, Cleveland Owns, and this article.

13 For rankings and further study of state-level community solar, see work by the National Renewable Energy Laboratory, the Institute for Local Self-Reliance, and the Coalition for Community Solar Access.

14 For more information on securities regulations and solar, see: in ILSR report, Lewis & Clark Law School Blog, link

Figure 8: Solar Financing for Local Ownership (Courtesy of Lynn Benander)

		Comes in when . . .	Repays . . .	Pays for . . .
1	**Pre-Development Loan**	Site is secured	Costs for securing the site	• Community Education, Planning, and Signup • Engineering Solar Design, Permits and Utility Interconnection and Incentives
2	**Construction Loan**	Project is ready to build	Development Loan	• Construction
3	**Sponsor Equity**	Community Members invest	Construction Loan	• Any project costs Note: Can also be borrowed by the community partner
4	**Term Debt and Tax Equity**	Project has been built	Construction Loan	• All project costs • Reserves • Start-up Operations
5	**Buyout Sponsor Equity**	Financing Period is over		• Final Tax Equity buyout

Paths to Ownership

Finding a path to ownership is fundamental for many community groups interested in community solar, and in many cases because of a desire for a more equitable energy system. Participating in a project through, for example, a subscription model, where the community never actually owns the project, does not always sufficiently reflect the community's values and desires nor does it allow for the benefits of ownership. Community solar projects typically involve high upfront costs, including the cost of the panels and associated infrastructure, as well as the land acquisition costs, labor costs, and more. Many community groups do not have the resources to pay these costs all at once. Therefore, they must come up with an alternative path to ownership.

Tax incentives, including in particular the federal Investment Tax Credit (ITC), have been put in place to offset the costs of project development and incentivize solar and other renewable energy. While some community groups may be able to use tax incentives to offset project costs, most community groups are unable to monetize tax incentives and take advantage of this path themselves. In some cases, community groups may partner with a third-party entity that can take advantage of tax incentives and thereby drive down the price of the project. However, such third-party ownership by an investor may not lead to a path to ownership for the community.

Some community-owned community solar projects overcome this barrier through a partnership flip model. Under this model, an investor initially owns the majority of a project and receives the tax benefits. After a given period of time, ownership "flips" to the community and they have the opportunity to buy out the investor.

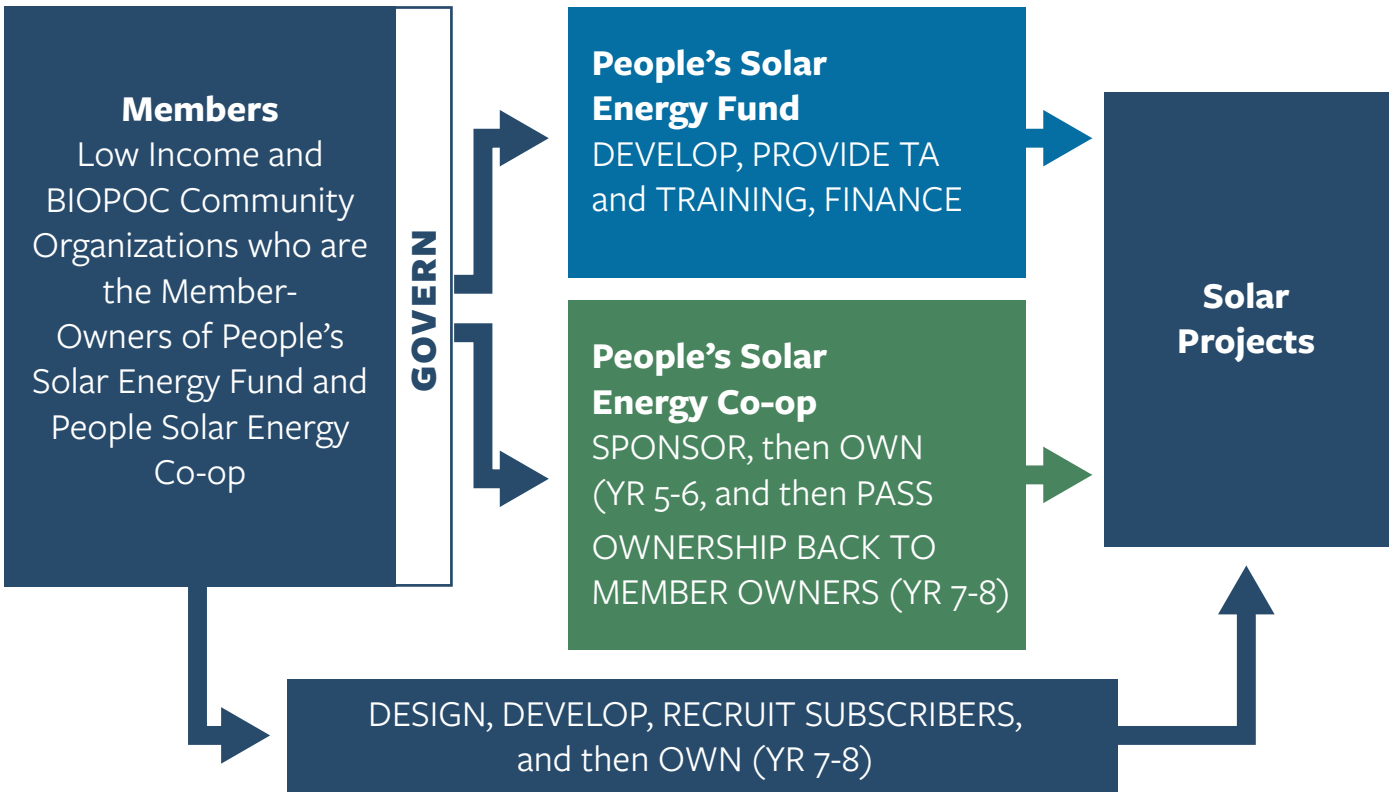
Instead of or in addition to tax incentives and the partnership flip model, some community-owned community solar projects explore other ways to raise the capital necessary to own a community solar project, including through some combination of loans, grants, and other fundraising within and outside their community.[15]

15 For more information on partnership flip models, see explanations from Woodlawn Associates and Norton Rose Fulbright.

Case Study 6: **The People's Solar Energy Fund**

- The People's Solar Energy Fund (PSEF) defines itself as "a tax exempt 501C3 loan fund that is structured as a cooperative of BIPOC and low income community organizations working together to build community-led, community-owned solar in their communities."
- PSEF was founded in 2018 to address the challenges of funding community-owned community solar as well as provide community organizing and development assistance nationwide.
- Their goal is to secure tax equity partnership flip financing for a $75M a year pipeline of solar projects with the People's Solar Energy Co-op as the Sponsor and LLC Manager.
- The figure below illustrates People's Solar Energy's model. The fund portion of the organization provides technical assistance, training, and financial knowledge while the co-op supports projects through tax equity partnership flip financing that passes ownership back to the owner members in 7-8 years.

Figure 9: The People's Solar Energy Fund Model (Courtesy of People's Solar Energy Fund)



External Factors

The early 2020s have presented numerous external factors that have inhibited community-owned community solar growth. For example, the COVID-19 pandemic—which has hit frontline communities the hardest—has made the community engagement necessary for community-owned community solar more difficult, at least for some communities. Associated supply chain disruptions and increasing material costs make community-owned community solar more expensive and difficult to finance. Finally, the March 2021 Commerce Department solar panel investigation in Southeast Asia led to a decrease in solar panel availability, further increasing costs and wait times for community-owned community solar projects. Eventually the Biden administration waived tariffs for two years for these countries. While these are some of the current external factors affecting community-owned community solar, others may arise in the future, sometimes in unpredictable ways.

Community Solar & Tax Structure

One of the largest drivers of solar development in the United States is the solar Investment Tax Credit (ITC), which provides a substantial tax credit for eligible solar projects. Historically, one challenge with the ITC is that it is non-refundable. What this means is that the individual or company must have a tax burden greater than the value of the ITC to take advantage of it. The newly passed Inflation Reduction Act changes some of the rules regarding the ITC and offers additional incentives for community solar development.[16] For example, credits can cover up to 50% of the costs for projects in disadvantaged communities.

Even with the passage of the Inflation Reduction Act, however, many community organizations may still not be able to take advantage of tax incentives which hobbles their ability to directly own or finance a community solar project. Projects must then use a third-party financer who is able to monetize the ITC (often in the form of partnership flip models). The benefit for the project is a sizeable equity investment, while the benefit for the investor is the ability to lower their tax burden. Third-party tax equity partners may provide the financing necessary for projects, but communities should be wary about possible diminished control and unfavorable financing terms.

16 For more information on the Inflation Reduction Act, see explanations from the Institute for Local Self-Reliance and Bloomberg Law.

What comes next?

Starting a community-owned community solar project is difficult. Communities must define themselves, take stock of their resources and capabilities, define success, and understand the regulatory and policy context they operate in before even beginning a project. Then comes choosing an ownership structure, financing the project, distributing benefits, and equity considerations. This final section lays out key questions for each of these areas that communities should ask when considering a community-owned community solar project.

Who is Your Community?

Before starting a community-owned community solar project, the first step is to determine who will own and benefit from the project. Your community could be your neighborhood, a local organization, or a group of individuals united by a common goal or identity.

- Who is your community? Is there already an organization that encapsulates it or is it necessary to form one? How is membership determined and who is eligible? What core constituency do you plan to serve?

- What are your community's strengths? What are its weaknesses?

What Does Success Mean for Your Community?

Community-owned community solar has many possible benefits which means there isn't a single metric for success. Success could mean many things, such as: 1) reduced electricity bills, 2) a healthier environment, 3) community engagement and empowerment, 4) investment opportunities and building equity, 5) workforce development, and more!

While community-owned community solar can have multiple benefits, defining what success looks like for your communities and which types of success are most important. You can design a community-owned community solar project that meets the needs and desires of your particular community. This is important since usually projects—especially financially-constrained projects—will have to make trade-offs. Therefore, clearly defining goals and metrics will help narrow the focus and assist in making difficult decisions.

- What does success mean for your community?

- What benefits are most important and why?

Who Are Your (Potential) Partners and Mentors?[17]

Community-owned community solar projects will often require meaningful and authentic partnerships and mentors. However, there is the potential for paternalistic, exploitative relationships that community organizations should be wary of.

- What resources does your community have (legal representation, land ownership, grant writers, access to capital)? What resources does your community have access to (grants and funding, technical assistance, capacity-building)?

- Who are potential partners and mentors that will put the community's needs and desires before their own motivations?

- How will your community differentiate between meaningful partnerships and inauthentic solutions?

17 For more on partnerships, low-income communities, and community solar in general, see this article from the World Resources Institute.

What Is the Policy and Regulatory Context In Your Locale?

The shape and structure of your community-owned community solar project will be heavily influenced by the policy and regulatory context of where you are located.

- Does your state have bill crediting? If not, do utilities offer it voluntarily? If so, does the program have capacity for further projects? What other elements of your state's or utility's community solar program could support or hinder your project?

- If there is not a policy regime to support community solar, or the current policy is insufficient somehow, can you design your project such that it can proceed despite these challenges? Does your community wish to work at the policy level to promote more enabling policies?

- How will you design your project to avoid securities issues and/or comply with any applicable securities laws?

- Which ownership structure makes the most sense for your project/organization? What are the legal and technical barriers to creating an LLC, a cooperative, or a combination of the two? Neither cooperatives nor LLCs clearly dominate as better than the other. LLCs are often simpler and more straightforward to form, especially for single projects. Cooperative laws vary between states, but one benefit is that they can make the distribution of benefits easier. Organizations may also use a combination of LLC(s) and cooperatives. All of these options have the potential for democratic governance, so you should seek what works best for your community.

- What is the tax structure associated with each?

- How will the ownership structure inhibit or support equity considerations?

- How will the ownership structure inhibit or support the distribution of benefits?

How Will Benefits be Distributed?

If bill crediting exists and electricity bill savings are the primary goal of a community-owned community solar project, distributing benefits will be relatively straightforward. Without bill crediting and/or if other benefits are the primary goal, distributing benefits may be a more complicated process. Groups interested in community-owned community solar should develop a clear understanding of what types of benefits they wish to prioritize and how best to distribute them.

- What are the benefits created by your project?

- Will benefits be distributed equally amongst participants or will there be mechanisms to distribute benefits proportionally based on different types of participants to promote equity?

- What mechanisms exist to distribute benefits? What are the barriers to distributing them?

- How will the community decide how to distribute indirect financial benefits (workforce development, home improvements, or others)?

How Will the Project Be Financed?

Community-owned community solar projects will most likely require outside investment to facilitate construction of the project. This can take the form of fundraising, grants, and/or third-party financing. External financing offers both an opportunity and a threat, in that it makes projects possible that otherwise would not be but it can reduce community control of a project.

- Does your community have access to capital? Which types?

- Do you have legal representation and/or the capacity to understand complicated financial documents? If not, what resources or other groups could assist with this?

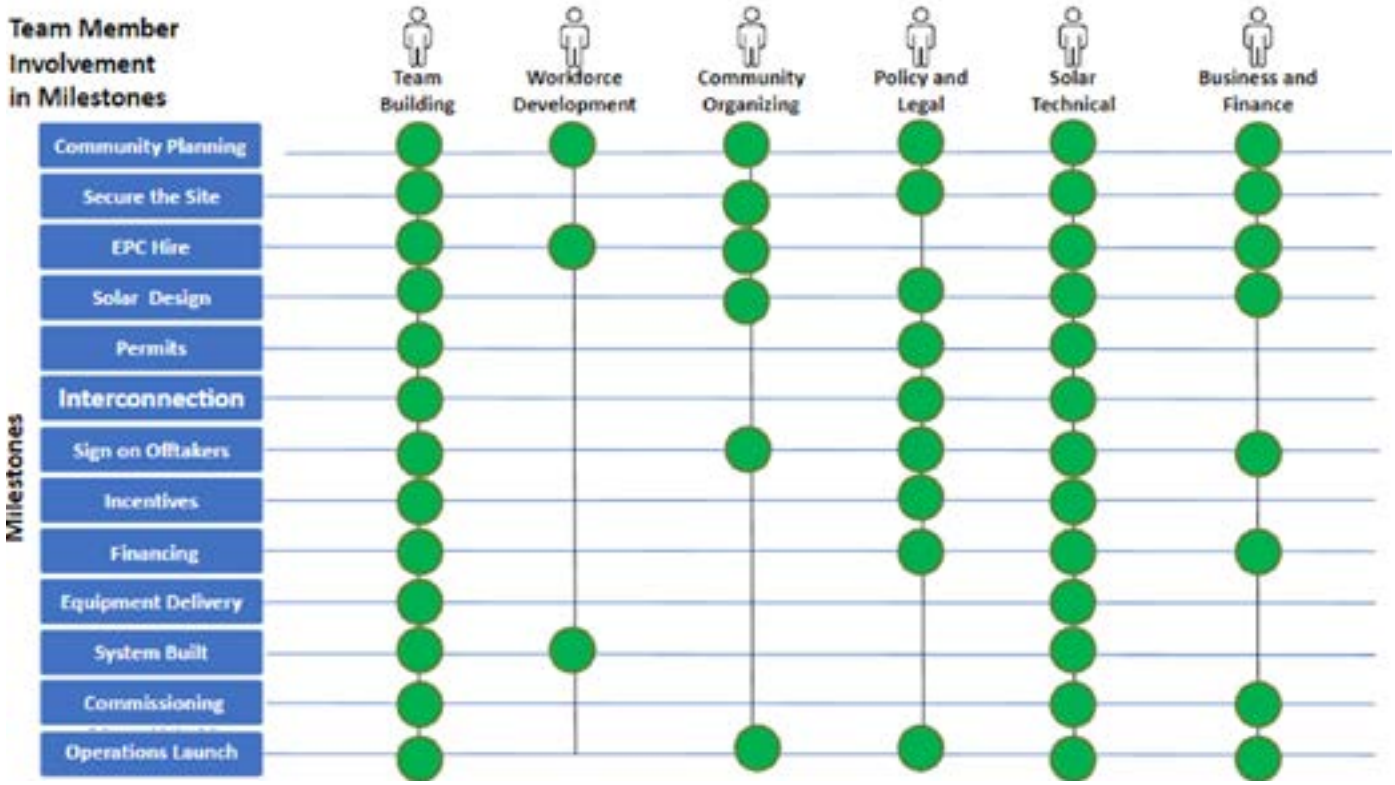
- Will your project be able to take advantage of tax incentives either directly or through a model such as a partnership flip? Are there other tax considerations for you? How does the ownership structure you have chosen enable or constrain those opportunities?

In Which Ways Will the Project Advance Equity?

Many community groups are interested in community-owned community solar in order to advance equity, but just because a community solar project is community-owned does not ensure equity.

- Is equity a goal for your project? What does your community understand equity to mean?
- Will your project focus on membership by certain groups? Who is able to buy in to the project? Are there mechanisms to support low-income potential participants?
- Will benefits target low-income and/or BIPOC members?
- Will workforce development programs target certain groups?

Figure 10: Community-Owned Community Solar Milestones (Courtesy of Lynn Benander)



Appendix A: Resources

Community-Owned Community Solar Documents

Cooperative Energy Futures Materials Organizational approach two-pager – https://static1.squarespace.com/static/5ced3079d9360a0000120337d/t/5d8fbcf5bd027f6ecf6b2b69/1569701109445/CEF+CSG+approach.pdf

People Power Solar Cooperative Materials

People Power Bylaws - https://drive.google.com/file/d/11qXiDId2_5RCT3ARovqhSTJnIH55q3um/view

Owner agreement - https://d3n8a8pro7vhmx.cloudfront.net/peoplepowersolar/pages/22/attachments/original/1545838445/People_Power_Owner_Agreement.pdf?1545838445

Articles of incorporation - https://d3n8a8pro7vhmx.cloudfront.net/peoplepowersolar/pages/22/attachments/original/1545838478/People_Power_Solar_Cooperative_Articles.pdf?1545838478

Privacy Policy - https://d3n8a8pro7vhmx.cloudfront.net/peoplepowersolar/pages/22/attachments/original/1552488444/3_12_19_People_Power_Privacy_Policy_PUBLISHED.pdf?1552488444

Sunset Park Solar (Co-Op Power Project) Materials

One pager - https://static1.squarespace.com/static/581b72c32e69cfaa445932df/t/5f22dfe7cef79f13f92a2fad/1596121065366/Sunset+Park+Solar+Factsheet.pdf

FAQs (English and Spanish) - https://static1.squarespace.com/static/581b72c32e69cfaa445932df/t/5f1f4d38aae24951927dc88c/1595886904712/FAQ%2BSheet%2BSPS%2BSpanish%2Band%2BEnglish.pdf

How to sign up (English, Spanish, Chinese) - https://static1.squarespace.com/static/581b72c32e69cfaa445932df/t/5f17686edcdc9365fd9a3280/1595369585909/How+To+Sign+Up+Factsheet_EN_SP_CH.pdf

Community letter - https://static1.squarespace.com/static/581b72c32e69cfaa445932df/t/5f17690114253704d83bc2c9/1595369729589/SPS+Community+Letter_EN_SP_CH.pdf

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