LOW-TO-MODERATE INCOME (LMI)

Community Solar Developer Workbook

National Community Solar Partnership
Community Power Accelerator

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This workbook was developed by Housing Sustainability Advisors and the Center for Impact Finance at the Carsey School of Public Policy, University of New Hampshire. This material is based upon work supported by the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy (EERE) under Solar Energy Technologies Office (SETO) Agreement Number 36483 and Contract No. DE-AC02-05CH11231.

HOUSING SUSTAINABILITY ADVISORS

University of New Hampshire
Carsey School of Public Policy

Community Power Accelerator
U.S. DEPARTMENT OF ENERGY

BERKELEY LAB

Introduction

This Workbook provides tools and advice to guide developers of community solar projects that benefit low-to-moderate income (LMI) households. While solar project development and finance is complex, all projects share a common set of steps and strategies that will be covered throughout this Workbook.

The Workbook is part of the **Community Power Accelerator™** (the Accelerator), which connects developers, investors, philanthropists, and community-based organizations to finance and deploy equitable solar projects across the country. U.S. Department of Energy's (DOE) **National Community Solar Partnership** (NCSP), the Accelerator provides training, technical assistance, and bridges the gap between solar projects that need funding, and lenders who want to finance them, expanding access to affordable solar energy.

Climate experts agree that in order to confront climate change we will need to scale many kinds of renewable energy projects to replace current fossil-fuel power generation. These projects will include utility-scale solar power plants, distributed solar installations, and community solar systems.

National Community Solar Partnership

Represents an increase from **3 GW to 20 GW** of community solar capacity

$1 billion in savings reflects an average **bill reduction of 20%**

Besides the benefit of renewable energy generation, mission-driven community solar projects can provide additional benefits for subscribers. The National Community Solar Partnership (NCSP) has defined a set of "meaningful benefits" that equitable community solar projects should strive to provide (see below). NCSP aims for developers to include at least two of the five meaningful benefits in their community solar project development and deployment.

For more information on the benefits of equitable community solar projects, please see How Community Solar Benefits Communities. This workbook is specifically for individuals who are focused on building community solar that provides co-benefits to low-to-moderate income and disadvantaged communities. Refer to the DOE landing page regarding education and outreach around community solar.

NCSP is a coalition of community solar stakeholders working to expand access to affordable community solar to every U.S. household and enable communities to realize other benefits, such as household energy bill savings, increased community and grid resilience and equitable workforce development. NCSP is led by the Department of Energy's Solar Energy Technologies Office, in collaboration with the National Renewable Energy Laboratory and Lawrence Berkeley National Laboratory. Partners leverage peer networks and technical assistance resources to overcome barriers to expanding community solar access and benefits. NCSP is open to any individual or organization located in the United States with an interest in supporting equitable community solar development in the U.S. Partners span government, utility, non-profit, and for-profit sectors.

For more information on the National Community Solar Partnership and to stay up to date on the latest opportunities, please visit **www.energy.gov/community-solar**

GREATER HOUSEHOLD SAVINGS

Provide a reduction in electricity bills for residential subscribers to a project

LMI HOUSEHOLD ACCESS

Include subscribers from low- to moderate-income (LMI) households

RESILIENCE AND GRID BENEFITS

Include the capability to deliver power to households and/or critical facilities during a grid outage or strengthen grid operations

COMMUNITY OWNERSHIP

Local community members, subscribers, or local community organizations own or have equity in the project

Other wealth-building strategies

WORKFORCE DEVELOPMENT AND ENTREPRENEURSHIP

Support prevailing wages and pre-apprenticeship programming

Ensure women and minority-owned businesses have equitable opportunity

This Workbook was created by the University of New Hampshire (UNH) and Housing Sustainability Advisors (HSA). Housing Sustainability Advisors is a consulting group that works at the intersection of solar and affordable housing development. HSA partners with the solar industry and housing developers to finance and build new projects that provide substantial benefits to LMI communities, find new sources of financing to fill gaps, meet requirements, and realize real returns on investments. HSA also supports local, state, and federal government agencies in designing programs to drive energy upgrades into the complex financial structures of affordable housing.

The Carsey School of Public Policy at the University of New Hampshire is nationally recognized for its research, policy education, and civic engagement. The school takes on pressing public issues with unbiased, accessible, and rigorous research, builds the policy and political problem-solving skills of its students, and brings people together for thoughtful dialogue and practical problem-solving. The Carsey School Center for Impact Finance addresses the role access to capital plays in addressing income inequality and building a more sustainable future for communities.

This Workbook can be used as a stand-alone tool and also as a companion for the virtual course called the Community Power Accelerator Learning Lab. The Workbook and Course content were developed in collaboration with several national leaders in the community solar field. We would like to extend a sincere thank you to these organizations for sharing their knowledge with us and we encourage you to visit their websites, contact their teams, and support their work.

CONTRIBUTING PARTNERS

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SOLAR UNITED NEIGHBORS

Is this Workbook for you?

The primary audience for this Workbook includes individuals, non-profit organizations, cooperatives, and mission-driven for-profit companies with the capacity to invest substantial time in learning how to develop community solar projects that include the meaningful benefits listed earlier. Here are some examples of stakeholders who will find the information in this Workbook most helpful:

- ☑ Staff from non- and for-profit organizations with some project or real estate development experience, interested in expanding into developing LMI community solar;
- ☑ Individuals with some solar development or basic project finance knowledge that want to expand into LMI community solar development;
- ☑ Current solar developers seeking to expand into LMI community solar development;
- ☑ Staff from non-profit organizations that provide services to low-income households, with interest in expanding into LMI community solar development; and
- ☑ Organizations that own land and/or property, and are open to partnering with community solar developers, including the following types of organizations:
  - Affordable housing developers
  - Commercial land and real estate owners
  - Non-profit organizations that own real estate, such as religious organizations, educational institutions, and farming cooperatives
  - Government entities that own real estate
  - Community organizations starting an energy cooperative to develop solar

Introduction to Community Solar

This Workbook is intended to go beyond the basics of community solar and is targeted to those who already have a basic knowledge of what community solar is and how it works. If you need basic context to frame the more in-depth information that follows throughout the workbook, see the resources and videos on this page.

To learn about the different ways to go solar, watch this video.

WHAT IS 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 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 individuals or groups to buy or lease a share of a project and earn credits toward their electric bill based on the amount of electricity their share generates.

Community Solar provides a great option for those who face barriers installing solar panels on their own roofs, such as renters who do not own their homes, owners with insufficient roof conditions for solar panels, or owners who cannot afford the high upfront investment in solar. Community solar installations offer the potential for an equitable transition to renewable energy by broadening the reach of solar participation.

To learn more, watch this video on Community Solar basics.

How does Community Solar work?

Community solar business models vary based on state policy and available incentives. In states with enabling legislation for community solar, individuals, businesses, or organizations may buy or subscribe to a "share" in a community solar project. When you subscribe to a community solar project, you receive a credit on your electric bill each month. The size of your share and the energy generated by the solar array determine how much credit you receive. Solar United Neighbors (SUN), a non-profit community solar advocacy organization, provides an excellent webinar series about the basics of community solar, which can be found below:

Episode 1, Community Solar Basics: Consumer Information

Episode 2, Community Solar Policy and Programs

Episode 3, Project Development: Grow Your Own

WHY NOW?

The Inflation Reduction Act of 2022 (IRA) may be the most important pro-solar law Congress has ever passed. For prospective solar developers, the most important piece is the extension of the 30% federal Investment Tax Credit (ITC) for community solar projects. Starting in 2023, small community solar projects (under 1 MW) may qualify for a base ITC of 30% through 2033. These projects can also earn additional credits, such as:

+ 10% for meeting domestic content specifications,

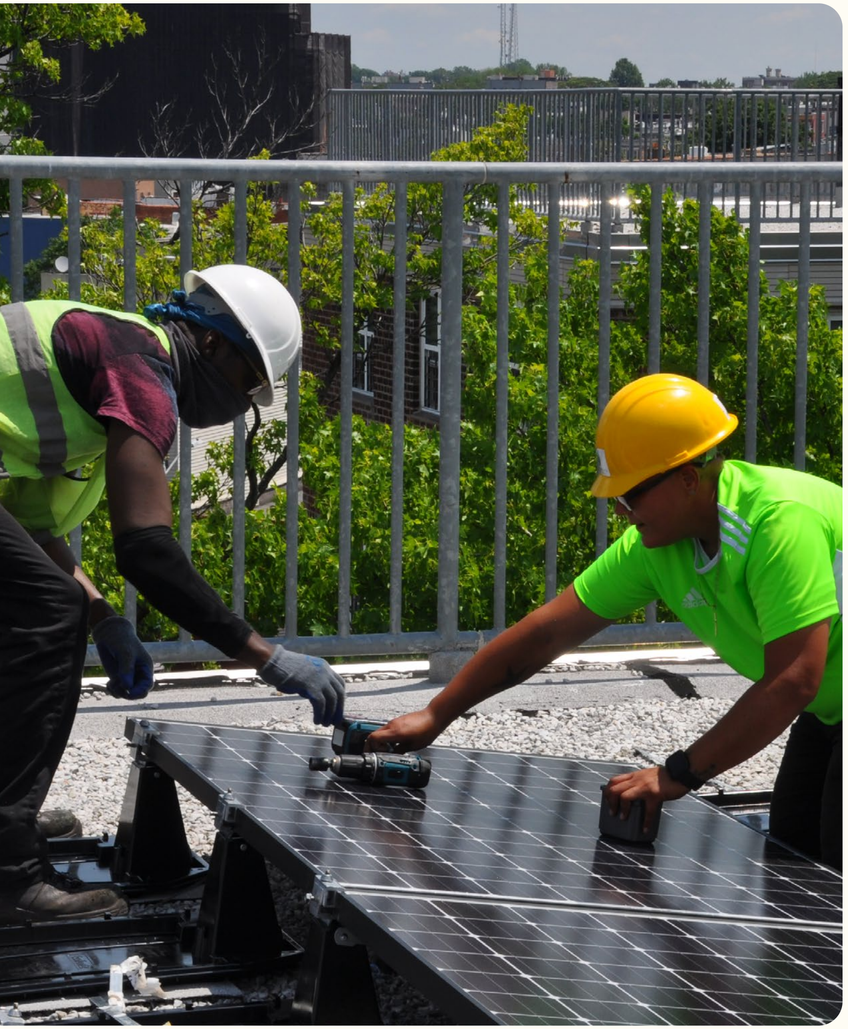
+ 10% if at a brownfield site or in a community directly impacted by fossil fuels,

+ 10% if in a low-income community or on tribal land (by application) OR

+ 20% if part of a Low-Income Residential Building Project or Qualified Low-Income Economic Benefit Project (by application)

The Solar ITC credit, along with the 20% bonus for qualified low-income economic benefit projects, is a game-changer that will be especially helpful for developing small-scale, equity-focused community solar. Larger community solar projects can also qualify for the tax credits above; however, these credits will only apply at the same levels if larger projects also meet certain labor and workforce development requirements.

Beyond the extension of the ITC and additional bonus credits, the IRA contains many further provisions and funding mechanisms that will help communities go solar and convert to clean energy technologies. For a broad overview of the IRA, the Department of Energy provides further details here. For those interested in specific details on IRA incentives for affordable housing, Novogradac provides a high-quality overview here.



Eyes on Equity

This Workbook is focused on equitable community solar. Equitable community solar is defined as projects that provide access to solar energy for people from all walks of life, including low-income and underserved communities, and that seek to create meaningful benefits for participants such as creating and supporting quality jobs, saving money, supporting community ownership and wealth-building, and providing energy resilience through distributed generation.

This Workbook helps community solar developers integrate equity considerations throughout the development process, including the NCSP's meaningful benefits. If approached intentionally, community solar can serve as a very effective tool for achieving equity goals. Groundswell recently created an overview of the components of equity within the context of community solar development, which can be found here.

"Eyes on Equity" sections are included in each chapter of this Workbook. In each, you will find tools, resources, and information that you can use to create a community solar project that prioritizes equity.

Understanding and incorporating the following themes and definitions is essential to prioritizing equity:

LOW-TO-MODERATE INCOME (LMI)

A low-income household is one in which the resident's total annual household income is 50% or less of the area median income (AMI) of where they live. A moderate-income household is one whose total annual household income is above 50% and less than 80% of their AMI. Therefore, households under 80% AMI can be identified as LMI. Neighborhoods and geographic areas can also be defined as LMI according to the percentage of people living there who meet the low- or moderate-income definitions. Due to the definition, a household considered LMI in one location, may not be considered so in another with a lower median income.

ENERGY JUSTICE

The Initiative for Energy Justice defines Energy Justice as "the goal of achieving equity in both the social and economic participation in the energy system, while also remediating social, economic, and health burdens on those historically harmed by the energy system ("frontline communities"). Energy justice explicitly centers the concerns of marginalized communities and aims to make energy more accessible, affordable, clean, and democratically managed for all communities." To learn more about Energy Justice, visit the Initiative for Energy Justice.

ENVIRONMENTAL JUSTICE (EJ)

The EPA defines environmental justice as "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies." The Department of Energy (DOE) and the Environmental Protection Agency (EPA) both currently have EJ-focused programs guided by the Justice40 Initiative. The DOE conducts regular stakeholder engagement with communities and integrates EJ considerations into its programs, and the EPA facilitates collaborative partnerships and awards EJ-focused grants.

ENERGY BURDEN

A household's energy burden is the proportion of annual household income spent on home energy costs annually, which can include electricity, heating fuel, and at times, transportation costs. Historically, low-income, Black, Latinx, and Native American households, as well as multifamily and renter households, have higher energy burdens than other households. The Department of Energy's Low-Income Energy Affordability Data (LEAD) Tool and the Climate and Economic Justice (CEJST) Tool allows users to explore which areas have the highest energy burden. Targeting clean energy investments to communities with higher energy burdens can help remediate inequities in our energy system.

For further information on the benefits of community solar, watch this video: **How Does Community Solar Benefit Communities.**

A Best Practices Guide on developing solar with meaningful benefits, **visit online here.**

Workbook Structure

Subsection	Content
Community Solar Self-Assessment	Self-Assessment Tool (pg. 13)
Project Readiness Test	Community Solar Project Readiness Framework (pg. 15)
Chapter 1	Community Solar Regulatory & Market Context (pg. 18)
Chapter 2	Community Solar Project Site Selection (pg. 32)
Chapter 3	Community Solar & Community Engagement (pg. 40)
Chapter 4	Community Solar Development Process & Contracts (p. 45)
Chapter 5	Community Solar Financial Modeling & Project Structuring (pg. 54)
Chapter 6	Community Solar Asset Management & Operations (pg. 65)
Chapter 7	Community Solar Business Structuring (pg. 73)

Each chapter is structured in the following manner:

PROJECT READINESS QUESTIONS

The intention of the project readiness questions used to introduce each chapter is to provide questions the reader should consider throughout the chapter's material and should be able to answer after completing the chapter. The questions in the Project Readiness sections coordinate with and expand upon the Credit Ready Checklist, which is a comprehensive tool that enables an organization to determine whether it has prepared all the necessary information to present its community solar project proposal to potential investors and lenders.

BACKGROUND

This section offers background for the information to follow, sets the context for the material, and provides the details necessary to complete the Action Items.

ACTION ITEMS

The Action Items are recommended steps a developer can take to work through that particular stage of the development process.

EYES ON EQUITY

The Eyes on Equity present resources and best practices to ensure developers stay on track to reach LMI communities and achieve NCSP's meaningful benefits.

ADDITIONAL RESOURCES

The Additional Resources provide additional readings, best practices, and tools for readers to further expand their knowledge of community solar development.

Additionally, within each chapter, linked resources add to the richness of the content. The **green resources** are documents made as content for the Community Power Accelerator Learning Lab Course and the **blue resources** are external documents made separately from the course. **Purple highlighted words** are defined in the "Key Terms" section of the Appendix.

Community Solar Self-Assessment

ARE YOU AND YOUR ORGANIZATION READY TO DEVELOP COMMUNITY SOLAR?

Before you go any further into this Workbook, you should spend some time to reflect on whether you and your organization are ready to develop community solar. Solar project finance and development is complex, and learning how to do it will require a substantial investment of your time and resources. Organizations with pre-existing experience in project development, finance, real estate, and service to low-income communities have significant advantages to succeeding in low-income community solar development.

The first step in determining your readiness for community solar development is to assess your existing experience in related fields, you and/or your organization's financial assets, and your risk tolerance. Unlike, for example, the medical field, where you must earn highly-specialized credentials to practice professionally, no credentials are required to develop community solar. Anyone can start developing a community solar project, yet those who are most prepared have the highest likelihood of achieving success.

SELF-ASSESSMENT TOOL

As you consider the path to becoming a community solar developer, those with the skills and experience below will have an advantage. If you are not already a community solar developer, think about whether your organization has the kind of experience or assets in any of the following areas. Organizations that are strong in any one of these areas can play very important roles in the community solar development process.

Project Developers & Operators

Those that already have some experience in any other real estate or equipment financing have the easiest time learning the skills required to develop community solar.

Property Owners

Solar developers must compete for sites against all other potential land uses. Typically, when a property owner decides to develop any site, their most valuable and first option is some form of real estate, followed by a parking lot. Because solar is not as competitive a land use choice as real estate or parking, it can be challenging to find sites for solar installations. Community solar developers must be thoughtful about the different development priorities of real estate owners and where solar fits in. For this reason, those organizations with property that they are willing to use for solar have the most substantial advantage in community solar development. Even if the property owners are not knowledgeable about the solar industry, they can partner with experienced solar developers who are searching for partners who own property.

Asset Owners

The solar development process requires a substantial amount of capital. Even if an organization is able to borrow the majority of a solar installation cost, lenders will always require a sponsor to invest or provide collateral in the project. Lenders will also require cash or other assets to be provided to secure loans. Cash will also be required from a developer at the very early stages of a project, also called Pre-development funding. As such, those organizations with other assets and cash on-hand have a huge advantage to access additional lending and project finance opportunities.

Low-Income Service Providers

Those organizations that already serve low-income households have the most accessibility to potential low-income community solar subscribers. They understand the unique challenges and costs of providing services and products to this population and can help to build trust with households who may have been impacted negatively by the energy sector in the past. They can also support equitable community engagement to ensure that communities support the development of community solar locally and help to raise awareness and enroll prospective subscribers within LMI communities.

Large-Scale Electric Commercial Customers

Those commercial businesses or organizations that require electric power, especially with substantial high electric demand, have the opportunity to serve as an "anchor tenant" or "anchor subscribers" (key customers). This allows large organizations to subscribe to a significant portion of the energy produced by a project which can provide certainty and reduce risk for developers. These organizations can provide a reliable source of revenue and potentially serve as a host location for a community solar project.

The Community Solar Developer Evaluation tests your organization's readiness by exploring your skills and experience in the areas above. Your answers will determine if this course is right for you and, if it is, which approach you should take to the rest of this Workbook. Once you answer the questions, the tool will provide you a "Readiness Score" from 0 to 300, with 0 being the least advantaged starting place for being a community solar developer and 300 being the most advantaged.

In addition, you may consider using the Department of Housing and Urban Development Organizational Solar Readiness Tool to evaluate your organization's current understanding of opportunities for solar project development and determine where you need additional guidance.

Community Solar Project Readiness Framework

ENSURING YOUR COMMUNITY SOLAR PROJECT IS READY TO BE DEVELOPED

Getting your organization ready to answer this question is the most important goal of this Workbook. The Workbook seeks to help aspiring community solar developers to prepare all necessary information so that they are ready to present their community solar project proposals to investors and lenders. As a result, lessons in project readiness are integrated throughout this Workbook, with exercises aimed at teaching you to pitch your community solar project to a potential investor or lender.

Before a community solar project can be developed, financing for the project needs to be secured, which includes predevelopment, construction, and permanent financing sources. Funders are lenders, investors, philanthropic organizations or government entities that provide capital, debt or equity to a project. Because funders have such a high bar to earn funding, they often push developers the hardest to solve the tough questions about their projects and ensure projects are feasible.

As such, it is helpful to consider project readiness through the lens of capital providers. The analysis of projects by Funders falls into the following categories:

☑ *Local Regulations and Policies*

The first question all community solar developers must answer is whether the type of community solar project that you are proposing is legal and possible within your state and local jurisdiction. Funders will assess the regulatory environment and local policies regarding community solar projects such as community solar enabling legislation, net metering laws, building codes, zoning requirements, fire codes, permitting issues, tax incentives, and interconnection rules to determine project feasibility. They will look at the status of any required government and utility permits for the project, especially "interconnection permits," which give permissions from local utilities for solar projects to connect to transmission infrastructure.

☑ *Site Control*

Funders will analyze whether you have some type of "site control." In other words, they will want to know if you either own the land or building where the project will be developed, or if you have an agreement in place with the owner to develop the project.

☑ *Project Performance*

Key factors that drive project performance include location, equipment selection, and installation plan. Project developers will model the location-specific energy generation potential based on average annual solar radiation, shading patterns, installation orientation, and equipment selection. Funders will assess this modeled generation potential as it relates to anticipated project revenues.

☑ *Financial Feasibility*

Funders will perform analysis to ensure that a project has a reasonable return on investment, both for their investment and other invested parties. The financial feasibility of the project is critical for repayment of and return on their investment. They will closely analyze upfront costs and sources, operating costs and potential revenue, and evaluate overall project risks. Developers must demonstrate that all parties can make reasonable returns and that the project plan includes a cushion, or room within profit margins that accounts for the chance that an outcome or investment's actual gains will differ from an expected outcome or return.

☑ *Financial and Performance Risks*

Funders will carefully evaluate the risks of investing in the project, such as regulatory or environmental issues, and weigh these against the expected returns on the investment.

☑ *Development team*

Funders will assess the development team's expertise and experience. They will evaluate the team's ability to manage the project, including their track record of delivering similar projects on time and within budget.

☑ *Community Engagement*

Community solar projects may face opposition from the local community so investors will want to assess the level of community engagement and support for the project. They will examine factors such as the level of authentic community involvement in the project's planning, the benefits the project will deliver, and the local community's willingness to support and/or participate in the project.

The Credit-Ready Checklist, developed by the Community Power Accelerator team, with input from funders and philanthropy, is the key resource that developers may use to ensure their projects are ready to shop around to Funders. Lenders, philanthropic organizations, and developers will know that a project is ready for them to begin initial funding conversations if the checklist is completed for a community solar project. The checklist contains nearly 50 important pre-development considerations, such as information about system size, siting, ownership, capital structure, revenues, and costs. It was developed in collaboration with over 40 representatives from financial institutions familiar with solar lending, including commercial banks, community development financial institutions, green banks, and credit unions. Community solar developers can answer the questions on the checklist with the help of technical support and resources provided through the Community Power Accelerator.

This Workbook will prepare you to be able to answer all of the questions in the Credit-Ready Checklist to help your project get ready to seek funding.

		Credit-Ready Checklist
System	1	What is the size of the system?
	2	What is the installation type - roof, ground, or canopy?
	3	What type of building or land is the project on?
	4	Who owns the building or land?
	5	What utility territory is the project in?
	6	What stage is the project in? (Pre-development, development, construction, operations)
	7	When are construction milestones set to occur -- NTP, Mechanical Completion, COD, Substantial Completion, Placed in Service?
	8	What, if any, development work has been done to date -- design (early, 50%, full), equipment selection, permitting, zoning, interconnection, utility application?
	9	What is the waiting period for interconnection after the utility application is submitted?
	10	Are there any incentive/customer/regulatory cliff dates?
Roles and Capital Structure	1	Does counterparty have a pro forma they can share?
	2	What role does counterparty play? Broker/Marketer, Developer/EPC, Owner/Operator, Subscriber Manager? How will they be involved with the project going forward?
	3	In what roles does the co-developer need additional assistance? Lenders? Owner/Operator? Tax Equity? Subscriber Manager?
	4	What is the ownership model? Single sponsor? Co-op? Customer ownership?
	5	Who are the development team members that are involved in this project? (EPC, construction inspector, lawyer?) And what experience does each team member have?
	6	Is tax equity secured? If so, any preference for front/back-leverage lending?
	7	Has construction or term debt been secured?
	8	What, if any, capital is needed? When do they need (equity/debt/tax equity) capital to come in? What financing have you secured, if any?
	9	Are any project marketing materials being developed? What is the subscriber acquisition strategy?
	10	Who is the borrower and what are their financials?
	11	What collateral does this project structuring include?

CHAPTER 1
Community Solar Regulatory and Market Context

PROJECT READINESS QUESTIONS

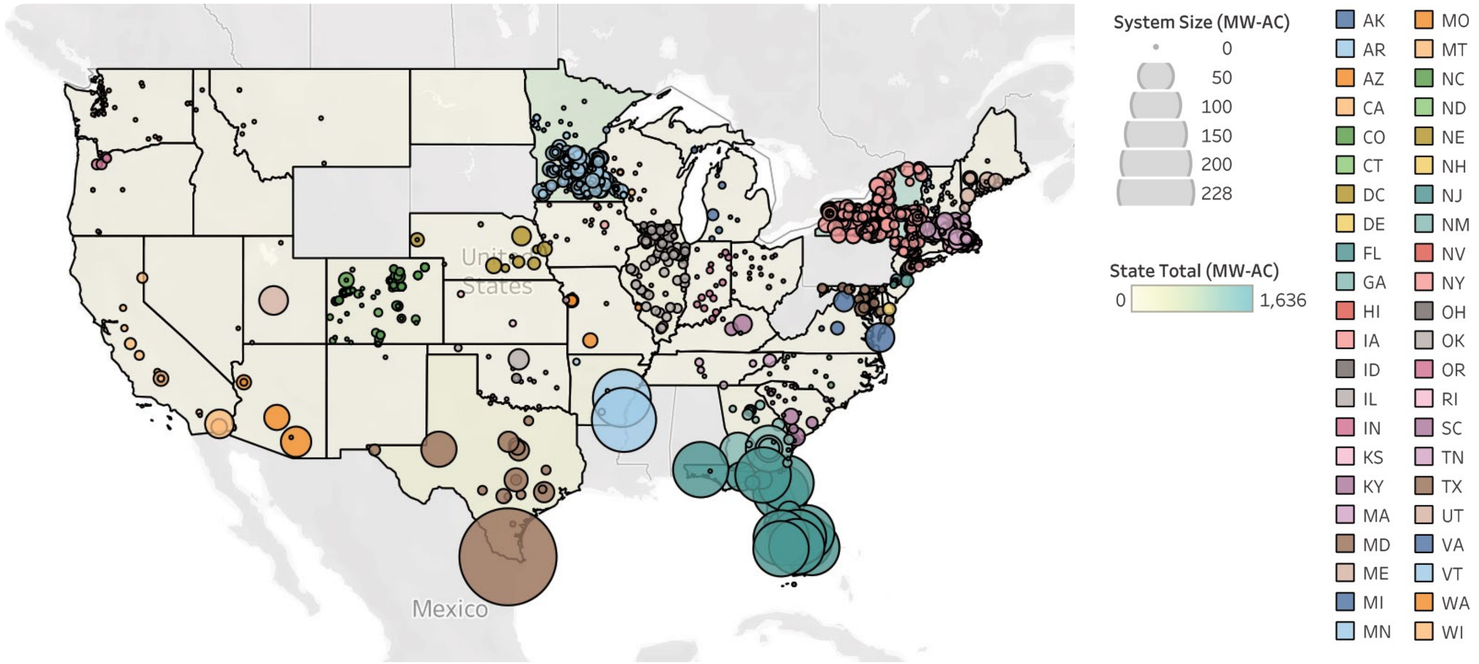
1. What structures for community solar are currently allowable in your state?
2. What are the key regulatory and market considerations for a specific location that will influence community solar project success?
3. How does electricity pricing in your specific market impact project viability?
4. What specific state and local laws facilitate or hinder community solar?

Background

Electric generation policies vary greatly by state, which has major impacts on how community solar can be developed. The U.S. Department of Energy defines Community Solar as any solar project or purchasing program, within a geographic area, in which the benefits flow to multiple customers such as individuals, businesses, nonprofits, and other groups. According to the U.S. Department of Energy, at least one community solar project exists in 40 states, including Washington D.C. Twenty-two (22) states and the District of Columbia have state-level policies that support community solar deployment. These policies are a combination of mandated levels of community solar deployment, incentives for deployment, policies that make deployment easier, or some combination of these.

COMMUNITY SOLAR PROJECTS (AS OF DECEMBER 2022)

Source: U.S. Department of Energy, Community Solar Market Trends



While community solar projects have developed rapidly, nearly three-quarters of the market is currently concentrated in four states: Minnesota, New York, Massachusetts, and Florida. Developing community solar projects requires an understanding of the complex regulatory and market context of each state.

REGULATORY CONTEXT

Each state has its own regulatory environment that governs the development of community solar projects. It's important to understand the relevant state laws and regulations, including utility commission rules and interconnection standards. For example, some states may only allow community solar projects within specific utility territories, while others allow community solar projects to be located anywhere throughout the state. Understanding these rules and regulations will help you to determine the feasibility of community solar projects in specific states.

MARKET CONTEXT

The market context of a state is equally important to consider when developing community solar projects. Factors such as electricity prices, the availability of incentives and subsidies (i.e. grants and renewable energy credits), and the level of demand for renewable energy can all impact the feasibility of a community solar project. In some states the cost of electricity is high, which can make community solar projects more economically viable. Similarly, in states with strong legislative demand for renewable energy, community solar projects may have a larger potential customer base.

2022 STATE COMMUNITY POWER SCORE (BEST & WORST)

Source: ILSR, 2022 Scorecard Methodology and Scores

	Net Metering	Property Assessed Clean Energy (PACE)	Community Choice Aggregation	State (Feed-in) Tariff	Residential Energy Building Code	Renewable Portfolio Standard Carve-Out	Interconnection	Shared Renewables	Third Party Solar Ownership	Utility Franchise Authority	Preemption of Local Gas Bans	**Community Power Score**	**Community Power Grade**
CALIFORNIA	5	5	7	1	5	5	2	4	4	2	0	**40**	**A**
ILLINOIS	5	3	7	0	5	5	2	4	4	2	0	**37**	**A**
MASSACHUSETTS	5	5	7	3	5	3	2	5	4	1	0	**40**	**A**
NEW YORK	5	5	7	0	5	5	1	5	4	1	0	**38**	**A**
ALABAMA	0	3	0	0	5	0	-2	0	0	1	-2	**5**	**F**
ALASKA	3	3	0	0	3	0	-2	0	0	1	0	**8**	**F**
IDAHO	3	0	0	0	1	0	-2	0	0	2	0	**4**	**F**
INDIANA	4	0	0	0	1	0	1	0	0	2	-2	**6**	**F**
KANSAS	2	0	0	0	3	0	-2	0	2	2	-2	**5**	**F**
KENTUCKY	1	3	0	0	1	0	-2	0	0	2	-2	**3**	**F**
LOUISIANA	2	0	0	0	1	0	-2	0	0	2	-2	**1**	**F**
MISSISSIPPI	2	0	0	0	3	0	-2	0	2	2	-2	**5**	**F**
NORTH DAKOTA	2	0	0	0	3	0	-2	0	2	2	0	**7**	**F**
SOUTH DAKOTA	0	0	0	0	3	0	0	0	0	1	0	**4**	**F**
TENNESSEE	2	3	0	0	3	0	-2	0	0	2	-2	**6**	**F**
WEST VIRGINIA	5	0	0	0	1	0	1	0	2	1	-2	**8**	**F**
WISCONSIN	2	5	0	0	1	0	-1	0	0	0	0	**7**	**F**

SCORECARD KEY: A (36+) F (8 or less)

LEARN MORE ABOUT GRADES ON PAGE 26.

IS YOUR MARKET COMMUNITY-SOLAR FRIENDLY?

Policies such as net-metering, virtual net-metering, streamlined interconnection standards across all solar, and strong incentives and subsidies for community solar development can promote the development of community solar. In community-solar-friendly states, you will find one or more of the following kinds of supports available to expand community solar markets and support community solar developers:

- **Community Solar Enabling Legislation.** This specific state-level legislation either allows third-parties to own and operate community solar or mandates that utilities partner with community-based organizations to pursue community solar.
- **Virtual net metering.** These policies allow community solar customers to receive credit on their electric bills for the power produced by a community solar project.
- **Streamlined interconnection policies.** These policies make it easier for community solar projects to connect to the grid.
- **Interconnection standards.** These govern the technical requirements for connecting a solar project to the grid. Streamlined and standardized interconnection standards can promote the development of community solar by reducing the administrative burden and cost of connecting a solar project to the grid.
- **Renewable Portfolio Standards (RPS).** RPS require or encourage utilities to produce a certain amount of their power from renewable sources. These standards, in turn, can allow community solar developers to earn money from selling Renewable Energy Credits (RECs). The RECs prices are determined at the state level.
- **Community Choice Aggregation programs** Community Choice Aggregators (CCAs aggregate the buying power of individual customers within a defined jurisdiction to negotiate with electricity supply companies regarding price, term, and sourcing on behalf of residents and small businesses to create a new local default supply option. CCA programs can purchase power from community solar facilities.
- **Incentives and subsidies.** Strong and consistent state or local incentives and subsidies can promote the development of community solar by reducing the upfront costs and making it more financially feasible.
- **Regulatory process.** Streamlined and predictable regulatory processes reduce the administrative burden and cost of obtaining permits and approvals.

COMMUNITY SOLAR OWNERSHIP OPTIONS

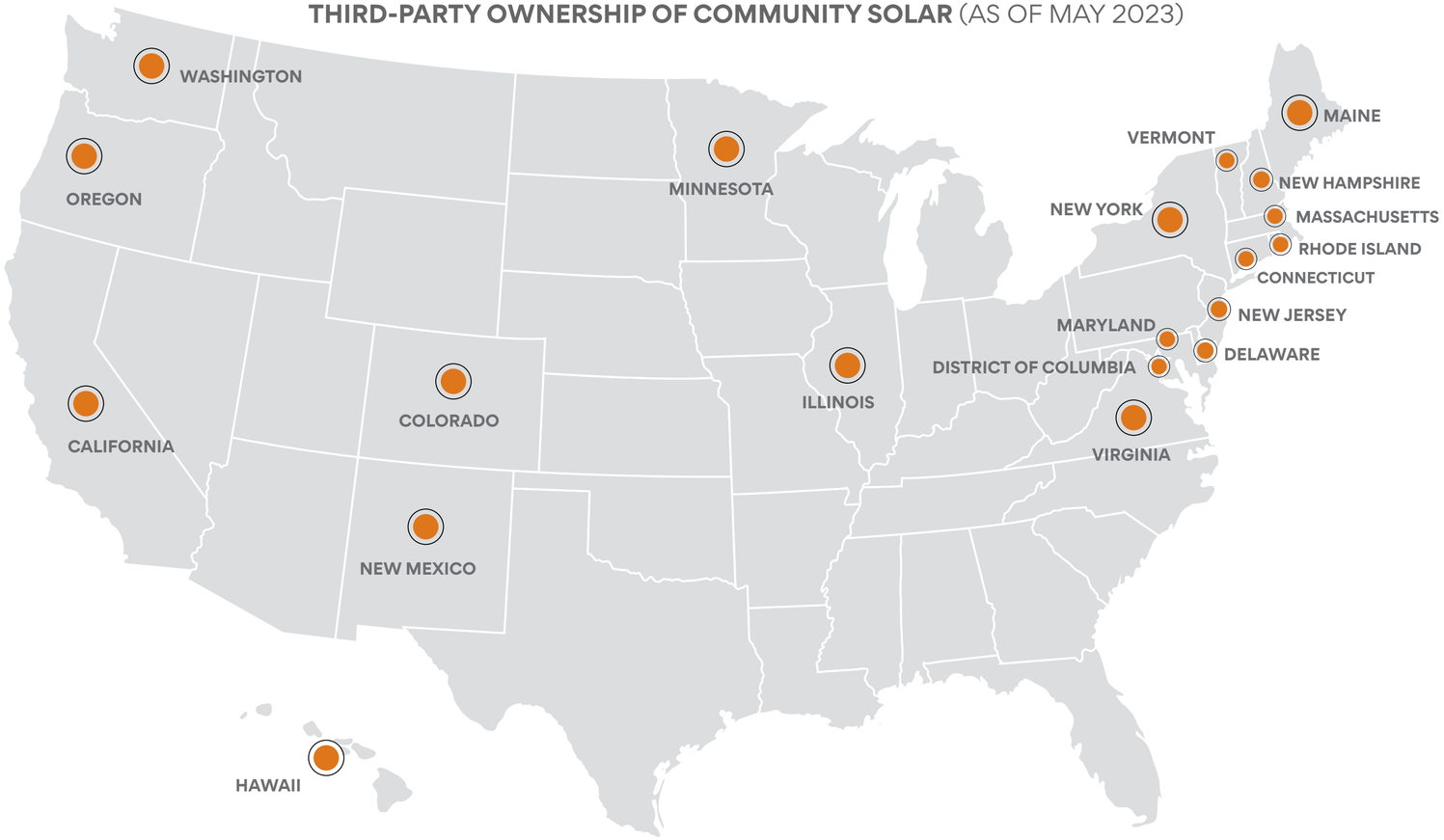
Community solar ownership options are largely determined by state legislation. As such, when considering a community solar ownership structure, it is critical that you first understand what is allowable in your state. Community solar can be developed in all 50 states, the District of Columbia, and territories through one of the five pathways listed below:

Third-party Ownership

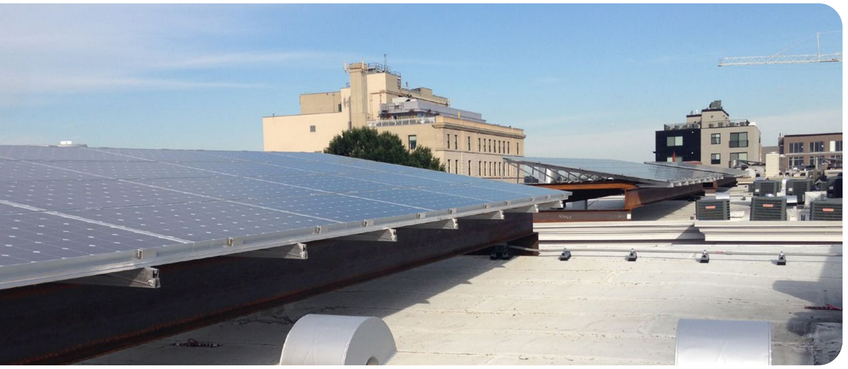
The biggest regulatory concern shaping community solar development across the country is whether states allow community solar to be developed by an entity that is not regulated by the state as a formal utility provider or whether community solar must be developed in partnership with a regulated utility. Third-party ownership is defined as allowing investors to form a new company to finance, own, and operate community solar without any ownership participation from a regulated utility.

Because third-party ownership enables community groups to be engaged in structuring the capital sources and expenses of developing a community solar project, the structure allows for the most flexibility in providing different and deeper benefits to LMI communities. 19 states, plus the District of Columbia, allow third-party ownership of community solar, including the following (as of May 2023).

THIRD-PARTY OWNERSHIP OF COMMUNITY SOLAR (AS OF MAY 2023)



CLICK ON TO LEARN MORE ABOUT EACH STATE.



Cooperative Ownership

In a cooperative community solar structure, a group of customers collectively own and operate a solar project. This structure can provide customers with the most control during the development process, yet cooperative ownership requires significant organization and coordination among the members. This structure is only allowable in the 19 states and D.C. that allow third-party ownership of community solar without participation by regulated utilities, unless specifically requested and allowed in partnership with a Rural Electric Cooperative or Municipal Utility.

Investor-owned Utility Community Solar

Regulated investor-owned utilities are those granted the exclusive right by each state to sell power within a certain territory. State Public Utility Commissions set the rules for regulated utilities, and these utilities are entrusted with ensuring reliable and affordable electric power to all residents in a given territory. Meeting these incredibly rigorous standards is very expensive and time consuming, requiring the resources of massive companies to achieve the required standards. Unfortunately, the time and expense necessary to meet these standards often serve as insurmountable barriers to entry for potential solar developers trying to develop community solar projects within a given territory without the participation and ownership from the local regulated utility.

Those seeking to develop community solar in the 31 states without specific third-party ownership enabling legislation must partner with their local regulated utility. The U.S Environmental Protection Agency defines this structure as the "Utility-sponsored model," whereby a solar developer or community-based organization partners with a regulated utility to develop community solar. The regulated utility owns, operates, and controls the community solar project with input from the developer or community-based organization.

The following states do not allow third-party ownership of community solar but have established mandates for their regulated utilities to participate with community-based organizations in community solar. As of May 2023, the following are states with investor-owned utility-owned community solar:

- Nevada
- North Carolina
- South Carolina

There are a few other notable states where solar development is not mandated but the utilities have volunteered to develop community solar, including the State of Florida.

For above references, the following resource lists the 22 states plus the District of Columbia that have enabling legislation for community solar.

Municipal Ownership
i.e., Community Choice Aggregation or CCAs

In those states where third-party ownership of community solar is not allowed and regulated utility-ownership is not mandated, it may be possible to partner with a local government to deliver community solar benefits. Municipal Ownership, also known as Community Choice Aggregation, allows local governments to procure power on behalf of their residents, businesses, and municipal accounts from an alternative energy supplier while still receiving transmission and distribution service from their existing regulated utility provider. CCAs are attractive for communities that want more local control over their electricity sources, more green power than is offered by the default utility, and/or lower electricity prices.

In 2022, the EPA estimates that about 5.7 million customers procured about 16 billion kWh of electricity through CCAs. Learn more on the status of states' efforts to enact CCA-enabling legislation.

By aggregating demand, communities gain leverage to negotiate better rates with competitive suppliers and choose greener power sources. CCAs are currently authorized in the following states:

- California
- Illinois
- Maryland
- Massachusetts
- New Hampshire
- New Jersey
- New York
- Ohio
- Rhode Island
- Virginia

Municipal Utilities (Munis)
Municipal utilities are publicly-owned electric power entities operated by local governments. According to data published by the American Public Power Association, they make up a significant portion of the national electric utility industry. Publicly owned utilities—which may include municipal utilities, water and power districts, and other public entities—make up roughly 60% of the nation's utilities (more than 2,000), serve 15% of all customers (21.4 million), and deliver 15% of annual end-use electricity sales (574 terawatt-hours, TWh). The size and scope of municipal utilities vary widely as they are naturally constrained by the boundaries of their underlying jurisdictions. The majority of municipal utilities are small, serving fewer than 3,000 residents, but some larger cities—Los Angeles, Seattle, Austin, Orlando, and Sacramento, for example—operate much larger municipal utility districts.

Because municipal utility customers are also voters who elect the officials governing the utility, these arrangements can foster outcomes that are more directly responsive to customer needs which can include support for community solar. As such, some of the first community solar projects in the nation were initiated by municipal utilities. Sacramento Municipal Utility District (SMUD) in California, for example, launched its SolarShares program in 2008 with a 1-MW installation. Today they operate 11 community solar projects. For more information on how municipal utilities can engage on LMI community solar development, please refer to the Municipal Utility Community Solar Workbook, authored by the American Public Power Association, the National Renewable Energy Laboratory, and the U.S. Department of Energy.

Rural Electric Cooperative Ownership

Partnering with rural electric cooperatives is another pathway to developing community solar. Rural electric cooperatives (also called "electric co-ops") are non-profit electric utilities. Unlike investor-owned utilities, rural coops are owned by member-owners, i.e., the customers for which they provide electricity. Rural co-ops were created in the 1930s to bring electricity to areas of rural America that investor-owned utilities refused to serve due to high costs. Today, electric cooperatives provide electricity to 12% of Americans and own 42% of the country's electric distribution lines.

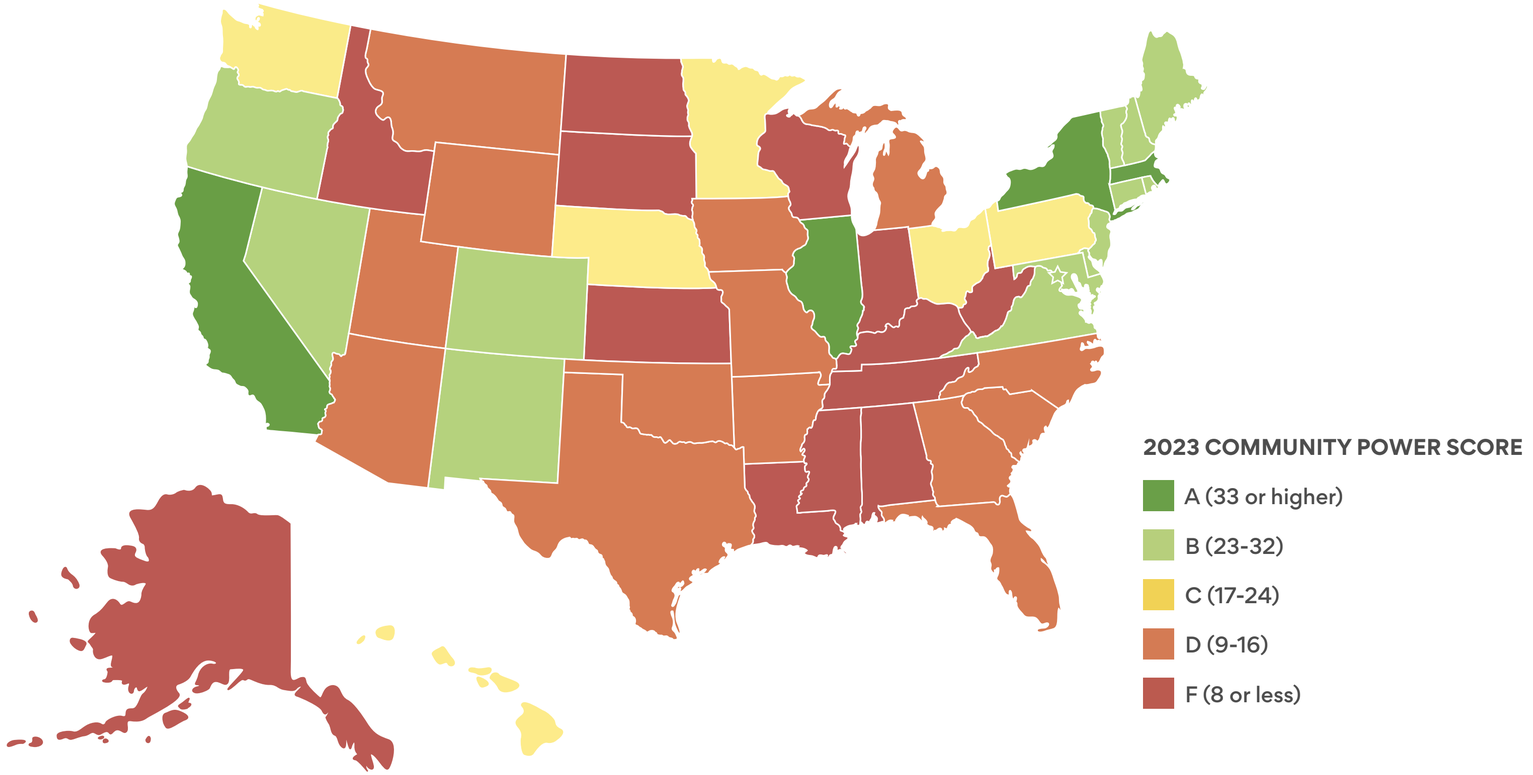
Because rural electric cooperatives are owned by their customers, they can be responsive to customers who advocate for community solar in their communities. Electric co-ops are not regulated by state public utilities commissions, which presents the opportunity for some to be more nimble and innovative. These coops are able to ensure that rural populations, which are often vulnerable to higher energy burdens and lower financial stability, are able to have equitable access to community solar opportunities.

Rural electric cooperatives exist in almost every state, especially in those states where third-party ownership or utility-owned community solar is not available. Partnering with electric co-ops makes community solar possible in all 50 states.

For more information on how rural electric cooperatives are making progress on community solar, you can visit NRECA Electric Cooperatives & Solar.

ILSR 2023 COMMUNITY POWER SCORECARD

The Institute for Local Self Reliance (ILSR) 2023 Community Power Scorecard is a report that ranks U.S. states based on their policies and programs related to community solar, energy efficiency, and energy storage. The scorecard, which was first released in 2021, is updated every two years by the nonprofit organizations Vote Solar and the Interstate Renewable Energy Council (IREC). The scorecard compiles data from the American Council for an Energy-Efficient Economy, DSIRE, the National Renewable Energy Laboratory, PACENation, SolarReviews, and Vote Solar, as well as the data ILSR regularly track on community solar, community choice aggregation, and state legislative changes in general. Readers should keep in mind that Community Scorecard focuses on community-solar-friendly policies, which are a major indicator of the ability to install community solar but not the only factor. The orange and red colors do not mean that Community Solar cannot be developed in those states, but rather that there are presently more barriers to development. For example, Minnesota, which is yellow, is one of the states with the most community solar deployed. Florida is red because it does not allow virtual net-metering and is very restrictive to community solar. Yet, Florida Power and Light, the investor-owned utility, has voluntarily developed over 1 GW of community solar.



Action Items

LEARN YOUR STATE SOLAR MARKET BASICS

Watch Market Environments for Community Solar

Determine the solar capacity installed in your state.

Solar Energy Industries Association (SEIA) Solar State by State webpage defines characteristics of the solar markets in each state.

Determine electricity prices in the state and utility area.

The U.S. Energy Information Administration (EIA) state electricity profiles provide the average retail electricity price in terms of cents per kilowatt-hour.

Compare grid electricity prices to the cost of solar.

The more expensive grid electricity is, the easier it is to make a solar energy project pencil out.

LEARN YOUR STATE POLICY CONTEXT

Watch Regulatory Environments for Solar

Are policies supporting solar energy in place in your state?

The Institute for Local Self-Reliance tracks and scores states based on their energy policies and how these policies help or hinder local clean energy action on the 2023 Community Power Scorecard.

Net Metering and Community Solar: Powering Your Local Community

Net metering allows people who own solar panels to sell any excess electricity they produce back to the grid, providing a significant financial incentive for individuals and businesses to invest in solar energy. Most solar projects, especially community solar initiatives, have much more favorable economics if net metering is allowed.

However, the timing mismatch between solar power generation and peak energy use creates a challenge for community solar developers. It is becoming more common for solar projects to include batteries and provide internal storage of power, but battery technology is expensive and still improving. Also, innovative solutions like virtual net metering are emerging, allowing subscribers to receive bill credits for their share of the electricity generated by a community solar project, even if it is located off-site. This opens up the benefits of solar energy to renters, homeowners with unsuitable roofs, and others who cannot install their own panels.

As such, net metering is often the single most important mechanism to have in place to create a friendly community solar regulatory environment. Look for a check mark under "customer-friendly net energy metering" in the 2023 Community Power Scorecard.

Does your state have straightforward interconnection rules?

Interconnection is connecting a solar array to the power grid. Look for a checkmark on the community power map "ensures simplified interconnection rules to encourage distributed renewables."

Does your utility have requirements to purchase renewable energy?

Under a Renewable Portfolio Standard (RPS – sometimes called a Renewable Energy Standard), state regulations require utilities to purchase a target amount of electricity from renewable sources, and may include a solar-specific mandate. An RPS requirement also facilitates demand for incentives to fuel the private renewable development market. Look for a check mark under "requires utility renewable energy procurement."

How is the electricity market regulated in your State? What utilities serve your State?

In all states, Public Utilities Commissions (PUCs) regulate the rates and services of investor-owned electric utilities. On most PUC websites there is detailed information about which regulated electric utilities are operating in a state and what rates are charged for electricity. You can also find detailed policies about Renewable Portfolio Standards, net metering, and other issues impacting solar development on the community power map.

RESEARCH YOUR STATE SOLAR INCENTIVES

Watch Community Solar Incentives

Learn the different types of community solar incentives and how they work. *Upfront Incentives* are essentially grants that serve to reduce the initial costs of developing community solar and lower the investment amount that must be paid back by a project, leaving funds available to provide more LMI benefits. *Production-based incentives* are funds provided based on energy produced during system operation, usually for a set number of years. *Tax-based incentives* are benefits that come in the form of tax savings to the solar owners. They can be utilized by the solar owner and some can even be sold. They provide an additional source of funds to solar owners, which leaves more funds available for LMI benefits.

- When considering financing in Chapter 6, be thoughtful about any expiration dates for incentive programs or pilots and be sure to let your funders know the milestones that have to be met to secure the incentive.

Use our **project feasibility checklist** and the **Regulatory and Market Environment Guide** to access the information you found in above action items.

COMMUNITY SOLAR PARTICIPATION IN STATES WITHOUT ENABLING LEGISLATION

Developing community solar projects in states without enabling legislation may require a combination of efforts including creative financing options, leveraging existing infrastructure, collaboration with utilities, and education and outreach efforts. By employing these strategies, project developers can overcome regulatory barriers and successfully develop community solar projects even in states without enabling legislation.

- **Focus on Education and Outreach:** In states without enabling legislation, there may be a lack of awareness or understanding of the benefits of community solar. To overcome this, project developers can focus on educating the community about community solar to build strong support for the benefits of solar. This can include hosting community meetings, engaging with local media outlets, working with groups to build awareness and support for community solar and partnering with organizations that serve low-income communities, such as community action agencies.
- **Seek Creative Financing Options:** In states without enabling legislation, financing can be a major barrier to developing community solar projects. To overcome this, project developers may need to seek out creative financing options, such as philanthropy, community ownership models, crowdfunding, community bonds, or power purchase agreements (PPAs). These financing options can help to reduce the upfront costs of developing a community solar project and make it more financially feasible.
- **Leverage Existing Infrastructure:** In states without enabling legislation, it may be difficult to find suitable land for community solar projects. To overcome this challenge, project developers may need to leverage existing infrastructure, such as rooftops or parking lots, for the installation of solar panels. This can help to reduce land costs and make the project more cost effective.

Eyes on Equity

State policy and regulations affect the uptake of Community Solar in LMI communities. Community solar is a powerful tool to provide solar benefits to those without easy access to the property or upfront capital needed to install a solar system.

- In many cases, states with equitable electricity decarbonization policies mandate delivering targeted benefits to historically disadvantaged communities.
- Programs that target LMI communities need to have deeper incentives to provide long-term financial stability and community wealth to create lasting change. This could include offering financial incentives, such as tax credits, grants, or low-interest loans, to encourage investment in affordable housing, small business development, and job training programs.
- Regulations pertaining to net energy metering or NEM, virtual net metering (VNEM), and other electricity rate design measures that compensate residential solar customers for the energy and other benefits they provide to the grid are essential for expanding access to low-income communities. By compensating residential solar customers for the excess energy they produce, NEM and VNEM policies provide a financial incentive for homeowners to invest in solar panels and other renewable energy technologies.
- Where possible, programs should include local hiring provisions for installers to create positive workforce outcomes in addition to energy access benefits. Local hiring provisions require that a certain percentage of the workforce hired for the installation of renewable energy systems come from the surrounding community.

The **Low Income Solar Policy Guide** provides a roadmap to successful policies and programs that are creating access to solar technology and jobs nationwide.

Additional Resources

- **Environmental Law & Policy Center:** Community-Owned Community Solar
- **The Database of State Incentives for Renewables and Efficiency:** a comprehensive source on renewable energy policies and incentives.
- **Coalition for Community Solar Access:** Learn more about the impact of community solar and download critical resources from CCSA and other organizations to bring community solar to your state.
- **IREC: Shared Renewable Energy for Low- to Moderate-Income Consumers: Policy Guidelines and Model Provisions:** These guidelines support the adoption and implementation of shared renewables programs that provide tangible benefits to LMI individuals and households.
- **National Renewable Energy Laboratory Low- and Moderate-Income Solar Policy Basics:** A resource to learn about low- and moderate-income solar policy basics in state, local, and tribal governments.

CHAPTER 2
Community Solar Project Site Selection

PROJECT READINESS QUESTIONS

1. What are the strengths and weaknesses of your preferred site?
2. What are the characteristics of your proposed solar project? System size? Installation type – roof, ground, or canopy?
3. What are the characteristics of your proposed project site? What type of building or land is the project on? Who owns the building or land? What utility territory is the project in?
4. Have you evaluated different system layouts, solar arrays, system sizes, and other important system inputs scenarios to determine solar production? What are your best options?
5. What local zoning and permitting requirements apply to the preferred site? Is the site in a special taxation category that limits development?

Background

Project readiness starts with a “good” site. Siting determines project quality, cost, performance, utility connection, and community impacts. Comprehensive solar siting criteria must include technical, economic, environmental, and political considerations. As a developer, you will have to work through each of these critical factors to determine the quality of your site. Solar projects include different potential types of installs, including ground mounts, rooftop ballasts, carports, and other methods of incorporating solar infrastructure.

WHAT MAKES FOR A GOOD SOLAR SITE?

Favorable Regulatory Context

We would be remiss if we did not state upfront that the highest-level determination of a good site is being located within a state and utility area with favorable community solar regulations. The 20 states that allow for third-party community solar ownership present the most fertile sites for community solar. Those with strong incentives for LMI community solar make it possible for developers to generate significant benefits that can be passed through the LMI communities. The first step is to determine the state and utility area in which your solar site is located and what is legal and allowable on that site.

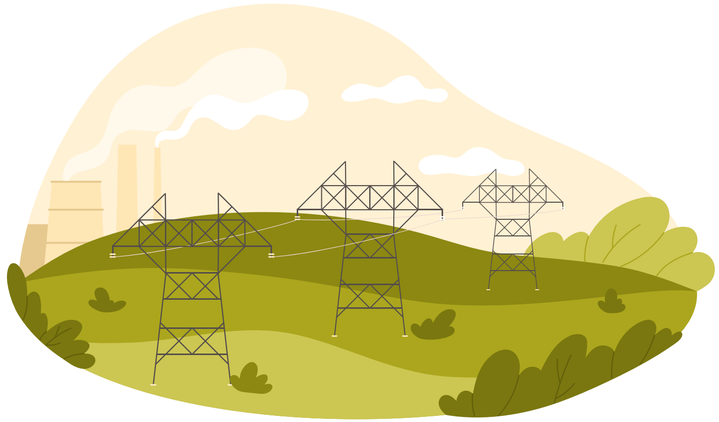
Easy Access to Utility Connection

After site control, access to proper power connection is the next big factor determining site quality. Community solar facilities are small power plants. They generate power and feed it back into the existing power grid. As such, they must be connected to the power grid. This power connection is one of the most complicated and expensive aspects of developing

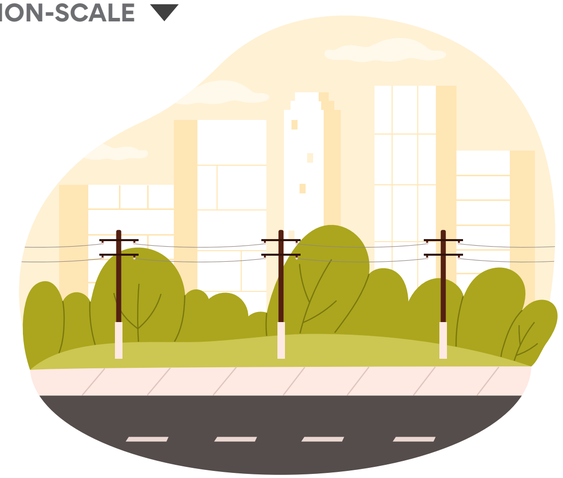
solar. The availability and cost of a utility connection will make or break a project. When looking for utility connections, type of connection and distance from other utility lines are the key factors.

There are two primary types of projects: transmission-scale and distribution-scale. Transmission-scale projects are larger (i.e. sites of more than 200 acres) and need access to transmission lines, which are high voltage lines that are seen criss-crossing the country. For most of our work in community solar, we are developing distribution-scale projects, which are smaller (i.e. sites between 10-50 acres) and tie into smaller three-phase power lines, which are more common and run along neighborhood roads. When considering a site, project developers must find the nearest three-phase power connection. The other consideration is distance. The further the distance to the nearest power connection, the more equipment and labor required to make the connection, which can very quickly escalate project cost and make it infeasible.

TRANSMISSION-SCALE ▼



DISTRIBUTION-SCALE ▼



Close Proximity to Substations

Substations are nodes in the utility grid that transition voltage (i.e. from high to low) and are required to manage the power generated from the solar facility so that it can be distributed to the rest of the homes in the area. A good rule of thumb: optimal sites need to be within 3 miles of these substations to minimize the distance the power needs to travel along the lines. The further out from a substation, the more likely that the powerlines cannot support the new power without investment in costly upgrades, which will most often be pushed onto the community solar developer.

Open, Flat Sites

After access to quality utility connection and substations, site grading is the next big factor determining site quality. Solar developments require flat, open land. So if land is forested and/or sloped even slightly, it is very expensive to remove the vegetation and change the angle of the land. Even relatively small slopes have major impacts on solar performance. As such, developers prefer flat, cleared land. The cost to clear and grade land can make

or break a project. In some cases, a project can be profitable enough to justify clearing costs, but this issue must be considered early in the development process.

Zoning Favorable for Solar

Zoning requirements will have a major impact on solar development. Zoning specifies land use, location, and design. A good site allows solar development "by-right," which means that the zoning of the site allows for solar development. If zoning is not allowed "by-right," it is still possible to change the zoning to allow solar development. Yet, the zoning change process is costly and will make your project less feasible.

Community Supportive of Solar

Solar projects are quiet, do not generate any traffic, and generate new tax revenue for local communities. Yet, many local communities are resistant to any kind of change in the land use and sometimes have the power to block projects from being constructed. As a result, good sites are located in communities that are not resistant to solar development. Some rural communities have raised serious concerns about farmland being converted and lost due to solar development. To limit the loss of farmland, some local governments have banned solar on agricultural land, even as models of agrivoltaics are accelerating in effectiveness. If solar is not an allowable land use, developers will need to request a special exception to install community solar. The process for earning a special exception adds considerable cost and can take months. We recommend that developers engage early with local government staff and leaders to determine if solar is an allowable land use, and that they engage with community members to gauge support.

Site Control

Site control refers to the ability of the developer to secure legal rights to use the land for community solar. Having site control provides certainty and allows developers to make necessary investments in the project with confidence. There are several options for gaining site control, such as purchasing the land outright, entering into a long-term lease agreement with the landowner, or obtaining an easement or license from the landowner to use the land. Each option has its advantages and disadvantages, and the choice may depend on factors such as cost, duration, and flexibility. A "good site" is a site controlled by the solar developer or one where the solar developer has spoken to the owner and believes a path to site control is imminent.

Avoid Flood-prone Areas

Flood-prone sites and those in designated wetland areas are typically not suitable or even legal for solar generation. There are some exceptions here for rare and low-risk flood zones, but check local regulations to determine if you are allowed to construct solar. You can see if your property falls within a flood zone by visiting FEMA. Depending on the type of equipment you are installing and how deep you are digging into the soil, soil studies are sometimes required as well.

Positive Environmental Conditions

Good sites have favorable environmental conditions and pass environmental screens. Developers must ensure against potential environmental risks and ensure compliance with local, state, and federal regulations. Good sites have good soil and water quality and are not identified as endangered species habitat, wetlands, or floodplains. Additionally, developers may need to evaluate sites' potential impact on air and water quality, noise levels, and waste management. These tests are often relatively expensive and are addressed after site control is secured and the other indicators above of a good site have been confirmed.

Promoting Resiliency

Resilience is one of NCSP's meaningful benefits. The American Institute of Architects defines Resilience as "the ability of a system and its component parts to anticipate, absorb, accommodate, or recover from the effects of a hazardous event in a timely and efficient manner, including through ensuring the preservation, restoration, or improvement of its essential basic structures and functions." Some common forms of resilience in community solar projects are improved electric reliability and reduced risk of disruption during emergencies. Below are some ways in which we can site projects to enhance their resilience:

- **Site selection:** Siting projects in areas with low risk of natural disasters, such as floods or wildfires, minimizes the risk of power outages.
- **Energy storage:** Adding energy storage to projects, such as batteries or pumped hydro storage, enables them to store energy and operate when the utility grid is out.
- **Microgrids:** Incorporating your community solar project with microgrid infrastructure provides a completely self-contained power system that can operate independently of the larger grid during an outage.
- **Solar back-up generation:** Selecting sites close to critical facilities, such as hospitals or emergency response centers, can help ensure that power is available to those facilities during grid outages.
- **Redundancy:** Siting your community solar project in a location with redundant power connections can help ensure that power is available during an outage. This can include connecting the project to multiple power grids or ensuring that there are multiple sources of power available.

Action Items

FIND POTENTIAL SITES

- Based on your current knowledge, create an exhaustive list of potential sites for community solar in your jurisdiction.

  Watch this video to learn more.

- Your list should include enough information about your potential sites that you can compare site quality and understand which ones will be best suited for your project.

DETERMINE SITE QUALITY

- To learn more about community solar siting, view this PowerPoint presentation on solar project siting from the NCSP Municipal Utility Working Group.
- Get an aerial view of properties using resources such as Google Maps and Project Sunroof.
- Site conditions: Investigate the characteristics of the site, use the qualities of a good site noted above and this checklist. You can also use this tool as part of your site screening.
- Research zoning and permitting requirements: These will help you better understand interconnection possibilities. Learn more here.
- Clarify who owns the property: Assessor records, plat maps, site plans, and other maps and documents can clarify which jurisdiction has authority over land development on a site. Make sure that you believe that you can work with the site owner or local stakeholder to get site control.
- Community consideration: What type of stakeholder engagement might be required with current property holders? Refer to chapter 4 to learn more about community engagement in community solar.

ESTIMATE SOLAR SYSTEM SIZE AND ENERGY PRODUCTION

Watch System Layouts and Solar Production

- These tools will tell you the expected amount of energy production in a year. This prediction is based on the design specifications input into the system, and the predicted sunlight and weather conditions at this location.
- Record the predicted kWh/year for this project.
- Experiment with different specifications
- Repeat steps as many times as desired to try new combinations of design details.
- Remember to stay within the regulations and what is feasible for your proposed project.

- Are there certain specifications that could improve the production levels of your solar array?
- Determine power value. Power value is the true value of the electricity produced by the solar panels that takes into consideration the unique factors of solar energy production to determine an acceptable market value that benefits both residents and utilities. It varies by state and utility. If you are providing power on site behind the meter, review site utility bills to determine the value of energy savings from solar. If you are providing power in front of the meter, which is typical in community solar applications, call your local utility to learn the value of the power at the site.
- Conduct a physical site visit. Physically visit and walk around the site to verify your assumptions and ensure that you have not missed any important landmarks or features of the site.

Software Tools for Estimating Solar Energy Production

Click on each to learn more.

PVWATTS Calculator

- Estimates energy production
- Basic solar capacity estimate

Helioscope

- Solar design tool
- Allows user to view aerial image of the site
- Allows user to add setbacks to the site
- User can select preferred solar panels and wattage

Aurora Solar

- Solar design tool
- Allows user to view aerial image of the site
- Allows user to add setbacks to the site
- User can select preferred solar panels and wattage

MOVING FORWARD If the site is adequate, the next step is permitting. See document samples here.

Eyes on Equity

Historically, solar adoption has not been equal across all households and communities–skewing toward communities with higher incomes and higher populations of White and Asian residents. Consider how our community solar siting decisions impact equity.

- When building your lists of priority sites, you can use the Department of Energy's Low-Income Energy Affordability Data (LEAD) Tool and the Climate and Economic Justice Screening Tool (CEJST) to explore which communities have the highest energy burden, and, ultimately, need the most support.
- Partnering with affordable housing owners to serve residents and site projects on their properties is another great way to ensure that you are reaching those in need because the affordable housing residents have already been income-qualified. The U.S. Department of Housing and Urban Development created a Renewable Energy Toolkit to better explain this process.
- Historically, polluting facilities were pushed into LMI communities because they had the smallest political influence to fight back against the facilities. When siting your project in an LMI community to serve those in need, you can ensure equity by not pushing any new potentially negative impacts onto the community–such as noise or dust during construction, visual and aesthetic impacts, or other concerns.

Additional Resources

- Renew300 program to provide renewable energy on subsidized housing properties.
- Estimating Rooftop Suitability for PV: A Review of Methods, Patents, and Validation Techniques: For researchers looking to understand the market potential of rooftop-installed photovoltaics (PV). Understanding the amount and characteristics of rooftop space that is available for installing PV is essential.
- Solar Development on Public Facilities, Brownfields, and Under-Utilized Land: This section of the SolSmart program's Toolkit for Local Governments provides information on how to install solar energy systems on public facilities and lands.

CHAPTER 3
Community Solar and Community Engagement

PROJECT READINESS QUESTIONS

1. Have you truly considered what the community needs, including their priorities when it comes to community solar?
2. Have you considered who, how, and when to engage community members, how to build trust and garner support for your project?
3. Do you have a plan for how to perform community engagement at all stages in the solar development process?
4. Do you have project strategies to address NCSP's five meaningful benefits, such as workforce development, resilience and storage, community ownership, and/or deep bill savings?
5. Have you considered how to positively engage with the local electric utility?

Background

Developing mission-driven community solar projects requires building trust and working with community members by listening and learning about their needs, and ensuring the projects are responsive. As a result, community engagement should be incorporated throughout the development process, including site selection, subscription strategy, zoning and permitting, construction, and operation/offtake.

Obtaining stakeholder input can be time-consuming and costly for developers but it is necessary to ensure equitable projects. Robust communication with local residents, community-based organizations and city officials helps identify community needs and how to best achieve them. Community engagement can also help raise local awareness about solar energy and provide public education. Equitable community engagement must include the voices of those low-income residents who are often left out of the process. Keeping communities informed of all aspects of your community solar project ensures that local residents will be invested in the project and assist in its success.

The guide for Equitable Community Engagement in Community Solar by Groundswell says, “Community engagement should start early and move throughout the project planning process. Discussions should be recurring with multiple opportunities for community members to provide input as planning develops further. Engaging early on and consistently can gain

community trust. Particularly, community members may not like the change in landscape when large solar arrays are installed. By enabling the community to voice their own ideas of how the project may benefit the community and explaining how the benefits could be realized can help ease opposition. As you plan your project, you will also want to identify the community networks, processes and key actors that may be useful in building and operating your project. The goal should be to build out project operations that leverage existing community resources and structures."

It is important to include information learned from community engagement to decide on your project's pricing model, which can be either a subscription or cooperative model, see chapter 7 for more details on these models. Information gathered through community engagement can be used to connect underserved and low-income communities with community solar subscriptions to efficiently lower the cost of customer acquisition, reduce low-income household energy bills, and increase the deployment of community solar projects. Additionally, by conducting intentional community engagement, developers can learn simple things such as how members pay their utility bills, what language is most spoken in the region, and how to best message bill savings, among other critical information to ensure strong community solar adoption.

If community engagement reveals that the community would like more ownership of the project, a developer could engage in a "cooperative" ownership model, which often relies solely on participants to fund the installation and maintenance of solar panels, storage components, and distribution infrastructure. Participants then receive solar net metering credits proportional to their investment in the community solar project. Once enough credits have accumulated to pay off a consumer's initial investment, they continue to have access to power produced through the system they helped to finance.

NATIONAL COMMUNITY SOLAR PARTNERSHIP (NCSP)
PATHWAYS TO SUCCESS INITIATIVES

Action Items

- Identify the decision-making power your community will have for the community solar project using the Spectrum of Community Engagement to Ownership Framework.
- Do a primary scan to learn about your community's demographics. One easy way to access a variety of demographic data is to use Policy Map (which has both free and paid versions), or you can access Census data.
- Develop and engage in a community engagement plan. Using the background knowledge you collected about your community and the demographics, design a plan of action for engaging community members. Using the guidance provided in the Community Solar and Community Engagement Guide, develop a robust plan to gather community insights. For detailed questions to ask, see this community engagement planning tool.

Steps include:

- Learn about community engagement throughout the development process.
- Learn preliminary information about your community.
- Form committed community partnerships with organizations that are supportive of the work and have good relationships with other community agencies and citizens.
- Develop an intentional timeline that includes time invested in community trust building.
- Schedule learning conversations with local stakeholders in your community of interest to explore the possibilities for community solar development. Use the Community Equity & Low-Income Checklist to guide these conversations.
- Understand the needs and interests of the community that your project will serve and how a community solar project can respond to those needs and interests. Review the first section of the Community Solar Equity Checklist on "Planning" while completing the list of activities above.

- Determine a pricing model using lessons learned from community engagement.
- Consider pros and cons of Community Solar Cooperatives and Co-Benefits
- Learn how to Build a Subscriber Pool through Community Engagement: Take the lessons that you learned from analyzing outreach results and use them to begin creating your program siting, design, financing, customer acquisition, and marketing plans. More information about Subscription Management can be found in chapter 7.
- Continually inform your community of the process and progress of your community solar project.

Eyes on Equity

Steps to take ensure that you reach LMI Communities in your Community Engagement Process:

- ☑ Identify historically underserved communities and invite community members, community representatives, and community-based organizations to the conversation.
- ☑ Be intentional about when and where engagement events occur, and consider evenings and weekends to ensure strong attendance with flexibility to support the community needs.
- ☑ Compensate participants for their participation and expertise.
- ☑ Create a linguistically and culturally accessible engagement strategy that includes transparency and accountability to the community.
- ☑ Partner with communities to design and deliver programs: See the Clean Energy States Alliance's Community Outreach and Solar Equity: A Guide for States on Collaborating with Community-Based Organizations for best practices and principles for developing relationships with community groups.
- ☑ Do not end your outreach once you have gotten initial feedback. As a part of your community solar project, continue to ask for feedback and talk to the customers you serve, especially LMI households.

Additional Resources

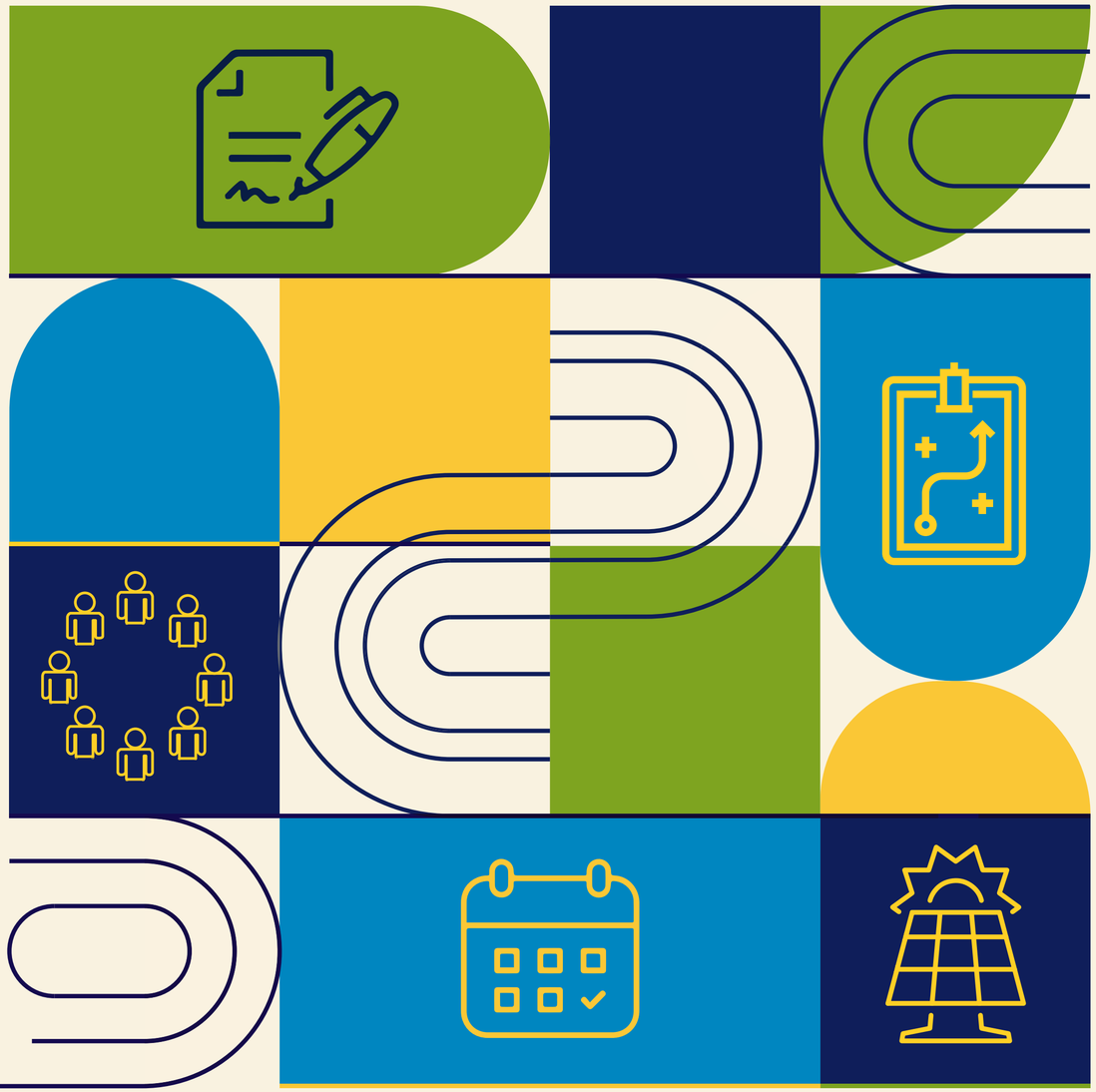
ENGAGING COMMUNITY PARTNERS

- Up to the Challenge: Communities Deploy Solar in Underserved Markets report provides insights from innovative projects that demonstrate that expanding solar access to under-represented markets is economically feasible.
- Community Engagement Guide for Sustainable Communities describes the Sustainable Communities Initiative, where communities are catalyzing new networks of relationships, finding new problem-solving methods, and creating new inclusive decision-making tables to craft an authentic vision for an equitable and prosperous future.

STAKEHOLDER ENGAGEMENT

- Stakeholder Engagement | SolSmart toolkit provides different formats for convening and engaging stakeholders–This section of *Solar Energy: SolSmart's Toolkit for Local Governments* provides guidance to municipal and county staff on how to develop and implement an engagement strategy.

CHAPTER 4
Community Solar Development Process and Contracts



PROJECT READINESS QUESTIONS

1. What are the steps in the development process?
2. How do you build a project development timeline, including key milestones?
3. Which are the key contracts required in the solar development process?
4. Who are the members of your development team?

Background

This chapter steps you through the tasks necessary to develop an LMI community solar project, teaches you how to develop a timeline and milestones for project completion, outlines the legal contracts required, and clarifies who should be part of your development team. The Solar Development process is not linear—it is very iterative. We recommend that you start the process by using the Community Solar Development Task List template provided to create an initial vision of the tasks that will be necessary to accomplish an LMI Community Solar project.

As you delve into each task, you will learn more about what is required and how the tasks affect one another, which will encourage you to go back and revise your approach to some tasks. This process is completely okay. Each iteration of the task list will refine your development process and bring your project closer to completion.

PREDEVELOPMENT

Initial project feasibility based on physical capacity of site, utility regulations, market conditions, availability of financing, and local community regulations

DEVELOPMENT

Once enough basic information is gathered in the Predevelopment stage to determine that a project is viable, the formal development process begins

CONSTRUCTION

Mobilization, installation, and preparation for operation

OPERATION

Formally setting up maintenance, accounting, and billing protocols

DEVELOPMENT ROLES

Watch 6 Key Development Roles

When considering solar development, it is essential to evaluate your organization's strengths and expertise to identify the roles that you are well-suited to play in the development process. For example, you may have experience in site selection, project management, or community engagement, which can help you take a lead role in certain aspects of solar development. However, it is also important to recognize areas where your organization may lack expertise or resources and consider seeking a partner to fill those gaps. Working with a partner can provide valuable support and expertise, particularly in areas such as financing, legal and regulatory compliance, and engineering and construction. Ultimately, by identifying your organization's strengths and partnering with other organizations that complement those strengths, you can maximize your chances of success and ensure that the solar development process is efficient, effective, and sustainable.

A developer must be a jack of all trades, yet does not need to be a master of any. Developers hire many expert consultants and vendors to guide the process, but **developers** must lead the following roles:

1. **Financing and Capital Raising.** Developers' primary role is to lead the financing of a project, which includes accurately predicting expenses and revenues, building financial models, secure financing, and ensuring benchmarks are being met to release financing. Community solar developers may work with financing entities to raise the necessary capital to fund projects. This could include seeking investment from private equity firms, banks, and other investors who are interested in supporting renewable energy projects.

2. **Vendor Evaluation.** After financing, developers' second most important role is vetting, hiring, and managing a team to get the job done, which includes Requests for Proposals (RFPs) for services, vetting bids, creating task lists, and contract negotiations.

3. **Project Management.** After vendor evaluation, developers' third most important role is managing and coordinating all of the vendors to ensure that the project gets done on time and as expected, which includes scheduling and facilitating regular team meetings, taking notes and ensuring follow-up, problem solving, and mediation between vendors.

4. **Site Identification and Acquisition.** A developer must be an expert in identifying and acquiring suitable sites for community solar projects. By saying "acquiring," we mean securing site control. Acquiring sites is one of the most important roles of a developer.

5. **Creative Financing Strategies.** Community solar developers who specialize in bringing creative financing sources into projects are the best at providing deep benefits to LMI Communities.

6. **Partnerships.** Developers are experts at pulling together a coalition of consultants, funders, and community members to get a project approved, financed, built, and into operation. They are the leaders of the team. They find answers to any questions that can not be answered by anyone on the team, and they politely push the powers that be until "No's" and "Maybe's" turn into "Yes's."

The following roles can be hired out by developers to a vendor but developers must at least participate and oversee this work to ensure quality control:

7. **Community Engagement.** This role can be hired out but having the developer play the community engagement role helps build trust with the community and ensures success of the project. Community engagement is delicate and is tied to permit approvals. Therefore, it is highly advisable to at least participate at some level in this role.

8. **Subscription Management.** Subscriber management requires dedicated staff and sophisticated software tools to track customer interactions. Some developers choose to handle this effort in house, but because of the expertise and capacity required, many hire out.

9. **Marketing and Sales.** Subscription management will include marketing and selling community solar subscriptions to customers. This work could be led by a Subscription Management vendor, but developers should participate in efforts to build relationships with community organizations and local businesses to promote participation.

10. **Project Design and Engineering.** Even though many people have the skills to design solar projects, in order to submit for permits, project designs must be stamped by a professional engineer. Some larger developers maintain a professional engineer in house, but most developers do not. Most developers hire vendors for engineering services. Regardless if you hire out, you should remain deeply involved in the design because it is one of the biggest drivers of cost.

11. **Permitting and Regulatory Compliance.** Developers are responsible for securing the necessary permits and approvals for community solar projects. Professional engineers, electrical contractors, and legal counsel should be hired to ensure that projects comply with government regulations and utility requirements.

12. **Construction Management.** Once a community solar project has received permitting and funding approvals, developers are responsible for overseeing the installation. This oversight includes coordinating with contractors, overseeing the installation of solar panels and other equipment, and ensuring that the project is completed on time and within budget. Some developers hire outside construction management but most do not. At minimum, we recommend that you hire a 3rd-party engineer to ensure quality control.

13. **Asset Management.** Asset Management involves overseeing the daily operations of the project, which includes managing the maintenance team, paying bills, and accounting.

14. **Operations and Maintenance.** After a community solar project is completed, the project owner will be responsible for its ongoing operation and maintenance. This can include monitoring system performance, conducting routine maintenance and repairs, and ensuring that the project is running efficiently.

DEVELOPMENT PROCESS PHASES

The typical LMI Community Solar Development Process mirrors that of other similar construction-type projects, which includes the following phases:

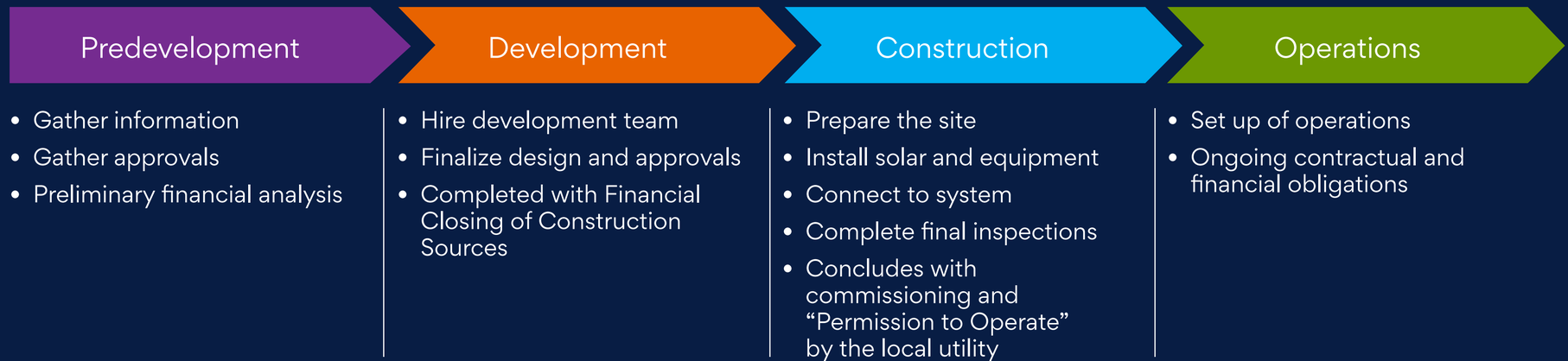
Predevelopment. In this initial stage you gather the information needed to perform a preliminary financial analysis and determine whether a project is viable. The goal in this stage is to spend as little money as possible to determine project viability. This phase culminates in a presentation of everything required to earn approval from your organization leadership to move forward into the development phase.

Development. Once it is determined that your project is viable, then the project development phase begins. Here is where you finalize the design, government and utility approvals, financing, and legal structure for your project. The phase concludes with a "Financial Closing" on the sources of capital that you will utilize to construct the project.

Construction. This is the phase where the project is built and connected to the grid. It requires coordination between the solar installers, property owners, financiers, and inspectors to complete the project. This phase concludes with commissioning and "Permission to Operate" by the local utility.

Operations. This phase includes the setup of operations, including performance monitoring, accounting systems, and subscriber billing. Once the system is operational, if you are the long-term owner of the asset, you will need to handle ongoing contractual and financial obligations and you will need to ensure peak operational performance of the solar array. Financial obligations will include not just paying capital providers but will also include subscription costs and bill credits. A third-party asset owner can be hired to handle parts or all of this activity. You should maintain parallel monitoring of the system.

The Development process concludes once all standard operating procedures are being implemented as anticipated and the system is performing as designed.

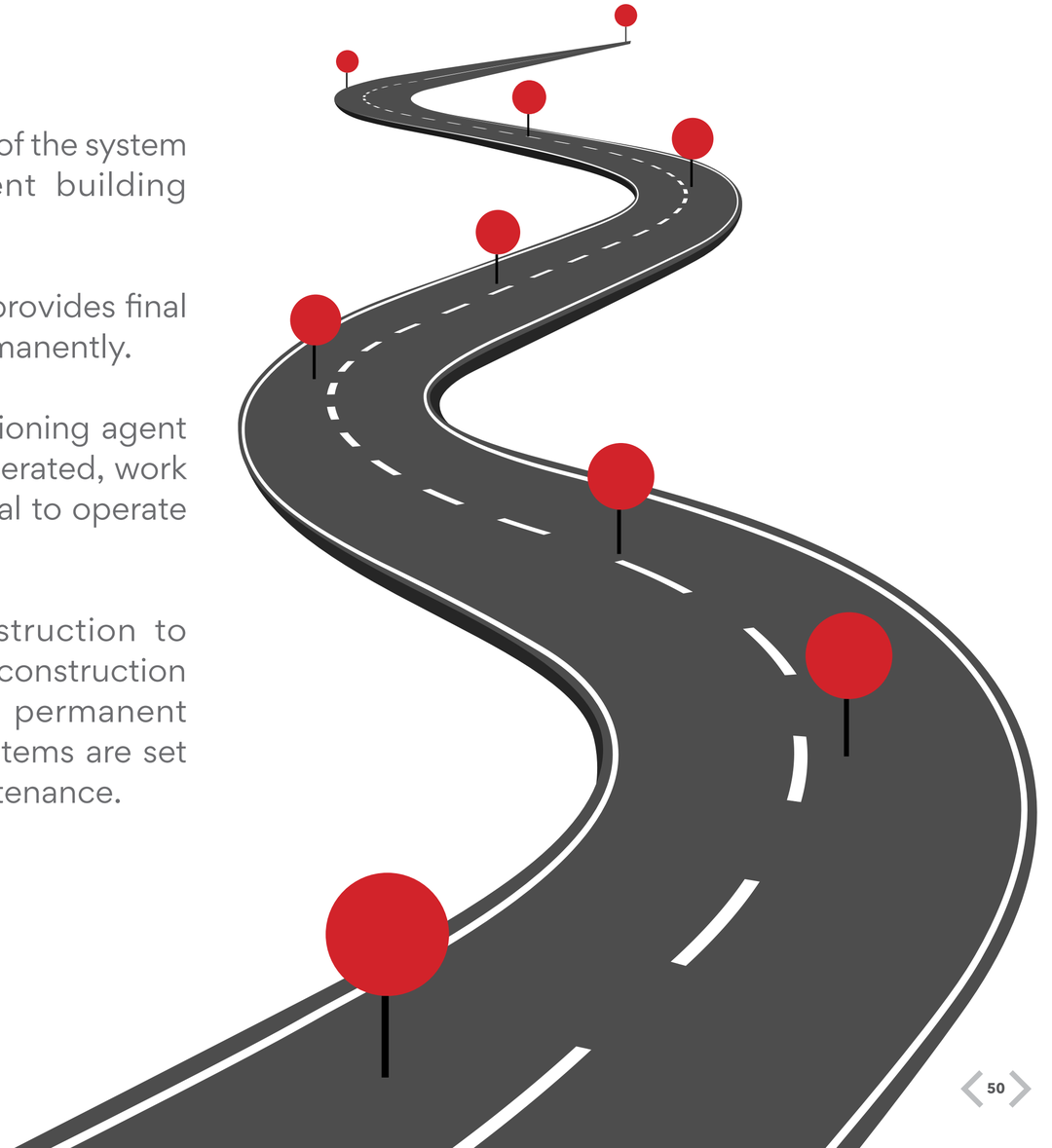


Source: Housing Sustainability Advisors

DEVELOPMENT MILESTONES

The typical LMI Community Solar development project includes the following milestones:

- **Initial Leadership Approval.** If you are part of a larger organization, once initial due diligence is complete, you will need to make a formal presentation to organizational leadership to earn approval of your project to move from Predevelopment to the Development phase.
- **Local Government Permit Application Submission.** Design is complete and submitted to the local government building department for approval.
- **Utility Interconnection Application Submission.** Design is complete and utility interconnection application submitted.
- **Financial Closing.** All utility and local government approvals are achieved, funding sources are lined up, and legal documents are executed to begin drawing funds for construction.
- **Notice to Proceed with Construction.** Developer formally notifies installer to begin.
- **Substantial Completion.** Completion of the system installation and local government building inspection approval.
- **Permission to Operate.** Local utility provides final approval to turn the system on permanently.
- **Commissioning.** 3rd-party commissioning agent inspects the project, punch list generated, work completed, and signed off. Approval to operate by the local utility.
- **Operations.** Transition from construction to operation. The obligations for the construction financing sources are complete, permanent financing is put into place, and systems are set up for ongoing operation and maintenance.



Action Items

PREDEVELOPMENT

- To start, review this slide deck describing an overview of the development process.
- Ensure LMI community solar is feasible in your local market.
  - This video provides tools for understanding your solar market.
- Choose your site. Review content gathered in Chapter 3 to identify a suitable site, identify site characteristics, determine land regulation and permitting needs, and connect with the local utility to determine grid access connection and substation load.
- Review the Community Solar Development Task List Template and define your organization's role in the development process.
- Identify the tasks that your organization would be best suited to perform as well as why you made that decision.
- Identify which tasks you would rely on partners to conduct and what would be needed from these partners.
- Create a memo for leadership summarizing project details and risks in order to receive approval to move forward into the development phase.
- Determine required consents to develop your project (i.e., permits, utilities, property ownership entities). You can utilize the community solar consent tracker.
- Learn your state's regulatory policy and utility policy. You can utilize the content provided in Chapter 2.
- Perform an initial project scope. You can utilize the tools provided in Chapter 3.
- Prepare initial financial model and financing strategy. Gather all initial assumptions required to build a reasonable financial model.
- Prepare a Development Project Budget, including all the costs required to get to a financial closing. A template Development Project Budget can be found in the LMI Community Solar Proforma Template.
- Prepare an initial subscription management strategy. Utilize the content provided in Chapter 7. Include who will subscribe to your project, how subscriptions and bill credits will be managed, and how much might it cost.
- Prepare an initial community engagement strategy. Utilize content provided in Chapter 4.
- Research and propose an initial development team. Utilize content from Chapter 4. Use the Community Solar Development Team Template to identify other roles and track team member roles. See the 6 key roles that team members play in this video.
- Present memo to leadership for approval to move to the development phase. Template here.

DEVELOPMENT PHASE

- Build a Development Schedule. You can use the Development Schedule Template.
- Hire development Team. Issue RFPs and negotiate contracts.
- Finalize a system design.
- Draft and implement subscription management strategy using this task list.
- Draft and implement a community engagement plan.
- Earn all necessary consents.
- Draft and negotiate legal contracts. See key contracts list.
- Negotiate development sources of capital and close financing.
- Issue Notice to Proceed for Solar Installer to start construction.

CONSTRUCTION PHASE

- Prepare the site, including grading and site access.
- Install solar racking and panels.
- Install inverters and wire solar equipment to the inverter pad.
- Connect the system to the electrical grid.
- Complete final inspection.
- Commission system.
- Apply for and earn utility interconnection approval.

OPERATION PHASE

(See Chapter 7 for more details on these steps.)

- Satisfy the obligations of construction financing and convert to any permanent sources.
- Settle all construction contracts.
- Set up performance monitoring.
- Set up banking and accounting system.
- Set up subscriber management and billing.
- Set up a system to track the benefits going to LMI households over time.

Eyes on Equity

Below are the high-level areas where you can ensure that equity is part of the development process:

PREDEVELOPMENT PHASE

- Ensure that you are utilizing all the available state incentives to be able to provide additional benefits to LMI subscribers, such as providing deep bill savings.
- In your leadership memo, highlight and quantify the benefits going to LMI households.

DEVELOPMENT PHASE

- Choose development team members experienced in delivering benefits to LMI households.
- The best opportunities to ensure equity is part of your project come in the development and execution of your community engagement and subscription management strategies. Ensure that you include specific tasks within these plans to engage with LMI households and that you develop an engagement plan that is authentic, transparent, and responsive to the community. Ensure your financial model clearly defines the benefits being provided to LMI households.

CONSTRUCTION PHASE

- Consider incorporating job training for local residents into the project.

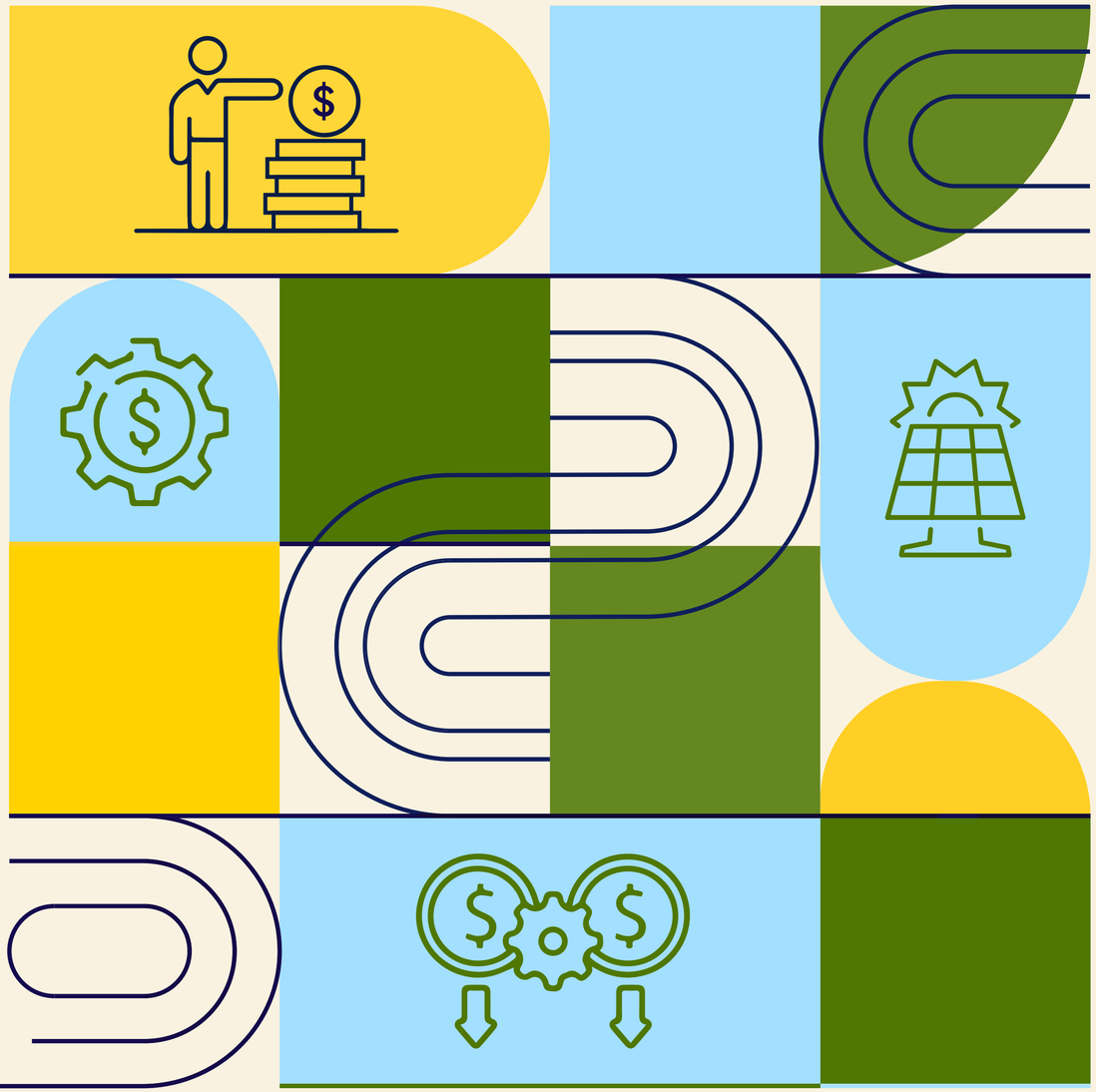
OPERATION PHASE

- Ensure that LMI residents are continue to be engaged in subscription management process and subscriptions.
- Track the benefits going to LMI households over time.

Additional Resources

- EPA Solar Development Process Tool. Most on-site renewable energy projects follow a common project development pathway from a project's conception to its completion. This page outlines the major steps you will take along your pathway.
- NREL Guide to Community Solar: Utility, Private, and Non-profit Project Development. This guide is designed as a resource for those who want to develop community solar projects from a broader perspective, including community organizers or solar energy advocates to government officials or utility managers.
- Resource list. Module #4–Community Solar Development Process and Contracts
- Milestones on the road to commercial operation. This article shares several kinds of risks that are typically the subject of lengthy negotiations and concludes with two case studies of dispute resolution.

CHAPTER 5
Community Solar Financial Modeling & Project Structuring



PROJECT READINESS QUESTIONS

1. What are the basic financing structures for LMI community solar?
2. How do you build a basic financial model to reflect your solar project?
3. From the funder perspective, what makes a “good” or “bad” solar project?
4. How do you determine if you need gap financing or grants to make your project viable?

Background

Becoming an LMI Community Solar developer requires a fundamental understanding of financial structuring. This chapter provides a brief introduction to solar project finance and lays the groundwork for you to begin building your own financial models.

BASIC SOLAR EQUIPMENT FINANCE

Once solar developers work with solar installers to determine the upfront cost to build their projects, they must find the sources of capital to cover the upfront costs. Most upfront capital contributed to solar projects must be paid back over time throughout the operation of the project. These sources are provided with an expectation of a minimum investment return. Initial investment returns for all sources are projected in financial models at the beginning of projects and then it is up to solar developers and operators to ensure the projects perform to certain expectations and repay capital providers. For LMI community solar projects to be considered financially successful and for developers to earn repeat business, projects must provide both the meaningful community benefits included within and exceed initially projected returns for all capital providers, which is calculated in the returns tab of the financial model.

In order to understand LMI community solar finance, it is critical to first learn standard community solar finance. This is because both financing models are functionally the same. They both require upfront capital for construction, reliable ongoing revenue sources, dollars to fund operating expenses, and then cash distributions to pay back owners and investors for providing upfront capital. The LMI Community Solar finance structure just adds a financing layer for LMI benefits. Before you become an expert at providing LMI benefits in your solar projects, you must first learn how to balance upfront costs against ongoing cash distributions to meet owner and investor return expectations.

Upfront capital to fund solar projects can come in two main forms—equity and debt. The difference between equity and debt is that equity is paid into a project in exchange for a share of ownership and

cash flows, while debt does not include ownership. Debt is paid into a project in exchange for a fixed repayment during operation. The sequence of debt and equity repayment is defined in a project's Operating Agreement. Generally, the revenues received by a solar project are paid in a sequence of payments called the "cash flow waterfall," which typically looks like this:

All expenses are paid

Fixed debt payments are made to lenders

Equity investors and owners split the remaining cash based on percentage of their ownership and/or other provisions in the Operating Agreement.

Tax equity and grants are considered other forms of equity that are used to finance the upfront cost of community solar. These sources are very critical for LMI Community solar developers because they generate more cash for construction, but this cash does not need to be paid back with the revenue made during operation, which allows for more benefits to go to LMI customers. Tax equity is cash paid into a project by an investor in exchange for the right to own certain tax certificates that are generated by the development of solar projects. Tax equity investors receive their returns in the form of tax benefits and not cash from operations.

Grants are cash paid into a project in exchange for a certain social good. For example, a foundation might make a grant to a project to provide discounted solar power to low-income households. As long as projects provide these social goods for agreed upon periods, the developer does not repay the cash received through the grant.

A deferred developer fee is another potential source of equity for a project. Deferred developer fee is money charged to a project by a developer that is not paid upfront, but instead is left in the project until the project has been completed and is instead paid from project operating.

Sponsor equity is the last potential capital source, which comes from the project developer's own contribution of capital from concept through start-up and operation. This investment is the highest-risk capital because it gets paid back last after all other sources.

COMMUNITY SOLAR FINANCIAL MODELING

A financial modeling template is a tool used by developers during the development process to create a financial plan for a project. It provides a framework for estimating the costs and revenues of a project over its lifetime, as well as the potential risks and returns associated with the investment. Community Solar Financial Modeling entails gathering and organizing a set of technical and financial assumptions to tell a story about how upfront costs of projects are funded, how specific sources of capital are allocated to specific upfront costs, and how much revenue and expense a project will incur during operations.

A good financial model should include a project scope, sources and uses, loan terms, an annual operating budget, year over year revenue and expenses, as well as a sensitivity analysis to assess the impact of different variables on the project's financial performance. There are many templates and calculations that can be added to community solar financial models, but all financial models should lay out the following information and calculations:

Project Scope. An overview of all the technical assumptions about your project, such as project location, size, anticipated performance, power value, energy savings, etc.

Sources and Uses. An overview of the upfront expenses necessary to complete the installation of a project and the upfront sources that will be used to fund all expenses.

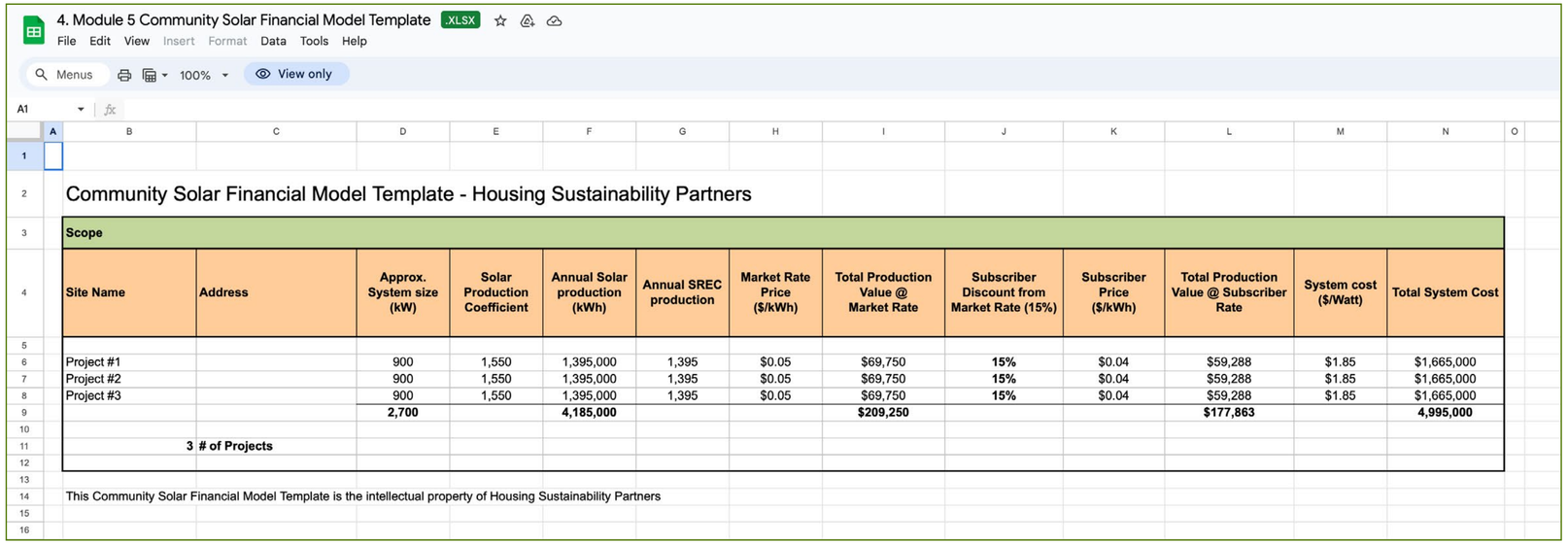
Loan. Upfront loan amount and agreed upon repayment terms are input to calculate an ongoing payment amount during operations.

Proforma. A year over year calculation of the ongoing revenue and expenses for a project. The template includes an expectation of the amount and timing of repayment for equity investors.

Grants/Incentives. A template used to calculate an upfront grant that can be used as a source of ongoing incentive that increases operating revenue.

FINANCIAL MODELING TEMPLATE

There are several financial modeling templates available online that can be used as a starting point, such as those provided by the National Renewable Energy Laboratory (NREL) or the Solar Energy Industries Association (SEIA). What is most important is that you clearly understand the financial model and explain all your assumptions and results. The template provided in this workbook was created by Housing Sustainability Advisors and adjusted over ten (10) years of trial and error. You will notice that it is simpler than most other financial modeling templates available. This simplicity is intentional to keep the developer focused on the primary factors determining project financial success and to manage project risks. The template can be customized to fit the specific needs of the project and to reflect the unique assumptions, costs, and revenue streams associated with community solar development.



4. Module 5 Community Solar Financial Model Template .XLSX

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Community Solar Financial Model Template - Housing Sustainability Partners

Scope												
Site Name	Address	Approx. System size (kW)	Solar Production Coefficient	Annual Solar production (kWh)	Annual SREC production	Market Rate Price ($/kWh)	Total Production Value @ Market Rate	Subscriber Discount from Market Rate (15%)	Subscriber Price ($/kWh)	Total Production Value @ Subscriber Rate	System cost ($/Watt)	Total System Cost
Project #1		900	1,550	1,395,000	1,395	$0.05	$69,750	15%	$0.04	$59,288	$1.85	$1,665,000
Project #2		900	1,550	1,395,000	1,395	$0.05	$69,750	15%	$0.04	$59,288	$1.85	$1,665,000
Project #3		900	1,550	1,395,000	1,395	$0.05	$69,750	15%	$0.04	$59,288	$1.85	$1,665,000
		2,700		4,185,000			$209,250			$177,863		4,995,000
	3 # of Projects											

This Community Solar Financial Model Template is the intellectual property of Housing Sustainability Partners

UPFRONT CAPITAL COSTS (USES)

The upfront capital costs required to build and set up the project for operations, also referred to as "Uses," can be separated into the following buckets:

Construction costs. These include costs associated with installing solar panels and other equipment, as well as labor costs.

Site acquisition costs. These include costs associated with securing site control.

Permitting and regulatory costs. These include engineering and fees for obtaining permits and complying with regulatory requirements.

Financing costs. These include fees and interest charges associated with obtaining financing for the project.

Administrative, legal, accounting costs. These include costs associated with setting the business structure, negotiating funder agreements, and financial accounting.

OPERATING REVENUE

With Community Solar, Operating Revenue refers to the income generated by the project's energy production and sales, typically through contracts with LMI customers. Revenue can be calculated by multiplying the energy produced by the project by the agreed-upon rate, also referred to as the Subscriber Rate or PPA rate.

A customer subscriber agreement is a contract between a solar energy provider and a customer that specifies the price at which the customer will purchase electricity generated by the solar project over a defined period. Forecasting the subscriber rate for a community solar project can be a complex process that involves using different methods such as comparing the customer rate to utility prices, using a calculator provided by a utility, or forecasting wholesale energy prices. A subscriber rate for solar electricity can be fixed or floating. A fixed rate means that the price remains constant throughout the contract period, while a floating rate means that the price varies depending on standard utility energy rate. The customer rate can also have an escalator clause, meaning that the rate increases over time, usually in line with inflation or other predetermined factors.

The subscriber rate for a community solar project should be estimated as early as possible in the development process. It is critical to have an accurate estimate of the subscriber rate in order to determine the financial feasibility of the project and to secure financing. The subscriber rate is typically estimated during the project planning phase, after the solar developer has conducted a preliminary assessment of the project site, evaluated financing options, and determined the expected energy output of the project. This information is used to develop a preliminary subscriber pricing model and estimate the rate.

As the project progresses through the development stages, the solar developer will continue to refine the subscriber rate estimate. For example, as more detailed engineering and construction plans are developed, the solar developer may be able to refine the project costs, which will in turn affect the subscriber rate. As the project moves closer to construction, the solar developer may also be able to secure more detailed financing terms, which will also impact the subscriber rate.

If applicable in your locality, Renewable Energy Credits (RECs) should be included in revenue sources, estimating the price that the project will be able to sell any RECs it generates, as well as any income the project may receive through participation in state renewable energy credit programs.

OPERATING EXPENSES

To generate a positive return on investment, community solar developers must make accurate estimates upfront regarding future ongoing operational costs. While operational upkeep is typically minimal for solar energy installations relative to real estate assets, solar owners must be prepared for occasional part failures, fixes, and replacements. Below are the typical operating expenses that you should prepare for:

Operations and maintenance costs. These include hiring a vendor to perform ongoing monitoring and maintenance on the solar system, as well as any necessary repairs.

Insurance and taxes. These include costs associated with insuring the project and paying property taxes.

Marketing and outreach costs. These include costs associated with promoting the project and attracting subscribers.

Site Lease. This includes any payment made to the land owner for the right to continue operating the solar facility on the site.

Administrative and legal costs. These include costs associated with managing the project and complying with legal requirements.

Subscription management. These include payments made to the vendor managing the customer subscriptions and invoicing for the project.

Operating capital. Operating capital refers to the funds that a project company has available to finance its day-to-day operations.

By knowing operating expenses and exactly how much energy is going to be produced by a project, solar owners can then weigh total expenses against revenue and ensure long-term profitability.

MITIGATING LENDER RISKS

With solar project financing, lenders may require either collateral and/or guarantees to mitigate the risks associated with projects, providing additional layers of protection against loan defaults. Collateral refers to any property or assets that a borrower pledges to a lender as security for a loan. In the context of solar project financing, the collateral typically refers to the solar panels and equipment that will be used to generate revenue, the project's actual revenue, and/or the project's real estate. The collateral serves as a protection for the lender, as they can seize and sell the assets if the borrower defaults on the loan. Or it provides lenders with a source of repayment if the project fails to generate enough revenue to pay off the loan.

In addition, lenders may require developers to provide guarantees to secure financing. Guarantees provide lenders with assurances that a third-party will step in to repay loans if the borrower defaults. These guarantees can be in the form of personal guarantees or corporate guarantees. Often, guaranteed loans have better terms and are easier to close because they are much less risky for lenders. Yet, a company's assets must be quite high for a lender to accept a guarantee. Pledging collateral is the most common form of lender security required, while guarantees are much less desirable to borrowers and less typical. Collateral and guarantees provide lenders with a greater level of security and increase the likelihood of lenders making loans.

Action Items

PROJECT SCOPE

- Gather solar energy production assumptions from installer and/or solar design software tools. For a more in-depth explanation of solar resources, check out this PowerPoint.
- Assumptions include site names, addresses, solar system sizes (KW), annual solar production potential (kWh), upfront system cost, utility power rates ($/kWh), community solar value ($/kWh), subscriber purchase price ($/kWh), and environmental attributes generated.

SOURCES AND USES

- Reach out to local vendors to determine upfront project development and installation costs. Solar is priced based on $ per Watt. Community solar pricing across the country ranges from $2/Watt on the low end to $4/Watt, depending on local labor rates and installation type (i.e., rooftop, ground mounted, carport canopy, etc.).
- Size development fee between 10-20% of total project costs, depending on how much the project can afford.
- Calculate tax equity generated. For more information on the tax credit, please see Tax Equity Investor Term Sheet and the Novogradac Renewable Energy Tax Credit Resource Center. Please note that the authors are not tax professionals. Before making accounting or tax decisions, consult a certified accounting professional.
- Reach out to lenders to determine basic loan terms.
- The loan amount must be sized to a payment amount on the proforma template that is not less than 85% of the Net Operating Income, or 1.15 Debt Service Coverage Ratio (DSCR).
- Use the incentive template to calculate any upfront or production-based grant amounts.
- Ensure the sources match the uses and the gap/surplus is zero. If sources and uses do not match, and there is a gap, then you will have to find another grant or contribute sponsor equity.
- Include a strong contingency against escalating costs during installation. Five (5) percent of hard cost is a small contingency. Fifteen (15) percent is probably too high. The higher the contingency, the harder the project is to finance upfront, but over the long run it reduces significant stress and further ensures project success.

LOAN

- Reach out to lenders to get indicative loan terms for your project. You must get at least the maximum loan amount, interest rate, term, and minimum Debt Service Coverage Ratio. For more detail on the indicative loan terms to gather, see the Debt Due Diligence Template and Debt Term Sheet Template.

GRANTS/INCENTIVES

- Research all available grants and incentives for your project. State solar incentives are usually sized based on project size. Use the "Incentives" tab of the financial modeling template to perform any necessary calculations to determine the grant size.

PROFORMA

- Reach out to vendors and confirm expense assumptions are correct.
- Ensure any loan is sized to the proper debt coverage ratio.
- If a solar company is a taxable entity, ensure the project has enough cash flow to pay taxes.
- Check that equity investment sections are working correctly and the cash flow is sufficient to repay equity. You should be projecting above a 10% Internal Rate of Return (IRR) on equity invested into the project.
- If IRR is considerably above 10%, then you may make more cash available to reduce the price of power for sale to LMI customers.

DOES YOUR DEAL "PENCIL OUT?"

Penciling out is a term that developers use to refer to whether a deal makes financial sense or not. They typically measure whether a deal pencils out in the following ways:

Internal Rate of Return (IRR). Good is between 10%-20%.

Annual Cash on Cash Return. Should be over 8% hurdle rate. A hurdle rate is the minimum rate of return required for a company or investor to move forward on a project. Most companies factor in a risk premium when determining their hurdle rate, assigning a higher rate to riskier projects and a lower rate to projects that present more moderate risks.

Total Cash Flow. There is no magic number here. It's whatever amount the developer feels like is worth the time and risk.

Payback period. Refers to how quickly your initial equity is returned. Most developers are interested to know the point at which their initial investment has been returned and they are earning money beyond that.

TAKE NOTE

Tax Equity Changes from the Inflation Reduction Act (IRA)

On August 16, 2022, President Joe Biden signed into law the Inflation Reduction Act of 2022 (IRA), which includes new and revised tax incentives for clean energy projects. This resource is a summary of an excellent resource provided by Novogradac on the IRA impact on tax credits for community solar, which were extended and significantly expanded. Please note that the authors are not tax professionals. Before making accounting or tax decisions, consult a certified accounting professional.

Tax Credit Bonuses

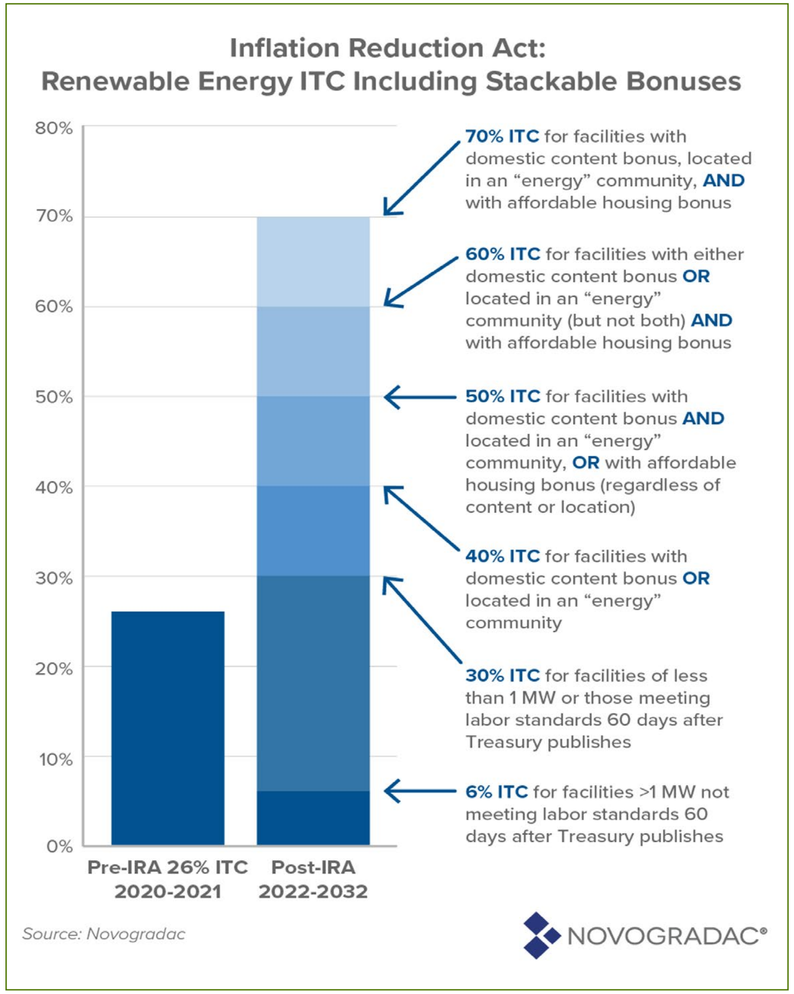
1. Low-income bonus: Used to promote cost-saving clean energy investments in low-income communities, on Indian land, as part of affordable housing developments, and benefitting low-income households. Adds an additional 10% to 20% for low-income projects
2. Energy Community Bonus: +10% Investor Tax Credit (ITC) bonus for three types of sites—Brownfield sites, a.k.a. Superfund, Metropolitan Statistical Areas (MSAs) in coal, oil, or natural gas industries with unemployment higher than the national average, or Census tracts where a coal mine or coal-fired electric generating unit closed
3. Domestic content bonus: +10% ITC Bonus—Steel and Iron (All steel and iron manufacturing processes must be in the U.S.) and Manufactured Products (A set percentage of the total costs of all manufactured products within a facility are attributable to manufactured products in the U.S.)

Direct Pay For Nonprofits

If an applicable entity makes a direct pay election, the amount of the tax credit is treated as a deemed payment of tax, which for a not-for-profit entity without taxable income, results in a cash refund payable by the government. Direct pay is only available to rural electric cooperatives, municipal utilities, and other tax-exempt entities such as local and Tribal governments.

Transferability

The IRA made Solar Investment Tax Credits completely transferable to another unrelated taxpayer, which opened the market for solar tax equity to many other tax equity investors and made deal structuring easier and less expensive.



Eyes on Equity

The key to unlocking more benefits for LMI communities through financial modeling and structuring lies in your ability to find sources of capital that do not require repayment from the cash flow waterfall. The cash flow waterfall refers to the order in which cash flows are distributed and paid back among various stakeholders in a project.

Typically, in a solar project, the first priority for cash flow distribution is debt repayment, followed by returns for equity investors, and then any remaining cash flow is distributed to other stakeholders, such as community members. If sources of capital are identified that do not require repayment, such as grants or tax credits, more cash flow becomes available for distribution to lower the cost of community solar subscriptions and pass on more savings to LMI customers.

Learn more about Project Finance for accelerating LMI Solar Access

Additional Resources

- Unlocking Solar for Low- and Moderate-Income Residents: A Matrix of Financing Options by Resident, Provider, and Housing Type: this NREL guide provides a matrix of financing options for LMI community solar projects for different housing types.
- SUNDA Project: a financial modeling tool from the National Rural Electric Cooperative Association (NRECA) for rural electric cooperatives developing community solar.
- Determining solar costs: U.S. Solar Market Insight Report and Lawrence Berkeley National Laboratory's annual update of utility-scale solar data and trends.
- Join the Community Power Accelerator: Powered by the U.S. Department of Energy, the Accelerator provides training, technical assistance, and bridges the gap between solar projects that need funding, and lenders who want to finance them, expanding access to affordable solar energy.

CHAPTER 6
Community Solar Asset Management & Operations

PROJECT READINESS QUESTIONS

1. What are the components of community solar operations and maintenance?
2. What are the components of community solar asset management?
3. How do you design an O&M plan?
4. What strategies will you use to get your project to its peak performance?

Background

There is something so exciting and gratifying about solar development—watching a vacant piece of land or empty rooftop be reshaped and turned into a solar generation facility. Yet, the very best developers know that true project success must be measured by how a system operates. Completed systems still only represent “potential” solar benefits.

Operation is when developers have the opportunity to prove how closely their projects actually perform relative to original projections. And projects do not perform as projected without continuous management. Because asset management requires long-term and consistent follow-up and oversight, it can often prove to be one of the hardest parts of the community solar development process.

Asset Management is defined as the process by which a community solar installation is overseen during its operation. The goal of asset management is to optimize performance, value, and lifespan of the solar system, while minimizing costs and risks. More specifically, solar asset management helps you:

- Improve investment performance
- Ensure lender and investor repayment
- Ensure benefits flow to LMI Communities
- Meet financial and code compliance requirements

Asset management includes:

1. **Financial Management.** Effective financial management is necessary to ensure a community solar project is profitable and sustainable. This includes budgeting, forecasting, financial reporting, and identifying cost-saving measures and revenue-generating opportunities, as well as filing annual taxes and making cash distributions to the investor members.

2. **Accounts Payable.** Accurate and timely billing and invoicing is essential to maintaining good relationships with subscribers. This includes generating invoices, collecting payments, and addressing any billing issues or disputes that arise.

3. **Financial and Regulatory Compliance.** Compliance with financials and regulatory requirements is necessary to ensure the community solar project is operating legally and safely. Financial compliance includes providing all regular reports required to investors and lenders from operating agreements and loan documents. Regulatory compliance includes obtaining permits and licenses, adhering to safety standards, and complying with state and federal regulations.

4. **Subscriber Management.** Subscriber management involves maintaining accurate records of subscriber information, responding to inquiries, and addressing any issues or concerns that subscribers have. This includes providing customer support and maintaining a user-friendly online portal for subscribers to manage their accounts. Some solar owners decide to hire outside vendors to perform these services.

5. **Monitoring and Reporting (part of O&M).** Regular monitoring of the solar project's performance is essential to identify any issues or areas for improvement. This includes monitoring the system's energy production, equipment performance, and weather conditions. Reports should be generated regularly to track the solar project's performance and identify any trends or issues. This is typically a shared task between the solar owner and an outside Operations and Maintenance vendor.

6. **Maintenance and Repairs (part of O&M).** Routine maintenance is necessary to ensure the solar project is operating at peak efficiency. This includes cleaning solar panels, replacing worn or damaged equipment, and repairing any issues that arise. A maintenance schedule should be established and adhered to in order to keep the system in good condition.

Operation & Maintenance (O&M) is a component of Asset Management. O&M refers to actual technical system monitoring and reporting, and maintenance and repairs of solar systems. The primary goal of O&M is to perform all necessary tasks to ensure that systems perform as productively as possible for as much time as possible, which increases revenue and LMI benefits. Most solar owners perform all the asset management tasks internally, except for O&M. O&M requires a technical team to perform daily system monitoring, respond to any alarms, perform regular maintenance inspections, and make any necessary repairs to ensure that assets are operating at their best.

Great asset management requires a comprehensive approach to overseeing solar assets throughout their lifecycle, from acquisition and installation to operation, maintenance, and disposal. As such, in this chapter we outline the specific components of community solar asset management and how to make a solid asset management plan.

Action Items

ASSET MANAGEMENT

- Learn the components of Community Solar Asset Management by watching this video.
- Decide whether to perform asset management in-house or outsource the work. It is common for smaller and newer community solar developers to outsource O&M and Subscriber Management, but it is not typical to outsource the other asset management activities. This is because no other company ever counts the numbers more accurately and consistently than the owner. As such, we do not recommend outsourcing any other asset management functions beyond O&M and Subscriber Management.
- Put together a spreadsheet of key asset management tasks by category. You can start from this template.
- Build the tool required to track system production. See the production tracking template.
- Learn more about accounts payable and set up your billing system. Refer to the invoice template. You should consider both an internal billing system for the solar company and the subscriber billing system. To learn more about billing to subscribers, please see the Subscriber Management Plan resource on page 69.
- Prepare a scope of work for operations and maintenance and seek bids from vendors. Once the installation is complete, if the solar company that completed the installation did a good job and has capacity to perform O&M, it can be beneficial to choose them for O&M because they know the system, but this is absolutely not a hard and fast rule.
- Regardless of whether you perform subscription management in-house with internal staff or hire a vendor, you will need to prepare a Subscriber Management Plan. The plan should detail the strategies for customer marketing, acquisition, invoicing, collections, and customer retention.

SUBSCRIPTION MANAGEMENT STRATEGIES

The subscription manager (SM) is typically responsible for overseeing the entire lifecycle of a customer's subscription, including sign-up, billing, customer support, renewal or cancellation, and acquiring new customers when there is turnover. They ensure accurate and timely billing, provide responsive customer support, and use subscription analytics to optimize revenue and retention.

Subscriber acquisition and subscriber management are often the most overlooked items by solar developers. Having a good understanding of your budget and timeline for acquisition/ management are essential. Developers need to have a firm grasp of the project timelines and financials to make strategic decisions around subscription acquisition and long-term subscription maintenance/management. State regulations will also determine how your subscriber management strategy works. For example, some states have consolidated billing in place, in which solar companies can add community solar costs onto local utility bills, whereas in other states solar companies must send separate invoices to each individual solar subscriber.

Learn about Subscription Management by watching this video.

Determine whether you will self-manage subscriptions or hire a 3rd-party manager.

Consider the following:

- What experience does your organization have with any type of subscription management?
- Does your organization have experience in marketing or forming community partnerships?
- Do you have dedicated staff that can perform all management functions including monthly coordination with the utility, regularly bill/ invoice customers, provide customer support, and signup new subscribers?
- What level of subscription (%) do you need to maintain annually to meet your project's financial goals or obligations?

The level of subscription management needed will depend on the size of the project, the cost of the solar installation, and the revenue generated by subscriptions. The specific target of percentage of cost will depend on the project's revenue goals, risk tolerance, and other factors, and should be regularly reviewed and adjusted as needed. If using a third-party, there will be an annual maintenance fee per kilowatt hour or subscriber. If taking on subscriber management yourself, there will be labor costs and costs around subscriber replacement that will be incurred.

For more information on tasks covered under Subscriber Management, refer to the **Subscriber Management Task List**.

BEST PRACTICES FOR BUILDING COMMUNITY SOLAR SUBSCRIBER POOL

- Charge no upfront fees.
- Charge no cancellation fees.
- Materials should be available in multiple languages.
- Month-to-month terms provide the most flexibility and encourage participation across subscriber classes.
- Inform subscribers of their expected savings. Most community solar developers seek to provide at least 5% savings, and developers focused on delivering benefits for LMI customers often seek to save these subscribers 20%.
- Require no credit checks for subscribers, as these discourage participation. Please note that some lenders will require credit checks—this will differ based on the lender.
- Use consolidated billing if possible, based on your region. If possible, work with the utility to provide a no-cost option for customers where savings is credited on existing utility bills. Try getting community solar payments incorporated into utility bills and avoid sending separate bills to customers for community solar subscriptions.
- Provide easy onboarding using automated systems for enrollment and bill pay and clear communication throughout the process.
- Engage subscribers with updates and news about their solar project including the environmental impacts.
- Use surveys to gather regular feedback on your program design.
- Keep customers informed about the progress of the community solar project, billing updates, and other important information through regular communication channels, such as email newsletters, social media updates, and community events.

The Low-Income Clean Energy Connector (formerly the Community Solar Subscription Tool) will connect income-qualified Low Income Home Energy Assistance Program (LIHEAP) households to community solar subscriptions with verified savings.

Eyes on Equity

An asset management goal for community solar projects could be to continually achieve at least 40% participation by LMI households, but this requires a concerted effort. Partnering with local organizations, providing targeted outreach and education, and offering flexible subscription options provides greater equity and access to clean energy. Best practices for continually subscribing LMI households include:

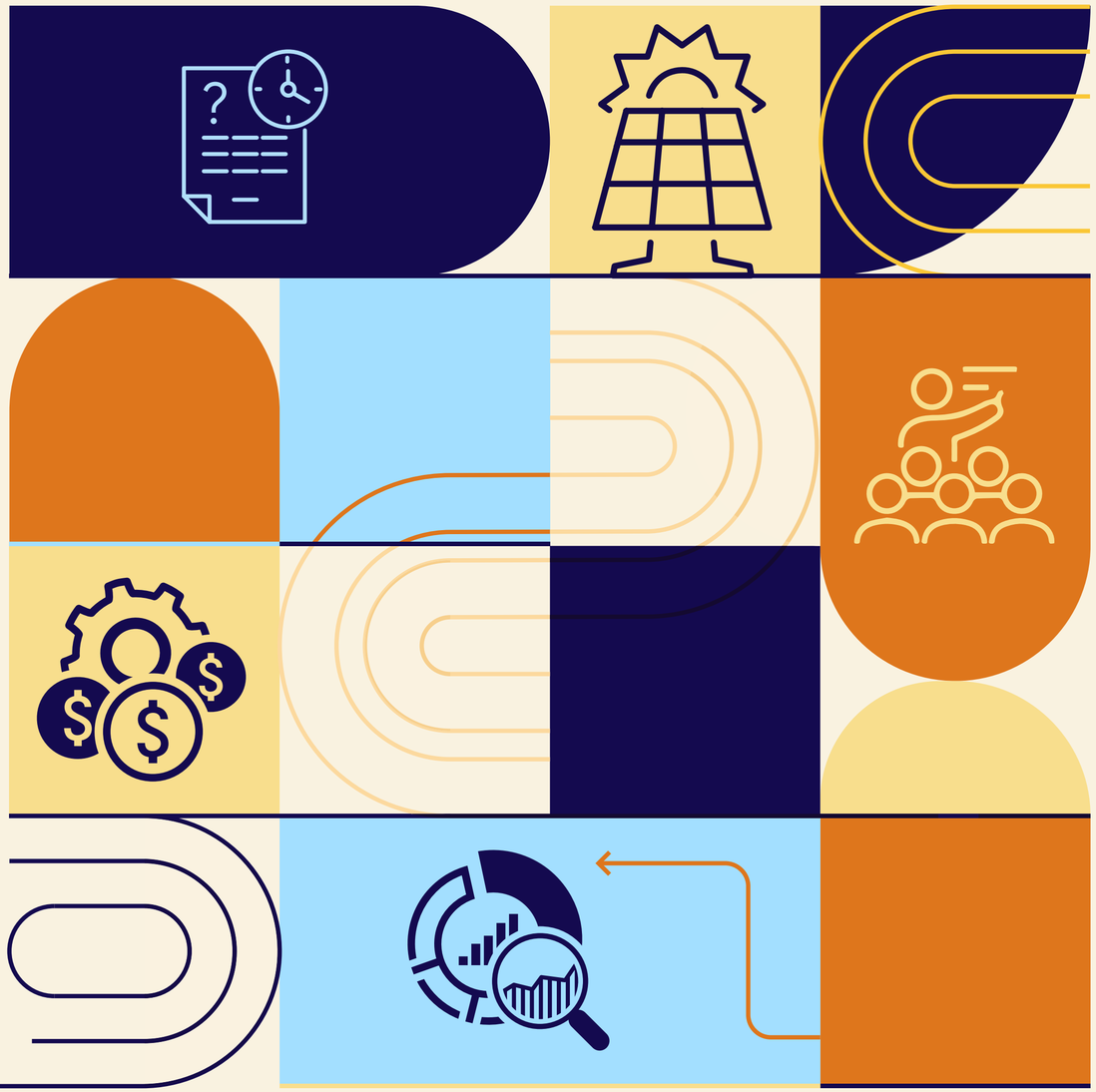
1. Immediate bill savings and no upfront costs encourage low-income participation.
2. Provide communications in multiple mediums and languages. Limited online fluency and/or access, and language barriers (e.g., contracts only being in English) can impede a customer's ability to engage and can be barriers to participation for some LMI households.
3. Ensure that outreach materials match the needs of diverse communities, i.e., all collateral should be translated into relevant languages, in-person enrollment events should be held in order to bridge the digital divide, and developers/subscriber managers should have dedicated support staff able to answer questions in a sensitive and timely manner.
4. Enable multiple methods for bill payment. Often in LMI communities, bills are paid by check and money order; this information will impact how the LMI community will engage in the program. Two bill systems (i.e., where the customer receives a utility bill and separate bill for their community solar subscription charge) can create barriers to participation if a household is unbanked or does not want to pay by bank account or credit card.
5. Design subscription plans to meet the needs of LMI subscribers and reduce barriers to entry, such as minimal initial costs, accessibility to renters, and immediate savings.
6. Consider risk mitigation strategies that provide non-punitive termination options for low-income customers.
7. Design programs to ensure consumers can monetize tax credits, rebates, and/or down payment assistance.
8. When building financial models, take into consideration that it is more time-consuming and costly to be truly inclusive than anyone ever anticipates, so make sure to account for that in your expenses. If we want to maximize LMI benefits for the longest time possible, we must become masters of the basic components of Asset Management and O&M. It is extremely important to be realistic in planning the budget, internal capacity, and time available for subscription acquisition and management functions.

To learn more, read the National Renewable Energy Laboratory's Implementation of CommunitySolar Programs for Low- and Moderate-Income Customers.

Additional Resources

- Community Solar Asset Management Best Practice Guidelines. A resource to create a professional and dedicated Asset Management (AM) service package.
- Best Practices in Asset Management for Solar Photovoltaic Energy Systems. A webinar that explores some best practices in managing solar energy systems.
- Best Practices in Solar Performance Monitoring. This SunSpec document describes best practices in solar performance monitoring and how asset owners can prepare their plants for performance risk assessment.
- Best Practices for Operation and Maintenance of Photovoltaic and Energy Storage Systems. The goal of this NREL guide is to reduce the cost and improve the effectiveness of operations and maintenance (O&M) for photovoltaic (PV) systems and combined PV and energy storage systems.

CHAPTER 7
Community Solar Business Structuring



PROJECT READINESS QUESTIONS

1. What are the different revenue models for community-driven solar businesses, and how do you evaluate which one is right for your organization?
2. Will you plan to sell your project or operate it for the long-term?
3. What are the elements of a LMI community solar business plan?
4. How do you build and maintain a pipeline of projects, including scheduling?
5. How do you present your project to a potential funder?

Background

There are several primary business models that organizations can use to build a business line in LMI Community Solar. Choosing the correct roles depends on staff capacity, level of solar knowledge, financial assets, and risk tolerance. Consider the business models and ask yourself where you fit in. When evaluating which business model is right for your organization, it is important to consider several factors:

Regulatory Context
Must be compatible with local and state regulations

Skill-Level
Must reflect the solar knowledge level of your organization

Staff Capacity
Must reflect the staff capacity that your organization can dedicate

Investment
Must reflect the assets that your organization is able and willing to invest

Risk Tolerance
Must reflect the risk tolerance of your organization for a solar venture

If you are providing a service, it is also critical to consider customer demand for that service. The revenue model should be aligned with the needs and preferences of potential customers. For example, if customers are more interested in owning a share of the solar project, an ownership model may be more appropriate. Ultimately, the choice of revenue model will depend on the specific needs and goals of the community-driven solar business. Careful analysis of the internal concerns above, along with the market and customer demand will help you pick between the most appropriate revenue models below.

FEE-FOR-SERVICE COMMUNITY SOLAR DEVELOPER

Most common business for companies participating in community solar development.

Regulatory context. Possible in all states, but if you are not working in a state that allows third-party ownership, you must have special approval to develop the project on behalf of a regulated utility, electric cooperative, or municipal utility.

Structure. Solar developer brings a deal together without intending to be the owner, investor, or operator. Developer leads all tasks to make a deal happen.

Skill-level. Requires your organization to be a solar expert.

Staff Capacity. Requires the highest level of capacity.

Investment. Ownership of development process. Major investment in staff capacity and ability to work without earning money for some time, but no ownership of real estate or solar assets required, otherwise known in the industry as "Sweat Equity."

Risk Tolerance. High risk in not being paid until certain milestones are reached. Low risk in that no other assets are required.

Revenue Model. Earns a "developer fee" for structuring a deal once certain milestones are reached.

EXAMPLES

Standard Solar and Pivot Energy. For more examples, visit Solar Power World's list of 2022 Top Solar Developers.

COMMUNITY SOLAR DEVELOPMENT CONSULTING

Great work if you can get it but requires exceptional expertise and is very uncommon.

Regulatory context. Possible in all states, but if you are not working in a state that allows third-party ownership, you must have special approval to develop the project on behalf of a regulated utility, electric cooperative, or municipal utility.

Least common business model for developing community solar because most other interested parties in projects require developers to have investments in projects, otherwise known in the industry as "skin in the game."

Structure. Solar development consultant is paid hourly to bring a deal together without intending to be the owner and operator. Consultant leads all tasks to make a deal happen.

Skill-level. Requires your organization to be the most expert and in-demand solar developer.

Staff Capacity. Requires some of the most specialized community solar development knowledge and experience.

Investment. Ownership of development process. Major investment in staff capacity, but no sweat equity required.

Risk Tolerance. Zero risk because you are paid for work performed.

Revenue Model. Earns an hourly rate for structuring a deal.

COMMUNITY SOLAR SITE LEASING AND PROJECT OWNERSHIP

Solar project ownership without land ownership. Second most common business model for companies participating in community solar development.

Regulatory context. Possible in all states, but if you are not working in a state that allows third-party ownership, you must have special approval to develop the project on behalf of a regulated utility, electric cooperative, or municipal utility.

Structure. Solar developer leases land owned by someone else to install solar and operate it for a fixed period of time. Solar developers pay a fixed fee for the right to lease. Solar developer designs, finances, installs, and operates solar systems and provides benefits, or brings in another financial backer to fund development and share ownership.

Skill-level. Requires your organization to be expert or have the capacity to learn.

Staff Capacity. Requires a very high level of capacity.

Investment. Ownership of development process. Major investment in staff capacity, but no sweat equity required.

Risk Tolerance. High risk in not being paid until certain milestones are reached. High risk in operating systems and ensuring performance.

Revenue Model. Earns a “developer fee” for structuring a deal once certain milestones are reached and then cash flow from operations.

EXAMPLES Nexamp and Sunshare

DIRECT OWNERSHIP OF COMMUNITY SOLAR

Offers most control of community solar development but is uncommon because landowners typically do not want to take on risks of solar development.

Regulatory context. Possible in all states, but if you are not working in a state that allows third-party ownership, you must have special approval to develop the project on behalf of a regulated utility, electric cooperative, or municipal utility.

Structure. Cash purchase of community solar for use on property already owned by solar developers.

Skill-level. Requires your organization to be expert or have the capacity to learn.

Staff Capacity. Requires high level of internal capacity.

Investment. Model that requires largest investment. Requires sweat equity, property ownership and dedication for solar, and upfront cash to invest or ability to secure loans. Because most property owners interested and capable of installing solar power need power on site, they do not choose to do community solar, making direct ownership of community solar very uncommon. The model is more common in multifamily housing, especially affordable housing, where most energy is already used by LMI residents.

EXAMPLE Enterprise Community Development 2.2 Megawatt Community Solar Project

COMMUNITY SOLAR SUBSCRIPTION OWNERSHIP

Provides organizations that serve LMI residents with substantial assets to support community solar without taking on major risks.

Regulatory context. Possible in states that allow 3rd-party ownership of solar assets. Otherwise, the business model must be done in partnership with regulated utilities, electric cooperative, or municipal utility.

Structure. A community organization can sign a contract to purchase upfront all or a share of the solar electricity production from a community solar project for a long-term contract. This model serves as an excellent way for community organizations to foster solar development in communities by guaranteeing demand for power but entails very little solar knowledge and risk for organizations. The organization controlling the power controls how much goes to LMI customers and determines the amount of benefits to LMI.

Skill-level. Requires least knowledge of solar development.

Staff Capacity. Requires least upfront staff capacity but requires ongoing subscription management.

Investment. Requires no upfront cash but requires ability to guarantee long-term purchase of solar power upfront. Does not require property or solar ownership.

COMMUNITY SOLAR SUBSCRIPTION MANAGEMENT

Offers least control of community solar development process, but enables organizations to minimize risk and upfront investment while being able to perform the special community engagement pieces that make LMI community solar projects unique.

Regulatory context. Possible in states that allow 3rd-party ownership of solar assets. Otherwise, the business model must be executed in partnership with regulated utilities, electric cooperatives, or municipal utilities.

Structure. The organization signs a contract with a solar developer to provide subscription management services to a 3rd-party owner, regulated utilities, electric cooperatives, or municipal utilities. This model serves as an excellent way for community organizations to begin working in the community solar industry and use the service offering as a platform for future project development. The organization can harness its community relationships to reach and sign up LMI subscribers. Otherwise, they do not have any other control of the process.

Skill-level. Requires least knowledge of solar development and most knowledge of LMI communities.

Staff Capacity. Requires less upfront staff capacity but requires ongoing staff for customer service and ongoing upkeep of the subscriber pool.

Investment. Since work is fee-for-service, it requires very little sweat equity without payment, but over time, if an organization wants to scale this business model, it will require investments in software to manage the process.

Warning: Often community organizations venturing into this space underestimate the ongoing hours and cost required to perform this work and low-bid themselves.

NON-PROFIT EXAMPLE Groundswell

FOR-PROFIT EXAMPLES Wunder Capital, a major solar financier, lists several subscriptions management companies as the best and pre-approves them for Wunder-funded projects: Arcadia, PowerMarket, Ampion, Solstice, and Common Energy.

COOPERATIVE COMMUNITY SOLAR DEVELOPMENT

Similar to Fee-for-Service Development from the developer perspective in terms of deal structuring, skill-level, capacity, investment, and risk. The big difference is ultimate ownership of the solar and benefits by a cooperative of members.

In some cases, community solar may be achieved through the development of cooperatives. This section explores some cooperative models for bringing groups of people together to finance community solar, all structured to lower the cost of electricity and provide access to solar power to interested individuals. Cooperative community solar developers believe that ownership matters. If they own their energy resources, they are theirs to fully control. The benefits of ownership include the right to have a say in the management of the project and access to profit-sharing.

Regulatory context. Only possible in states that allow 3rd-party ownership of solar assets. Under a dividend model, community members unite to raise funds, install, and own a cooperative solar installation. Upon completion of the installation, the cooperative members receive a recurring dividend payment for the electricity produced by their proportional share of the solar installation. While individual homes may not receive clean power, the cooperative contributes to a more renewable future. People Power Solar is a Californian organization working to expand access to solar energy through the dividend model of solar cooperatives.

Structure. A group of interested renters or homeowners organize together to purchase ownership of a community solar project. The coop serves as a Fee-for-service Developer, bringing the cooperative members together, finding a site,

securing financing, overseeing the installation, and transitioning the project into operation. Members purchase panels and co-locate them in the shared array. They earn the federal tax credit and any other renewable energy incentives for their share of the membership. The members hire an organization to ensure system operations and maintenance. Members get paid back over a set number of years and after that they receive the panels' production for free for the life of the system, which is 20-25 years.

Skill-level. Requires much more community organizing knowledge than other models.

Staff Capacity. Requires much more staff time on community engagement than any of the other models.

Investment. Requires high level of internal capacity, sweat equity, and assets to secure upfront cash to construct solar array

Investment. Model that requires smaller cash investment relative to others but an enormous amount of sweat equity. Shared ownership has many positives, but structuring cooperative investments is incredibly time consuming because of the number of small investments, which increases transaction costs, staff costs, and development timing.

EXAMPLE Community Energy Co-op, Brattleboro Food Co-op

Considerations When Choosing A Business Model

- ☑ What are the outcomes your organization is seeking?
  - Energy savings for properties
  - Energy savings for LMI residents
  - Environmental benefits
  - Fee income from revenue generated from the sale of solar energy produced
  - Investment opportunities
  - Steady electricity pricing for a fixed term
- ☑ Is your organization interested in generating new income streams and prepared to address risks?
- ☑ Does your organization have the ability to finance assets through a combination of equity and debt?
- ☑ Is your organization able to provide guarantees for debt?
- ☑ Does your organization have experience and/or interest in gaining experience with any of the phases of developing and owning real assets?

When should we sell?

Not all developers are installers , owners, or operators of solar. Some companies like to conceive of projects. Other companies like to build projects that are already conceived. Other companies like to operate projects that are already built. Achieving each stage of the cycle creates more value but requires more investment and more risk. Fee-for-Service Developers can work up to site control without making a direct investment in equipment. Yet, communities are looking to work with companies that they can trust and rely on. Please keep in mind that selling a project may go against the original promise of long-term ownership and violate trust.

COMMUNITY SOLAR DEVELOPMENT CHAIN

When a community solar project is developed, there are two main options for what to do with it: sell it to a third party or operate it for the long-term. Here are some considerations for determining which option is best:

Financial Goals. One of the main considerations when deciding whether to sell or operate a community solar project is financial goals. If the primary goal is to maximize short-term profits, selling the project may be the best option. However, if the goal is to generate long-term revenue and establish a steady income stream, operating the project for the long-term may be more appropriate.

Expertise and Resources. Another factor to consider is the expertise and resources needed to operate a community solar project. If the organization has the necessary expertise and resources to operate the project, it may be more cost-effective to keep it and operate it for the long-term. However, if the organization lacks the expertise or resources to operate the project, selling it to a third party may be the better option.

Risk Tolerance. Operating a community solar project for the long-term can come with risks such as changes in energy prices or equipment failure. If the organization has a low risk tolerance, selling the project may be the better option to avoid the risks associated with long-term ownership.

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Source: Housing Sustainability Advisors

Social and Environmental Goals. If the community solar project was developed with social and environmental goals in mind, such as reducing greenhouse gas emissions or providing access to renewable energy for low-income communities, operating the project for the long-term may align better with those goals. Selling the project may result in a loss of control over how the project is operated and whether those social and environmental goals are maintained.

Market Conditions. Market conditions can also play a role in the decision to sell or operate a community solar project. If there is a high demand for community solar projects and favorable market conditions, selling the project may be more lucrative. However, if market conditions are unfavorable or there is a lack of demand for community solar, operating the project for the long-term may be the better option.

Ultimately, the decision to sell or operate a community solar project for the long-term will depend on the specific circumstances and goals of the organization. Careful analysis of the financial, social, and environmental considerations can help determine the best option.

Action Items

- **Select a Community Solar Business Model.** Evaluate which Community Solar business model is the best fit for your organization. Watch this video to consider where your organization can add the most value and what a 3-year business model would look like.
- **Community Solar Business Planning.** Put together a Community Solar Business Plan using this template to summarize the project that will be moving forward in the pipeline. A Low-to-Moderate Income (LMI) community solar business plan should include the following key elements:
  a. Market Analysis: This section should provide a thorough analysis of the target market for the LMI community solar project, including demographic and economic data. It should also identify any competitors and assess the demand for community solar in the target market. For more information on performing Market Analyses for community solar, see NREL's DIY Solar Market Analysis Webinar Series: Community Solar Scenario Tool.
  b. Product/Service Line: This section should describe the specific community solar products or services that the business will offer, including pricing and financing options.
  c. Marketing and Sales Strategy: This section should outline the marketing and sales strategies that the business will use to attract and retain customers, such as outreach to community organizations, advertising campaigns, and referral programs.
  d. Management and Organization: This section should detail the organizational structure of the LMI community solar business and provide information on the management team and their qualifications.
  e. Financial Plan: This section should include a detailed financial analysis of the LMI community solar project, including revenue projections, expenses, and cash flow projections. It should also identify any sources of funding, such as grants or loans.

f. Risk Assessment: This section should identify any potential risks and challenges that the LMI community solar business may face, such as changes in government policies or market fluctuations, and provide strategies for managing those risks.

g. Legal and Regulatory Requirements: This section should outline the legal and regulatory requirements for operating a community solar business in the target market and provide a plan for compliance.

h. Implementation Plan: This section should provide a detailed plan for implementing the LMI community solar business, including timelines, milestones, and resources needed.

i. To get you started, see LMI Community Solar Business Planning Outline.

Build a Community Solar Project Pipeline.

a. Schedule each stage of the community solar project carefully, with milestones and deadlines clearly defined.

b. Create a project management plan that includes a timeline for each stage of the project, along with specific deliverables and tasks. Use this development tracker tool to remain organized and keep track of all your developments in the pipeline. Learn more about how to use the development tracker tool here.

c. Regularly review the progress of each project and adjust the schedule as necessary to account for unforeseen delays or changes in project scope.

d. Establish strong relationships with local stakeholders, including community organizations, utility companies, and government agencies, to ensure smooth and efficient project development and implementation.

e. Maintain a disciplined and strategic approach that focuses on meeting the needs of the community and delivering tangible benefits, such as job creation, energy cost savings, and environmental sustainability.

Funder Presentation. Prepare and provide a pitch deck presentation selling a project to an investor. Use the materials you developed over the course to prepare a comprehensive and compelling presentation that effectively communicates the value of your community solar project to potential funders. Focus on specific points that investors want to know to evaluate their interest in your project, refer back to lender videos (1 & 2) for context. Use this template to fill out.

Include:

i. System Details
ii. Site information
iii. Project Financial Summary
iv. Development Timeline
v. Development Team Members
vi. Organizational chart
vii. System Operation and Maintenance Plans
viii. Subscriber Management Plan
ix. Community benefits: Power production value and community savings
x. Financing

Refer to Credit Ready Solar checklist to **ensure your project is ready for financing.**

Join and learn about Community Power Accelerator to connect to developers, investors, philanthropists, and community-based organizations to work together to get more equity-focused community solar projects financed and deployed.

Eyes on Equity

Your choice of community solar business model will impact the benefits that are available to LMI communities and how they flow down to those residents. When selecting a business model, please also consider your equity goals and their impacts below.

Job creation. Consider the number of jobs that could be created through different business models and which business models may result in more jobs.

Non-profit partnership. If your organization is not a non-profit, consider partnering with a non-profit with experience providing benefits and community engagement to LMI communities.

Cooperative ownership. Cooperative models provide a democratic and participatory structure that allows members to collectively own and benefit from projects. This can create a sense of ownership and empowerment within an LMI community.

Utility-sponsored Community Solar. In the states where you must partner with a local utility, rural electric cooperative or municipal utility to pursue community solar, it is still possible to provide community empowerment and economic benefits to low-income households. Make an impact however you can and continue to push for change.

Additional Resources

- Project Summary: Community Solar Stakeholder Impacts in Cook County, Illinois: This NREL document summarizes the process used to evaluate stakeholder impacts of community solar in Cook County.
- GO Green Energy Fund Case Study: Local leaders in the predominantly Black neighborhood of Hough (in Cleveland, Ohio) aim to prove that solar can do more than lower electric bills. Their plan to leverage a 1-Megawatt project to boost economic development and build wealth for future generations could be a template for other communities.
- Community Solar Power: A Look at the Business Models Behind Shared Solar: With the business models outlined here, there is considerable flexibility available for various consumer groups, but these models still rely on patchwork state and local policies and would benefit from a more standardized approach to regulation.

Conclusion

There is no magic to LMI Community solar development. But if there was a "secret" ingredient, it would be perseverance. Developers must continually be problem solving, innovating, and trying alternatives until all the "no's" turn into "yes." Keep in mind that good developers are measured by whether they can close deals, but **great developers are measured by whether they can build projects that perform as well as projected before installation**. Only in operation do we truly know the quality of a project, when we can prove out that benefits are being delivered to funders and LMI communities as projected.

Although this workbook does not cover every topic, if you are able to closely follow the lessons included herein, you will have an excellent start at becoming a great developer and truly making an impact in your communities. As you continue on your journey, you will likely find the templates and resources in this workbook useful. When you are in need of guidance or inspiration, keep the link to this workbook handy and be sure to refer back to it from time to time.

Appendix: Key Terms

The following terms are defined in the context of community solar. *Definitions adapted from* Clearway Community Solar.

Bill Offset

Community Solar customers will receive the credit value generated by the assigned portion of the Community Solar farm in solar credits to help reduce their electricity bill. Depending on your home energy usage and the amount of solar production, the value of the solar credits could help offset your energy bill. The amount of your energy supply charges that are reduced, or offset, is your bill offset percentage.

Carbon Dioxide Emissions (Carbon Emissions)

The greenhouse gasses produced from natural sources (like the ocean) and human sources (like transportation). Fossil fuels are the leading cause of carbon emissions from human activities. One way the environmental impact can be understood is by the offsets of carbon emissions made by the solar energy produced from solar farms. For more information about this calculation visit the EPA Greenhouse Gas Equivalencies Calculator.

Community Aggregation

Community Aggregation allows local governments to group residents and businesses. This helps them negotiate lower electricity rates and choose greener energy options. Residents can opt in or stay with their existing provider.

Community Solar

Community Solar is a solar energy sharing program in which a solar farm (or solar garden) at an offsite location generates the shared electricity. The solar farm is supported by local residents and businesses that can subscribe to a portion of the solar farm. In turn, the community members receive solar credits for the solar energy generated by their subscription. The model allows for locals to benefit from solar energy and support clean energy generation without taking the steps to install and maintain rooftop panels on their home .

Debt Service Coverage Ratio

A financial measurement used to calculate an entity's ability to create a sufficient monetary sum to pay its debt obligations. For example, a DSCR will measure how easily a corporation will be able to cover its annual debt obligations using its operating cash flow.

Energy Supplier

An energy supplier is the company that supplies your home's power at a contracted kWh rate. The supplier is your local utility company, or, in deregulated regions, it could alternatively be a retail energy provider.

Federal Solar Investment Tax Credit (ITC)

Section 48 of the Internal Revenue Code defines the federal ITC. The ITC allows commercial, industrial and utility owners of photovoltaic (PV) systems to take a one-time tax credit equivalent to 30% of qualified installed costs. There is also a federal residential renewable energy tax credit (Internal Revenue Code Section 25D) but the residential tax credit requires that the PV system be installed on a home the taxpayer owns and uses as a residence, thus it would rarely, if ever, be applicable to community solar projects.

Fossil Fuels

The leading source of carbon emissions, fossil fuels are non-renewable energy sources like oil, coal, and natural gas. These fuels require mining or drilling for extraction and must be burned to produce electricity. Fossil fuels currently make up approximately 81% of U.S. energy demand.

Greenhouse Gas Emissions

Atmospheric gasses, like carbon dioxide, absorb and emit radiation, thus trapping heat in the atmosphere and warming the planet. The leading source of greenhouse gas emissions in the United States is electricity production.

Interconnection

Interconnection is the process of connecting a source of electric power generation, like a solar farm, to the power grid.

Inverter

Inverters convert the DC power generated by a solar farm into AC power to supply energy into an electric grid that distributes the power to consumers.

Investor-Owned Utility (IOU)

An investor-owned utility (IOU) is a private company that generates, transmits, and distributes electricity to customers. IOUs are owned by shareholders who invest in the company in hopes of earning a profit. They are regulated by the government to ensure that they provide safe and reliable service at fair prices. IOUs are responsible for maintaining the power grid and investing in new infrastructure. They also play a role in developing and deploying renewable energy sources.

Kilowatt

1,000 watts of electrical power.

Kilowatt hour (kWh)

The total energy of 1,000 watts over an hour. On an electric bill, the electricity cost is determined by the amount of energy used by a home. This is measured in kWh. The amount of energy used is then multiplied by your utility rate to determine your energy supply cost and delivery charges. The value of the solar energy produced by a Community Solar farm is determined by the amount of energy the farm produces in kWh, multiplied by the contracted rate of solar power.

Megawatt

A unit of power equal to 1,000 kilowatts, or 1 million watts. Large community solar farms typically measure the solar power generation in megawatts.

Megawatt Hour (MWh)

A unit equivalent to 1,000 kilowatt hours.

Municipal Utility

A municipal utility is a government-owned entity that provides essential services, often including electricity, water, and sanitation. Unlike investor-owned utilities focused on profit, municipal utilities prioritize serving the community with reliable and affordable services. They reinvest any profits back into the infrastructure and services they provide, ensuring long-term sustainability.

Net Energy Metering

Net Energy Metering, or NEM, is a billing system where rooftop solar customers are billed for their home's net energy use, after the output of the solar energy generated by their home is applied. If more solar energy is produced than energy consumed by the home, these credits may apply to the home's meter. A total of 43 states plus D.C. have implemented net metering policies.

Net Metering Credits

Credits that are generated for the solar energy produced by a customer's assigned portion of a solar farm each month. These credits can help reduce your energy costs over time. Net Metering Credits is another term for solar credits, virtual net metering credits, or enhanced bill credits. For most regions, the Net Metering Credits are applied directly to a customer's utility bill.

Photovoltaic System (PV System)

The complete system that converts sunlight to electricity on a solar farm, from the solar arrays to the remaining necessary components like an inverter.

Power Grid (or Utility Grid)

The system that connects electricity to homes and businesses. The United States has three interconnected grids to ensure stability and meet demand: The Eastern Interconnection, Western Interconnection, and the Electric Reliability Council of Texas (ERCOT) which covers most of Texas. Each of these three interconnections are made up of many regional grid operators that balance supply and demand of electricity and ensure the reliability of power in the region. The solar energy generated by a community solar farm is delivered directly to the power grid, allowing for energy distribution.

Power Purchase Agreement (PPA)

An agreement between a customer and a solar system operator wherein the solar system operator owns, maintains, and operates a solar system, and where a customer purchases the solar energy produced each month at a set price per kWh.

Renewable Energy

Energy produced from naturally regenerating sources including solar, wind, water, and geothermal power. Renewable energy sources do not require burning of fossil fuels that release harmful greenhouse gas emissions for usable electricity, and are therefore considered clean energy sources.

Renewable Energy Credits (RECs, carbon offsets, or green tags)

A renewable energy facility produces two distinct products. The first is electricity. The second is the package of environmental benefits resulting from not generating the same electricity–and emissions–from a conventional gas or coal-fired power plant. These environmental benefits can be packaged into a REC and sold separately from the electrical power. A REC represents the collective environmental benefits, such as avoided mercury, CO2 and other environmentally harmful pollutants, as a result of generating one megawatt-hour (MWh) of renewable energy. In most cases, RECs are sold on a per MWh basis. However, some project organizers choose to sell all future rights to RECs up front, on a per installed watt basis, effectively capturing an installation rebate and forgoing any future revenue from REC sales.

Rooftop Solar

Placement of solar panels on the rooftop of a home or business for energy to generate solar power for that individual home or business. Rooftop solar requires adequate roof space and access to heavy sunlight, permitting and installation, and maintenance of the solar system by the home or business owner.

Rural Electric Cooperative

A rural electric cooperative is a nonprofit utility owned by its members, the residents it serves. These cooperatives bring electricity to rural areas where it isn't profitable for investor-owned utilities to operate. They reinvest profits back into the community and prioritize affordability and reliability for their members.

Securities

A security is an investment instrument issued by a corporation, government, or other organization that offers evidence of debt or equity. Any transaction that involves an investment of money in an enterprise, with an expectation of profits to be earned through the efforts of someone other than the investor, is a transaction involving a security. Community solar organizers must take care to comply with both state and federal securities regulations, and preferably, to steer clear of inadvertently offering a security.

Solar Array

A group of solar panels connected together. A solar array is one component of a photovoltaic system, consisting of the combination of several solar panels. Many solar arrays ultimately create a solar farm.

Solar Cell

Also called a photovoltaic cell, a solar cell is a component of a solar panel that converts sunlight into electricity via the photovoltaic effect (PV Effect).

Solar Credits

Credits that are generated for the solar energy produced by a customer's assigned portion of a solar farm each month. These credits can help reduce a customer's energy costs over time. Solar credits are another term for Net Metering Credits, Virtual Net Metering Credits, or Enhanced Bill Credits.

Solar Farm (or Solar Garden)

A collection of solar panels in an ideally suited location that produce large quantities of solar energy that is sent to the utility's power grid for distribution.

Subscription

Community Solar customers are subscribed to a portion of a Community Solar farm. Customers pay the associated subscription fee each month once the farm is active. Customers may receive billing information on-bill from their local utility or receive a separate bill from their subscription manager for their monthly solar energy charges.

Utility Company (electricity)

A power company that supplies electricity to a set of customers in regulated and deregulated markets. Utility companies price power supply at a kWh rate. Utility rates historically fluctuate and are unpredictable.

Virtual Net Metering

The bill crediting system used by Community Solar that enables crediting for solar energy generated from an offsite farm, rather than from an individual's home. Massachusetts, Minnesota, Illinois, and New York are among the top Community Solar states that offer virtual net metering.

For questions, comments, more information or assistance on becoming an LMI community solar developer, please reach out to Jared Lang, Principal of Housing Sustainability Advisors, at jlang@housingsustainability.com

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