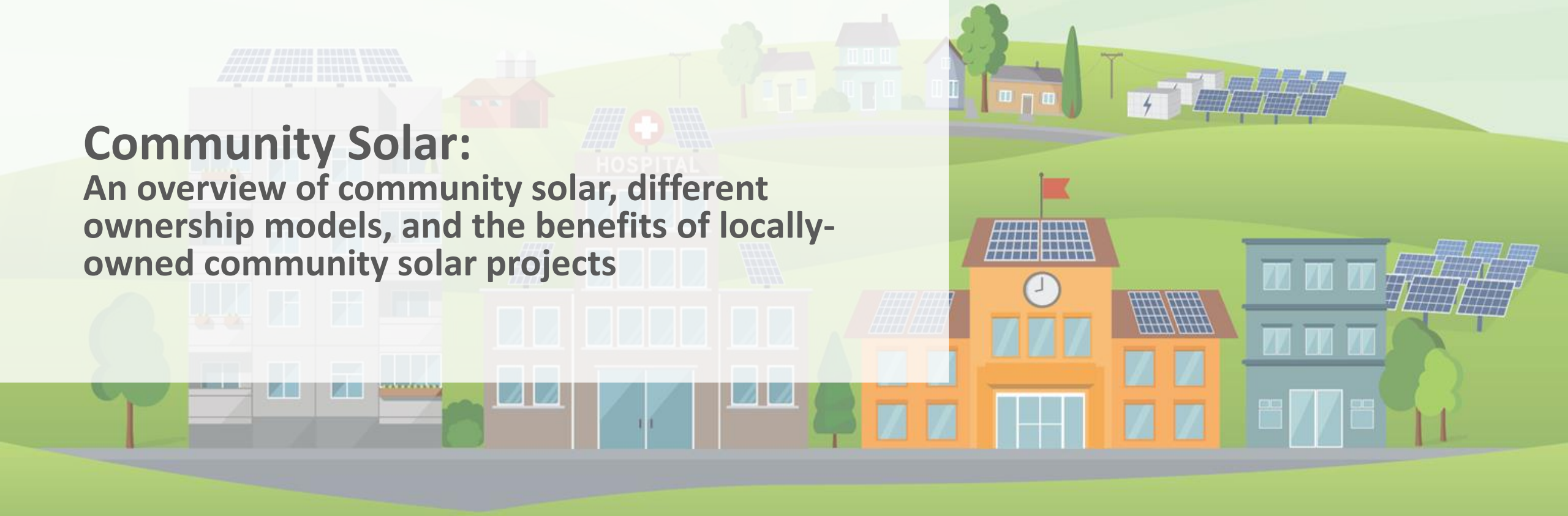
U.S. DEPARTMENT OF ENERGY | Office of ENERGY EFFICIENCY & RENEWABLE ENERGY
SOLAR ENERGY TECHNOLOGIES OFFICE

NREL
NATIONAL RENEWABLE ENERGY LABORATORY

BERKELEY LAB

Community Solar:

An overview of community solar, different ownership models, and the benefits of locally-owned community solar projects



This slide deck gives an overview of community solar. It introduces community solar programs and their benefits, explains different ownership models, and ends with the best practices to keep in mind when starting a locally-owned community solar project.

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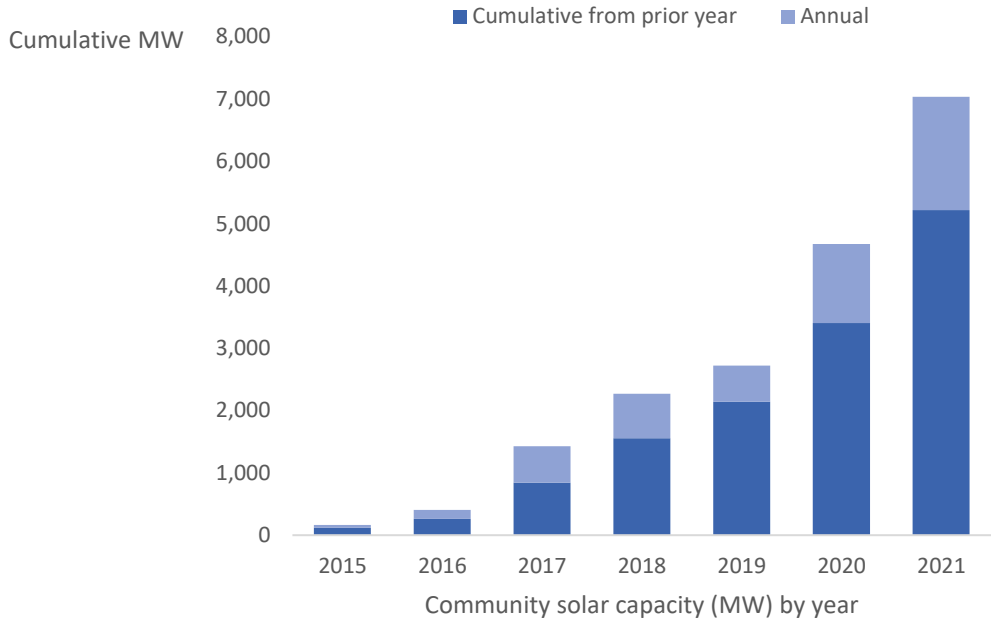
Community Solar Overview

Community Solar is Growing Rapidly

- Community solar is one of the fastest growing segments of the U.S. solar photovoltaic market.
- The amount of community solar (measured in megawatts) more than doubled, on average, each year between 2010 and 2021.
- About 1800 MW came online in 2021 alone.



[Sharing the Sun Community Solar Project Data (December 2021)]

What is Community Solar?

- Community solar allows multiple customers, or “subscribers”, to purchase the output from a single solar photovoltaic array.
- Community solar gives customers who can not install solar on their own property a way to access solar energy.
- Customers who do not own their homes, do not have space to install solar, or do not have access to capital can usually still participate in community solar.

Community Solar Distributes Financial Benefits to Subscribers that Choose to Participate

Exclusive

All community solar programs serve an exclusive set of subscribers within a utility or community choice aggregation service territory.

Opt-in

Participation in community solar is always by choice. Subscribers opt into the program, either through contractual payments or some non-financial transaction.

Financial Benefits

All community solar products convey some part of the financial benefit to subscribers. Community solar products may also include non-financial benefits, such as environmental benefits (e.g., renewable energy certificates).

Key Actors in Community Solar Programs

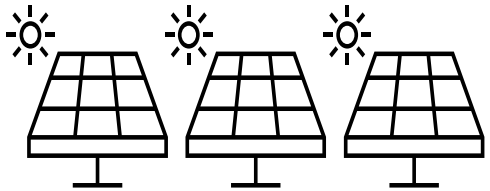
There are always four actors in a community solar project: the host, the sponsor, the utility, the subscribers, and the sponsor.

- The **host** is the owner of the location where the community solar project will be located.
- The **sponsor** manages the subscriptions to the solar project and the relationship with the utility. The project sponsor and project host can be the same.
- The **utility** measures the energy produced by the solar project and distributes the power via the electricity grid.
- The **subscribers** are the individuals, businesses, nonprofits, or local governments, that purchase a share of the electricity generated by the community solar project.

Subscribers receive Bill Credits for Community Solar

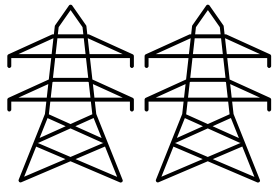
Community Solar Project

Subscribers pay the sponsor for their share of the community solar project



Solar panels generate electricity from the sunlight

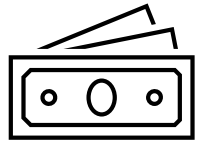
Utility



The electricity flows through a meter to the utility grid

Each utility assigns a dollar value to solar electricity

Subscribers



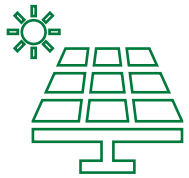
The subscriber gets a credit for the value of the solar electricity on their monthly electric bill

Community Solar Projects depend on Virtual Net Metering

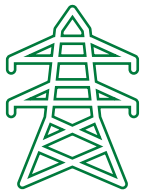
- A community solar project is not located at the house or business where the subscribers use electricity.
- Subscribers receive a **credit on their utility bill** equal to the amount of electricity that is produced by their share of the solar project.
- This crediting system is called **virtual net metering.**

Imagine your share of a community solar project produces 600 kWh of energy in one month. On the next utility bill, you would receive credit for the 600 kWh of electricity. If your total consumption was 800 kWh that month, you would only need to pay the utility company for the remaining 200 kWh of electricity.

Everyone Benefits from a Community Solar Project



The project host and/or sponsor receives financial benefits from federal, state, and local renewable energy incentive programs



The community solar project provides the **utility** with inexpensive, reliable power

Subscribers are offered a way to "go green" and save on their electric bill

Everyone benefits from cleaner air and a more diverse energy supply.

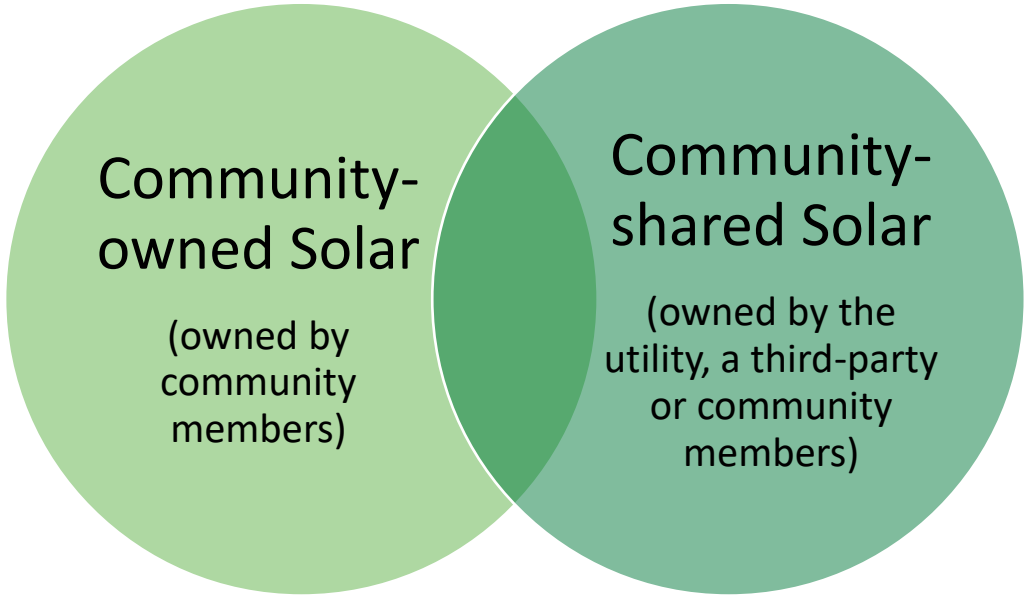
Subscribers in some markets receive a monthly savings of 5-15% on their electricity bill.[1]

[1]https://solstice.us/solstice-blog/what-is-community-solar/

Community Solar Ownership Models

Who owns a Community Solar Project?

Not all community solar projects are community-owned



Community Solar Projects can be owned by:

- Utility Company
- Solar Developer (aka “third-party” owned)
- Community members (sometimes via a “special purpose entity”)

*Community solar projects are most often owned by the **utility** or **third-party developers***

Community Solar Ownership Arrangements

Utility-Owned

The utility company provides investment capital to build the project, in accordance with utility regulations or board oversight. The utility maybe the host or have an agreement with another party that hosts the project on their site.

Third Party-Owned

A third-party investor provides investment capital and owns all solar assets under an agreement with the site host. The investor receives a rate of return to cover their upfront investment along with financial incentives and subscription payments.

Third Party Flip

A third-party investor provides investment capital and owns the solar assets long enough to take advantage of federal tax credits and project revenues to gain a rate of return. After 6-10 years, the ownership then transfers (i.e., “flips”) to a community partner.

Community-Owned

The solar project and solar assets are wholly financed and owned by local individuals and entities. Local owners may or may not be able to access federal tax benefits. Projects can be financially acceptable at lower rates of return.

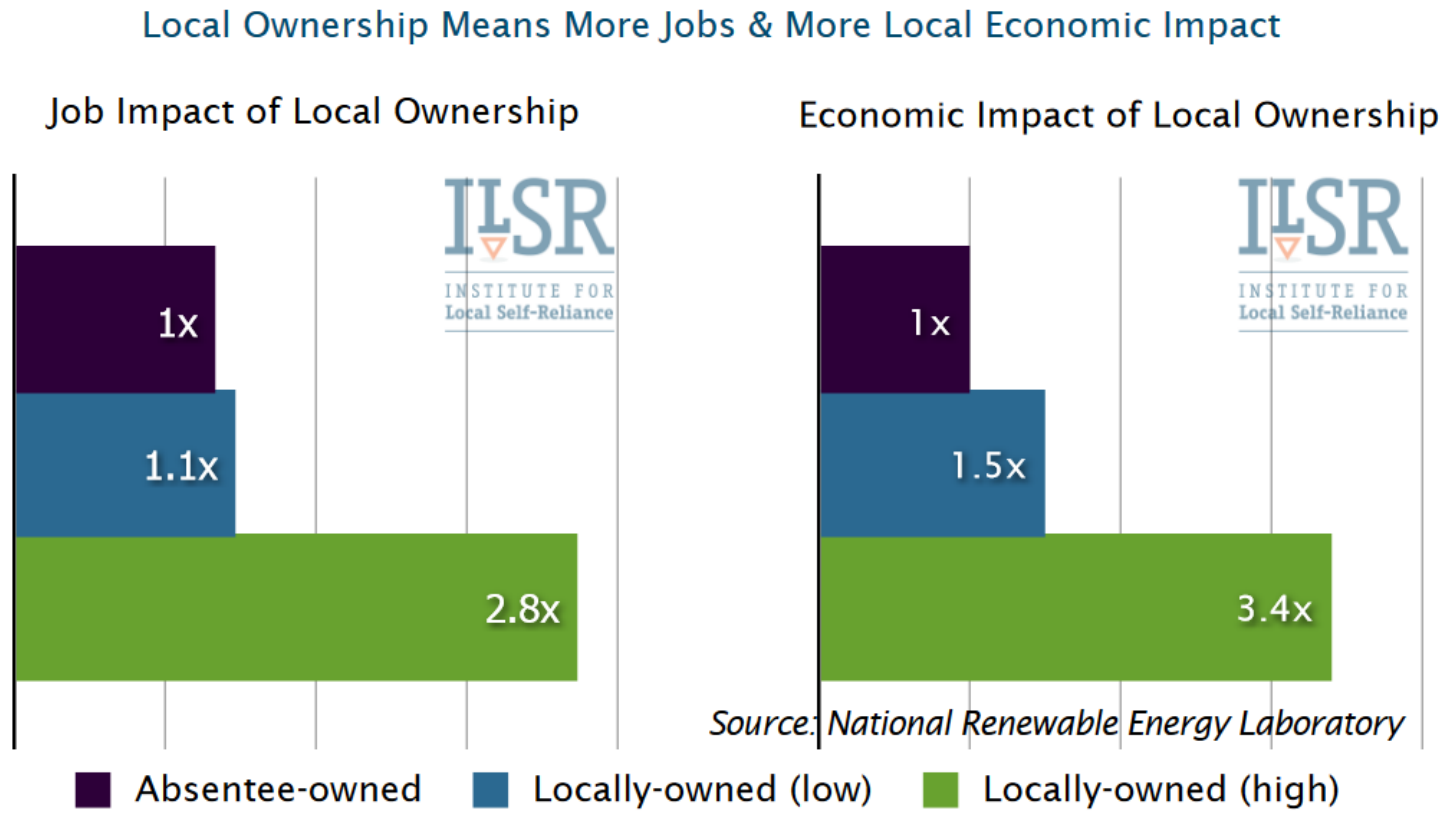
Potential Local Economic Benefits by Ownership Structure

	Third-Party Ownership	Third-Party Flip	Community-Owned
Benefits to the Community →	**Limited Economic Benefits** Land? Lease Payment, Payment in Lieu of Taxes (PILOT) or Power Purchase Agreement (PPA) or Net Metering with energy discount	**Delayed Economic Benefits** Similar benefits for Third-Party Ownership for first 6-10 years, followed by full benefits of Community Ownership	**Maximum Economic Benefits** Local ownership/investment leads to full project cash flows accruing within the local economy and associated economic multiplier.

Increasing Local Economic Benefits

Locally-owned Solar Provides Local Benefits

Research shows that the number of jobs and economic returns to communities are substantially higher when energy projects are locally-owned.



https://ilsr.org/wp-content/uploads/2018/03/Advantage_Local-FINAL.pdf

Best Practices for Starting Locally-Owned Community Solar

- ✓Survey the sectors of the community that would have the most interest in participating in a project.
  - Gauge interest, willingness to pay, and expectation of benefits.
- ✓Make sure to engage the local utility early in the process.
- ✓Determine what financial incentives are available (or could be made available) to participants in the program.
- ✓Decide which aspects to prioritize when locating the project (physical conditions, grid connections, public visibility, etc.).
- ✓Conduct a legal review.
- ✓Ensure consumer protection. Provide information to alert consumers to potential scams and unfair contract structures.

https://solsmart.org/solar-energy-a-toolkit-for-local-governments/community-solar/

Additional Resources

Definitions

Community Solar: a product where the financial benefits of a single solar photovoltaic array are distributed among an exclusive group of customers that have chosen to subscribe to the program

Community Owned Solar: a solar project that is wholly owned by local members of a community

Shared Solar: any solar electric generation that is distributed between multiple end-use customers

Virtual Net Metering: the regulatory mechanism that allows subscribers to receive utility bill credits equal to the amount of electricity produced by their shares of a community solar project

Power Purchase Agreement (PPA): a long-term electricity supply agreement between an electricity producer and an electricity consumer

Community Solar Project Host: the owner of the site where the community solar project will be located

Community Solar Project Sponsor: manages the project subscribers and their relationship with the utility. The sponsor and the host can be the same

Community Solar Project Subscriber: the individual entities, such as residents, businesses, nonprofits, or local governments, who purchase a share of the electricity generated by the community solar project

Community Solar Bill Credit: the monetary value assigned to one kWh of solar energy produced by a community solar project that appears as a payment reduction on a subscribers' utility bill

Anchor Tenant: a subscriber to a community solar project that holds a large portion of the project's total capacity compared to other subscribers (often up to 40%)

Additional Resources

Link	Resource Description
Solar Energy: SolSmart's Toolkit for Local Governments SolSmart, 2020	This section of Solar Energy: SolSmart's Toolkit for Local Governments provides an overview of community solar and explores three community solar ownership models.
Expanding Solar Participation Through Community Solar SolSmart, 2020	This SolSmart Issue Brief describes the community solar model and highlights approaches for developing new projects.
Beyond Sharing: How Communities can Take Ownership of Renewable Power Institute for Local Self-Reliance, 2016	This report reviews the benefits and barriers to community-owned renewable energy, specifically community owned shared solar projects.
Community-Informed Solar Financing and Ownership Options Fact Sheet University of Massachusetts, 2021	*UPCOMING RESOURCE* This Fact Sheet will provide a brief introduction to considerations for local officials and community constituents to familiarize themselves with how local benefits and risks contrast across the basic ownership structures available.
Understanding and Evaluating Solar Financing and Ownership Option University of Massachusetts, 2021	*UPCOMING RESOURCE* This Guideline is intended for town officials and constituents to provide a high-level understanding of how solar development can be owned and financed, highlighting solar project cash flows of costs and benefits, how they accrue over time and to local and non-local project participants, and how financial risk is appropriated.

Additional Resources

Link	Resource Description
Sharing the Sun: Understanding Community Solar Deployment and Subscriptions NREL, 2020	This slide deck presents data and analysis from an initial round of data collection for a three-year project studying the U.S. community solar market.
Economic Development Impacts of Community Wind Projects: A Review and Empirical Evaluation NREL, 2009	This report provides a review of previous economic development analyses of community wind projects and compares these projected results with empirical impacts from projects in operation as of April 2009.
Advantage Local – Why Local Energy Ownership Matters Institute for Local Self-Reliance, 2014	This report serves as a resource for communities seeking alternative ownership mechanisms to develop renewable energy on a local level
Community Solar Basics Interstate Renewable Energy Council, 2017	This resource offers a brief overview of critical community solar program elements, an accompanying checklist to help guide decision-makers and program designers as they develop programs, and useful relevant additional resources for reference.

Additional Resources

Link	Resource Description
Guiding Principles for Shared Renewable Energy Programs Interstate Renewable Energy Council, 2017	This resource is intended to define broadly what constitutes a shared renewable energy program, to define shared renewable energy and reflect the benefits of these programs to participants, the renewable energy industry, utilities, and all energy consumers.
Community Outreach and Solar Equity: A Guide for States on Collaborating with Community-Based Organizations Clean Energy States Alliance, 2021	This guide is designed as a resource for state energy agencies that are looking to strengthen their relationships with local under-resourced communities or are beginning to engage in energy justice work. It is a collection of best practices, ideas, and principles that provide states a foundation for building equitable relationships with community-based organizations (CBOs) and for working with them on solar development.
New Mexico SB 84, Enacting the Community Solar Act 2021	Final text of New Mexico's Community Solar Act, passed on March 18 2021