THE GEORGE WASHINGTON UNIVERSITY

WASHINGTON, DC

CATALYZING COMMUNITY SOLAR: A HANDBOOK FOR MUNICIPALITIES

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CATALYZING COMMUNITY SOLAR:
A HANDBOOK FOR MUNICIPALITES

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Community solar is an innovative new investment model that can provide Americans with the many benefits of solar energy even if they cannot site a system on their own property because they are renters, have roofs that are shaded or in disrepair, or they are not able to finance a solar installation. These barriers are particularly prevalent in less affluent areas, making community solar a promising way to improve access to renewable energy in low-income neighborhoods.

This Handbook is intended to help municipalities clearly define and articulate the project's objectives and understand the financial, legal, and policy issues they would need to address to initiate community solar investments in their communities and convey the resulting benefits to their constituents.

The Handbook identifies three obstacles to success – access to capital, expertise, and risk-allocation – and includes suggestions on how to overcome these obstacles, including the potential use of public funds to reduce the project's cost and public-private partnerships. This study also includes ideas gleaned from other community solar projects that appear particularly interesting or innovative. In addition, it offers five possible deployment models municipalities could use to support, finance, or build a community solar project in their jurisdictions.

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INTRODUCTION

Currently, the majority of Americans are unable to secure the benefits of solar ownership because, among other reasons, their rooftops are unsuitable, they are renters or live in multi-family units, or they are unable to afford upfront installation costs or qualify for loans or third party financing.[1] These reasons are particularly prevalent in lower-income communities, which make up 40 percent of US households but account for less than 5 percent of solar installations.[2]

Community solar promises to break through those barriers by letting consumers buy or lease a portion of an off-site solar array or its output with little or no money down and at prices below prevailing electricity rates.

LOW-INCOME FAMILIES:

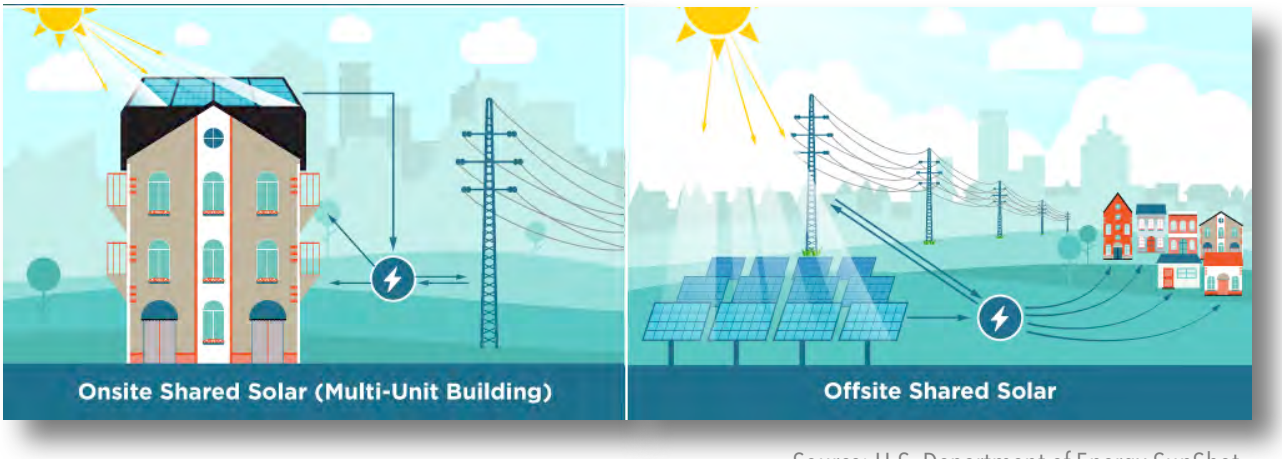
- are less likely to own roofs due to higher rates of living in multi-family buildings and being renters
- have limited access to financing due to lower savings, less income to borrow against, and lower credit scores that further reduce access to capital
- are more likely to live in older buildings that require other upgrades to support solar
- are unable to realize solar value in cases where they do not pay utility bills

The concept, which also goes by the interchangeable designations of shared solar and solar gardens, is growing in popularity. The Solar Energy Industries Association (SEIA) reported in March 2017, "[t]he once-nascent community solar market quadrupled in 2016, playing a key role in supporting the largest year ever for the non-residential PV market."[3] That growth is expected to continue. According to leading solar market analyst GTM Research: "[t]he community solar segment is on the cusp of becoming a mainstream driver of U.S. solar market growth. Starting in 2017, community solar is expected to consistently drive 20 to 25 percent of the annual non-residential PV market and become a half-gigawatt annual market by 2019."[4]

This Handbook is intended to help municipalities understand the financial, legal, and policy related issues they would need to address to make their own publicly funded investments in community solar and convey the resulting benefits to their constituents.

What is Community Solar?

A community solar project functions very much like a rooftop solar project, except that rather than each beneficiary hosting a solar system on his or her own roof, the panels are installed in a common location and operate as a single project. While project locations vary considerably, ranging from a shared rooftop of a multi-family building unit, to a structure over a parking area, to a ground-mounted installation on otherwise vacant land in the utility's service territory, in most cases the power generated is not behind the meter of the benefiting ratepayer.



Source: U.S. Department of Energy SunShot

How It Works

Each beneficiary owns, or has a right to receive, a specified share of the project's benefits. The benefits are typically in the form of a credit against the cost of electricity on the beneficiary's monthly electric bill, but could include monetary compensation too. The credits are typically enabled by "net metering" or "value of solar" tariffs (as explained below), which set the value of the credit. In some jurisdictions, the beneficiary can assign his or her credits to another of the utility's customers.

Why Community Solar?

Community solar offers a number of advantages to residential customers over rooftop or other on-site solar solutions, and can extend the advantages of solar power to the estimated 49 percent of U.S. households that cannot install rooftop solar because they are renters or live in multi-family units and the 48 percent of businesses that lack sufficient roof space to host a solar array.[5]

Community Solar Can Help Low-Income Households

Community solar is also uniquely suited to convey the benefits of solar energy to lower-income households who might otherwise be unable to access the solar market because they do not have the credit or capital to invest in their own solar rooftop system. Therefore, it can be a powerful tool for municipalities interested in promoting local clean energy supplies while addressing community development and equity issues.

Community Solar Provides Societal Benefits

By placing solar generation on the distribution system, community solar also produces multiple societal benefits, including:

- Solar is one of the most economical new sources of electricity, with costs at or near grid parity. And solar generation costs are expected to continue to decline significantly over the next few years, particularly for non-residential sized projects like a community solar installation. So, community solar may reduce energy costs for lower-income families, who most need the help.
- Solar can be situated at the location of, or close to the location where electricity is used, and therefore does not experience losses associated with long-distance transmission and voltage step-down inherent to a centralized generation system.[6]
- Solar is a resource that can deliver electricity without the emission of greenhouse gases or use of water and can help a city or region achieve its renewable energy or carbon reduction targets.
- Municipalities may also be interested in how a shared solar project can serve as a community building tool that brings together like-minded people in pursuit of a common end.

Source: Westmill Solar Cooperative

Community Solar Can Provide Additional Cost Savings

In addition, as compared to individually owned rooftop or ground mounted installations that serve only one customer, a community solar project can deliver added cost-savings and flexibility. Since community solar projects are sized to meet the needs of multiple users, they are somewhat larger and therefore can obtain a greater economy of scale, which significantly reduces installation costs relative to a project's generation capacity. Moreover, a project can be located where interconnection costs are lower or where it can deliver a particular service to the distribution grid, such as voltage support, and therefore increase its value to the distribution system as a whole and reliability to the area.

Community Solar Benefits Are Transferable

A project can also be organized to permit each beneficiary's interest to be transferred separately from his or her individually owned or leased real estate, allowing the beneficiary to "take it along" to a new home (although this feature is typically limited to new addresses within the same utility area) or transfer it to someone else if desired, even while remaining in the same home. This feature is particularly helpful in lower-income households that are more impacted by changing economic circumstances or moving addresses.

Community solar models to-date have experimented with a range of subscriber commitment requirements, from yearlong membership contracts (although they often have no penalty opt-outs with sufficient notice) to simple month-to-month arrangements. Subscriber requirements are often dictated by the demands of project financiers who are seeking to minimize the risk of project revenue shortfalls due to a lack of customers.

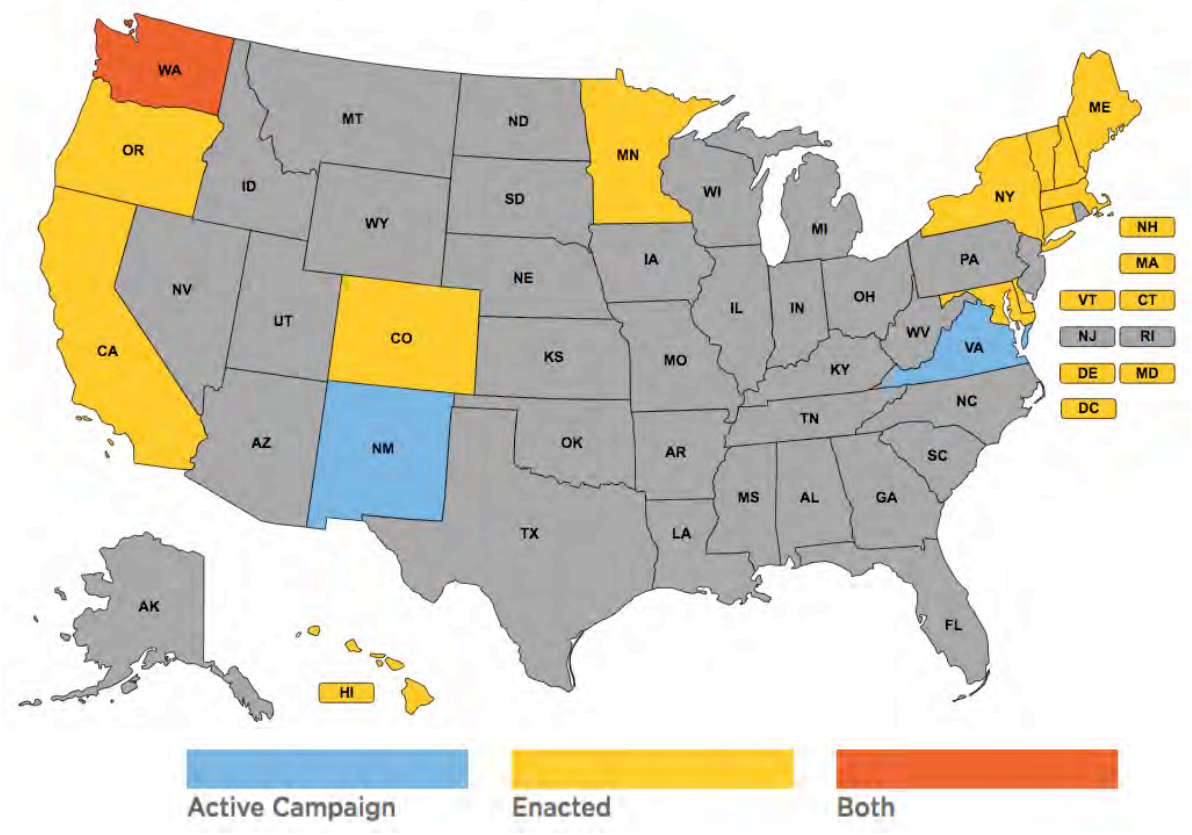
Community Solar Can Provide Grid Resilience

In addition, if a solar installation is combined with battery storage or integrated into a microgrid, it may be able to provide additional reliability and resilience in the area in which it is interconnected, for example, during periods in which the surrounding electric grid has incurred an outage. Community solar projects with storage may also be able to realize additional revenue streams from ancillary or capacity markets, although these opportunities are currently only available in a few regions and have been subject to considerable uncertainty.

States Supporting Community Solar

The map below from Shared Renewables HQ[7] indicates that, as of July 2017, 14 states and the District of Columbia have laws or regulations that support community solar. However, these state policies are in various forms of development and implementation and some are considerably more supportive and flexible than others. The Database of State Incentives for Renewables & Efficiency, www.dsireusa.org, is an excellent resource for identifying state programs that may help advance your project. Since U.S. solar is primarily regulated at the state level, there is little role for federal policies or regulators, although there are some legislative proposals to allow federal tax incentives to unambiguously apply to community solar projects.

State Community Solar Polices



Source: www.sharedrenewables.org

Scope of this Handbook

A municipality seeking to develop community solar has a complex task ahead. This guide provides a blueprint to think through development of the project, with emphasis on decision points that could reduce project costs or harness resources that are uniquely available to help serve lower-income constituents.

This Handbook identifies three obstacles to success – **access to capital**, **expertise**, and **risk-allocation** – and includes suggestions on how to overcome these obstacles. Throughout, we have also included ideas gleaned from other community solar projects that appear particularly interesting or innovative.

This Handbook is not meant to be a complete guide to community solar projects in general. There are numerous excellent references that already meet that need.[8] Rather it is intended to look specifically at how a municipality or other governmental body can make community solar more accessible to lower-income residents. [9] There are a number of additional resources available online like the U.S. Energy Department sponsored Community Solar Hub[10] where municipalities can learn more about projects in their region or how other pioneering community solar projects were designed and implemented.

FRAMEWORK CONSIDERATIONS: PROJECT SCOPING

Before initiating a community solar project, it is essential that planners and advocates be able to clearly define and articulate the project's objectives.

While solar, in general, and community solar, in particular, can offer a multitude of benefits, not every project will fully deliver all conceivable benefits, and in some cases compromises or trade-offs will be necessary. Therefore, it is helpful to carefully consider and prioritize the project objectives and let those objectives shape the project structure. Reaching consensus around the goals and objectives of any municipal sponsored project will also help ensure the project is a good fit for the community in which it is built.

In order to assist the planners and advocates of a proposed community solar project, this section reviews a number of key issues that should to be considered to properly scope and design a project that benefits the targeted community. It is also important to reach out early during the scoping phase to critical stakeholders, such as the local utility and community groups, who may have valuable resources or information to share. Support from such stakeholders may bring down the cost of the project or facilitate its ability to achieve critical milestones such as site approval.

Delivering Benefits to Low-Income Customers

In keeping with the purpose of this Handbook, a presumptive objective of the project is to generate benefits that will flow to low-income residents. These low-income recipients are referred to throughout the Handbook as the project's beneficiaries. Although serving these beneficiaries seems to be an obvious objective, it is best to articulate all assumptions so that all stakeholders have a common understanding. Thus, the project planners should clearly identify the proposed beneficiaries, the nature of the benefits to be provided, and the timeframe over which they are to be delivered, as further elucidated below.

It is also important to consider how the benefits will flow to the beneficiaries. For example, is a direct bill credit available? Or, if the intended beneficiaries are residents of leased housing who do not receive individual bills, perhaps because they live in a master-metered building or are receiving government or utility rate subsidies[11], will benefits provided to a housing authority or landlord satisfy the program goals? And if so, how will the benefits

DEFINING LOW-INCOME

The terms "low-income" or "lower-income" are used loosely in this report to describe individuals or households whose recurrent income streams are below certain thresholds relative to their local cost of living. One commonly used criterion is based on the Low-Income Home Energy Assistance Program (LIHEAP) statute, in which the income eligibility threshold is set at the greater of 150 percent of the federal poverty guidelines or 60 percent of the state median income. However, different jurisdictions use a variety of metrics that can vary by region or even individual program design. For example, Colorado's Solar Garden legislation says individuals that qualify for the Colorado Low-Income Energy Assistance Program, as certified by the Colorado Department of Human Services, are eligible to be low-income solar garden subscribers. Other jurisdictions peg eligibility to households with incomes that are 60 or 80 percent of the Average Median Income (AMI).

of the lower electric bills be passed through to the intended beneficiaries, for example, as a credit against their rental costs?[12] If the project is intended to operate for the benefit of a mix of lower-income beneficiaries and others, for example, an entity that can enhance the credit profile of the project, that decision should also be clearly articulated at the onset of the effort.

Benefit Distribution Decisions

For the purposes of this Handbook, the project benefits are assumed to include on-bill net energy metering credits issued by the utility that receives the project's energy output.[13] Assuming the jurisdiction's community solar project regulations allow these credits to be freely assigned to any customer of that utility (as is possible in the District of Columbia), these credits can be distributed directly to specific low-income customers who are served by the utility to reduce their bills. In many jurisdictions, the ability to assign the credits from a project to a customer who is not directly connected to the project is referred to as "virtual net metering."

Alternatively, the credits can be monetized, with some or all of the funds being distributed to low-income people as cash dividends or other tangible financial benefit such as subsidized rent, regardless of their status as utility customers. The project may be able to generate other financial benefits too, including funds from sale of the renewable energy credits ("RECs") associated with its output. Depending on the degree to which these benefits are needed to offset project costs, they may also generate value for distribution to the project beneficiaries.

Planners must determine the nature and amount of the benefits that can be received from the project, as well as consider all the implications of the form of benefit that they choose. For example, local regulations or tariffs may place limits on how the on-bill net energy metering credits may be used, and cash benefits might be viewed as income, which may affect the recipient's eligibility for other assistance or create a tax liability. Identifying such implications early during the planning phase allows them to be fully evaluated and addressed.

Financially Active Beneficiaries

Depending on the model chosen for the project, the beneficiaries could be active financial participants in the project, either as co-owners who make a contribution up front and "own" a portion of the project, or as pay-as-you-go participants (e.g., paying a portion of a solar lease payment in exchange for the value of the solar generated) during the period of their participation.

The beneficiaries' active financial participation has powerful advantages in addition to facilitating the economic feasibility of the

Source: Planet Forward and GW Solar Institute

project. By actively electing to participate, the beneficiary becomes aware of how solar technology can contribute to sustainability and is empowered to assist. However, as referenced above, depending on the composition of the beneficiary class, financial participation may not be feasible, or may be limited and require supplemental resources. For a household living paycheck to paycheck, an upfront capital expenditure of even a few hundred dollars can be insurmountable.

Further, participation that requires a financial contribution may also carry with it certain financial risks, for example, if the amount of on-bill credit is reduced below expected amounts or the project does not perform as expected, then the payback period will be extended.[14] For this reason, consideration must be given to whether there will be a guarantor or some other protection that limits financially active beneficiaries' risks.

Financially Passive Beneficiaries

Beneficiaries can also be passive participants. Under this model all project costs are handled by an entity other than the financial beneficiaries, such as the municipality or a charitable organization.

While this structure does not convey the same educational or empowerment benefit of active financial participation, it would be appropriate where the beneficiaries do not have the financial capability to participate or in cases in which the beneficiaries are expected to be replaced from time to time (e.g., based on their eligibility for the program or when they move from a specific location).

Governance Responsibility

A decision must be made about how to manage the project. Administrative responsibility, financial participation and the allocations of costs, benefits (including tax benefits), and risks will be driving factors in defining the appropriate organizational structure for the projects.

Any entity with a financial stake in the project will likely want an active role in administration

PASSIVE BENEFICIARY CASE STUDY

One example of financially passive beneficiaries can be found in the District of Columbia, where the law firm of Nixon Peabody pioneered a community solar model that created a multi-building solar generation facility on the rooftops of leased buildings. Nixon Peabody donates the value of the resulting electricity to two low-income properties in a disadvantaged neighborhood several miles from the downtown installations. In real numbers, the 182-kilowatt installation generates electricity worth $25,000 a year, which translates to approximately $20 per month for 110 residents, a meaningful sum for beneficiaries earning less than 30 percent of average median income. Installing the arrays on three tall buildings in a dense urban area cost almost $800,000.

Source: Nixon Peabody

Nixon Peabody secured a loan and tax equity to cover almost three-fourths of projects costs, with SREC sale revenues covering expenses and future debt service. Grants from the District of Columbia and the law firm covered the remaining $200,000 of project costs. Jeff Lesk and Herb Stevens, the Nixon Peabody partners driving this innovative project also took no developer fees and provided all necessary legal work pro bono.

and management, but it may also be appropriate to give beneficiaries who are not financially active a role in administration and management, to ensure their continued interest and engagement and to assure the project is continuing to serve the interests of the community. The local utility may also be able to provide assistance, including by using its existing systems for program management.

Grid Benefits

A community solar project may be sited in a manner that strengthens the local distribution and/or transmission network and improves power quality. For example, these projects can alleviate congestion that stresses transformers and electric power lines and causes power outages. This is particularly useful if electric energy storage is included, by reducing surges, sags, and transients.

In some cases, the addition of the project may stress the distribution or transmission network. This aspect has multiple implications that require consideration, including:

Project Siting and Interconnection Costs

Interconnection costs, to connect the project to the grid, can be a very significant part of the total costs of the project. The costs vary widely, and are influenced by multiple factors, but could be in the tens of thousands to hundreds of thousands of dollar.[15] In general, a project that adds stress to the grid will likely incur costs to reinforce or upgrade the surrounding network at the time it seeks to interconnect. Alternatively, a project that is sited to improve the quality of the grid will likely have lower interconnection costs and/or it may help defer upgrade costs that the utility would otherwise incur (thereby helping to keep costs lower for others). Other factors, such as the nature of the other nearby uses of the grid, may affect the cost as well.[16]

Close consultation with the local utility will be needed to determine the optimal location. Some state commissions are working with their distribution utilities to make such information more readily available to entities that wish to connect projects to the distribution grid. The benefits of choosing the location with the lowest interconnection costs will need to be weighed against other issues, such as the availability and cost of an appropriate site and the reliability and resiliency concerns discussed below.

Grid Reliability

A community solar project may enhance the reliability of the local grid by reducing stresses on the grid and improving the power quality, as discussed above, thereby reducing the risk of localized outages. A project that delivers reliability benefits to the local community may be particularly well-suited for a lower-income neighborhood where reliability is an issue, since some lower-income residents are dependent on continuous electrical service for medical needs (such as respirators and charging

electric wheelchairs) and may have fewer alternative resources than more prosperous residents.

Further, improved reliability also benefits businesses serving these neighborhoods and therefore the micro-economy of the neighborhood. As discussed above, close consultation with the local distribution grid operator will be essential to identify potentially optimal locations and may dictate project siting as well as which communities could disproportionately benefit from a community solar installation.

Grid Resiliency

If tied into a microgrid with storage and appropriate controls, a community solar project can be configured to automatically island during a grid outage. If the project is intended to continue to operate during an outage of the larger grid (which often happens in conjunction with severe weather events that leave residents without essential services), consideration must be given to which loads will be directly connected and supported during the outage. These might include, for example, an emergency shelter, a grocery store, a hospital or urgent care center, and first responders.

The concept of integrating the community solar project into a microgrid would need to be considered very carefully, since creating a project with these capabilities would be more complex and costly. For example, regulatory codes may not explicitly contemplate microgrids, creating uncertainty as to the rights and responsibilities of the microgrid owner, or place restrictions on their ability to serve multiple customers. An advanced microgrid can deliver substantial benefits to the surrounding grid as well as its interconnected customers, but its advanced control system is costly. And any microgrid that is expected to provide continuous and extended operations during an emergency will need energy storage and/or additional sources of generation in addition to the solar project, which will add to the cost and complexity.

Source: Idaho National Laboratory

However, some of the enhanced benefits of integrating the solar project into a microgrid may result in longer term cost savings. For example, a community solar-enhanced microgrid might provide continuous power to housing for residents with medical needs, allowing them to shelter in place during an emergency and avoid emergency evacuation costs. Other benefits may be monetized, creating additional sources of revenue. For instance, a microgrid that can aid in grid recovery might be able to obtain compensation from the local grid operator for agreeing to provide that service.

The directly connected entities that would be supported during a grid outage might contribute to the cost of a community solar-enhanced microgrid, too. For example, a grocery store could benefit from the microgrid by being able to operate during grid outages and avoid expensive losses due to a lack of refrigeration and food spoilage. It would also receive revenue from its continued operation during the outage. Therefore, it could be reasonably asked to help offset the additional cost of the microgrid, as well as pay for its share of the community solar project and for any additional power received from the project during the outage. Even if not directly connected, beneficiaries and their neighbors would share in this resiliency benefit by having access to these emergency services in their neighborhood.

Sale of Renewable Energy Credits

Each megawatt-hour of power generated from a community solar project can be tagged with a solar renewable energy credit ("REC" or "SREC"), which in some states can become a significant source of additional revenue or project financing.

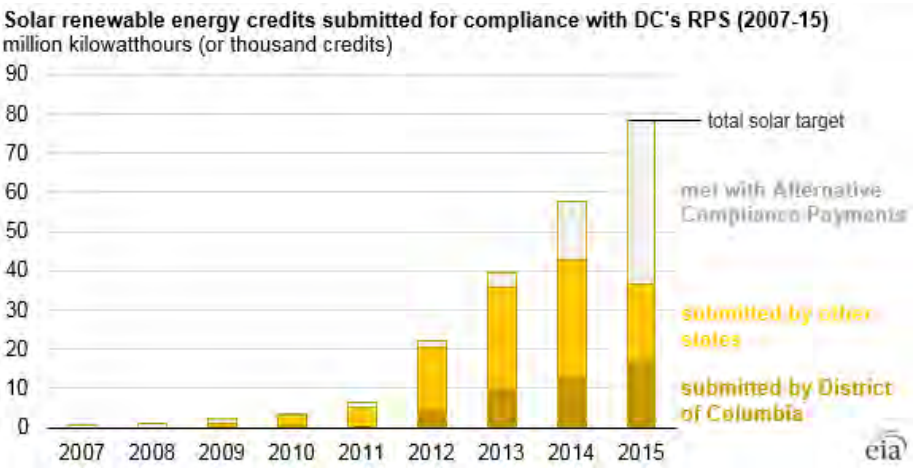
There are a number of different entities with which the project may register and which will track the SRECs associated with that project. These entities assign each SREC a unique identifier in order to track it, enabling the SRECs to be bought and sold, or retired. The beneficiary of the electric billing credits may also own the associated SRECs and therefore the right to monetize them. In other cases, ownership of the SRECs may accrue to another party, such as the owner/lessor of the panels or the utility that provides the billing credits in a net metering program. [17]

It should be noted that while SRECs can in some circumstances greatly improve project economics, SREC values can be quite volatile due to changing supply levels and regulatory changes. Project developers can reduce this price risk by contracting to sell future SRECs from the project upfront, typically by locking in a fixed price for all SRECs generated over the first three or five years of a project or by committing to turn over all future SRECs for a single lump sum annuity.

Source: U.S. Department of Energy

Project Sustainability Goals

While solar energy is "green," sale of the SRECs associated with the project's generation allow the new holder of the SREC to claim the "green" attribute in lieu of the original owner. This may enable the generation of additional "brown" power, which arguably diminishes the contribution of the project to the reduction of greenhouse gases.[18] The Federal Trade Commission has issued guidance that confirms that "marketers who generate renewable energy – say, by using solar panels – but sell RECs for all the renewable energy they generate shouldn't claim they "use" renewable energy."[19] Thus, if sustainability is a central goal, then retiring the Renewable Energy Credits (or selling them to an entity willing to do so) may be preferred. Doing so, however, eliminates a potential revenue source, that might otherwise be used to offset project costs or increase the benefits generated by the project.



Source: Energy Information Administration

Education Contribution

Locating the project where it is visible provides an opportunity to educate nearby residents about solar power. Thus, a ground-mounted project or one located on a visible rooftop in a trafficked area like a local park would provide more opportunities for education than one hidden on the top of a high-rise building.

The educational value can be enhanced by providing information about the project's operations through a building dashboard that displays a project's output and savings or by offering periodic tours. Anecdotal evidence also suggests that community solar subscribers feel a stronger connection to an installation that they can view regularly and is sited near or within their neighborhood.

Project Security

The project may require the installation of security controls, such as fencing or surveillance cameras. Zoning or other restrictions, the project's insurer's requirements, and the concerns of neighboring property owners are all matters for consideration. Some sites may also require 24-hour site security during installation (for staging materials) that can materially increase project costs as compared to a secure project site. In some cases, concerns with security, aesthetics or costs will require siting the project where it is least visible or accessible. This limits the educational value of the project, although inclusion of a dashboard or periodic tours, as set forth above, can ameliorate that loss.

Stability of Project Generation

Whether a project generates value in excess of its costs depends on the level of the costs, the amount or quantity of energy or other products produced and the price or value received for those products. Warranties, lease terms with minimum production guarantees, and similar measures from the supplier can help assure the panels produce as expected. This will add stability for the beneficiaries and project sponsors because they can depend on the panels producing the amount of energy or other products expected.

Similarly, professional project management with regular monitoring and maintenance can enhance long-term performance. There may be a cost, however, to obtaining this assurance. Thus, cost versus the assumption of production risk needs to be assessed and considered.

Stability of Project Economics

The value of the net energy metering credits received for the products generated are typically determined by a regulatory body, and because policies and markets can change, the project necessarily carries price risk. While costs may be largely locked-in by the time the project is complete, price risk remains for the duration of the project. A long-term commitment from the off-taker of the electric products, if available, can help mitigate this risk.

Similarly, an advance sale of the SRECs or other hedging strategies can help reduce project value risk. However, the price received from an advance sale is discounted for price uncertainty and the time-value of money, so the project may be foregoing a potentially more-profitable future revenue stream in exchange for locking in price certainty now. Program designers must assess the risk tolerance and structure the project accordingly.

Understand that there are many variations on what a community solar project is and can do. Clearly articulate your project's goals, with awareness of what benefits can and cannot be achieved.

FRAMEWORK CONSIDERATIONS: LEGAL AND REGULATORY

Solar deployment rates are heavily correlated with supportive state-level legal and regulatory policies. One clear indication is that around two-thirds of the solar generation capacity added in 2016 occurred in the five states with leading state-level policies.[20] While some of the top solar states are those with the best solar potential, other leading states like New Jersey and Massachusetts have relatively poorer solar resources and higher population densities limiting available space for solar systems. The common factor is that all of them have enacted policies that facilitate access and reduce the cost of installing solar on rooftops.

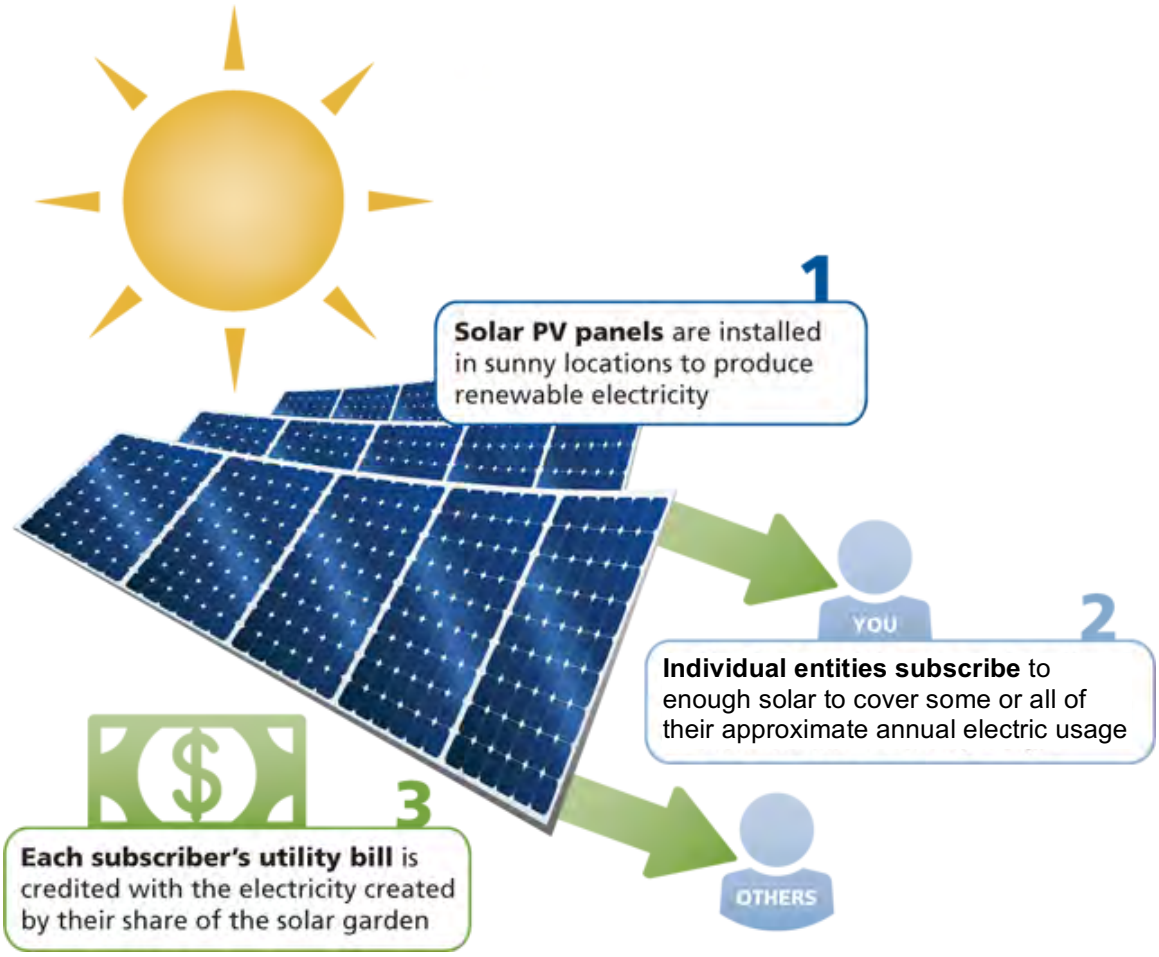
This section provides an overview of the key policies to take into account when scoping a community solar system because they can have an inordinate impact on project economics and feasibility.

Net Metering

The economic structure and financial viability and benefit of a community solar project often rests on net metering or virtual net metering. Net metering (sometimes called "net energy metering" or NEM) allows a utility's customer to receive a credit for the amount of power generated by the customer's solar project and delivered to the utility. When power in excess of the beneficiaries' immediate needs is generated, it is delivered to the utility and the utility in effect "stores" it such that the beneficiaries get retail rate compensation or credit for what they generated at another point in time, when their use of electricity is less than what the project is generating.[21]

If a customer were to install solar panels on his or her roof, the project and the customer's electric-consuming loads would likely share the same meter. But, in order for a community solar project to function economically, it is essential that the net metering policy allow the solar project to deliver power into the grid at a point ("Point A") that is, at a point separate from the point where the beneficiaries' usage is metered. This is sometimes called virtual net metering.

The credits accumulated by the project from the local utility for delivering the power into the grid at Point A can then be distributed to each of the project's beneficiaries, regardless of whether they consume the solar power themselves. Note, for purposes of this discussion, "net metering" is used to refer generically to programs under which beneficiaries of a project receive a credit. Some utilities, such as the one that serves Washington, D.C., maintain a definitional distinction between a "net metering" program that serves individuals and a "community energy renewable facility" program which serves multiple beneficiaries, for example, with community solar.



Source: Clean Energy Resources Team, Minnesota

Net metering policies vary by state and sometimes by utility. Although the Interstate Renewable Energy Council has set forth proposed model rules for community solar[22], there is no mandate for consistency across states or even to have such rules at all. Indeed, some states that permit net metering for projects that are sited on the beneficiary's own property may not have provided for community solar net metering and some projects have gone forward without laws or regulations specific to community solar.

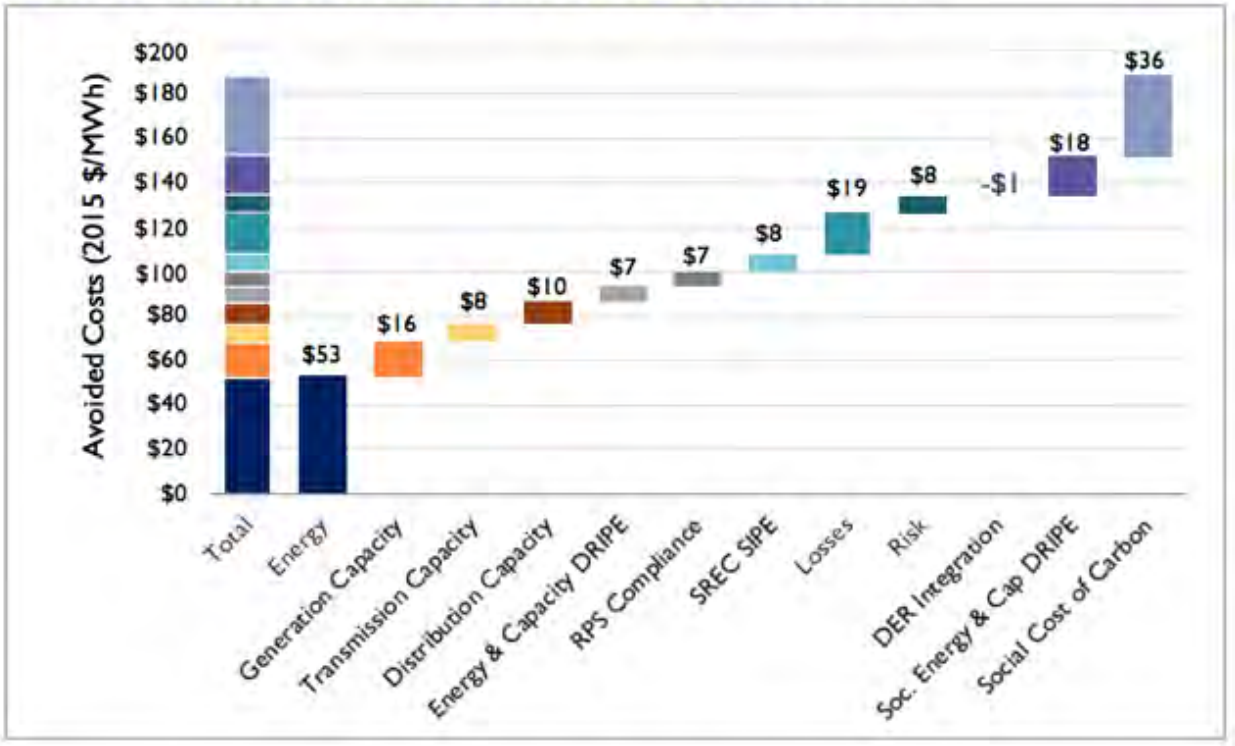
Where community solar laws exist, they may include important limitations, such as a minimum number of participants or a maximum size limitation. And it may also be the case that there is a significant difference in the amount of the credit allowed for energy generated by a customer's privately owned project on his or her own property and the credit allowed for energy generated by a community solar project. In most jurisdictions, community solar projects are currently receiving retail rate compensation, which makes them considerably more economically viable than a typical larger solar installation that would only receive wholesale rates for the power it generates.

Value of Solar Proposals

Another important trend to be aware of is the growing number of proposals to replace net metering with a tariff-based "value of solar" (VoS) payment structure. The basic concept behind VoS is that utilities should pay a market-based price for distributed solar energy based on the net value of a comprehensive set of costs and benefits that solar energy generation provides both the utility and society. These costs and benefits typically include values beyond just the electricity produced, like avoiding the need to build additional power plant capacity to meet peak power demands, avoiding the need to build additional transmission lines, the cost of integrating intermittent supply sources into the larger grid, and reductions in greenhouse gas emissions.

Generally, the concept of VoS has proven controversial, particularly among solar advocates who fear the resulting rate structure will prove less favorable than existing net metering policies. However, when Minnesota implemented its rules, the first state in the nation to do so, its VoS rate actually exceeded the retail rate, due to the inclusion of an adder for avoided greenhouse gases.[23] Similarly, a comprehensive VoS study released by the Office of the People's Counsel for the District of Columbia in April 2017 considered over three dozen values associated with solar generation and calculated that the societal total value for Washington, D.C. rooftop solar should be 19.4 cents per kilowatt, considerably higher than the current retail price for electricity that solar system owners receive for selling their excess electricity to the grid.[24]

Figure ES-4. Levelized societal value of solar by component



Source: Synapse Energy Economics

The chart above from that study shows how while the value of the electricity generated by solar is only worth $53 per megawatt hour (the equivalent of 5.3 cents per kilowatt), including the many other financial benefits of solar brings the total value of Washington, D.C. solar to 19.4 cents per kilowatt. Interestingly, the study also found that while there were other costs and benefits associated with solar, their financial value was negligible and therefore not included. Inclusion of these factors could make a VoS tariff more valuable to the community solar project's beneficiaries.

Massachusetts and New York are also moving in this direction. Under a plan being considered in Massachusetts, the basic payment structure could be enhanced with "adders" including for community shared solar, low-income community shared solar, solar serving lower-income properties, and for siting projects on landfills/brownfields.[25] New York is implementing a Value of Distributed Energy Resource payment that includes factors to reflect the location at which the power is injected into the grid along with adders to reflect the avoided losses and other distribution benefits and an environmental factor.[26] Whether this will be more beneficial to distributed solar providers in New York or leave them worse off as compared to the net metering program it replaces remains to be seen.

The parameters for a net metering program or VoS tariff can be set by legislation or a regulatory body. Active involvement in proceedings to establish or change these programs can help assure that the programs are structured to meet the needs of lower-income customers.

Power Purchase Agreements

An alternative means to generate revenue from a project could be a sale of some or all of the power to the interconnected utility, to a power marketer, or to the beneficiaries or one or more other consumers through a contractual arrangement with the owner of the community solar project.

Such contracts are called Power Purchase and Sale Agreements (often referred to as "PPAs"). Unlike the value of a net metering credit that can be changed by the utility with the approval of its regulator, the price, terms, and conditions of a sale under a PPA (including conditions under which the price might change) bind the parties. Disputes arising under a PPA are typically settled through arbitration or adjudicated in a court.

> Any specific proposal needs to be carefully vetted under the applicable laws.

On its surface, a PPA is a valuable asset because it provides a better level of security and stability than net metering and it produces cash– that can be put to any use – rather than credits on an electric bill. However, structuring a project to utilize a PPA rather than a net metering or community solar tariff is much more complex, in part because net metering

programs have been designed to avoid many legal and administrative complexities. Introducing a PPA into the project structure changes some of the fundamental assumptions.

While it is conceptually possible that a private entity that develops a project under a public-private partnership may wish to monetize a portion of the project through use of a PPA, doing so could have consequences affecting the eligibility of the remainder of the project for a net metering program, the characterization of the project for tax purposes, and the status of the project owners under federal and state law, including in some cases the governmental entity that has authority to regulate the sale.[27]

The diversity of possible configurations makes it difficult to analyze in a general way, and so for purposes of this Handbook, the focus will be on structures that utilize net metering rather than PPAs.

Other Considerations

Another key legal consideration is compliance with securities laws. Soliciting people or organizations to invest in a community solar project could be deemed an offering of stock. There are means to avoid becoming subject to securities regulations, which will be important to reducing the costs of establishing and maintaining the organization that owns the project.[28]

The project must also be aware of zoning laws, local building codes, and similar laws that would be applicable to any construction project.

Exploring applicable regulatory frameworks and the interconnecting utility's tariffs at the outset is critical to determining the available crediting mechanism and any operative project barriers or criteria that must be met. Further, legal advice should be sought to assure compliance with all applicable laws.

FRAMEWORK CONSIDERATIONS: BUSINESS AND ORGANIZATIONAL

Once the project goals are determined, many additional matters still remain to be decided.

These include selecting the project financing model, the beneficiaries, the site, and structuring the project economics, including equity and debt capital.[29] Keep in mind that all of these elements are interrelated. Changing one may affect the others.

Know Your Costs

Each project needs a comprehensive plan and budget that is specific to that project. The costs include far more than panels. For example, land costs are obviously a substantial line item that will vary by location. But even if a site is donated, this item cannot be overlooked since land preparation costs also can be significant. Further, project costs are interrelated. For example, the site chosen may affect the type of mounting system to be used, and therefore its cost, as well as interconnection costs. Soft costs such as legal fees, insurance, and administrative costs must also be considered. Thus, not only must the budget be developed at the outset, but it must be periodically updated during the development process as assumptions used in creating it change.

Financial and Tax Considerations

The financial structure is of key importance. Funds are needed to acquire a site and construct the project. These funds could come from the beneficiaries themselves or others, including government funds or foundations.

Tax incentives could help reduce the cost of equity but for any project that is expected to generate tax credits, it is necessary to have financial participants with sufficient "tax appetite." Since municipalities, other governmental entities, and non-profit organizations do not pay taxes there is value in working with an equity participant with taxable income who can monetize these tax credits for the benefit of the project. (See discussion in Appendices.)

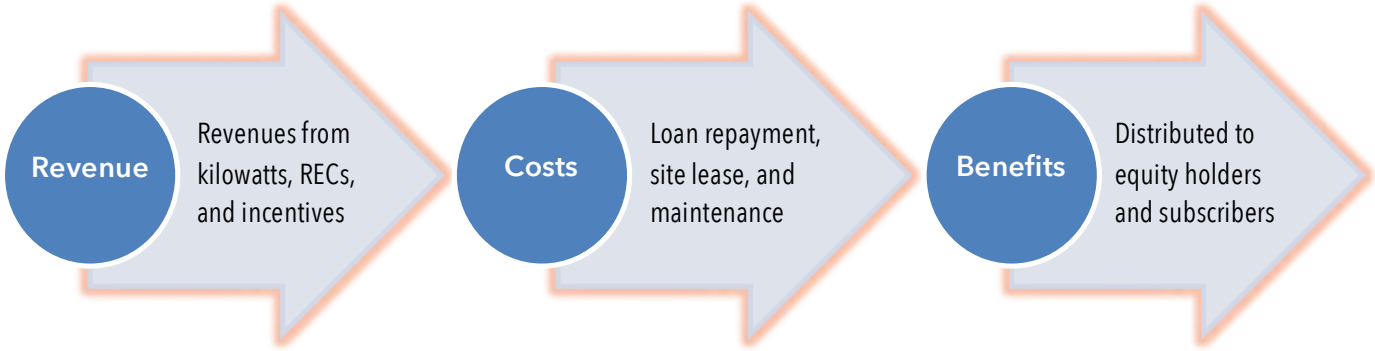
A portion of the funds may be borrowed, in which case it is necessary to consider who would lend to the project (e.g., a green bank) and whether there are mechanisms to reduce the cost of that debt (e.g., loan guarantees). Practically speaking, the project will likely be funded with a mix of equity and debt.

As the project operates it will generate benefits. Some of these benefits may need to be monetized to pay for on-going maintenance and operations, and the remainder distributed with appropriate amounts applied to the repayment of debt and divided among the equity contributors and other intended beneficiaries. If some of the equity was sourced from grants or charitable contributions, and thus those equity contributors do not require a share of the

benefits, then a greater portion of the benefits can be distributed wholly to the other beneficiaries such as the low-income ratepayers.

Challenges Serving Lower-Income Residents

Structuring a project in which lower-income residents hold an equity stake carries special challenges. Even if potential beneficiaries are found who can make a direct investment, additional support may be needed from one or more non-beneficiaries, either for direct funding or to enhance the creditworthiness of the project. If cash is required, then additional equity or debt providers must be brought in, and the project structured to produce and deliver the return they require for their participation. Thus, careful consideration must be given to the business model.



Selecting the Beneficiaries

Determining an efficient and equitable way to distribute the benefits generated by a community solar project is essential to the success of any effort that has the goal of helping low-income households. As discussed previously, the wealth generated by a solar installation can be transferred either by crediting the electricity generated against electricity consumed by a beneficiary, usually on their monthly electricity bill, or by a more direct method such as a cash dividend or a reduced rent payment.

Program designers also need to make determinations on the number of beneficiaries, how they are selected, and the level of financial support that will be provided. This can be a challenging task which will necessitate picking winners and losers and may require the input and perhaps signoff of community leaders, local stakeholders, and elected officials.

In most cases, it will be easier to establish a cohort of beneficiaries for an onsite community solar project, such as a rooftop array on a multifamily housing unit, since the resulting benefits will likely be divided among unit residents and perhaps the property owner. Offsite projects can be more challenging because decisions need to be made as to who benefits from a project that will realistically only be able to serve a few dozen or hundred low-income

households out of an eligible pool of thousands or tens of thousands. Some successful models transfer all the benefits to a particularly needy housing unit or rely on a first-come, first-served membership list. Colorado's community solar law requires that at least five percent of the subscribers to any project need to be low-income.[30]

The amount or level of benefits going to each individual or household also needs to be determined. Will the resulting benefits provide participating households with relief from all of their monthly electricity bills, or some predetermined portion of a monthly bill? How long will these benefits be guaranteed: for, a season, a year, or as long as that person lives at the address correlating with the benefit? If an offsite project is transferring benefits to low-income residents with a dividend, should each eligible household receive the same amount of cash at the same frequency regardless of number of residents and household income?

There will always be a tradeoff between the number of beneficiaries and the amount of benefit available for each which will require some value judgments based on the goals of the program, the amount of benefits generated by a project (which can also vary in both the short- and long-term), and the administrative costs of issuing those benefits.

Sources of Funding and Ownership

The funding of a community solar project will depend on the way the ownership structure is set up. Not all financing options are available under all structures. Consider the various stakeholders that the project may have. The parties that might be involved in setting up the project are:

1) Low-income community members
2) Corporate partners
3) Private investors
4) Property owners
5) Local governments
6) State governments
7) Non-profit or not-for-profit non-governmental organizations

Potential stakeholders may elect to organize into partnerships, LLCs, or corporations for the purposes of development, ownership and operation.[31] The organizational structure selected, as well as the contractual arrangements the stakeholders enter into with one another, will determine how the costs, benefits and risks are allocated, and can assure that the tax benefits and subsidies (federal, state, and local government) available to the project are used to maximum effect.

There are opportunities to decrease the capital required for the project just by choosing the right ownership structure because some potential participants are themselves potential sources of capital while others can help get access to subsidies and tax credits, grants, or loan guarantees offered by different levels of government.

Options such as bank loans may also be available but require investors with good credit ratings. Potential sources of equity capital include:

1) Private investors
2) Corporations
3) Community funding (including from local charitable organizations that may contribute cash or goods or services) or crowd-funded
4) Foundations[32]
5) Government appropriations or competitive grants

Note that the latter sources listed may or may not require a return on their money, but may include conditions for their use that limit their availability or applicability. Potential sources of debt capital could include:

1) Loans from traditional financial institutions
2) Green Banks or other government-sponsored loan programs
3) Municipal bond financing, including Clean Energy Renewable Bonds
4) Property owners where solar is installed

More complex forms of investment could include sale-leaseback models or various types of "flip structures" that are designed to allocate potential tax benefits the project may be entitled to receive to investors who can monetize them. Selecting business partners with a "tax appetite" can be critical because not all potential investors can take advantage of these tax incentives, which can be crucial to the economics of any solar project.

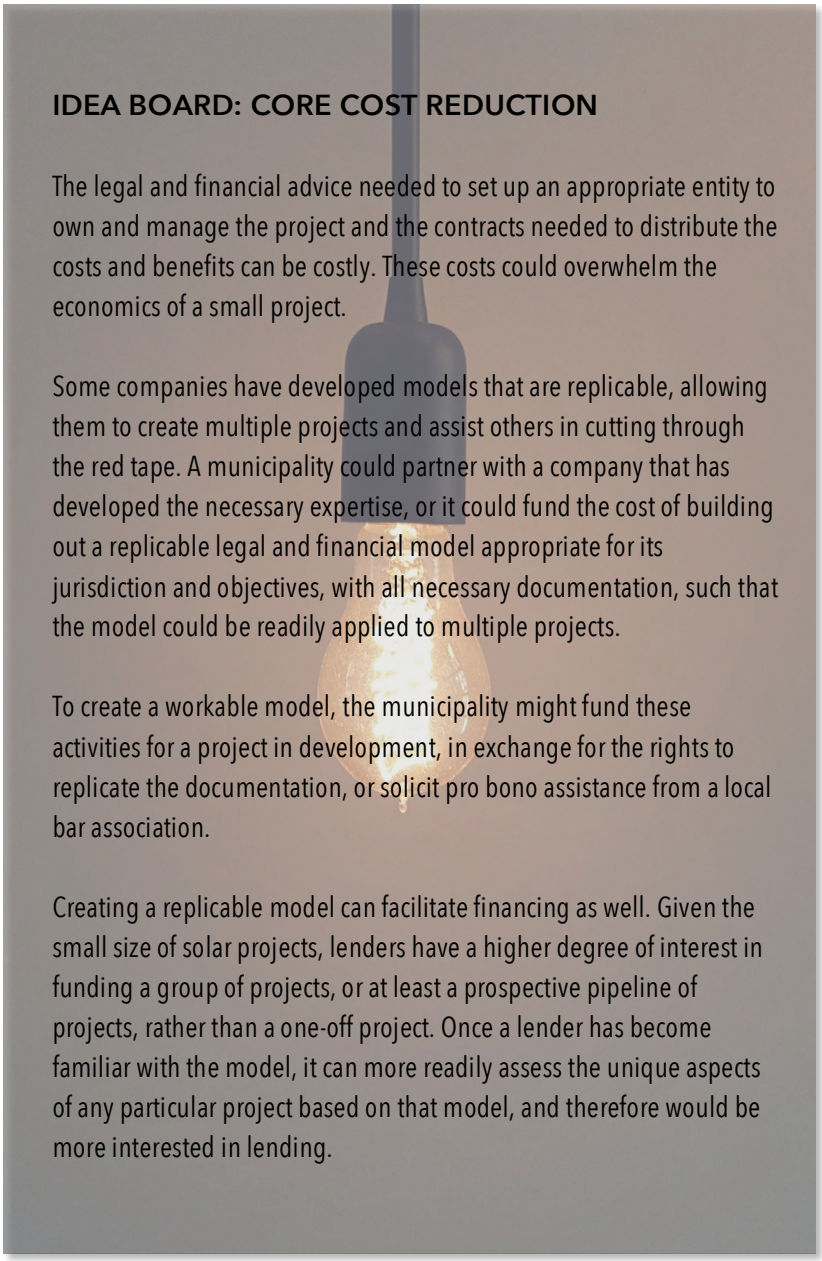
The biggest hurdle that needs to be overcome to apply traditional financing mechanisms is finding a creditworthy counterparty. From interviews with financial service providers, it is apparent that community solar is still a nascent market and there are few established or standardized financing models. Financial institutions can be approached to provide funds for the project, but they will be looking for key, traditional features to mitigate the risk.[33]

A governmental entity may be able to mitigate project risk by acting as the primary borrower or as a guarantor for less credit-worthy beneficiaries to stand behind. This type of support would be particularly important if there are financially passive beneficiaries, as they would not be expected to make any direct financial contribution.

A municipality that is in the position of being able to make loan guarantees in the event the project fails to generate the revenue needed for loan repayment would help overcome this hurdle. Green banks can also be used. These financial institutions are already present in states such as Connecticut and New York.[34] These institutions can provide loans with a lower financing cost as compared to private banks and thus can be leveraged as the principal funder for the project.

The quality of the panels to be used, the supplier's operating performance experience and warranties, the experience and reputation of the construction contractor, the security of the site location and its suitability for the project, and similar issues will all be of concern to any lender.

Experience of the development team and the engineering, procurement, and construction contractor can be another hurdle. Engaging an experienced company with a solid installation track record to develop the project and handle the operations and administration of the project could be seen as a positive attribute by potential lenders. However, hiring professionals, rather than relying on volunteer labor (e.g., the beneficiaries) or an inexperienced project owner for some of the services will add an operational cost, so the costs and benefits of each approach should be measured.



IDEA BOARD: CORE COST REDUCTION

The legal and financial advice needed to set up an appropriate entity to own and manage the project and the contracts needed to distribute the costs and benefits can be costly. These costs could overwhelm the economics of a small project.

Some companies have developed models that are replicable, allowing them to create multiple projects and assist others in cutting through the red tape. A municipality could partner with a company that has developed the necessary expertise, or it could fund the cost of building out a replicable legal and financial model appropriate for its jurisdiction and objectives, with all necessary documentation, such that the model could be readily applied to multiple projects.

To create a workable model, the municipality might fund these activities for a project in development, in exchange for the rights to replicate the documentation, or solicit pro bono assistance from a local bar association.

Creating a replicable model can facilitate financing as well. Given the small size of solar projects, lenders have a higher degree of interest in funding a group of projects, or at least a prospective pipeline of projects, rather than a one-off project. Once a lender has become familiar with the model, it can more readily assess the unique aspects of any particular project based on that model, and therefore would be more interested in lending.

Reducing the portion of the funding that comes from debt also makes a project more attractive. As an analogy, a home mortgage can be more easily secured with a higher down payment. Similarly, a lender may be more interested in a community solar project that is seeking funding for 50 percent of the cost rather than 80 percent. Since the lender will require a first lien on the project, it will be better assured of recovering its investment when less of its money is at risk, relative to the total value of the project.

To reduce borrowing needs, the potential project developers may look for sources of equity capital from entities that are not seeking a return on investment (e.g., grant funding from a foundation or governmental entity) or at least not seeking a market-rate return on equity. Some of the potential governmental programs that can provide capital or be used to reduce project costs are discussed below.

Organizational and financial structures are dependent, in part, on the participants and goals. Finding an appropriate model requires considerable deliberation, in conjunction with sound and jurisdiction-specific legal and financial advice.

PATHWAYS TO SUCCESS

Obstacles to Success

There are three particular barriers that must be addressed to bring community solar to lower-income communities. Assistance is needed to fund the project, technical and management expertise is needed for development and operation of the project, and provisions are needed to deflect financial risks from the low-income beneficiaries to entities better able to manage and withstand them.

Obstacle: Access to Capital

A key obstacle, to state the obvious, is that low-income customers are less able to access solar energy due to their limited financial resources. Providing ready cash or borrowed cash are likely beyond their means and even committing to a "pay-as-you-go" structure under an arrangement similar to a lease would generally require a favorable credit score and the capacity to continue to make payments, even if the project does not perform as expected.

To overcome the financial hurdle, a municipality can (1) seek means to reduce the cost of the project; and/or (2) find funding to substitute, or supplement, for the monetary contribution that would typically be made by the beneficiary of the project. A municipality seeking to advance low-income participation may have resources available to it that can address either or both of these objectives, as well as the capacity to tap other governmental or private resources that may be able to help. These solutions to this obstacle are discussed below, under the heading "Accessing Capital."

Obstacle: Finding Expertise

Another obstacle is that either the beneficiaries or someone acting on their behalf must provide or acquire a certain amount of expertise to coordinate the development, construction, and on-going operation and maintenance of the project, as well as handle administrative matters relating to the project. This is true of any community solar project, but a project intended to serve a lower-income community may have fewer resources with which to address it. As discussed below, some or all of these services could be provided by a municipality, sought from the local utility, or acquired through a third-party in exchange for a management fee.

IDEA BOARD: PRE-DEVELOPMENT COST ASSISTANCE

Exploring the feasibility of a project and getting it started also requires funding. Not every attempt to launch a project will be successful, but a developer with a large portfolio would expect to recover its costs over time from the percentage of attempts that succeed.

However, for entities breaking into this market, including community groups or other NGOs who might be willing project sponsors, this funding gap can be a significant hurdle. Conventional capital is not available for pre-development costs. [Sanders & Milford, note 12, at 21]. Municipalities could help fill this gap with grant funding or direct assistance programs that provide technical experts and other aid.

Alternatively, also as discussed below, the project may include an experienced solar company in its ownership structure who would provide these services in conjunction with an equity stake in the project.

Obstacle: Ability to Assume Risk

The ability to assume risk is perhaps a less obvious obstacle but of critical importance. Investment in a community solar project entails some degree of risk. Risks could include the failure to secure a site, a zoning problem, or an unforeseen construction issue that delays or derails a project, all of which could put the initial capital invested in the project in jeopardy. There is also the risk that the project may not perform as expected.

> Many experienced solar financiers have also balked at funding community solar projects until they can be convinced projects will be able to obtain and maintain subscribers.

Some of these risks can be mitigated, for example, with development grants, or warranties on products or workmanship, but others are unavoidable. For example, depending on climatic conditions as well as many other factors, such as changes in the crediting mechanism, even a well-conceived project that is operating properly could experience a longer than anticipated payback period or different-than-expected cash flow. That could result in the amount of bill credits generated by the project failing to match the rate at which the project costs must be repaid. In an extreme case, project revenues may be so uneven that payments must be made in months in which there are insufficient credits to offset it. [35]

Source: Montgomery County, Maryland

Lower-income customers are not likely to have the financial flexibility to sustain such risks. Therefore, the project can be made more viable by transferring this risk to an entity better able to manage it, for example, by diversifying it across multiple projects or to an organization with the resources to withstand an uneven cash flow. The municipality can provide this type of help or it might work with the local utility to adjust the crediting mechanism to better match the cost repayment schedule. Or, as described below, the municipality might seek to foster business and organizational structures that would induce a third-party to assume this downside risk in exchange for the potential to share in the benefits produced by the project.

When a municipality considers the organizational and business models that might be applied to a community solar project, its evaluation and selection should be made in part on the ability of the selected model to address these latter two risks – expertise and risk-allocation – to the satisfaction of the municipality.

CASE STUDY: A COMMUNITY SOLAR PROPOSAL FROM CONSOLIDATED EDISON

While this paper focuses on models for low-income solar projects in which a municipality may participate (in varying degrees), some utilities are also considering offering such programs. Consolidated Edison Company of New York (ConEd) recently received approval to do so, and comparison of its proposal to the approved program helps illustrate the risk allocation problem.

New York State's Public Service Commission (PSC) opened a proceeding specifically addressing lower-income residents' access to solar as part of its Reforming the Energy Vision (REV) initiative. (Case 14-M-0101, Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision.) Consistent with its emphasis on market solutions, the PSC encouraged projects developed under its Community Distributed Generation program to reserve 20 percent of their capacity for low-income customers. Although distribution companies such as ConEd, which serves a large part of the New York City area, are generally barred from owning generation, the PSC provided a carve-out to be used if the market fails to meet the needs of lower-income customers.

In October 2016, ConEd proposed a pilot project. It proposed to provide 11 megawatts ("MWs") of utility-owned community solar projects to be sited on utility-owned properties, with an initial phase of 3 MWs. In August 2017, the PSC approved the first phase. (Case 16-E-0622.) ConEd will obtain bids from third parties to develop and construct the projects, which will then be transferred to ConEd. Beneficiaries will be selected from among customers in its Electric Low Income Affordability Program. If over the term of the program a beneficiary's status changes so that it no longer qualifies, after a 6 month period the beneficiary can be replaced.

Financial risk was a significant issue in the proceeding. ConEd expects the cost for the initial 3 MWs to be $9 million before state or federal tax benefits or incentives. The power generated would be valued at the net metering rate. ConEd proposed to credit the beneficiaries with the net value between the amount generated and the levelized program costs on a monthly basis. However, ConEd proposed to guarantee that a beneficiary would never receive a net credit of less than zero in any month by allocating any losses over its entire customer base.

The guarantee proposal was met with mixed reactions, including concern that ratepayers not involved in the program might be required to fund it due to the guarantee. Opponents also argued that having ratepayers provide this backstop provides the utility with a competitive advantage in offering such a program as compared to a private company. Several suggested shareholders should bear the risk of costs exceeding benefits.

The Commission approved a ratepayer (rather than shareholder) backstop, with modifications. It directed ConEd to acquire the maximum amount of MWs possible with its proposed budget (which would be capped). ConEd will be required to "bank" a portion of the credits during net positive months, up to $100,000, to be used to offset costs in months in which the levelized project costs exceeded the credits. Ratepayers would fund losses in excess of the banked amount, but only to the extent incremental to the Company's electric revenue requirement.

Accessing Capital

One of the key benefits a municipality can bring to the table in these projects is assistance in securing sources of capital to supplement or fully displace any contribution that would otherwise be made by the low-income beneficiaries. Such help might be in the form of capital, loans, or loan guarantees. The municipality might also explore other federal initiatives that can help support a project, such as providing expertise or labor. Any means by which costs are reduced or "free" capital or expertise is brought into the project helps to reduce the risk of the project. If the project would still require additional capital to move forward, its improved risk profile would be more attractive to potential investors. Thus, this should be a starting point for development. Some areas that were available as of the time this Handbook was developed are set forth below.

LIHEAP funds

One possible source of funding for low-income community solar is a federal program called the Low Income Home Energy Assistance Program (LIHEAP). LIHEAP is funded at the federal level and administered at the state level. Whether a household qualifies as low-income depends on either income eligibility[36] or categorical eligibility.[37] Recipients of LIHEAP funds do not incur tax liability for the equivalent income received.

Because LIHEAP is administered at the state level, any allocation of funding for low-income community solar projects must be established well in advance of a new fiscal year, usually through a request for proposals (RFP) issued by a state. LIHEAP gives states flexibility in organizing their plans, allowing them to apply, for example, state tax credits to energy suppliers, such as utilities, for providing reduced energy rates to low-income households. Nevertheless, states must conform to the criteria set forth by LIHEAP.

Although there are no explicit prohibitions on using LIHEAP funds for community solar, the statutory language suggests several limits to its use. However, several states have applied LIHEAP funds to solar developments. Appendix II provides a more in-depth look at several possible barriers and constraints, as well as possible ways to overcome them.

HUD Community Solar Funding Programs

The United States Department of Housing and Urban Development (HUD) encourages the use of low-cost on-site or local power to meet resident needs. In July 2015, together with the United States Department of Energy, HUD announced the goal of 300 MW of renewables for low-and-moderate income housing.[38] Accordingly, if the municipality is interested in bringing community solar to a public housing community, it may have several options that work in conjunction with other federally assisted housing programs.[39]

HUD has provided guidance on how solar installations can be accommodated under its programs. If the installation of on-site utility technologies reduces the utility costs of a Public

Housing Authority (PHA), the PHA receives a Rate Reduction Incentive (RRI), which is typically 50 percent of the cost savings, in cases where the PHA pays the utility costs.[40] In housing where the residents pay the utilities, the application of the incentive award is less straight-forward, but an RRI may still be awarded where the PHA can demonstrate it has made a special and significant effort to reduce resident utility rates.[41]

PHAs may also utilize Energy Performance Contracting (EPC) to achieve consumption reductions. Under an EPC program, "cost savings from reduced energy consumption [is used] to repay the cost of installing energy conservation measures."[42] That is, the PHA contracts with an energy services company, and that company bears the upfront costs and often will guarantee a level of savings.

HUD's 2014 Notice resolved a conflict between its EPC and RRI programs by allowing the PHA to retain 100 percent of the savings generated by a combined application of consumption reducing and rate reducing efforts during the period in which both are in effect.[43]

While neither EPC nor RRI are specific to community solar projects, and indeed, the guidance addresses only on-site solar, the guidance treats the energy generated by the solar project as a reduction in energy consumption. Where the benefit of the project accrues to the tenants of the PHA's rental units, such as in cases in which the residents pay their utility bills, the impact is that of a community solar project.

There are a variety of other ways in which HUD encourages decreases in utility costs for buildings and housing projects under its authority that are not specific to community solar but can still be used for that purpose. These include the Public Housing Operating Fund Program[44] and The Public Housing Capital Fund Program.[45] For example, in a "Three-year Rolling Base [program] utility cost savings from energy conservation are phased out over a four-year period," resulting in the housing authority receiving 150 percent of the first year's cost savings over the four years.[46] If adapted to community solar, the savings could be applied to loan repayment or otherwise used to reduce project costs that must be funded from other sources.

Low-Income Housing Tax Credits

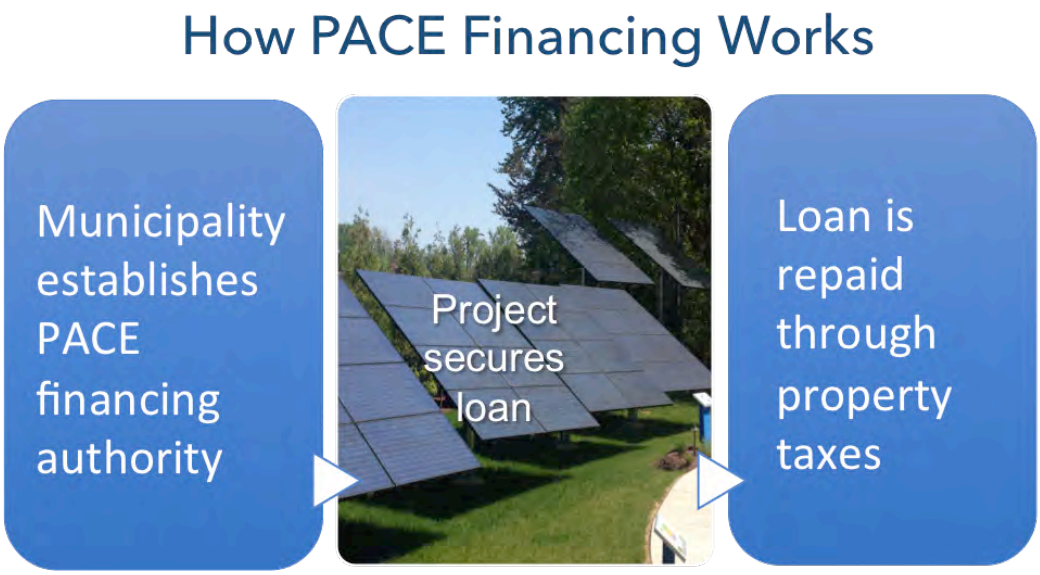
These federal tax credits are allocated to agencies in the states and certain other jurisdictions (such as the District of Columbia, the City of Chicago, and Guam), which determines the plan for their further allocation to private investors in low-income housing.[47] "The tax credit is calculated as a percentage of costs incurred in developing the affordable housing property, and is claimed annually over a 10-year period. Project developers can jointly structure transactions to qualify for solar energy tax credits (energy credits) and low-income housing tax credits."[48]

Section 108 Loan Guarantee Program

According to HUD, "the Section 108 Loan Guarantee Program (Section 108) provides communities with a source of financing for economic development, housing rehabilitation, public facilities, and other physical development projects. This flexibility makes it one of the most potent and important public investment tools that HUD offers to state and local governments."[49] This program allows municipalities to convert a percentage of their Community Development Block Grant (CDBG) funds into federally guaranteed loans to help fund physical and economic revitalization projects in eligible communities.[50] These Section 108 loans can range from $500,000 to $140 million. The flexible repayment terms and low interest rates of these loans make the Section 108 program an ideal source of capital for community solar projects.[51] Eligible recipients include states, cities, and urban counties (CDBG recipients), communities that aren't CDBG recipients that are assisted in their application by a State that administers the CDBG program, and communities that receive Small Cities CDBG money.[52] "The public entity may be the borrower or it may designate a public agency as the borrower."[53]

PACE Financing

Property Assessed Clean Energy (PACE) financing is a structure in which states or municipalities can extend the use of "land-secured financing" to private property owners for publicly beneficial improvements in energy, including for solar generation, typically on below-market terms, secured by the property and repayable through property taxes.[54] The program availability, terms, and project eligibility vary by state. For example, in the District of Columbia, the repayment period for this loan can be up to 20 years.[55]



Whether this type of financing would work for a community solar project would depend on many factors, including whether the project owner proposing to borrow the funds also owns the property on which the project is located, and the availability of PACE financing within that state for such projects. Despite these fact-specific issues, this is certainly an area appropriate for exploration and, even if not permitted at present, proponents for community solar might seek to have the regulations governing their PACE program amended.

National Community Solar Partnership

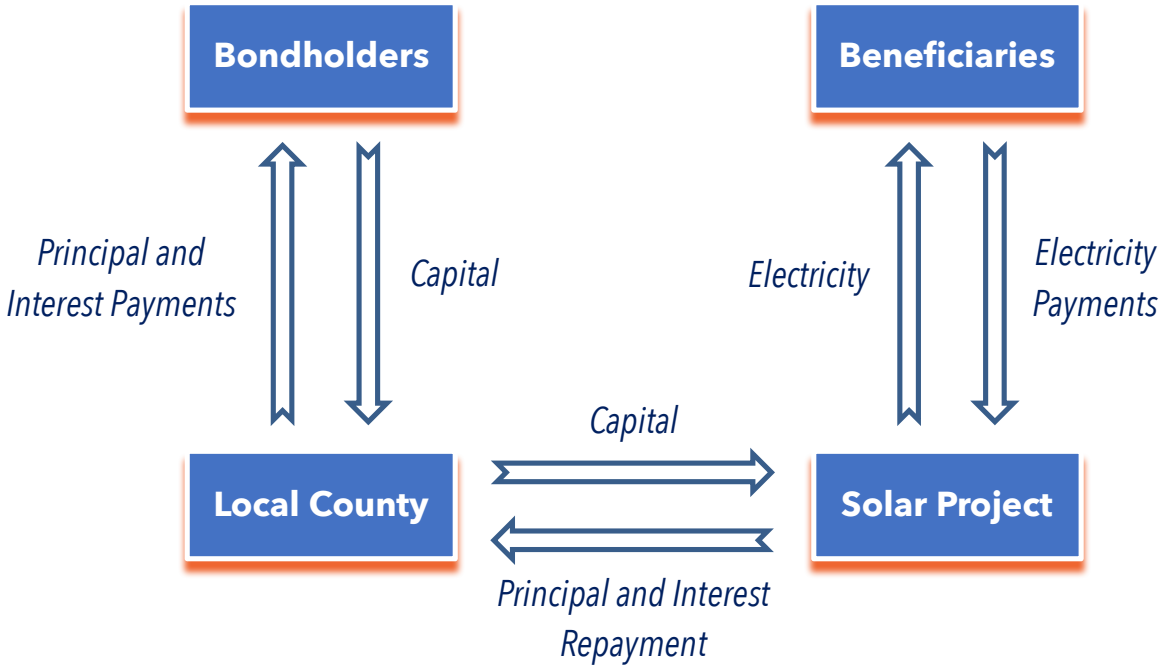
HUD partnered with the Department of Energy (DOE), the Environmental Protection Agency (EPA), and the Department of Agriculture (USDA) to expand solar access to low and moderate-income communities. Community solar is a major part of the strategy to increase access.[56] In order to accomplish this goal, the partnership brought together stakeholders (representatives from solar companies, non-profit organizations, state and community leaders, and financial institutions) under DOE's SunShot Initiative to assess hindrances to solar development in low-income communities and encourage deployment of community solar in low- and moderate-income communities.[57] Municipalities can contact these agencies to learn the latest on these efforts in order to help navigate the pitfalls of establishing these projects in low-income communities. This access to information will decrease the amount of time and resources municipalities must devote to research and due diligence during the early phases of a project.

Clean Energy Savings For All Initiative

Under the Obama Administration, a partnership between DOE, HUD, USDA, EPA, Health and Human Services (HHS), and Veteran's Affairs (VA) was formed to increase access to solar power and promote energy efficiency with a focus on low- and moderate-income communities.[58] The Clean Energy Savings for All Initiative seeks to promote innovative financing mechanisms, provide technical assistance for states and communities, encourage innovation, ramp-up workforce training, bring together stakeholders, and work with the private and philanthropic sectors to expand the solar footprint.[59] Similar to the National Community Solar Partnership, municipalities could use this as a resource when considering forging ahead with a community solar project, therefore reducing time and resources on the front end of projects. Whether this program will continue under the Trump Administration is not yet clear.

Municipal Bond Financing

Local county governments may issue bonds to raise capital for a solar PV project. Bondholders are repaid their capital plus interest generated as per the fixed schedule declared by the local county. The county could use this capital to develop its own projects. Any municipally owned project, however, would forego the tax benefits available to a for-profit entity, which is a significant consideration.[60] Bond repayments are funded through sales of the electric energy generated or sale of other benefits. A sketch of the model appears in the diagram below:



Other Federal Programs

There are many other federal programs that include funds that can be applied to a community solar project. For example:[61]

- *Weatherization Assistance Program*: provides funding to states and non-profits to upgrade homes to be more energy efficient, including upgrades to make homes "solar-ready."
  https://energy.gov/eere/wipo/weatherization-assistance-program
- *Community Development Block Grant (CDBG)*: Discussed above with 108 Loans, these grants are also quite flexible and could be used themselves by states to develop solar projects for communities in need.
  https://energy.gov/eere/solarpoweringamerica/federal-resources-community-solar
- *Rural Energy for America Program*: Agricultural producers and rural small businesses (private projects) can get 25 percent of eligible project costs or a guaranteed loan for 75 percent of the project.
  https://www.rd.usda.gov/programs-services/rural-energy-america-program-renewable-energy-systems-energy-efficiency
- *Rural Energy Savings Program*: Rural families, small businesses, and rural utilities can apply for this program, which provides low-interest loans to finance energy projects like solar.
  https://www.rd.usda.gov/programs-services/rural-energy-savings-program
- *Energy Efficiency and Conservation Loan Program*: This program provides loans to finance energy efficiency and conservation projects, e.g., community solar, to rural utilities (private projects).
  https://www.rd.usda.gov/programs-services/energy-efficiency-and-conservation-loan-program

- *Clean Energy for Low Income Communities Accelerator*: This is similar to the National Community Solar Partnership and Clean Energy Savings for All Initiative. Primarily it provides a structure for bringing new ideas to the table and providing technical expertise and financing options.
  https://betterbuildingssolutioncenter.energy.gov/sites/default/files/attachments/Low_Income_CE_Fact_Sheet_0.pdf

State Environmental Agencies

The development of solar energy can further state environmental goals. Accordingly, state agencies responsible for the State Implementation Plan (SIP) under the Clean Air Act (CAA) may have funding available for community solar.[62]

Other State Incentives

Some state and local governments are already supporting solar installations with SRECs, tax incentives, direct rebates or other means. They may also have additional funding available through public benefit funds, economic development funds, or infrastructure funds. These should all be explored as potential means for funding new projects.

Further, when any of these programs become subject to renewal or reauthorization, a municipality might become an active participant in determining the program's effectiveness at promoting the desired goals and consider whether community solar for low-income customers might be furthered by program modifications.

Utilizing Brownfields

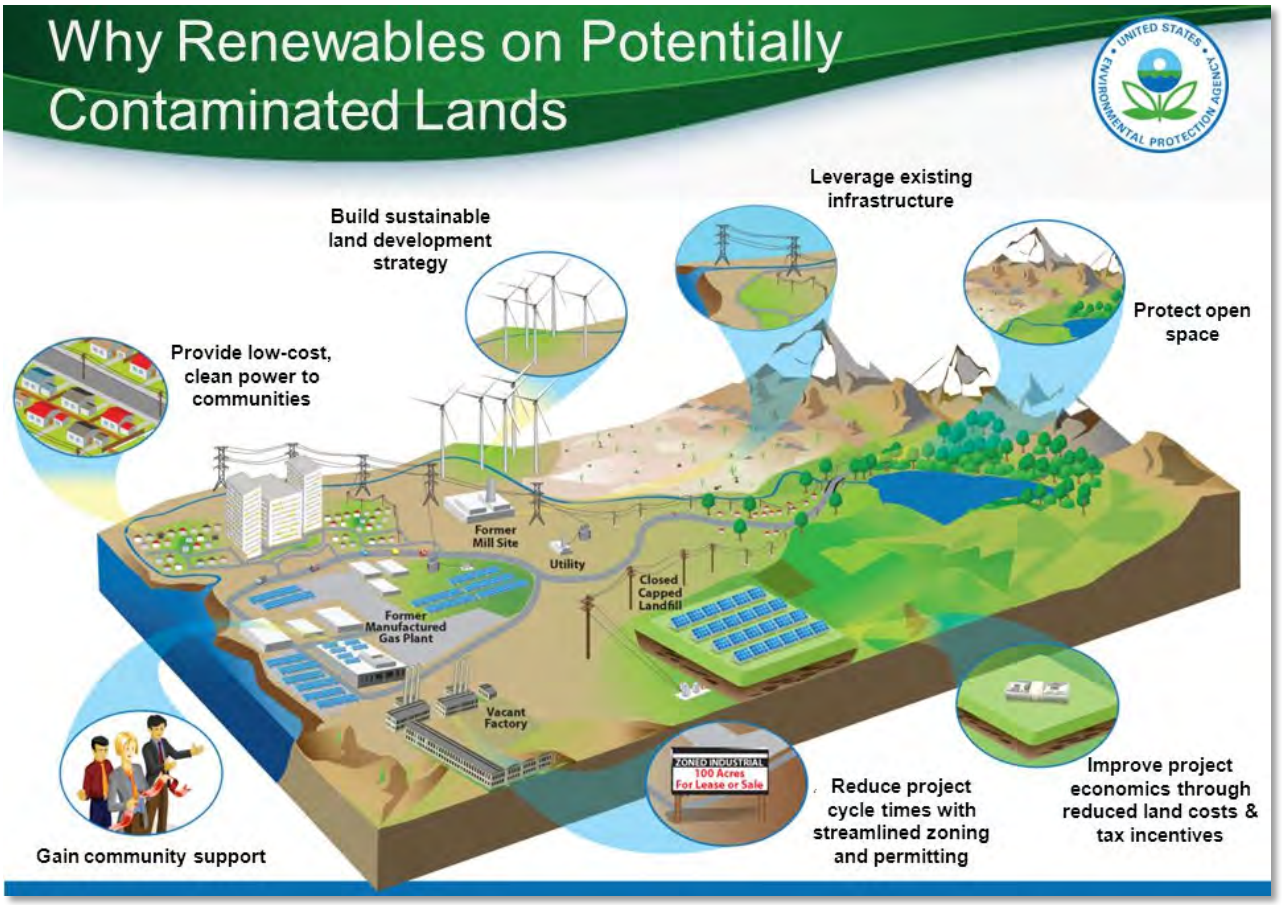
One of the advantages of community solar is the ability to locate it on a site away from the beneficiaries' homes, including on otherwise vacant properties and brownfields. As explained in a recent report "[Communities] that have suffered decades of population and job losses, as well as those especially hard hit by the Great Recession, are struggling with high numbers of vacant properties, be they former industrial sites, abandoned houses, or shuttered strip retail."[63] Municipalities could put these vacant properties and brownfields to use as community solar sites.

A municipality that is promoting community solar should think about the program in conjunction with its broader land use plans. Developing solar projects on brownfields in a blighted neighborhood can bring multiple benefits to the community, including the potential for new jobs (training workers to install solar), improved properties, and lower-cost electricity. Moreover, a municipality might elect to make sites available at little or no cost to community solar projects that serve lower-income populations to further reduce the cost of these projects.

Brownfields are not without their problems however. As explained by the American Planning Association: "When considering solar projects on brownfields, one of the biggest potential barriers to solar redevelopment is the fear of liability related to the presence, or potential presence, of contamination."[64]

Municipalities can reduce the risk of this source of liability by either determining the scope of liability before the start of a project by hiring environmental consultants and lawyers to review the site, or by providing help to developers of the property to understand and navigate this form of liability.[65] If developers are notified of these risks ahead of time, it will usually not derail a project, as experienced developers can anticipate and manage these risks.[66] Additionally, many investors have "come to accept contamination or capped, subsurface waste as nothing more than a condition that enables acceptable economics for the development of a solar project."[67] Any such initiative would also be a tacit admission that the brownfield would not be cleaned up for at least the 20 to 30 year lifetime of a typical solar installation.

There are a variety of federal laws surrounding brownfields that may or may not apply depending on the facts of the specific project. Depending on the condition of the site, the Clean Air Act ("CAA"), the Clean Water Act ("CWA"), the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA" or "Superfund"), the Resource



Conservation and Recovery Act ("RCRA"), and other environmental laws could affect the project's development. In order to be eligible for funding and certain defenses from liability, a formal site-investigation known as an All Appropriate Inquiry ("AAI") is often required.[68] An AAI begins with a Phase I Environmental Site Assessment ("ESA"). An ESA involves "a review of existing records for the site, interviews with current and former owners and occupants, and a visual inspection using photographs and maps."[69]

The good news is this relatively quick and inexpensive screening often does not find any contamination, at which point the project can continue. However, in cases where a Phase I ESA detects the possibility of contamination, the site investigators are required to initiate a much more extensive Phase II ESA – including soil and water sampling – to determine the specific nature and extent of the problem.[70] It is important to note that unlike most potential uses of brownfields, specialized panel mounting systems are available which allow for ballasted solar installations that don't require ground penetrations that might result in exposure to contaminated soils.

Where a city-owned site is utilized for the project, and the city retains ownership of the land, contractual arrangements with the project owner/operator can specify care for the site. A baseline assessment combined with a post-decommissioning assessment can be used to ascertain that the community solar project has not contributed to environmental degradation of the site during the period of its use.

The EPA, through its RePowering America Program, has identified brownfield sites that are usable for solar development.[71] Started in 2008, Re-Powering America is an initiative designed to support renewable energy development on brownfields.[72] The program has developed maps that identify brownfields, RCRA sites, Superfund sites, landfills, and mine sites.[73] "Re-Powering America also supports pilot projects, identifies state and federal incentives, promotes success stories, conducts outreach, and provides information on regulation and permitting compliance."[74]

The Neighborhood Stabilization Program, created by the Housing and Economic Recovery Act of 2008 and then continued under the American Recovery and Reinvestment Act of 2009, is another tool to identify and utilize eligible brownfield sites, whereby land banks acquire foreclosed properties and open them for solar development.[75]

From a state standpoint, a project also has to obtain the necessary permits and satisfy local zoning laws and regulations that are involved in any development project. Beyond regulations, there may also be incentives for developing brownfield solar. For example, the District of Columbia offers certain incentives for use of brownfields, and due to the lack of greenfields in Washington, D.C. available for solar development, this can be a win-win for both the city and potential solar project developers.[76] Maryland's Public Service Commission has also identified brownfield community solar development as a key avenue to further developing solar capabilities in Maryland.[77]

Large brownfield sites may be scarce in a heavily populated area such as cities, while vacant lots dispersed throughout a residential neighborhood may be more readily available and appropriate for a community solar project. That being said, there are still traditional brownfield sites that can be used for community solar projects.[78]

A particular type of brownfield site that may be of interest in densely populated areas are highway rights-of-way (ROW). As the U.S. Department of Transportation notes in guidance encouraging the use of these ROW for solar and other renewable energy projects. Highway ROW renewable energy projects can:

- Add value to ROW assets and create a revenue source for State DOTs to offset energy demand and operating costs;
- Reduce greenhouse gas (GHG) and other pollutant emissions;
- Promote energy security by diversifying energy generation and delivery methods; and
- Foster the creation of a local green job market that enhances the viability of the Nation's renewable energy industry.[79]

While a highway department may elect to utilize the ROW for its own energy projects, the land might also be made available to others through a lease.[80] The highway department may also be a potential purchaser of renewable energy credits generated by the project, or perhaps a partner that takes a portion of the project output, helping to stabilize the revenue stream to the project and benefitting the other beneficiaries of the project's output, namely lower-income customers.[81]

POTENTIAL MODELS FOR PROJECT OWNERSHIP STRUCTURES

As discussed above, there are three fundamental hurdles that must be surmounted to make a project succeed: the availability of funds (capital and operating), expertise, and risk-management. If lower-income residents were to seek to establish their own LLC to own and operate a project for their benefit, they would need to overcome all these hurdles. In addition, a major challenge in these structures is fully utilizing the tax benefits and working within government limits on the number of unaccredited investors if the project is to be exempt within securities law.

A municipality can assist with varying degrees of involvement. For example, it is uniquely qualified to guide the project on certain matters, such as assuring that the project site accords with the local government preferred land use policies and objectives.

Below we consider several possible models, pointing to ways in which the municipality might elect to be involved and the advantages or disadvantages of the models relative to one another. Since this Handbook is intended to assist municipalities in their development of community solar, including through the possible use of public funds to help reduce the project costs, the discussion below focuses only on models that include a role for the municipality, ranging from facilitator, to direct owner, to partner.[82] Many other types of structures, or variations on the structures suggested, are possible. Readers are encouraged to consider case studies of operating projects for additional ideas suited to their needs.

Some of the available compilations include:

- *Interstate Renewable Energy Council:* Community Shared Solar: Diverse Approaches for a Common Goal
  http://www.irecusa.org/wp-content/uploads/Community-Shared-Solar-Handout-final-010913.pdf
- *Shared Renewables HQ: Case Studies*
  http://www.sharedrenewables.org/coop-energy-resources/case-studies
- *Environmental and Energy Study Institute*: Community Solar Case Studies
  http://www.eesi.org/obf/solar/casestudies
- *Smart Electric Power Alliance:* Community Solar Program Design Models
  https://energy.gov/sites/prod/files/2016/11/f34/SEPA%20Community%20Solar%20Program%20Design%20Models_0.pdf

Model 1: Municipality Owned

In this model, the municipality or another division of government owns and operates the project. It designates the beneficiaries to whom the billing credits will flow and may structure the project to include beneficiaries who are financially involved (e.g., making a small "pay-as-you-go" contribution each month to help reimburse the municipality for the cost of the project) or financially passive (i.e., receiving only the credits with no payment required), or both.

The municipality has control over any RECs generated by the project. It may allocate the RECs toward meeting any commitments the municipality has made to reduce greenhouse gases by retiring them. Alternatively, it may sell them to help pay for the project or supplement the benefits distributed to residents. Note that if the municipality is the sole owner, it may not fit the definition of a community solar project in all jurisdictions, and therefore, the availability of community solar benefits for the project will need to be carefully explored.

MUNICIPALITY OWNED MODEL ADVANTAGES

A municipality can likely achieve the greatest scale while reaching the most disadvantaged neighborhoods. By doing multiple projects, it can learn and improve execution over time, and use the benefits of scale to develop relationships with suppliers and the utility to assure that the beneficiaries served by the project are receiving the highest degree of benefits possible, including placement of the projects in areas that enhance the reliability of service to lower-income areas. It can determine whether to develop its own management expertise to administer, maintain, and service the projects, or to outsource the tasks that can be better managed by a private enterprise or another governmental body.

Perhaps most importantly, ownership by the municipality or a division of the government also may open funding opportunities not available elsewhere. For example, municipal bonds might be used to finance the projects or, if ownership is vested in a public housing authority, HUD funding many be available. The municipality can also exercise control over siting by utilizing municipally owned sites, including those that might be in secured areas where access by another owner might need to be restricted.

MUNICIPALITY OWNED MODEL DISADVANTAGES

The municipality bears the full cost and accepts all the risks of the project. As a tax-exempt entity, it cannot utilize the tax benefits that effectively reduce the cost to a private investor. (Partnerships that can overcome this disadvantage are discussed below.) Unless the beneficiaries are asked to make a contribution to the program, for example, in the form of a charge against the credits they receive or by taking a role in the governance or maintenance of a project, they are passive participants and may maintain a low level of awareness about the source of their green power.

Model 2: Municipality-Facilitated, Beneficiary-Owned LLC

In this model, the beneficiaries organize to form an LLC (or other form of business organization) and own the project. Although the municipality has no direct ownership interest in the project, it could facilitate the project in one or more ways:

- Provide grants for early stage development;
- Develop a set of standardized agreements and legal guidance that can be used by an LLC seeking to organize in the jurisdiction, covering for example, the formation and governance of the LLC and guidance regarding zoning and tax issues;
- Assist the project in securing loans or other sources of funding, for example, by allocating LIHEAP funds to the project or establishing a green bank that has a specific mandate to lend to beneficiary-owned LLCs that are developing community solar;
- Provide a site at a low- or no-cost, for example on a brownfield, the roof of a public building, or other municipality owned property;
- Provide loan guarantees;
- Provide low- or no-cost experts to help guide the LLC in management of the project;
- Help establish buying cooperatives to reduce the cost of purchasing panels and installation services; and
- Establish and maintain a directory of service providers or hold periodic trade shows at which companies offering necessary services are invited to present their offerings

MUNI-FACILITATED, BENEFICIARY OWNED ADVANTAGES

A beneficiary-owned LLC would likely attract people who are highly motivated and it would serve as a vehicle to empower and educate the participants. Contributions by the municipality reduce the cost to the LLC and therefore inherently reduce the amount of risk that remains with the LLC, potentially making it viable for beneficiaries who are capable of making a significant commitment of effort and some financial commitment, and absorbing the reduced risk of this subsidized project (that is, the risk that the payback on their investment will be extended or that the benefits in any given month will be less than the costs).

MUNI-FACILITATED, BENEFICIARY OWNED DISADVANTAGES

Depending on the level of municipality participation, this model could potentially impose a substantial cost on the municipality, as there are no other participants with whom to share costs or risks, other than the beneficiaries. Further, the beneficiaries may be unable to utilize the tax credits, which effectively increases the project cost (as compared to one where the tax credits are utilized).

Because the beneficiaries are directly engaged as members of the LLC, exiting the program requires transfer of the LLC membership (or redistribution of the shares to the other members), so there is less flexibility in entering and exiting the program than in some of the other models in which the beneficiary can simply transfer his or her subscription. In addition, although some measures, such as the loan guarantee, absorb part of the downside risk, the beneficiaries (through the LLC) retain the risk that the project will not produce net benefits.

Model 3: Outside Investor[83]

A municipality might seek to outsource development and ownership of community solar projects, for example, to the local utility (if permitted under its regulatory structure), a for-profit entity like a commercial solar company, or a non-profit community group such as a church or community organization. Under this structure, that entity (called here the "Community Investor") would own the project and be responsible for the costs and risks. The municipality would specify the support it will provide and likely solicit bids from third parties to undertake the Community Investor role. As in the municipality owned model, the Community Investor should be required to distribute net metering credits to the beneficiaries, but beneficiaries could be either financially involved, financially passive, or a mix of both.

A for-profit Community Investor would require compensation, i.e., a share of the project revenues or direct compensation from the municipality, but there are examples of non-profit entities undertaking all the responsibilities for developing, owning, and operating solar projects for the benefit of low-income beneficiaries, including the costs and risks. To make the project meet the definition of a "community solar" project, there may need to be two or more owners. Ideally, the Community Investor (which could be an LLC made up of two or more entities) would include an owner with a "tax appetite" that could take advantage of the 30 percent tax credit provided by the federal government. The Community Investor will invest all the capital required for setting up the project.

The municipality could still provide some of the types of support that it would provide to a Beneficiary-Owned LLC. Broad support might be particularly important if the Community Investor is relatively inexperienced, such as a community group. A for-profit Community Investor, however, should be selected for the expertise it will bring to the project, so in that case, the municipality's support could and should be more limited, for example, to providing a suitable site or assisting with access to low-cost capital (i.e., through a green bank) or grant funding.

OUTSIDE INVESTOR ADVANTAGES

The municipality's role is defined by the municipality and strictly limited to the specific supports, costs, and risks that the municipality accepts. All other risks are undertaken by the Community Investor. The project could be structured to utilize the tax benefits, effectively reducing the cost of the project.

OUTSIDE INVESTOR DISADVANTAGES

Like the Beneficiary-Owned LLC, the municipality lacks direct control over where this project is sited, its costs, and who it serves, except to the extent required by contract or as conditions to any aid provided by the municipality. Because a for-profit Community Investor will require a return commensurate with its investment in the project, the benefits of the project will need to be shared with the Community Investor. Unless the Community Investor is experienced in these projects, which may be less likely if the Community Investor is a non-profit, its need for support and the risk the project will fail during the development phase is potentially greater than in a model utilizing an experienced commercial developer or a municipal-ownership model through which the municipality has built expertise.

Model 4: Shared-Ownership (Without Municipality)

A variation on the model above might include shared ownership with the beneficiaries. In this project structure, the project will be owned by an entity formed by the Community Investor and beneficiaries (which would require a higher degree of involvement by the beneficiaries than simply subscribing to a project that is owned and operated by the Community Investor.) In this structure, the beneficiaries are more involved and thus also gain educational value as well as the economic benefits of participation. The management provided by the Community Investor should help the residents navigate through commercial and operating issues. The Community Investor can enter into an agreement with the beneficiaries allowing it to recoup its investment over a fixed period of time through the revenues generated by the project. After the Community Investor has secured the necessary returns, it could then transfer full ownership of the project to the beneficiaries.

The beneficiaries would get a chance to train and learn with the management of the Community Investor. When the project is transferred to the beneficiaries, they will have complete control of all the economic benefits generated from the project.

SHARED-OWNERSHIP WITHOUT MUNI MODEL

The advantages and disadvantages are similar to the model above, with the added advantage of a greater degree of education and engagement of the beneficiaries. However, as in the Beneficiary-Owned model, the ability of the beneficiaries to exit the project and be replaced by new beneficiaries is more difficult, as their interest in the LLC would need to be transferred.

Model 5: Public-Private Partnership (with Municipality)

The fifth model is one in which the municipality partners with a commercial solar company or the local utility to develop one or more projects. Under this model, the municipality has shared control, and therefore can bring all or most of the benefits it would to a municipality owned project, such as low-cost funding or grants that might not be available to a non-governmental agency. However, it has the advantage of an experienced partner and preferably one with a tax appetite that will help reduce the effective cost of the project if properly structured. The municipality may also be able to provide suitable sites.

By leveraging the municipality's resources, the costs and the risks of this project are reduced. Therefore, it would be reasonable for the municipality to request that the solar company take on all the remaining risk. The experience of the solar company in markets and operations make it better suited to manage these risks. To the extent that Beneficiaries are asked to make a "pay-as-you-go" contribution, the risks incurred by the solar company might include a guarantee to the Beneficiaries that they will never be required to make a payment in excess of the benefits received, thus assuring the Beneficiaries of a risk-free opportunity to secure solar energy to offset their electric bills.

PUBLIC-PRIVATE PARTNERSHIP (W/MUNI) ADVANTAGES

Utilizes the strengths of the municipality and the private sector to produce a superior project. The municipality's active involvement assures the project remains focused on the public purpose it is expected to serve. The involvement of the solar company reduces the investment that the municipality must make.

PUBLIC-PRIVATE PARTNERSHIP (W/MUNI) DISADVANTAGES

Since the solar company will require a return commensurate with its investment in the project, the benefits of the project will need to be shared with the solar company.

CONCLUSION

There are no simple, one-size-fits-all, models for a successful community solar project. However, a municipality can be a catalyst and hub for development of the necessary expertise, and it has opportunities to help reduce project costs and risks that can open the door for successful projects.

APPENDICES

Tax Incentives

Federal tax policies have been a primary driver for solar's remarkable recent growth. The two, key tax policies for solar are the 5-year Modified Accelerated Cost Recovery System (MACRS) and the 30 percent Investment Tax Credit (ITC) under Section 48 of the Internal Revenue Code for commercial systems and Section 25D of the Internal Revenue Code for residential systems.

Federal Investment Tax Credit (ITC)

The Energy Policy Act of 2005 (P.L. 109-58) established a 30 percent ITC for both commercial and residential solar systems for one year. It was subsequently extended for an additional year before Congress passed an eight-year extension as part of the Emergency Economic Stabilization Act of 2008 (P.L. 110-347).

In December 2015, Congress voted to approve a multi-year extension of the federal Investment Tax Credit (ITC). While this extension provided a tremendous boost to the solar industry, which feared the 2008 ITC would expire in 2016, the legislation does gradually decrease the value of the ITC over time. The specifics for the commercial ITC (Section 48) are as follows:

- Projects that commence construction before the end of 2019 receive the full 30 percent ITC
- Projects that commence construction before the end of 2020 receive a 26 percent ITC
- Projects that commence construction before the end of 2021 and are placed in service before 2023 receive a 22 percent ITC
- Projects that commence construction before the end of 2021 and are placed in service after 2023 receive a 10 percent ITC

Projects that qualify for the residential ITC (Section 25D) are on the same schedule except they don't qualify for the "commence construction" clause. Instead, they must begin generating electricity by 2019 to get the 30 percent credit, by 2020 to get the 26 percent credit, and by 2021 to get the 22 percent credit. The residential credit ends after 2021.

Using the ITC for Community Solar

There is some uncertainty regarding whether and how the ITC can be applied as an offset for a community solar project.

Generally, Section 25D of the U.S. tax code allows for a homeowner to claim 30 percent of qualified expenditure on a solar project as a tax credit and Section 25D is considered more flexible in its application than the parallel Section 48 provisions.

In a private letter ruling released in September 2015, the IRS agreed that a taxpayer who invested in a community solar project could claim this credit, which by its terms applies to electricity used in the taxpayer's residence.[84]

While a private letter ruling is only applicable to the taxpayer to whom it is issued and under the specific facts set forth in the request, the letter reveals the IRS' thinking about the appropriate application of Section 25D.

Modified Accelerated Cost Recovery System

The Tax Reform Act of 1986 (P.L. 99-514) created the Modified Accelerated Cost Recovery System (MACRS), which determines the depreciation schedule for many property investments including solar generation assets.

Under MACRS solar generation assets are classified as a five-year property. This accelerated depreciation schedule can be extremely beneficial to certain solar projects and in some cases is as valuable an incentive as the ITC.

Low Income Home Energy Assistance Program (LIHEAP)

There are possible barriers to using LIHEAP funds for low-income community solar, which include the following:

LIHEAP funds must primarily be used for "immediate" home energy needs

Under LIHEAP, the Secretary of Health and Human Services (HHS) has authority to make grants to states to "assist low-income households primarily in meeting their immediate home energy needs." Because LIHEAP funds have traditionally been used to pay for once-annual energy bills during a cold or hot spell, or to pay for an energy bill in an emergency situation, a payment for solar electricity years in advance may conflict with the statute. However, because states need only expend funds "primarily" on home energy needs, it may not be unreasonable to use the funds for community solar.

LIHEAP funds can only be used for "home energy," defined as "heating and cooling"

The term "home energy" is defined as "a source of heating or cooling in residential dwellings." To be sure, electricity generated by a community solar project is not necessarily used only for heating and cooling. The definition of "home energy" could preclude the use of solar electricity for purposes other than heating and cooling. However, there is some suggestion that the purpose of home energy costs is less relevant because the term "heating and cooling" was removed from part of the statute in a 1994 amendment.[85]

LIHEAP funds cannot be used for certain types of construction

Section 8628 prohibits spending LIHEAP funds on "the purchase or improvement of land, or the purchase, construction, or permanent improvement (other than low-cost residential weatherization or other energy-related home repairs) of any building or other facility." This construction provision is possibly the most limiting factor on the ability to use LIHEAP funds for community solar because a solar array may be considered an improvement to land (e.g., a ground-mounted system) or a permanent improvement to a building or facility (e.g., a roof-mounted system). However, if the array is considered "other energy-related home repairs," LIHEAP funds may be used, but as discussed below, the term is ambiguous.

Further justification for using LIHEAP funds for low-income community solar, despite the construction provision, come from a 2005 addition to the program allowing for renewable fuels to be paid for with LIHEAP funds. However, the term "renewable fuels" is also ambiguous. Based on a reference to biomass, it is possible that this provision only applies to tangible fuels, like wood. However, given the ambiguity of the language, this section could

be interpreted to mean that funds can be used to pre-pay for solar electricity generated from a community solar facility, for example, in the form of a power purchase agreement (PPA).

Possible constraints on using LIHEAP funds for low-income community solar

LIHEAP specifies that not more than 15 percent of funds be used for "low-cost residential weatherization or other energy-related home repair." This can be increased to 25 percent if the state obtains a waiver from HHS. Because the term "other energy-related home repair" is ambiguous, it is possible that community solar could be construed as applicable under this provision. Referring to weatherization, Congress has recognized that "long-term benefits can accrue" even if "investments involve higher initial cost than LIHEAP payment benefit levels." As such, a case could be made that spending up to 25 percent of LIHEAP funds on community solar supports Congress' policy choice.

Although LIHEAP funds can be used by program administrators for administrative costs, the upper limit is 10 percent of LIHEAP funding. Therefore, entities wishing to advance low-income community solar can use part of LIHEAP funds to pay to administer and even market the program, but they are limited to 10 percent of total funds.

ENDNOTES

[1] David Feldman et al., *Shared Solar: Current Landscape, Market Potential, and the Impact of Federal Securities Regulation,* NAT'L RENEWABLE ENERGY LABORATORY v (Apr. 2015), http://www.nrel.gov/docs/fy15osti/63892.pdf. Other sources affirm the linkage between renting and lower-incomes. For example, over 60% of all households in the U.S. own their homes, but among households with incomes at or less than the median, the homeownership rate falls to about 50%. U.S. Census Bureau, Quarterly Residential Vacancies and Homeownership, Second Quarter 2017, Release Number: CB17-110 (July 27, 2017). Similarly, based on 2013 census data the Joint Center for Housing Studies at Harvard University found that nearly half of renters (46%) have incomes of less than $30,000 while only one-third of the population has incomes of less than $30,000. Joint Center For Housing Studies Of Harvard University, America's Rental Housing, 12 (2013), http://www.jchs.harvard.edu/sites/jchs.harvard.edu/files/jchs_americas_rental_housing_2013_1_0.pdf.

[2] James A. Mueller & Amit Ronen, *Bridging the Solar Income Gap,* GW SOLAR INSTITUTE 2 (Jan. 2015), http://solar.gwu.edu/research/bridging-solar-income-gap.

[3] *Solar Market Insight Report 2016 Year In Review*, SOLAR ENERGY INDUSTRIES ASS'N (Mar. 9, 2017), http://www.seia.org/research-resources/solar-market-insight-report-2016-year-review.

[4] Corey Honeyman, *U.S. Community Solar Outlook 2017*, GTM RESEARCH (Feb. 2017), https://www.greentechmedia.com/research/report/us-community-solar-outlook-2017.

[5] *Id* at 2.

[6] For the purposes of this Handbook, we assume the project is located on the distribution system of a utility, rather than on the higher-voltage transmission system. This assumption is relevant to the assertion that the project avoids losses and to some of the legal analysis.

[7] *See USA Shared Energy Map*, Shared Renewables HQ, http://www.sharedrenewables.org/community-energy-projects/, (last visited Aug. 6, 2017).

[8] *See, e.g.*, *A Guide to Community Solar: Utility, Private, and Non-profit Project Development*, U.S. DEP'T OF ENERGY (Nov. 2010), http://www.nrel.gov/docs/fy11osti/49930.pdf, ("A Guide to Community Solar"); *Community Solar: What is it?*, ENERGY SAGE (Oct. 2016), https://www.energysage.com/solar/community-solar/community-solar-power-explained/; *Solar Market Insight Report 2016 Year In Review*, *supra* note 3.

[9] Due to the rapid development of community solar, including enactment of new state laws, changing policy positions at the federal level, evolving interpretations of tax regulations, and other developments, the information in any guide should be verified before acting.

[10] This resource was created jointly by the U.S. Department of Energy and community solar provider Clean Energy Collective. The Community Solar Hub is a web-based resource center that seeks to bring together the key information and resources essential for a successful community solar program. *See* COMMUNITY SOLAR HUB, http://www.communitysolarhub.com, (last visited Aug. 6, 2017).

[11] According to the U.S. Department of Housing and Urban Development's ("HUD") 2012 Progress Report and Energy Action Plan, HUD expends approximately $6.4 billion on energy costs each year across its portfolio of nearly 5 million units of public and federally assisted housing. *See Affordable Green: Renewing the Federal Commitment to Energy-Efficient, Healthy* Housing, HUD i (Dec. 2012), https://portal.hud.gov/hudportal/documents/huddoc?id=oshcenergyreport2012.pdf.

[12] *Community Solar: An Opportunity to Enhance Sustainable Development on Landfills and Other Contaminated Sites*, EPA § 2.2 (Dec. 2016), https://www.epa.gov/sites/production/files/2016-12/documents/epa_repowering_community_solar_discussion_paper_final_120716_508.pdf. HUD assisted housing policies that cap the rent payments made by a sub-metered tenant based on income, and an allowance for utilities can also act as a disincentive for tenants to participate in programs that reduce utility bills, because a reduction in utility bills may be offset by a rent increase. Robert G. Sanders & Lewis Milford, *A Resilient Power Capital Scan: How Foundations Could Use Grants and*

Investments to Advance Solar and Storage in Low-Income Communities, CLEAN ENERGY GROUP 30 (Feb. 1, 2017), http://www.cleanegroup.org/ceg-resources/resource/resilient-power-capital-scan/.

[13] Under a different structure, the project could sell energy for cash rather than receive energy credits, but since that structure is not generally contemplated by community solar laws and regulations, it is not considered here. *See infra* "Power Purchase Agreements."

[14] Protections in the form of minimum performance guarantees, warranties, insurance, etc. can help insulate a project against performance risk and mitigate potential harms associated with that risk. However, enforcement of such protection mechanisms may involve costs and unexpected events, including bankruptcies of service providers. These unexpected events make it impossible to eliminate or mitigate all project risk. Therefore, allocation of the risks, however remote, needs to be contemplated as thoroughly as the allocation of benefits.

[15] While cost data can be difficult to find, California has required its investor-owned utilities to publish cost guides that include a variety of examples. *See, e.g.,* Pacific Gas and Electric's Unit Cost Guide (Sept. 2016) https://www.pge.com/pge_global/common/pdfs/for-our-business-partners/interconnection-renewables/Unit-Cost-Guide.pdf (last visited Sept. 11, 2017).

[16] *Id.*

[17] For example, in Vermont, the customer can elect whether to retain the RECs or not, and if it does not, the utility acquires ownership. The customer is provided monetary compensation (or a penalty) reflecting his or her choice. *Net Metering: Vermont*, DSIRE (Mar. 17, 2017), http://programs.dsireusa.org/system/program/detail/41. In Nevada, the customer owns the RECs "unless [the] utility subsidizes [the] system." *Net Metering: Nevada*, DSIRE (Oct. 28, 2016), http://programs.dsireusa.org/system/program/detail/372. In New Hampshire, the utility may acquire the RECs associated with excess annual generation that is purchased by the utility. *Net Metering: New Hampshire*, DSIRE (May 6, 2016), http://programs.dsireusa.org/system/program/detail/283.

[18] Some entities that want to claim they are using "green" power, whether to satisfy a mandate or voluntarily, will elect to purchase RECs rather than purchase power directly from a renewable resource. When the generator of renewable power transfers its RECs separately from the green power itself, it gives up its right to claim it is using "green" power; instead, the new owner of the RECs can purchase "brown" power and still get credit for having purchased green power (i.e., by showing it has also purchased a REC). For example, some utilities that are obligated by law to meet a certain percentage of their customers' needs with green power are permitted to demonstrate their performance by showing that they possess the requisite number of RECs in lieu of actually purchasing renewable energy. For the owner of a renewable energy project, the alternative to selling a REC is to retire it, thus reducing the number of available RECs and therefore encouraging others to seek out new sources of renewable energy. *See, e.g.*, *Three Myths About REC Purchasing*, RENEWABLE CHOICE ENERGY, http://www.renewablechoice.com/blog-three-myths-to-rec-purchasing-14-05-27/, (last visited Aug. 6, 2017); dmguion, *Renewable Energy Certificates (RECs): Hope or Hoax?*, SUSTAINING OUR WORLD (Apr. 27, 2017), http://sustainingourworld.com/2017/04/27/renewable-energy-certificates-recs-hope-hoax/.

[19] For more information on FTC guidelines, *see Environmental Claims: Summary of the Green Guides*, FTC (Oct. 2012), https://www.ftc.gov/tips-advice/business-center/guidance/environmental-claims-summary-green-guides.

[20] Authors' calculations based on data from the Solar Energy Industries Association. *See Top 10 Solar* States, SEIA, http://www.seia.org/research-resources/top-10-solar-states, (last visited Aug. 2, 2017).

[21] Some utilities limit the amount of excess power than can be carried over from one billing period to the next, and may make a payment for the excess generation from time to time, (e.g., annually). But generally, net metering programs includes limits to prevent consumers from generating in excess of their own needs, when measured over a specified period of time, (e.g., a year).

[22] *See Model Rules for Shared Renewable Energy Programs*, INTERSTATE RENEWABLE ENERGY COUNCIL, http://www.irecusa.org/publications/model-rules-for-shared-renewable-energy-programs/, (last visited Aug. 6, 2017).

[23] *See* Mike Taylor, *The Minnesota Solar Experiment – Value of Solar: Part III*, RENEWABLE ENERGY WORLD (Dec. 20, 2016), http://www.renewableenergyworld.com/articles/2016/12/the-minnesota-solar-experiment-value-of-solar-part-iii.html; John Farrell, *Minnesota's Value of Solar: Can a Northern State's New Solar Policy Defuse Distributed Generation Battles?*, INST. FOR LOCAL SELF-RELIANCE 3 (Apr. 2014), https://ilsr.org/wp-content/uploads/2014/04/MN-Value-of-Solar-from-ILSR.pdf.

[24] See Melissa Whited et al., *Distributed Solar in the District of Columbia, Policy Options, Potential Value of Solar and Cost-Shifting District of Columbia*, Synapse Energy Economics, Inc. (Apr. 12, 2017), http://www.opc-dc.gov/images/pdf/solar/Synapse-DC-Solar-Report-April1217.pdf.

[25] *Next Generation Incentive Straw Proposal*, MASS. DEP'T OF ENERGY RESOURCES 11, 15 (Sept. 23, 2016), http://www.mass.gov/eea/energy-utilities-clean-tech/renewable-energy/rps-aps/development-of-the-next-solar-incentive.html.

[26] *In the Matter of the Value of Distributed Energy Resources,* Case 15-E-0751, 2017 WL 4224405 (N.Y.P.S.C. Sept. 14,2017)

[27] Arguably, any power that is produced by a project and delivered to the utility in exchange for anything of value could be characterized as a wholesale sale, which would be subject to the rate jurisdiction of the Federal Energy Regulatory Commission ("FERC") unless otherwise exempted. Small renewable power projects are granted many exemptions from otherwise applicable federal laws pursuant to the Public Utility Regulatory Policies Act of 1978. *See* 16 U.S.C. § 2601 et seq. In addition, FERC has explicitly disclaimed jurisdiction over transactions in which a third party delivers electricity directly to an individual who then delivers it to a utility under net metering programs, preferring to treat such programs as only a matter of retail billing, which would be wholly within the rate jurisdiction of state commissions. *Sun Edison LLC*, 129 FERC ¶ 61,146 (2009).

[28] For a discussion of these issues, *see A Guide to Community Solar*, *supra* note 8, at 14, 32–33.

[29] In addition, forming a beneficiary-owned entity that would own and operate the project without violating securities law restrictions is of great importance. This topic is beyond the scope of this Handbook, but it has been widely discussed in the literature and merits close consideration. *See, e.g.*, Stacey K. Mullany, *Complex Securities Laws and the Eligibility of Trusts to Make Alternative Investments*, ABA, http://www.americanbar.org/content/dam/aba/publishing/rpte_ereport/TE_Mullaney.authcheckdam.pdf, (last visited May 15, 2017).

[30] Colorado House Bill 10-1342 (Community Solar Gardens Act) signed by Governor Ritter in 2010. Colo. Code Regs. 723-3, §3665(d)(IV) (2017).

[31] The business organization could take the form of a partnership, limited partnership, limited liability company, or corporation. For a discussion of the differences and advantages and disadvantages of each, *see A Guide to Community Solar*, *supra* note 8 at 40–45.

[32] *See generally* Sanders & Milford, *supra* note 12.

[33] *Interview with Michael Ware*, Authors' Notes (Nov. 28, 2016).

[34] *See New York Green Bank*, NYSERDA, https://greenbank.ny.gov/, (last visited May 16, 2017); CONN. GREEN BANK, http://www.ctgreenbank.com/, (last visited May 16, 2017).

[35] *See, e.g.*, *Petition of Consolidated Edison Company of New York, Inc. for Approval of a Pilot Program for Providing Shared Solar to Low Income Customers*, N.Y. PUB. SERV. COMMISSION, http://webcache.googleusercontent.com/search?q=cache:jZ9D5SeHef0J:documents.dps.ny.gov/public/Common/ViewDoc.aspx%3FDocRefId%3D%257B273673E7-970C-4100-AAD0-D8BD9EE42ECF%257D+&cd=3&hl=en&ct=clnk&gl=us, (last visited May 15, 2017); *Solar Power from Con Edison Rooftops to Benefit Low-Income Customers*, CONEDISON (Oct. 31, 2016), https://www.coned.com/en/about-con-edison/media/news/20161031/solar-power (discussing

Consolidated Edison's proposal to limit risks to lower-income customers.) The Consolidated Edison proposal is set forth in the text box below.

[36] *Low Income Home Energy Assistance Program*, PAYING FOR SENIOR CARE (May 2017), https://www.payingforseniorcare.com/longtermcare/resources/liheap_financial_aid.html (household income cannot exceed either 150% of State poverty level or 60% of State medium income); *see also Low Income Home Energy Assistance Program (LIHEAP)*, BENEFITS.GOV, https://www.benefits.gov/benefits/benefit-details/623, (last visited Aug. 6, 2017, 2017).

[37] *E.g.*, *Supplemental Nutrition Assistance Program (SNAP)*, USDA (Jan. 30, 2017), https://www.fns.usda.gov/snap/supplemental-nutrition-assistance-program-snap.

[38] *See Renew300: Advancing Renewable Energy in Affordable Housing*, HUD EXCHANGE, https://www.hudexchange.info/programs/renewable-energy/, (last visited Aug. 6, 2017).

[39] *Id.* ("Federally assisted housing includes HUD's rental housing portfolio (Public Housing, Multifamily Assisted) and USDA's Rural Development Multifamily Programs, as well as rental housing supported through the Low Income Housing Tax Credit (LIHTC).").

[40] *Notice PIH-2014-18 (HA)*, HUD, OFFICE OF PUB. & INDIAN HOUSING 5–8 (Aug. 8, 2014), https://portal.hud.gov/hudportal/documents/huddoc?id=pih2014-18.pdf.

[41] *Id.* at 8–9.

[42] *Energy Performance Contracting*, HUD, http://portal.hud.gov/hudportal/HUD?src=/program_offices/public_indian_housing/programs/ph/phecc/eperformance, (last visited Aug. 6, 2017).

[43] *Notice PIH-2014-18 (HA)*, *supra* note 40, at 10–11.

[44] 24 C.F.R. § 990 (2016).

[45] 24 C.F.R. § 905 (2016).

[46] *HUD Incentives to Reduce Utility Costs*, HUD, http://portal.hud.gov/hudportal/HUD?src=/program_offices/public_indian_housing/programs/ph/phecc/funding, (last visited Aug. 6, 2017); *see also Federal Resources for Community Solar*, OFFICE OF ENERGY EFFICIENCY & RENEWABLE ENERGY, http://energy.gov/eere/solarpoweringamerica/federal-resources-community-solar, (last visited Aug. 6, 2017).

[47] *Low-Income Housing Tax Credits*, HUD (July 10, 2017), https://www.huduser.gov/portal/datasets/lihtc.html.

[48] *Federal Resources for Community Solar*, U.S. DEP'T OF ENERGY, https://energy.gov/eere/solarpoweringamerica/federal-resources-community-solar, (last Aug. 6, 2017).

[49] *See Section 108 Loan Guarantee Program*, HUD EXCHANGE, https://www.hudexchange.info/programs/section-108/, (last visited Aug. 6, 2017).

[50] *Id.*

[51] *Id.*

[52] *Section 108 Loan Guarantee Program Fact Sheet*, HUD EXCHANGE, https://www.hudexchange.info/programs/section-108/section-108-program-eligibility-requirements/#section-108-eligibility-requirements, (last visited Aug. 6, 2017).

[53] *Id.*

[54] *See generally, Best Practice Guidelines for Residential PACE Financing Programs*, U.S. DEP'T OF ENERGY (Nov. 18, 2016), https://energy.gov/sites/prod/files/2016/11/f34/best-practice-guidelines-RPACE.pdf.

[55] *PACE Financing*, URBAN INGENUITY, http://urbaningenuity.com/dc-pace, (last visited Aug. 6, 2017).

[56] *See National Community Solar Partnership*, OFFICE OF ENERGY EFFICIENCY AND RENEWABLE ENERGY, http://energy.gov/eere/solarpoweringamerica/national-community-solar-partnership, (last visited Aug. 6, 2017); *Fact Sheet Administration Announces New Initiative to Increase Solar Access*, THE WHITE HOUSE, https://www.whitehouse.gov/the-press-office/2015/07/07/fact-sheet-administration-announces-new-initiative-increase-solar-access, (last visited Aug. 6, 2017).

[57] *SunShot Initiative*, ENERGY.GOV, https://energy.gov/eere/sunshot/sunshot-initiative, (last visited Aug. 6, 2017).

[58] *See Fact Sheet Obama Administration Announces Clean Energy Savings For All*, THE WHITE HOUSE, https://www.whitehouse.gov/the-press-office/2016/07/19/fact-sheet-obama-administration-announces-clean-energy-savings-all, (last visited Aug. 6, 2017).
[59] *Id.*
[60] See *Lessons Learned: Community Solar for Municipal Utilities,* NATIONAL RENEWABLE ENERGY LABORATORY, 12-13 (2016), *https://www.nrel.gov/docs/fy17osti/67442.pdf* (finding that municipal utility ownership of a viable project required substantial value, such as enhanced operational control, or the utility needed to add substantial value, such as reduced administrative costs, to offset the lost value of federal tax credits).
[61] *See generally Federal Resources for Community Solar*, ENERGY.GOV, https://energy.gov/eere/solarpoweringamerica/federal-resources-community-solar, (last visited Aug. 6, 2017).
[62] Communication from Scott Sklar, Author's Notes (Apr. 13, 2017).
[63] *Recycling Land for Solar Energy Development*, AM. PLANNING ASS'N, https://www.planning.org/research/solar/briefingpapers/recyclingland.htm, (last visited Aug. 6, 2017).
[64] *Id.*
[65] *Id.* Rifle, Colorado's repurposing of a uranium processing facility and Brightfield's partnership with Scituate, Massachusetts are two examples of successful brownfield solar projects cited by the U.S. Environmental Protection Agency. *Id.*; *Translating Policy into Brownfield Solar Redevelopment*, BRIGHTFIELDS DEV. LLC (July 1, 2015), http://solarbrownfields.com/news/transplanting-policy-into-brownfield-solar-development. For more examples of project successes and the benefits of brownfield solar *see Learn More About RE-Powering*, EPA (May 26, 2016), https://www.epa.gov/re-powering/learn-more-about-re-powering#why.
[66] *Translating Policy into Brownfield Solar Redevelopment*, *supra* note 65.
[67] *Id.*
[68] *Recycling Land for Solar Energy Development*, *supra* note 63.
[69] *Id.*
[70] *Id.*
[71] *Learn More About RE-Powering*, *supra* note 65.
[72] *Id.* The National Renewable Energy Laboratory and the EPA created a solar decision tree, available through EPA's Re-Powering America's Lands website to help communities and stakeholders assess the solar redevelopment potential of a brownfield. *Id. See also Recycling Land for Solar Energy Development*, *supra* note 63.
[73] *Translating Policy into Brownfield Solar Redevelopment*, *supra* note 65.
[74] *Id.*
[75] *Recycling Land for Solar Energy Development*, *supra* note 63; *see, e.g.*, GENESEE COUNTY LANDBANK, http://www.thelandbank.org/, (last visited May 15, 2017).
[76] *See* John Bagwell, *The Brownfields Revitalization Amendment Act: DC's So-Slow Site Cleanup – Don't It Make Your Brownfields Blue?*, 26 WM. & MARY ENVTL. L. & POL'Y REV. 855 (2002).
[77] *Landmark Community Solar Initiative Moves Forward in Maryland*, EARTH JUSTICE (Feb. 22, 2016), http://earthjustice.org/news/press/2016/community-solar. Another example of local solar incentives is Bloomington, Indiana, which permits increased density and waives filing fees for projects that utilize sustainable development practices, including on-site renewable energy generation. *See* BLOOMINGTON UNIFIED DEVELOPMENT ORDINANCE § 20.05.049.
[78] Due to the sensitive nature of potentially contaminated sites, developers generally use ballasted, noninvasive racking that does not breach the site cap or exacerbate any underlying contaminants. In the case of closed landfills, solar panels mounted on a ballasted rack are lightweight and do not threaten geotechnical integrity. *Translating Policy Into Brownfield Solar Redevelopment*, *supra* note 65.
[79] *Renewable Energy Generation in the Highway Right-of-Way*, FHWA-HEP-16-052, DOT 2, http://www.fhwa.dot.gov/real_estate/publications/row/renewablerow.pdf, (last visited May 16, 2017).
[80] *Id.* at 3 (discussing potential business models).
[81] *Id.*
[82] Other models for a community solar project are possible. *See, e.g.,* IREC, *supra* note 22, at 13; NREL Guide, *supra*

note 8, at 7. NREL identifies three models as "utility," Special Purpose Entity," and "Non-Profit." IREC describes them as "owned by participants directly, by the utility, or by a third party." In our review of cases studies, we have found projects owned by utilities, participants, governments, and third-party developers.

[83] The local distribution utility might also offer a community solar program for low-income residents. However, since such a program would likely be under the supervision of the utility's regulator and pursuant to the utility's public service obligations, those programs are not discussed here.

[84] *See* I.R.S. Priv. Ltr. Rul. 201536017 (Sept. 4, 2015), https://www.irs.gov/pub/irs-wd/201536017.pdf. *See also,* David B. Weisblat & Kurt R. Rempe, *IRS Releases Favorable Guidance for Individual Investors in Community Solar to Claim Section 25D Tax Credit, Renewable Energy Outlook*, FOLEY AND LARDNER LLP (Sept. 17, 2015), https://www.renewableenergyoutlook.com/2015/09/17/irs-releases-favorable-guidance-for-individual-investors-in-community-solar-to-claim-section-25d-tax-credit/.

[85] *See* 42 U.S.C. § 8624(b)(1); *see also* Human Services Amendments of 1994, PL 103–252, § 305(a), 108 Stat 623.