



Community Solar Funding and Financing Options: A Primer for State Energy Officials and LIHEAP Program Directors

Overview

Community solar developments can expand solar power access to more people, including low-to-moderate income (LMI) customers who have been historically underserved by clean energy programs. Structuring programs for LMI customers prompts important questions about financing and funding projects. This brief offers an overview of existing models for funding and financing community solar, and it explores a number of potential improvements and adjustments that can support greater access by LMI and other underserved customers. The options laid out here will provide State Energy Office Directors, Low Income Home Energy Assistance Program (LIHEAP) Directors, and other key stakeholders with additional information as they explore innovative ways to expand access to solar in their states and communities.

The Value Proposition

There is potential for community solar to simultaneously benefit LMI customers while helping states meet clean energy goals. LMI customers together represent around 43 percent of U.S. households, of which 40 percent reside in multifamily housing.¹ A recent report from the National Renewable Energy Laboratory estimates the potential market for community solar to be between \$8.2 and 16.3 billion, and potential deployment of community solar between 5.5 and 11 GW.² As LMI customers could make up a significant proportion of this deployment, LMI customers represent an important market for solar developers and key decision makers.

However, LMI customers can be shut out from access to solar energy due to a combination of barriers, such as:

¹ "Community Solar Vision Study." Study. VoteSolar.org, 2018. <https://votesolar.org/policy/policy-guides/shared-renewables-policy/csvisionstudy/>.

² Heeter, Jenny, Lori Bird, Eric O'Shaughnessy, and Sam Koebrich. 2018. *Design and Implementation of Community Solar Programs for Low- and Moderate-Income Customers*. Golden, CO: National Renewable Energy Laboratory. NREL/TP-6A20- 71652. <https://www.nrel.gov/docs/fy19osti/71652.pdf>.

- Systemic inequities, such as racial, ethnic, and economic segregation and other patterns of disenfranchisement that have limited some communities access to wealth and the ability to invest in clean energy technologies such as solar;
- Higher costs borne (or perceived) by developers to subscribe LMI customers to community solar projects, deterring developers from pursuing this market;
- Limited access to capital for LMI community solar projects, due to higher perceived rates of risk and transaction cost;
- Difficulty for owners of lower-cost buildings and homes to qualify for solar incentives on their own, due to a lower tax burden;
- Lower rates of homeownership, and increased prevalence of LMI residents in multifamily properties where they have less control over energy equipment and upgrades decisions;
- Distorted price signals due to energy assistance programs that may make solar more expensive than LMI customers' current electricity rates based on conventional generation sources; and
- Less exposure to and awareness of solar programs.³

The LMI housing market is tiered, with a distinction between low-income customers and moderate-income customers. Policies that may work for moderate-income customers may still be insufficient to meet the additional needs of low-income customers, which may make those markets even more challenging for solar developers to penetrate. These tiers are reflected in recent data from Lawrence Berkeley National Laboratory: the growth in solar for moderate-income households rose by five percent from 2010 to 2018, while growth in solar for low-income households only rose by one percent during the same timeframe.⁴ These barriers to low-income household solar adoption means that while LMI customers represent forty percent of U.S. households, as of 2015, those customers only represent approximately five percent of all solar installations.⁵

While many states currently lack the policies and programs that are necessary to ensure that LMI customers can take full advantage of community solar and other clean energy technologies, with the right combination of tools and support, community solar can meet state energy goals and ensure that the benefits of clean energy are accessible to anyone. Novel financing solutions leveraging existing state resources can be one such tool, by mitigating the perceived or real risks and costs of serving LMI households.

³ Low- and Moderate-Income Solar Policy Basics. National Renewable Energy Laboratory, 2020. <https://www.nrel.gov/state-local-tribal/lmi-solar.html>.

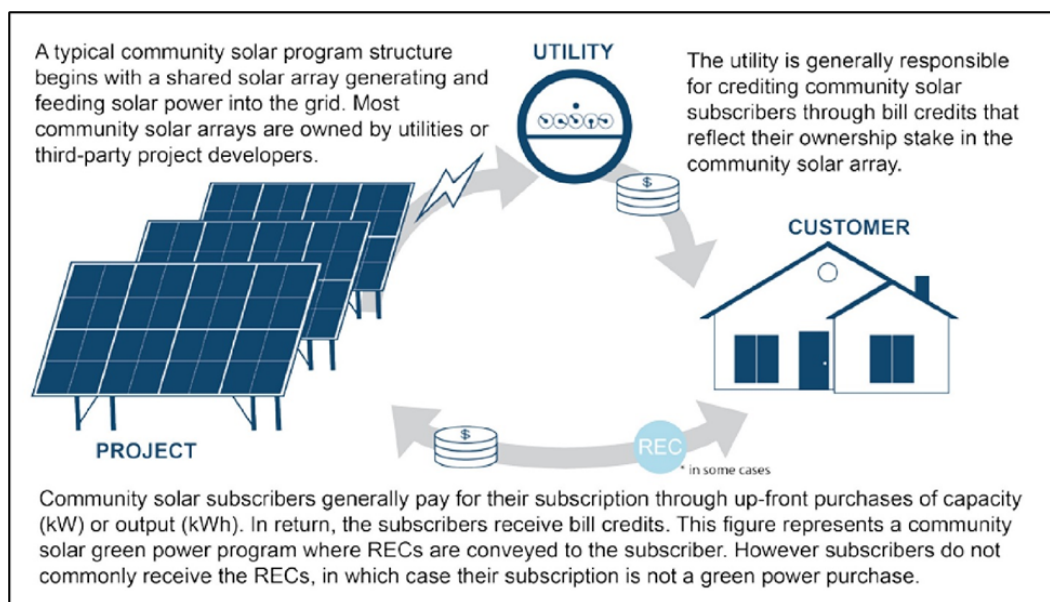
⁴ https://eta-publications.lbl.gov/sites/default/files/solar-adopter_income_trends_report.pdf, p. 25.

⁵ Mueller, James A, and Amit Ronen. Working paper. *Bridging the Solar Income Gap*, January 2015.

https://solar.gwu.edu/sites/g/files/zaxdzs2391/f/image/GWSI-Bridging%20the%20Solar%20Income%20Gap%20Working%20Paper_0.pdf.

How are Community Solar Projects Typically Financed?

Figure 1: Typical Community Solar Program Structure



Source: Heeter, Jenny, Eric O'Shaughnessy, and Jenny Sauer. 2018. *Status and Trends in the U.S. Voluntary Green Power Market: 2017 Data*. Golden, CO: National Renewable Energy Laboratory. <https://www.nrel.gov/docs/fy19osti/72204.pdf>.

The community solar development process is multifaceted and involves several steps and actors to go from inception to completion. The following section discusses the steps involved to implement a community solar project.

Initial Funding/Financing

Before beginning construction on the community solar project, a developer needs to obtain the initial capital to fund the solar array and interconnections. This involves planning the system, identifying the target customer base(s), securing the use of tax credits (if applicable), and determining the preferred financing structure to use to repay the capital loaned.

Customer Acquisition

The solar developer then needs to recruit customers to subscribe to the solar system. This can involve a targeted marketing campaign with advertising or partnerships with community organizations. Under some program structures a government entity or the utility may provide customer acquisition services which could potentially include auto-enrollment of certain customer classes. Customers then need to sign up if they meet the criteria for enrollment. This process can involve credit checks, income verification, and utility documentation, which may present barriers to entry for LMI customers.

Bill Credit and Subscription Payment

Once customers are enrolled into the program, they generally receive a monthly bill credit on their electric utility bill for their portion of the project's generation. Under one common structure, customers receive a separate bill from their community solar provider for their subscription payment. In this scenario, the customer's savings would be the difference between the value of their utility bill credits and their subscription payment, and the project owner's revenue is the subscription payments it receives from each customer. Some states have implemented policies that allow customers to receive the savings associated with their community solar subscription directly on their utility bill, with the remaining value of the credit paid directly to the project owner. This reduces complexity for the customer by eliminating the need to pay two bills and removes the need for community solar providers to use credit scores as criteria for enrollment (they can instead use bill payment history or other, more inclusive criteria).⁶ Under other program structures, a government entity or utility is responsible for customer acquisition and management.

Potential Models for Incentivizing Community Solar for LMI Customers

States can consider several innovative models to support community solar projects that cater to LMI subscribers. Some of these options rely on tax credits to reduce the costs of the community solar systems, while others rely on different funding streams from public and private capital providers.

Low Income Home Energy Assistance Program (LIHEAP)

Low Income Home Energy Assistance Program (LIHEAP) dollars are a source of funding that has great potential to help integrate LMI customers into community solar projects. LIHEAP funds can be used to support the physical construction of parts of community solar systems if the developer follows LIHEAP rules governing the construction and operation of solar systems. However, greatest potential for LIHEAP funds to support LMI customers' access to solar is by paying for some or all of those customers' subscription fees. This setup enables LIHEAP beneficiaries to access the benefits of community solar without bearing high upfront subscription costs, which can deter access. While no state currently operates this model at large scale, Colorado used LIHEAP funds along with utility funding to install solar panels on 300 single-family homes as part of a pilot program.⁷ California's Solar For All program also leveraged LIHEAP funds to install solar panels on 1,500 LMI households throughout the state.⁸

⁶ "Low- and Moderate-Income Solar Policy Basics." NREL.gov. National Renewable Energy Laboratory, 2016. <https://www.nrel.gov/state-local-tribal/lmi-solar.html>.

⁷ Heeter, Jenny, Lori Bird, Eric O'Shaughnessy, and Sam Koebrich. 2018. *Design and Implementation of Community Solar Programs for Low- and Moderate-Income Customers*. Golden, CO: National Renewable Energy Laboratory. NREL/TP-6A20- 71652. <https://www.nrel.gov/docs/fy19osti/71652.pdf>.

⁸ LIHEAP Clearinghouse. "Renewable Energy and LIHEAP: Solar Projects Target Energy Burdens," February 2015. <https://liheapch.acf.hhs.gov/pubs/LCIssueBriefs/solar/renewable.pdf>.

Tax Credits

A tax credit is a tax incentive which enables users to subtract the amount of the credit they have accrued from the total they owe a public entity, such as a state or federal government.

Solar Investment Tax Credit (ITC)

The solar investment tax credit (ITC) is a tool that can incentivize the development of solar systems in the United States. The ITC allows residential, commercial, or utility customers to claim a 26 percent tax credit against the value of an installed solar system on their property.⁹ Currently, the ITC is in the middle of a phase out period: in 2021, the ITC will only allow developers to claim 22 percent on their solar properties, and in 2022, the credit further reduces to ten percent for commercial and utility-scale solar, and phases out entirely for residential systems. This means that the value of using this credit to help finance community solar is steadily decreasing, and given the time it takes to design, finalize, and construct a community solar project, so too is its ability to make the economics of LMI-focused community solar projects attractive to developers and investors.

Read More: [U.S. Department of Energy's Homeowner's Guide to the Federal Tax Credit for Solar Photovoltaics](#)

[U.S. Department of Energy's Guide to the Federal Tax Credit for Commercial Solar Photovoltaics](#)

Low Income Housing Tax Credits (LIHTC)

Low Income Housing Tax Credits (LIHTCs) can also help finance community solar projects. There are two types of LIHTCs: a four percent credit for projects financed with tax-exempt bonds, and a nine percent credit that is awarded to eligible projects financed with conventional debt based on criteria set by a state's Qualified Allocation Plan (QAP).¹⁰ Projects must apply and be selected for the nine percent credit by the state's housing finance agency. Some states' QAPs provide a bonus to applicants for including solar photovoltaic systems on their buildings or by ensuring that those buildings are solar-ready.¹¹ Community solar for multi-tenant LMI facilities could therefore be part of a project that can leverage these tax credits to aid in the financing process.

Read More: [SEIA Brief - Low Income Housing Tax Credits: Affordable Housing Investment Opportunities for Banks](#)

[U.S. Department of Energy Issue Brief: Reducing Energy Burden for Low-income Residents in Multifamily Housing with Solar Energy](#)

⁹ "Solar Investment Tax Credit (ITC)." SEIA, 2020. <https://www.seia.org/initiatives/solar-investment-tax-credit-itc>.

¹⁰ *Low-Income Housing Tax Credits: Affordable Investment Housing Opportunities for Banks*. Office of the Comptroller of the Currency, March 2014. <https://www.seia.org/sites/default/files/resources/insights-low-income-housing-tax-credits.pdf>.

¹¹ For example, in Massachusetts' QAP, the state can award applicants up to three points (out of a total score of 100) for including on-site clean energy systems, which includes on-site solar.

New Markets Tax Credit (NMTC)

The New Markets Tax Credit (NMTC) is a potential source of revenue that can be used to finance community solar in LMI areas for certified Community Development Entities.¹² For investors who develop projects in census tracts with a poverty rate of over 20 percent, or where median family income is below 80 percent of the median, the NMTC provides developers with a credit of 39 percent over seven years. This can significantly lower the cost of a community solar project and make that project a more attractive proposition to potential solar developers. However, there are no examples of community solar projects using the NMTC to date. The NMTC application process is time-consuming and complex, and the complexity of using the NMTC for community solar projects may deter solar developers from utilizing this tax credit as part of a financing deal.

Read More: [U.S. Department of the Treasury's New Markets Tax Credit Fact Sheet](#)
[U.S. Department of the Treasury's Introduction to New Markets Tax Credit Presentation](#)

Community Reinvestment Act (CRA)

Another model that could help incent community solar for LMI populations is the leveraging of banks' Community Reinvestment Act (CRA) obligations.¹³ The CRA is designed to support banks in making investments into LMI communities. Banks could use CRA investments in community solar to fulfill their CRA obligations and also reduce the cost of community solar through bundling CRA investments with their own shares in each system.¹⁴ This could also be financially beneficial for the bank depending on the tax credits it is able to leverage through its purchase of community solar. The downside to this model is that there are many different ways banks can invest in LMI communities to meet their CRA obligations, which means that there may be many other competing priorities for that funding and community solar may be too low of a funding priority for a bank trying to meet its CRA obligations.

Read More: [Overview of the Community Reinvestment Act](#)
[Federal Guidance on Community Solar and the Community Reinvestment Act](#)

¹² Financial institutions must be certified as Community Development Entities to be able to leverage the NMTC. For more information on the certification process, please see <https://www.cdfifund.gov/programs-training/certification/cde/Pages/default.aspx>.

¹³ Heeter, Jenny, Lori Bird, Eric O'Shaughnessy, and Sam Koebrich. 2018. *Design and Implementation of Community Solar Programs for Low- and Moderate-Income Customers*. Golden, CO: National Renewable Energy Laboratory. NREL/TP-6A20- 71652. <https://www.nrel.gov/docs/fy19osti/71652.pdf>.

¹⁴ *Ibid.*

Community Development Financial Institutions (CDFIs)

CDFIs can provide financing to LMI households and multifamily properties at favorable terms.¹⁵ Integrating these institutions into community solar projects can both help the solar market get more accurate information on the risk of customer defaults and design offerings that have manageable risks and are more palatable to capital providers.¹⁶ Partnerships here between State Energy Officials, LIHEAP Officials, CDFIs, and solar developers could be both sustainable and replicable by other states.

Read More: [Case Study: Denver Housing Authority's Community Solar Garden](#)

Qualified Opportunity Zones (QOZs)

Qualified Opportunity Zones (QOZs) were created as part of the Tax Cuts and Jobs Act of 2017. QOZs are designated areas within a state that are eligible for preferential tax treatment by the IRS. Investors in QOZs are able to defer taxes on eligible capital gains made on investments within a QOZ if they hold those investments for a specified period of time.¹⁷ This deferral can include solar investments. For example, the Norfolk Solar QOZ Fund was able to fund seven solar installations in QOZs in Norfolk, Virginia.¹⁸ However, funding solar projects in QOZs may be complicated and challenging due to the relative novelty of QOZs. Leveraging QOZs may also come with unintended side effects, such as exorbitant rent increases, that could disproportionately affect lower-income residents and lead to displacement and gentrification.¹⁹ Solar developers should carefully consider how to ensure that LMI businesses and customers in the QOZ can play active roles so that QOZ activity is a net benefit to them.

Read More: [Internal Revenue Service – Opportunity Zones Frequently Asked Questions](#)

Bond Financing and Bond Banks

Bonds are a powerful tool to help drive investment in community solar, and a number of newer bond products are available for states and developers to consider. Green bonds are an emerging class of bond that developers can utilize to finance community solar projects. Green bonds operate similarly

¹⁵ Kieran Coleman, et al., Financing Community-Scale Solar: How the Solar Financing Industry Can Meet \$16 Billion in Investment Demand by 2020 (Rocky Mountain Institute, 2017). rmi.org/Content/Files/Financing_Community_Scale_Solar.pdf.

¹⁶ *Ibid.*

¹⁷ "Opportunity Zones Frequently Asked Questions." Internal Revenue Service, August 11, 2020. <https://www.irs.gov/credits-deductions/opportunity-zones-frequently-asked-questions>.

¹⁸ Kasotia, Pari. "Where Investors See a Tax Savings, She Saw a Pathway to Clean Energy Equity Goals." *Clean Energy Finance Forum*. Yale Center for Business and the Environment, September 14, 2020. https://cleanenergyfinanceforum.com/2020/09/14/where-investors-see-tax-savings-she-saw-pathway-to-clean-energy-equity-goals?utm_source=newsletter&utm_medium=email&utm_content=New%20finance%20in%20Norfolk&utm_campaign=CEFF-%23187.

¹⁹ *Ibid.*

to normal General Obligation (GO) bonds, but are meant to be used for sustainable assets.²⁰ They are a small but rapidly growing market share of the total bond market. Similarly, qualified 501(c)3 bonds are available to nonprofits to finance project development and upgrades at lower cost. Depending on the developer’s corporate status, they may be able to leverage these bonds to implement community solar projects for LMI customers with less risk to the consumer.²¹

Another way to source capital for community solar projects can come from utilizing the services of a Bond bank. Bond banks consolidate bond issuances from local governments or other smaller entities and sell those issuances to investors.²² By consolidating the issuances and reducing the risk to investors, the bond bank is able to obtain lower interest rates for the original issuers, saving them money over time. Bond banks could be leveraged to package and sell off various bond issuances for community solar projects, reducing the costs for developers and enabling those projects to more easily accommodate LMI customers in their pricing schemes.

Read More: [International Renewable Energy Agency \(IRENA\) - Renewable Energy Finance Brief: Green Bonds](#)
[Clean Energy Bond Finance Model: Qualified 501\(c\)3 Bonds](#)
[Council of Development Finance Agencies – State Bond Banks: Municipal Borrowing Made Easy](#)

Tax Increment Financing (TIF)

Tax increment financing (TIF) is a model that leverages future increases in property taxes from redevelopment projects to finance the improvements that create those increases.²³ However, TIFs are time consuming and can be very complex due to the number of actors involved in each deal. TIFs are also limited to specifically-designated districts, so not all buildings or areas can leverage them for development projects. Community solar developers may find it difficult to site solar arrays in TIF districts as a result.

Read More: [Council of Development Finance Agencies – Tax Increment Financing Resource Center](#)

²⁰ “Renewable Energy Finance: Green Bonds.” International Renewable Energy Agency, January 2020. <https://www.cdfa.net/cdfa/cdfaweb.nsf/ordredirect.html?open>.

²¹ Council of Development Finance Agencies, and Clean Energy Group. “Clean Energy Bond Finance Model: Qualified 501(c)3 Bonds.” Clean Energy Bond Finance Initiative, 2014. <https://www.cdfa.net/cdfa/cdfaweb.nsf/ordredirect.html?open>.

²² Anderson, Louise. “State Bond Banks: Municipal Borrowing Made Easy.” Council of Development Finance Agencies. Accessed October 20, 2020. <https://www.cdfa.net/cdfa/cdfaweb.nsf/ordredirect.html?open>.

²³ “Tax Increment Financing (TIF).” Institute for Market Transformation, 2010. <https://betterbuildingssolutioncenter.energy.gov/sites/default/files/news/attachments/RILA%20TIF%20Primer.pdf>.

Takeaways

There are a number of potential models that could help LMI customers gain access to the benefits of solar energy. However, many of these models are relatively new and untested. It will take coordination between State Energy Officials, LIHEAP Directors, solar developers, and capital providers to develop and implement potential pilot programs that can utilize these models to overcome the barriers to entry that LMI customers face when accessing solar energy. Pilot programs using some or all of these newer models can demonstrate that there are sustainable methods to integrate LMI customers into the solar community and, consequently, spur the development of community solar across the nation.

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