

Community Solar Development Process for Tri-State And G&T Member Co-ops

Technical Assistance from the NCSP
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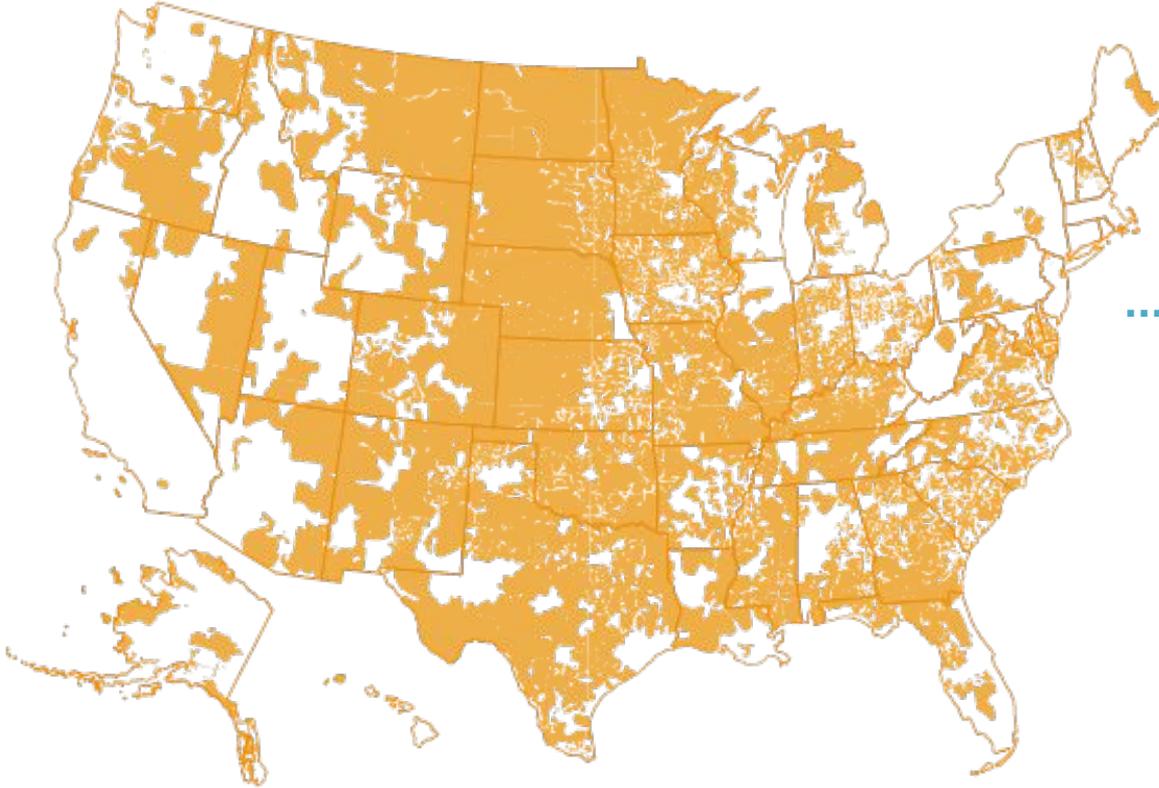
The Assignment

- **Tri-State G&T** has expressed interest in developing a community solar product for local co-ops—especially for co-ops that have not significantly used their local generation option. Local co-ops could benefit from incentives in the IRA for community solar projects (2 to 5 MW each) that target LMI households, optionally in addition to other subscribers. The maximum savings to LMI subscribers would depend on the installed cost of PV, the subscriber mix, marketing and CRM savings, and possibly the addition of companion measures such as EE, storage or beneficial electrification. The target is to achieve savings of 25% or more. The plan must avoid a cost shift among local ratepayers.
- **An initial roll-out for this product is aimed for Socorro, NM.** The economic analysis and program design for this project assumes participation by Socorro Electric Cooperative in New Mexico. The program design will be introduced at Socorro and then modestly customized for other Tri-State co-ops.
- **This TA provides guidance, based on “lessons learned”** through other co-op and public power program design and modeling efforts. An existing model will be adapted for this effort, but the TA assumes that Tri-State staff will take the lead on finalizing and carrying forward the solutions and tools that we provide. We aim for a TA Scope of Work that can be completed in Q4 2023.

Meeting Agenda

1. Background and methodology (7 min)
2. *Cooperative Solar Savers* - a flexible strawman shared solar program design (8 min)
3. Model design and scenario modeling results (15 min)
4. Recommendations for pilot implementation and customization (15 min)
5. 15-minute Q&A

Electric Cooperatives Serve America

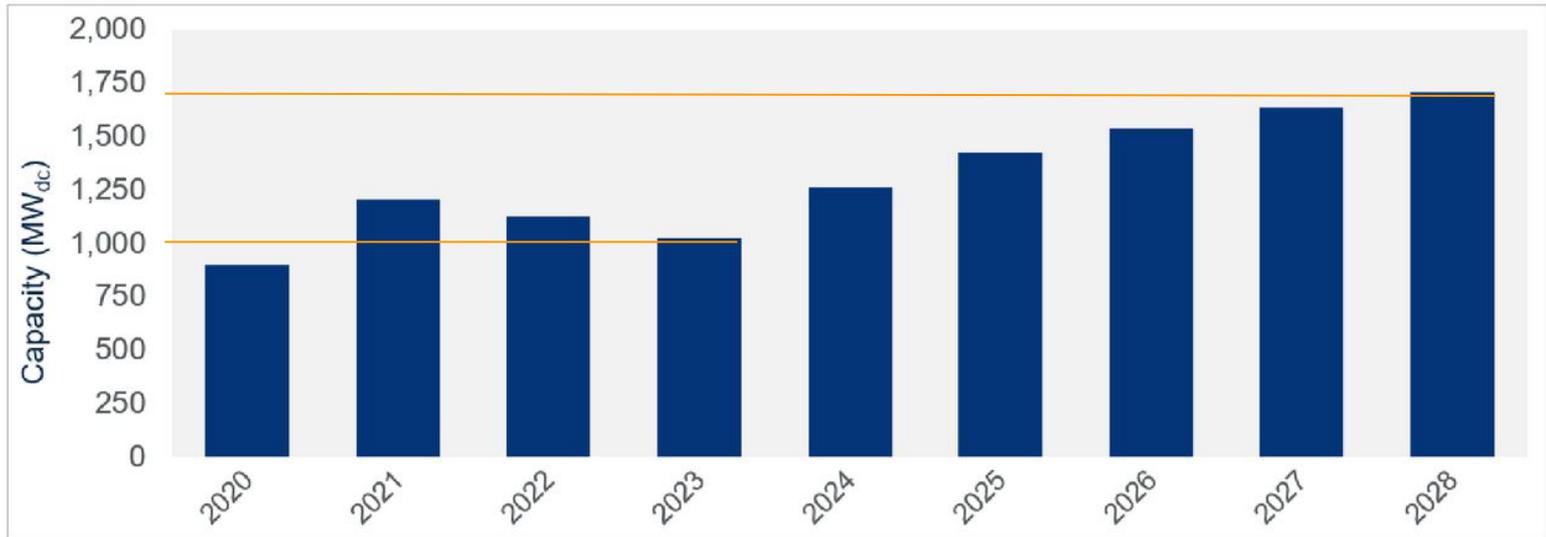


830 local electric co-ops
>60 wholesale G&Ts
...serving >90% of America's
poorest counties

Co-ops have tripled
solar capacity since 2010
Yet this is a fraction
of market potential

National Market Status

Community solar installations and forecast, 2020-2028



Meaningful Benefits of Community Solar



GREATER HOUSEHOLD SAVINGS

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

J40 Priority 1: Reduce Energy Burden



LMI HOUSEHOLD ACCESS

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

J40 Priority 3: Increase Parity in Clean Energy



RESILIENCE AND GRID BENEFITS

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

J40 Priority 7: Increase Energy Resiliency



COMMUNITY OWNERSHIP

- Local community members, subscribers, or local community organizations own or have equity in the project
- Other wealthbuilding strategies

J40 Priority 8: Increase Energy Democracy



WORKFORCE DEVELOPMENT AND ENTREPRENEURSHIP

- Advance high wages
- Reduce income disparities across race and gender
- Ensure a trained and available workforce reflective of the project community

J40 Priority 6: Increase Clean Energy Jobs

Electric Co-op & Muni Examples

Roanoke, NC
Solar-Plus Storage
& Clean EVs



OPALCO, WA
T&D Deferral &
Resilience



Ames, IA
Community Solar



Grand Rapids, MN
Solar-Plus



Electric Cooperative IRA Benefit Options

Note that many co-ops qualify both as Electric Cooperatives and Rural Small Businesses

In addition, tax-exempt entities, including co-ops that cannot use tax credits, can benefit from ITC-equivalent Elective Pay and Transferability options. Total value of credits varies from 30% to 60% of installed cost.

See <https://tinyurl.com/4wxkjncv>

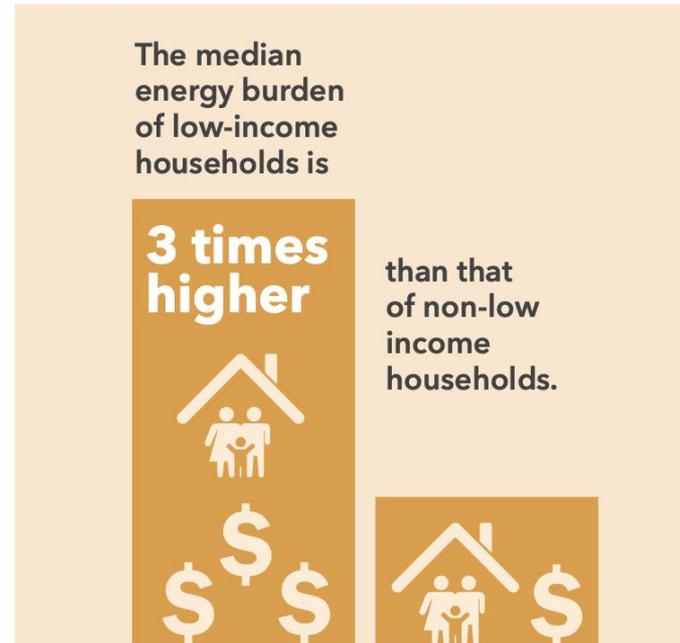
Source: [U.S. USDA, 2023](#)

See also: [U.S. USDA, 2023](#)

	Selected Programs and Support	For-Profit Organizations	Rural Small Businesses or Agricultural Producers	Nonprofit Organizations	State or Local Governments	Tribes, and their wholly owned arms and instrumentalities	Alaska Native Corporations, Regional or Village Corporations	Institutions of Higher Education	Electric Cooperatives	Transportation Fueling and Fuel Distribution Facilities	Associated Webpages
USDA	PACE*	X		X	X	X	X	X			https://tinyurl.com/yw8h2sja
	New ERA*								X		https://tinyurl.com/3shkv2uk
	REAP Grants*		X								https://tinyurl.com/bdund9e5
	REAP Loan Guarantee		X								https://tinyurl.com/bdund9e5
	B&I Guarantee	X	X	X	X	X	X	X	X	X	https://tinyurl.com/56mc3raw
	EECLP	X		X	X	X	X		X		https://tinyurl.com/4cvrzefx
	RESP#	X					X			X	https://tinyurl.com/mrx8f27e
	ERC#								X		https://tinyurl.com/zmwahzsw
	HECG	X	X	X	X	X	X		X		https://tinyurl.com/jjs9h427
	HBIP*									X	https://tinyurl.com/ry7jssf5
	IRP				X	X	X		X		https://tinyurl.com/2p7juck6
	RBDG				X	X	X		X		https://tinyurl.com/29ftkufc
REDLG#				X				X		https://tinyurl.com/3w8bpw2z	
DOE	LPO-EIR (1706)*^	X	X	X	X	X	X	X	X		https://tinyurl.com/yrv23mvc
	LPO-Clean Energy (1703)^	X	X	X	X	X	X	X	X		https://tinyurl.com/2p9x3d5x
	LPO-TELG*^+					X	X				https://tinyurl.com/y7snbfea
	OCED-ERA	X	X	X	X	X	X	X	X		https://tinyurl.com/yh4mwsca
	GDO-GRIP**	X	X	X	X	X	X	X	X	X	https://tinyurl.com/n9vxcu3
	GDO-GRSTF**				X	X	X			X	https://tinyurl.com/5xaps6w4
	OIE-TCUs Clean Energy+					X	X				https://tinyurl.com/bdevhcf7
EPA/EDA	PWEAA			X	X	X	X	X	X		https://tinyurl.com/mtxcenrz
	GGRF*			X	X	X	X				https://tinyurl.com/4cafdp2h

A Closer Look: CS Program Design for LMI

- It pays to keep electric service affordable for all households.
- Top CS appeals for LMI: tangible economic savings, simplicity, predictable costs*
- These appeals are unique in that LMI cares less about expressing autonomy and more about access/financing
- Program design anticipates marketing: how will the program connect to each stakeholder group?
- Be aware: as integration costs rise, the net impact of CS on bill savings may lag.
- **Are there other ways to boost community solar bill savings?**



Source: [ACEEE.org/energyburden](https://www.aceee.org/energyburden)
* [Vote Solar/CCSA/Wood MacKenzie](#)

Summary of Program Design

Recommendations for Electric Co-ops

- No sign-up fees; no standard credit checks (use utility credit history or other tools)
- Offer flexible exit rules; subscriptions may be transferred or re-sold to a new customer
- Marketing partners and market segmentation help tailor the message
- Invest in the CRM and billing platform; use utility consolidated billing
- *Consider:* more predictable, though modest monthly savings with an annual true-up
- Use a mix! **Standard residential or commercial customers + LMI residential** (qualified for greater savings) + **a Utility reserve fund** to achieve targeted savings. NCSP aims for LMI 20% savings or more
- Customers like companion offers (one-stop shop)
- Engage, inform, and celebrate subscribers to assure long-term success
- *Consider:* State-mandated community solar programs find LMI savings through *installed-cost competition* and *soft-cost reduction*; co-op programs may follow suit

Retail Consolidated Billing for a Solar Subscription

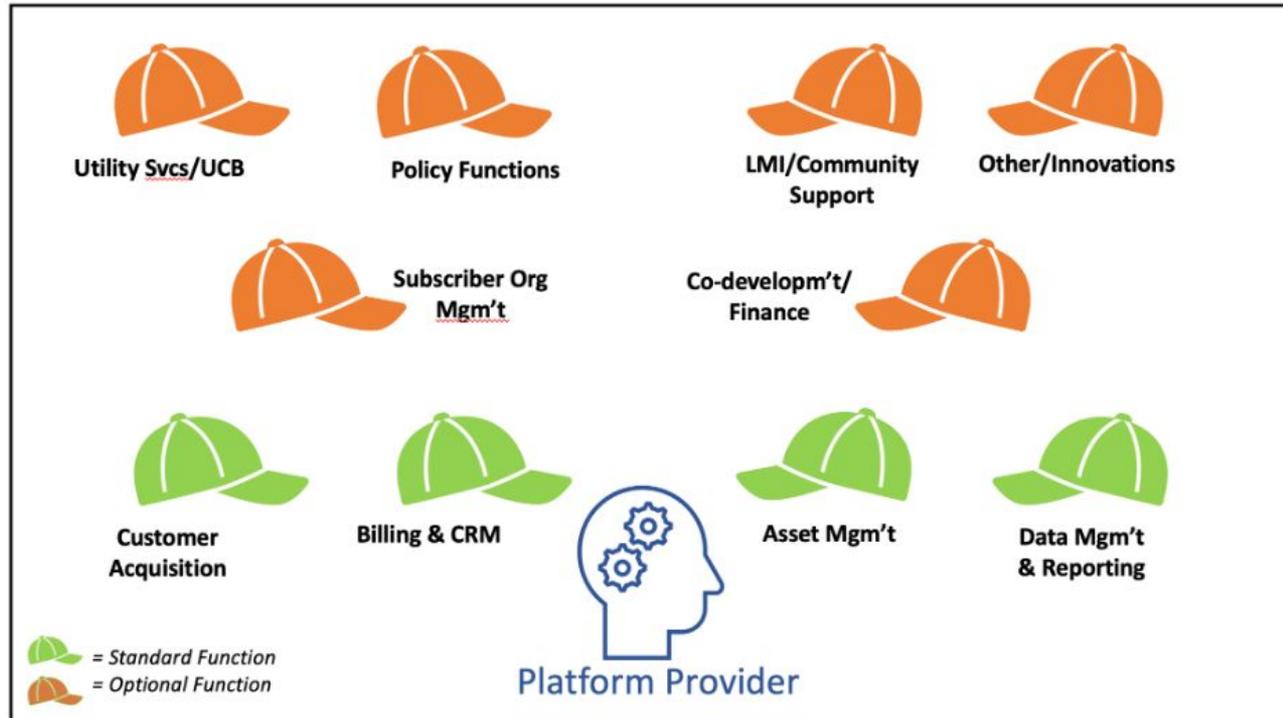
$$\begin{aligned} & (\text{PV Installed Cost} + \text{Financing} + \text{O\&M} + \text{Integration} + \text{Marketing} + \text{Admin Costs}) \\ & \quad \text{Minus Applicable Incentives} \\ & \quad = \text{Cost Per Solar Share (1 kW solar capacity)} \\ & \text{Minus Credit for Associated Monthly Generation, \$/kWh value per kW share} \\ & \quad = \text{Net Monthly Savings Per Share} \end{aligned}$$

For each subscriber, the consolidated monthly bill shows

- All wires/service charges, including a charge for solar share/s
- Credit for solar generation associated with the subscriber's total shares
- Standard rate \$/kWh charge for any additional electricity used
- Credits or charges, if applicable for RECs, fuel adjustment, etc.
- Net solar savings (highlighted)
- Additional credits, fees and taxes as required by law

Consider a CRM and Billing Platform

Dozens of platform providers specialize in services for CS developers and program providers, including local COUs. One may be just right to grow with you.



Source: [Cliburn \(NCSP 2023\)](#)

Don't Let the Model Drive the Program Design

Modeling Tools

- **System Advisor Model – SAM**: An open source tool from NREL, which provides technical and operational outputs for solar-only and limited solar hybrid configurations. The model is relatively complex and useful to solar developers; less useful to co-op and muni program designers. Results may be readily exported into the SPECs Early-Stage Decision (ESD) model or transferred to the Solar Savers Elevate model for more program design clarity.
- **Solar Plus for Electric Co-ops – SPECs ESD Model**: A modeling tool developed by Cliburn and Associates that performs “decision grad” economic analyses for solar-only or solar plus battery storage projects, tapping value streams that are currently available and those that may emerge during the project life. Enhanced gap analysis and sensitivity analysis features. A customized version offers the distribution utility perspective, using energy and demand charges or a 3-tiered wholesale rate option; approximates IRA benefits for co-op purchased systems.
- **Elevate Model – Customized by Cliburn and Associates for Co-op Community Solar Use**: This tool was created by Chicago-based Elevate Energy with funding from the US DOE SunShot program. It reviews costs/benefits to the system developer and subscriber of a single community solar project, including program implementation costs. Cliburn and Associates customized it to model utility-driven community solar and solar plus thermal storage and beneficial electrification options.

[1] <https://www.elevatenp.org/publications/community-solar-business-case-tool/> Contact jkcliburn@cliburnenergy.com for this update.

Economic Modeling for a Utility Solar Project

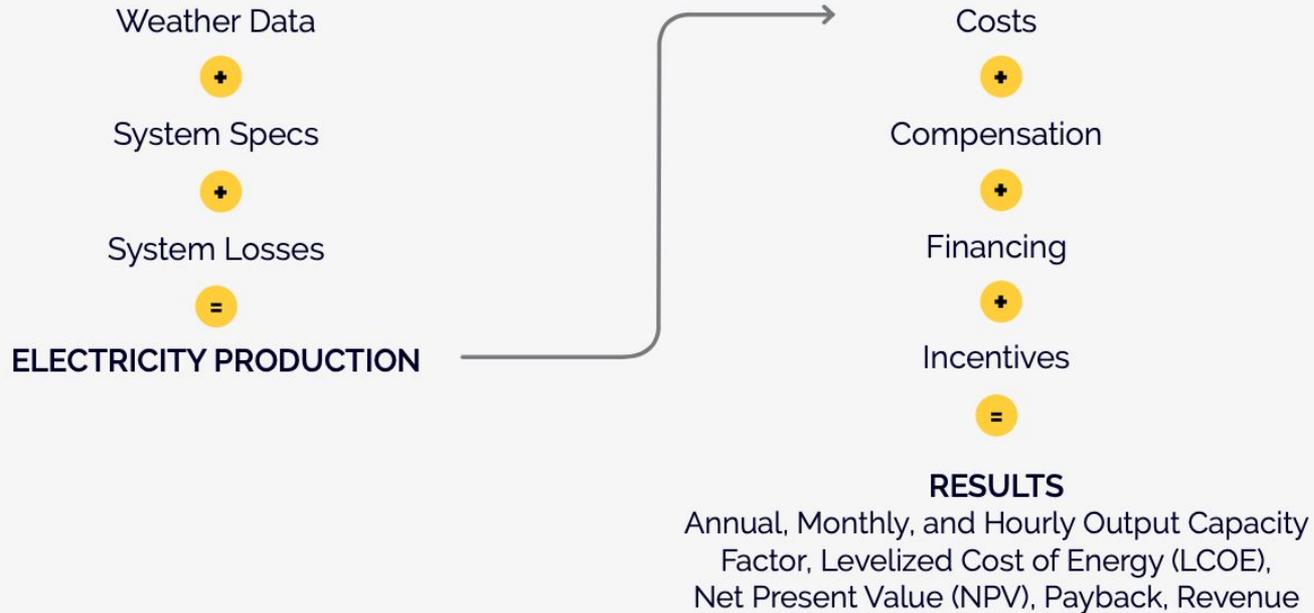


FIGURE 5.2.

Process for modeling feasibility of your solar project.

(Source: Community Solar Project Planning: Working Group Session #5, NREL.)

Source: APPA Community Solar Working Groups; 2021

Benefits-Side Analysis for Socorro Electric Using Prerequisite Tools and SAM

Assume 3.5 MW dc Community Solar Project • Socorro Electric Cooperative
Using historic load data and current wholesale energy and demand costs

Fixed			Tracking		
Avg Demand Reduction	2,844.56	kW	Avg Demand Reduction	3,348.33	kW
Avg Demand Savings	\$ 50,092.74		Avg Demand Savings	\$ 58,964.02	←
Avg Energy Reduction	6,819,211.67	kWh	Avg Energy Reduction	7,754,594.39	kWh
Avg Energy Savings	\$ 244,741.51		Avg Energy Savings	\$ 278,312.39	←
Avg Savings (1 yr)	\$ 294,834.25		Avg Savings	\$ 337,276.41	←

Total annual savings

This benefit-side analysis may be completed prior to using Solar Savers (Elevate) model.
For this TA project (2023), NREL provided this analysis, primarily using SAM.

Socorro Electric Co-op Pilot: Decision Points

- Project development relationships that impact costs (primarily beyond TA scope)
- Selection of targets, stakeholders and marketing partners
- Acceptable value of solar credit (incorporate some strategic value?)
- Choice of subscriber classes and capacity offered:
 - LMI residential
 - Standard residential
 - Small business (Commercial)
 - Institutional (Hospital? Public schools? Local government?)
- Whether or how to implement companion measures
- CRM and billing strategy

A Flexible Strawman Model for Solar Savers

- 3.5 MW dc SAT solar project; sited on utility land; financed with 40% forgivable loan and 40% direct pay IRA incentive
- Prerequisite local co-op benefits analysis (NREL) accounted for specific solar resource, technology line-item costs, wholesale energy and demand savings
- Base case: \$11/kW price x 3 kW for LMI residential, \$15/mo x 3 kW commercial; 0.08 \$/kWh CS bill credit
- 3 subscriber groups: 2000 kW capacity maximum LMI; 1000 kW capacity commercial (or standard residential) with lower savings; 500 kW reserve fund (emergency assistance or efficient/electrification pilot optional)
- \$1.90 installed cost PV
- Program life 20 or 25 years
- Scenarios will test different ways to balance subscriber groups including LMI households; different subscription costs and solar credit values; and an optional LMI reserve fund or companion programs



Subscription Costs



Solar Credit per Solar kWh



Installed Cost of PV



Capacity Available per Subscriber Group



Utility Reserved Capacity; Companion Measures

**Turn These Knobs
for Program Design**

Solar \$ Savers - "Elevate" Model Modified for Electric Co-ops and Munis

Critical System Inputs

Macro pertains to an option to determine the threshold of cost-effectiveness

Project Lifetime NPV of Utility is Zero

Run Macro

System Owner Financials

Business Model:	Share Leasing
Monthly Residential Lease Price per Share:	\$11.00
Monthly Commercial Lease Price per Share:	\$15.00

Project Information

City:	Albuquerque
State:	NM
System Size - DC (Gross kW):	3500
Share Size (W):	1000
Installation Type:	Ground Mount Single Axis Tracking
Ownership Entity:	Tax-Exempt Entity
% of array for residential subscribers	57%
% of array for commercial subscribers	29%
% of array not allocated for community solar	14%
Shares per Subscriber:	3
Years to Full Subscription:	1
Project Start Date	2024
Amount of Annual Utility Revenue Allocated to LI Fund	\$0

Allocation of Community Solar Array

Capacity for Residential (kW)	2000
Capacity for Commercial (kW)	1000
Reserved Capacity (kW)	500

NPV of system costs (excluding CS administrative costs for LCOE)	\$	5,772,524
Lifetime Cost of Energy (LCOE from PV) (\$/kWh)	\$	0.024

Output Snapshot

Lifetime Lease Total	\$9,900
Total number of residential subscriptions	667
Upfront Subscription Price for Project:	N/A

Bill credit rate (\$ per Solar kWh)	\$0.08
Residential Energy Rate (\$/kWh)	\$0.13
Monthly Residential Subscription Price:	\$33.00
Res Subscriber Y1 discount per kWh	-\$0.03
Res Subscriber Y1 energy cost per CS kWh	\$0.10
Res Subscriber Y1 % savings per kWh	21%

Res Subscriber NPV:	\$3,186
Res Subscriber net benefits (costs) yr 1:	\$198.72
Subscriber B/C Ratio	1.60

Commercial Energy Rate (\$/kWh)	\$0.13
Monthly Commercial Subscription Price:	\$45.00
Comm Subscriber Y1 discount per kWh	-\$0.01
Comm Subscriber Y1 energy cost per CS kWh	\$0.12
Comm Subscriber Y1 % savings per kWh	6%

Comm Subscriber NPV:	\$2,605
Comm Subscriber net benefits (costs) yr 1:	\$54.72
Subscriber B/C Ratio	1.17

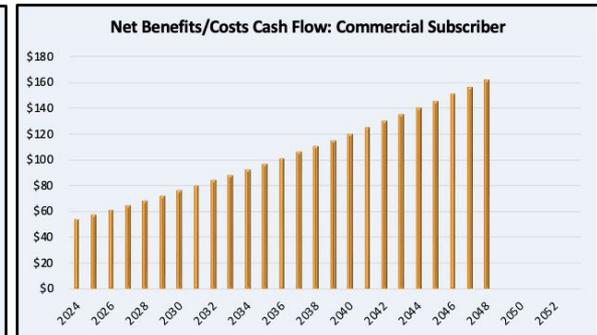
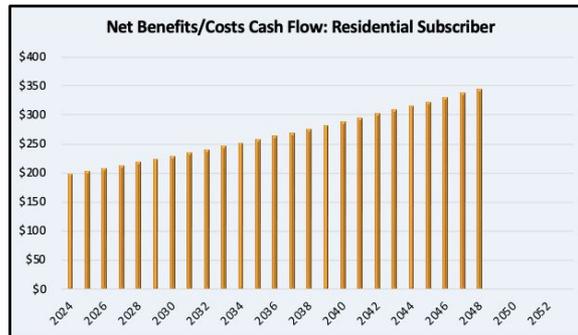
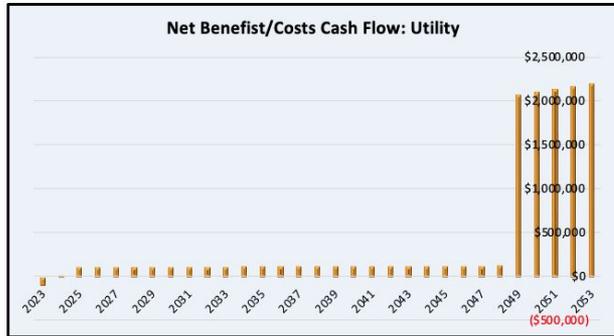
Utility NPV:	\$3,940,798
Utility B/C Ratio	1.44

*Standard Residential could be substituted for Commercial in the Socorro pilot, as the \$/kWh and rate structure is the same.

Results of Strawman Program Design

Base Case With 1.90 \$/W PV, Share Price: Res/LMI \$11, Comm: \$15, Solar Bill Credit \$0.08

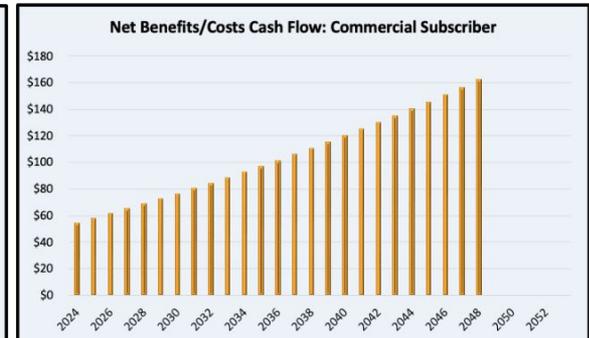
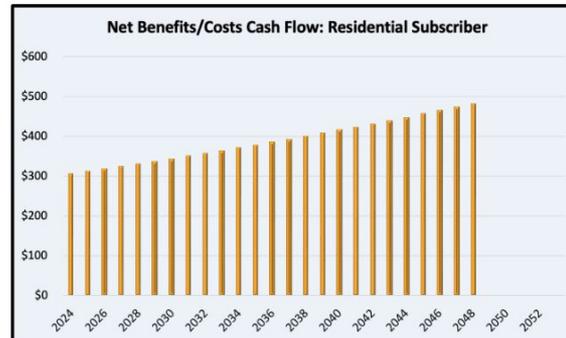
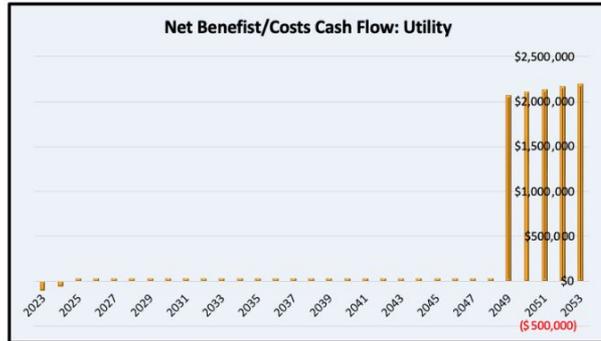
		Utility	Residential/LMI	Commercial
Net Present Value (NPV):	\$	\$3,940,798	\$3,186	\$2,605
B/C Ratio		1.44	1.60	1.17
Yr 1 % savings per kWh	%	N/A	21%	6%
Year 1 Net Benefits:	\$	N/A	\$198.72	\$54.72



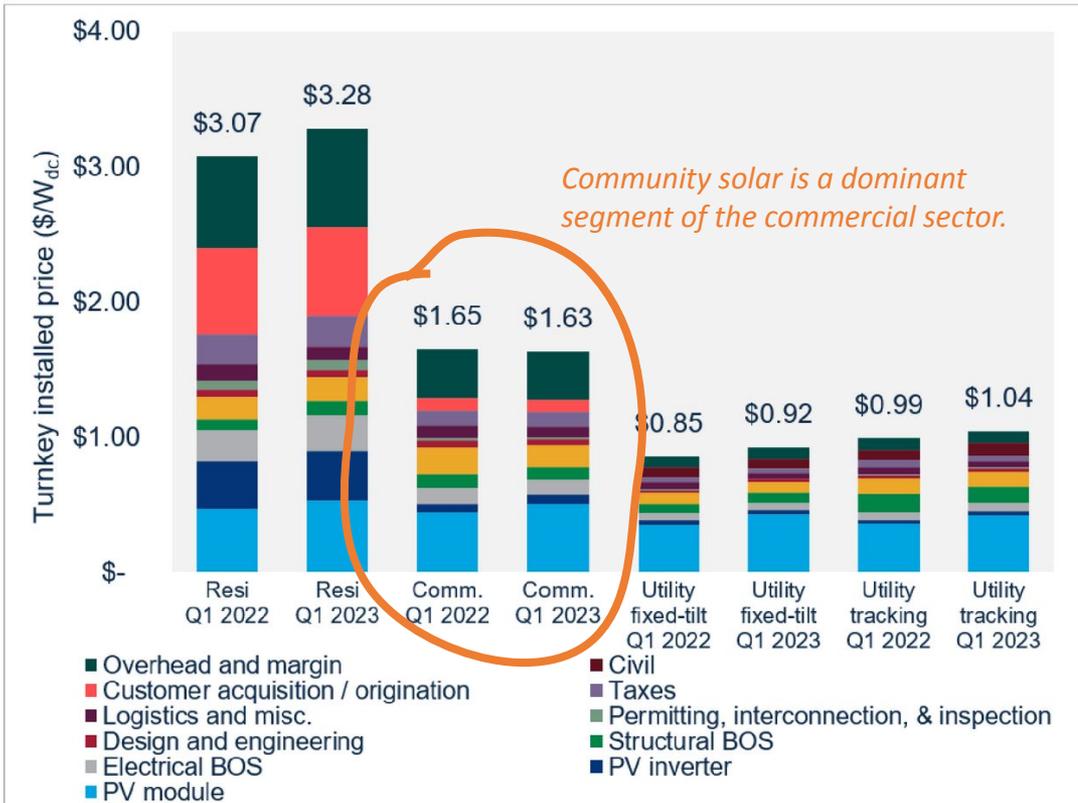
Increase Residential LMI Benefit

With 1.90 \$/W PV, Share price: Res/LMI \$8, Comm: \$15, , Solar Bill Credit \$0.08

		Utility	Residential	Commercial
Net Present Value (NPV):	\$	\$2,860,187	\$4,701	\$2,605
B/C Ratio		1.37	2.20	1.17
Yr 1 % savings per kWh	%	N/A	32%	6%
Year 1 Net Benefits:	\$	N/A	\$306.72	\$54.72



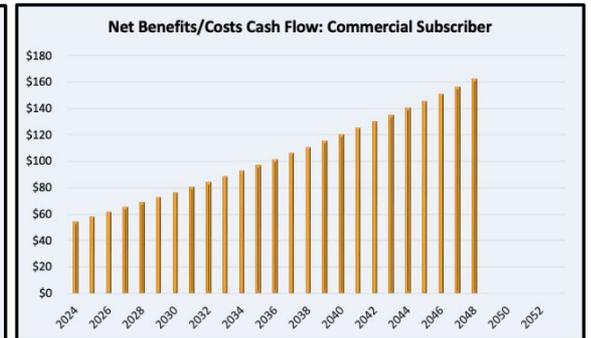
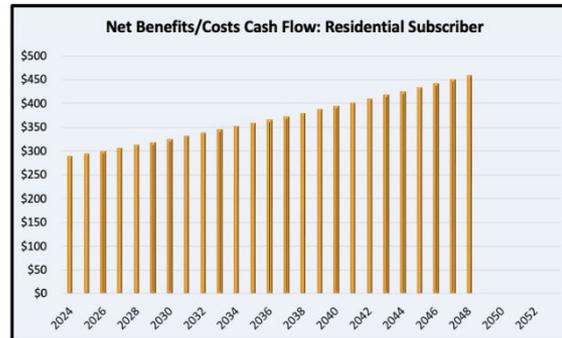
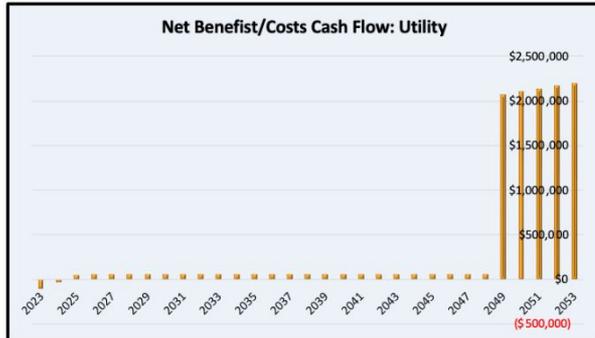
Modeled US national average system prices by market segment,
Q4 2021 and Q1 2023



Seek Better PV Installed Cost & LMI Benefit

With 1.63 \$/W PV, Share price: Res/LMI \$8, Comm: \$15, , Solar Bill Credit \$0.08

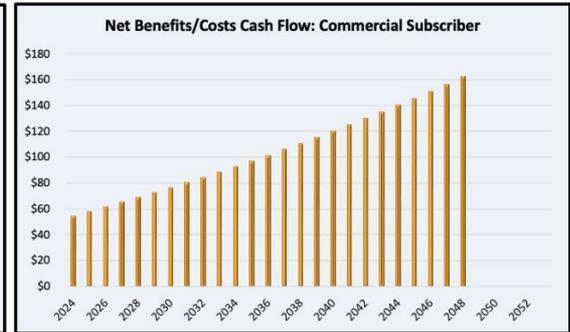
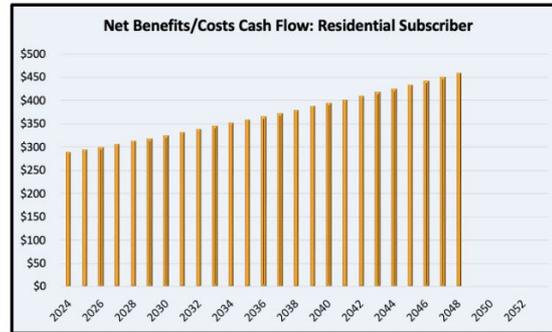
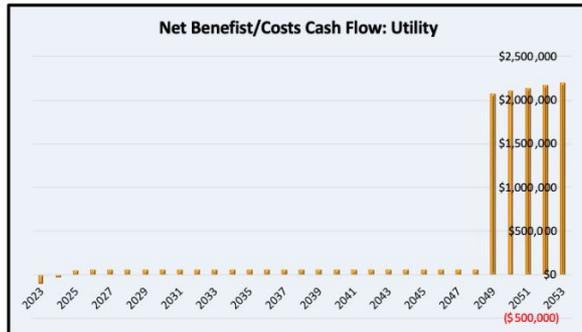
		Utility	Residential	Commercial
Net Present Value (NPV):	\$	\$3,010.934	\$4,448	\$2,605
B/C Ratio		1.39	2.07	1.17
Yr 1 % savings per kWh	%	N/A	32%	17%
Year 1 Net Benefits:	\$	N/A	\$307.72	\$54.72



Slight Nudge on Better PV Cost and LMI*

With 1.63 \$/W PV, Share price: Res/LMI **\$8.50**, Comm: \$15, , Solar Bill Credit \$0.08

		Utility	Residential	Commercial
Net Present Value (NPV):	\$	\$3,191,036	\$4,448	\$2,605
B/C Ratio		1.40 	2.07	1.17
Yr 1 % savings per kWh	%	N/A	30% 	17%
Year 1 Net Benefits:	\$	N/A	\$288.72	\$54.72



* This assures a utility b/c ratio of 1.40 and quicker shift to cash flow positive, but retains a 30% savings for LMI

Push-back on PV Credit? \$0.06/kWh works

With 1.63 \$/W PV, Share price: Res/LMI \$6, Comm: \$9

Macro pertains to an option to determine the threshold of cost-effectiveness
Project Lifetime NPV of Utility is Zero

Run Macro

System Owner Financials	
Business Model:	Share Leasing
Monthly Residential Lease Price per Share:	\$6.00
Monthly Commercial Lease Price per Share	\$9.00

Project Information	
City:	Albuquerque
State:	NM
System Size - DC (Gross kW):	3500
Share Size (W):	1000
Installation Type:	Ground Mount Single Axis Tracking
Ownership Entity:	Tax-Exempt Entity
% of array for residential subscribers	57%
% of array for commercial subscribers	29%
% of array not allocated for community solar	14%
Shares per Subscriber:	3
Years to Full Subscription:	1
Project Start Date	2024
Amount of Annual Utility Revenue Allocated to LI Fund	\$0

Allocation of Communit Solar Array	
Capacity for Residential (kW)	2000
Capacity for Commercial (kW)	1000
Reserved Capacity (kW)	500

NPV of system costs (excluding CS administrative costs for LCOE)	\$	5,243,777
Lifetime Cost of Energy (LCOE from PV (\$/kWh)	\$	0.022

Output Snapshot	
Lifetime Lease Total	\$5,400
Total number of residential subscriptions	667
Upfront Subscription Price for Project:	N/A

Bill credit rate (\$ per Solar kWh)	\$0.06
Residential Energy Rate (\$/kWh)	\$0.13
Monthly Residential Subscription Price:	\$18.00
Res Subscriber Y1 discount per kWh	-\$0.03
Res Subscriber Y1 energy cost per CS kWh	\$0.10
Res Subscriber Y1 % savings per kWh	24%

Res Subscriber NPV:	\$3,526
Res Subscriber net benefits (costs) yr 1:	\$230.04
Subscriber B/C Ratio	2.20

Commercial Energy Rate (\$/kWh)	\$0.13
Monthly Commercial Subscription Price:	\$27.00
Comm Subscriber Y1 discount per kWh	-\$0.02
Comm Subscriber Y1 energy cost per CS kWh	\$0.11
Comm Subscriber Y1 % savings per kWh	13%

Comm Subscriber NPV:	\$4,242
Comm Subscriber net benefits (costs) yr 1:	\$122.04
Subscriber B/C Ratio	1.46

Utility NPV:	\$2,230,838
Utility B/C Ratio	1.38

Divert \$10,000/yr Revenue to LMI fund

With 1.90 \$/W PV, Price/share: Res \$11, Comm: \$15

		Utility	Utility w/ Fund Diversion
Net Present Value (NPV):	\$	\$3,940,798	\$3,792,691
B/C Ratio		1.44	1.43

Some electric co-ops like the LMI fund as an addition or alternative to a typical community shared solar program. For example, we have worked with co-ops to test applying a portion of community solar PV generation value to make high-impact bill savings equipment, like HPWH or high-e room AC, accessible to LMI households. If a portion of the reserve is diverted to the LMI fund, it affects the utility B/C ratio, but only slightly. In this case, LI Fund Distribution Tab tools may be useful.

LI (Reserve) Fund Distribution Options

Based on TA project with NRECA/OPALCO, 2021. OPALCO (WA) directed solar generation value to 2 LI funds: emergency assistance and billing rebates for LI serve providers. Cliburn added an option to leverage new heat pump water heaters (HPWH) for LMI.

New Option: By leveraging solar generation to enhance an available HPWH rebate with 2-yr on-bill financing, OPALCO could save LMI customers over \$230/yr (**\$18.60/mo avg**). This savings would continue for 10 to 18 years.

HPWH Clean Electrification also could be load controlled (thermal storage) or Energy Star window air conditioners, both a win-win

1 Evaluation Sheet for using the money generated by the CS array that is

2

3 Values in Blue can be modified

4	% of solar generation dedicated to LI	39%
5	\$ Produced for LI fund in Year 1	\$ 37,514
6	% of LI Funding for EAP	0%
7	% of LI funding reserved for LISP	15%
8	% of LI funding remaining for HPWH rebates	85%
9	# of LI hh receiving subsidy/yr	26
10	\$ to LI HPWH Solar Water Rebate participant	\$ 1,226
11	# of customers receiving HPWH Rebate in 10 yrs	260
12		

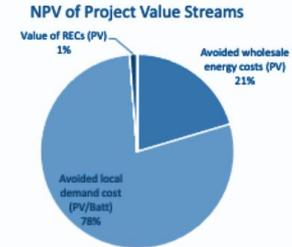
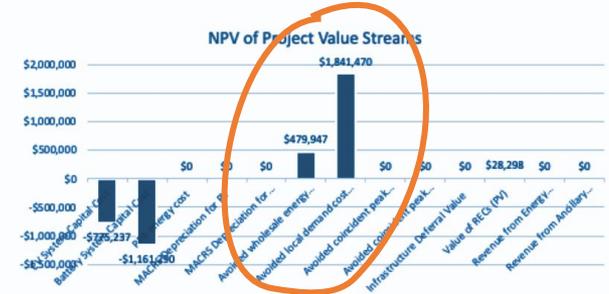
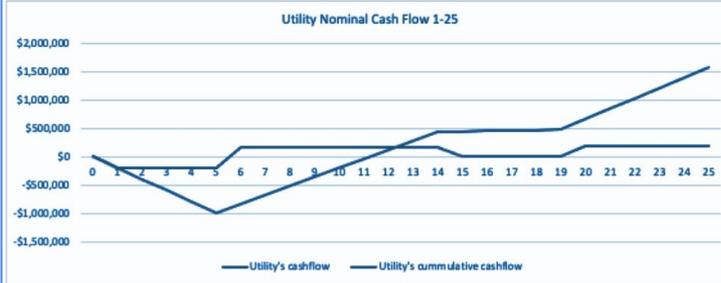
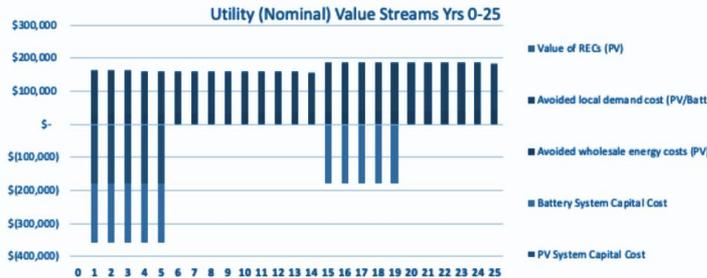


Today, the IRA provides up to \$1750 instant rebates to low and moderate income households, or tax credits for those who qualify, up to total \$2,000/yr.

What If Community Solar Were Designed With Storage?

The Cliburn/SPECs model can be used with Elevate to assess various storage values, inc. demand savings, arbitrage, distribution deferral, resilience and ancillary services value.

System Purchase w/ 4-hr BESS



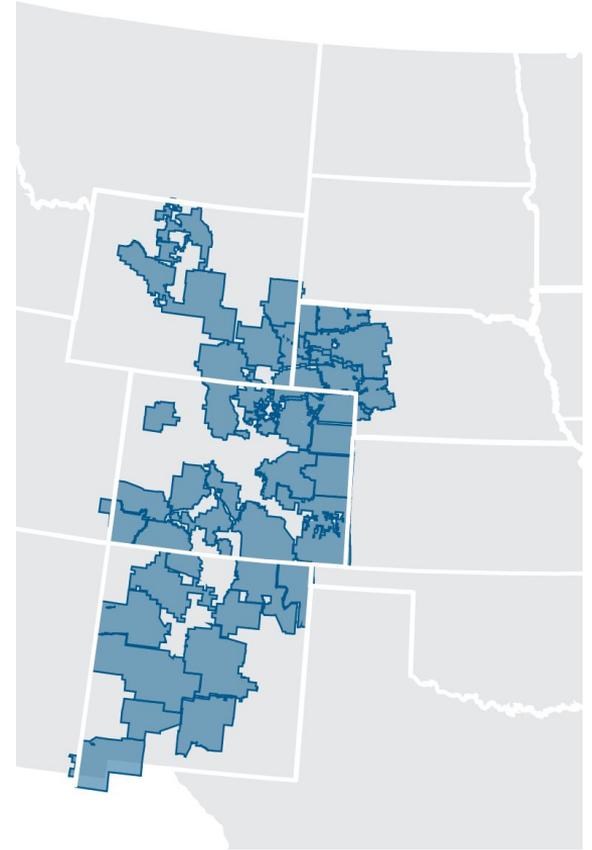
(For reference only; Roanoke EC, 2022)

Replicating the LMI impacts

Tri-State G&T serves >40 local electric cooperatives.
If 15 of these adopt community solar using a Conservative Base Case Scenario*, for a total 25 MW market penetration by 2025, benefits may include:

- LMI, each saving \$199 yr 1; **\$6,700 each over 25 yr**
- x 5,500 LMI subscribers = **\$86.8 million savings over 25 yr**
- Utility ROI ~48%

*66% LMI, 20% standard/commercial, 14% utility reserve;
conservative base case PV cost assumptions (\$1.63/W) and



Additional Resources

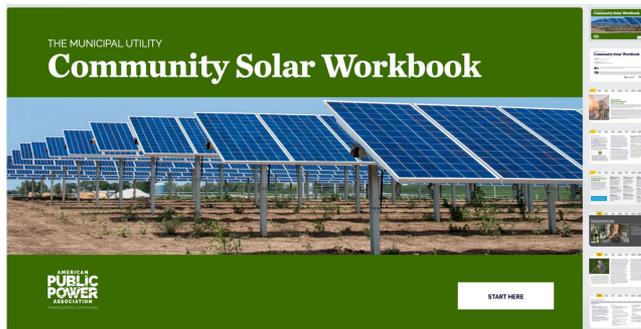
Community Solar Program Design Resources

The [Community Power Accelerator™](#) connects developers, investors, philanthropists, and community-based organizations to create an ecosystem of partners that work together to get more equity-focused community solar projects financed and deployed. Part of the U.S. Department of Energy (DOE) [National Community Solar Partnership](#) (NCSP).

[NCSP provides free one-on-one](#) technical assistance on many aspects of community solar program design, stakeholder engagement, technical challenges, outreach and financing.

McLaren, Joyce, *Design Elements and Considerations for Creating a Municipal Utility Community Solar Program*, [NREL/PR-7A40-85716](#), (NREL for American Public Power Association, 2023).

[Texas Community Solar Roadmap 2020](#) is a useful overview for rural community solar, including case studies.



For tips and resources to adapt the NCSP/APPAs [Community Solar Workbook](#) for co-op use, see Cliburn and Associates' [solarvalueproject.com](#) site (solar shares or solar-plus tabs).

Additional sources offer research-based advice on outreach for LMI:

Design and Implementation of Community Solar Programs for Low and Moderate Income Customers, Heeter, et al, National Renewable Energy Laboratory (2018) <https://www.nrel.gov/docs/fy19osti/71652.pdf>

Sharing the Sun: Community Solar Deployment, Subscription Savings, and Energy Burden Reduction, (2021) National Renewable Energy Laboratory, NREL/PR-6A20-80246, <https://doi.org/10.2172/1823422>.

E-Source Blog <https://www.esource.com/130201g8te/using-solar-programs-help-low-income-customers-during-covid-19>

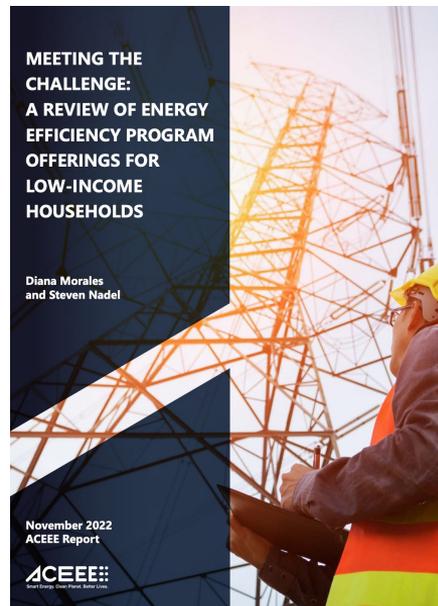


Electricity Markets & Policy Department
Energy Analysis & Environmental Impacts Division
Lawrence Berkeley National Laboratory

An Assessment of Evaluation Practices of Low- And Moderate-Income Solar Programs

Bentham Paulos, Sydney Forrester, Eric O'Shaughnessy,
Christopher Dyson, Galen Barbose, and Ryan Wisler

April 2021



Take a marketing perspective. This perspective should be both general and solar program specific. Suggested resources include:

Market Research and Market Segmentation for Community Solar Program Success (2016), from CSVP (Grounded Research and Consulting, Olivine, Cliburn and Associates and Extensible Energy.) Discusses target market research. Still current!

https://www.communitysolarvalueproject.com/uploads/2/7/0/3/27034867/2016_01_08_market_research.pdf

State of the Consumer Report (Annually) and *Lower-Income Consumers and the Smart Energy Future* (2020) and other reports from the Smart Energy Consumer Collaborative. Executive summaries are available free. Click through to obtain them. Request access through LMI agencies or the utility. **See smartenergycc website for more updated resources.**

<https://smartenergycc.org/category/resource-library/consumer-data/>

Also search for meaningful terms on the SECC blog pages, which are free, such as:

<https://smartenergycc.org/three-notable-racial-disparities-among-lower-income-consumers/>

Presentations covering market segmentation and communications strategies, including program evaluations, available from the Behavior Energy and Climate Change Conference (annual series). Check with LMI agencies for free access or tap past-year archives that are affordable. Available from <https://podiumcast.com/store/events/2019-becc>

The Vision for U.S. Community Solar: A Roadmap to 2030 (2018), GTM Research (Woods Mckenzie) for Vote Solar. See data from national surveys describing general residential and low-income consumer priorities for community solar. See [CCSA](#) for updated reports and links.

https://votesolar.org/wp-content/uploads/2021/05/FULL_REPORT_The_Vision_for_US_Community_Solar_072518.pdf

ONE LAST COOL IDEA! The Beneficial Electrification League is an excellent source of information on IRA benefits and solar plus ee or load management. See their program on Weatherization-Plus: <https://be-league.org/we-together/>



The W/E Together initiative improves building efficiency by tackling the challenge of heating and cooling from two different directions: first, improve the building envelope to reduce energy loss, and second, install high-efficiency, right-sized electric appliances to reduce the amount of energy needed for heating and cooling. These appliances can also lower peak demand, reducing stress on the grid. This inside and out approach will lower bills, improve air quality and, scaled up, can promote a robust, resilient and equitable energy system.

\$9 billion for home electrification—but can we spend it wisely?

The Inflation Reduction Act (IRA) will pay up to \$14,000 upfront for a low- or moderate-income family to efficiently electrify and weatherize their home, with lower but still generous rebates available to all households. But there are formidable obstacles standing in the way of the utilities, nonprofits, local governments, and other entities that want to ensure this opportunity benefits large numbers of low- and moderate-income households.