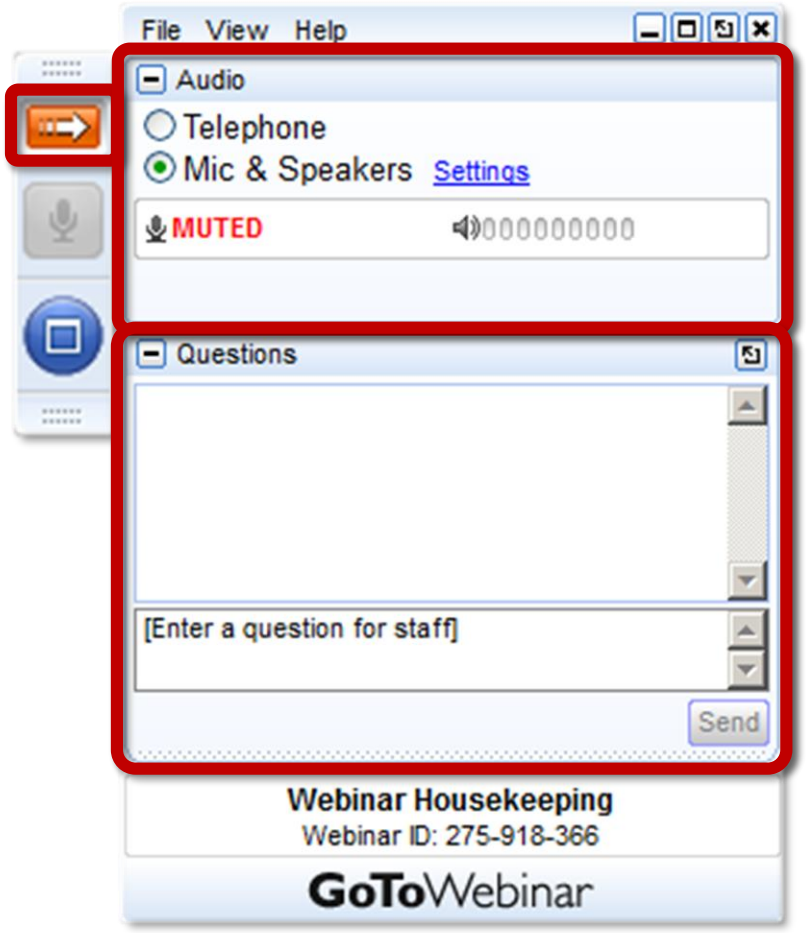
Clean Energy States Alliance Webinar

Community Solar Program Design and Implementation for Low-and Moderate-Income Customers

August 30, 2018

CleanEnergy States Alliance

Housekeeping



Join audio:

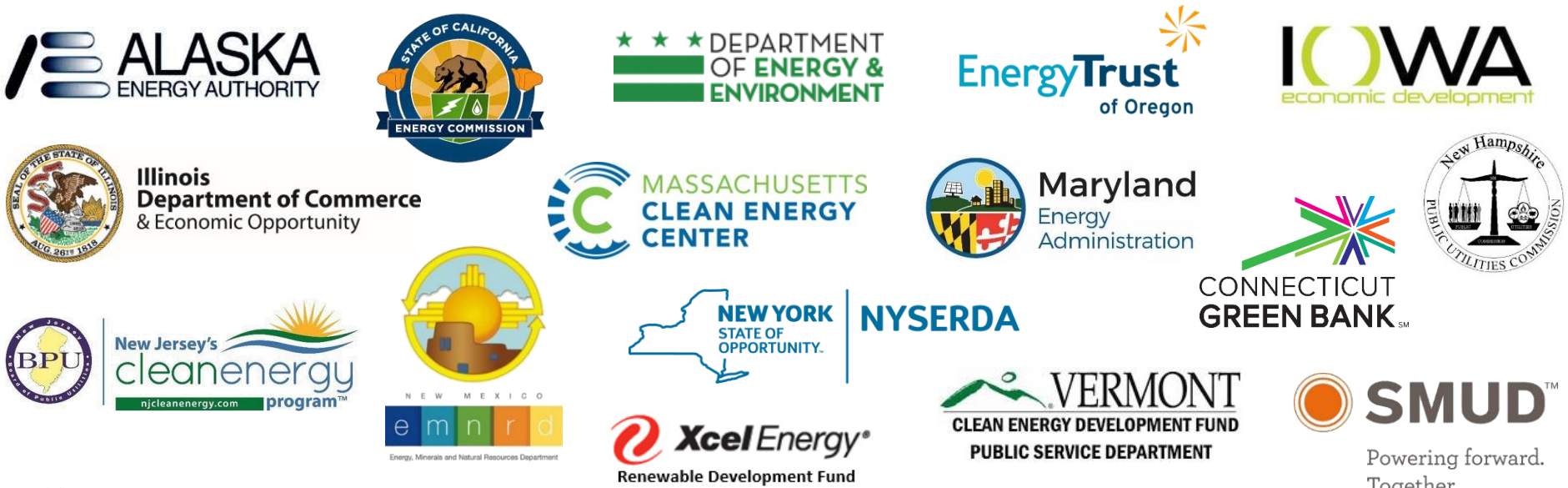
- Choose Mic & Speakers to use VoIP
- Choose Telephone and dial using the information provided

Use the orange arrow to open and close your control panel

Submit questions and comments via the Questions panel

This webinar is being recorded. We will email you a webinar recording within 48 hours. CESA's webinars are archived at www.cesa.org/webinars

Clean Energy States Alliance



www.cesa.org

State Energy Strategies

SOLAR ENERGY TECHNOLOGIES OFFICE
U.S. Department Of Energy

- Funded by the U.S. Department of Energy through the Solar Energy Technologies Office.
- The Clean Energy States Alliance is working with CT, DC, MN, NM, OR and RI to make solar more accessible to low- and moderate-income residents.

DEPARTMENT OF ENERGY & ENVIRONMENT
CONNECTICUT GREEN BANK
COMMERCE DEPARTMENT
OREGON DEPARTMENT OF ENERGY
EnergyTrust of Oregon
STATE OF RHODE ISLAND OFFICE OF ENERGY RESOURCES
NEW MEXICO emnrd Energy, Minerals and Natural Resources Department

- Research support provided by Lawrence Berkeley National Laboratory and the National Renewable Energy Laboratory.

BERKELEY LAB
Bringing Science Solutions to the World

NREL
NATIONAL RENEWABLE ENERGY LABORATORY

CleanEnergy States Alliance

Webinar Speakers

Lori Bird
Principal, Markets and Policy Group, National Renewable Energy Laboratory

Jenny Heeter
Senior Energy Analyst, National Renewable Energy Laboratory

Diana Chace
Project Director, Clean Energy States Alliance

NREL
NATIONAL RENEWABLE ENERGY LABORATORY

CleanEnergy States Alliance

NREL
NATIONAL RENEWABLE ENERGY LABORATORY

Community Solar for Low- and Moderate-Income Customers

Jenny Heeter, Senior Energy Analyst

Project team: Lori Bird, Eric O'Shaughnessy, and Sam Koebrich

CESA Webinar

August 30, 2018

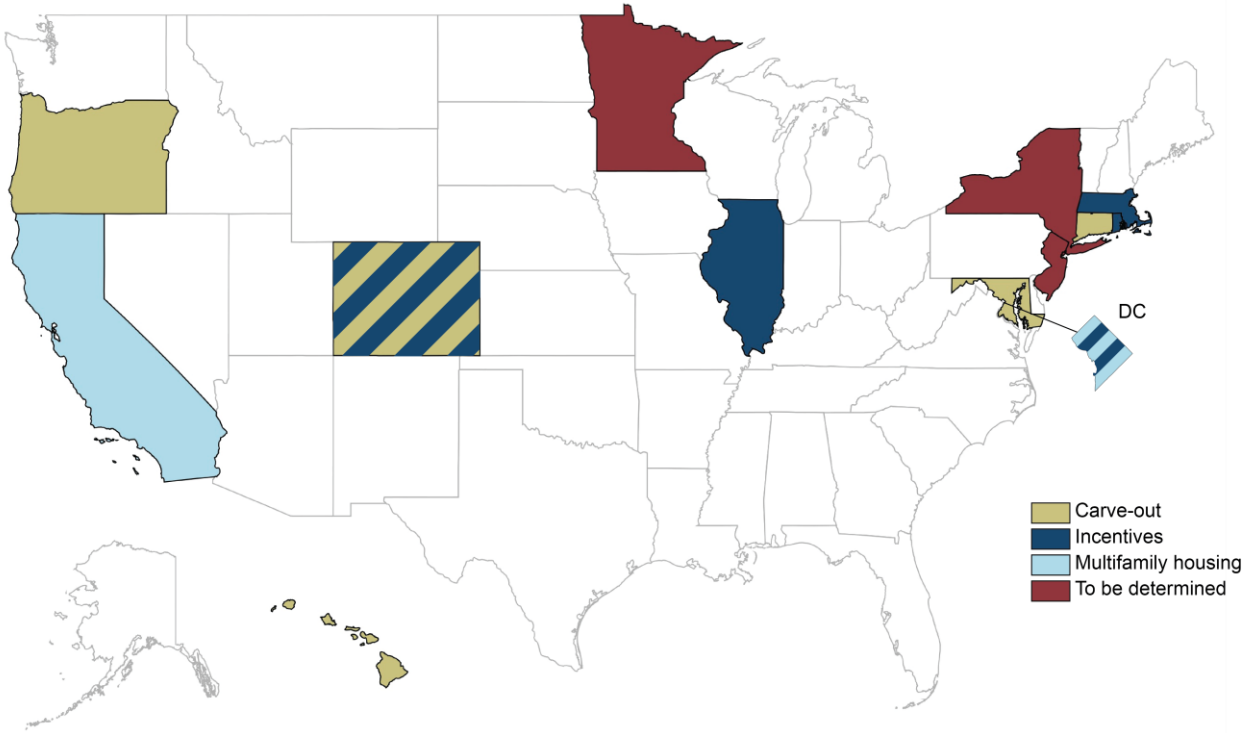
Project Overview

Objective: Focus on key community solar design and implementation issues for LMI customers

- Existing state community solar LMI programs
- Program design considerations
- Incentives and financing
- Customer outreach

State LMI Community Solar Programs

States are Rapidly Expanding LMI Focused Community Solar



12 states and Washington, D.C. have a policy or program supporting some type of LMI community solar program.

Traditional Community Solar Designs Vary Considerably

***Sample* of Community Solar Pricing and Product Structures in Key Markets**

Project	State	Financing available?	Upfront or monthly cost	Credits received on electricity bill	Estimated simple payback period
Blue Wave Mendon Solar Project	MA	N/A; monthly payment	Monthly discount of 10% on electricity	N/A	10% savings[a]
SunShare	MN	N/A; monthly payment	14.01 cents/kWh for kWh subscribed to; 2.75% annual increase in rate	14.596 cents/kWh	Approximately 4% savings[a]
Seattle City Light	WA	No	$6.25/W	$0.70/kWh (state incentive) + $0.09/kWh virtual net metering credit	7 years[b]
Clean Energy Collective	CO	No, but directs customers to Elevation Solar or other local resources	Upfront cost of $2.50/W	13.6-18.6 cents/kWh	8.5 years[a]
Renovus Community Solar	NY	No	Upfront cost of $2.09/W	Net metering rate	9 years[a]
New Richmond Utilities Solar Garden Program	WI	No	$1.80/W	$0.078/kWh (if utility keeps RECs), $0.076 (if customer keeps RECs)	11-12 years[c]

Some products with immediate savings exist (MA, MN) but most products are structured as an upfront payment with simple paybacks ranging from 7 to 12 years.

LMI customers likely cannot afford the upfront payment and/or are not able to finance it themselves.

Program Design Options

Multiple elements may be included in one program or project

LMI Carve-Out

The program can reserve a fraction of the project's capacity or generation for LMI customers and allow non-LMI customers to subscribe to the remaining share. For example, states have developed requirements for 5-20% LMI participation, or higher.

Example: Maryland has a 60 MW set aside (out of 193 MW of community solar) for LMI community solar projects.

Advantages	Disadvantages
• Carve-outs ensure a minimum level of LMI participation. • Non-LMI customers can also participate, which can keep costs lower for LMI customers. • A wide range of customers are eligible (e.g., commercial). • A broader mix of customers could reduce default risk.	• Maintaining LMI participation at a set level adds LMI customer acquisition costs to address turnover. • Prescribing a minimum LMI requirement may serve as an artificial limit on LMI subscribers, as developers seek to only serve up to the minimum requirement. • Non-LMI customers may bear some costs of LMI customer participation.

LMI-Only Project or Program

In this scenario, the array would be 100% subscribed by LMI customers.

Example: In 2015, the Colorado Energy Office awarded a $1.2 million grant to support coop and muni demonstration projects of LMI community solar. Eligible projects were required to be dedicated exclusively to LMI customers and use different program structures to reduce energy burden for low-income customers.

Advantages	Disadvantages
• It is easier to link to other LMI programs and offer specific incentives to LMI customers. • Marketing materials can be designed exclusively toward LMI customers. • It serves more LMI customer through a single community solar project.	• Making the project financially viable for both the developer and the LMI participants can be more challenging, as LMI customers will have to support all project costs, instead of costs being spread among non-LMI and/or anchor tenants. • Other customer classes may also want access to community solar. • Third-party developers may see higher financial risk

Anchor Tenant

Project developers can seek a single creditworthy non-residential anchor tenant to subscribe to a large portion of the project's capacity. For instance, the framework proposed by the Hawaii Public Utilities Commission allows a single anchor tenant to be any size up to 60% of a project's capacity.

Example: The framework proposed by the Hawaii Public Utilities Commission allows a single anchor tenant to be any size up to 60% of a project's capacity.

Advantages	Disadvantages
• It can improve project economics and help developers obtain financing by reducing the risk associated with customer subscriptions. • Flexible anchor tenant agreements could mitigate customer turnover risk. • Anchor tenants may be able to provide land or rooftop space for the community solar array.	• Allowing anchor tenants could reduce the number of LMI subscribers per array. • Anchor tenant assumes more risk.

Example: The Solar Massachusetts Renewable Target (SMART) program is a 1,600 MW declining block net-metering program. It provides for an added 6 cents/kWh to community solar projects serving at least 50% low-income customers.

Advantages	Disadvantages
• Does not provide a cap (real or artificial) on LMI subscribers. • Builds on existing incentive program structure.	• LMI participation is not guaranteed. • It may be difficult to set an incentive at an appropriate level; setting it too high would result in over-spending while setting it too low would result in low or no LMI participation.

Incentives for LMI Participation

Some states and programs are developing added incentives for LMI community solar subscribers. For example, if the state already has a solar renewable energy certificate (SREC) program, it may decide to award LMI community solar projects or subscribers a higher SREC rate.

Program Designs to Reduce Customer Turnover and Default Risk

Advantages	Disadvantages
• It eliminates the possibility of customer default, as customers have no on-going payment.	• It requires funding via state funds, grants, or other options. • Paid subscriptions would need to be reassigned if the LMI customer moves out of the subscription territory. • Developers may be slow to re-assign subscriptions.

Prepaid Subscriptions

Prepaid subscriptions would use external funding for an up-front payment of the subscription. This funding could be provided via state funds, grants, or other options.

Housing Authority Management

If programs allow affordable housing units to subscribe and pass the benefits on to their LMI tenants, there is little risk of customer turnover or default, as the building landlord would be the subscriber, rather than individual tenants.

Example: The Public Housing Agency of the City of St. Paul, Minnesota, is working with developer Geronimo Energy to subscribe 100% of their electricity use at 10 high-rise facilities, and in so doing is expecting to save $130,000 per year, or $3.25 million over 25 years.

Advantages	Disadvantages
• It eliminates the possibility of customer default, as the housing authority would be the off-taker. • There are fewer issues with customer turnover, as the housing authority would be able to reassign benefits to new tenants.	• There can be complexities in crediting customers with direct bill benefits, depending on the housing arrangement. • The structure creates an administrative burden for housing authority staff.

Example: The Colorado Energy Office required LMI participants in its grant-funded community solar projects to have already had their homes weatherized or be on the waiting list for weatherization.

Advantages	Disadvantages
• It can result in lower bills for LMI customers compared to community solar alone.	• Some LMI residences may not qualify for free weatherization upgrades, if, for example, their house is newer construction. • Some homes may be on a long waiting list to be weatherized, thus delaying community solar subscriptions.

Bundling Energy Assistance Funds

LMI subscribers can reduce their community solar subscription size. Since their subscription costs would be reduced, this would increase the likelihood that LMI subscribers would continue to pay their electricity bills and community solar subscriptions.

Example: Cooperative Energy Futures is building community solar gardens in Minnesota that follow this model. It has “backup subscribers” such as churches, mosques, and cities that agree to cover defaults by participants. That structure is allowing Cooperative Energy Futures to subscribe customers with lower credit scores.

Advantages	Disadvantages
• It reduces risk for the developer. • It can reduce project financing costs and reduce the cost of subscription management.	• Some acquiring of new customers may still be required. • Flexible subscriptions may be bound to a pre-set amount (e.g., the tenant would take 40%–50% of the project offtake).

Flex-Tenant Subscriptions

A large anchor tenant, such as a municipal government, could have a flexible subscription that temporarily increases to absorb the loss of subscriptions from LMI customers who move or drop out of the program. Non-anchor tenants could also serve this function.

Workplace Subscription Programs

Having customers obtain their subscription through their employer could potentially help address turnover as well as credit risk issues. If all or some of the employees are LMI, then the community solar project would enable LMI participation.

Example: The Vermont Energy Investment Corporation worked with a spin-off company, Sun Shares, to subscribe its employees to fulfill a 200-kW solar array. The program structure allows employees of all incomes to participate.

Advantages	Disadvantages
• It reduces risk for the developer. • Employers have a pool of potential subscribers to address turnover. • The employer could also serve as a flexible-tenant, as described in Option 4.	• Some new customers may still need be acquired. • The employer would assume the time and cost of managing subscriptions.

Customer Eligibility and Verification

Eligibility Criteria:

- Income qualified
- Location qualified
- Participation in an existing program
- Participation by LMI housing and service organizations

Verification:

- Utility, developer, or third-party?

Other Options and Considerations

- Incentives for maintaining fully subscribed arrays
- Shorter subscription duration (e.g. 2-5 years)
- Customer default management via a loan loss reserve
- Alternative underwriting criteria
  - Use utility bill repayment history to establish creditworthiness

Incentives and Financing

On-bill Financing

On-bill financing allows customers to pay community solar subscription fees through ongoing payments on utility bills.

Example: The Grand Valley Power LMI program in Colorado allows LMI customers to pay subscription fees through on-bill financing. The program charges a subsidized subscription fee of $0.02/kWh, which is simply subtracted from LMI customers' bill credits.

Advantages	Disadvantages
• LMI customers do not need to obtain up-front capital to fund their subscription. • LMI customers would have both their payments and credits on their utility bill (can see net savings). • The potential subscriber pool can be increased by using bill repayment history as a proxy for creditworthiness.	• The risk of subscriber default falls on the utility. • If the subscription is higher-cost than the default electricity product, subscribers are at higher risk for not paying their bill and being disconnected; disconnection would not happen if the loan were provided by a third party (RAP 2017). • Utility financing may be restricted by regulators.

Lower Interest Rates Loans

Lower interest rates allow LMI customers to obtain a loan at a rate lower than market rate.

Example: The Mass Solar Loan program offers to reduce interest rates for solar loans (including for community solar subscriptions) by 1.5 percentage points. Furthermore, the program pays down 20% of the loan principal for customers below 120% of state median income, and 30% of the principal for customers below 80% of state median income.

Advantages	Disadvantages
• LMI customers pay lower interest rates, thus making subscription more financially attractive.	• Such loans require a subsidy to cover risk and buydown. • Customers may be resistant to signing a loan. • Administrative process and paperwork could be barrier.

Funding for LMI Community Solar *Subscriptions*

- **Utility low-income bill subsidies**
  - Instead of utilities using ratepayer surcharges to pay LMI electricity bills or give LMI electricity "discounts", use the funds for LMI community solar subscriptions
- **Federal Weatherization Assistance Program (WAP)**
  - WAP dollars can be used on RE if it achieves a Savings to Investment Ratio (SIR) of 1.0
  - Renewable energy system costs are capped at $3,598
  - No states have used WAP funds for community solar to date
- **Federal Low Income Home Energy Assistance Program (LIHEAP)**
  - Some LIHEAP dollars are spent on weatherization projects (typically 5-15%)
  - Those dollars could be used to pay a community solar subscription, instead of just paying the LMI customer's electricity bill
  - No examples to date of states using LIHEAP funds for community solar

Funding to Lower Community Solar *Project Costs*

- **Community Redevelopment Act (CRA) investments**
  - Banks can use off-site renewables to demonstrate CRA activities if benefits are provided to affordable housing project or a community facility that has a community development purpose
  - Alpine Bank satisfied CRA investments by purchased 25 kW from a community solar array and donated the subscription to an NGO, who will distribute credits to LMI customers
- **New Markets Tax Credit**
  - Provides investors a tax credit of 39% of the qualified equity investment over 7 years. Applies to project investments made in census tracts where poverty rate is > 20% or median family income < 80% of area median.
  - Has been used for large solar arrays but no community solar examples to date.
- **State budget funds**
  - The Colorado Energy Office used $1.2 million from state budget to provide grants to 5-12 LMI community solar projects
- **Multipliers on existing incentives (REC multipliers)**
- **Customer acquisition subsidies**

Customer Outreach

Customer Outreach Challenges

- Time constraints on LMI customers
- Customer access
- Having sufficient time to explain program
- Language barriers
- Lack of trust, particularly if sounds too good to be true
- Undocumented immigrants
- LMI messaging may differ from other customer types

Hard-to-Reach LI Customers
Renters in multifamily properties
Rural households
Foreign-language-only households
Undocumented immigrants
Seniors
People with disabilities

Effective Partnerships for LMI Customer Outreach

Partner	Value of the Partnership
Utilities	Utilities have the most direct access to customer information and can most readily estimate customer energy burdens. Some utilities already have rate-subsidized customers that may automatically be eligible for LMI community solar programs.
Community LMI groups/NGOs	Working with a non-utility partner may help programs overcome LMI customer skepticism of utilities. Community groups already have established relationships with LMI customers that facilitate customer education and acquisition.
Existing LMI programs (e.g., LIHEAP)	LMI customers that already participate in other LMI programs may be suitable candidates for community solar subscribers.
Housing authorities	Housing authorities may serve as the offtaker and pass benefits through to their tenants.
Solar developers	Solar developers can provide expertise on customer acquisition, even if these practices must be modified in the LMI context.

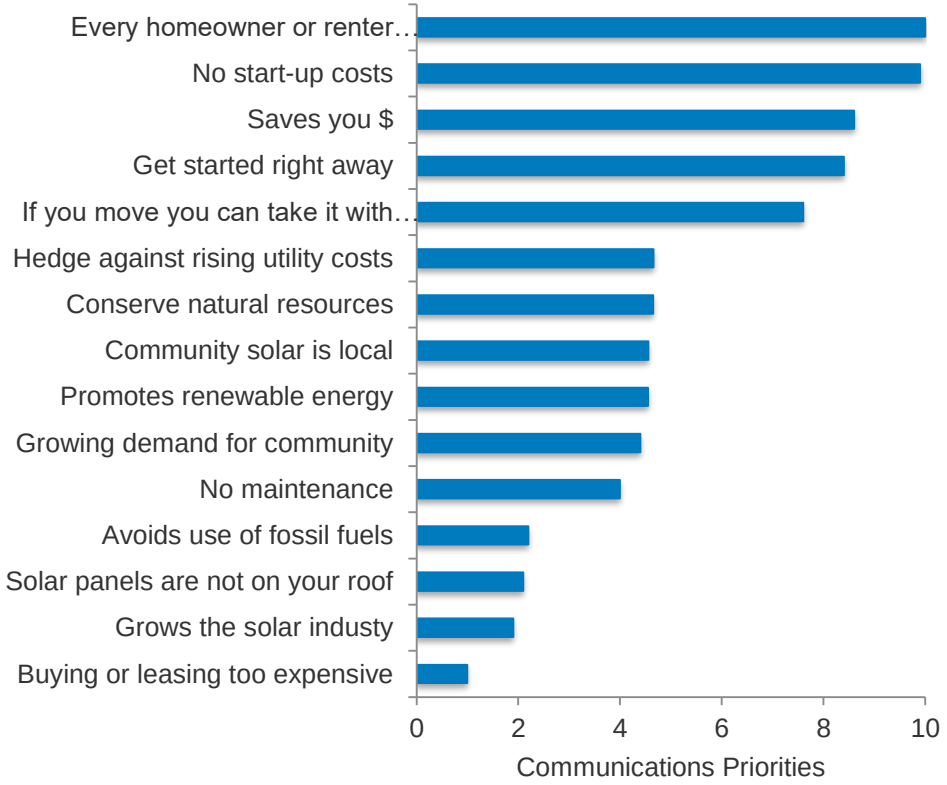
Reaching LMI Potential Customers

- Defining LMI customers consistently with pre-existing programs (e.g., LIHEAP)
  - Allows community solar programs to leverage existing customer lists and easily identify program-eligible leads
- Using housing authorities and community action agencies
  - Leverage related programs and existing outreach vehicles
- Target other programs working with LMI customers

What are effective messaging strategies?

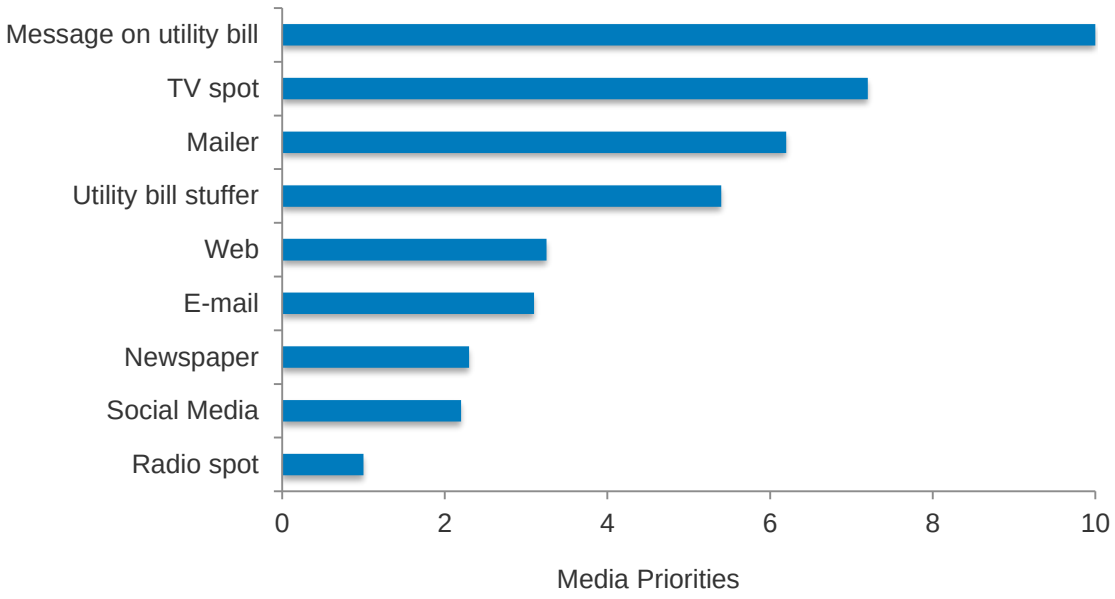
- Cost-based messaging: Including costs in marketing prevents the “too good to be true” problem
- Audience-specific messaging: Cater messaging to local educational levels, spoken languages, and appropriate local media
- Test messaging - try various approaches with local communities through small pilots, re-assess the efficacy of the messaging

Most compelling messaging for LMI customers based on survey data



Source: Pacific Consulting Group 2017

Effective Communications Vehicles



Most Effective Messaging Channels for LMI Community Solar Customers

Source: PCG 2017; SEPA LMI Webinar May 11

- Community-based social marketing may also be effective; referrals could be one source
- LMI customers may respond to experience of neighbors and friends

Conclusions

Key Issues

- Addressing enrollment barriers: upfront cost, length of subscription, credit score, etc.
- How much incentive do LMI customers need to participate?
- How to address ongoing subscription management?
- What is the role of the state in providing incentives, outreach, forming partnerships, and perhaps siting?

Design Options Menu

LMI Share	Funding/Incentives	Array Ownership	Subscription Management	Program Goals
100% LMI	State funding	Utility	Utility	Reduce energy burden
Partial LMI subscription - requirement	Non-LMI subscribers	Developer	Developer	Reach target # of LMI customers
Partial LMI subscription – incentive	Ratepayers		Energy NGO / Community Org.	Provide greatest bill subsidy to LMI
	Federal funds (LIHEAP, WAP)		Affordable housing owner	
			Government agency	

Webpage: https://www.nrel.gov/technical-assistance/lmi-solar.html

Contact Information

Jenny Heeter
Senior Energy Analyst
National Renewable Energy Laboratory
jenny.heeter@nrel.gov
303-275-4366

Appendix: Existing and Planned LMI Community Solar Programs

State Program	Program Status (Launch Date)	Program Structure
California Multifamily Affordable Solar Housing	Closed to new applicants (2015)	Incentives for solar systems on multifamily housing
Colorado Community Solar Gardens Act	Active (2011)	Specified LMI participation levels: 5% of each project designated through rulemaking
Colorado Low-Income Community Shared Solar Demonstration Projects	Closed (2015)	Incentives for 1.5 MW of dedicated LMI community solar arrays
Colorado Xcel Energy Settlement	Launched (2017)	13.5 megawatts (MW) of RFPs for new LMI community solar systems, Xcel Energy assuming 5% carveout through new program (under development)
Connecticut Shared Clean Energy Facility Pilot Program	Active (2017)	5.2 MW across three projects, with 20% LMI participation in each; Senate Bill 9 (2018) made the Shared Clean Energy Facility program permanent, allowing up to 25 MW of projects per year, with 10% of capacity towards LI subscribers, 10% to LMI or LI service organizations
District of Columbia Solar for All	Active (2016)	Program required to reduce electricity bills of at least 100,000 LI households by at least 50% (community solar is one piece of this program); incentives for demonstration projects
Hawaii Community-Based Renewable Energy	In development (2015)	Specified LMI participation levels: 50% for 9 MW of utility-led projects
Illinois Community Renewable Generation Program	In development (2016)	Incentives to LMI customers or developers: 37.5% of Solar for All funds will subsidize LMI customer for community solar participation; 22.5% of funds will go to LMI community solar pilot projects

Existing and Planned LMI Community Solar Programs (con't)

State Program	Program Status (Launch Date)	Program Structure
Maryland Community Solar Energy Generating Systems Pilot Program	Pilot (2017)	Specified LMI participation levels: 60-MW carve-out for projects where LMI customers own 20% of output; additional 60-MW carve-out for "small" projects, including projects with more than 50% LMI participation
Massachusetts Virtual Net Metering	Phasing out (2017)	Incentives to LMI customers: LMI customers are eligible for low-interest financing from the Mass Solar Loan program
Solar Massachusetts Renewable Target (SMART)	In development (2017)	1,600-MW declining block net-metering program. Community solar serving at least 50% low-income customers receives an added 6 cents/kWh; low income community solar projects less than 25 kW will receive 230% of the base compensation rate
Minnesota Community Solar Gardens	Active (2014)	Utilities are required by commission to submit plans for LMI projects. Xcel's pilot proposal involves a 0.5-MW–1.0-MW system providing free subscriptions to low-income customers
New Jersey Community Solar Energy Pilot Program (Senate Bill 877)	In development (2018)	Senate Bill 877 directs the Board of Public Utilities to develop a community solar pilot program; the program must "provide access" to LMI customers
NYSERDA Low Income Community Solar Initiative	In development (2017)	NYSERDA is tasked with introducing an initiative to provide financial support for pilot projects, streamline pre-development assistance, and develop LMI credit and support mechanisms such as a loan loss reserve
Oregon Community Solar	Active (2016)	Specified LMI participation level of 10%; rules under development
Rhode Island Community Remote Net Metering	Active (2016)	Incentives to LMI developers: $200/LMI subscriber bonus to developer that is passed on to LMI subscribers

Thank you for attending our webinar

Diana Chace
Project Director, CESA
diana@cleanegroup.org

Find us online:

www.cesa.org

facebook.com/cleanenergystates

@CESA_news on Twitter

Upcoming Webinar

California's Pioneering Policies for New Homes: Greater Efficiency with Required Solar Energy

Tuesday, September 11, 1-2:15 pm ET

In May, California became the first state to require new homes to include solar power. Guest speakers from the California Energy Commission will explain the requirement, how it will be implemented, and how other states might adopt similar policies.

Read more and register at www.cesa.org/webinars