NARUC Winter Policy Summit

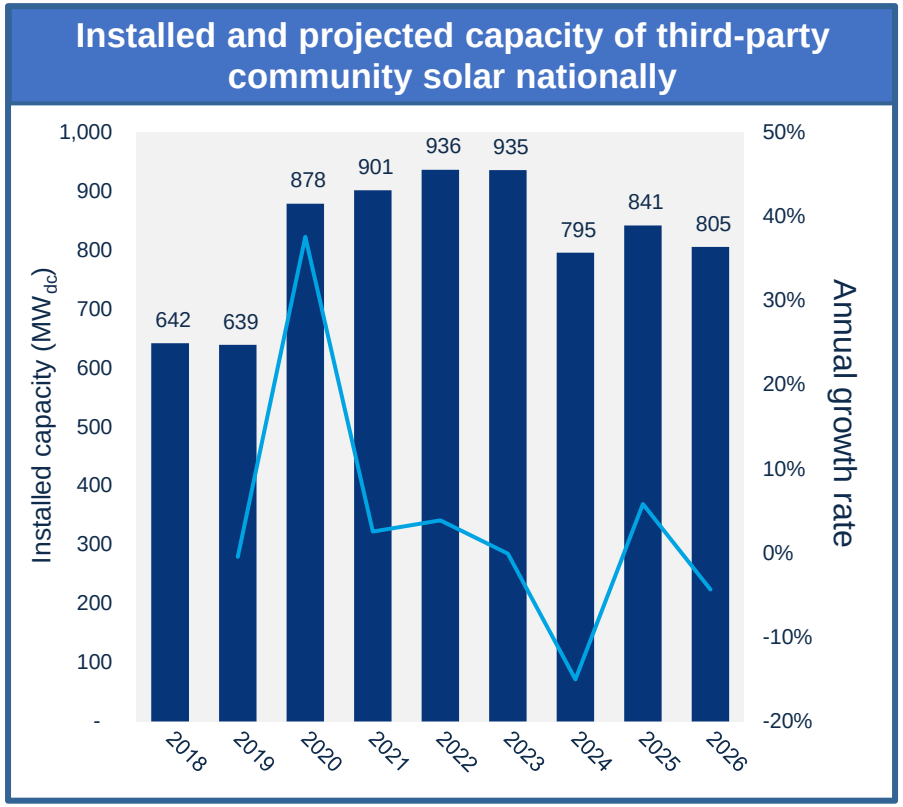
Staff Subcommittees on Energy Resources and the Environment, Rate Design, Electricity, Electric Reliability and Resilience, and Consumers and the Public Interest

What is Community Solar 1: Benefits for Low- and Moderate-Income Consumers

10:00 – 11:00 a.m. ET

What is Community Solar?

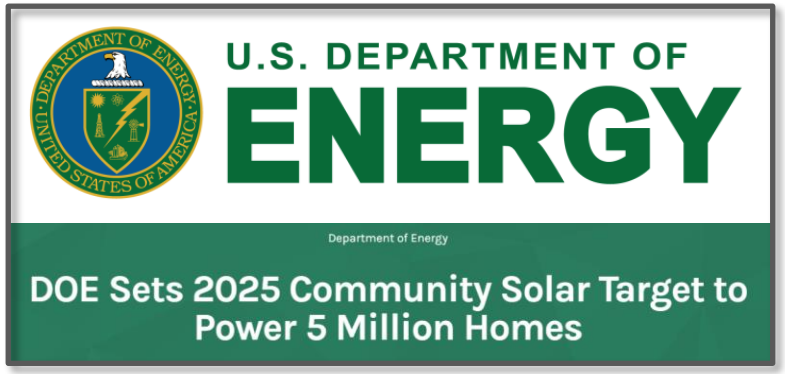
- 75% of U.S. households & businesses can't access rooftop solar
- Community solar projects are shared by multiple subscribers who receive credits on their electricity bills for their share of power produced
- Community solar facilities are small (typically 2-5 MW) and located closer to load on the distribution system
- Benefits:
  - Subscribers save 10-20% on monthly energy bills – savings can be targeted to achieve equity and energy justice goals
  - Distributed resources increase resiliency and putting energy closer to load reduces grid costs for all ratepayers
  - Creates jobs & brings tax and economic benefits to communities
  - Provides revenue opportunities for farmers, building owners, and to bring value to brownfield sites
- There are policies enabling third-party community solar in 21 states today 3.5 GW of community solar currently on the grid and another 4.5 GW in the pipeline over the next five years.



** Wood Mackenzie's US community solar market outlook: H2 2021 published Feb 2022*

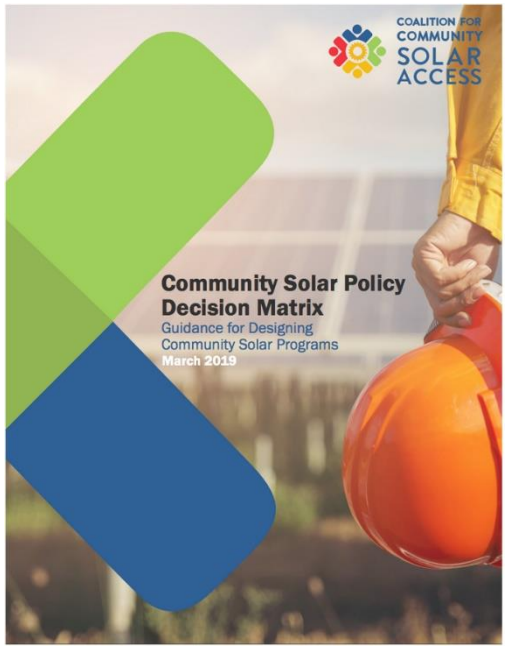
Department of Energy Sets Ambitious Community Solar Goal

- DOE and National Community Solar Partnership (NCSP) announced goal of enabling enough community solar to power 5MM homes by 2025 and create $1 billion in energy bill savings.
    - Secretary Jennifer Granholm said, “Community solar is one of the most powerful tools we have to provide affordable solar energy to all American households. Achieving these ambitious targets will lead to meaningful energy cost savings, create jobs in these communities, and make our clean energy transition more equitable.”
- Coalition for Community Solar Access (CCSA), a national coalition of businesses & nonprofits advocating for community solar, committed to build 20 GW of community solar by 2025 to support DOE’s goals.
- To achieve this goal, we must remove barriers & incentivize deployment - including adopting new third-party programs in more states, increasing the size of existing programs, unlocking federal funding & tax incentives, improving interconnection, building & training highly skilled workforce



Important Community Solar Resources

- DOE Sets 2025 Community Solar Target to Power 5 Million Homes
- Department of Energy's National Community Solar Partnership
- Coalition for Community Solar Access website
- Coalition for Community Solar Access's Policy Decision Matrix and Policy Guide
- Third-party community solar model Legislation: vertically integrated states & restructured states
- White paper on interconnecting distributed solar and resources published by CCSA and Local Solar for All (available online at www.communitysolaraccess.org)
- Vibrant Clean Energy and Local Solar for All roadmap and why DERs reduce grid costs for all ratepayers



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Community solar in leading markets

NARUC 2022 Winter Policy Summit

Richard Caperton

VP, Policy and Market Development

Arcadia

AGENDA

01

What is Community Solar?

02

Active Community Solar Markets: Arcadia

03

Third-party community solar product offerings

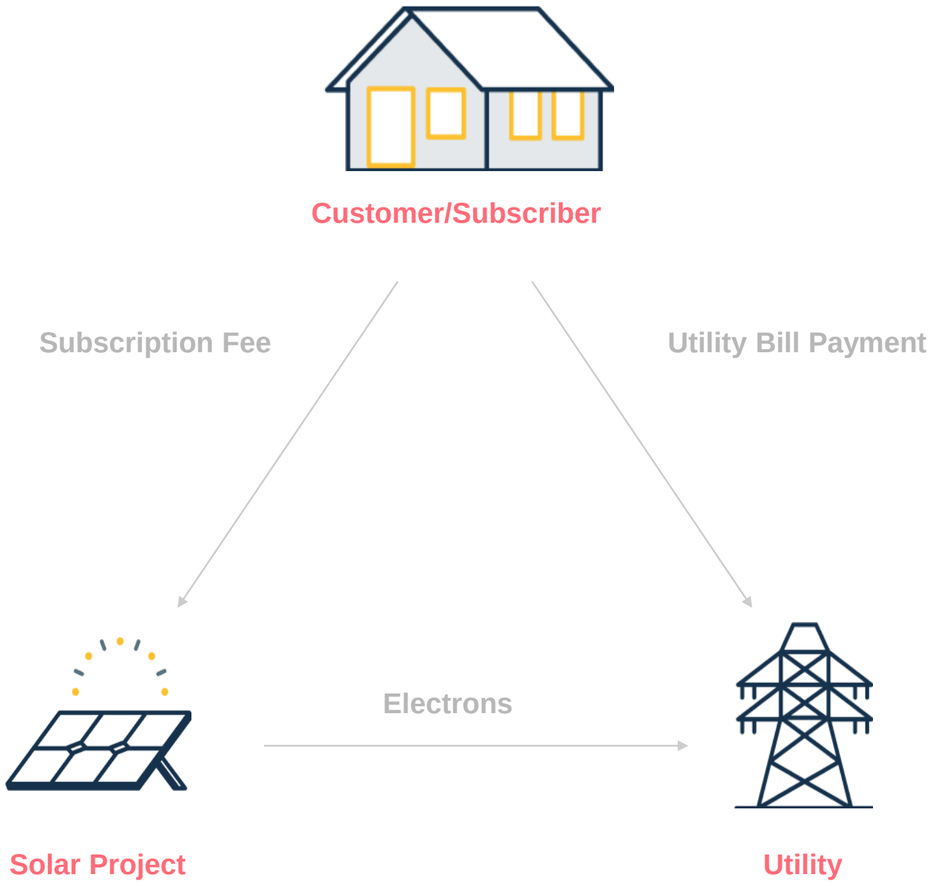
04

Low-to-Moderate Income (LMI) Programs

05

Establishing LMI Eligibility

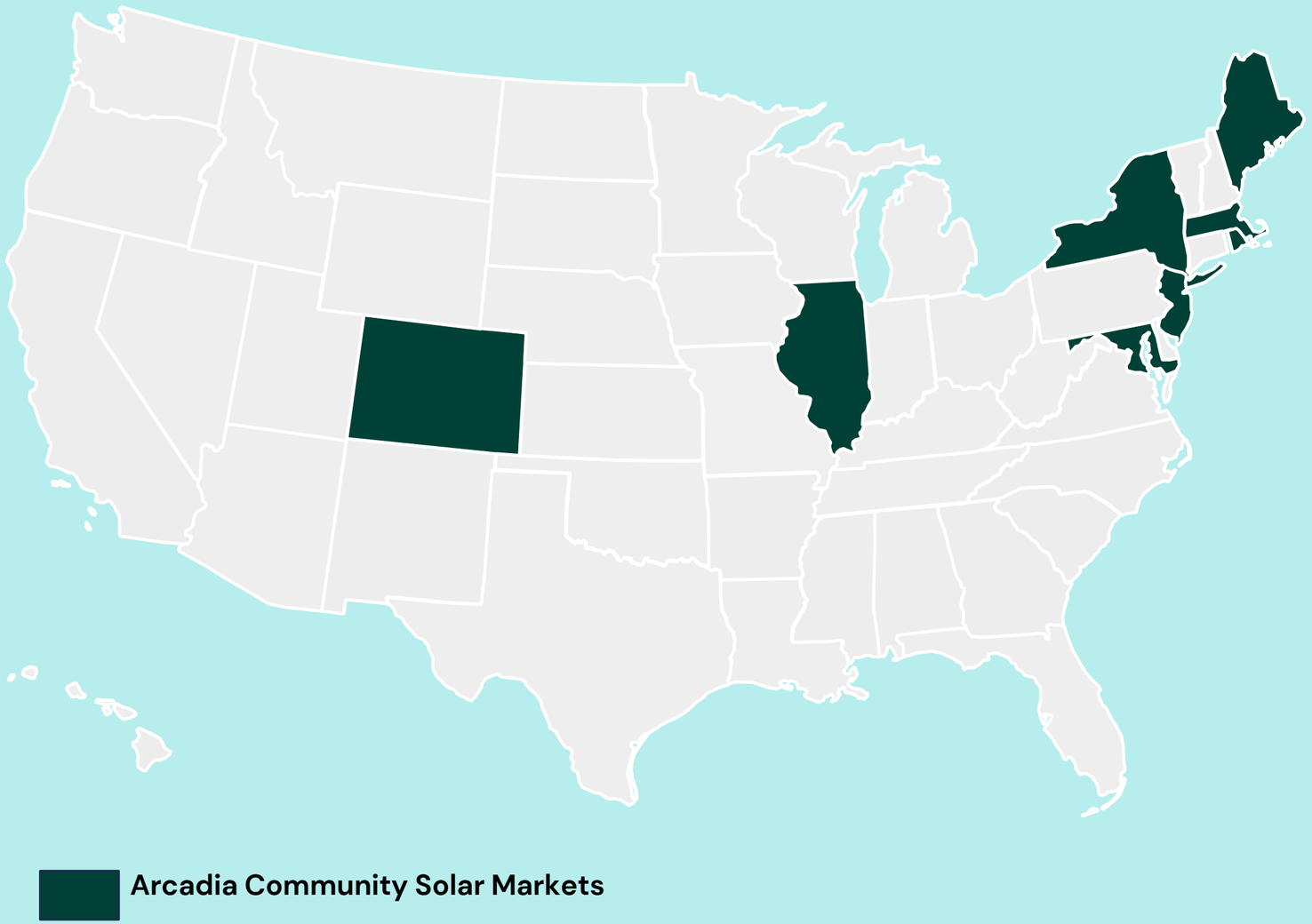
What do I mean when I say “Community Solar”?



Community solar is expanding

Arcadia manages more than 500 MW across 9 markets today.

New markets are coming online quickly, and Arcadia is expanding into other states with active markets.



Arcadia Community Solar Markets

Third-party community solar is customer-friendly

Risk has been transferred from the customer to the developer over the last ten years

PERFORMANCE RISK

The old days: Large upfront investment for entire cost of allocation	**Transition:** Fixed monthly payments (like a lease)	**Today:** Guaranteed savings; subscription fees are a portion of credits

CREDIT RISK

The old days: Credit checks and long-term contracts	**Transition:** No credit checks, but exit fees still exist	**Today:** Zero risk and universal availability; no credit checks or exit fees

Different models exist to encourage LMI participation

Community Solar LMI Program Types	State Examples
Designated LMI Programs	• DC Solar for All • Maryland CSPP
LMI Carveout or Requirement	• Virginia Shared Solar • New Mexico CS
LMI Project Incentives	• New York CDG • New Jersey CSEP

Arcadia

LMI status verification should be customer-friendly

Best Practices:

- Residence in qualifying geographic/economic areas
- Participation in qualifying State & Federal assistance programs
- One-time qualification

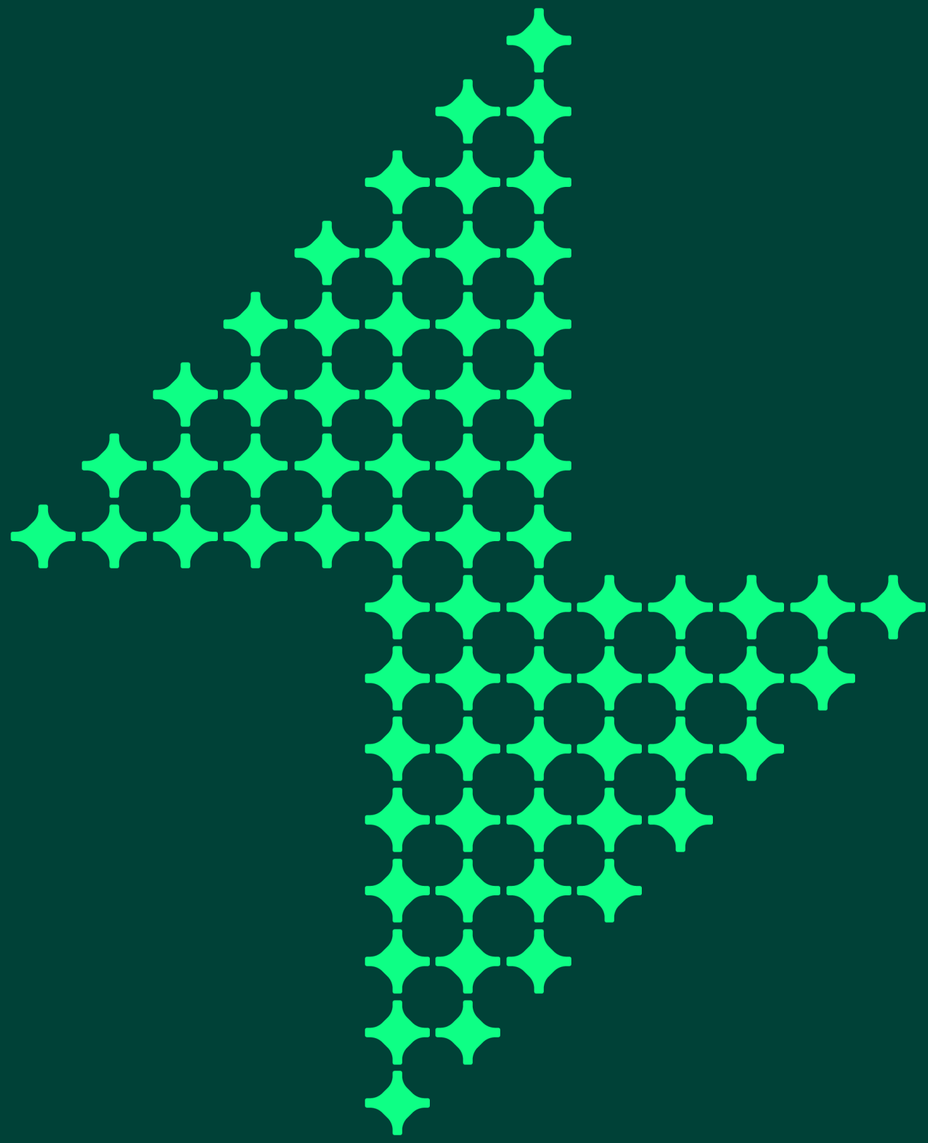
Practices to Avoid:

- Extensive + onerous documentation requirements & income verification
- Self-Attestation that duplicates other methods
- Recurring qualification requirements

Arcadia

Get in touch!

richard.caperton@arcadia.com



Arcadia

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What is Community Solar 1: Benefits for Low- and Moderate-Income Consumers

LIFT Solar

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Financial Innovation to Accelerate Solar Access

Groundswell

LIFT Research: Accelerating LMI Solar Access

Topline Results

- LMI community solar subscribers in areas with high REC values are more satisfied with their solar service.
- Solar projects that enjoy healthier Value Stacks correlate with higher savings and satisfaction

LMI Finance Trends:

- Difficult to finance smaller (<5MW) projects
- No standardization yet in solar financing models
- Without specific regulatory requirements, low-income community solar subscribers will not see reduced bills. Most community solar projects deliver minimal savings to subscribers ($5-$9/month).

Customer Experience and LMI Community Solar Programs

- Many programs do not ask their customers – ever – if they are satisfied
- Higher RECs and incentives lead to higher customer satisfaction.
- Higher bill credits led to greater satisfaction, although higher savings did not.
- No upfront costs and easy sign-up is more important for LMI than non-LMI

How to Increase LMI Solar Access?

Research Questions: **Customer Experience**

1. How does Customer Experience for LMI community solar subscribers correlate with financial performance/investment trends?
2. What are the key barriers for participating in community solar for LMI subscribers?
3. What are the trends (or anomalies) we see for customer experience of LMI subscribers?

Research Questions: **Financing LMI Community Solar**

1. How to standardize finance models
2. How to reduce risk premiums for loans to projects that include LMI residential customers. (E.g. Demonstrate the LMI customers are not at higher risk of default.)
3. Can financing for smaller community solar projects be offered that maintains financial returns and performance?

The poorest 20% of Americans pay the most for electricity - 10% or more of their total household income on average - and more than half the country can't access solar.

Regulatory Considerations

- Few community solar programs now offer significant bill reductions to low-income households. Avg savings: $5/month
- Common ‘solar carve outs’ specify 10% LMI subscribers, and/or at least 10% energy savings. [*but this is only applied to fuel charges*]
  - Regulatory mitigation may consider the entire consumer bill (electricity rate charges, fees, surcharges, taxes) and guarantee significant (50% or greater) total bill savings to income-qualified households.
- Many LMI consumers experience scams and price gouging. Trust is low. Remove requirements for long contracts, upfront deposits. Require dashboards and other subscription information portals.
- Eliminate humiliating requirements to prove income eligibility. Allow any of several assistance programs to qualify a household for community solar.

LIFT: Research & Innovation

A. Research Design & Challenges to Data Collection

- LIFT collected, then aggregated Finance and Customer Experience data sets from community solar projects that include at least 10% LMI subscribers.
- 1,640+ Community Solar projects now active in the US. ~200 include LMI subscribers.

N= 600 to N= 4,700 Customer Experience Respondents

Between 16 and 87 Projects / Models

Direct Driver Sampling Matrix		
RECs - None	RECs - Low	RECs - High
Subsidies - None	Subsidies - Low	Subsidies - High
Tax Treatment - Yes	Tax Treatment - No	
Net Metering- Retail/ VOS	Net Metering- Supply/Aoided	
Energy Rates - Low	Energy Rates - Mod	Energy Rates - High
Customer Savings - Low	Customer Savings - Mod	Customer Savings - High
Finance Models		
Categorized by Driver	Capital stacks still unique to project	
Pay As You Save®		
Indirect Driver Sampling Matrix		
Utilty Type - IOU	Utility Type - Muni	Utility Type - Co-op
Regulated	Deregulated	

B. Drivers Correlate to LMI Project Feasibility

Eight community solar program 'financial drivers' match finance analysis with customer experience outcomes

LIFT analysis seeks to Define how financial drivers impact financial performance of the project, thus affecting risk and sustainability and influencing LMI inclusion.

LIFT Research Sampling Design

LIFT Data Drivers with Sampling Considerations

Finance and Customer Experience data streams were analyzed separately

Drivers were used to correlate findings across regulatory environments and utility types.

Direct Drivers	
RECs	*None* *Low: <25% of installed cost* *High: 25% of installed cost*
Incentives / Subsidies	*None* *Low: <25% of installed cost* *High: 25% of installed cost*
Tax Treatment	*Yes* *No*
Net Metering	Low: Supply or Avoided Cost High: Retail or VOS
Energy Rates	Low: At or Below National Average High: Above National Average
Customer Savings	*Low: 0% to <25% of cost* *Mod: 25% to <50% of cost* *High: 50% or more of cost*

GEOGRAPHY	
Northeast	CT, DC, MA, MD, NY
Southeast	AR, GA, NC, SC, TN, VA
Midwest	IL
Northwest	CO
Suthwest	CA

UTILITY TYPES	
IOU	*Regulated* *Deregulated*
Muni	*Regulated* *Deregulated*
Co-op	*Regulated* *Deregulated*

INSTALLATION TYPE
Community Solar
Rooftop (or Behind-the-Meter)

LIFT Finance: ***Initial Observations***

What Works to Finance LMI Community Solar at 100% for income-qualified?

- A partnership with affordable housing authorities and facilities (both net metered and community solar approaches used to deliver solar savings), or
- State-wide programs requiring full LMI allocation in order to receive incentives (both community solar and residential rooftop approaches are used to deliver solar savings), or
- The project was entirely grant-funded with no return on investment required.

--> LMI participation rates on other projects ranged from 10% to 60%

Ability to Scale:

- Project finance approaches may scale within a market or within markets where the economic incentives are similar or more favorable.
- A large amount of federal loan financing is available, particularly through the Rural Utilities Service agency at USDA, to utilities serving rural populations throughout the US.
- Programs bringing solar into the fuel mix can scale by using the same project finance approach; this also may lower the cost to participate as the average price per kWh typically decreases.

Barriers to LMI Community Solar project financing:

- **Developers** identified "**risk mitigation**" and "**time needed to structure and execute the deal**" as the top two barriers impacting the financing of community solar projects that serve low-income households.
- **Financiers** identified "**project/portfolio size (too small)**" as the greatest barrier impacting the financing of community solar projects that serve low-income households, followed by "**risk mitigation**."

LIFT Finance: ***Insights Survey*** results

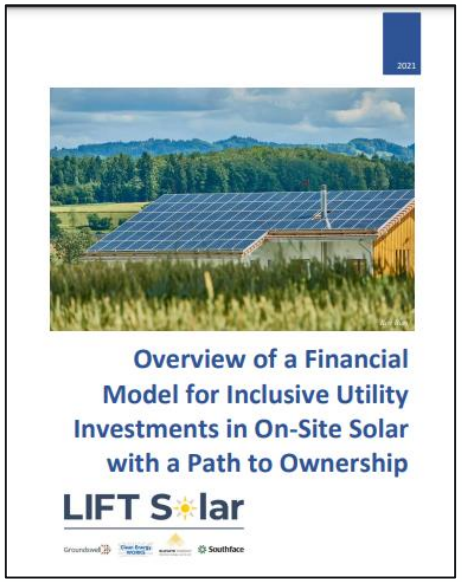
In addition to Finance data surveys and interviews with community solar project administrators, LIFT conducted an open "Insights" survey through the National Community Solar Partnership (DOE).

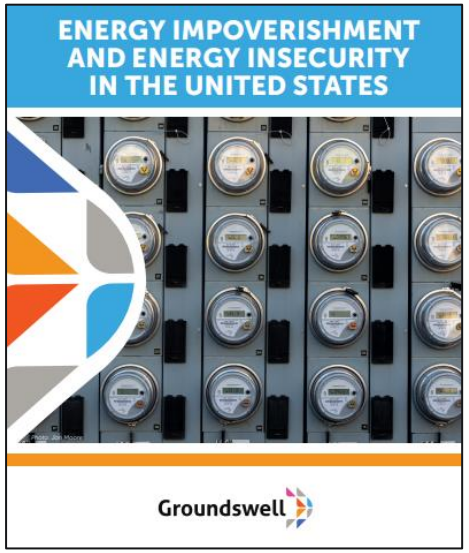
- Respondents ranked 11 common LMI community solar barriers
- Results not sorted by respondent role or type

Most Important Barriers	Moderately Important Barriers	Least Important Barriers
• Project/Portfolio Size • Risk Mitigation • Host Site negotiations including navigating affordable housing regulations • Time needed to structure and execute the deal	• Availability of tax equity • Interconnection costs • Transaction costs (legal, accounting • Other	• Lack of pre-existing relationships with capital sources • Property Taxes

- DOE's National Community Solar Partnership just announced the Credit Ready Solar Initiative to attempt to overcome some of the challenges facing small community solar developers.

LIFT Future Plans: Discoveries, Changes





- **LIFT Ancillary research is triggering systemic change:**
  - LIFT published analyses increase attention to systemic causes of high energy burden and poverty: equity gaps, rural policies
  - BBB Federal legislation includes ITC revisions driven by ***Solar with PAYS®*** analysis
- **Utilities contacted for LIFT research are initiating customer service engagement and program evaluation** *(even if they don't share data*)
- **Toolkit (*financing and program designs for accelerated LMI access*) readying for release, Fall 2022**
  - Provides exhaustive resources on community solar design and financing
  - "Project Builder" feature allows users to design community solar programs specific to their utility model and regulatory environment. Provides financing and program recommendations.
  - Community Solar map will show 200+ projects that serve LMI households
  - 30-40 projects now being developed as detailed Case Studies to increase replication
  - Toolkit to include process for users to add new data (matched to drivers) in 2023 and beyond

LIFT Customer Experience: Early Observations

a. **Customer Satisfaction**
    i. **Value of bill credit impacts satisfaction**
    ii. Paying a premium more likely to be dissatisfied. But level of savings does not affect satisfaction
    iii. **Healthier Value Stack correlates with higher savings and satisfaction**
b. **Customer Motivation**
    i. Helping the environment was more important than saving money
    ii. Saving money was more important for LMI than non-LMI
    iii. **No upfront costs and easy sign-up is more important for LMI than non-LMI**
c. **Value and Savings**
    i. Higher bill credits led to greater satisfaction, although higher savings did not. This correlates with findings in the LIFT Finance Research Report that shows the value of bill credits drives savings levels and project financial performance.
    ii. Savings were more unclear than any other program factor (program did not calculate; customers didn't know)
d. **Savings and project financial performance**
    i. **Higher RECs and incentives lead to higher customer satisfaction.** This correlates with findings in the LIFT Finance Research Report that shows the value of RECs drives savings levels and project financial performance.
    ii. 2 out of 3 subscribers who pay a premium are not satisfied
    iii. Higher bill credits led to greater satisfaction. But higher savings did not.
e. **Communication**
    i. LMI were more likely to hear about the program from a community organization. Non-LMI were more likely to hear about the program through their utility
    ii. All subscribers were *least* likely to hear about the program by word of mouth or referrals
f. **Demographics**
    i. All subscribers are more likely to be homeowners than renters
    ii. Non-LMI are 9 times more likely to be homeowners than renters

Further Analysis

Financing:

- Investigations into current commonly practiced community solar policies and whether they have achieved the desired outcomes for LMI households (for example, looking at Minnesota, Connecticut, and DC markets; and at Opportunity Zones).
- Implications of *storage trends in community solar financing.*
- A comparison between rural and urban trends in financing solar and community solar projects
- Evaluation of what drives developers and financiers to pursue LMI-inclusive solar and what enables them to overcome the first financial hurdle
- Analysis of REC distribution and ownership in the programs
- Analysis of loan risk premiums

LMI Program Design:

- Specific channels that build trust LMI households
- Low-cost partnering for greater delivery with lower customer acquisition costs for developers

Groundswell

Thank you!

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LIFT Solar

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What is Community Solar 1: Benefits for Low- and Moderate-Income Consumers

The Benefits of Solar for All Community Solar in the District of Columbia

DC SUSTAINABLE ENERGY UTILITY

Ted Trabue, Managing Director

SOLAR FOR ALL
A PROGRAM OF DC'S DEPARTMENT OF ENERGY AND ENVIRONMENT

Solar for All is Mayor Muriel Bowser's initiative to bring the benefits of solar energy to 100,000 income-qualified DC residents by 2032. The DC Sustainable Energy Utility (DCSEU) and the Department of Energy & Environment (DOEE) are working with local solar developers contractors to design and install solar photovoltaic (PV) systems **to provide income-qualified District homeowners with solar energy savings**. These systems have the potential to offset electricity costs by as much as $500 each year, saving DC families money for fifteen years.

DC SUSTAINABLE ENERGY UTILITY

DEPARTMENT OF ENERGY & ENVIRONMENT

GOVERNMENT OF THE DISTRICT OF COLUMBIA
MURIEL BOWSER, MAYOR

Solar for All History

2012-2016 DCSEU Affordable Solar Program

- Fewer than 20 PV systems in Wards 5, 7, and 8
- 500+ single-family systems installed

Year 1 Solar for All (2019)

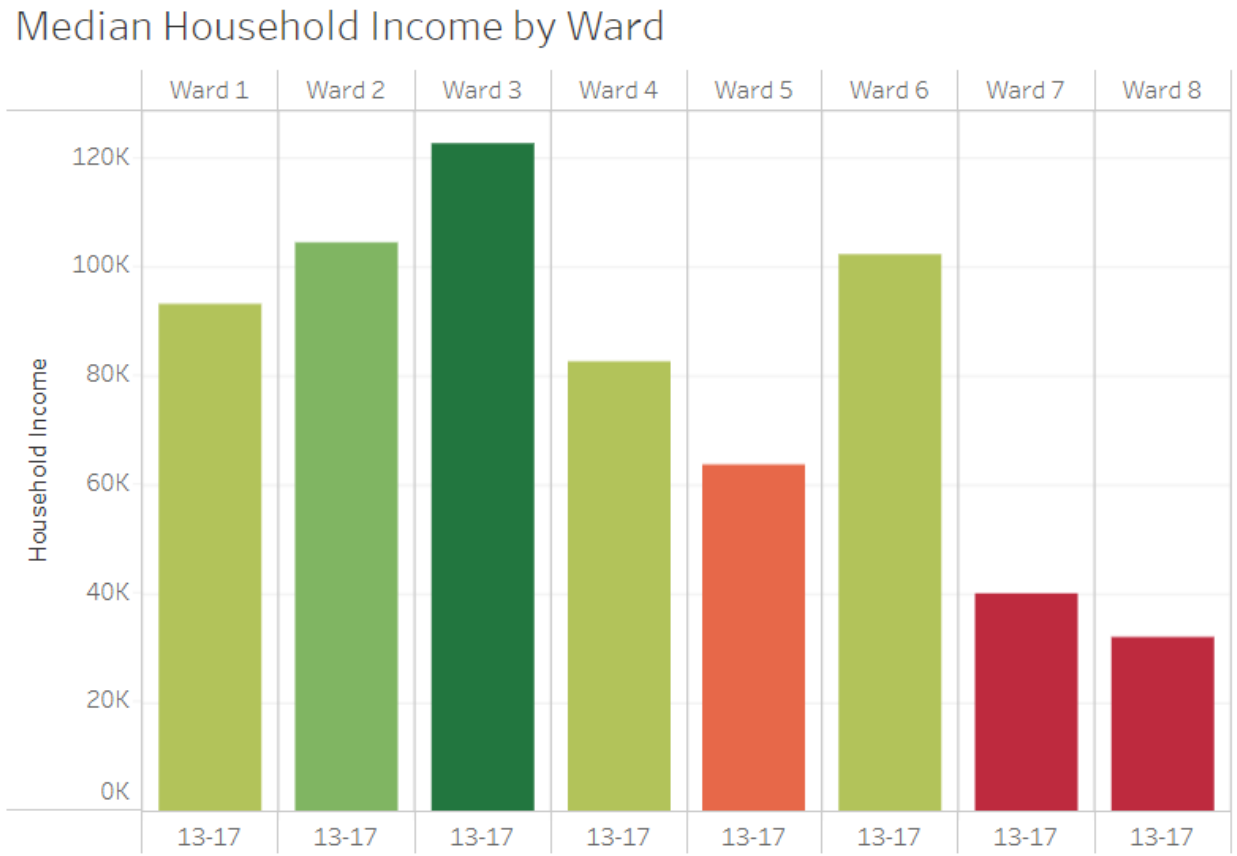
- 86 single-family homes
- 84 community solar projects

Year 2 Solar for All (2020)

- 120 single family homes
- 50 community solar projects

Year 3 Solar for All (2021)

- 122 homes
- 32 community solar projects



Source: https://dceconomicstrategy.com/household-income/

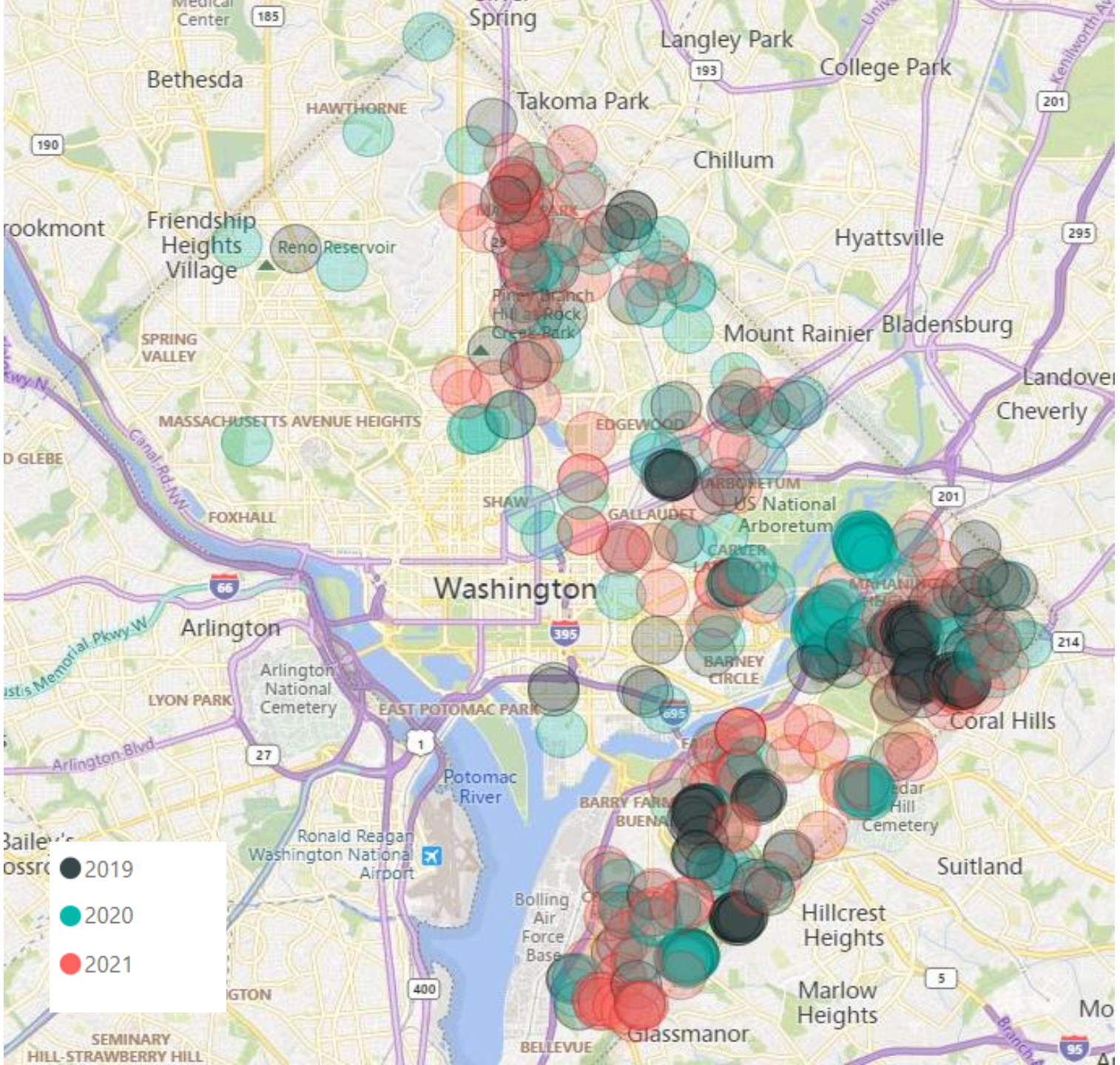
Solar for All Projects 2019-2021

166 CREF facilities
331 Single-Family

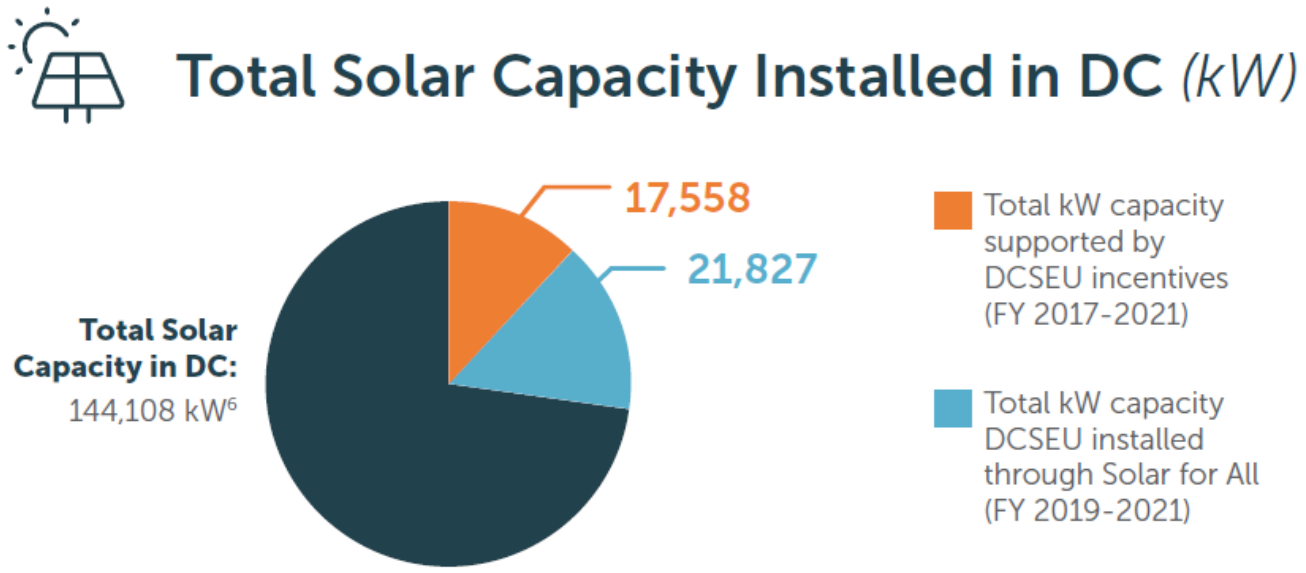
-6,100 families served

-$40+ million lifetime energy cost savings

-233,000 Metric Tons CO_2e lifetime emissions prevented



DCSEU Renewable Energy Impact



The DCSEU has been involved in 27% of ALL solar PV developed in DC to date over the past 5 years.

Impact on the Economy & Jobs

Incentives Spent with Local Contractors

- $25 million in incentives working with 8-10 local developers and contractors, especially CBEs

Jobs Created for DC residents

- Developers and contractors hiring local residents to complete the work
- ~127 FTE green jobs created

Workforce Development & Training for DC Residents

- Developers and contractors participating in the DCSEU Workforce Development program

DC SUSTAINABLE ENERGY UTILITY

Thank You

DEPARTMENT OF ENERGY & ENVIRONMENT

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GOVERNMENT OF THE DISTRICT OF COLUMBIA
MURIEL BOWSER, MAYOR

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This session has ended.
The next session begins at 11:15 a.m. ET