LOCAL SOLAR PROCUREMENT

Key Considerations

Presenters: Michele Boyd, Mark Gaiser, Mady Tyson and Ali Rotatori,

Tools In The Solar Toolbox:

MULTIPLE TOOLS EXIST THAT LOCAL GOVERNMENTS, TRIBES, AND INSTITUTIONS CAN USE TO HELP RESIDENTS ATTAIN SOLAR

AGGREGATION & MARKETING	• Aggregation and marketing campaigns can help residents procure cost effective rooftop solar
SOLAR AS A PROPERTY INVESTMENT	• Tying solar investment to the property, not the owner, re-frames solar as a mortgageable property upgrade
FINANCIAL ASSURANCES	• Programs that improve applicant credit-worthiness can help residents participate in local solar projects
COMMUNITY SOLAR	• Community solar can help residents own or directly support local solar projects even if they don't have a suitable roof

Local Solar Policies and Programs

- New Mexico Context
  - Credit Enhancement
  - PACE
  - Solarize
  - Community Solar

Solar in New Mexico – Mark Gaiser

Policies and Programs

- New Mexico Context
  - Credit Enhancement
  - PACE
  - Solarize
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Credit Enhancement:

LOCAL GOVERNMENTS, TRIBES, AND INSTIUTIONS CAN HELP ENABLE SOLAR ACCESS FOR POPULATIONS WITH LOW CREDIT

Tools that offer lenders protection against losses if a borrower defaults or does not pay on time

Stand alone program or part of a more comprehensive "Green Bank"

State, Locally, or Utility Administered

City Role	*Identify Program Administrator* • Identify most relevant government department; or, • Partner with a third-party entity	*Secure Program Funding* • Administer funds directly (public benefit funds, bonds, appropriations, etc.); or, • Utilize private lenders (local banks, economic development programs, etc.)
Benefits	• **Enable residents with low credit scores** to participate in solar programs (e.g. Community solar, Solarize, PACE) • Can be tied with existing efficiency or LMI financing programs • Improve attractiveness of overall solar market (market signal) • Can be financially sustainable (dependent on implementation terms).	

Credit Enhancement

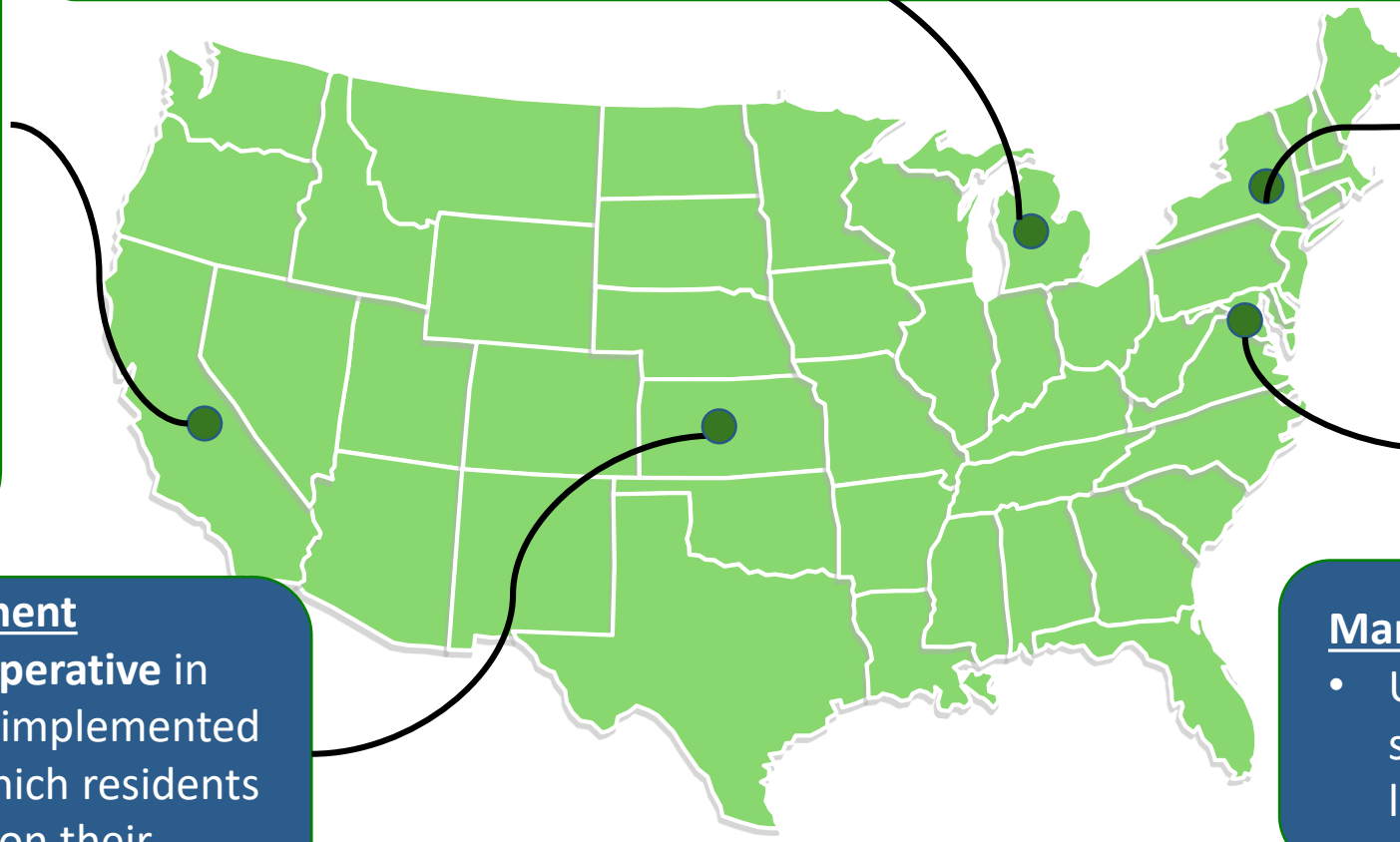
MANY OPTIONS EXIST FOR PROGRAM DESIGN AND IMPLEMENTATION

Debt Service Relief Fund (DSRF)

- Pool of funds designed to cover a lender when a borrower is delinquent on payments
- When payments are made, funds are returned to debt service fund.

Gap Financing

Michigan's Economic Development Corporation provides "gap financing" to help potential participants that have a lender interested in their project, but do not have adequate credit or collateral



Loan loss reserve (LLRs)

- Pools of funds that lenders can tap to recover some portion of losses in the event of a default

On-bill Repayment

- **Roanoke Electric Cooperative** in Kentucky and Kansas implemented the PAYS model, in which residents pay a voluntary tariff on their utility bill for energy upgrades

Maryland Climate Action Fund

- Underwriting community solar projects benefiting low-income residents

Steps for creating credit enhancement program

1

Identify program administrator (Months 1-3)

- Legislative mandates can proscribe a program administrator, or it can be locally organized
- State, local, utility, 3rd party

2

Identify program funding source (Months 2-6)

- Establish a governing board for decision making
- Identify program capitalization funding source (Private, public or public/private partnership funds

3

Set objectives and select project (Months 3-7)

- Identify qualifying project criteria
- Identify how will the project achieve long-term sustainability

4

Hire key staff (Months 5-9)

- Executive director, administrators, and other key staff hires will be needed to implement the program

5

Conduct outreach and enrollment (Months 8-16)

- Develop an online portal, distribute print and electronic materials, and engage local media
- Host general and technical workshops for key stakeholders

Local Solar Policies and Programs

- New Mexico Context
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Property Assessed Clean Energy (PACE) Financing

NEW MEXICO HAS PASSED STATE LEGISLATION TO ENABLE C-PACE FINANCING

City Role

Enable PACE Financing Locally

- Amend an existing local improvement district authority (which normally finances public goods such as sewer upgrades) to allow C-PACE financing

Fund Upfront Costs

- Fund up-front costs of PACE projects either directly or (more commonly) serve as an intermediary for private investors

Benefits

- **Relieves up-front cost** barriers with no money down financing
- Allows customers to **deduct property loan interest** from federal taxable income
- Enables **financing over a longer term** to enable more economically viable projects
- Allows home-owners to **transfer payment obligations** to new owners if they sell the property

Property Assessed Clean Energy (PACE) Financing

36 STATES HAVE ENABLED PACE RESULTING IN VARYING STATE- AND CITY-RUN MODELS

Colorado (2016)
- Statewide model
- Commercial

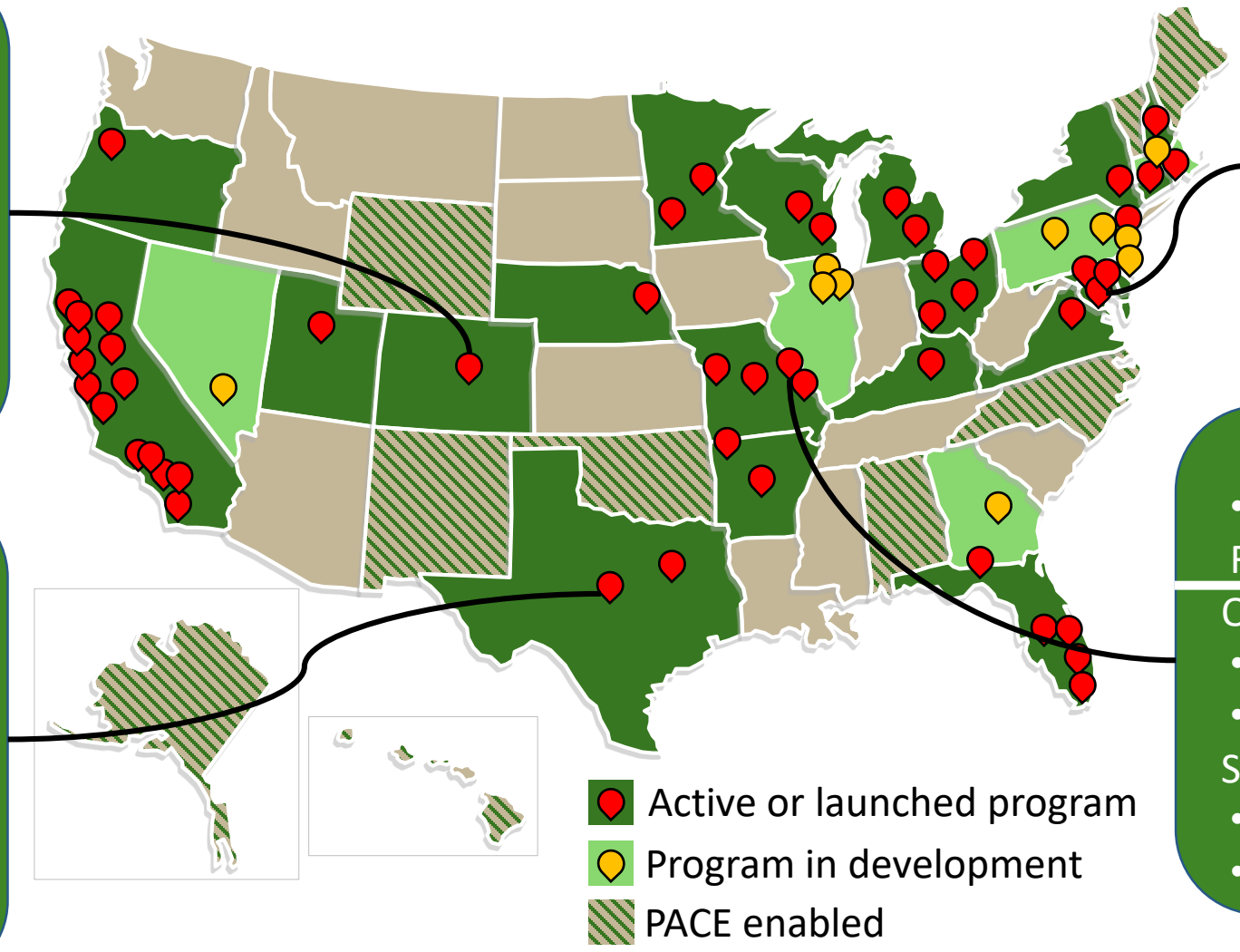
Overall
- 35 projects
- Financing $33M
- Creating 664 jobs

Solar PV
- 6 projects for 660 kW

Texas (2013)
- Statewide model
- Commercial

Overall
- 10 projects
- Financing $32M
- Creating 302 jobs

Solar PV
- 2 projects for 246 kW



DC (2015)
- City run model
- Commercial

Overall
- 26 projects
- Financing $38M

Solar PV
- 9 projects for 1.2 MW

St Louis (2013)
- City run model

Residential	Commercial
Overall • 139 projects • $2M	Overall • 11 projects • $26.5M
Solar PV • 13 projects • 81 kW	Solar PV • 3 projects • 139 kW

Source: PACENation (accessed March 2019)

Property Assessed Clean Energy (PACE) Financing

LESSONS LEARNED AND KEY TAKEAWAYS

Consider an Open Market for Capital Providers	• Advances diversity in projects (small to large scale) and setting (urban and rural) • Improves the market and lender terms/conditions through competition • Enables local banks to be active lenders and PACE advocates
Set Clear Objectives	• Align on energy and/or equity objectives early to drive programmatic structure • Prioritize filling the market gap and owner/developer needs • Develop inclusive project criteria
Continuously Improve the Program	• Create ability to update policy and guidelines to reflect best practices • Track impact metrics to determine if objectives are achieved • Frequently engage stakeholders to gather feedback and reach new markets

Property Assessed Clean Energy (PACE) Financing

IMPLEMENTING PACE TYPICALLY FOLLOWS A SIMILAR PROCESS

1

Work with *state* legislature to adopt C-PACE enabling legislation (6-12 months)

- Depending on current legislation, either create a special assessment district, an amendment to statute, or bypass special district process and pass ordinance. This authorization must happen before local legislation.

2

Pass *local* legislation to authorize C-PACE and its program structure (6-12 months)

- Pass a resolution to opt into existing statewide program or pass local law to set up a locally run program.
- Define program administrator (government or third party).

3

Develop C-PACE program organizational and logistical structure (6-12 months)

- Determine the entity serving as the program sponsor / administrator (local government/tribe or third party).
- Develop project capitalization, specify qualification guidelines, and specify funding sources.

4

Launch program and conduct outreach (3-6 months)

- Set specific capital and energy reduction goals.
- Conduct outreach to stakeholders and market the program.

Source: LBNL's Lessons in Commercial PACE Leadership, 2018

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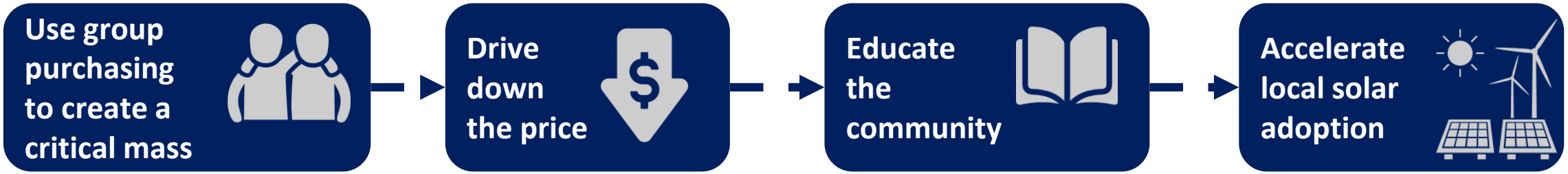
Solarize Campaigns

THE ROLE OF THE CITY OR TRIBE AND POTENTIAL BENEFITS



City Role	*Lead Project Organizer* • Lead effort by coordinating outreach, RFP process, and overall project management	OR	*Secondary Support to Community Leadership* • Provide secondary support to the lead community organization by assisting with outreach, education, or technical aspects
Benefits	*Increases Affordability and Jobs* • Reduces upfront solar costs typically by about 20% primarily due to marketing / acquisition cost savings • Increases local solar workforce development	AND	*Improves Implementation* • Educates residents and reduces the complexity of going solar • Motivates residents to act in a limited timeframe • Streamlines implementation process

Source: Yale Center for Business and the Environment's Solarize Your Community, 2017.

Solarize Campaigns

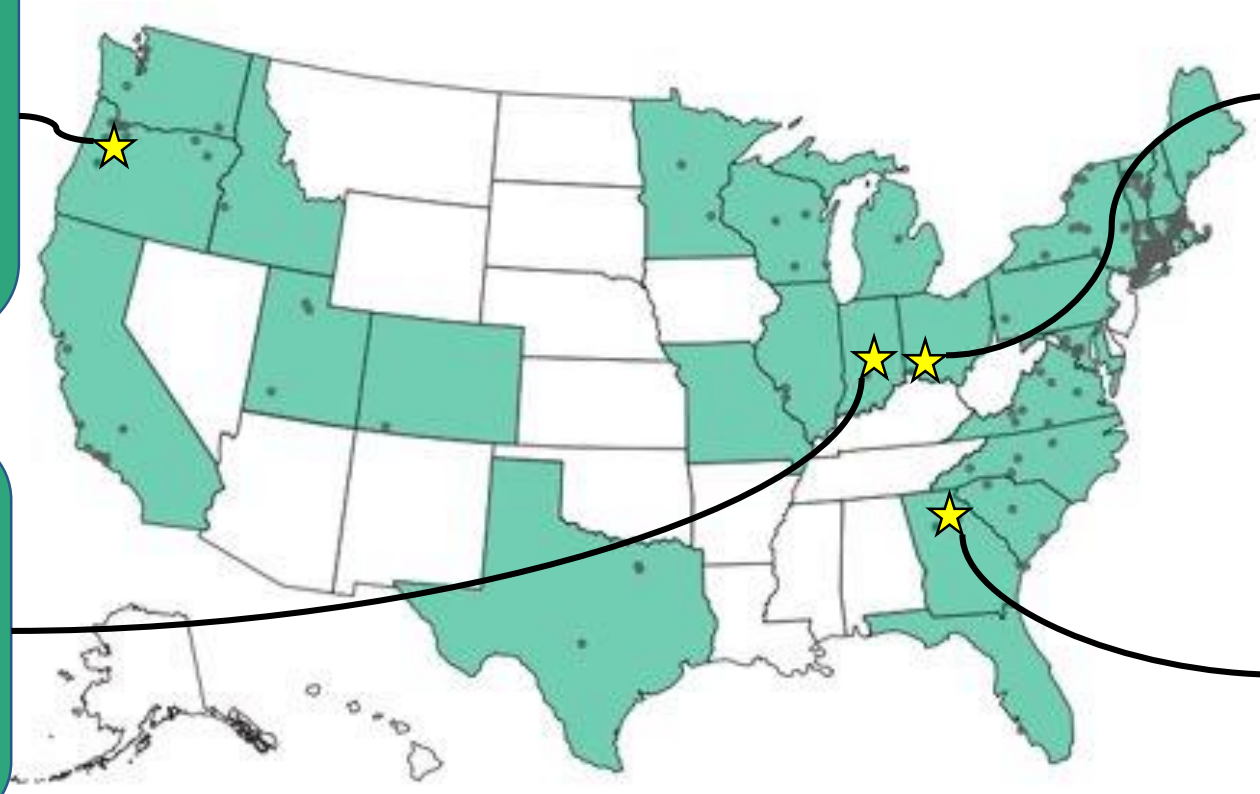
SOME CITIES HAVE DOUBLED CITY-WIDE RESIDENTIAL SOLAR PV UTILIZING SOLARIZE CAMPAIGNS

Portland, OR ('09-'11) [1]

- 6 campaigns → 1.7 MW across 560 homes
- 50 permanent on-site solar jobs created
- Reduced costs by ~20%

Bloomington, IN ('17-'18)

- 4 campaigns → 1.2 MW across 184 homes
- > Doubled city-wide residential PV*



Cincinnati, OH ('15-'18)

- 4 campaigns → 868 kW across 137 homes
- Doubled city-wide residential PV*
- Reduced costs by ~15%

Atlanta, GA ('18)

- 1 campaign → 855 kW across 143 homes
- Doubled city-wide residential PV
- Saved ~$0.60/W

[1] NREL's The Solarize Guidebook, 2011.

Map: Yale Center for Business and the Environment's Solarize Your Community, 2017.

*includes only PUC registered PV systems so this may not incorporate all systems installed.

Solarize Campaigns

LESSONS LEARNED AND KEY TAKEAWAYS

Organization	• Set clear roles and responsibilities for the lead organizer and outreach coordinator • Create one steering committee to lead RFP decision and a separate one for outreach • Have city officials publicly advocate for the campaign to improve awareness
Logistics	• Motivate action through friendly competition, tiered pricing, and a shorter campaign • Consider a primary and secondary developer to guard against project overload • Install projects on a rolling basis to prevent deadline bottlenecks and to showcase projects
Outreach	• Advertise in monthly utility bills and newspaper articles to increase initial exposure • Use peer-to-peer workshop interaction and testimonials to increase final project closure • Tailor the marketing campaign messages to the community's priorities and needs

Sources: CESA's Planning and Implementing a Solarize Initiative, 2014 and NREL's The Solarize Guidebook, 2011.

Solarize Campaigns

IMPLEMENTING SOLARIZE CAMPAIGNS TYPICALLY FOLLOW A SIMILAR PROCESS

1

Set up the program (Months 1-3)

- Develop partnerships with community organizations and finalize program organization
- Identify project lead, community organizer, technical lead, and solar ambassadors

2

Run RFP process (Months 2-3)

- Create the RFP using available templates
- Establish a steering committee to develop RFP decision criteria based on community priorities

3

Conduct outreach and enrollment (Months 4-7)

- Develop an online portal, distribute print and electronic materials, and engage local media
- Host general and technical workshops

4

Complete site assessments and installations (Months 5-9)

- Invite contractor to assess sites and begin installations on a rolling enrollment basis
- Update online portal to display updated statistics

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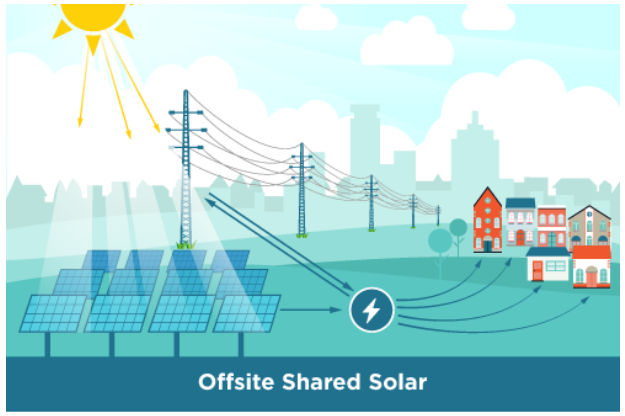
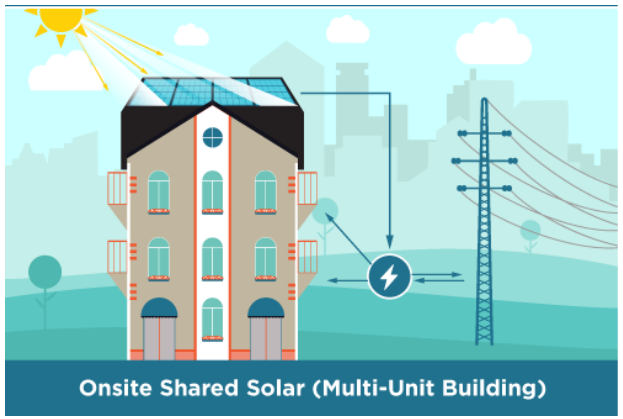
What is “community solar”?

Community solar comes in many shapes and sizes.

For the purposes of this presentation:

- Community solar is a solar installation where the financial benefits of a single PV array are distributed among an exclusive group of customers that have elected to subscribe to the program.
- Solar array can be onsite or offsite from the location of the subscribers.





Key Criteria

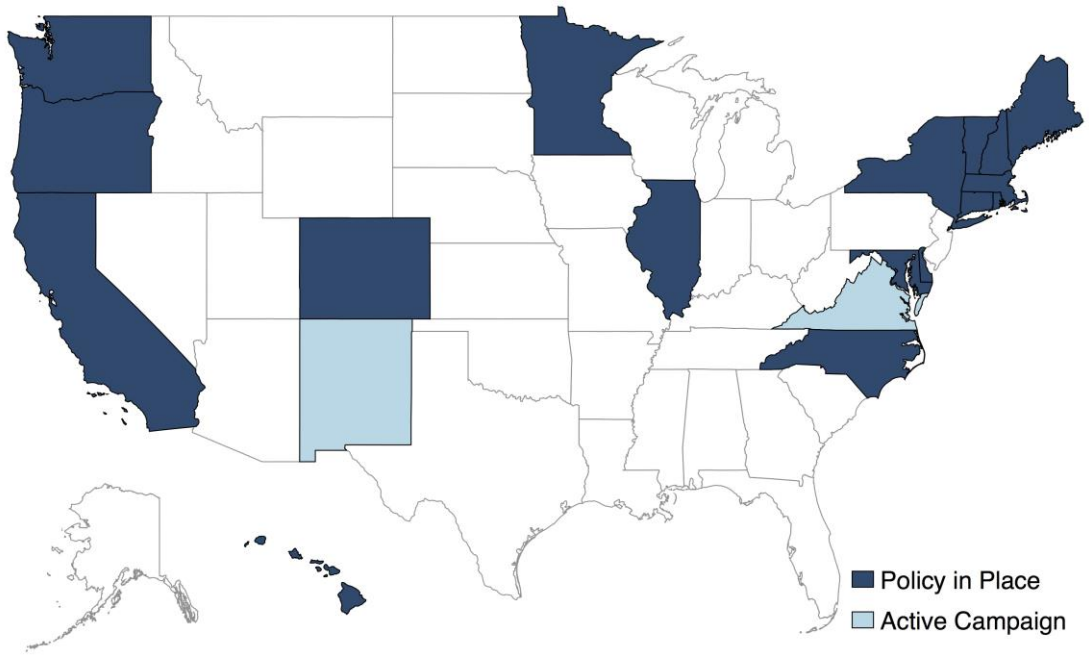
Financial benefits: Some part of the financial gains of the solar electricity generation go to subscribers.
Exclusive: Community solar program serves some set of customers within a utility or other type of load serving entity
Election: Subscribers opt into the program.

Why “community solar”?

- Nearly half of all rooftops (49% of residential and 48% of businesses) cannot host solar due to
  - insufficient roof space,
  - lack of control over roof (renters, condos),
  - poor roof orientation or shading concerns
- Low income populations face even greater challenges, often due to
  - poor roof condition,
  - inability to make long-term financial commitment on home,
  - lack of access to financing,
  - lower than average credit scores
- Investment Tax Credit (ITC) excludes individuals and organizations with no federal tax liability, including non-profit and governmental organizations, low-income individuals, and retirees.

Community Solar Market

- Community solar projects represent about 1.340 GW of total installed capacity across 834 projects
- Community solar projects are located in 39 states, plus Washington, D.C.
  - 17 states, plus Washington, D.C., have some form of legislation enabling community solar.
  - Generally, all allow for some form of virtual net meeting.
- More than half of the total market is concentrated in:
  - Minnesota (> 500 MW installed)
  - Massachusetts (> 250 MW installed)
- ***Enabling legislation is not a prerequisite for a community solar market:***
  - 25% of the community solar capacity (334 MW) and 19% of projects (159) are located in 26 states without enabling legislation



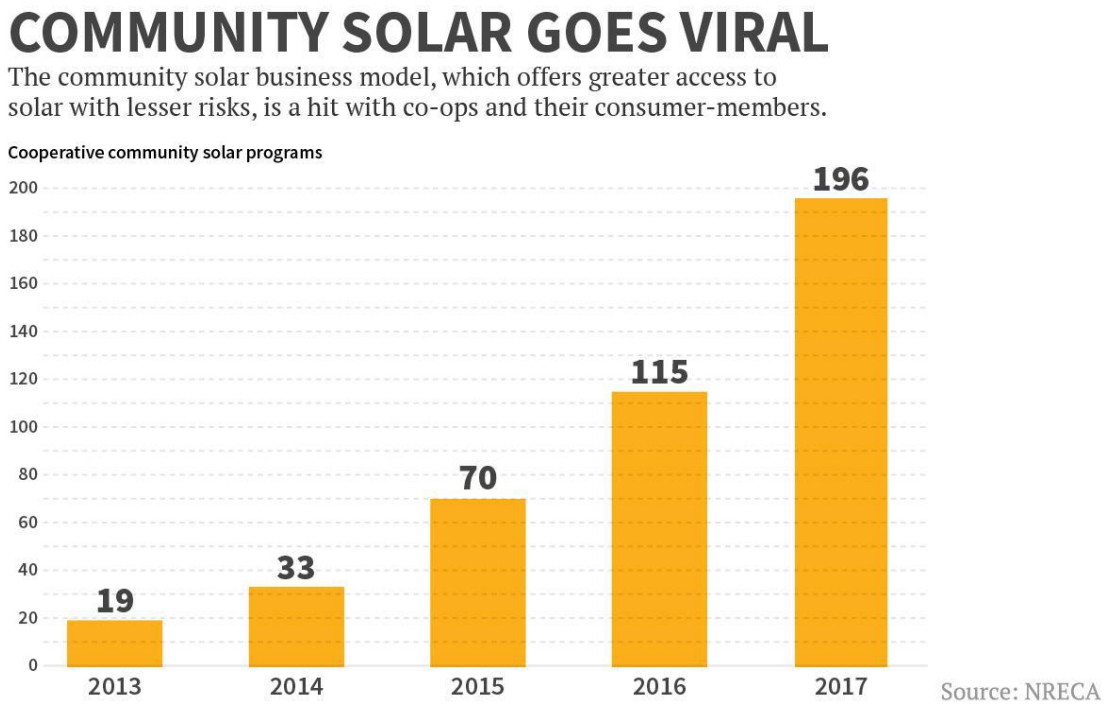
- In states without enabling legislation, community solar can include:
  - Utility-led projects (e.g., Kit Carson Electric Coop)
  - Affordable housing buildings*
  - Municipal buildings*

*Not included in NREL data on this slide

DRAFT Data from NREL

Solar Utility Network Deployment Acceleration (SUNDA)

- SUNDA was led by the National Rural Electric Cooperative Association from 2013 to 2018
- Focused on reducing costs and identifying and addressing barriers to PV deployment at cooperative utilities
- In 2013, <1% of co-ops had deployed PV systems at 250 kW or larger, and only 3% expressed interest
- At the end of 2017, co-ops collectively owned or purchased **more than 860 MW of solar PV**—up from 94 MW in 2013
- 196 co-ops – nearly a quarter of NRECA's membership – offer community solar to their members.



Community Solar Playbook, a detailed guide for cooperatives on developing a community solar program

National Rural Electric Cooperative Association
A Touchstone Energy® Cooperative

SUNDA Materials

Tools and resources to help cooperatives get up-to-speed on all types of solar, organized by the phase of the project:

1. Just Beginning
   - Solar PV Getting Started Brochure
2. Project Scoping
   - Solar Decision Guide
   - Cost & Finance Screening Tool
   - Template PV System Designs
3. Learning More
   - PV Manuals
   - Online Learning
4. Detailed Planning
   - Project Manager's Quick Start Guide
   - Community Solar Playbook
   - System Impact Guide
5. Building Consensus
   - Communications Toolkit

https://www.cooperative.com/programs-services/bts/sunda-solar/Pages/default.aspx

Solar In Your Community Challenge (2017-2018)

- **Goal:** Engage and support a wide variety of teams developing **innovative and scalable business and financial models** that can unlock the low- and moderate-income (LMI), nonprofit, and local government solar market
- **Contest:** Design and deploy scalable local solar projects or programs ranging between 25-5,000 kW in 18-months that serve a minimum 20% LMI or 60% non-profits and local governments
- **Participants:** 178 teams were selected from 40 states + DC, Guam and Puerto Rico

Solar in Your Community – Two Example Models

Solarize Philly (Philadelphia, PA)

- Led by the Philadelphia Energy Authority, the team modified the traditional solar group buy (solarize) model by adding a small program fee on participating customers.
- Fee used to guarantee payments to the solar developer who leases systems to LMI residents
  - As of July 2018, 232 solar contracts signed, which generated $200,000 for 45 LMI leases
- LMI customers will save ~20% on their electricity bills

Kerrville Area Solar Partners (Kerrville, TX)

- Kerrville's municipal utility leased land from local nonprofits to host community solar projects
  - 50% of the capacity of each project is reserved for the anchor nonprofit; remaining 50% is reserved for LMI residents that live within income-qualified housing.
- Reduces the utility's wholesale peak load, generating ~$143,000 in ERCOT transmission cost savings annually
- Residents receive ~14% electric bill savings each month (one blended rate)

Solar in Your Community – Key Takeaways

- Develop a clear understanding of how federal, state, and local policy enable local solar projects.
- Build durable and long-term partnerships with community members and solar stakeholders.
- Develop a creative portfolio of financing solutions for small and medium sized solar projects.

NREL, *Up to the Challenge: Communities Deploy Solar in Underserved Markets,* May 2019
https://www.nrel.gov/docs/fy19osti/72575.pdf

- Details innovative models tested by the teams

Information about the Challenge teams final prize winners:
https://www.energy.gov/eere/solar/solar-your-community-challenge

National Community Solar Partnership

- 2016-2017: National conversation with federal agencies, solar companies, nonprofits, state and community leaders, academia, and financial institutions
  - Four working groups: finance and business models, community building, state best practices, and federal resources

New Programming Coming Soon

Additional Resources

Reports:

- NREL Website: https://www.nrel.gov/state-local-tribal/community-solar.html, including a list of community solar projects nationwide
- *Up to the Challenge: Communities Deploy Solar in Underserved Markets*, NREL (2019)
- *Design and Implementation of Community Solar Programs for Low- and Moderate-Income Customers*, NREL (2018)
- *Low-Income Community Solar: Utility Return Considerations for Electric Cooperatives*, NREL (2018)
- *Unlocking Solar for Low- and Moderate-Income Residents: A Matrix of Financing Options by Resident, Provider, and Housing Type*, NREL (2018)
- *Project Summary: Community Solar Stakeholder Impacts in Cook County, Illinois*, NREL (2017)

Tools and Models:

- Community Solar Business Case Tool - Flexible financial model that projects the costs and benefits to the system developer and subscriber of a single community solar project
- Low-income Energy Affordability Data (LEAD) Tool – Web application to help make data-driven decisions on energy goals and program planning by improving understanding of LMI household energy characteristics
- Tribal Energy Atlas – Provides solar and renewable energy resource data **on tribal land**. It includes other types of data such as energy infrastructure location, environmental attributes, and energy expenditures.
- System Advisor Model (SAM) – A performance and economic model designed to facilitate decision-making for people in the renewable energy industry, including government program designers

NREL Interconnection Resources

- *Review of Interconnection Practices and Costs in the Western States* https://www.nrel.gov/docs/fy18osti/71232.pdf
  - Report evaluates the nature of barriers to interconnecting distributed PV, assess costs of interconnection, and compare interconnection practices across various states, including New Mexico
- *New Approaches to Distributed PV Interconnection: Implementation Considerations for Addressing Emerging Issues* https://www.nrel.gov/docs/fy19osti/72038.pdf
  - Report examines new policies and practices for interconnecting residential and commercial PV systems that are being implemented by states and utilities nationally to address emerging challenges with the increased volume of interconnection requests.
- *An Overview of Distributed Energy Resource (DER) Interconnection: Current Practices and Emerging Solutions* https://www.nrel.gov/docs/fy19osti/72102.pdf
  - Report summarizes considerations, practices, and emerging solutions across a broad set of topics related to DER interconnection. Target audience is utilities.

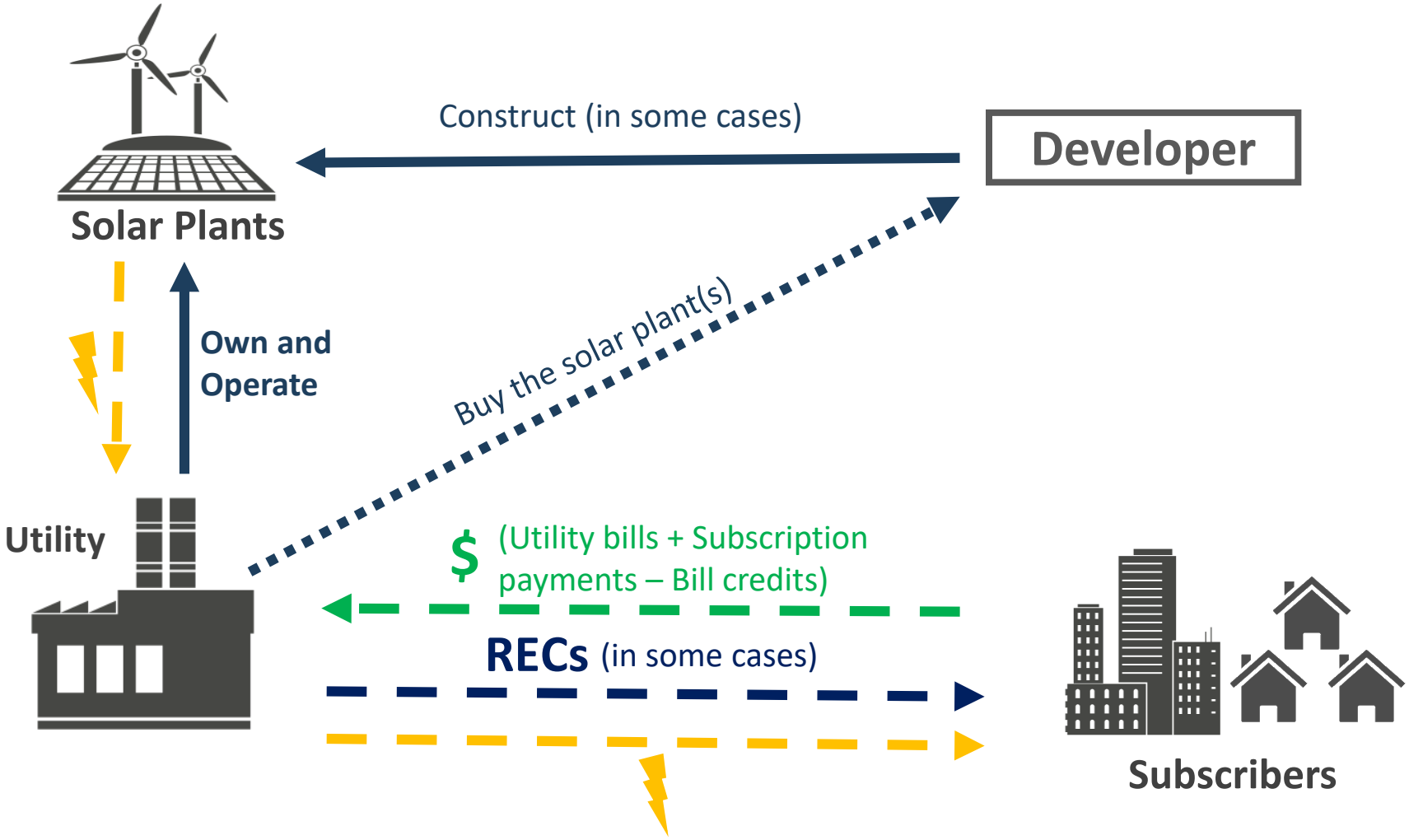
Community Solar Regulatory Types: Examples

Virtual Net Metering Mandate	• **Delaware Public Service Commission Order:** *Net-metering rules extended to require that IOUs compensate aggregated meters at net-metered rates*
	  • **Project Ownership:** Utility, 3rd party or subscriber
	  • **Program Specifics**: Subject to net-metering cap, credited in kWh at net metered rates, subscriber retains RECs

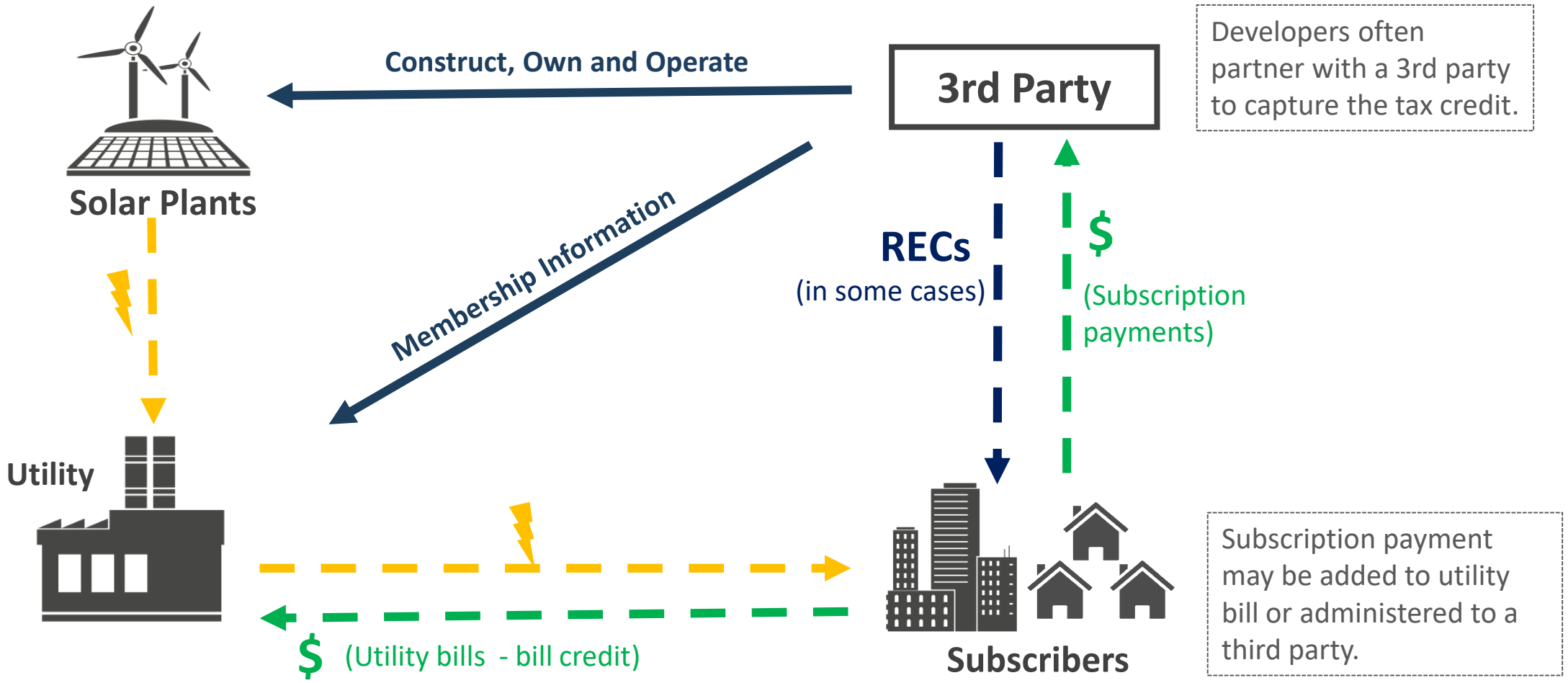
Legislative Mandate	• ***Colorado Community Solar Gardens Act***: *IOUs required to buy energy for CS capacity; primarily through a competitive RFP process*
	  • **Project Ownership:** 3rd party
	  • **Program Specifics**: 5% LMI allocation, customer billing at net-metered rate, utility retains RECs

Utility Initiated Program	• **Tucson Electric Power's TEP GoSolar Shares Program***: Utility-led project allows customers to purchase community solar shares*
	  • **Project Ownership:** Utility or 3rd party
	  • **Program specifics:** Purchased solar "bricks" add $3 to customer bill, but are exempted from future rate increases, utility retains RECs

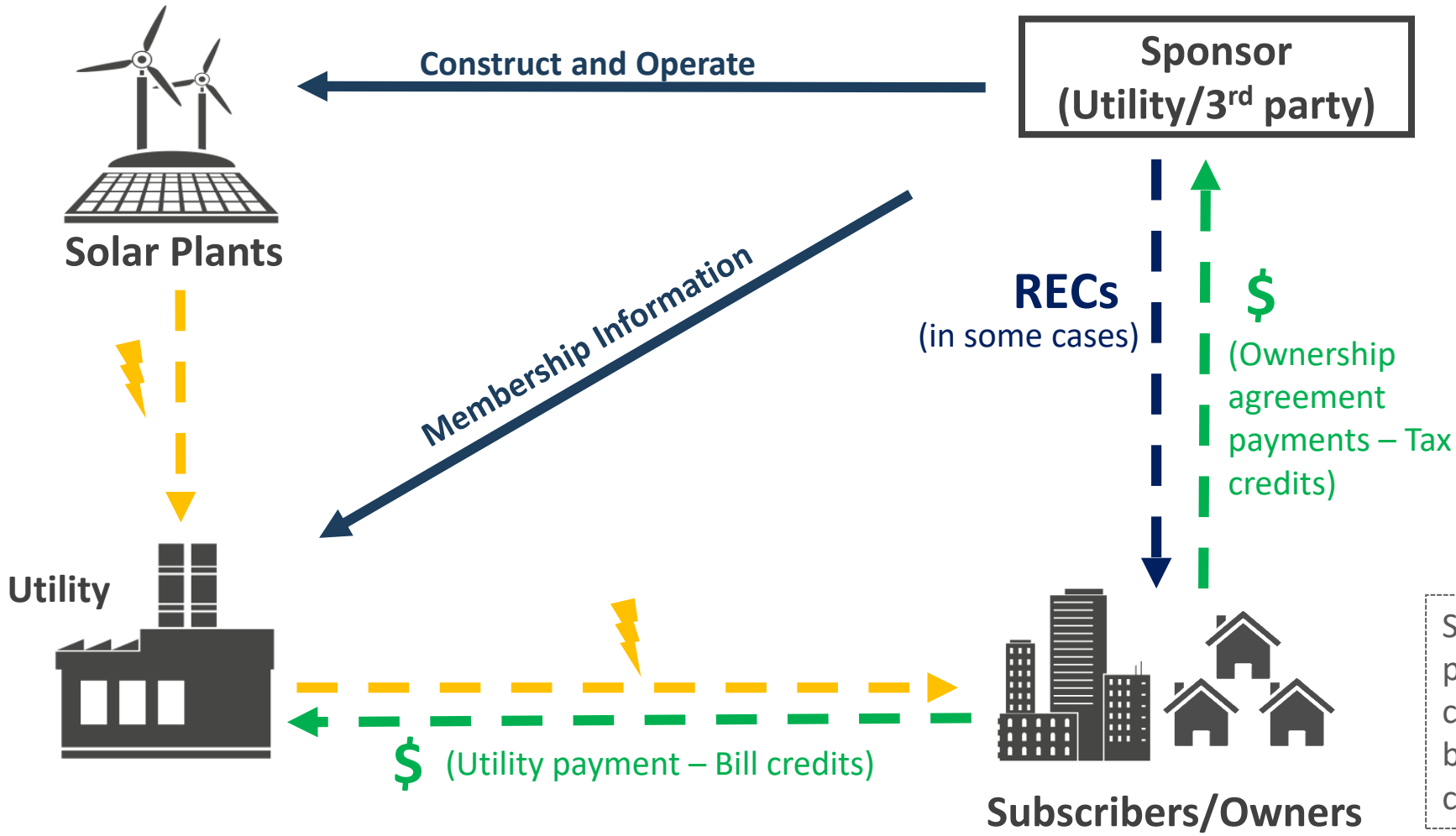
Ownership Model: Utility-owned



Ownership Model: 3rd Party



Ownership Model: Direct Ownership



Subscribers that own the panel may be able to capture the tax credits, but may require upfront capital or other financing.

Community Solar City Roles

- Overview
- City Roles
- Siting
- Cost Reduction Strategies & Enhancing LMI Access

Roles

YOU MAY PLAY ONE OR MORE OF THE FOLLOWING ROLES

Project Host

Lease local land or rooftops for a community solar project

Subscriber

Subscribe to a project as an anchor or a flexible off-taker

Facilitator

Build partnerships to help make CS projects more equitable and successful

Project manager

Spearhead the effort to move projects from ideation to development and subscription to administration

Role: Project Host

Definition: Lease local land or rooftops for a community solar project.

Pros	Cons
Can significantly decrease total system costs and, therefore, subscription rates	Requires the parties to manage any additional burdens (e.g. review, permitting, etc.) of using public land
Can reduce blight in local communities	Requires the city incur the costs of determining site suitability
Can give the city "a say" in how the project is developed	Does not ensure benefits flow to local community
Can provide revenue to the city	

A host can:

Identify potential sites for the developer(s)

Generate developer interest in identified land

Provide low-cost access to sites…

…via land leases or other arrangements

Help developer(s) navigate regulations

Smoothen and speed up the development process

Role: Subscriber (Flexible or Anchor Off-taker)

Definition: Subscribe to a project to protect against undersubscription *(Anchor off-taker)* or underpayment *(Flexible off-taker).*

Pros	Cons
Potential to negotiate lower prices and lower transaction costs, which can help increase subscriptions within target populations	Subject to developer timelines and interests
Enables greater participation for low-income residents by requiring developer(s) to target such communities	Future price risk if subscription rates are not competitive in the future
Can help low income customers with poor credit ratings subscribe by guaranteeing their portions in the case of a default (flexible off-taker)	Low income subscriber default risk (flexible off-taker)
Potentially low complexity	

A subscriber can:

Provide a memo of support

When: Early on in project development

Enter into a subscription contract

When: Once a project is approved

Role: Facilitator

Definition: Build partnerships to make the community solar project more equitable and successful.

Pros	Cons
Spurs broader community access and engagement	Requires dedicated staff time and resources
Inspires additional community solar projects through aggregation	Can require managing a complex web of stakeholders
Convening stakeholders can help create programs such as solar job trainings or a local green bank that support the solar ecosystem	Additional “PR” risk if facilitation enlarges scope of cities role in multiple projects

You may become a facilitator by:

Leveraging existing city programs	Coordinating project development and aggregation	Enabling low income subscription	Conducting education and outreach
e.g.: Affordable housing, Brownfield programs, Community development	e.g.: site owners, major off-takers, developers, project managers	e.g.: credit unions, local utility, neighborhood or community groups	e.g.: solar job training programs, community colleges, other cities

Role: Project Manager (Dependent on Local Legislation)

Definition: Spearhead the effort to move a project from ideation to development and subscription to administration. Could include a variety of roles, depending on the legislative context.

Pros	Cons
Control over a project can enhance ability to meet city goals	Requires high staff capacity and a larger budget, especially if the city will be managing subscribers
Few dependencies on others taking initiative	Special issues and nuances for government major off-taker/manager around taking tax credit
Running an aggregated RFP can help spur more project development to meet local goals	The city bears significant risk of undersubscription and cost escalation

You may become a project manager by:

Selecting the sites	Choosing the developer	Managing the project	Managing project subscriptions
Identify, evaluate, and select site(s)	Run an RFP or other selection process	Oversee project development	Marketing and outreach

Steps for developing a CS project

1

Understand your regulatory context and identify the role you will play (Months 1-3)

- Based on your goals, motivations and regulatory context you will want to identify what kind of role (facilitator, host, subscriber or project manager) you will play.

2

Understand the differences in ownership and subscription models (Months 2-4)

- An understanding of how the different ownership and subscription models can be implemented will help you to identify what kinds of models you would like to pursue and support.

3

Engage with core stakeholders (Months 3-5)

- Engaging with core stakeholders, especially the utility and any target organizations is crucial for project success

4

Create a plan of action relevant to the role you intend to play (Months 4-6)

- Each role will have a different set of activities that they should consider.

5

Implement your plan of action (Months 5-16)

- Project manager and facilitator roles will have a much longer and involved plans of action than a subscriber or a host