

Community Solar Program Design Models

2018

HISTORY

In 2015, SEPA developed the Community Solar Program Design Models report which provided an overview of the community solar market, findings from a survey of program administrators, and our initial program design decision tree. Now, in 2018, we have updated this report with new data on the community solar market, and lessons learned over the past two years.

“COMMUNITY SOLAR” DEFINITION

In this report, SEPA defines a community solar program, also known as shared solar, as a voluntary business model where multiple subscribers pay for a share of a specified offsite solar project and receive credit on their electricity bill for their portion of power produced.

“PROGRAM ADMINISTRATOR” DEFINITION

Many programs are developed by multiple organizations who share development responsibilities. For simplicity, SEPA defines the program administrator as the primary organization responsible for managing customer subscriptions. Some portions of this report split the community solar market into programs administered by the utility and those administered by third-party providers.

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SURVEY PARTNER

The Program Administrator Survey Findings section of the report was developed in collaboration with the Coalition for Community Solar Access (CCSA). CCSA is a national coalition of businesses and non-profits working to expand consumer choice and access to clean, local, affordable energy to all Americans through opening, protecting, and serving markets for community solar.



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<https://energy.gov/eere/solar/solar-energy-technologies-office>

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COMMUNITY SOLAR OVERVIEW

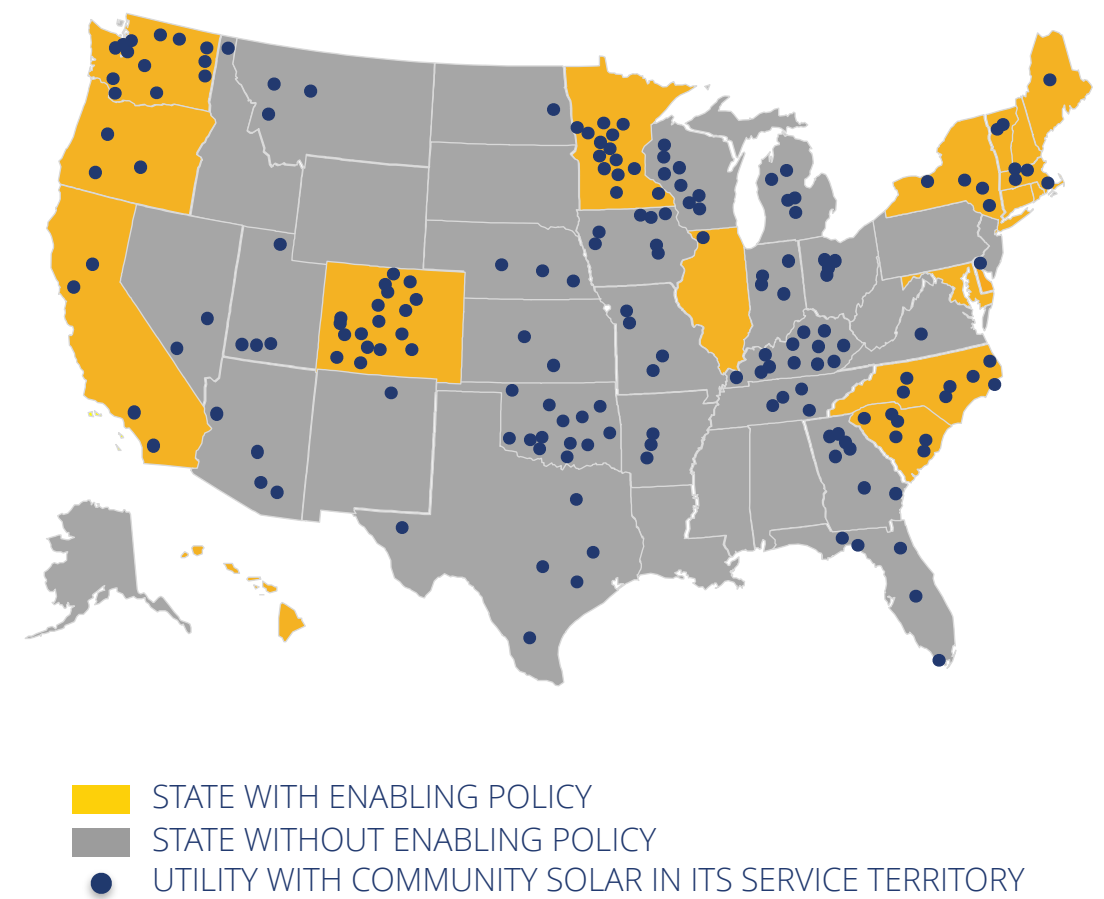
SEPA has researched and catalogued community solar programs since 2010. Over this period, we have collected an extensive database on every launched program and publicly announced program. The database includes information on each program's size, launch year, and customer value proposition, among other fields. This section provides an overview of the information collected in the database.

CULTIVATING NEW MARKETS

Community solar programs are proliferating across the entire U.S. In our 2015 report, SEPA announced there were 68 utilities in 23 states that had programs in their service territories. At the time of publishing this report, 228 utilities in 36 states had an active program. Many other utilities across the country have announced plans to develop new programs. There is even a planned program in Alaska; [Chugach Electric Association](#) located in Anchorage approved a community solar project in October 2017.

Community solar programs are developed in states with and without shared solar policies, though many of the most active states have some form of state policy. The specific language in each of these policies varies dramatically, particularly concerning scale, bill credit rate, and ability of third-party ownership. But the foundation for each is the enablement of bill crediting for customers participating in community solar programs. Currently, 17 states plus the District of Columbia have enacted shared solar policies. According to the Coalition for Community Solar Access (CCSA), proposed legislation has been introduced in at least nine states across the country to open or expand existing community solar programs in the last year.

FIGURE 1. PROGRAM MAP



Source: SEPA Community Solar Database. Data up to date as of December 31, 2017

STEADY GROWTH OF INSTALLED CAPACITY

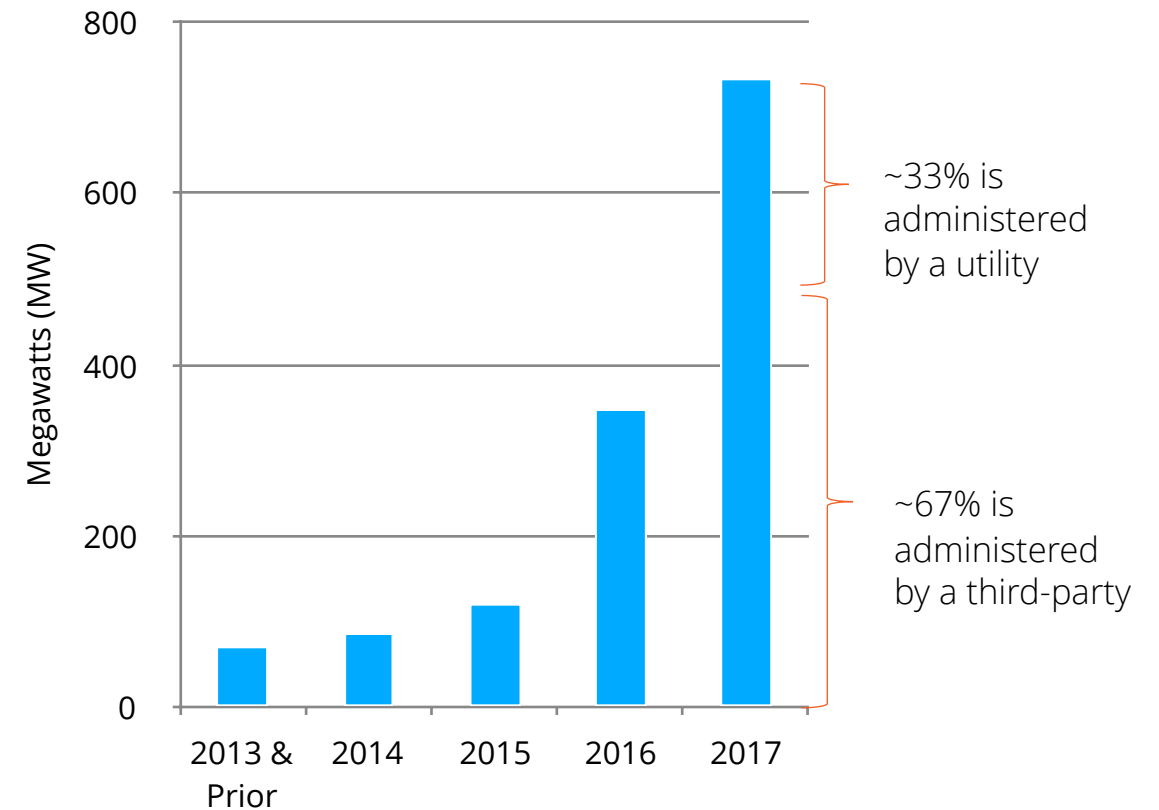
The total installed capacity of community solar programs has expanded to 734 megawatts (MW), with approximately 387 MW of that being installed in 2017. This corresponds with a year-over-year growth in capacity last year of 112%. For a comparison, the total solar market in the U.S. has grown at an average annual rate of 68% over the last 10 years.¹

In the short term, SEPA expects this growth to continue. Declining solar costs, increasing customer awareness of the business model, and the opening of new state markets by policy, will all contribute. Whether this growth continues in the long term after state renewable portfolio standards are met and the standard utility supply has a greater share of renewable generation, or after the most environmentally conscientious customers have already subscribed, is undetermined.

A majority of the total installed capacity is being administered by a third-party community solar provider. These organizations are responsible for 495 MW, or approximately 67% of the total installed capacity. Utilities administer the remaining 239 MW of installed capacity (see page 1 of this report for how we define the program administrator). Interestingly, the administrator split has flipped from 2015, when approximately 60% of capacity was administered by a utility and 40% by a third party.

¹ Solar Energy Industries Association Solar Industry Data accessed 1/9/2018, <https://www.seia.org/solar-industry-data>

FIGURE 2. CUMULATIVE COMMUNITY SOLAR CAPACITY



Source: SEPA Community Solar Database. Data up to date as of December 31, 2017

STILL AN EMERGING MARKET

Despite its continued growth, community solar is still a relatively small part of the solar marketplace. The National Renewable Energy Laboratory (NREL) reported that there were 47.5 gigawatts (GW) of total installed solar in the U.S. in all markets through the third quarter of 2017.² Utility-scale solar and rooftop solar made up the lion’s share of this capacity. Community solar was responsible for just over 1% of this installed solar capacity.

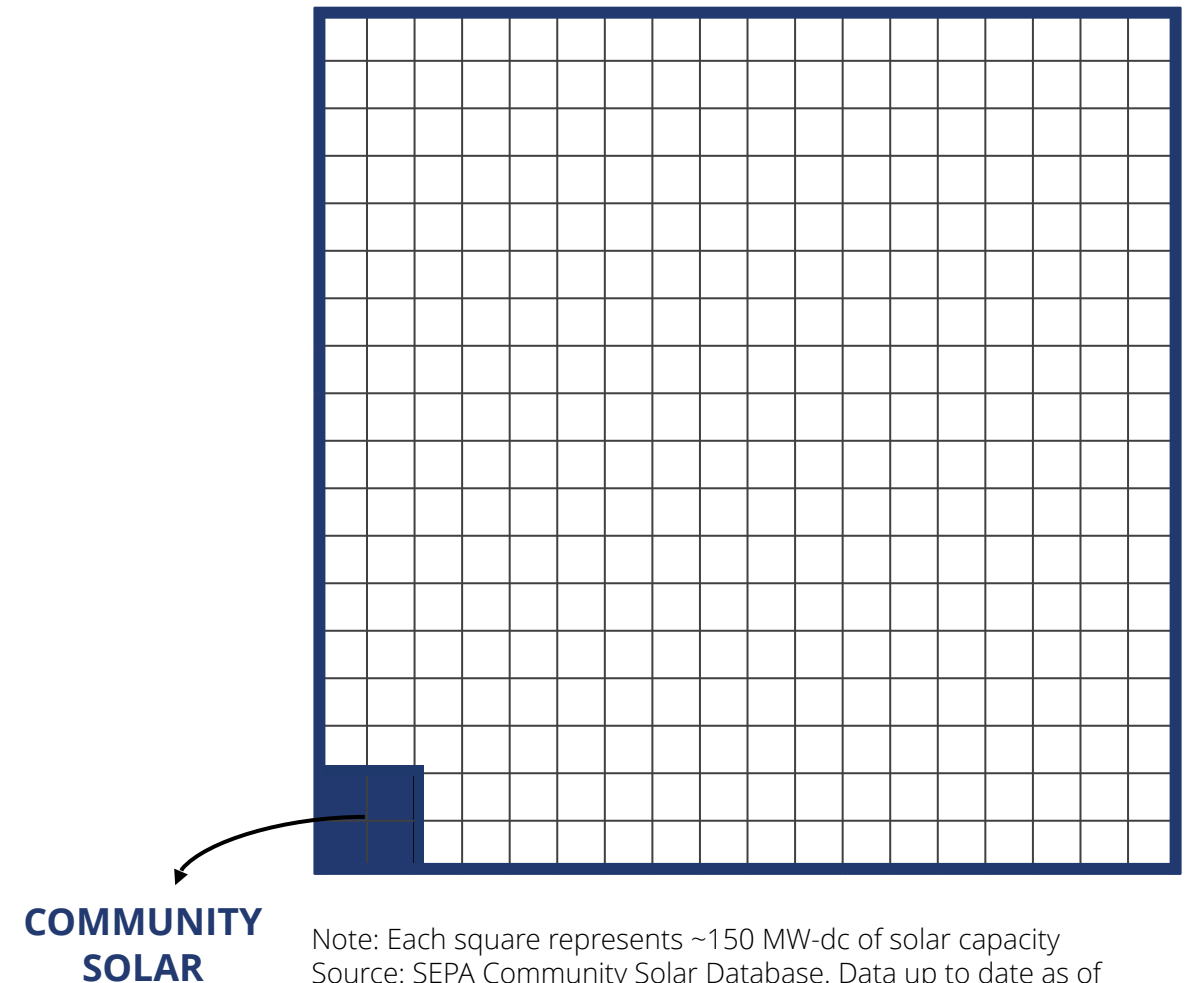
While community solar capacity is significantly less than rooftop and utility-scale solar, much of the potential market has yet to be addressed. As noted, community solar programs are currently available in 228 utilities’ service territories. As there are a total of approximately 3,100 utilities across the U.S., customers in nearly 90% of utility service territories do not have the opportunity to subscribe to a program. Additionally, 33 states have not yet enacted a shared solar policy — and of the 17 states with an existing policy, many are considering ways to broaden their existing programs.

In 2016, the Shelton Group and SEPA released a study that suggested the total potential community solar market was 6.5 million households.³ At this point, less than 300,000 have subscriptions. For the potential to be realized, much greater availability of programs is needed.

² National Renewable Energy Laboratory, Q3/Q4 2017 Solar Industry Update

³ Smart Electric Power Alliance, The Shelton Group, “What the Community Solar Customer Wants”, 2016. link: <https://sepapower.org/resource/what-the-community-solar-customer-wants/>

FIGURE 3. TOTAL INSTALLED SOLAR CAPACITY IN THE U.S. 2017



Note: Each square represents ~150 MW-dc of solar capacity
 Source: SEPA Community Solar Database. Data up to date as of December 31, 2017; Total installed capacity estimated based on Q3 data from NREL report

PROGRAMS COME IN A WIDE RANGE OF SIZES

In terms of the number of community solar programs, cooperative utilities have been trailblazers. At present, 160 cooperative utilities have a program in their territory. This far exceeds the total in investor-owned utilities (31 programs) and public power utilities (37 programs) combined. Most programs are small. Only 30% of programs have a total generating capacity greater than 1 MW. In fact, the largest community solar program, that in Xcel Energy's Minnesota territory (246 MW), is larger than the combined total of more than 100 of the smallest programs. But the average program size is steadily growing. In 2015, only 20% of programs had an operating capacity of 1 MW or greater. Additionally, the median program size has increased from 120 kilowatts (kW) in 2015 to 200 kW now.

FIGURE 4. PROGRAM CAPACITY TREE MAP BY ADMINISTRATOR AND UTILITY SERVICE TERRITORY

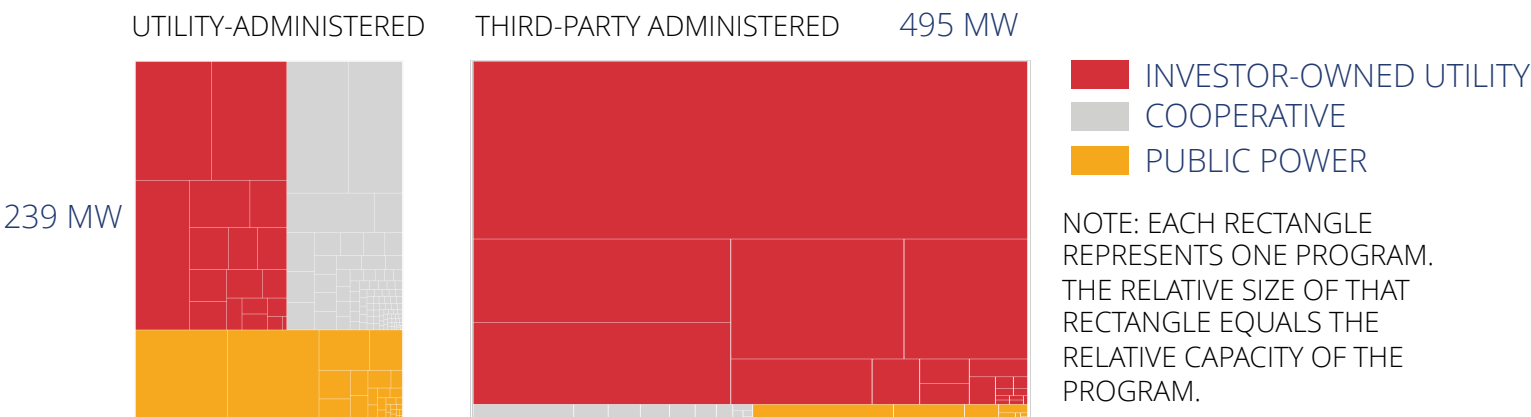


FIGURE 5. SERVICE TERRITORIES WITH THE LARGEST AMOUNT OF COMMUNITY SOLAR⁴

■ **Investor-Owned Utility**

1. Xcel (MN) 246 MW
2. National Grid / Eversource (MA) 159 MW
3. Xcel (CO) 48 MW

■ **Cooperative⁵**

1. Green Power EMC (NC) 20 MW
2. Valley Electric Association (NV) 18 MW
3. East Kentucky Power Cooperative (KY) 9 MW

■ **Public Power**

1. City of Tallahassee Utility (FL) 20 MW
2. Salt River Project (AZ) 20 MW
3. Lincoln Electric System (NE) 5 MW

Source: SEPA Community Solar Database. Data up to date as of December 31, 2017

⁴Includes both utility-administered and third-party administered programs

⁵Includes generation and transmission (G&T) utilities that serve cooperative distribution utilities.

INNOVATIVE PROGRAMS ARE LEVERAGING OTHER DISTRIBUTED ENERGY RESOURCES

Many would suggest the primary benefit of community solar is that it provides access to solar ownership to customers who otherwise couldn't, or wouldn't want to put panels on their property. But this is certainly not its only benefit. Community solar reduces dependence on foreign fuels, helps the environment, as well as provides local economic development, job training opportunities, and access to solar for low-to-moderate income customers. Additionally, some utilities are starting to explore how community solar can aid grid reliability and other ancillary services. A few examples of these "next generation" community solar programs are below.

COMMUNITY SOLAR + STORAGE

Austin Energy, a public power utility in Texas, is siting a 1.5-MW/3-MW-hour LG Chem battery at the substation next to their 2.5-MW community solar facility. The storage will be utility owned, thus it does not add any cost to the community solar subscription.

COMMUNITY SOLAR TIME-VARYING CREDITS

The Hawaii Public Utilities Commission directed Hawaii Electric Company and Kauai Island Utility Cooperative to develop community-based renewable energy program tariffs that include a time-varying bill credit value. This is designed to incentivize power production during peak grid demand. Subscribers will earn at least 20% more for power dispatched during peak periods as compared to off-peak periods.

COMMUNITY SOLAR + TOU RATES

Oklahoma Gas & Electric's community solar program requires subscribers to be concurrently subscribed to a time-of-use tariff. Subscribers earn a solar credit for the solar energy that is aligned with the applicable time-differentiated energy charge of the subscriber's metered energy.

COMMUNITY SOLAR + DEMAND MANAGEMENT

Meeker Cooperative Light and Power Association's member solar program provides an option for subscribers to get a \$400 discount on their community solar purchase if they also join the Peak Shave Water program which comes with a free 50-gallon water heater to provide beneficial demand management for the Litchfield, MN-based utility.



PROGRAM ADMINISTRATOR SURVEY FINDINGS

In November of 2017 SEPA and the [Coalition for Community Solar Access](#) surveyed utilities and developers to learn more about their experiences leading community solar programs. The survey was structured to learn more about some of the harder to find data, such as subscription rates and program costs.

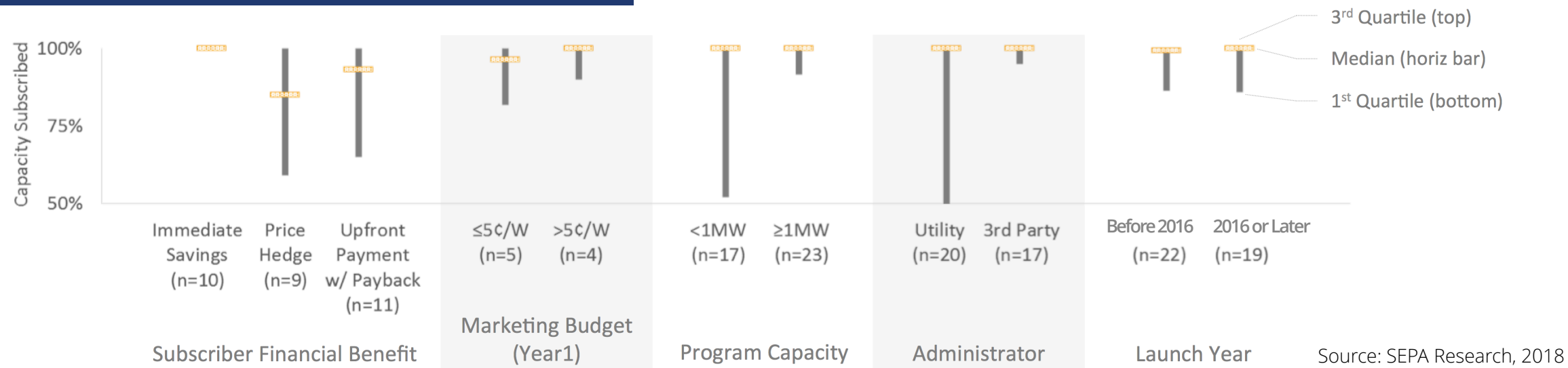
A total of 56 entities, 30 utilities and 26 third-party community solar developers, provided data. These organizations represent over 444 MW of community solar generating capacity, which is 60% of the total community solar market. Select findings from the data are presented in the following pages.

THERE ARE NO GUARANTEES OF FULL SUBSCRIPTION

The average program had 83% of its capacity subscribed. But a simple average can be misleading. Individual programs are different – they are different in scale, are launched in different years, exist in different electricity markets, contain different economic propositions – and these differences may affect subscription rates.

We analyzed subscription rates in five different sets of programs. The greatest difference was found when comparing programs with different financial benefits for the subscribers. It is not surprising that programs promising immediate bill savings almost universally garner a full subscription. Programs that provide either a hedge against potential rate hikes or payback the upfront payment after a set period experienced lower subscription rates. The marketing budget also seemingly had an effect on the subscription rate, with programs spending above 5 cents per Watt (cents/W) of capacity experiencing higher subscription rates than those spending less. The program's capacity, administrator, and launch year may have a less telling effect on subscription rates. A caveat is that the sample sizes for many of the comparison sets are quite small. Thus, these findings should be considered illustrative instead of absolute. More data collection will be needed to confirm any correlations between program design and subscription rates.

FIGURE 8. PROGRAM SUBSCRIPTION RATES



WHO IS PARTICIPATING IN COMMUNITY SOLAR?

In most community solar programs, a mix of residential and small commercial customers participate. There are a few programs, such as Austin Energy's, where only residential customers can participate. And only one, Xcel's Solar*Connect program in Wisconsin, where only commercial customers can participate.

SEPA discovered that the size of the program is correlated to the split of residential and commercial subscribers. In programs with under 1 MW of total capacity, a vast majority of subscribers, 91%, were residential customers. However, in larger programs with more than 1 MW of total capacity, only 34% of subscribers were residential customers, with the majority, 66%, being commercial customers. The reason for this significant discrepancy isn't perfectly clear, but many small programs are located in service territories of rural cooperatives, who have a greater percentage of residential meters than the rest of the industry.

Who the program administrator is for the program can also provide a hint as to the makeup of residential and commercial customer participation. In the survey, it was found that third-party administrators subscribed a majority of capacity (68%) to commercial customers while utility administrators subscribed a majority of capacity (52%) to residential customers.

Source: SEPA Research, 2018

FIGURE 9. CUSTOMER PARTICIPATION BY PROGRAM SIZE

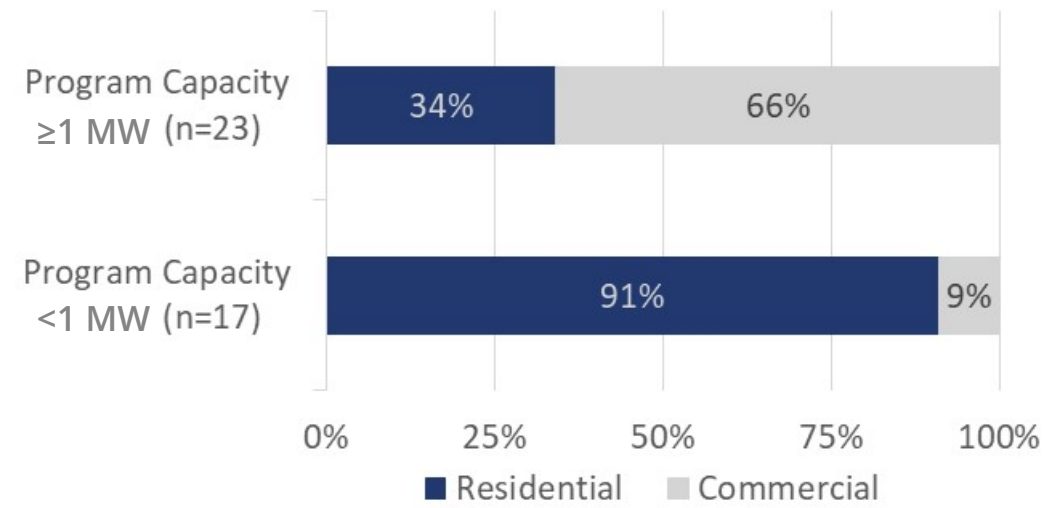
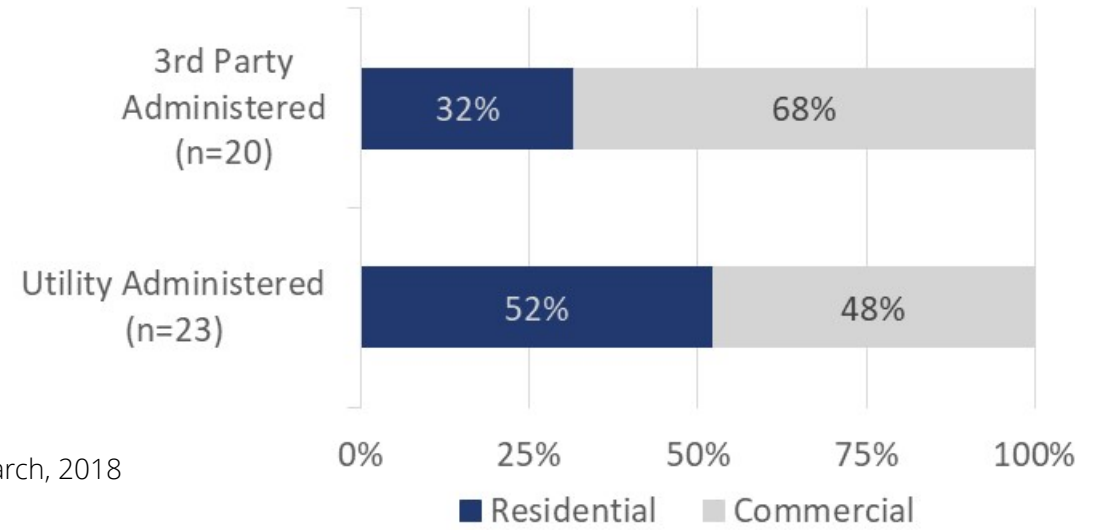


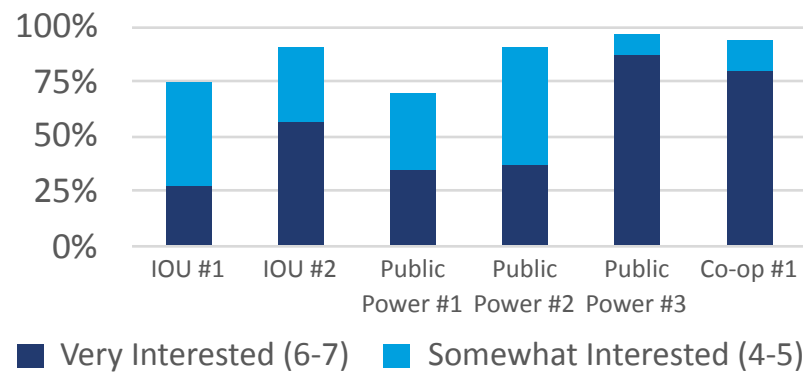
FIGURE 10. CUSTOMER PARTICIPATION BY ADMINISTRATOR



CUSTOMER INTEREST IS HIGH

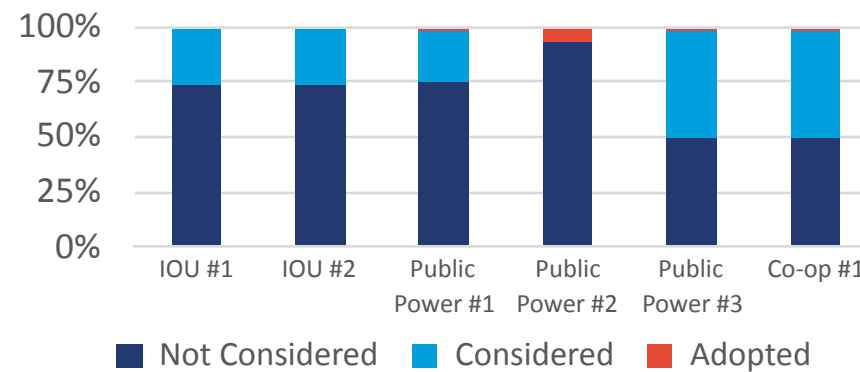
Through the support of the Solar Market Pathways grant, SEPA conducted multiple technical assistance projects across the country. Of interest to this report, SEPA created end-consumer online surveys for six separate utilities: three public power utilities, two investor-owned utilities, and one cooperative utility. Consistent across each customer base was the desire to learn more about community solar offerings, with four of the utilities experiencing 90% or more of respondents signaling interest in a program. Importantly, solar as a product was not unfamiliar to many of these consumers, with over 20% and up to 50% having considered rooftop solar options already at five of the six utilities. And, broadly speaking, customers do not appear interested in trivial participation; rather, 50-100% of the annual bill being covered by community solar was a popular response across each survey. These utility-specific surveys bolster the results found in the national survey conducted by SEPA and The Shelton Group, which estimated a national market potential of 6.5 million or more U.S. households.⁶

FIGURE 11. INTEREST IN COMMUNITY SOLAR CONCEPT⁷



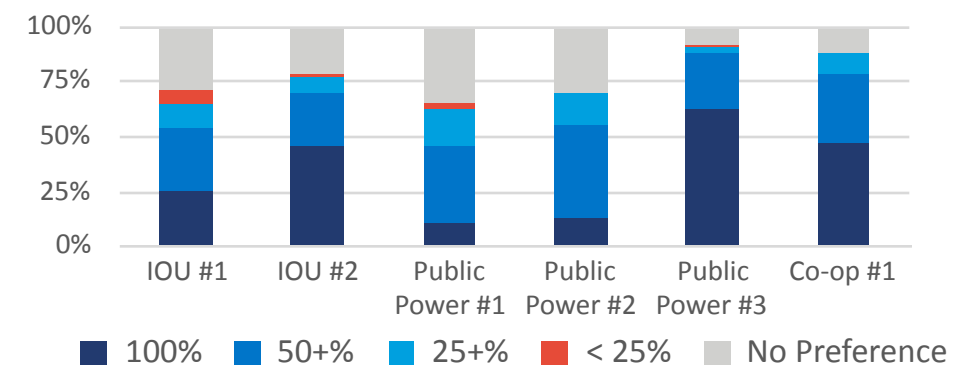
Source: SEPA Research, 2018

FIGURE 12. PRIOR CONSIDERATION OF ROOFTOP SOLAR



Source: SEPA Research, 2018

FIGURE 13. BILL % CAPTURED BY COMMUNITY SOLAR



Source: SEPA Research, 2018

⁶Smart Electric Power Alliance, The Shelton Group 2016 What the Community Solar Customer Wants, link: <https://sepapower.org/resource/what-the-community-solar-customer-wants/>

⁷Some surveys used a seven point scale while others used five qualitative phrases (Very Interested, etc.). Participants were asked about the concept of sharing ownership of an offsite solar facility without any pricing information.

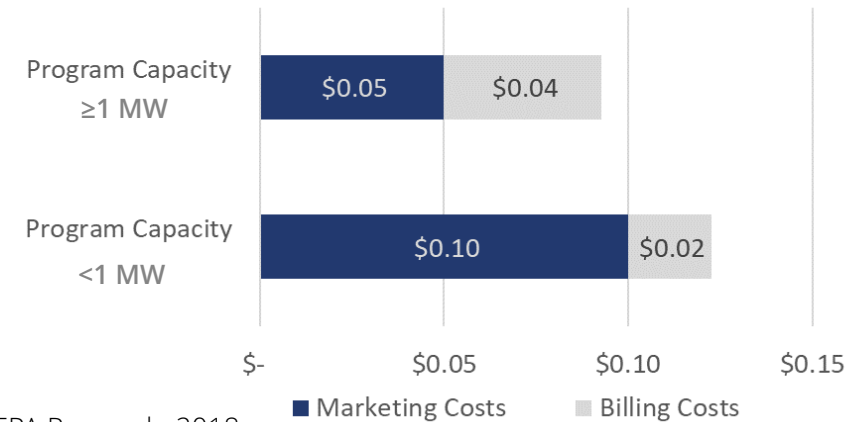
WHAT ARE THE ADDITIONAL COSTS OF A PROGRAM?

SEPA includes considering both the cost of customer acquisition and customer billing and crediting as administrative costs. These are effectively the additional costs to make a standard solar project a community solar one. In general, community solar administrative costs experience economies of scale. The median program with a capacity above 1 MW had just 9 cents/W in administrative costs as compared to 12 cents/W for the median program with a capacity below 1 MW.

The program administrator also seemed to affect the costs. While third-party administered programs spend more on customer acquisition, utility-administered programs spend more on billing. Billing costs for utility-administered community solar programs were 4 cents/W more on average than those administered by third parties. Marketing, or customer acquisition, costs for third-party administered community solar programs were on average higher than those administered by utilities. Of those surveyed, third-party administered programs spent 2 cents/W more on average on marketing costs than utility-administered programs.

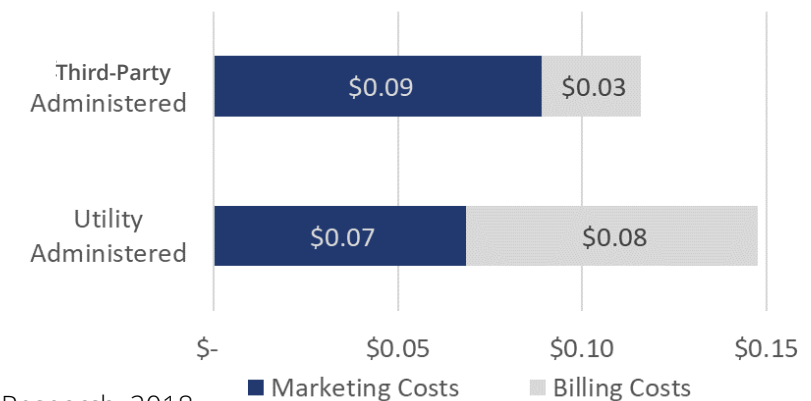
⁸For third-party administered programs, billing costs do not include those incurred by utility

FIGURE 14. MEDIAN FIRST YEAR ADMINISTRATIVE COSTS BY PROGRAM SIZE (\$/W)



Source: SEPA Research, 2018

FIGURE 15. MEDIAN FIRST YEAR ADMINISTRATIVE COSTS BY ADMINISTRATOR (\$/W)⁸



Source: SEPA Research, 2018

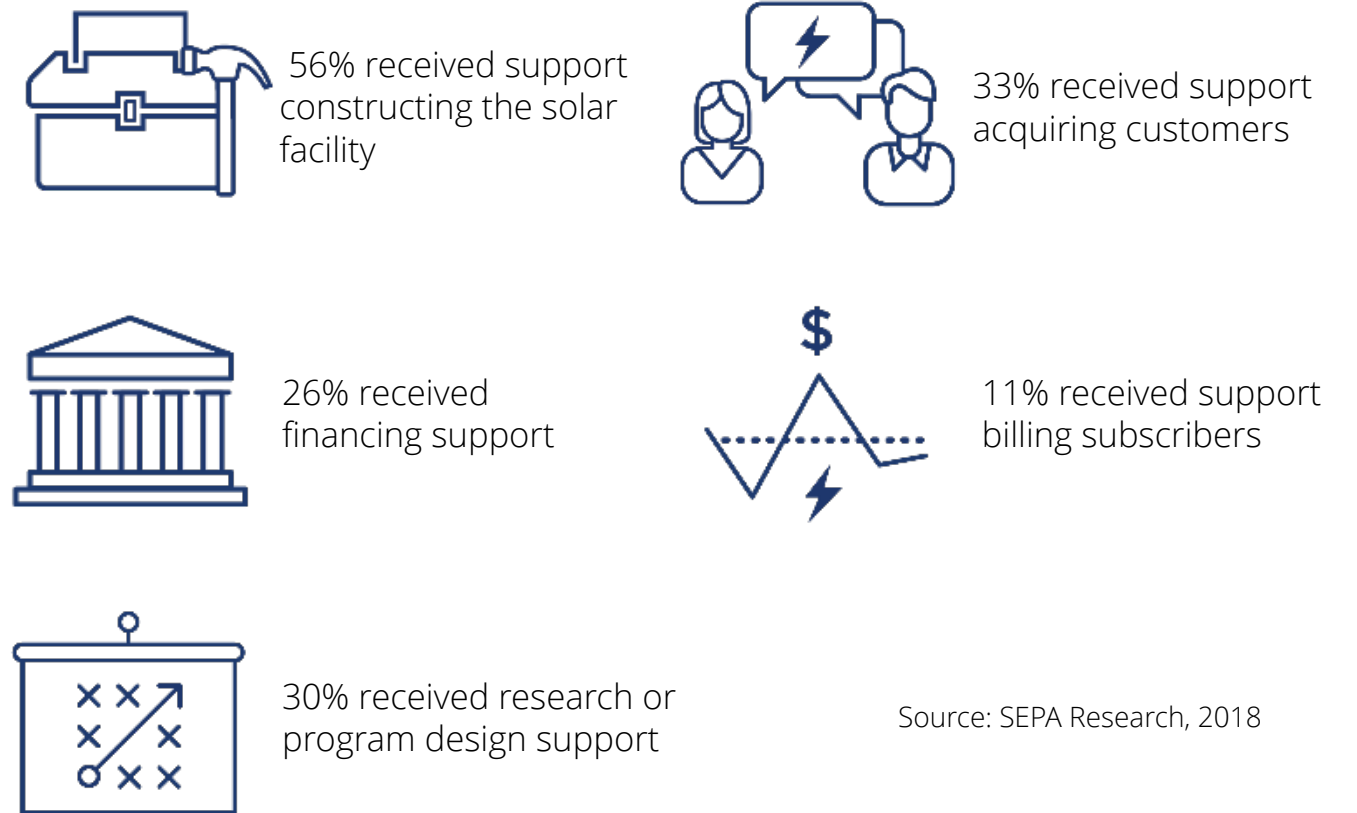
UTILITIES BUILD INDUSTRY RELATIONSHIPS

Even when a utility administers its own community solar program, it rarely develops the entire program on its own. There is a burgeoning industry centered around supporting utilities in implementing their programs.

Of all the utilities participating in our survey, 56% had another firm construct the generation facility. In most of these cases the utility relied on a developer for engineering, procurement, and construction. But in a few instances the utility entered a power purchase agreement (PPA) on behalf of subscribers for the energy produced from a third-party owned facility.

Many utilities looked for support administering their programs. Customer acquisition support was the second most common service, with 33% of surveyed utilities receiving support from a third-party. And 30% of utilities received support designing their program, while 26% got financing support. Only 11% of the utilities received support billing subscribers.

FIGURE 16. UTILITIES RECEIVING DEVELOPMENT SUPPORT



Source: SEPA Research, 2018

ACCESSING LOW-INCOME COMMUNITIES

A key benefit of community solar vs. rooftop solar is that it is more accessible to low- to moderate-income (LMI) customers, since subscribers do not need to own their roof or have a high credit score to participate. But the reality is that LMI customers are comparatively price conscious, so expanding the participation of the LMI community will require a subscription price that is equal or below the prevailing cost of electricity. As solar power is still a premium-priced product in many geographies, this is often a challenge, but one that is starting to be addressed. Of those surveyed, 44% of program administrators indicated they had some level of LMI participation in their program, most often through one of three paths (below).

BY SUBSIDIZING LMI PARTICIPATION

The New York Public Utilities Commission has approved a pilot program (case number 16-E-0622) where Consolidated Edison will directly provide community solar to customers through the company's low-income bill assistance program.

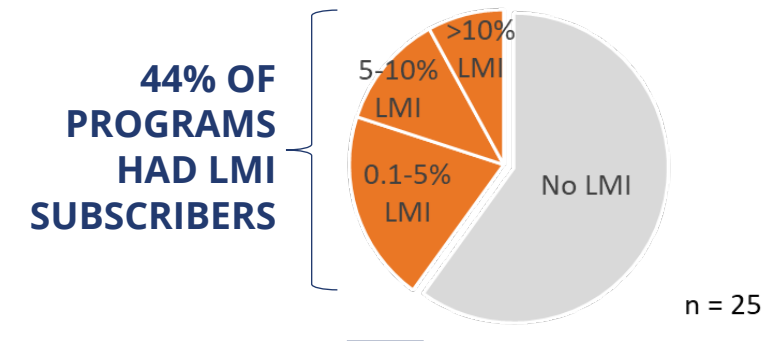
The initial phase of the program will generate 3MW, which is anticipated to save between 800 to 1,600 participants \$5 per month. If the cost of the program exceeds the generation value consolidated Edison will recover the shortfall from all ratepayers through a bill adjustment mechanism.

BY LEVERAGING EXTERNAL FUNDING

Grand Valley Power partnered with GRID Alternatives in Colorado to build a dedicated LMI project. Equipment and time were donated, erasing a majority of the initial project cost. LMI subscribers who participate get solar power and a reduced electric bill. The subscribers are selected by lottery and change every 2 years.

Poudre Valley Rural Electric Association used a grant from the Colorado Energy Office and financing from DOE to reduce project costs. This allowed them to develop a project with 700 kW allocated to LMI subscribers. LMI subscribers receive a 30% upfront discount and a 4-year term to guarantee savings and provide customer flexibility.

FIGURE 17. PROGRAMS WITH LMI SUBSCRIBERS (% LMI)



Source: Smart Electric Power Alliance Program Administer Survey Data, 2018

BY CREATIVELY STRUCTURING THE CUSTOMER OFFER

In Rocky Mountain Power's Subscriber Solar program in Utah, subscribers receive a bill credit for actual production. When production is greater than consumption, The excess kilowatt-hours (kWh) get rolled over to the next month.

At the end of the year, all remaining excess production is valued at the avoided cost of energy and donated to Rocky Mountain Power's LMI bill assistance program.

BIG CHALLENGES REMAIN

Administrators can encounter all sorts of road blocks when attempting to implement a program. For utility administrators, the biggest challenge is signing up the initial customers. Though surveys have shown that most individuals are interested in the idea of community solar, translating that interest into paying customers can take significant effort. When asked to list their biggest challenge, over half of utilities suggested it was related to customer acquisition. Third-party administrators overwhelmingly indicated that working to meet complex and diverse policy requirements is their major challenge. Even beyond these primary hurdles lie many additional challenges. Utilities also cited challenges finding full-service vendors, selecting and securing a site, avoiding passing costs to other ratepayers, and utilizing the federal tax credit. Third-party administrators also cited working with complexity in policy, adjusting to uncertainty in program regulations and caps, acquiring financing, educating customers, marketing, and ongoing administration of the programs once live.

WHAT ADMINISTRATORS STATE AS THEIR BIGGEST CHALLENGE

- “Converting interested signups to paying and committed participants”
- “Subscribing all of Phase I before construction”
- “Determining a subscription model that would meet potential participants’ wants and needs”
- “Finding subscribers willing to actually put money into purchasing shares”
- “Finding members to participate”
- “Selecting and securing a site”
- “Making the price attractive and utilizing the 30% federal tax credit”
- “Cost recovery for utility”
- “Finding cost-effective marketing tactics to promote the program”
- “Finding a full-service vendor for our customers”
- “Modifying the program to compete with the quickly changing solar market”
- “Expanding the program quickly enough to accommodate all interested customers”
- “Explaining that solar energy bill credits vary from month-to-month depending on weather conditions”
- Reducing the number of cancellations due to customers’ unwillingness to wait for long-term savings potential”

Source: Smart Electric Power Alliance Program Administer Survey Data, 2018

UTILITY FOOD FOR THOUGHT

For utilities considering developing a program, your peers have some words of wisdom. Most encouraged others to push forward, but advised that carefully listening to your customers is the key to success. Keeping in communication, being fair, and being flexible with your customers are things all utilities should want to do. Bringing these best practices to the core of your business will also help bring success to your community program. Using customer participation as an indication of success, the difference between interested customers and committed customers tends to be the financial cost. Keeping the customer engaged and the share prices at a reasonable cost are the two most shared strategies for success.

UTILITIES' SUGGESTIONS (CUSTOMER ENGAGEMENT)

- "Pre-sell shares"
- "Talk to your customers about what they want"
- "Have all of your community solar phase purchased before you start construction"
- "Be fair to your customers. Funding, equipment, and installation are secondary"
- "Make sure your program is flexible for your customers"
- "Just do it. It's what your customers say they want and this is your core business"

UTILITIES' SUGGESTIONS (FINANCE)

- "Payback is key to success"
- "Only do it if it makes financial sense for customers"
- "Keep share prices reasonable enough for the average customer"
- "Build pricing based on sustainable model rather than as a subsidized pricing project"
- "People will say they will pay a premium for green power, but when the opportunity is available, they will not pay"

UTILITIES' SUGGESTIONS (STRATEGY)

- "Have a thorough understanding of why you want to start the program"
- "Look to other utilities - what works and what doesn't"
- "Community solar adds to the overall portfolio of options available to customers"
- "When developing a community solar program, get your billing and IT departments involved early"

Source: Smart Electric Power Alliance Program Administer Survey Data, 2018



PROGRAM DESIGN DECISION TREE

In 2015, SEPA worked with a group of 18 utilities and organizations who had previously launched community solar programs to define the key decisions that must be made when designing a program. Since that time, SEPA has assisted multiple utilities in designing community solar programs for their service territories. Using lessons learned from these efforts, SEPA has updated the program design decision tree found in this section.

COMMUNITY SOLAR: THE DECISION TREE

WHO RUNS THE PROGRAM?

- Utility Role
- Asset Owner

WHAT IS THE SUBSCRIBER'S ECONOMIC PROPOSITION?

- Subscriber Payment Structure
- Subscriber Initiation Fee
- Subscriber Credit
- Generation Guarantee

WHAT ARE THE PARTICIPATION RESTRICTIONS?

- Target Customer Classes
- Siting & Scale Impacts
- Participation Limit: Residential
- Participation Limit: Non-Residential

WHAT ARE THE OTHER TERMS & CONDITIONS?

- Minimum Term
- Program Length
- Unsubscribed Energy
- Subscription Transferability
- Additional Grid Benefits
- REC Treatment

The Community Solar Decision Tree seeks to streamline the major community solar program attribute design process down to a series of discrete choices, which have been built off of SEPA's years of research into and work on community solar program design. At its core, the Decision Tree seeks to add specificity to the following key questions:

- 1) Who runs the program?
- 2) What is the subscriber's economic proposition?
- 3) What are the participation restrictions?
- 4) What are the other terms and conditions?

Each major attribute of a community solar program has been broken down into these four categories, and the options most commonly seen in programs today are identified for each. The following pages of this report dive into further detail behind each option, and provide examples from programs across the country that use these program attributes.

By following the questions identified and options presented, it is possible to create a draft community solar program design in short order.

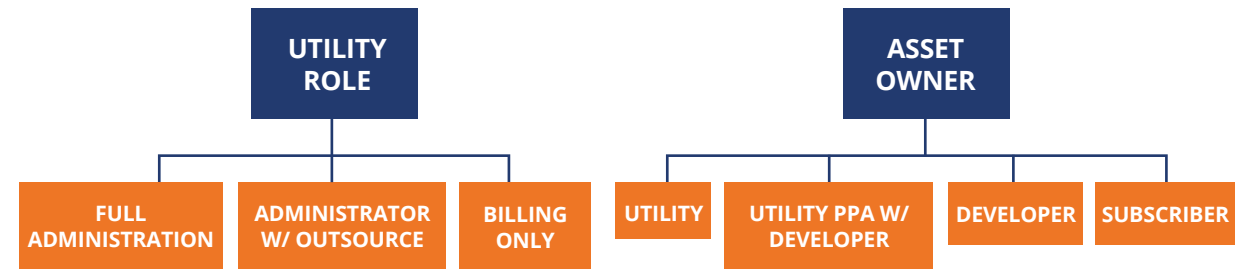
Source: SEPA Research, 2018

COMMUNITY SOLAR: THE DECISION TREE

WHO RUNS THE PROGRAM?

When launching a community solar program, one of the first decisions required is related to who administers the program. The program administrator is most directly connected to the subscribers. This means they have the greatest control over how the program is messaged and can gain the most customer relations benefit. In legislatively enabled markets, this role typically falls to a third-party developer, with the utility engaged for billing purposes only. In voluntary markets, many utilities take on full administration (including marketing, customer acquisition, program design, etc.) themselves, while others leverage developers for some – or all – of those activities.

Similarly, physical ownership of the community solar asset can be done in several ways. Municipal and cooperative utilities often leverage a developer to either own and administer the program, or sell the energy to the utility under a PPA. In other programs, subscribers physically purchase and own (rather than lease or gain access to) their shares of the system.



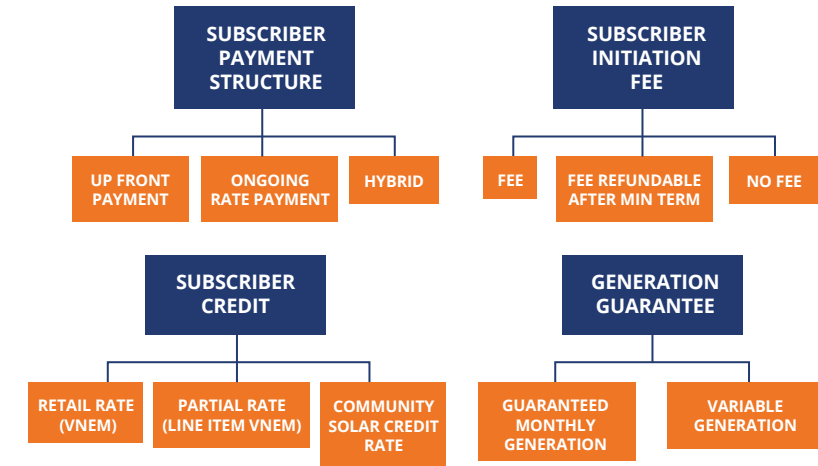
ASSET OWNERSHIP				
KEY CONSIDERATIONS	<ul style="list-style-type: none"> Does the utility have access to low-cost financing? How can you best monetize the investment tax credit? How much experience do you have managing solar generation? 			
OPTIONS	Utility	Utility PPA with Developer	Developer	Subscriber
EXAMPLE	Northern Lights Community Solar	Rocky Mountain Power Subscriber Solar	CPS Energy / Clean Energy Collective Simply Solar	Fremont Department of Utilities Community Solar

COMMUNITY SOLAR: THE DECISION TREE

WHAT IS THE SUBSCRIBER'S ECONOMIC PROPOSITION?

The first evolution of community solar programs relied upon an up-front payment model, mimicking a rooftop ownership scenario for the consumer. In recent years, and particularly as utilities have begun launching programs, an ongoing payment structure has become popular where the customer pays a fixed rate for energy produced each month. Many programs leverage net energy metering to provide customers their energy credit. In some jurisdictions, often where bills are unbundled, the utility has identified specific charges that are offset by participation in the community solar program. For example, the utility may fully credit all fuel and generation related charges, but continue to pass through at prevailing rates any transmission and distribution charges. Alternatively, a handful of companies have identified the specific value created by the community solar project to the system, and provide that as a credit to participating customers.

One other item that directly impacts the customer's value proposition is the generation that gets credited. Solar is a variable resource, and many argue that the end consumer should see that variability passed through in the community solar program. This is most often reflected in programs where the customer subscribes in kW blocks, or panel increments. In some situations, however, the utility "sells" blocks of kWh. For those programs, it can be stated that the participant is getting guaranteed production from the program. Blocks of kWh can be far simpler for customers to understand, and for utilities to integrate on the bill; however, they can also create added complications. In order to ensure that the system is not oversold, the utility may need to sell fewer blocks of kWh to account for seasonal variability, or long-term system degradation.



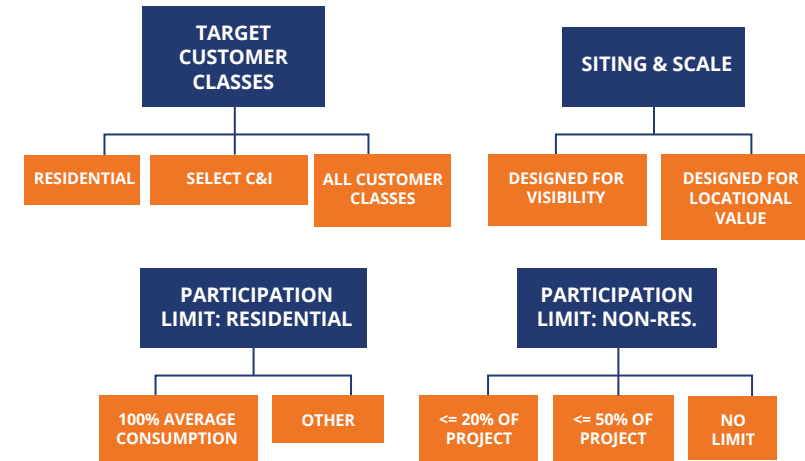
SUBSCRIBER PAYMENT STRUCTURE			
KEY CONSIDERATIONS	<ul style="list-style-type: none"> What do target subscribers say they most want? Can your current billing system handle ongoing payments? Is there a risk that your state will consider the subscription a financial security? 		
OPTIONS	Upfront Payment	Ongoing Rate Payment	Hybrid
EXAMPLE	MiEnergy Cooperative's Renewable Rays	Orlando Utilities Commission Community Solar	Consumers Energy Solar Gardens

COMMUNITY SOLAR: THE DECISION TREE

WHAT ARE THE PARTICIPATION RESTRICTIONS?

Since community solar programs often are tied to a specific asset, they can become size- and participation-constrained. Some programs are structured to limit participation solely to one customer class, such as Residential, while others allow for broader participation on a first-come-first-served basis. A handful of programs are designed for explicit communities – typically where the system is located – and prioritize those customers over all others for participation.

A separate restriction for participation exists regarding the physical amount of energy that an individual customer may procure. The most frequently used approach for Residential customers is a restriction based on their average annual consumption. For larger customers, like the commercial and industrial (C&I) class, it may be more appropriate to limit participation to a specific portion of the entire project so that smaller customers still have an opportunity to participate.



PARTICIPATION LIMIT: RESIDENTIAL		
KEY CONSIDERATIONS	<ul style="list-style-type: none"> • Most customers (per survey data) prefer offsetting 100% of their load • Limiting to < 100% can allow for more participants in the program • Does any portion of the program need to be carved out / reserved for C&I and/or Low Income customers? 	
OPTIONS	100% Average Consumption	Other
EXAMPLE	Jacksonville Energy Authority SolarSmart	Madison Gas Electric Shared Solar

COMMUNITY SOLAR: THE DECISION TREE

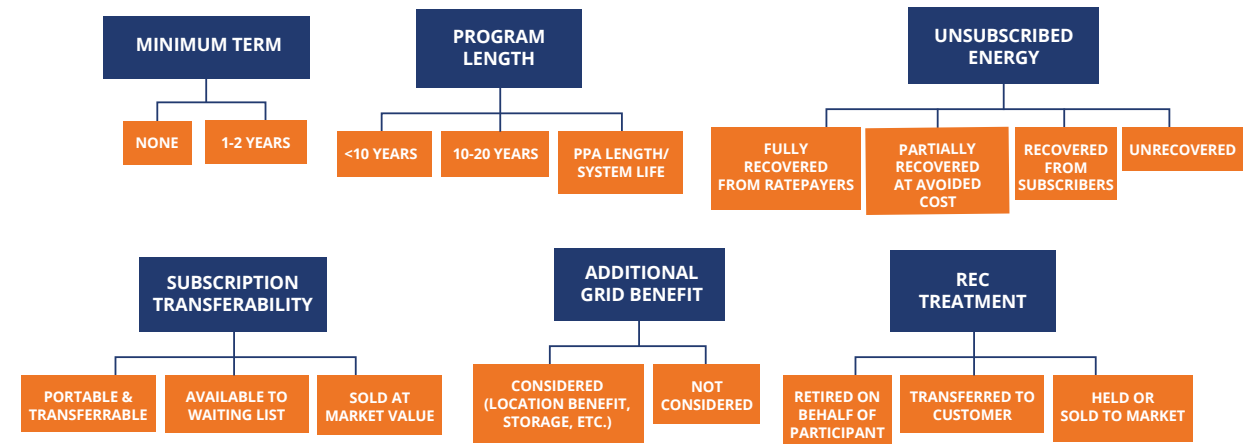
WHAT ARE THE OTHER KEY TERMS & CONDITIONS?

Lastly, details regarding the term of the transaction, how available capacity gets allocated, and how specific benefits and attributes get monetized can all impact the ultimate economics of the community solar program. Perhaps the most important items to clarify for consumers are the Minimum Term and the Program Length. Generally speaking, consumers prefer short-term contracts and don't like being tied into long-term agreements (based on multiple comments during focus groups conducted under this project).

But term is more nuanced than it sounds, and really breaks down into two specific factors: (1) how long a customer is required to stay in the program (Minimum Term), and (2) how long the program administrator guarantees the economic transaction (Program Length).

The vast majority of programs seen create some type of long-term guarantee of the program's economics. This is accomplished by either the up-front payment or a locked-in ongoing payment; that is, the consumer knows exactly what the solar costs over a long period.

Minimum Terms are sometimes created so a customer does not switch between different rate schedules multiple times in a year ("gaming," for example, seasonal price differences between a standard rate and a time-of-use rate). Not all programs require a minimum term, and those that do often only require a commitment of one to two years.



PROGRAM LENGTH			
KEY CONSIDERATIONS	<ul style="list-style-type: none"> What do target subscribers say they most want? Can your current billing system handle ongoing payments? Is there a risk that your state will consider the subscription a financial security? 		
OPTIONS	<10 Years	10-20 Years	PPA Length / System Life
EXAMPLE	Peninsula Light Company Harbor Community Solar	Austin Energy Community Solar	Kit Carson Electric Cooperative Community Solar

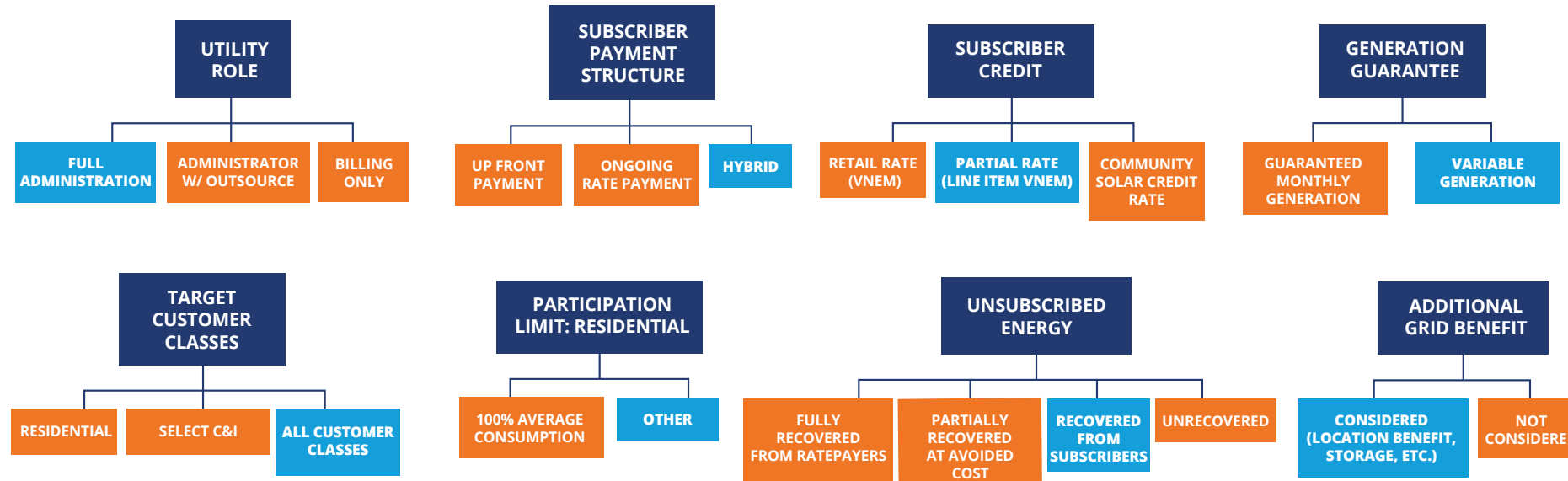
DECISION TREE IN ACTION

Ultimately, there are many ways a community solar program can be successfully designed. The key is giving proper consideration to what target subscribers are looking for in a program and what the administrator is aiming to accomplish. For example, a program designed to satisfy the demand of the most environmentally concerned customers will and should look very different compared to a program aiming to reduce the electricity bills of low- to moderate-income customers.

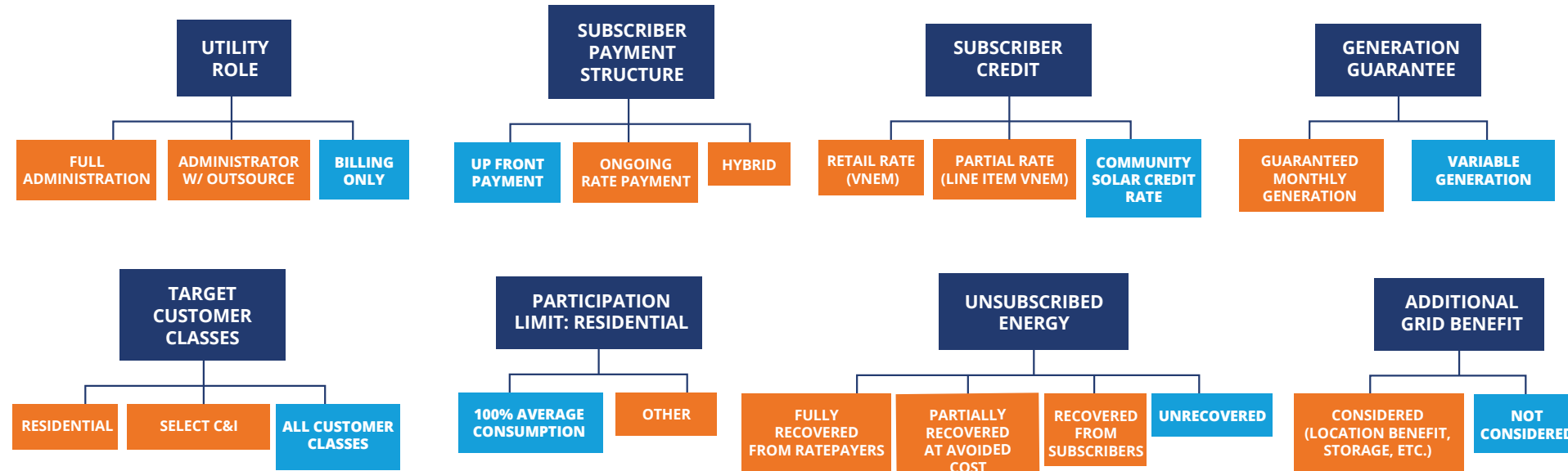
Consider the two examples on the following pages. Each utility made vastly different design selections and each has been very successful based on SEPA's criteria that they:

- 1) are fully, or nearly fully, subscribed;
- 2) return value to all rate-payers in an economically balanced and equitable manner; and
- 3) have largely satisfied subscribers.

MADISON GAS ELECTRIC SIMPLE SOLAR



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