

# **Market Research and Market Segmentation for Community Solar Program Success**

## **A Brief for Utility Program Designers**

**Community Solar Value Project**

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**Community  
Solar Value  
Project**



## Summary

### **Market Research and Market Segmentation for Community Solar Program**

**Success** is part of the *Community Solar Value Project (CSVP) Solutions Toolkit*. The CSVP is aimed at developing best practices for community-solar programs at electric utilities, including guidelines on how to achieve greater reach and net value by working in four areas: strategic solar project siting and design, project financing and procurement, target marketing and segmentation, and integration with solar-plus companion measures, such as demand-response and storage.

This brief is focused on the target marketing topic area. It guides utility program managers through the market research process, as they design, develop, and market the community solar program offer. By understanding the sub-groups or market segments within the customer base, the savvy community solar program designer can improve customer satisfaction and lower solar customer acquisition and retention costs.

Where does a program designer or manager begin in this effort to understand and act upon their customers' needs? They should start by asking themselves questions that define five key market-research tasks:

1. **Assessing Needs:** Where do I need the most help, in relation to understanding customers' perspectives on community solar?
2. **Drawing On Outside Research:** What can I find out from other organizations that have explored community solar?
3. **Mining Customer Data:** What information does my utility already know about the wants and needs of the targeted customers?
4. **Interviewing Customers:** What additional information can I gather from customers given available resources?
5. **Incorporating Feedback Loops.** How do I collect feedback, then monitor and adjust the program as it moves forward?

This brief explains the process and the resources that are useful at each step along the way. It is particularly sensitive to the realities of working in a utility today, where resources may be available, but are nevertheless hard to find and challenging to interpret. The brief also explains the strengths and limitations of popular new market-research techniques, such as the use of Prizm and other micro-target market segmentation tools.

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Key words: community solar, target marketing, market research, program design, outsource.

## About the Community Solar Value Project

The Community Solar Value Project (<http://www.communitysolarvalueproject.com>) is aimed at developing best practices for community-solar programs at electric utilities, including guidelines on how to achieve greater reach and net value in four areas: strategic solar project siting and design, project financing and procurement, target marketing, and integration with solar-plus companion measures, such as demand-response and storage.

The project is led by Extensible Energy, with support from Cliburn and Associates, LLC, Olivine, Inc., and Navigant Consulting. Utility participants include the Sacramento (California) Municipal Utility District (SMUD), and other utilities nationwide. The project is powered by SunShot, under the Solar Market Pathways program of the U.S. Department of Energy.

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## Disclaimer

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# Contents

**Summary ..... ii**

**About the Community Solar Value Project ..... iii**

**Acknowledgments ..... iii**

**Disclaimer..... iii**

**Introduction.....1**

**Market Research Checklist..... 3**

**Step 1. Assessing Needs ..... 4**

**Step 2. Drawing On Outside Research ..... 6**

**Step 3. Mining Customer Data .....13**

**Step 4. Interviewing Customers.....18**

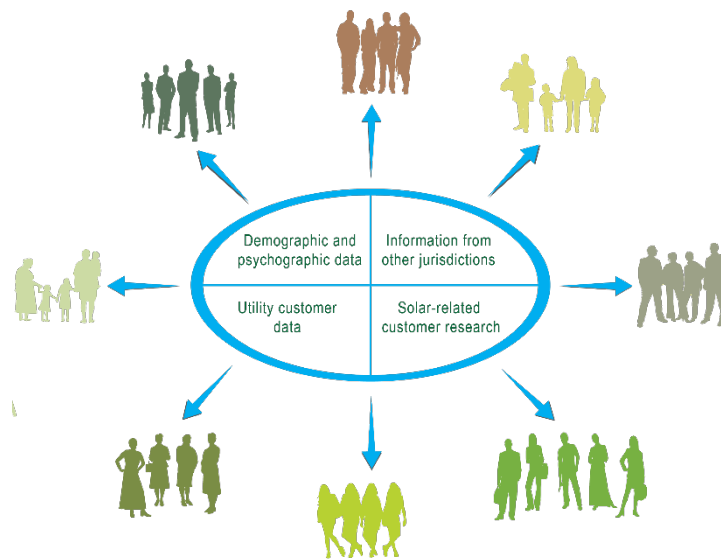
**Step 5. Developing a Program Design With Feedback Loops..... 22**

**References ..... 23**

## Introduction

Utility customers' interest in community solar varies across many variables. Some of these are geographic, related to different policies and access to solar development. Some are demographic, defined by socio-economic indicators such as gender, age, income level, or education. Others are psychographic, defined by similar attitudes, values, and lifestyles. Understanding all these influences can be instrumental to the success of a community solar program. In particular, the study of demographic and psychographic influences are at the core of market research activities, required for successful utility program design and implementation. Utilities can and should draw on existing data from outside jurisdictions, demographic and psychographic data, their own utility customer data, and solar-specific surveys of their customers to help design community solar programs (Figure 1). Collectively, this information can be used in estimating the market potential upfront, understanding the types of products that might be of interest, helping to narrow in on a group or groups that the utility wants to appeal to, and marketing the program to targeted customer segments, in the course of program implementation.

### Use Market Research and Segmentation to Understand the Variation in Customer Sub-groups in Advance of Offering a Community Solar Program



*Figure 1. The above figure highlights the use of market research and segmentation to understand the variation in customer sub-groups in advance of offering a community solar program.*

Designing an offer with target-market research in mind is critical to the success of any community solar program. This is especially true if the utility desires a program that incorporates companion program measures and “high-value” aspects—e.g., one relying on locally sited projects, which may come at a slight premium, but which bring grid-integration value to the market, along with the solar choice.

Where does a program designer begin in this effort to understand their customers' needs? Utility program designers should start by asking themselves questions that define five key market-research tasks:

1. **Assessing Needs:** Where do I need the most help, in relation to understanding customers' perspectives on community solar?
2. **Drawing On Outside Research:** What can I find out from other organizations that have explored community solar?
3. **Mining Customer Data:** What information does my utility already know about the wants and needs of the targeted customers?
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5. **Incorporating Feedback Loops.** How do I collect feedback, then monitor and adjust the program as it moves forward?

While the exact timing, focus and approach will vary, below we present a checklist of the basic steps to get utility program designers through this process. (See Figure 2 below.)

Notably, some utilities may have the resources to customize each of the research steps for their utility, while others may find it valuable to outsource some steps. Throughout this brief, we mention external resource options where these are available.

## Market Research Checklist for Designers of Utility-Based Community Solar Programs



### Step 1. Assessing Needs

*Determine where the utility needs assistance the most (e.g., overall program design, identifying top targets, identifying companion measures, determining marketing messages)*



### Step 2. Drawing on Outside Research

*Build on knowledge from other utilities and outside resources (but question the questions, and recognize that education on community solar will be critical)*



### Step 3. Mining Customer Data

*Understand what customers want and need through data mining*



Explore existing target-market segmentation related to any existing utility programs or services



Assess and tap into existing data sources, such as energy usage patterns or survey data



### Step 4. Interviewing Customers

*Collect program specific data*



Determine opportunities to (1) collect data through primary research and (2) leverage cross-departmental resources for gathering data



Conduct qualitative research, e.g., focus groups or in-depth interviews, to explore issues



Conduct customer surveys to test hypotheses and explore alternative options



Analyze all available data to inform the development of the program and marketing plan



### Step 5. Developing a Program Design with Feedback Loops to Monitor and Adjust

*Develop an interactive program-design process, integrating enhancements based on customer feedback with technical concerns, such as project siting and design, pricing, customer sign-up and billing, etc., to create a win-win for both the customer and the utility. Build in feedback loops to monitor and adjust.*

Figure 2: A market research checklist for designers of utility-based community solar programs.

## Step 1. Assessing Needs: The Value of Market Research and Market Segmentation

Market research and market segmentation can help utilities understand their customers better and allow them to move to a more customer-centric model, improving program success and often lowering overall program costs. In particular, market segmentation can be used to design elements of a program, to identify likely target markets, and to create effective messaging.

- 1) **Design elements of a community solar offering<sup>1</sup>.** Market research and market segmentation can be used to design or refine a draft program offer by testing and analyzing options for participant terms and payment structures, as well as possible companion measures to community solar, such as energy efficiency, load management or storage. More specifically, to help ensure that the proposed offering meets the needs of targeted segments in the community, utilities can test product bundles among various sub-groups of their population, (such as community solar and a new rate or community solar and a demand-response offer).
- 2) **Identify likely target markets.** It is important to know which groups of customers are interested in community solar, what is driving local interest, and whether customers are aware of what these programs offer (e.g., savings, bill certainty over time, environmental benefits, etc.). Understanding what customers know and what they want is particularly important if the utility is using community solar to retain a particular segment of customers within the residential or commercial sector, or to identify the right companion measures for marketing with a community solar offering.
- 3) **Create effective messages** and ways of reaching customers. Market research and market segmentation can be used to understand the best messages and channels for reaching a variety of sub-groups within a population. This can reduce marketing costs, thereby shortening the sign-up process and lowering customer-acquisition costs.

Depending on the utility's needs, these efforts can occur at either the design stage of the program or the marketing stage, in advance of customer acquisition.

Ideally, market research and market segmentation will occur at the program design stage, as well as at the marketing stage; however, utilities with limited resources may focus more heavily on the program design stage to ensure that the offer meets customer needs. That is prerequisite to effective messaging. Generally recommended:

### At the Program Design Stage:

- If the utility wants to build a customer-centric community solar offering, including, as desired, identifying appealing companion measures, then research and segmentation are conducted on the front end, both to inform the development of the offer, and to match the offer to a particular customer group.

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<sup>1</sup> See <http://www.communitysolarvalueproject.com/resources> for guidance on the overall community-solar program design process.



### **At the Marketing Stage:**

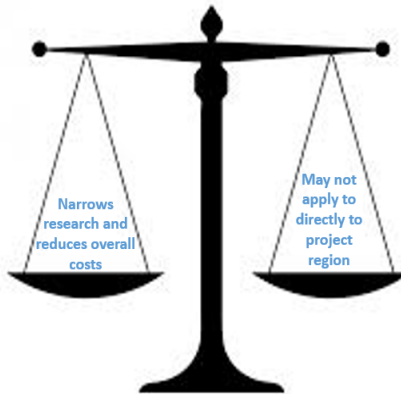
- If the utility has a good sense of the product that they want to offer, based on what they have seen in other territories and/or what needs to be offered to meet the needs of the grid, then it may be possible to minimize new market research at the front end. Market research and segmentation work that takes place at the marketing stage can provide a good understanding of the best targets for a community solar offer that already is defined. While this “later stage” approach tends to be more utility-centric (i.e., the product is defined by utility needs more than by the customers’ needs), it can still provide important insights on customers and improve program success.

The first steps for any program designer involve understanding the value of market research and market segmentation, and determining where the utility needs assistance the most. For example, Does the utility need customer insights for overall program design, for identifying top targets, for identifying companion measures, or for creating marketing messages? The program designer’s reflection on such needs, including taking input from internal and external stakeholders, will be an important determinant of later success.

## Step 2. Drawing On Outside Research: Building On Knowledge From Other Utilities and Outside Resources

As an early step, all utilities embarking on the community-solar journey should learn from past work in other areas of the country. With respect to understanding customer perspectives on community solar, there is some information available that can start to answer questions, such as: What are the segments that have the most potential for community solar deployment? What are the market drivers and barriers for each of the markets or segments? What are the best channels for reaching customers? However, while some lessons from other regions of the country apply directly to utilities looking to start their own community solar programs, there are also unique aspects of any community that set them apart—such as the cost of electricity, patterns of constrained distribution lines, other geographic aspects that affect project siting, or attitudes among consumers.

### Benefits and Drawbacks of Outside Information



*Figure 3: The above figures identifies the benefits and drawbacks of outside information.*

Local energy markets can vary dramatically, so information from other jurisdictions should be reviewed in the context of: 1) the way the research was conducted (e.g., identifying how customers for the research were selected and whether surveys, focus groups or other methods were used), and 2) the characteristics of this utility territory compared to those of the utility where the research that is referenced was performed (e.g., differences in energy costs, differing customer familiarity with innovations, etc.).

This section briefly describes results from several recently conducted studies, including those from Shelton Group, SEPA, PCG, Hoffman and High-Pippert, Fitzjarrald and Salazar, and the Optimization Group. (The full reference for each study is provided in the References section.) Work by Shelton Group, in partnership with SEPA, is extensively cited here, because it is the most extensive source of national market research on community solar to-date.

The program designer who wants to tap into this wide-ranging research for baseline market intelligence, might focus on two key questions:

- Who is interested in community solar?
- What specific program attributes are they interested in?

Utility-program researchers often draw on national survey work first, because large-scale, nationwide research generally applies to a wider audience. As the utility comes to understand the local market better, the conclusions drawn from national surveys may need to be adjusted. Further, *it is important to remember that community solar is in a relatively early stage of market development*, so specific market research data is scant and easily outdated. For example, program scale can have a significant impact on how customers see a program offer—whether customers are asked to become pioneering participants of a small, new program or whether they are asked to join in a similar program that seems expansive and well-established. Moreover, whenever interpreting survey findings from other sources, there are several caveats that the reader should consider. These caveats are presented below, in the context of what today’s available community solar market research can tell us.

## Who is interested in community solar?

Customers interested in community solar are generally thought to be those who have an affinity towards the environment and solar, but are more cost sensitive than those who buy rooftop solar and/or do not have the option or do not want the burden and risk of installing rooftop solar systems. Notably, Shelton (2016b) found that customer groups most interested in solar leases (i.e., leasing panels or kW shares) are very different than those interested in a community-solar subscription program (typically paying per kWh or kWh blocks); thus, any information describing “who is interested” must be tied to the general type of community solar offer, e.g., subscription or lease. Further, since results are highly sensitive to the customer’s education about community solar, it might be useful to ask further, what descriptors of leasing and rate options “connected” with these groups to drive their interest? Within Shelton’s survey of 2,000 residential customers nationwide in December 2015, the following target groups emerged:

- **Concerned parents were most interested in solar leases.** This included suburban parents ages 25-44, who are white-collar. This group was most concerned about saving money, the environment, being role models for their children, and time management.
- **Single suburban women over 45 were most interested in solar “block” subscriptions.** Based on the Shelton research, this group included women over the age of 45, most of whom (69%) are homeowners. This group was middle-class with no children at home; they cared about the environment, locking in lower energy costs, and being responsible.

Similarly, CSVP research for this brief included an unpublished study of an early community solar program at the Sacramento utility, defined by a \$/kWh subscription offer. Here, 40% of program participants appeared to be middle-income or above (>\$75K income); 90% lived in single-family homes that they own, and most were married. The study also found that those participating in the program also had higher than average energy use. Though not identical to Shelton national survey results, these utility-specific findings appear to be similar to the group identified nationally (as described above). Both sources indicate that these programs are currently appealing more to homeowners than renters, and that is counter-intuitive to a popular assumption that community solar is “ideal” for those, such as renters, who simply cannot pursue rooftop solar.

Renters, however, may be the target that utilities want to reach with a community solar program. They have been the target of some other, documented programs, like a SolarCity project in Minnesota that focuses specifically on renters. “To reach them, the company will offer streamlined signup, single-year commitments, and savings of up to 10 to 15 percent off electric bills” (Fitzjarrald & Salazar, 2016). Renters also may be prominent among the group of “millennials” that at least one source has identified as more likely to invest in socially conscious activities (Kopp, 2016).

Education about community solar is critical. Generally, customers lack information and familiarity with the term community solar. While the results above point out the groups most interested, several sources also show that respondent interest in community solar changed dramatically, after respondents were informed about what community solar actually is. For example, Shelton (2016b) noted that in one study, interest in community solar among residential decision makers moved from 14% to 47%, after they were informed about what community solar is. However, before interpreting results from outside surveys, it is important for utility researchers to know exactly how the term *community solar* was defined, i.e., what kind of expectations might have been developed, based on the education received (Cliburn, 2016). There are several definitions of community solar, some stressing the financial-savings attributes, others stressing local community spirit or environmental aspects, and still others that stressing the utility- or *non-utility* nature of the program provider. The definition implanted can affect survey results. The definition implanted also can reflect a survey bias, with lasting results.

Interest in community solar should be explored more, as many people are interested, but many are not considering taking specific actions—and even those considering taking action may not be likely to do so. For example, Table 1 below demonstrates how a single survey shows a clear drop in how many customers may participate in a new program, depending on the question they are asked.

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*Education about community solar is critical. Survey findings on interest in specific programs or program elements can significantly shift after some additional information (or education) is provided.*

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**Table 1. Example of Difference in Responses Within A Single Survey Based on the Question**

Sector	Interested in Community Solar	Currently Considering Community Solar	Very Likely or Likely to Participate in a Community Solar Program
	Single survey, nested questions - asked from left to right		
Residential	47%	14%	Not asked
Commercial	52%	19%	9%

Source: Shelton Group (2016a) and Shelton Group (2016b)

A review of existing community solar market research suggests caution in interpreting survey results from other regions of the country. Surveys (performed via the telephone or online) are often used to help determine interest in community solar. When reviewing outside surveys, it is wise to examine how the questions were asked, and whether they represent the full population or whether they screened for a sub-group that was already pre-disposed toward community solar. In reviewing other research, it is also important to ask, *How similar is this utility to my utility*, and, *Are there multiple studies that show similar results?*

## What community solar program attributes are customers interested in?

While there is not a lot known about exactly why customers participate in community solar programs, some research indicates that the preference for community solar over other solar options is largely driven by economics. For those customers who prefer community solar over rooftop options, their rationale is that they cannot afford to purchase rooftop solar (39%), they do not want maintenance costs (39%), they want less risk (28%) and they want more flexibility (24%) (Shelton, 2016b). Some utilities believe that the ability to achieve energy independence is a dominant motivator (Hoffman & High-Pippert, 2015). Other utility program administrators hypothesize that some customers choose the community solar option for “convenience,” to “help out” or “do their part” in a community-oriented program (Fitzjarrald & Salazar, 2016).

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*In reviewing others’ research, program designers may ask:*  
*How were their questions prepared?*  
*How comparable are their geographics and demographics?*  
*Are there multiple studies that show similar results?*

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A study by the Pacific Consulting Group (PCG) found that two of the three most persuasive messages about community solar are ones that emphasized financial factors (PCG 2016). The top three messages were: 1) every homeowner or renter is eligible, 2) there are no start-up cost or investment required, and 3) assuming that offer can deliver savings immediately or over time, that community solar saves you money.

Based on all available studies of customers who are interested in community solar, the customer preferences that are most likely to apply nationwide include:

- **Lower costs, relative to other solar options:** Cheaper options (lower premiums and no sign-up fees for block subscriptions, or lower costs per panel, with financing where it makes sense) have appeal. “Customers tend to respond best to offerings that are priced at a small premium or even a discounted rate, compared to their current bills. (Fitzjarrald & Salazar, 2016)” A popular alternative is to “lock in” the \$/kWh for solar generation on a subscription program, so that customers save as typical utility costs rise.
- **Beneficial terms:** Shorter terms for panel-lease programs, and longer terms for subscription programs, but with no penalty for early departure.
- **Real-time information:** Real-time panel production that is visible to customers
- **Local siting:** According to several studies, community solar sited in the community is generally preferred. Shelton (2016a) reported that some customer segments, such as

young families choosing leased-panel options, customers prefer local siting so strongly that they would pay a slight premium for it. However, it is advised that utilities test whether a locally sited solar would add program value (or under what conditions) in working with other customer segments.

Across these four bulleted points, cost is cited as the most important. This might be expected anywhere; however, the best pricing offer for a specific target market, as well as the importance of other terms and options, such as real-time information and local siting, could vary. Further, these attributes may be packaged in many different ways, and specific combinations or variations can affect customer interest. CSVP has documented a proposed offer from one Southwestern utility that promotes likely, long-term savings, but puts more emphasis on a no-hassle, fixed-bill pricing strategy (Cliburn, 2016). Although there can be differences in the type of people choosing among various options (see Table 2 below), the research reveals that people are currently about evenly split between preference for panel leasing or subscriptions. The trend among utility-led programs is to favor the subscription model, so time will tell whether customer interest shifts as the subscription model becomes more refined.

**Table 2. Differences in Participant Interests in Community Solar Options, Based on Data From a National Market Survey**

	Residential Comparison		Commercial Comparison	
	Likely Panel Lease Participants	Likely Subscription Rate Participants	Likely Panel Lease Participants	Likely Subscription Rate Participants
<b>Age</b>	Ages 25-44	Ages 45+	Younger executives (CEO/CFO/COO)	Older - more likely to be owner / partner
<b>Ownership</b>	Homeowner / renter (72%/28%)	Homeowner / renter (69%/31%)	Own their building	Lease their building
<b>Size/ Income Level</b>	\$50K+HH	Less than \$75K HH	Small to mid-size companies	Small companies
<b>Interest</b>	Want to save money and be a good role model.	Like the idea of locking in lower energy costs, want to be responsible and not waste.	Interest driven by reducing energy costs and being a good corporate citizen	Interest driven by reducing energy costs and wanting more control / independence from electric utility
<b>Geography</b>	Northeast part of the US	Somewhat more likely to like in the Southern part of the US	Midwest part of the US	Midwest or Northeast part of the US

Source: Shelton Group (2016a) and Shelton Group (2016b)

Attributes can be packaged in many different ways, and the specific packages can affect customer interest and participation. This also means that by varying the different program options, utilities can optimize their product or maximize the number of participants. Each utility will have unique results, but utilities can learn from the successes and shortcomings of other, current programs.

Available market research suggests that developing a customer-centric offer can make a huge difference in program success. This includes attention to characteristics such as the utility serving as point of contact, the proper term of the offer, no/low entry or exit fees, the location of the project, and how well the program communicates about month-to-month generation and value, among other aspects of the offer.

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*Market research can be used to explore program-design trade-offs. It also helps in prioritizing market segments and methods to reach them.*

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Conversely, there are utilities that are wary of quick program growth and its impact on utility revenues or on solar market penetration. Field experience suggests that adding barriers to customer participation, such as a significant sign-up fee, create more risk than reward for the utility. Community solar program pricing is a particular challenge for utilities, but it is better to introduce a program that anticipates sustained customer retention and steady program growth. (For example, one solution that a few utilities are testing involves fleet pricing. Assuming solar costs decline as the program grows, all participants could see greater savings in future years.)

Utilities may be drawn to the finding that customers prefer strong involvement by the local utility company. However, details on this research question are relatively scant; one might assume that the strength of the response would be related to the utility's other metrics on utility customer satisfaction and trust.

Across multiple studies, the “costs” of participation have proven to be important. One research survey found that people want to lower their electric bill and to have low/no startup costs (Optimization Group, 2013), and another found that interest in participation dropped rapidly beyond a 10-year payback and with the prospect of rising monthly bills. (Hoffman & High-Pippert, 2015) The Hoffman and High-Pippert study also showed a preference for placing community solar projects on brownfield sites or on community assets, such as schools or church roofs, assuming the solar could be sited within their community.

A fourth research study analyzed data from three scenarios<sup>2</sup> and was able to determine a 36% projected market penetration when a program provided a package to include \$0 initial investment, a fixed rate for the solar portion of the bill, participation covering 25% of the bill, a month-to-month contract (instead of long-term commitment), and when consumers could expect a 3% immediate decrease in their monthly bill (PGC, 2016).

In addition to this research, actual experience shows that the attribute mix can affect participation. For example, one utility doubled their subscriptions within six months when they changed their design from a fixed monthly payment for 5 years (of \$15) to an offering with no fixed payment and an additional 18 years of continued bill credits for the power produced from their panels (SEPA, 2014).

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<sup>2</sup> This type of analysis is also called conjoint analysis.



Individual study findings may not map directly onto a particular utility's program design, but multiple study trends suggest that utilities should strongly consider customer preferences when they develop their offers. Further, they should use customer surveys (discussed under Step 4) to look at the trade-offs of various options and how the trade-offs may affect participation.

## Take-aways when reviewing outside research

The studies described in this section offer some good information for utilities, but utilities must go further to explore topics specific to their offering, for their specific customer base.

When interpreting the results from outside resources, program designers should:

- Consider how people are asked questions within a survey and the way the questions influence the results;
- Determine whether the results represent the full population, or just those already pre-disposed towards solar or community solar;
- Ask if the utility from which research is gathered is similar to the utility territory where the program will be implemented. If the economic or demographic conditions are very different between the two, customers may respond differently than what the case study describes;
- Look for multiple examples or case studies and see if results are similar. Even absent knowing details about the other utilities in the case studies, when results begin to show up multiple times, a trend arises, and the likelihood of getting similar results increases. One source of case study information is the Community Solar Value Project website, and Utility Forum network: <http://www.communitysolarvalueproject.com>.

For utilities that do not have the resources to conduct their own literature review and understand the latest research findings in the market, there are research services that can provide insights. A number of energy-focused market research firms offer relevant services. For example, the Smart Grid Consumer Collaborative (<http://www.smartgridcc.org>) offers research and insights relevant to local solar and integrated DER offerings. E Source, a utility-oriented research and consulting firm, offers an annual research service through its *Solar Customer Project*. This is a subscription-based service that explores residential and business customers' desires, opinions, and likely actions related to solar, so that utilities can incorporate this information into their solar strategies. This product combines new customer research, industry and solar installer intelligence, and marketing and communications best practices to help utilities: 1) develop or refine solar and DER customer strategy, 2) design solar-related customer offerings, 3) develop effective approaches for solar education and communications, and 4) identify opportunities for partnerships and stakeholder engagement. See <https://www.esource.com/about-solar-customer-project> for more information.



### Step 3. Mining Customer Data: Digging Into Existing Data

Mining existing customer data—including digging into utility marketing or corporate-communications knowledge—can tell community solar program designers a lot about the sub-groups, or segments, within their customer base, and each groups' potential to be interested in a community solar offering.

The best way to approach this is to work with the utility's marketing or corporate communications team, as well as related program teams, to fully understand the customer data that are available. This may include energy usage, payment history, preferred communication channels and web-based interactions; details of engagements with utility, as well as any other known behaviors. For utilities that have existing energy-efficiency, demand-response, or low-income energy programs, there may be a wealth of information in those program databases. Often, participant groups fall in certain geographic or demographic categories, or there is rich information on which customers are interested in optional utility rates or services. Examples of the types of information that can be surmised from an analysis of existing data include where to find sub-groups, or segments, that may be more receptive to community solar, such as customers who are:

- **Most likely to engage**, based on customer use of different communication channels and direct participation in related utility programs;
- **Identifying with green communities**, based on which geographic areas have been more active participants in past clean energy offerings, such as energy-efficiency programs or active installations of rooftop solar;
- **More tech savvy**, based on web interactions, interest and participation in smart thermostats, EV rates, etc.;
- **In higher usage and/or price-sensitive groups**, based on usage, usage patterns and participation in TOU rates or online energy audit options, where those are offered;
- **Part of customer groups pre-defined** in national community solar market research.

In the past, this type of data has been spread across multiple databases within the utility and only loosely connected, if at all. Today, however, many utilities are working towards centralizing customer data, so that it is accessible for in-depth analysis of customers. The centralization of data company-wide provides an opportunity for community solar programs; utilities with centralized data can access and use existing information to inform the development of community solar programs.

In addition to these databases, the utility marketing or corporate communications group may already have insights on what customers want. This could range from anecdotal information drawn from discussions between customer account managers and their customer base, to knowledge from past focus groups or surveys, to detailed customer segmentation schemes. Open discussions with those who have knowledge about past communications and market research can provide insights. Moreover, it is important for the program designer to ask whether anyone within the utility has done any work on segmentation, whether it is fully available or in some developmental stage. Segmentation may include broad-based categories that are used for marketing. This is more of a macro-segmentation into 4-6 broadly defined "types" of customers, which may go so far as key demographic characteristics, or more granular

sub-groups identified through a micro-segmentation that takes into account their lifestyle characteristics. For example, Figure 4, below describes a segment that is likely to “download music” and “go to zoo.” CSVP has found that some community solar program designers were not aware of the richness of customer data that turned out to be available to them, so this type of internal “asking around” is highly recommended.

For utilities already using a segmentation schema for their customers, key areas to investigate include:

- Whether this is available for residential customers only, or both residential and commercial customers;
- Whether the utility uses a pre-packaged or subscription segmentation (e.g., Prizm), or whether it employs a firm to build a more customized segmentation scheme;
- Whether each customer record is assigned to a customer group or not.

Overall, pre-existing utility segmentation schemes can be very valuable to the design of a community solar program. They can help identify the best customers to help achieve broad community-solar objectives, what is important to these customers, the size of the market, and potentially where community-solar projects should be located (i.e., which communities would be more favorable to a community solar product). Often utilities have this information, but program designers or managers from specific technical groups, such as the solar program group, are not aware of it, unless they ask specifically about it.

In general, there tend to be three types of variables used to identify similar residential customer segments: 1) geographic or demographic variables, 2) attitudinal variables, and 3) behavioral or transactional characteristics (Schroeder, 2000). These can be combined in various ways to shed light on customers. Some utilities have designed their own custom macro-segments, while others have used available segmentation resources, such as:

- **Demographic or Psychographic Variables:** Companies such as Experian, Acxiom, or Equifax offer customer data at the zip code level that can be used to go beyond the meter to understand customer’s households, preferences, and attitudes. This type of information can be purchased and appended to each utility customer record, and can prove valuable for utilities that are conducting their own segmentation research. However, the information is not always directly applicable to the task at hand; the utility will need to conduct its own analysis using this data.
- **VALs “Value and Lifestyle.”** There are also commercially available segments, based on attitudinal variables, such as VALs, which is a segmentation schema created by SRI International, a California-based non-profit R&D firm. VALs is built off the belief that consumers with similar attitudes and psycho-demographic characteristics will exhibit similar behaviors. It was developed based on responses to a battery of questions about risk, status and attitudes and can be useful for identifying or ranking program offers. For utilities, it may be difficult to connect to their geographic region and customer base, since this segmentation is based on values and lifestyles rather than geo-demographics.
- **Prizm.** There are also commercially available segments that are more targeted geographically, such as the geo-demographic segmentation scheme in Prizm. This system was created by Claritas, Inc. and is now provided by The Nielson Company. Prizm is based on the belief that similar households tend to group together by

geography. It tends to be meaningful for utilities because it describes customers in a way that can be used directly in a marketing strategy. Prizm takes all U.S. households and divides them into dozens of segments to provide a granular understanding of customer segments based on household lifestyles, from what people like to eat to where they like to go for recreation, to their use of personal technologies, and more. Segment-identifying information may be appended to each record in a utility's customer database. Prizm has been used for media buys for many years, so market research teams within larger utilities often have access to this or some similar research. If not, they may be interested in getting this type of resource. Prizm is not specific to energy use habits when used in its basic form (as opposed the Nielson/E Source partnership discussed below), so while it provides valuable insights, it will not give direct information on who might be interested in specific community-solar offers.

Among utilities that have segmentation efforts, customized segmentations and Prizm appear to be the most common. Where a segmentation scheme already exists, this can be tapped into to look at who the utility is serving already with existing solar offerings, who might be interested in community solar, and/or who the utility might need to serve. Notably, among the Prizm segments, some utilities have found that groups such as “Movers and Shakers,” “Upper Crusts,” and “Kids & Cul-de-Sacs” tend to participate in solar offers more than the other groups (Kopp, 2016). The Sacramento Municipal Utility District (SMUD) is one of many utilities that has used Prizm data for many years, along with other types of market research to create more successful, customer-centric programs.

In addition, SMUD and other utilities are beginning to use more customized segmentation products. Nielson and E Source have collaborated to create industry-specific residential consumer groups, created around metrics that are important and relevant to utilities and energy companies, i.e., Residential Energy Segments. The seven key energy-related segments include: 1) Plugged In Families, 2) Recycling and Rebates, 3) Online Pragmatists, 4) Rural Reducers, 5) Thermostat Turners, 6) Young Renters, and 7) Unengaged Owners. These groups are clustered and described based on syndicated research by Nielson and Mediamark Research (MRI), regarding participation in energy efficient behaviors, energy consumption, and energy and environmental attitudes, as well as housing and demographic data. While still not specifically tied to solar preferences, this kind of segmentation can be used as a first attempt to size the community solar market and understand who might be interested in specific program offerings.

Note that among the seven residential energy segments, “Plugged-In Families” tend to have the highest propensity for solar based on their psychological characteristics (Sumner, 2014). See Figure 4 below for a description of this group.

## PLUGGED IN FAMILIES



17%

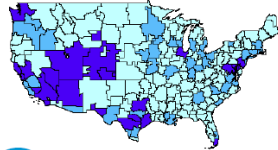
U.S.  
Households



### Energy Efficient Program Participation

#### ENERGY BEHAVIORS

- Participate in Appliance Rebates, Load Management Programs
- Use Programmable Thermostat to Adjust Temp in Off-Peak/Seasonal
- Use 11+ CFLs, Light Timers
- Use Sprinkler Timer; Have Low Water Plants
- Drive Hybrid, Plug In Electric Vehicles
- Participate in Time of Use Rates, Real Time Pricing
- Participate in Online Energy, Whole House Audits
- Use Energy Company Online Service to Monitor Use
- Have 2+ Refrigerators
- Added Shade Screens to Save Energy
- Use <10% of Monthly Income for Energy Bills



### WHO THEY ARE

#### DEMOGRAPHICS

- Age 25-54 (40% Age 35-44)
- Income \$75k+ (63% \$75k-\$200k)
- Married Couples with Kids
- 84% Work Full-Time
- 74% Caucasian, 6% Asian; 14% Hispanic

#### HOUSING CHARACTERISTICS

- 84% Home Owners
- Reside in Urban, Suburban Areas
- Home Value \$200k+
- Length of Residence 1-4 Years
- Home Built, 2000 or Later



### WHAT THEY THINK

#### ATTITUDES & OPINIONS

- Prefer Carbon Neutral/Green Energy: Solar Power
- Would Pay \$10 More per Month For Smart Meter Service
- Conserve Energy to Improve the Environment
- I Feel I am More Environmentally Conscious than Most



### LIFESTYLE & MEDIA CONSUMPTION

#### LIFESTYLE & SHOPPING

- Active Lifestyle: Jog, Ski, Weight Lift, Exercise at Club
- Download/Purchase Music; Go to the Zoo
- Spend \$200+ on Children's Toys; Rent Children's Videos
- Shop at The Gap, Old Navy, Costco, Best Buy, Target

#### ONLINE

- Heavy Internet Users
- Order from amazon.com, zappos.com, ebay, target.com
- Use Internet for Real Estate Information, Download Music, Financial Information
- Visit cnn.com, expedia.com, iTunes.com, shutterfly.com

#### MOBILE

- Use Apps Multiple Times a Day
- Use Cell Phone or Tablet to Access WiFi
- Has iPhone or Blackberry

#### RADIO

- Above Average Radio Listeners
- Listen to Contemporary Hits, Alternative Rock

#### PRINT

- Read Parenthood, Sports, News Weekly Magazines

#### SOCIAL MEDIA

- Use Facebook and Twitter Daily
- Use LinkedIn Weekly or Less often

Figure 4: Example of Residential Energy Segment Group with higher propensity for community solar (Sumner, 2014).

Utilities, such as SMUD, have been able to use the data from Prizm and the Residential Energy Segments, as well as data that they collected on their customers, to build a strong foundational understanding of who their customers are. Through a comprehensive data analysis, they seek to design programs with customers' goals in mind. SMUD is taking a utility-wide effort to look at the needs of customers in order to understand who the customers are and design program offers that meets their needs. In fact, SMUD currently has several "SolarShares" program offers for different customer segments; larger utilities may be able to follow suit in that approach (Cliburn & Powers, 2016). Specifically, they looked at known data, e.g., from Prizm/E Source and their own customer data, to understand their various customer groups, and then they rank-ordered their segments, based on which groups might be interested in programs such as community solar. This allows them to estimate the size the potential market and design customized program approaches (Kopp, 2016).

SMUD also took the analysis one step further, to incorporate a proprietary framework developed by Strategyzer, called the Business Model Canvas ([www.strategyzer.com](http://www.strategyzer.com)). This tool look at whether the existing

*Leverage existing data  
collection efforts to gather  
basic information on  
customer needs and wants,  
related to the new program*

offerings line up with what customers are looking for. This step was followed by utility-specific research, including focus groups, surveys, etc., with customers, to understand specific wants and needs. All of this is being used as an input to the utility's community solar (SolarShares) program design and marketing (Kopp, 2016).

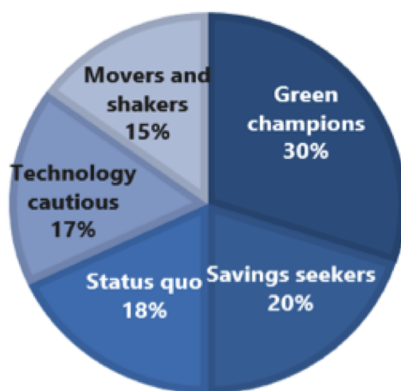
Overall, when designing a community solar program, the program designer should assess and tap into existing data sources within the organization and explore existing market segmentation efforts. This will help size market and explore options. More general data should be coupled with specific data, to hear directly from customers, if at all possible.

## Types of Segmentation

Macro-segmentation divides a population into groups, while micro-segmentation divides the population into smaller groups or individuals. Micro-segmentation is a targeted approach for reaching select customers, and in the case of utilities, can be tied to individual records within the customer database so that it becomes more actionable for the utility. However, micro-segmentation does require more resources (both financial and analytical) to implement a broader macro-segmentation effort.

### Macro-segmentation

- 4-6 groups representative of population
- Segment has similar characteristics
- General approach for reaching



### Micro-segmentation

- Smaller groups, or individualized
- Tied to individual records within customer database
- Targeted approach for reaching select customers



Figure 5: Types of segmentation (Sumner, 2014).

## Step 4. Interviewing Customers: Data Collection and Analysis Specific To Community Solar

Because each utility has its own needs, there are a few questions that a specific utility program designer should consider before beginning new, utility-specific research. Considering a few driving questions can help to define the specific research sample and questions for any community solar research effort. The questions below are followed by likely steps in the specific process of collecting program research.

- Why am I running this program?
  - E.g., To retain certain groups of customers or reach customer groups we haven't been able to reach through other program offerings; to reduce costs of renewables integration, or to fill another specific customer need?
- Is the program focus on residential, commercial or both?
- What options do I want to explore with customers?
  - E.g., Price points and terms, visibility/importance of local siting, importance of real-time information, desire for recognition?
- Do I have a sense of the program name and marketing messages?
  - What messaging options are we considering (good for planet, lower energy costs, independence from utility, take your kids to see your solar array, avoid hassle, affordability, you can be part of the solution)?
  - Do customers need education about what community solar is, or on technical terms, or on what type of information is needed to persuade them?

### 1. Determine ability to collect data through primary research and leverage cross-departmental resources for gathering data

For organizations with limited resources and/or organizations hoping to develop a step-wise effort to understanding customer needs before fielding a larger-scale survey effort, there may be an opportunity to leverage cross-departmental resources to gather information about customer interest. For example, many utilities have:

- **Existing market research panels**, that is, a group of customers that answer a short online survey on a monthly or bi-monthly basis,
- **Annual customer satisfaction surveys**, or
- **General population surveys** for evaluation efforts or other reasons.

While these existing survey efforts have other purposes, there may be an opportunity to add one or two questions to specific to interest in community solar. When coupled with the existing demographic data, which these surveys already collect, one or two more questions about interest in community solar or about aspects of this program offering, could be useful.

## 2. Conduct qualitative research, such as focus groups or in-depth interviews, to explore issues

When the program designer has resources for a multi-step research approach, qualitative research on the front end can allow the program to test various options for offerings. This is particularly useful for a complex program—like community solar—that people may be unfamiliar with. Among utilities that have conducted focus groups before designing their community solar programs, they often have a difficult time getting respondents to understand the topic. The qualitative interactions in a focus group allow one to provide more information on the products than in a traditional survey. Focus groups can help refine how to succinctly ask about community solar, and give feedback on terminology that might be difficult for customers to understand. Focus groups also can help narrow options when there are too many options to test through a survey.

However, in focus groups, the information that customers receive from the utility or from each other can shape the research outcome. Customers can influence each other through the group dynamic, and results cannot be extrapolated to the larger population, whether because of small sample sizes and the fact that these groups tend to screen for those with some inclination towards solar. As such, coupling focus group findings with a survey effort is very important.

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*Use focus groups to test understanding of program terminology, to learn about effective messaging, and to identify options for further research.*

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If targeting business customers, in-depth interviews may be more efficient, or the utility could use new methods of web-assisted, in-depth interviews to show information while discussing a topic. For utilities that do not have robust resources for market research, they may be able to draw on customer service representatives, or others who interact with customers day-to-day, to understand customer needs.

As an example of research customization, San Antonio-based CPS Energy, which has advised the CSVP, conducted focus groups. It found that focus group participants initially felt all solar programs, including community solar, were for higher income customers. Because this utility wanted to structure its program to be available to all customers, they used the results of the focus groups to understand general acceptance and attitudes toward community solar, and then they adjusted their customer-education and marketing to make sure that the offer would appeal to a broader group (Wagner, 2016).

## 3. Conduct customer surveys to test hypotheses and explore alternative options

The best information to understand how to design the program, and potential uptake of a community solar offering, may come directly from customers. Customer surveys can explore:

- Upfront cost compared to monthly premiums
- Preferred contract length
- The importance of geographic location
- Optional companion offerings

- Key motivations for investing
- Messaging
- Trade-offs between the factors above

Surveys can be fielded by email, phone, or both, depending upon the availability of contact information and the targeted group that the programs wishes to reach. Web-based surveys are often lower cost, and can allow for more sophisticated trade-off analyses, but the researcher should be careful to make sure that any web-based group is somewhat representative of the groups being targeted. For example, if using lists of customers who already engage with utility through internet to pay their bill, it is important to consider how representative this is of the full population (e.g., do 10% of population have e-mail addresses, or closer to 60% of the households or businesses?), and who might not be represented (e.g., non-tech savvy customers).

Be aware that one key finding of the SEPA/Shelton research on community solar was that most customers know very little (if anything) about community solar at the outset. Survey findings may be of limited use unless this information gap can be addressed. According to some program designers (Cliburn, 2015), use of predictive market-segmentation research on customer lifestyles is a valuable complement to survey work, in order to better predict customer interests in this new product offer, which may be hard to describe. If the program designer's utility can sort by market segments, then one could sample by targeted groups, or cross-reference a general-population survey by identified segments. For community solar, there also may be a desire to sample geographically, for areas where the program anticipates siting the solar project.

Ultimately, the best approach will depend on the targeted group/s and available budget, but regardless of the approach, any program survey should be designed with the end point in mind.

#### **4. Consider best approach given budget and needs for expertise**

Some utilities may find that they need external help from a consultant or subscription service. There are several private research companies and membership groups that can offer assistance. For example, E Source's PV Predictor can help utilities examine their customers' propensity to go solar. This is a "predictive analytics propensity tool" to help identify utility customers with the highest propensity to go solar. It is part of a customer-centric approach to predicting customer interest in solar, based on proprietary E Source research on customer interest and behaviors. It can provide 1) a propensity-of-adoption score for a customer segment and/or individual customers; 2) projected total adoption (in MW) across the service territory; 3) actionable recommendations on the most effective solar-related targeted marketing and communication approaches. Note that this tool has been developed primarily for rooftop solar programs, but that it may be adapted to community solar needs (Schofield & Garrett, 2016).

Other consultants offer similar services, both more or less detailed. The utility program designer may opt for expert assistance in pulling various sources of market research together and providing recommendations for several reasons, such as 1) practical issues, such as deadlines requiring focused attention, 2) the opportunity to get a "second set of eyes" that are unbiased by internal utility culture, 3) the opportunity to increase customer trust in findings.

Community solar program managers that tap outside support are still wise to work closely with other utility departments, in designing the program and determining a marketing plan.



As they assess their capabilities and needs, utility program designers may find that they identify with one of two groups:

- **Limited Resources - Leveraging:** For a program designer who has limited resources—that is, minimal existing data on their customers, and not a lot of resources available to field market research, or to specifically interpret the needs of the customer base with respect to community solar. There are usually options for these program designers to work across departments to leverage other data and data collection, as well as to look for outside support.
- **Robust Resources:** The program designer who works in a utility that has already transitioned to a customer-centric approach, or that is considering shifting more broadly to that approach. This program designer may integrate many sources of existing data and segmentation work into the program design and marketing stages. This will help target the program, reduce customer acquisition cost, and/or appeal to certain market segments to retain customers. Those program designers in this group may be ready to succeed with larger or more complex community solar programs, such as those that include companion offers related to demand response, energy efficiency, or storage. Yet, as they break new ground, these program designers also may identify specific needs for outside support.

## **Step 5. Developing a Program Design With Feedback Loops That Allow It To Monitor And Adjust**

Once the utility program designer has gathered the research needed to understand potential program customers, this information should be integrated with technical information, such as project siting and design, pricing, customer sign-up options and billing etc., to create a win-win for both the customer and the utility. From the market-research perspective, it is important to build in information feedback loops, so that any program can be continuously monitored and adjusted as necessary. For example, as the program rolls out, programs managers should look at who is participating and whether it aligns with the expected segments, and then tweak the marketing plan as needed.

It is critical in this final step of monitoring and adjusting to determine the best information to track (e.g., enrollment costs, take rates) for the chosen marketing plan. If designing a program for customer retention, program designers should look at customer participation and/or turnover within the targeted group. If the utility aims to lower customer acquisition costs, program designers should look at the costs of reaching out to and getting a participant for this program, versus for other utility programs. Many utilities also find it valuable to test various options to compare products or outreach methods to understand uptake, retention, and customer acquisition.

This final step also involves working with a cross-departmental group of utility stakeholders. For example, if early-stage inquiries about the program suggest problems with proposed project siting, then there may be time to make change—if not in siting, then at least in messaging. If customer acquisition seems hindered by a complicated pricing structure, then staff charged with pricing might make some adjustments. Likewise, if a recommendation of early market research proves difficult for technical staff to implement, or if customer-recommended terms prove unworkable, then the project team can adjust accordingly.

The five steps for using market research and market segmentation, as summarized earlier in this brief (Figure 2), will help program designers to develop a more customer-centric community solar program. Using a customer-centric approach that draws on market research and market segmentation can help build towards a successful, scalable, and more cost-effective community solar program offering.

For more information on the CSVP project, and additional resources to help design community solar projects, go to <http://www.communitysolarvalueproject.com>.

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