

Community Solar for the Southeast Gap Analysis Report

Introduction

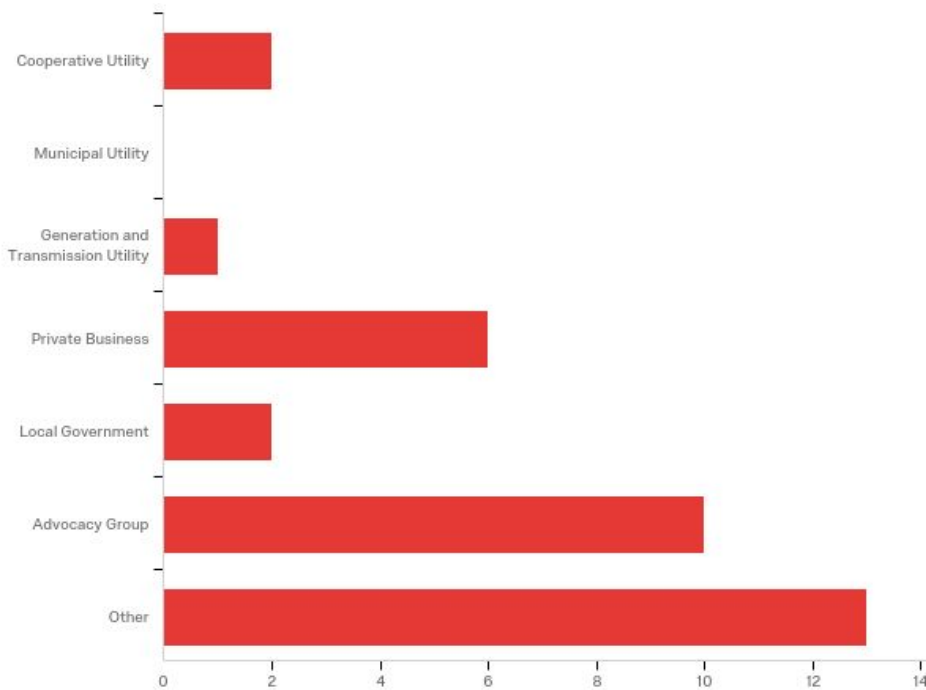
The goal of the Community Solar for the Southeast project is to support the development of community solar projects by electric cooperatives and municipal utilities in the southeast through technical support and resource development.

As member-owned and public power utilities, cooperative and municipal utilities are focused on meeting their customers' needs. Community solar is a natural fit for these utilities seeking more clean, local, and affordable energy. Public power utilities have fewer regulatory barriers and have greater flexibility to develop community solar projects. However, cooperatives and municipal utilities also have their own set of unique challenges. Phase I of the project is geared towards engaging key stakeholders to identify and build upon available resources and knowledge.

The project team organized workshops, interviewed key utility personnel, and conducted a survey to identify challenges that are unique to co-ops and municipal organizations in deploying community solar projects. The project team reviewed existing community solar best practices and identified gaps within existing resources that require further development. This gap analysis provides direction to working groups that will consider these gaps and develop resources tailored to fill these gaps. The findings will be published in our *Guide to Designing and Implementing Community Solar projects at Public Power Utilities in the Southeast*. This guide will cover specifics to cooperative and municipal utilities in the southeastern U.S., and serve as a guiding document for Phase II of the project, which is focused on providing technical assistance.

Key Survey Results

1. **Response Rate** - We received 33 responses to the survey out of 129 potential respondents; this is a 25.6% response rate.
2. **Average Time Spent** - Respondents spent an average of 8 minutes and 39 seconds completing the survey.
3. **Interest in Working Groups** - 11 respondents said they would be interested in participating in working groups on gaps and challenges, and another 11 said they would “maybe” be interested. 11 respondents said they were not interested in participating in working groups.
4. **Organization Type** - The respondents were affiliated with various types of organizations. The number of respondents by organization type is presented in the graph below:



5. **Community Solar Programs** -
 - 8 respondents indicated that their organization currently has a community solar program. 25 respondents indicated that their organization does not have a community solar program.
 - Of the respondents whose organizations currently lack community solar programs, 6 indicated their organization plans to have a program in the future,

and 18 said their organization is not planning to have a community solar program.

- 2 of the respondents whose organizations were not planning on having community solar had considered community solar programs but decided against them. 14 respondents indicated that their organizations had not considered community solar.

6. **Organizations with or planning Community Solar Programs** - Of the respondents with community solar programs, the number of respondents by organization type was:

- 1 cooperative utility,
- 2 private businesses
- 2 local governments
- 2 advocacy groups
- 2 "other"

Of the respondents planning to have community solar programs, there were:

- 1 cooperative utility
- 2 private businesses
- 2 advocacy groups
- 1 "other"

7. **Success of Current Programs** - Respondents expressed a generally positive assessment of the success of their current community solar programs. Most expressed that the programs had been at least somewhat successful, although many of the programs were still at early stages, making assessment necessarily premature. All of the respondents representing cooperative utilities and local governments expressed that their programs were still at too early a stage to judge success.

8. **Gap and Challenge Ranking** - We asked respondents to rank some potential gaps and challenges in order of importance. This was the resulting importance ranking based on rank-weighted averaging:

1. Program Model and Pricing
2. Limitations in Wholesale Power Contracts
3. Different State Policies
4. Unfamiliarity with Program Design
5. Integration with Billing
6. High Upfront Costs
7. Unfamiliarity with Storage Options
8. Cost-Shifting to Non-subscribers
9. Customer Interest

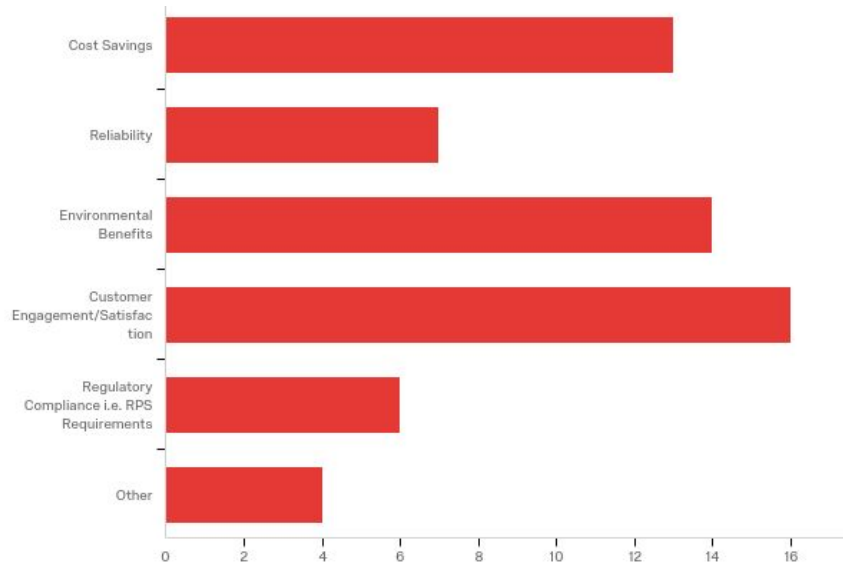
9. **Other Gaps/Challenges** - Respondents suggested some additional gaps and challenges in an open entry space. Two respondents highlighted dealings with investor-owned utilities. Another respondent indicated a lack of interest in new programs

from cooperative utility management. One respondent mentioned the necessity of obtaining city council support (presumably for municipal utility programs) and the need to consider the effect on city revenue allocation. One respondent indicated that the future of the investment tax credit was a challenge. One respondent wrote that the premiums placed on customer subscribers in various markets were a challenge, perhaps referring to difficulties promoting community solar to low-income customers. One respondent stated that overcoming misinformation was a challenge.

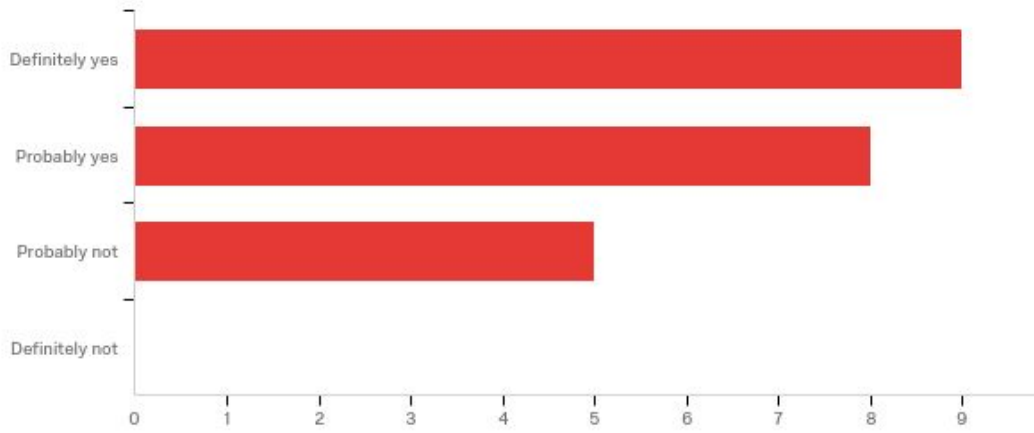
10. **Assistance/Service Ranking** - We asked respondents to rank some technical assistance and service options that the SES team may provide according to how helpful they thought these options would be. This was the resulting ranking based on rank-weighted averaging:

1. Economic Feasibility Analysis
2. Education and Promotion
3. Community Solar Program Design
4. Customer Survey
5. Joint Procurements
6. Site Assessments
7. Market Research
8. Power Dispatch Modeling

11. **Appealing Aspects of Community Solar** - Responses to the question “In general, which aspects of community solar are appealing to your organization?” are shown in the graph below:



12. **Solar Plus Storage Interest** - Responses to the question “Is your utility in any way interested in solar plus storage?” are shown in the graph below:



Key Takeaways from Survey

One message from the survey is that **customer interest** in community solar is not a major problem for community solar programs; customer interest was the least important challenge ranked, and customer engagement and satisfaction was the most important reason for organizations to find community solar appealing. Whether this characterization applies outside our survey population is unclear, but we can at least say that community solar programs with representatives involved in the survey are more motivated than they are challenged by customer interest.

Another message is that **program design** is viewed as a challenge. It appears that the technical and financial aspects of program design are not what is driving the concern here, as respondents indicated that site assessment, power modeling, and joint procurements were low priorities for assistance, and high upfront costs, although important to some respondents, were not highly ranked as a challenge overall. Instead, respondents seem more concerned by valuation and pricing issues, as well as legal and policy issues.

Respondents expressed a high degree of interest in assistance with **economic feasibility analysis**. This appears to reflect interest in valuation or cost-benefit analyses like what was performed for Fayetteville Public Works Commission, and ties in with the ongoing evolution and increasing complexity of solar valuation approaches taking place throughout the country. The increasing importance of energy storage will also have implications for solar valuation and will need to be addressed in program design.

The differences in state policies and **limitations in wholesale power contracts** were also viewed as important challenges. It is possible that a major program design challenge is figuring out how to design programs so that they do not conflict with state or utility rules, and make the best use of available policy-based incentives and compensation structures.

Based on the survey takeaways and our assessment of currently available resources, we classified the identified gaps and challenges into non-gap challenges, which the SES team will only address through technical assistance, and current gaps, which the SES team will address through both resource development and technical assistance.

Non-Gap Challenges

Several of the challenges identified by survey respondents may be addressed by existing resources. As there is no need to generate additional resources to address these issues, we refer to them as “non-gap challenges.” While these challenges do not require working groups or further research, they do present a need for technical assistance utilizing existing resources and tools.

The first non-gap challenge identified was **billing integration**. Multiple resources, including NRECA’s Community Solar Playbook, currently exist to assist utilities with integrating community solar fees and credits into the customer billing system, so additional resource development would be duplicative.

The next non-gap challenge identified by respondents was **community solar program design**. NRECA’s Community Solar Playbook and SEPA’s Community Solar Program Design Models guide both provide comprehensive information on utility-sponsored community solar program design. While these resources provide most relevant information related to program design, we found that two narrow issues within community solar program design - (1) the impact of energy storage on program design and (2) innovative credit structures, such as those based on the value of solar or time-varying rates - require further research and are discussed later in the Current Gaps section.

Another non-gap challenge identified was **customer interest**. Several resources related to program marketing and communications currently exist, including NRECA’s Community Solar Playbook and SEPA’s Utility Community Solar Handbook. Through use of these resources and targeted technical assistance, these challenges may be overcome.

Upfront cost was another non-gap challenge identified by respondents. While the team may provide information and technical assistance related to incentives, financing options, bulk procurement, and optimal RFP design, cost itself is a challenge that cannot be directly solved by the project team. Sufficient resources currently exist related to incentives, project finance, bulk procurement, and RFP design, such as the Database of State Incentives for Renewables and Efficiency, NRECA’s Community Solar Playbook, and project partner Rocky Mountain Institute’s direct experience in bulk procurement.

The final non-gap challenge identified was **overcoming misinformation or a lack of information** among both customers and decision-makers. A wealth of resources, including SEPA’s Utility Community Solar Handbook, currently exist that describe what community solar is, as well as the value and benefits it provides. Misinformation is a continual challenge, but it is one that may be addressed through technical assistance and provision of existing educational resources.

Current Gaps

These are challenges that this project will seek to address; there are currently few existing resources for addressing them, and the project team has the capacity to develop resources that will help address them.

1. Program Design Including Storage

The economics of electricity storage have improved rapidly over the last several years. Although storage options are generally expected to be helpful to solar, program design for community solar will need to adjust to make sure that storage is used economically. Resources for community solar program design therefore need to be updated or supplemented with information and guidance on how to incorporate storage into community solar programs.

The SES project team will convene a working group on storage with the aim of creating a resource examining program design for current and planned community solar projects involving storage. The valuation and credit rate working group described below will also consider storage and how it pertains to valuation and compensation.

2. Innovative Credit Rate Structures

While most community solar programs, like net metering programs, have traditionally credited participants at the retail rate, states and utilities are looking increasingly at alternative credit rate structures. In Hawaii, proposed community solar rules would provide time-varying credit rates to participants, while Minnesota is shifting toward community solar credit rates based on the value of solar. New York is now utilizing a “value stack” approach, whereby credit rates are based on the hourly locational value of the energy, the capacity value, the environmental value, and the demand reduction/locational system relief value.

Utilizing an alternative credit rate design can often provide for a more accurate compensation scheme. Introducing locational, temporal, or value-based variation increases granularity and may help avoid cross-subsidization - a concern noted by multiple survey respondents. However, these rate structures are generally much more complex to implement, especially in locations without wholesale power markets, like the southeastern U.S, and few resources are currently available about emerging credit rate options for community solar and how utilities may implement them.

The plus storage, and (3) how the utility may implement each design, both from a technical standpoint and a billing standpoint. As discussions around value of solar tend to be rife with debate about which benefits to include in the value calculation, the project team will work to provide objective guidance on different valuation options and methodologies, rather than advocate for one particular approach. The team will also incorporate rate design flexibility into

its technical model in order to analyze the impact on customer payback for technical assistance recipients.

NCCETC's pilot work with the Fayetteville Public Works Commission will help to inform discussion of this gap. Fayetteville's proposed project would credit participants at a rate based on the value of solar plus storage, rather than a standard retail or avoided cost rate. This case study will provide insight on the benefits of an innovative credit structure and the methodology behind it.

3. State Policy and Market Variations

State governments wield significant control over their electricity markets. However, while state laws and regulations may impact co-ops and municipal utilities to a degree, these utilities also have a lot of control over their own operations. Cooperative and municipal utilities are not governed by state rules they are limited by long term power purchase contracts with their generation and transmission providers or with merchant generators, which can further complicate the development of community solar projects. As a result of these variations, implementing community solar in each of the ten southeastern states covered by this project may come with ten different sets of challenges.

A complete understanding of the existing regulatory environment for community solar in each state will be crucial to the successful delivery of high-value technical assistance in this project. The responses to the survey showed that other stakeholders in the southeast agree with the project team's assessment that a full account of the policy environment for each state is a noticeable gap in the available resources.

The project team has created a draft document which provides information about the current policy landscape for each southeastern state. The team will convene a working group to fully document the policy and market conditions for each state, using the draft document as a starting point.

4. Getting buy-in from local leadership (city council, co-op board); tailoring to local political contexts

Aside from the resources developed by the NRECA, most of the existing resources for community solar are focused on investor-owned utilities. While many of the topics on community solar design are cross-cutting, public power utilities have different operational and regulatory structures with different end goals. Investor-owned utilities are for-profit companies that are regulated by and accountable to the state public service commission. Municipal utilities are government entities that are typically regulated by and accountable to the city council. Similarly,

electric cooperatives are non-profit entities that are member-owned and governed by the member-elected board. State public service commissions usually have limited purview over both municipal utilities and electric cooperatives. This independence provides these utilities with significant flexibility in terms of making decisions that are relevant to its jurisdiction or membership.

There is little existing literature that explores how this flexibility and local decision-making ability of co-ops and municipal utilities affects community solar development. Since both municipal utilities and electric co-ops are concerned about local community values, customer service, and community engagement, one can assume that they would be more likely to be interested in community solar. This working group will explore effective strategies to obtain support from city councils or co-op leadership bodies to develop community solar projects.

While both municipal utility and electric cooperatives are non-profit entities, they differ in terms of how they treat costs and savings from utility operations. A city council could choose to pass on the savings from utility operations to fund other city operations. Since rural electric cooperatives are member-owned, any excess of revenue collected is owed to the members and distributed according to the bylaws. Since community solar development requires upfront investment and can provide significant savings over its lifetime, a municipal utility and a cooperative may consider this through different lenses. This difference in treatment could impact the utilities' views on community solar development. This working group will examine these differences and how it impacts support from utility leadership.

Next Steps

The NCCETC will establish separate working groups consisting of project partners and other stakeholders to consider workable solutions to the gaps identified in this report. The stakeholder-driven working groups will provide guidance in creating additional resources for each of the identified challenges. The working groups will meet through conference calls and webinars when appropriate on a weekly basis and collect input from all participating stakeholders. The deliverable will include a white paper summarizing the working group findings and conclusions, which will be incorporated into the *Community Solar Design and Implementation Guide* published at the end of Phase I of the project. Lessons learned and any derivative work of the working groups will be incorporated into the next stage of the project.

Please contact communitysolar@ncsu.edu for more information. Additional resources are available at the project website - <https://nccleantech.ncsu.edu/community-solar/>.

Appendix

Survey Tables:

Gap and Challenge Ranking - 29 respondents had answers recorded to this question, but 9 of these respondents left the rank order entirely unchanged from the default; we assume these respondents did not actually answer this question, leaving 20 responses. The responses to this question are summarized in the table below. The top row contains the rank order options for each gap (1 being most important, 9 least important), and the left-hand column lists the gaps. The cells show the number of respondents that gave each gap each rank. The right-hand column gives an aggregate measure of importance for each gap based on weighting of the ranks given to each gap by the respondents.

	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6	Rank 7	Rank 8	Rank 9	Weighted Importance
Integration with Billing	1	5	1	2	5	2	1	0	3	107
Limitations in Wholesale Contracts	2	2	5	6	1	1	0	2	1	119
Different State Policies	5	1	2	2	3	2	3	0	2	113
Program Model and Pricing	3	2	3	3	4	3	2	0	0	120
Unfamiliarity with Storage Options	1	3	1	2	2	4	1	4	2	91

Unfamiliarity with Program Design	4	2	0	2	4	4	2	2	0	110
Cost Shifting to Non-subscribers	0	2	4	0	0	3	5	3	3	80
High Upfront Costs	4	1	3	1	0	1	4	5	1	98
Customer Interest	0	2	1	2	1	0	2	4	8	62

Services and Technical Assistance Ranking - 29 respondents had answers recorded for this question, but as with the gap ranking question 9 respondents left the rank order at the default and are therefore excluded, giving 20 considered responses. The table below summarizes responses to the question in the same way as did the previous table for the gap ranking question.

	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6	Rank 7	Rank 8	Weighted Importance
Customer Survey	1	5	3	2	3	1	3	2	94
Education and Promotion	7	3	1	3	1	3	1	1	114
Economic Feasibility Analysis	7	4	8	1	0	0	0	0	137

Site Assessments	1	0	0	4	4	6	2	3	69
Joint Procurements	0	2	2	2	5	4	4	1	77
Market Research	0	1	1	4	2	5	5	2	68
Power Dispatch Modeling	0	2	1	1	3	1	9	7	65
Community Solar Program Design	4	3	4	3	2	0	0	4	104