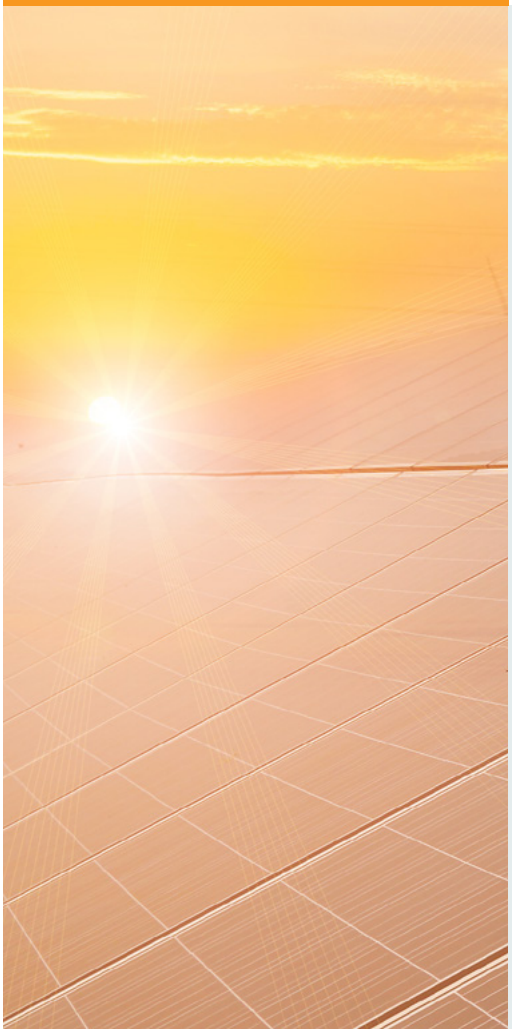
Quick Take

Community Solar

Let It Shine—How Community Solar Can Expand Solar to the Benefit of All Customers

By Carolyn Brouillard and Steven Fine, ICF



Shareables

- Community solar offers utility customers the option of supporting renewable energy and sharing in the benefits of solar energy without installing solar on-site.
- Community solar can be a cost-effective resource that is accessible to all ratepayers, provided compensation is based on the real value solar provides to the grid.
- A locational value analysis can help determine where a community solar installation can provide the greatest system value.

Customer interest in solar energy continues to grow. In the residential sector alone, the number of installed MW grew by more than 50 percent for the fourth consecutive year.[1] Until recently, customers wanting to "go solar" had only one option: rooftop solar. However, approximately half of households and businesses are unable to install solar on-site because of rental or leasing arrangements, shaded or otherwise unviable rooftops, poor credit ratings, or other limiting factors.[2]

[1] GTM Research and Solar Energy Industries Association, "US Solar Market Insight, 2015 Year in Review" (March 2016).

[2] David Feldman, Anna Brockway, Elaine Ulrich, and Robert Margolis, "Shared Solar: Current Landscape, Market Potential, and the Impact of Federal Securities Regulation," National Renewable Energy Laboratory (April 2015), http://www.nrel.gov/docs/fy15osti/63892.pdf

Community solar programs can solve this problem while also helping utilities satisfy customer interest in solar energy, expand available energy options, and gain experience with solar technologies. Other benefits of community solar include the economies of scale associated with larger solar installations serving multiple customers and the opportunity to place solar installations at strategic locations on the grid to maximize benefit and minimize interconnection cost.

Community solar programs also can present an opportunity to establish a fair and equitable rate for solar that allows for the recovery of utility fixed costs and recognizes the benefits that solar brings to the grid. Community solar is particularly ripe for advancing equitable rate design because these new solar programs may not be covered by existing net metering tariffs. This is due to community solar generation generally not directly serving a participating customer's load and, simply because community solar is a relatively new concept that was not contemplated at the time many states' net metering laws were developed.[3] Currently, only 14 states and D.C. have policies authorizing community solar programs.[4]

What is community solar?

Community solar, also sometimes referred to as "shared solar," offers utility customers the option of increasing the portion of their electricity provided by a renewable resource and sharing in the benefits of solar energy without installing solar on-site. In a typical arrangement, customers subscribe to a defined portion of a large solar array located within a utility's service territory and receive a credit on their electric bills for their share of the solar electricity sold to the utility.

Community Solar as an Opportunity to Advance Solar Rate Design

One of the most impactful and sometimes controversial questions when designing a community solar program is how to credit participating customers for electricity sent to the grid. How this question is answered determines the degree of impact to nonparticipating customers, which is the central issue in net metering debates taking place across the country. To make nonparticipating customers indifferent to purchasing solar energy compared to the grid-supplied alternative, the price paid for solar energy must reflect the costs that are truly avoided.

Programs that adopt a "virtual net metering" rate framework miss an opportunity to test new approaches to solar compensation that balance the interest in solar expansion with rate impacts. Virtual net metering allows community solar participants to apply a kWh credit against their total kWh consumption, reducing their contribution to the system's fixed costs.

In most jurisdictions, recovery of a significant portion of fixed costs occurs entirely or in part through a volumetric rate. It may be helpful to think of fixed costs like stairs in a house. The cost to build the stairs does not change based on how often they are used or whether people are going up or down—they are part of the infrastructure that connects the different floors of the house and allows people to move around. The distribution system is the same. The cost of being connected to the grid and having it available to import and export energy

[3] Several states allow virtual net metering, which may be an impediment to designing equitable rates for community solar.

[4] North Carolina Clean Energy Technology Center, "The 50 States of Solar: Q1 2016 Quarterly Report" (April 2016).

is largely the same regardless of how many kWhs flow in and out. Thus, when net metering customers are allowed reduce the kWh on which they are billed, they are also reducing their contribution to fixed costs, which must then be collected from other customers.

Drawing on ICF's white paper, *True Value of Solar*,[5] which outlines a value-based approach to solar compensation, the table below provides an overview of cost-of-service components and how they may be impacted by community solar.

Cost Component	Potential for Avoided Costs
Per-customer Costs	Community solar will not avoid basic service costs like the service lateral and meter.
Energy	Solar energy will avoid generation from other sources.
Distribution Capacity and Line Losses	Community solar can defer distribution capacity upgrades and reduce line losses if it interconnects on highly loaded circuits.
Transmission Capacity and Line Losses	Larger scale community solar facilities could impact transmission system needs depending on their location on the system.
Generation Capacity	If solar output is coincident with the demand characteristics in its load area, an aggregation of community solar systems could contribute to resource adequacy on the bulk system as well.

Based on this high-level analysis, bill credits should be limited to cost components that can be reasonably shown to be avoided or deferred. A locational value analysis can help determine where a community solar installation can provide the greatest system value.

Should incentives be necessary to stimulate the market or meet other program objectives, they should be treated separately from the rate design, be transparent to customers, and be responsive to market changes. This is consistent with the long-standing approach ICF takes in implementing utility energy efficiency programs: As the incremental cost of the premium efficiency product declines, the incentive is reduced to align with market conditions. This helps keep rates down for everyone and avoids certain customers or third parties earning excessive returns at the expense of utility ratepayers.

[5] Steven Fine, et al. "The True Value of Solar," ICF (2014).

About ICF

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Wrap-Up

The community solar market shows no signs of slowing down. More and more customers are interested in having the same choice and control over their energy use as they do over other areas of their lives. Community solar programs can tap this potential in a way that benefits all customers. By setting bill credit rates equal to the costs truly avoided, the interests of nonparticipating customers are protected.

About the Authors

Carolyn Brouillard is a Manager of Distributed Energy Resources at ICF. Carolyn has over 10 years of experience supporting transformation in the energy sector. She spent nine years in policy, strategy and regulatory roles at a major U.S. electric and natural gas utility, where she advised on a broad range of industry issues, including solar policy and programs. Ms. Brouillard has an MBA from the University of Minnesota and undergraduate degrees in Environmental Studies and English from the University of Colorado.

Steve Fine is a Vice President with ICF's Commercial Energy Division, and leads the Distributed Energy Resources Team. Steve has particular expertise in evaluating the economics of conventional and renewable energy resources—both central station and distributed generation—within the context of developing market design and environmental regulations. He works with many of the major US power companies and developers in evaluating the impact of technology trends, regulatory policies and business models on asset deployment, fleet compliance, and system capex.

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