Community-Solar Utility Programs

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Community Solar Value Project

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Community Solar Value Project interviewed five program managers at utilities across the United States to learn about their community solar programs.

Utility Solar Programs Evaluated

- Tucson Electric Power, Arizona
- Avista, Washington
- Cedar Falls Utilities, Iowa
- Pacific Gas & Electric, California
- City of Palo Alto Utilities, California

Tucson Electric Power has developed two solar programs over the last 5 years and is awaiting commission approval for the latest program revision.

Program Objectives and Development	
Key Program Objectives	Three program options: • **Bright Tucson Community Solar program** was developed to provide option for customers who wanted to participate without major capital outlay, regardless of roof or credit constraints. Program allows customers to opt out at anytime. • **Residential Solar Program (Rooftop)** enables TEP to retain RECs for RPS compliance and meet the residential distributed generation carve-out. TEP provides solar on customer roofs, as a hedge against future electricity price increases, and it protects solar customers from NEM and rate design changes. • **Proposed Hybrid Residential Community Solar Tariff** enables customers who can't have solar on their roofs to participate in the Residential Solar Program/ It saves development costs, as it draws on one large, community-solar system. • An objective of all three programs is to meet customers desire for electric rate certainty. Customers want a fixed rate per month, similar to cellphones.
Program Development Approach	• **Bright Tucson Community Solar program** was first developed internally by utility pricing and renewables groups. • **Residential Solar Program (Rooftop)** was first tested with a group of 30 customers, then in phase two with another 50 customers. In July, accepting an additional 200 program applications, followed by 200 customer applications every two-three months until the program is filled. • **Hybrid Residential Community Solar Tariff** is awaiting commission approval.
Third Party Role	• Use of third party developers to install residential solar program systems.
Program Website	• https://www.tep.com/renewable/home/bright/ • https://www.tep.com/renewable/home/residentialsolar/

Launched in 2011, the Bright Tucson Community Solar program was one of the first United State's community solar programs.

Program Characteristics	
Program Size	• 5-MW and 1,100 residential customers since program launch. An additional 18 MW reserved for larger customers (jurisdictional entities, large C&I customer) under special contracts. The energy is generated by solar power systems located in the Tucson metropolitan area. Additional solar resources are available to satisfy growing demand for the Bright Tucson Community Solar Program.
Eligibility	• The program is available to TEP customers paying Residential Service (R-01), General Service (GS-10) and Large General Service (LGS-13) rates. Each participant can purchase enough 150-kWh blocks to meet their entire electric needs with solar energy. Blocks of solar energy purchased through the program are associated with a specific service address and cannot be transferred. If program blocks are still available, customers can subscribe for the program again at their new address at the current solar energy rate.
Market Research	• TEP did not perform market research before developing a program. Knew customers wanted access to solar through a community solar program. Positive response to the program shows the great demand.
Procurement	• Procures PV using the RFP process or self-develops. Utility locates the parcel of land, performs preliminary engineering and cost estimates. Utility choice of a good interconnection location for the project is very important. TEP may utilize either a PPA or self-own the solar projects. TEP has developed their own internal project development and management group that procures the project equipment and TEP only hires a third party general contractor for the system construction.

The Bright Tucson Community Solar program raises $400,000 annually to fund additional renewable energy resources.

Program Characteristics	
Cost	• Solar tariff ($/kWh) = Average blended winter and summer fuel cost ($0.035) + fixed solar tariff 20% adder ($0.02) + T&D costs (flexible over time). • Pricing assumes most people will spend a few extra dollars to support solar. The current retail rate is about $0.10/kWh, so asking customers to pay an extra 20% or $0.12/kWh was considered a reasonable premium. • Purchased in 150-kWh per month blocks for an additional $3/block premium over standard electric rates. • This premium is used by TEP's annual renewable energy plan for developing additional renewable resources and helps TEP meet RPS.
Bill Credits	• Bill is credited in 150kWh per month blocks. The program is not designed to reduce customers' electric bills. Rather, it offers an easy, affordable way to meet your electric needs with clean, renewable energy.
Program Duration	• 20 years from when contract is signed, with rates remaining fixed other than being subject to non-fuel rate changes. Customers can cancel their participation in the program at any time. The program is still accepting customers.
Federal ITC	• Claimed by TEP or project developer
Production & RECs	• 150 kWh guaranteed in exchange for a $3/block monthly premium; TEP owns RECs.

Launched in 2015, TEP's Residential Solar program (rooftop) offers customers the opportunity to go solar with no installation or maintenance costs, while enjoying stable long-term energy prices.

Program Characteristics	
Program Size	• Program available for up to 600 TEP residential customers; 4,700 customers are currently on the program interest/waiting list.
Eligibility	• TEP residential customers, regardless of FICO credit scores. Residential customers lease their roof to TEP to install solar and receive a fixed monthly energy rate for the 25-year program agreement.
Market Research and Marketing	• Due to the success of the Bright Tucson Community Solar program, TEP identified the need for this program.
Procurement	• Procures PV using the RFP process and builds solar on the customer's rooftop.

Under the Residential Solar program (rooftop) , the customer's monthly bill remains relatively the same with the potential to save money in the future as utility rates rise.

Program Characteristics	
Cost	• Residential community solar tariff uses a price of $16.50 per KW to calculate the fixed rate. • The rate would be evaluated annually and increase or decrease if consumption increased or decreased by 15%. • A cost-shift occurs between non-participating and participating customers, however, the shift is about1/3 the cost-shift of a customer buying their own system or going to a 3rd party under current NEM rules.
Bill Credits	• None, as residential customer doesn't own the system. Charged a fixed electricity rate similar to their previous electricity retail rate.
Program Duration	• 25 years fixed term
Federal ITC	• Claimed by TEP
Production & RECs	• TEP does not guarantee a certain level of production; TEP owns the RECs.
Energy Efficiency	• Energy efficiency is encouraged through this program because the customers rate can decrease if electricity consumption decreases by 15%.

TEP's proposed Hybrid Residential Community Solar Tariff program is a hybrid of the existing Community Solar program and Residential Solar (rooftop) program.

Program Characteristics	
Program Size	• 5-MW system developed by the utility instead of individual PV systems in the existing TEP Residential Solar (rooftop) program.
Eligibility	• TEP residential customers.
Market Research and Marketing	• Due to the success of the Bright Tucson Community Solar program, TEP identified the need for this program. Program allows TEP to cut solar installation costs when compared to installing solar PV on individual rooftops.
Procurement	• Procures PV using the RFP process. Utility locates the parcel of land, performs preliminary engineering and cost estimates. TEP owns the solar projects. TEP has developed their own internal project development and management group that procures the project equipment and TEP only hires a third party general contractor for the system construction.

The proposed Hybrid Residential Community Solar Tariff program is currently awaiting commission approval.

Program Characteristics	
Cost	• Hybrid Residential Community Solar tariff ($/kWh) proposes a price of $17.50 per KW, as opposed to $16.50 per kW, to calculate a fixed rate and the same calculation as the Residential Solar program (rooftop). • This program lowers the fixed solar installation cost, as it is 30% less expensive to build larger centralized PV system and roof repair and maintenance does not become a component of the system. • The proposed increase in price from $16.50 to $17.50 adds about $6 per month to the average customer but the customers does not have to worry about monthly insurance costs, possible property tax consequences, or roof maintenance or repair. It probably costs customers less to be on the hybrid program instead of the roof program. • Under this tariff, there is close to zero cost-shift, and if the tariff changed to $18.50 the program would exceed its rate of return. • Customer will not have the option to purchase the system at the end of the term. The electric rate will be evaluated annually and increase or decrease, only if consumption increases or decreases by 15%.
Bill Credits	• None, as residential customer doesn't own the system. Customers pay a fixed electricity rate similar to retail rate.
Program Duration	• 10-year fixed term
Federal ITC	• Claimed by TEP
Production & RECs	• TEP does not guarantee a certain level of production; TEP owns RECs
Energy Efficiency	• Customers may request further information from the utility regarding energy efficiency options.

Avista Utilities, with a service territory spanning from eastern Washington to northern Idaho, partnered with Clean Energy Collective to develop their community solar program.

Program Objectives and Development	
Key Program Objectives	• Community solar is a great way for Avista to engage with customers interested in solar. • The community solar project allowed Avista to utilize the state solar incentive, and learn how to build and integrate solar into their generation mix. Without the incentive, this program would not have been cost effective.
Program Development Approach	• Quickly developed the program to take advantage of the Washington state solar incentive. • Worked with CEC to develop the program. • Based upon market data, CEC experience, and other nearby community solar programs, Avista assumed the program would sell out rather quickly.
Third Party Role	• Avista partnered with Clean Energy Collective (CEC) as the developer of the 423 kW solar array and community solar program. • CEC brought industry experience, marketing recommendations, enrollment and an e-commerce website, and customer platform and construction expertise to the table. • Avista remained involved with the project development as the utility partnered with CEC to learn about solar and program development.
Program Website	• https://www.avistautilities.com/services/Pages/communitysolar.aspx

The program lasts until the expiration of the Washington state incentive on June 30, 2020.

Program Characteristics	
Program Size	• 423 kW or 1,512 panels. • As of October 2015, the program is 80% enrolled.
Eligibility	• Residential and non-residential/commercial electric customers who reside in WA can purchase panel subscriptions. Customers can purchase between 1-12 panels as 12 panels maxes out the individual WA state incentive. • Program participants must pay upfront for their subscription, which has been a barrier to program enrollment. Financing has been set up with a local, partner bank but utilization of that financing mechanism has been minimal. • Do not need to own home or building. System ownership moves with the customers within the utility WA territory.
Market Research	• Avista evaluated various options for program administration and program design before choosing to partner with CEC.
Procurement	• CEC sub-contracted the engineering, procurement and construction of the array. In order to maximize the amount of generation prior to the 2020 expiration of the WA state incentive, the array was built in parallel with program enrollment.
Cost	• Customers enroll in the program by subscribing to 1-12 panels. • Program costs $1,400 per 280W Itek panel, with no additional future fees.

Over 5 years, the program saves the customer an estimated $400 per PV panel subscribed.

Program Characteristics	
Bill Credits	• Bill credits are provided based on monthly panel production. Customers receive $1.08/kWh through the Washington state incentives and an additional $0.049/ kWh from Avista, which represents Avista's 5-year PURPA rate (avoided cost of energy). • Average residential rate is about $0.08/kWh, so the solar production is valued at over 14 times what a customer pays. • Customers can expect bill credits of approximately $360 per year per panel through June 2020 for a total of $1,800 in cumulative bill credits.
Program Duration	• The program lasts until the expiration of the Washington state incentive on June 30, 2020. Subsequently, customers will no longer receive bill credits. • Avista did not rate-base the program. • After the program ends, the array will continue to provide clean, localized renewable energy for the benefit of all Avista Electric customers.
Federal ITC	• Federal tax credit is leveraged in financing and development of system.
Production & RECs	• CEC and Avista don't guarantee production. Avista owns the RECs.
Lessons Learned	• Develop a program with a pay-as-you-go structure or offer on-bill financing. • "Free solar panel" raffle was a particularly successful marketing strategy. • Leverage network of local champions to promote program. • Don't underestimate the amount of education that will be required.

Cedar Falls Utilities in Iowa began signing up customers for their community solar program in June 2015. The program has been very popular.

Program Objectives and Development	
Key Program Objectives	• Aimed to provide publicly available and local solar, particularly for renters. • An alternative to Net Energy Metering (NEM)
Program Development Approach	• Developed through collaboration with staff, consultants, and community-based solar-experts. • Iowa Economic Development Authority submitted a request for technical assistance under the National Renewable Energy Laboratory's Solar Technical Assistance Team to identify issues and options for encouraging the development of community solar programs in Iowa. • NREL released a report *Community Solar Programs in Iowa: Issues and Options,* in December 2013. • For an unsubsidized program model, the utility believes it is less difficult and there is less risk to the utility to develop a solar project by requiring customers to pay upfront. • Procure 500-kW to 1.5-MW (AC) PV system based upon initial customer interest levels. Utility does not need project to meet customer electricity demand. CFU wanted to ensure customers would buy into the project before procuring a system. • One draw back is that participants will have to wait 6-12 months from time of pre-enrollment until their share of the PV system is producing clean electricity.
Third Party Role	• No role in developing the program. A third party will construct the installation and take federal tax credits.
Program Website	• http://www.cfu.net/save-energy/simple-solar.aspx

The program is in the process of procuring a 1.5-MW system to meet customer demand.

Program Characteristics	
Program Size	• Minimum target was to develop a 500 kW project. • Now scheduled to build a 1.5-MW system due to program popularity. • As of September 2015, 7,280 units have been sold to about 1,200 retail and wholesale customers.
Eligibility	• Any Cedar Falls Utilities retail or wholesale customer.
Market Research and Marketing	• Program leveraged the research done by NREL. • No focus groups or additional formal market research was conducted. • Marketing included yard signs, direct mail, phone calls and meetings with key accounts, television advertisements, speaking at local events, and online targeted ads. In a small community word circles fast. Word of mouth was useful.
Procurement	• Program has procured the PV system through an RFP. • RFP process has taken longer than originally anticipated.
Cost	• Each solar project unit costs $270, which can be spread across 12 installments. Each unit is 170 Watts of a PV system.

Participants are expected to receive approximately a 15-year payback on their investment.

Program Characteristics	
Bill Credits	• Credit is based on value of solar (avoided wholesale energy, generation capacity, and transmission capacity costs that the solar installation avoids CFU from incurring). This credit is currently estimated at about $0.05/kWh credit but is expected to increase over time. CFU estimates this to be less than a 15-year payback. Customer credit = Number of Units x Per Unit Energy x Energy Value (in $/kWh). • Each unit expected to generate 2.5% of an average home's annual electricity usage. • Customers will receive a monthly credit for 20 years.
Program Duration	• 20 years
Federal ITC	• The project developer will claim the ITC; CFU will attempt to claim a new state PTC by itself and pass it through to customers.
Production & RECs	• Utility has not explained RECs to residential customers. CFU has allowed some participants to own their RECs, but will own most of them.
Energy Efficiency	• Not considered currently; Utility would like energy efficiency to be integrated in future.
Lessons Learned	• Understand the key drivers behind the community solar project (e.g. generation supply, RPS requirements, provide customers with options). • Set expectations that the RFP process may take up to 6 months and bid pricing needs to remain valid during that time period. Be prepared for new state, federal, or local incentives starting during the RFP process time and have a plan to adjust for this. Having locked in bid pricing for 500 kW, 1 MW, and 1.5 MW sizes for 6 months was helpful in that we had much greater certainty about actual costs and how they declined as local interest levels grew from a 500 kW to a nearly 1.5 MW size.

In April 2013, PG&E filed for a Community Solar Program. In late 2013, SB 43 required California's major utilities to propose a voluntary shared renewables program, which is capped at 272 MW for PG&E.

Pacific Gas and Electric Company

Program Objectives and Development	
Key Program Objectives	• Provide a 100% renewable option for customers, including those who can't install solar on their own roof. • Community solar programs have to pay for themselves with no cross subsidization from other rate payers.
Program Development Approach	• The rate program requires customers to pay per kWh for solar energy. • Program development utilized lessons from the ClimateSmart program. 3Degrees did a comprehensive program evaluation for this program. Evaluation revealed the importance of focusing marketing on driving enrollment, using the test and learn marketing approach and carefully tracking marketing costs and results. • Market research indicated that some customers are interested in having the solar located in proximity, while others were more interested in lower price. • PG&E believes that long-term contracts and termination fees may deter customers, so there is no minimum enrollment term for the program. • IT and developing an online enrollment channel are two of the biggest administrative costs .
Third Party Role	• Program is being developed by PG&E with support from marketing agencies and in compliance with SB 43 and Decision 15-01-051.
Program Website	• http://www.pge.com/solarchoice

Customers can participate through either the Green Tariff option or Enhanced Community Renewables option.

Pacific Gas and Electric Company

Program Characteristics	

Program Size	• Under SB 43, the program cap of 272 MW could accommodate 40,000-50,000 customers enroll under the two program components
	  • Green Tariff (GT) - Subscribe 50% or 100% of their electricity from a pool of small and mid-sized solar projects created for this program in PG&E's service territory.
	  • Enhanced Community Renewables (ECR) - Make a separate agreement with a solar developer to buy subscription rights for a selected portion of a local solar project's output.
	• Customers are actively seeking information about the new programs but self-reported intention to enroll is generally more favorable than actual adoption.

Eligibility	• Residential and non-residential bundled electric customers are eligible to participate, with the exception of Stand-by, non-metered service agreements, transitional bundled service, and NEM (initially). Direct Access and Community Choice Aggregation customers are not eligible. SB 43 also imposes some participation limits.
Market Research and Marketing	• Utility plans to market program through email, web, bill inserts, direct mail, newsletters, cross message opportunities, window clings and social media.
Procurement	• GT: Contract electricity from new small-to-mid-sized solar photovoltaic projects sized 0.5 – 20MW, located within its service area. During project development, PG&E will serve participants with solar power from recently developed and operating projects that meet the same criteria. Utilizing RAM program for procurement. • ECR: Customers will work directly with developers to identify and develop solar projects within their own communities. PG&E will sign PPAs for qualifying new solar photovoltaic projects size 0.5-3MW within the PG&E service area through the ReMAT procurement mechanism.

The programs are anticipated to launch in early 2016.

Program Characteristics	
Costs	• GT customers will pay per kWh for solar energy at a rate based on the pool of solar projects in the program and CPUC-mandated charges to ensure that non-participants are held indifferent. The program is expected to have an initial 2-4 cent/kWh premium that may diminish over time if PG&E's procured costs of solar continue to decline. • ECR customers will pay developers for the rights to the output they subscribe to from a local solar project. • The customers of both programs will pay a per kWh charge on their PG&E bill for CPUC-mandated charges to ensure that non-participants are help indifferent. • The new GT and ECR electric rate schedules are available in Advice Letter 4639-E-A.
Bill Credits	• GT and ECR customers will receive a bill credit for the energy they no longer need from PG&E's standard energy mix. ECR customer bill credit and charge will be based on the output of their solar subscription.
Program Duration	• GT enrollment will begin in early 2016. ECR developers can begin process by submitting marketing materials in late November/early December. Enrollment will be left open until the 272 MW capacity is met or through 2018. • Customers may un-enroll or change participation level at any time. When a customer un-enrolls or changes their participation level, they may not reenroll or make another participation level change for a period of 12 months.
Federal ITC	• May be claimed by project developer if they meet ITC requirements.
Production & RECs	• RECs retired on behalf of the customers and will not count towards PG&E's renewable mandate. PG&E tracks RECs through WREGIS/Green-E Energy.
Energy Efficiency	• Energy efficiency is not part of the program design but the utility is looking for opportunities to co-market the community solar program with energy efficiency programs.

City of Palo Alto Utilities has a goal of meeting 4 percent of the City's energy needs with local solar PV by 2023.

Program Objectives and Development	
Key Program Objectives	• Provide a 100% solar option, so all customers have access to solar. • Install solar locally in the community. • Meet Local Solar Plan goal of 4% of City's energy from local solar by 2023.
Program Development Approach	• The program-development approach to-date is detailed in the CPAU City Council Staff Report.
Third Party Role	• CPAU considered outsourcing and released an RFP in July 2014. • According the staff report, many of the risks identified during the risk assessment could be mitigated through provisions incorporated into the agreement between the City and the third party community solar turnkey developer. • Primary concern is that a turnkey program offered through a public-private partnership presents unique transparency and risk mitigation challenges which may be at odds with the vendor's confidentiality requirements. • Since any shortcomings of the program could damage the City's reputation and trust within the community, all direct risks to the participants may be indirect risks to the City. • CPAU decided not to work with a third party and is currently looking for a solar project site.
Program Website	• www.cityofpaloalto.org/solar

CPAU has decided not to use a third party and instead develop their community solar program in house.

Program Characteristics	
Program Size	• Planning to run a 1-3-MW program but it will be difficult to find a local site where 0.5-1-MW of solar can be built. Size of the program will depend on subscriptions.
Eligibility	• Residential and commercial customers.
Market Research and Marketing	• Ran focus groups when developing the CPAU Solar Plan, which indicated interest in community solar. • Marketing: To be determined
Procurement	• Plan to procure the community solar PV system through RFP. CPAU is currently looking for a site for the project.
Cost	• Has not been determined yet. Not necessarily aiming for customers to save money. Program participation will probably come at a premium.
Bill Credits	• To be determined.
Program Duration	• To be determined.
Federal ITC	• Project developer/ financier will claim ITC so system must be third party owned.
Production & RECs	• CPAU electricity is all carbon-neutral. Will need to revisit the REC decision when developing the community solar program.
Energy Efficiency	• Have considered looking at energy efficiency but not at that stage of program development. Definitely interested in incorporating energy efficiency.

The Presenter and the Project

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The Community Solar Value Project is focused on improving community-solar program value, through solar + storage + demand-response and other strategies, at electric utilities in Sacramento and beyond. It is led by Extensible Energy, LLC, and draws on expertise from three energy consulting firms.
http://www.communitysolarvalueproject.com

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