

Bringing Down the Cost of Solar through Community Shared Solar



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SunShot
U.S. Department of Energy

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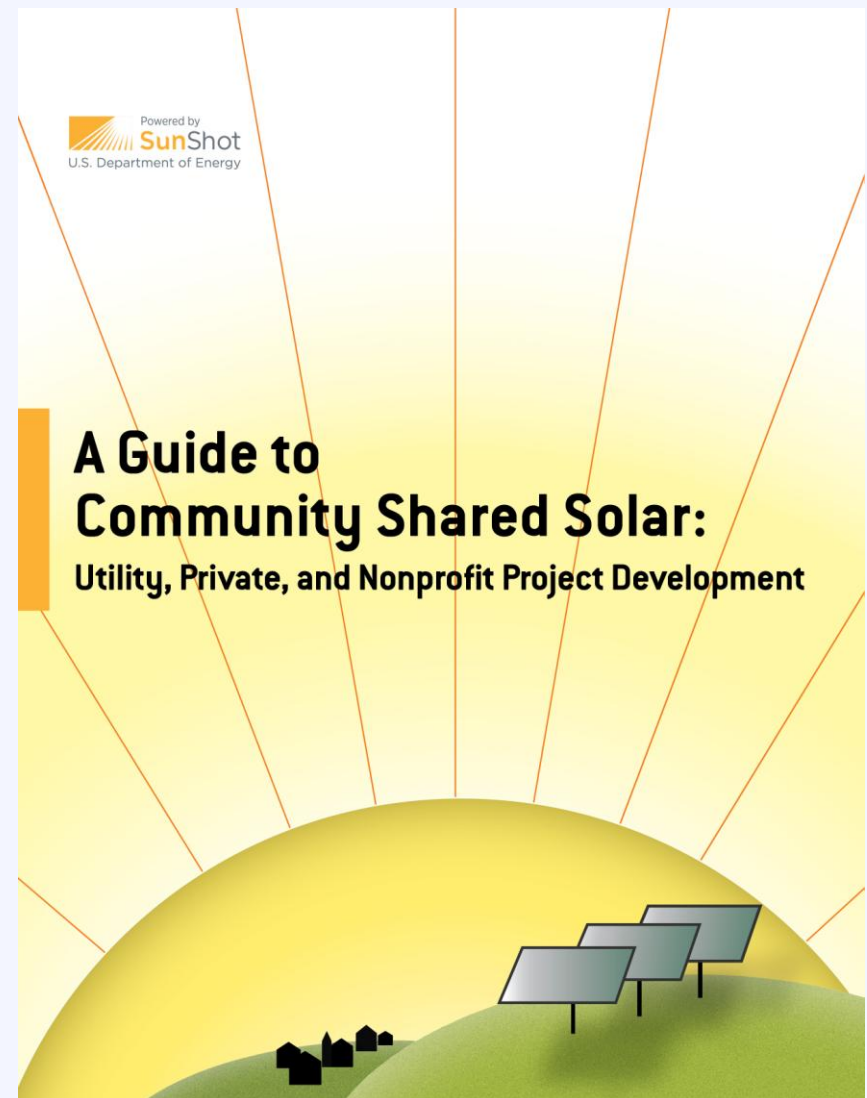
About the SunShot Solar Outreach Partnership



The SunShot Solar Outreach Partnership (SolarOPs) is a U.S. Department of Energy (DOE) program designed to increase the use and integration of solar energy in communities across the US.

Increase Community Solar Access

- *A Guide to Community Shared Solar* helps you:
 - Develop a community shared solar project
 - Explore options and examples of successful solar projects
 - Navigate processes from planning to implementation
 - Understand project models, policies and financing
 - Avoid structure and securities law pitfalls
 - Expand your solar market



Speakers

- Amy Heinemann, North Carolina Solar Center (moderator)
 - amy.heinemann@ncsu.edu
- Hannah Masterjohn, Vote Solar Initiative
 - hannah@votesolar.org
- Bianca Barth, Solar Electric Power Association
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- Paul Spencer, Clean Energy Collective
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Photo credit: Clean Energy Collective

Community Shared Solar

Bringing Solar to the Masses

July 2012



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Vote Solar
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Some Definitions



Group Purchasing

(aka "Solarize" programs)

Residents get together to buy solar panels at volume discount, have them installed on each of their homes.

- Great for homeowners with suitable roofs
- Bulk purchasing can also be done by larger entities, e.g. several municipalities could do a joint procurement

Single Customer Virtual Net Metering

(aka Aggregate Net Metering)

Energy produced by a solar system on one facility be credited toward energy used by other facilities under the same electric account

- One system, multiple meters, one customer / one bill
- Great for campuses, municipalities, farms – customers with multiple facilities and a good site for solar



COMMUNITY SHARED SOLAR:

One solar project provides power or economic benefits to multiple customers



Solar Project Investments

(aka the Solar Mosaic model)

Individuals invest in "Solar Power Notes" and receive a return, and the proceeds go to solar projects.

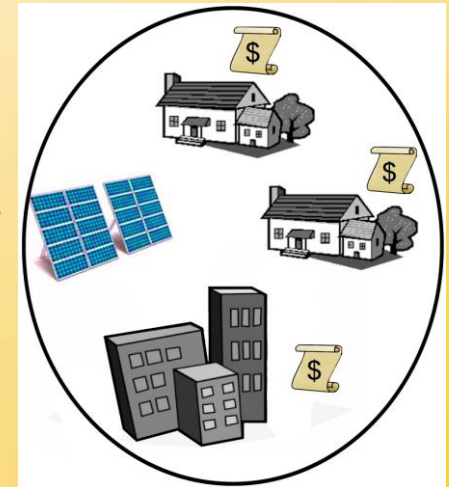
- Great for experienced individual investors. More of an investment decision than an energy decision (for now)
- Can also be structured as a simple donation with no expectation of return

Virtual Net Metering

(aka Community Net Metering)

Energy produced by a solar system at one site can be credited toward the energy bills of multiple offsite subscribers

- One system, multiple meters, multiple customers / multiple bills
- Great for the 75% of customers who can't put solar on their own property



What does shared solar via virtual net metering look like to a customer?

- Customers who opt in pay a subscription fee to participate in an offsite solar project and receive a correlating credit, typically via their utility bill.
- Ideally,
 - the subscription payment occurs over time (e.g. monthly), the way customers are used to paying for energy
 - it's a simple online process to sign up and to cancel your subscription
- It's possible for the system to be located right in the customer's community, so the customer feels a sense of ownership and connection to the system



Why do we need shared solar?

- People really want to green their energy supply
- But, only 25% of residents and businesses are able to install solar on their own property



How shared solar can help

- Shared solar works for **the other 75%**
- Gives renters, schools and public buildings, millions of home and business owners access to solar for the first time
- Simple for customers to participate
- Solves financing challenges for solar developers
- Systems can be installed in optimal locations and achieve lower cost/Watt through economies of scale



Policy recommendations to bring shared solar to all Americans

- In states with fully regulated electricity markets
 - Enable virtual net metering, likely through legislation. Establish reasonable bill credit value, and ensure that existing state incentives can also flow to virtually net metered systems as appropriate.
- In states with deregulated / restructured electricity markets
 - Maybe nothing. Through partnerships with energy suppliers, solar developers can theoretically provide all customers with solar energy without new legislation. We're going to watch carefully to see if this meets customers' needs before focusing on new policies in these states.

[\[Link to map of which states are deregulated\]](#)
- In municipal utility / electric co-op territories
 - Get the utility to start virtually net metering. Doesn't require state legislation; they can just do it!
 - Establish reasonable bill credit value, and ensure that existing incentives can also flow to virtually net metered systems as appropriate.



Status of shared solar policy

- 8 states currently have some type of shared solar policy
 - CO, MA, CA, DE, VT, WA, RI, ME
 - Enabling mechanisms include virtual net metering, group billing, and joint ownership.

- California SB 843 – vote in August 2012
 - Potential game changer. Would create 2 GW shared solar program.



Resources

- [A Guide to Community Shared Solar](#), National Renewable Energy Laboratory
- Vote Solar's [Shared Solar info center](#)
 - Stay tuned for a new policy tracker launching late summer!
- Interstate Renewable Energy Council's [Model Rules for Community Renewables Programs](#)




The Bottom Line:

Shared solar can bring solar energy to the 75% of Americans who can't put solar on their own property. Now is the time for states and local utilities to establish the policy frameworks necessary to support shared renewable energy – it's an important part of the next generation of American energy.

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When there's a huge solar energy spill,
it's just called a "nice day"

www.votesolar.org



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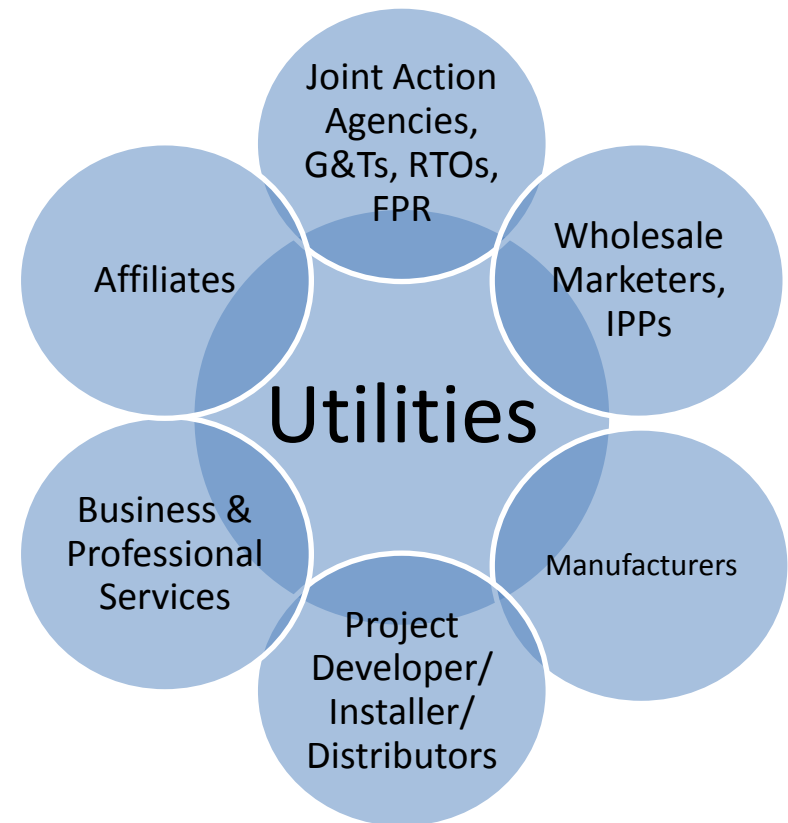


Helping Utilities Make Smart Solar Decisions

Utility Community Solar Programs

Bianca Barth
Research Manager
Solar Electric Power Association

- Formed in 1992 as the Utility Photovoltaic Group
- Educational non-profit organization
- Provides unbiased solar information, services and events with a utility focus





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Utility Community Solar

- One or more utility-managed photovoltaic projects from which customers can benefit from a fractional share of the electricity output

The utility takes on risk for the customer (cost, maintenance, performance, etc) in exchange for enhancing utility and customer value:

Utility Value	Customer Value
Control deployment and contain costs	Flexibility to move within utility area
Available to more customers	Simple, customer friendly process
Lower cost than other incentive programs	No up-front or maintenance costs
Use towards renewable goals	Pricing benefits
Enhanced relationship with customer	Utility operates for customer



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Rising popularity of Utility Community Solar Programs





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Key Design Criteria

Criterion	Options	Issue(s) to Consider
Customer Rate Structure	<ul style="list-style-type: none">• Virtual Net Metering• Solar Rate (fixed or inflation-adjusted)	Customer interest correlated to economic benefit
Customer Performance Risk	<ul style="list-style-type: none">• Variable kWh performance• Guaranteed kWh performance	Customers bearing the performance risk - if the program is considered a financial investment tool, lawyers get concerned.
Deliverable	<ul style="list-style-type: none">• Purchase varying kWh output• Purchase pre-set kWh blocks• Buy or lease panels	What exactly is the customer buying?



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Key Design Criteria cont'd

Criterion	Options	Issue(s) to Consider
Siting	<ul style="list-style-type: none">• Utility• 3rd Party• Customer property	Where will the system(s) be located?
Size/ Configuration	<ul style="list-style-type: none">• Ground-mounted• Rooftop	What is the economic tradeoff between ground-mount and rooftop?
Financing	<ul style="list-style-type: none">• Power Purchase Agreement (PPA)• Utility-owned<ul style="list-style-type: none">○ Grants○ Low-interest loans, e.g. CREBS○ Utility capital	How will the capital costs of the project be managed?

SolarShares Program

- Description: SMUD has designed a community solar program that allows customers to purchase output from a solar project on a monthly basis. Under a long-term PPA SMUD buys energy from local PV projects installed by third-party vendors. SMUD resells this energy to SolarShares participants at a price lower than the PPA price. The utility uses a monthly virtual net-metering model based on expected system generation.
- Solar Credit Structure: Customers pay fixed monthly fees and receive kWh credits to their monthly bills in relation to the quantity of output they subscribed for and the fixed energy rate they qualify for. The credit per kWh is the same as what the customer would earn from a net energy-metered rooftop system—i.e., full retail. The size of system offered to a Solar Shares customer depends on the customer's annual electricity consumption for the previous 12 months.
- Customer Deliverable and Performance Risk: SMUD guarantees the amount of energy delivered over a 12-month period. The minimum amount of time a customer must subscribe to the program is one year.
- Siting: The SolarShares system is located in Sacramento County, on third-party owned land.
- Size/Configuration: 1 MW; ground-mounted system. In 2012, SMUD plans a 1 MW extension of its Solar Shares program.
- Financing: PPA; no utility capital investment, but admin. Through a legislative change, SMUD is enabled to use funding collected through the solar surcharge for financing Solar Shares systems. The subsidy per installed Watt which SMUD is paying for Solar Shares was considerably less at the time than the rebate that SMUD was offering for residential systems—\$1.85/Watt compared to \$2.25/Watt.



(Photo: SMUD)

Seattle Community Solar

- Description: Customers may purchase one or two solar “units” on a first come, first serve basis for a one-time cost of \$600 per unit. Each unit is estimated to produce 50 kWh annually. There are a total of 500 solar units in aggregate. In addition to energy generation, the project serves as a locus of solar power education.
- Solar Credit Structure: Each year through June 2020, customers receive a credit on their bill equal to the value of their portion of solar electricity produced (~\$0.07/kWh, in 2012 dollars), plus the value of the Washington State renewable energy production incentive (anticipated to be \$1.08/kWh).
- Customer Recognition: Founding Community Solar members will be permanently recognized at the site with their names artistically inscribed on colored metal bands surrounding structure support columns.
- Customer Deliverable & Performance Risk:
Actual kWh variable performance (one solar unit equals 1/500th of the project’s actual annual output).
- Siting: Jefferson Park in the Beacon Hill neighborhood (owned by Seattle Department of Parks and Recreation).
- Size/configuration: 23.4 kW; three new picnic shelters with roofs made of solar electric panels.
- Financing: Utility-owned; Grant from the U.S. Department of Energy which covers most of the installation costs, less a few miscellaneous components.



(Architectural illustration: Seattle City Light)

SunWatts Sun Farm

- Description: Customers may purchase upfront the output of PV panels from the SunWatts Sun Farm on a first-come, first-serve basis in $\frac{1}{4}$, $\frac{1}{2}$ and full panel increments - up to but not to exceed their average monthly usage or 10 kW, whichever is less. The customer will be billed the full cost of the panels contracted as a one-time up-front charge. Prices are \$920 for a full panel, \$460 for a half panel, \$230 for a quarter panel. Each panel has a rated-output of 270 watts.
- Solar Credit Structure:
In accordance with the rates and charges under the customer's Standard Rate Schedule in a similar fashion as the Cooperative's Net Metering Tariff Schedule, a 36 kWh credit (per full panel) is applied monthly to the bill for 20 years.
- Customer Deliverable & Performance Risk:
Customers get a guaranteed kWh credit based on the number of panels they buy.
- Siting: The Sun Farm is located at Trico's office.
- Size/configuration: 227 kW; ground-mounted system.
- Financing: Utility-owned; ARRA Grant.



-
- Legal – especially as it relates to utilities serving as middle men and the financial, legal, and other risks assumed;
 - Billing & Customer Management – can get complicated;
 - Marketing and Communication – don't underestimate;
 - Pricing – finding a balance between participant interest and cost-recovery is critical.



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Lessons learned

- Leadership engagement and buy-in from other utility divisions are essential in the process of creating a utility community solar program.
(Seattle City Light & Tucson Electric Power)
- It is critical that messaging clearly relays the benefits the customer will realize in exchange for their investment and that the target audience is appropriately identified.
(Salt River Project)



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Lessons learned cont'd

- Communicating and working with the local solar community is critical.
(Tucson Electric Power)
- Overall, determining the kind of Community Solar Program the utility wanted to develop was central to the program's success.

(Seattle City Light)

Per Seattle City Light program manager Jack Brautigam: “[You need to do] a little bit of soul searching on what works for your utility or organization—and your program constituents. It’s good that there are a lot of models, but on the downside it takes time and effort to do the research and agree what you want, and what you are able to implement within your system of governance or regulations.”



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SEPA Resources

- SEPA Utility Solar Business Models Database
(including Utility Community Solar Programs)
<http://www.solarelectricpower.org/usbm-solar-data-and-mapping>
- Assessing Community Solar Programs, ASES paper
http://ases.conference-services.net/resources/252/2859/pdf/SOLAR2012_0222_full%20paper.pdf
- Technical Brief: Community Solar Program Design:
Working *Within* the Utility
http://www.solarelectricpower.org/resources/publications.aspx#Community_Solar_Program_Design
- Forthcoming (in Dec 2012)
Community Solar Handbook for Utility Managers



SEPA

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Helping Utilities Make Smart Solar Decisions

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Community Solar Solar for Everyone!

The Clean Energy Collective







Goals of the Clean Energy Collective (CEC)

- 1. Accelerate the adoption of long-term clean energy solutions**
 - Eliminate the barriers-to-entry: ***easy access, reduced cost*** and ***eliminate maintenance issues*** (a structure that benefits and protects the consumer)
 - Expand availability and participation – Fractionalization (240 W), Renters, Non-profits, Poor access
- 2. Provide utilities with lower risk and more beneficial clean energy generation**
 - *Maintained solutions produce more energy!* Utility-grade production, design, equipment and monitoring without the cost
- 3. Create local clean energy jobs and a mutually beneficial production relationship** between utilities and their customers (member and social equity)

Clean Energy Collective defined



-  Community-sized renewable energy facilities that benefit their utility's customer- owners
-  Mutually beneficial contracts between the utility, its customers and the CEC
-  Same benefits as an individual installation; metering economics, rebates and tax benefits – plus more beneficial production generation for the utility
-  A long-term management and growth strategy which is perpetually maintained



How does it work?



- 100% ownership/benefit to community members (opt-in/voluntary)
 1. All power delivered directly to the utility via contract (PPA, FIT, etc.)
 2. Payment for power production delivered to customers via **on-bill credit by CEC's RemoteMeter™** (\$/kWh or kWh credits)
- Used to offset power use not to produce excess generation
- Utility receives long-term, in-network clean power at reasonable rates; **system paid for by private customers**
- Utility provides a solution that its members want



Why community energy with the CEC?



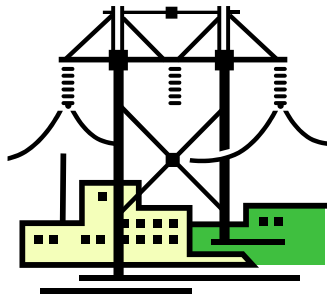
- **Lowers the barrier-to-entry and expands availability**
 - Fractionalization enables ownership for **as little as \$525** depending on incentives (a solution for low-income owners)
 - **Ownership** for **renters** and sites **without** solar accessibility (not with traditional solar)
- **Maximum production equals maximum return on investment**
 - Everyone can own - optimally placed for **maximum production** (no shading, trees, poor aesthetics, permitting hurdles, etc.)
 - Maintained solutions **produce more** (much more – for 50 years)
- **Aggregated purchasing**
 - **Lowers overall costs** by purchasing in bulk, making clean energy ownership **available to more of the public**
 - Advantageous financing vehicles (**low interest loans**)
- **CEC handles everything:** installation, sales & marketing maintenance, production credits and administration
 - A simple turn-key solution to increase adoption... **don't lift a finger**. You can move or resell at any time



Finding the Right Balance



A successful program for Utilities and customers



Too Low
No Participation
Poor Image

Too High
Unfair to the Utility


\$

Power Purchase

Clean Energy Collective Partners



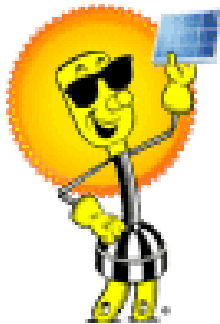
HOLY CROSS ENERGY

A Touchstone Energy® Cooperative 



Colorado Springs Utilities

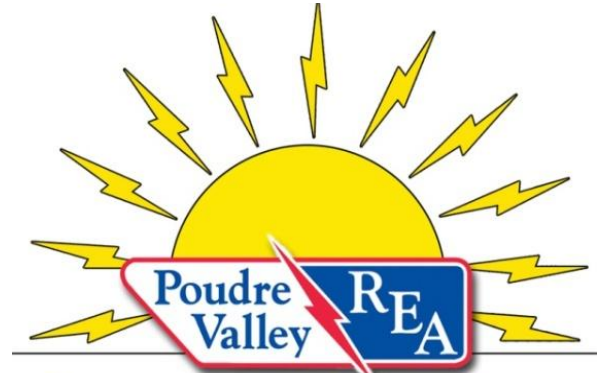
It's how we're all connected



**Kit Carson Cooperative
Community Solar**

Sun for All - All for Sun!

A Touchstone Energy® Cooperative 



Community Solar Farm

Locally grown. Locally owned.




SAN MIGUEL POWER ASSOCIATION

 Touchstone Energy® Cooperatives
The power of human connections®



**WH Solar
Community**

Wright-Hennepin
Cooperative Electric Association

A Touchstone Energy® Cooperative 

A simple way to own solar

Clean Energy Collective Case Studies



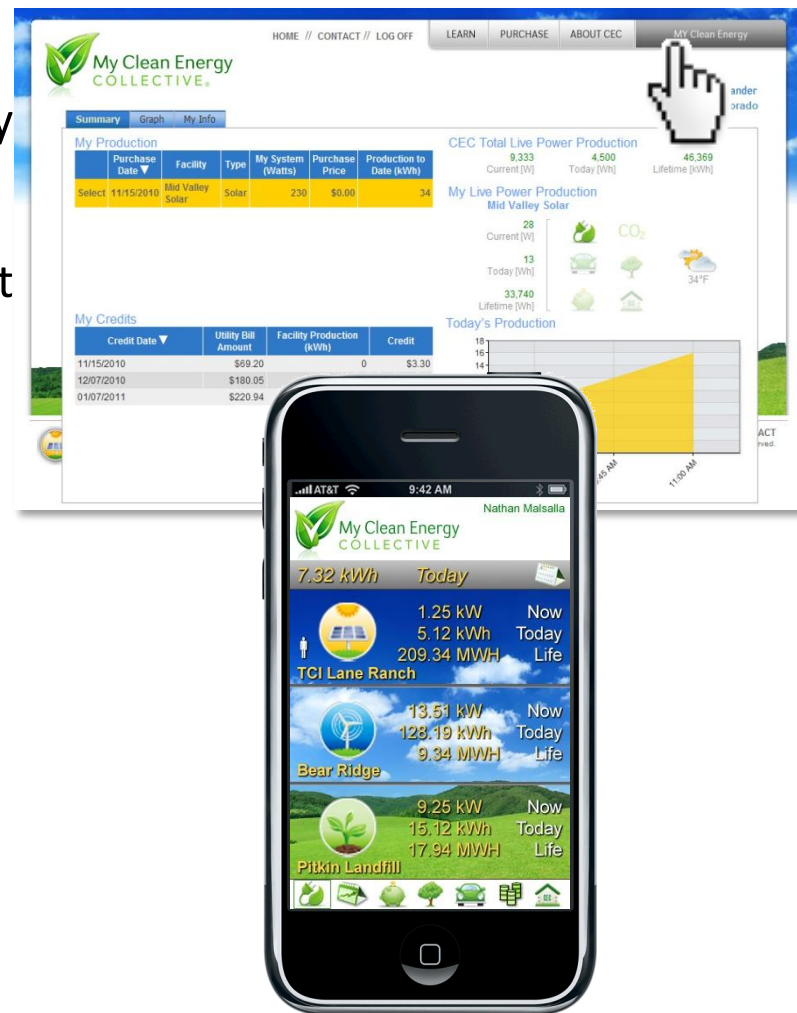
Clean Energy Collective Case Studies



RemoteMeter™ Makes It Possible








- Turn-key remote metering
 - Regardless of the physical facility proximity
- Integration with utility billing systems
 - Track/apply clean energy production credit
 - Production surpluses tracked / applied depending on the utility's policy
 - Credited directly on customer's bill
 - Versatile integration engine
- Easy monitoring (customer / utility)
 - Real-time clean energy production, account information and reporting
 - Telemetry and meteorological data
 - Management tools
 - Accessed online and via mobile devices



Program Implementation – Turn Key



Program Components	Utility	CEC
<ul style="list-style-type: none"> -Site development and permitting -Equipment procurement, system design, installation -Contracts: insurance, PPA, escrow, land lease, resale 	Sign PPA/FIT Branding optional	
PV rebates and RECs -Fewer Interconnection Agreements, inspections, paperwork	Reduce admin costs	
<ul style="list-style-type: none"> -Delivery of power credits on customer bill/monthly task -Verify rate schedules 	Simple electronic import (to NISC. ATS or other billing systems)	
Federal Investment Tax Credit	Nothing	
<ul style="list-style-type: none"> -Long term maintenance and customer service -Customer relocation, subscription sale, increase or transfer -Financing options 	Nothing	

Who can own & what if they move?



- Residences / Renters
- Businesses
- Townhomes / Condominiums
- Homeowners Associations
- Tax-exempt entities / nonprofits
- Governments
- ***Anyone with an electric bill!***

Staying within the utility network?

- Keep it! Simply call and credits are assigned to your new meter

Leaving the Area?

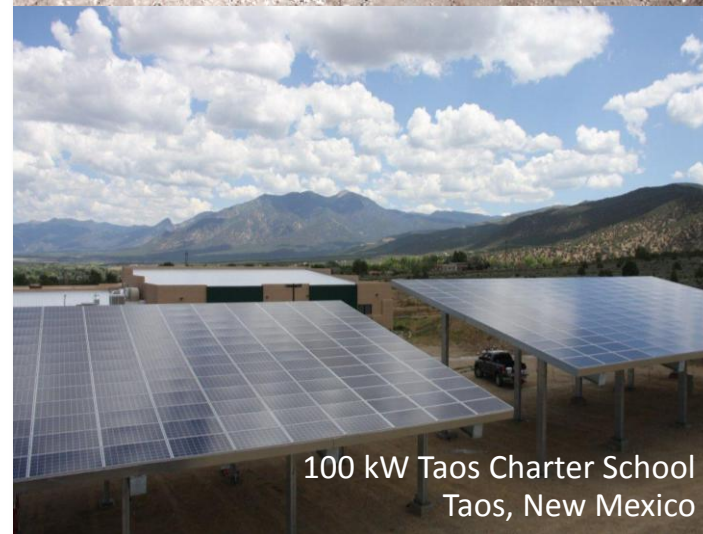
- Sell it with your home / building
- Sell it separately, to any utility customer or the CEC
- Gift it to a relative or include it in your estate planning
- Donate it to a charity and give the gift of electricity while taking a tax write-off



How can you help?



- Encourage policies of equality
 - Onsite and offsite
 - Metering, rebates, fair pricing, etc.
- Provide a conducive environment
 - Sales tax & use tax exemptions
- Create supportive entitlements
 - Sensible land use & permitting
 - Reasonable fees and timelines
- Spur adoption
 - RPS and legislative support, sites
- Smart solutions
 - Consumer protection, O&M reserves
- Call us...

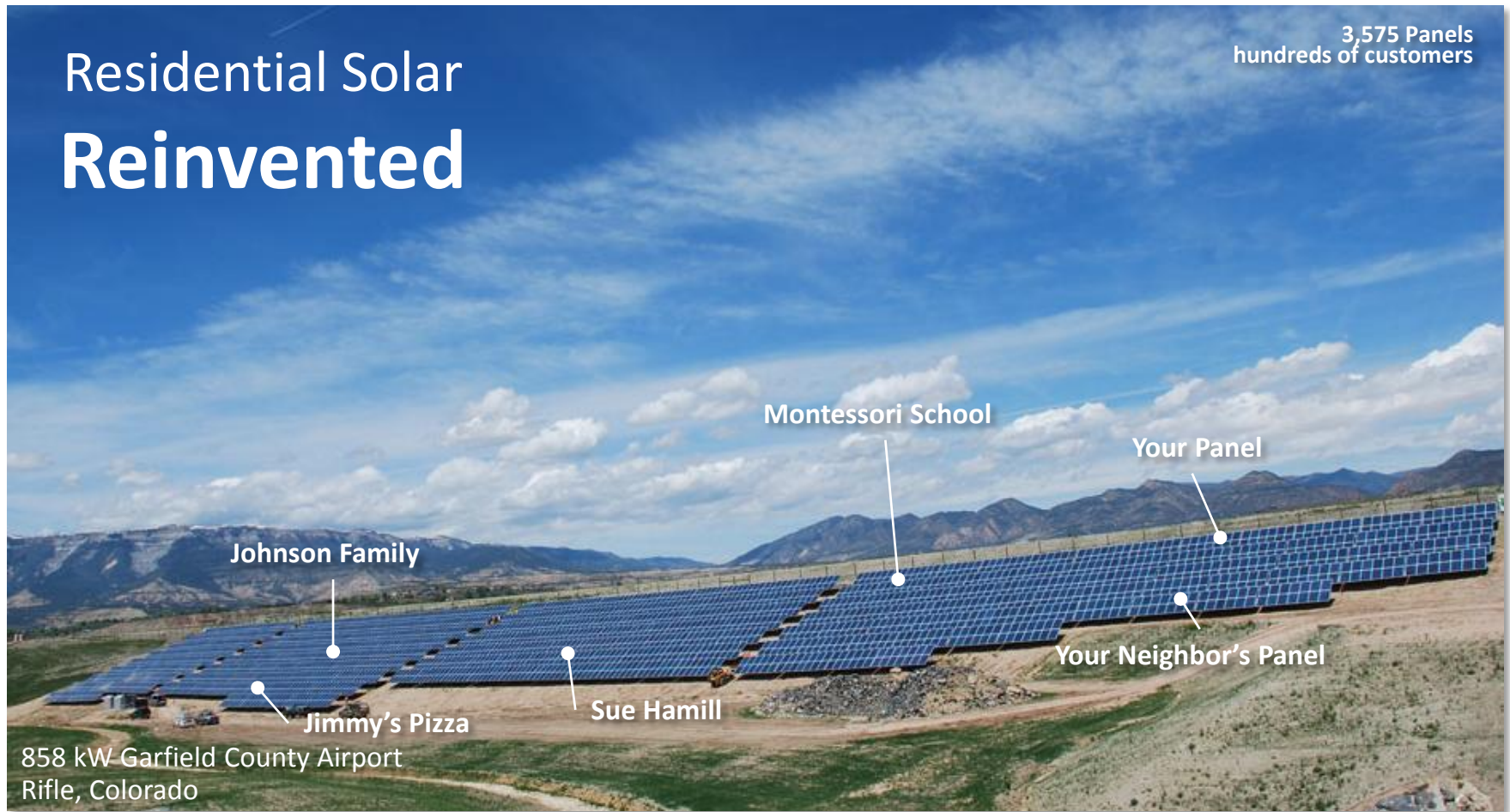


Community Solar with the CEC



3,575 Panels
hundreds of customers

Residential Solar Reinvented



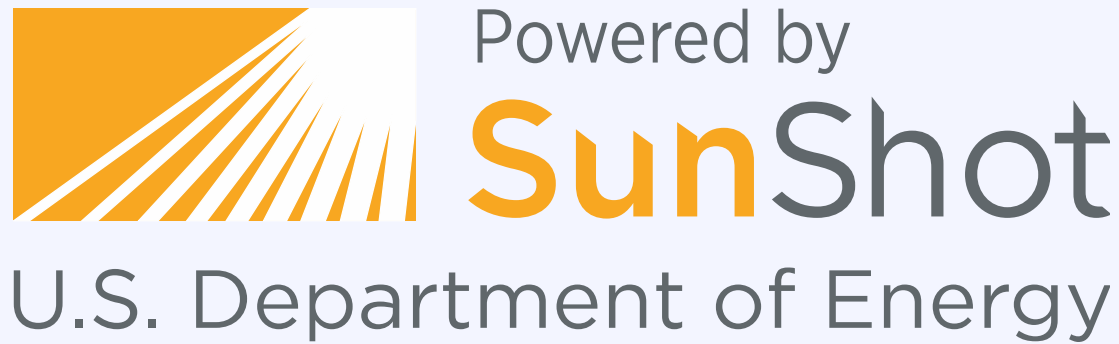
go ahead. power



Clean Energy
COLLECTIVE®

Thank You.

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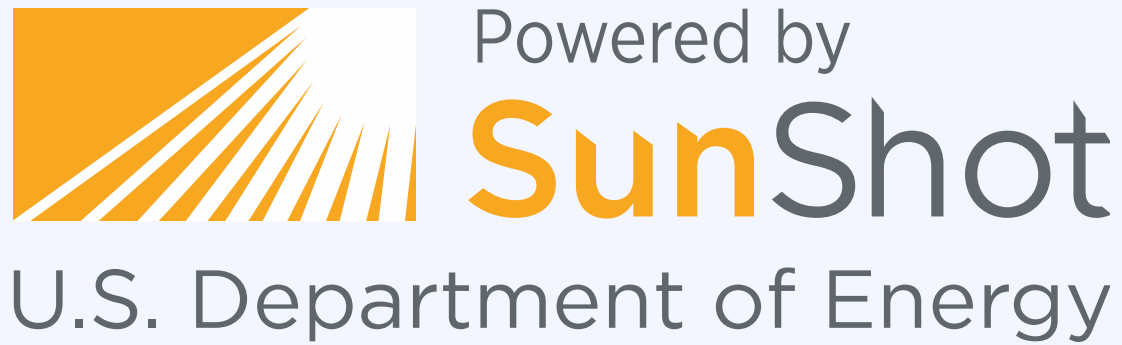
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Questions?