A Prosperous Marriage?

Targeted Program Design for Community Solar + DR

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Community Solar Value Project

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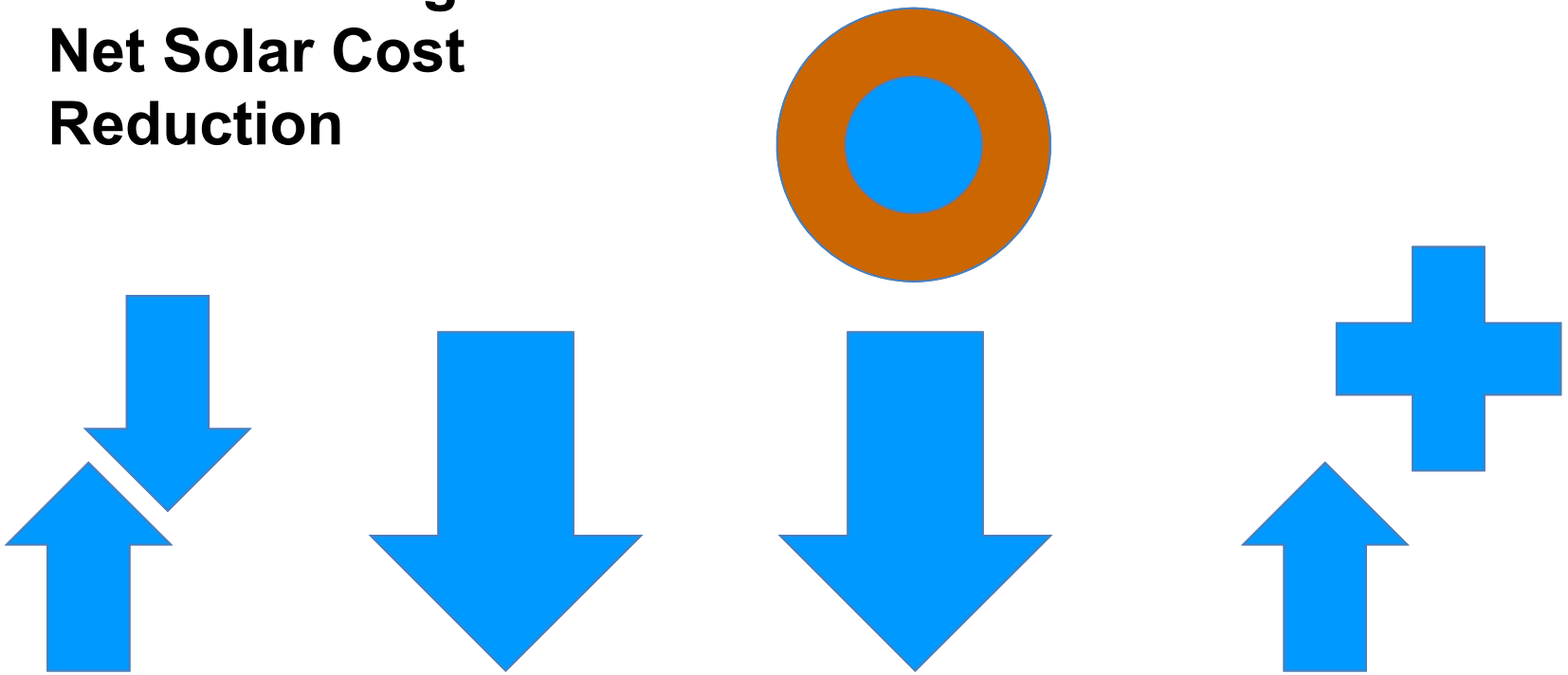
Speed Talk: 1) In order to reach the market penetration that climate preservation demands, we need “solar-plus” integration strategies 2) We can start with willing community solar-plus participants 3) …So let’s find them!

From gardens…
To grid resources

CSVP: Driving Net Solar Cost Reduction



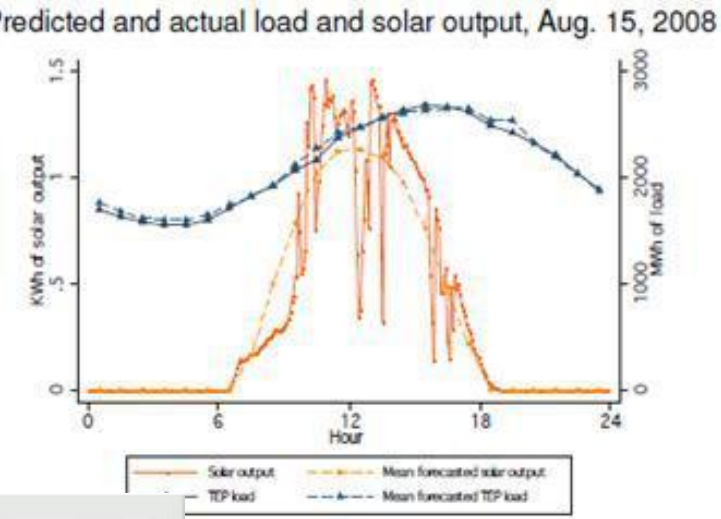
Strategic solar design/specifications

Best-practice project financing/ procurement

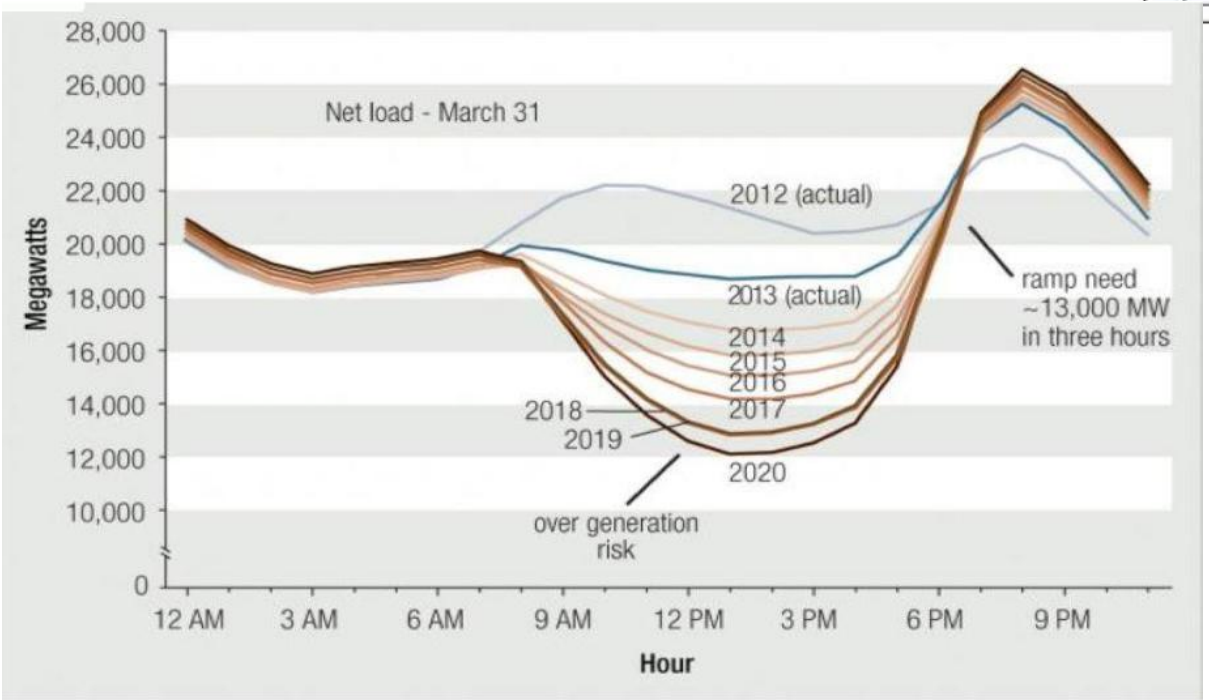
Utility-driven target market development & a more customized offer

DR and storage companion measures increase net solar value

Shape of the Challenge In Different Time Domains



Tucson PV Plant Performance
EnergyStorage.org



Source: CAISO 2014

Solar +

Demand Response

Community Solar Plus DR… *Why??*

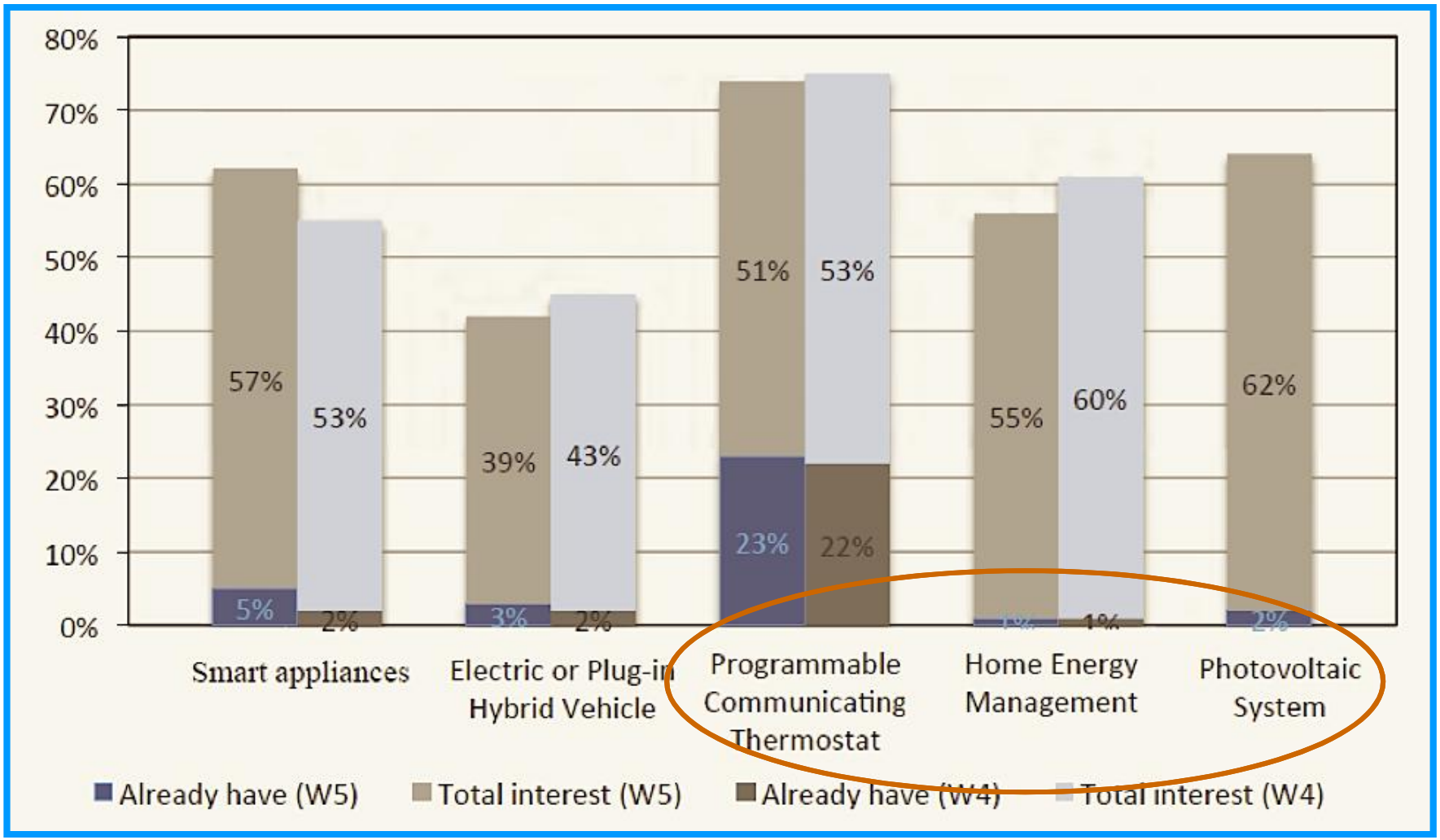
- According to The Shelton Group (SEPA, 2015) >60% of residential utility customers want a solar option; in focus groups, *they prefer community solar to rooftop solar*
- Matching CS with companion measures (DR, storage) offers customers a chance to be sure their solar counts
- Bundling services cuts costs, adds convenience, and promotes utility customer-retention
- DR may be designed to address seasonal peaks, daily peaks and steep load-ramping, daily forecasted solar variability, or variability in even shorter timeframes
- Utilities are starting to see that DR often makes more sense than batteries, and DR + batteries makes more sense than batteries alone

Community Solar Plus DR… *Why Not??*

- Rule of Thumb: Simpler is Better
- Indications that DR of any kind is little-understood; less than half of customers nationwide (SGCC, 2015) have heard of smart grid, an overarching concept for DR
- Even within utilities, DR *for renewables integration* is new and requires some program changes
- A community solar-plus program implies that the utility is going to engage with customers in a conversation about what a 21st Century utility needs to look like

Why Not!

Putting the Question to the Subset Who Are More Aware…

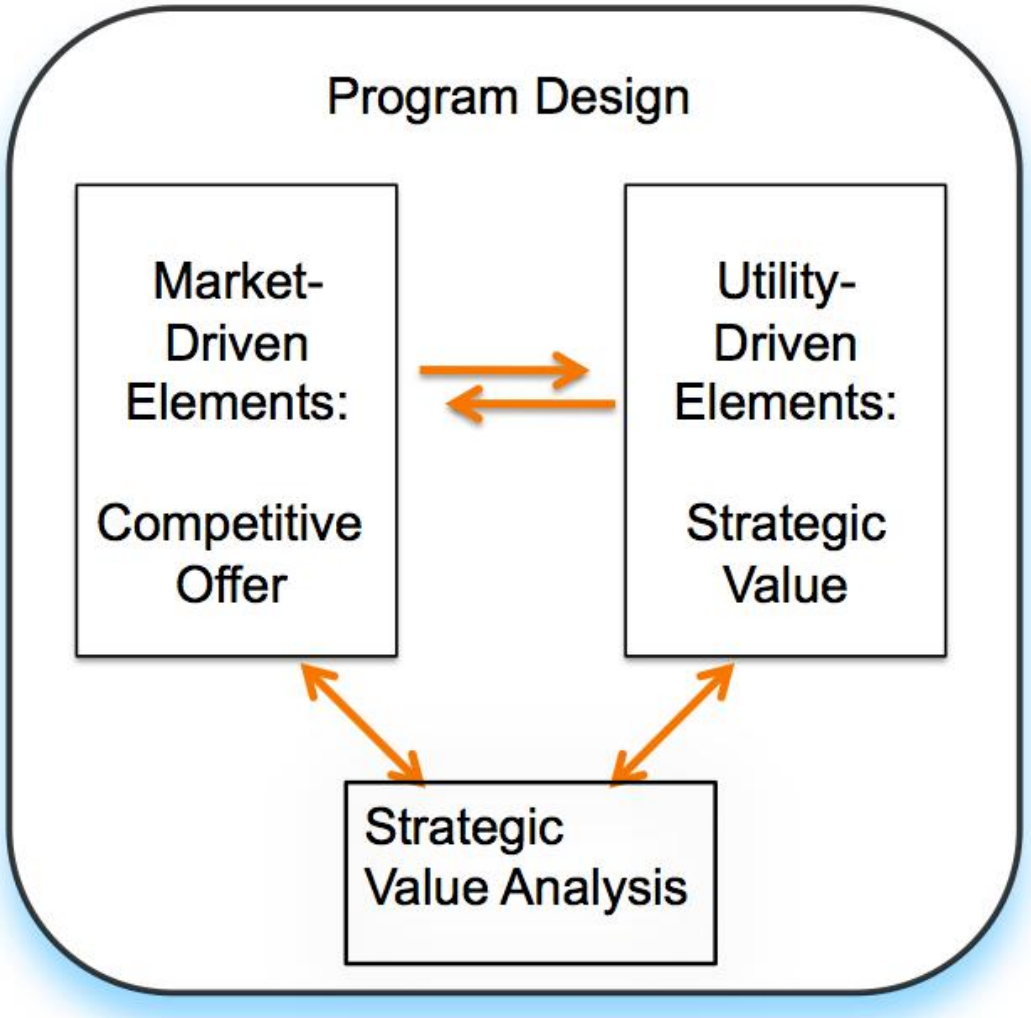


DNV GL for Smart Grid Consumer Collaborative
"Consumer Value in Action" 2015

Matrix One
10 DR Measures

DR Option		Enablement Cost	Incentive Cost	Avg. Load Impact per Unit	Seasonal Availability	Impacts by Weather Condition	Events Feasible per season	Max event hours per season	Response time to signal	Duration of Impact	Re-charging, necessary?	Resource Magnitude Per Location
1	Curtailable Load (Day-ahead)	Low-Medium $25/kW-yr or less	$10-$30/kW-month for capacity (+ energy payments)	Depends on end-use	Limited to summer season	Limited to summer season	Frequently limited to less than 50	100	20-26 Hours	2-6 Hours	Yes; usually limited to one event per day	Large
2	Curtailable Load (Day-of)	Low-Medium $25/kW-yr or less	$15-$35/kW for capacity Month (+energy payments)	Depends on end-use	Limited to summer season	Limited to summer season	Frequently limited to less than 50	100	3-5 Hours	2-6 Hours	Yes; usually limited to one event per day	Large
3	Auto-DR	$10-282$/kW	$200-$400/kW load reduction	Depends on end-use	14% of peak load winter; 16% of peak load during summer	N/A	Depends on program	Depends on program	5-15 Min	5 min – 1 Hour	Depends on end-use	Medium/Large
4	Direct Load Control (A/C switch control)	$70-$150/switch $55/kW/yr	One-time payment (~$100)	0.37 kW (27% cycling); 0.80 kW (50%cycling)	Warm months only	N/A	~100	120 Hours	2-10 min	2-4 Hours	Yes	Small

A Balanced Program-Design Process Can Help



The Market-Driven Side of the Equation

“It's really hard to design products by focus groups. A lot of times, people don't know what they want until you show it to them.”

— Steve Jobs

SMUD Takes a New Approach

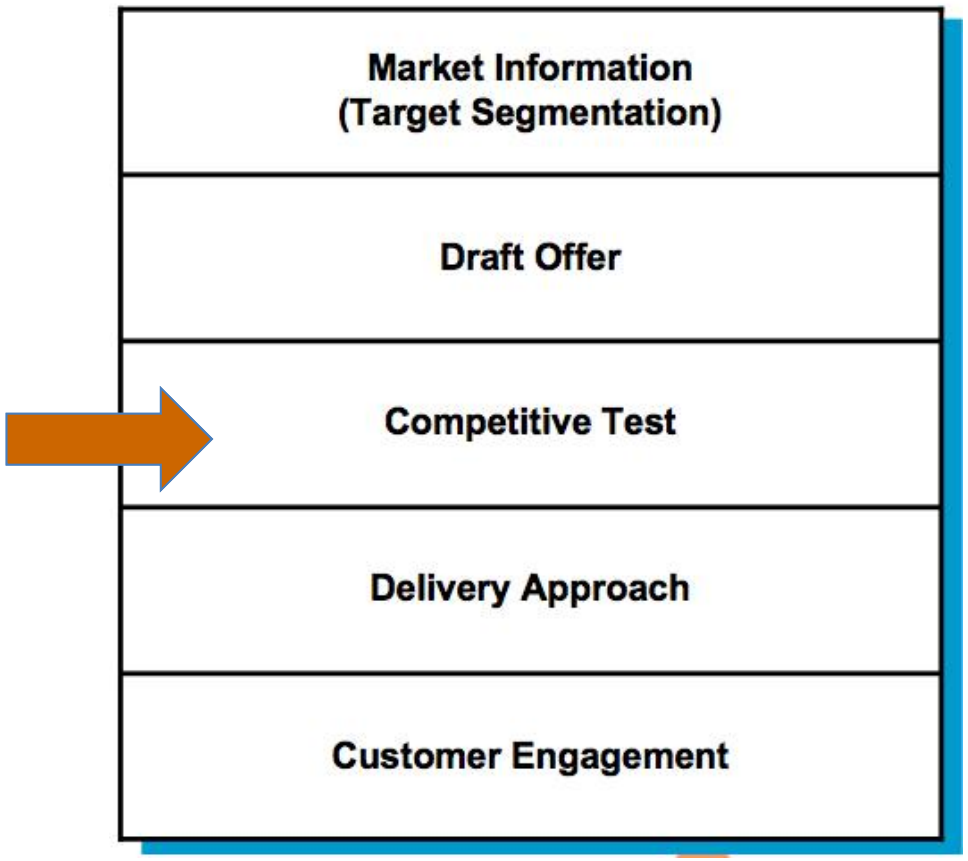
Sours: Shah, 2015

- Identify Prizm segments based on customer attributes
- Sketch offers based on targeted-sector headline attributes, e.g., preferred technology, financing, level of engagement
- Rank, based on market potential and benefits of each offer
- Complete the draft offer to suit the targeted sector/s, including site location, bundled services, pricing/terms, messaging, and outreach based on the sector's values and preferences

For Example

- SMUD-specific research indicated that *overall* … community solar is a top “star” idea; remote utility management of customer equipment is the opposite—yielding a strong negative response
- Previous studies concurred that there were 2 drivers for community solar: that it is the right thing to do, and that participating could save money… but not all *segments* favored both equally
- *Particular* target segments thought differently, and regarding DR concepts, some thought very differently
- A few segments are favorable toward DR when they have some control, including (but not exclusively) via mobile device
- Results from evaluations of SMUD’s PowerStat AC load-control program confirmed how effective communications can turn wary preconceptions into strong support

Not Done Yet!



- Also consult available Utility CIS, county-data, JD Power survey, additional studies (e.g., BrandDelphi), past program evaluations
- Zero in with survey or focus group questions specific to your offer, your target sectors
- Include a Competitive Test against other offers or alternative actions

By Using Segmentation, Outreach/ Engagement is Simplified

Imagine Growing Fleets of Community Solar-Plus Projects, Leading to Widespread Use of DR + Storage Integration Strategies

88% of utility execs ranked distributed energy resources as their greatest opportunity, but 63% weren't sure how to build a good business around it*

* Utility Dive, 2014 Annual Survey

About the Project and the Presenter

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. See www.communitysolarvalueproject.com

Jill K. Cliburn is Program Manager of the CSVP**.** She brings long experience in the utility industry, including work in solar and wind market development, solar program and policy consulting, utility integrated resource planning, and DSM and load management program design. Contact: jkcliburn@cliburnenergy.com.

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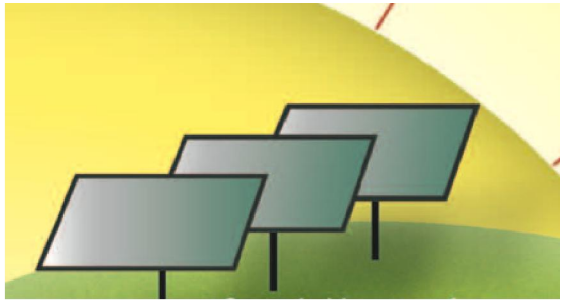
Supplementary Slides

What It Looks Like: Strawman Model

Competitive Product with Voluntary Companion Measures

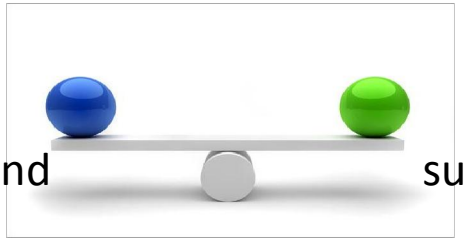
- Participants' rate based on wholesale solar cost + admin + wires costs
- Keyed to solar capacity "share"
- ***Plus payments for adding integration value via DR / storage***

Solar Project/s with Strategic Design



- Siting/design for value-added wholesale solar
- Utility pays price set by competitive PPA; specifying design; likely buyout
- Fleet expansion expected, with technical and pricing adjustments

Utility



demand supply

*CSVP model; *generic* to the SMUD proposal