

Utility Solar Business Models

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Source: Solar Electric Power Association

Overview



Source: Nellis Air Force Base

1. About SEPA
2. Utility Context
3. Utility Solar Business Models
4. Summary

About SEPA



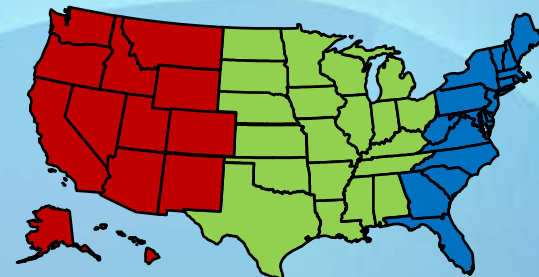
- Formed in 1992 as the Utility Photovoltaic Group
- Mission: facilitate solar solutions for utilities
 - Provide unbiased, reliable information
 - Answer utilities' solar questions, big and small
 - Help utilities collaborate with peers
 - Serves as a bridge between the utility and solar industries
- Membership
 - 110 Electric Utility companies
 - 450 Solar Industry & Stakeholder companies
- Board of Directors: 14 of 18 members are from electric utilities

SEPA Program Areas



- Reports
- Q&A

- Webinars
- Workshops
- Fact-Finding Missions
- Utility Solar Conference
- Solar Power International



Overview



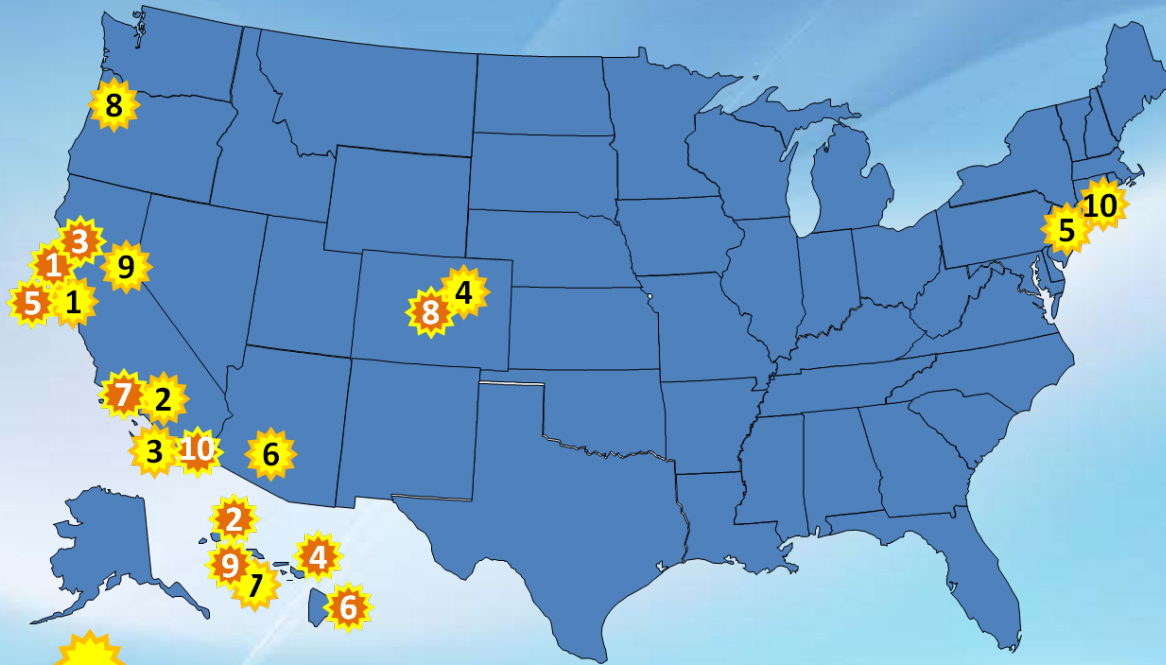
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Expanding and Evolving Levels of Utility Involvement:

1. None
2. Interconnection
 - Customer net metering requests
 - Customer service and distribution engineering
3. Customer Facilitation
 - Standardizing procedures
 - Incentive programs
 - Green pricing programs
4. Integration and Exploration
 - Increasing number of interconnections
 - Concerns about grid impacts
 - Supply-side procurement
 - Innovative approaches to business needs and customer access
5. Business Models

Overall Rankings: Annual – 2008



Total Solar Megawatts



- #1 Pacific Gas & Electric Co. - CA (84.9)
- #2 Southern California Edison - CA (32.4)
- #3 San Diego Gas & Electric Co. - CA (16.0)
- #4 Public Serv. Co. of CO (Xcel Energy) – CO (14.2)
- #5 Public Service Electric & Gas Co. – NJ (5.5)
- #6 Arizona Public Service Co. - AZ (3.56)
- #7 Hawaiian Electric Co. - HI (3.54)
- #8 Portland General Electric - OR (3.538)
- #9 Sacramento Municipal Utility District –CA (2.9)
- #10 Long Island Power Authority - NY (2.5)

Total Solar Watts per Customer



- #1 San Francisco PUC - CA (2696.3)
- #2 Kauai Island Utility Coop. - HI (47.1)
- #3 Palo Alto Utilities - CA (44.4)
- #4 Maui Electric Co. - HI (32.7)
- #5 Pacific Gas & Electric Co. - CA (16.4)
- #6 Hawaii Electric Light Co. - HI (13.6)
- #7 Burbank Water & Power - CA (12.9)
- #8 Black Hills Energy - CO (12.5)
- #9 Hawaiian Electric Co. - HI (12.0)
- #10 San Diego Gas & Electric Co. - CA (11.8)

Overall Rankings: Cumulative



Total Solar Megawatts



- #1 Southern California Edison – CA (441.4)
- #2 Pacific Gas & Electric Co. – CA (229.5)
- #3 NV Energy – NV (77.9)
- #4 San Diego Gas & Electric Co. – CA (49.3)
- #5 Public Serv. Co. of CO (Xcel Energy) – CO (28.5)
- #6 LA Department of Water & Power – CA (13.6)
- #7 Public Service Electric & Gas Co. – NJ (13.2)
- #8 Arizona Public Service Co. – AZ (10.6)
- #9 Sacramento Municipal Utility District – CA (10.2)
- #10 Long Island Power Authority – NY (7.7)

Total Solar Watts per Customer



- #1 San Francisco PUC – CA (4739.3)
- #2 Port of Oakland – CA (3414.7)
- #3 Southern California Edison – CA (91.7)
- #4 Kauai Island Utility Coop. – HI (70.6)
- #5 Palo Alto Utilities – CA (70.4)
- #6 NV Energy – NV (68.6)
- #7 Pacific Gas & Electric Co. – CA (44.3)
- #8 Maui Electric Co. – HI (43.8)
- #9 Hawaii Electric Light Co. – HI (41.0)
- #10 San Diego Gas & Electric Co. – CA (36.3)

Solar Electric 'Supply-Side' Announcements



Purchasing Utility	PV MW (DC)	CSP MW (AC)	State	Anticipated Completion
Arizona Public Service	125	280	AZ	2012
Tucson Electric	15		AZ	TBA
Pacific Gas & Electric	1305	1337	CA	2011
San Diego Gas & Electric	77	300	CA	2012
Southern California Edison	258	1905	CA	2013-2016
TBD		600	CA	2011
San Francisco PUC	5		CA	2010
Public Service Co. of CO (Xcel Energy)	17	225	CO	2015
Florida Power & Light	110	75	FL	2010
JEA	15		FL	2010
Lakeland Electric	24		FL	2009
Tampa Electric	25		FL	2011
National Grid	5		MA	2010
Western Mass. Electric Co.	6		MA	2010
DTE Energy	20		MI	TBD
Duke Energy - NC	31.5		NC	2010
Jersey Central P&L	42		NJ	2012
PPL Energy	5		NJ	2009
PSEG	150		NJ	2008
Public Service of New Mexico		70	NM	2011-2012
Tri-State Generation	30		NM	2010
NV Energy		250	NV	2013-2014
Consolidated Edison	12		NY	2011
Long Island Power Authority	50		NY	2011
Duke Energy - OH	12.4		OH	2012
Austin Energy	30		TX	2010
CPS Energy		100 (TBD)	TX	2010
Total	2370	5042		

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- Phase 1: 2007-2008
 - Workshops
 - Working Groups
 - Webinars
 - Report

- Phase 2: 2009
 - Tracking and summarizing announcements and updates
 - Quarterly webinars
 - Creating decision tool
 - Summary report
 - Regulatory implications report

What is a 'utility solar business model'?

- A promising utility solar business model –
 - creates value in the energy marketplace
 - enables the utility to capture part of that value
 - will sustain itself over time

- It must serve multiple stakeholders –

OWNERS

- IOU shareholders
- POU community

CUSTOMERS

- participants
- non-participants
- protected groups

SOCIETY

- IOU regulators require it
- POU officials represent it

- Cost-effectiveness is the key
- Win/win/win is the goal

What is a 'utility solar business model'?

● Business model elements include -

- utility roles
 - buy output • acquire projects • develop projects
 - own assets • provide services • incentivize others . . .

- others' roles
 - provide a site • sell &/or install equipment • develop projects
 - provide maintenance • buy or aggregate output . . .

- economic impacts
 - value streams & magnitudes • cost/benefit allocations
 - project & aggregate impacts . . .

- regulatory treatment
 - ratebase • revenue impacts • incentives . . .

Why it's timely to look at them

- Climate change is accelerating
- Solar technology is maturing
- Solar costs are dropping
- RPS requirements are proliferating
- Utility generation options are narrowing
- Tax changes expand utility solar options
- Utilities need new business models to deliver 21st-century resources

USBM Categories

- Ownership: utilities directly owning solar projects
 - Project Type: Centralized or Distributed
 - Siting: Utility, Third-party, Customer
 - Side of Meter: Utility (Supply) or Customer (Demand)
 - Utility Type: Investor owned, Public power
- Financing: utilities providing financing to customers, third-party developers, or as investments
- Energy Purchases: utilities purchasing solar energy from customers or third-party developers

Utility Project Highlights



- Centralized Ownership or Purchases
 - Photovoltaics: Pacific Gas & Electric (CA), Austin Energy (TX), Xcel Energy (CO), Florida Power & Light (FL), Tri-State Generation (NM),
 - CSP: Xcel Energy (CO), Pacific Gas & Electric (CA), San Diego Gas & Electric (CA), Southern California Edison (CA), Public Service New Mexico (NM), Arizona Public Service (AZ), Florida Power & Light (FL)
- Distributed Ownership and/or Purchases (“Distributed Power Plant”)
 - Duke Energy (NC), San Diego Gas & Electric (CA), Pacific Gas & Electric (CA), Southern California Edison (CA), Public Service Electric & Gas (NJ), ConEd (NY), WMECO (MA), National Grid (MA), Pepco (MD)...
- Financing
 - Public Service Electric & Gas (NJ)
- Community Net Metering
 - City of Ellensburg (WA) and City of St. George (UT)

Utility Project Highlights



- Solar Tariffs
 - Sacramento Municipal Utility District (CA)
 - Arizona Public Service (AZ)
- Feed-in Tariffs (Standard Offer; no RFP)
 - Rebate alternative: Gainesville Utilities (FL)
 - Green pricing integration: WE Energies (WI), Madison Gas & Electric (WI), TVA (southeast)
- Innovative Procurement
 - Flips / Buyouts: Portland General (OR)
 - Pre-purchases: no solar examples (SCCPA)

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Summary

- Net metering / customer systems are not going away but the market is diversifying
- Utility owned, utility scale, and utility-side of the meter are emerging and have a large potential
- Utilities are exploring new business project and program ideas
- Regulators and stakeholders are assessing and reacting to these developments

Questions?



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