

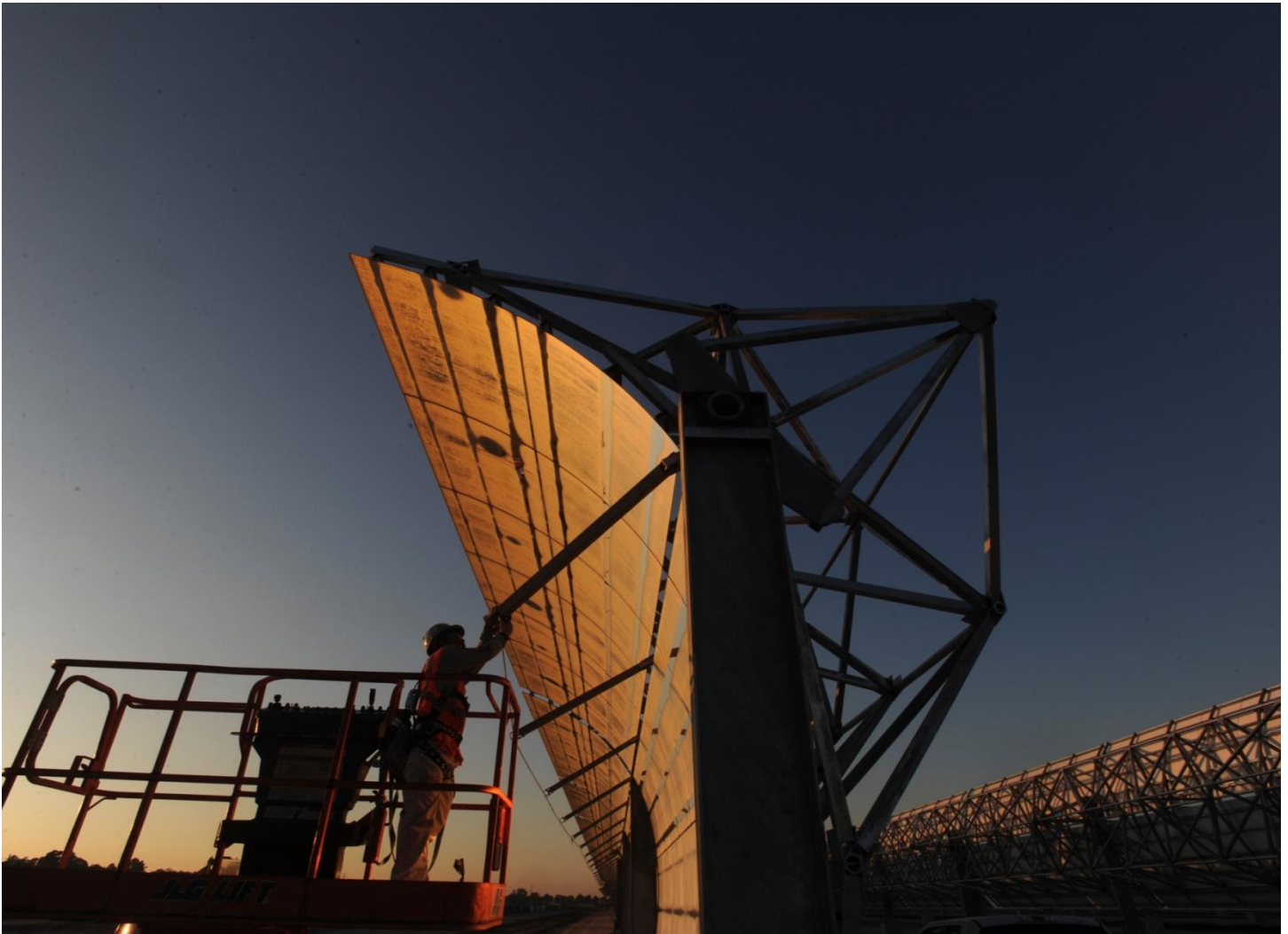
REPORT # 01-11



**SEPA**

solar electric power association

2010 SEPA Utility Solar Rankings



**Fourth Annual**  
**2010 SEPA Utility Solar Rankings**

**June 2011**

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# SEPA

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## Acknowledgements

The Solar Electric Power Association would like to thank all the participating utilities for submitting their data in the survey (see appendix for a full list), as well as the American Public Power Association, Edison Electric Institute, and the National Rural Electric Cooperative Association in assisting with distributing the survey. A special thank-you goes to Larry Sherwood at IREC for collaborating on data verification.

## Feedback

The Solar Electric Power Association would appreciate feedback on this and past reports, as well as new areas of research we should consider in the future. Please take a moment to provide comments and suggestions through an online survey:

<http://tinyurl.com/SepaReportFeedback>

## Cover Photo

Construction at Florida Power & Light's Martin 75 MW hybrid concentrating solar power plant, the largest solar project of 2010, and the first commercial hybrid plant in the U.S. Courtesy: Florida Power & Light.

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# About the Report

SEPA's fourth Utility Solar Rankings report details the results of the yearly survey sent to hundreds of utilities in the United States of their annual and cumulative solar electric installations.

The annual rankings include new solar projects installed in 2010, and take into account large and small solar projects owned by customers, solar companies, or the utilities themselves that are integrated into the utility's grid, allowing comparisons against peer, regional, or national benchmarks. The cumulative rankings take into account all solar that was interconnected into the utility's grid through the end of 2010, including all prior years.

New efforts to expand and incorporate more utilities into this independent survey have been extremely effective, capturing a nearly complete picture of the U.S. solar market. Utility participation has increased 334 percent from 2007 to 2010, from 53 to 230 participating utilities respectively. As a result, the 2010 survey has captured an estimated 99 percent of the annual and 96 percent of the cumulative national solar market.<sup>1</sup>

Each of the Top 10 rankings includes both 'Solar Megawatts' and 'Solar Watts-per-Customer' in the following categories:

- National
- Regional
  - Eastern U.S.
  - Central U.S.
  - Western U.S.
- Utility Type
  - Cooperative
  - Investor Owned
  - Municipal

The report is broken down into four sections, beginning with overall **Trends** from 2010, followed by the **National Solar Rankings** for 2010. A chapter on **Regional Solar Rankings** looks at how utilities ranked when divided by Eastern, Central and Western regions. Next, the report includes a section on **Utility-Type Rankings**, examining how the three major utility types (cooperative, investor-owned and municipal) ranked. The **Appendix** contains a list of definitions of terms commonly used throughout the report, information on the survey methodology, and the annual and cumulative data and rankings for all participating utilities.

A special webpage has been set-up for the project, which includes interactive maps and tables: [www.sepatop10.org](http://www.sepatop10.org).

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<sup>1</sup> This information is based on comparisons with data collected by other consultants using different methodologies, including Larry Sherwood of the Interstate Renewable Energy Council and Greentech Media/SEIA.

# Introduction

The Solar Electric Power Association's (SEPA) fourth annual Utility Solar Rankings report analyzes utility solar electricity markets in the United States, focusing particularly on the top utilities that are driving solar electric power growth. The SEPA Top 10 ranked utilities integrated 561 megawatts<sup>2</sup> (MW) of solar electricity capacity in 2010, representing 100 percent growth over one year.

In addition to continued growth, the new report shows two dramatic changes taking place in utilities' use of solar power. 1) The report demonstrates that more and more growth came from areas outside the traditionally strong solar regions of California and the Southwest. Many utilities in other parts of the country now have sizeable solar portfolios, and tens of thousands of photovoltaic (PV) systems were installed nationwide. 2) With a growing trend toward more utility-owned solar projects and third-party power purchase agreements (PPA), the industry is no longer based solely on customer-owned, net-metered systems.

Among the Report's key conclusions:

- *Utility solar electric markets continue to expand rapidly across the country.* About 63 percent of the new solar capacity came from utilities outside California in 2010, the largest percentage on record. Seven of this year's Top 10 Solar MW utilities were from outside of California, and four of the top-ranking utilities were located in the Eastern United States. Solar power is becoming recognized as an important element in the energy supply planning and customer energy management of utilities nationwide.
- *Two new growth trends are changing the profile of solar electric power in the United States: centralized projects and utility ownership.* Traditionally, solar markets have relied on distributed PV for most new capacity. However, centralized projects are gaining new traction—eight centralized projects greater than 10 MW each were installed in 2010. This included what are now the two largest PV projects in the United States—the 48 MW Copper Mountain project, in Nevada, with power purchased by Pacific Gas & Electric and the 30 MW Cimarron project, in New Mexico, purchased by Tri-State Generation & Transmission Cooperative Association. The largest concentrating solar power (CSP) project in nearly 20 years was also installed in 2010. It is a hybrid CSP-natural gas facility owned by Florida Power & Light. Centralized projects totaled 226 MW in 2010, up from two projects totaling 46 MW the year before.

Thirty utilities reported owning 140 MW of solar, as opposed to purchasing the power from facilities owned by others. This utility ownership represents a more than 300 percent increase over the previous year.<sup>3</sup> Based on future announcements and plans in both categories, both trends are expected to continue their growth and market penetration.

- *Individual utility solar portfolios reveal very different market dynamics and procurement strategies.* Utility solar portfolios differ by project technology (PV or CSP), type (distributed or centralized) and ownership

**“The Top 10 ranked utilities’ solar megawatts grew over 100% to 561 MW, representing 72% of the national market.”**

<sup>2</sup> All megawatts (and watts) are listed in utility-standard MW-ac grid capacity, comparable to other generating technologies. Significant differences from other consultants' solar data are often attributed to this nomenclature.

<sup>3</sup> One 75-MW and one 10-MW project were common to both categories.



(customer, third-party or utility). Some utilities are purchasing power from solar systems, such as rooftop PV, owned by their customers, while others are creating a solar electric market by procuring and/or owning large amounts of solar generation resources. Many are doing both. Like different investment portfolios varying in percentages of stocks, bonds and cash, the Top 10 utilities' cumulative solar portfolios reflect varying amounts of utility ownership, CSP technology and distributed PV, discussed in more detail in the full report. Solar portfolios vary from utility to utility because of different state policies, utility preferences, solar resources, electricity prices, incentives available and other factors.

This year's Top 10 report not only depicts a rapid rise in the amount of solar installed on utility grids, but a trend towards utility-led initiatives that is behind much of the expansion of the solar market. The remainder of the report includes discussion on the national rankings, including an analysis of the Top 10 cumulative utilities' solar portfolios, as well as rankings by region (west, central, and east) and utility-type (cooperative, investor-owned and municipal). Each rankings section includes detailed discussions about emerging trends in geographic diversity, project characteristics, technologies, and utility ownership.



Pacific Gas and Electric 48 MW Copper Mountain PV project (Courtesy: Sempra Generation)

## National Rankings

The annual national rankings measure a utility's newly installed solar power and include photovoltaic and concentrating solar power technologies that were interconnected between January 1 and December 31, 2010. The data includes everything from distributed customer systems to wholesale contract purchases from independent power producers to utility owned projects. There are two rankings categories—*Solar Megawatts* (MW), which measure a utility's total solar capacity, and *Solar Watts-per-Customer* (w/c), which standardizes solar capacity by the size of the utility. SEPA awards the Top 10 utilities in these two categories at its annual Utility Solar Conference (USC). The 2011 USC will be held in July in San Diego, CA.

### ANNUAL SOLAR MEGAWATTS

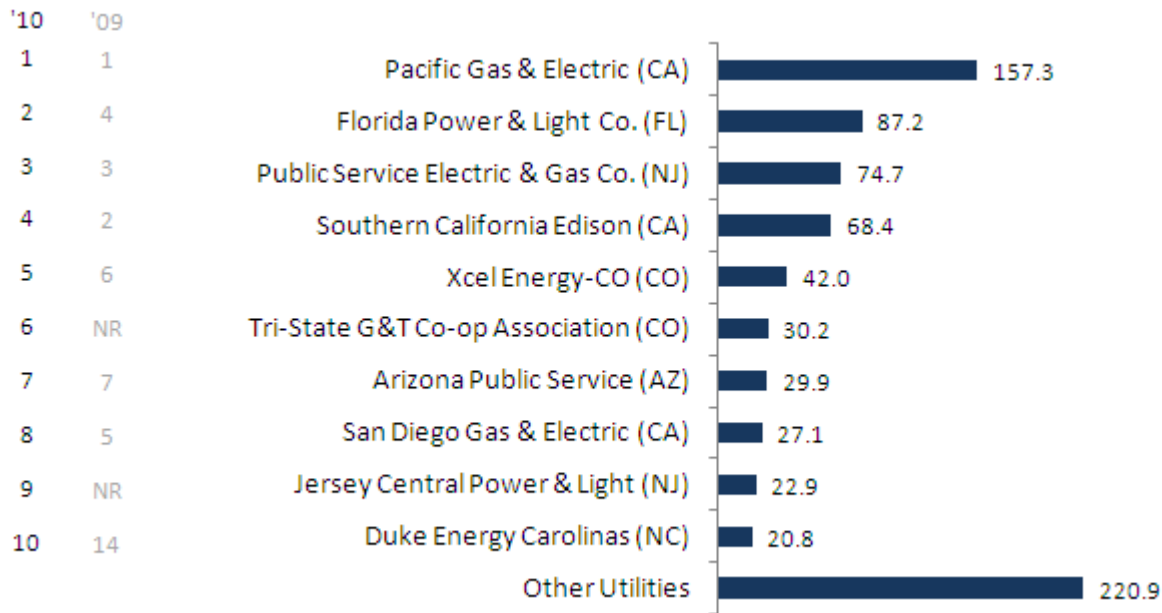
Pacific Gas and Electric (CA) (PG&E) installed 157 MW in 2010 (Figure 1), which secured the top position in the annual solar megawatts rankings. PG&E's 2010 solar portfolio was about two-thirds distributed, customer PV projects, with more than 10,000 projects totaling more than 104 MW. PG&E also purchased the output of the new 48-MW Copper Mountain PV facility, the largest in the country. In contrast, Florida Power and Light (FL) (FPL), the second ranked utility, installed 87 MW, largely based on two utility-owned projects—a 10-MW PV project at the Kennedy Space Center and a 75-MW hybrid CSP power plant at a combined-cycle natural gas plant. Public Service Electric and Gas (PSE&G), of New Jersey, maintained its third place position in 2010 through a 75-MW portfolio, about 30% of it utility-owned and 70% customer-rooftop projects.

Tri-State Generation and Transmission Cooperative Association, in Colorado, was the highest ranked cooperative utility at sixth on the list, based on a power purchase agreement with the 30-MW Cimarron PV project. Other newcomer utilities to this year's Top 10 include Jersey Central Power and Light, ranked ninth after interconnecting 1,150 distributed systems in 2010, and Duke Energy Carolinas (NC), ranked tenth on the strength of two very different projects. Twelve megawatts of the 15.5-MW Davidson Solar Facility in North Carolina were completed in 2010, along with the deployment of more than 7 MW of utility-owned, customer-sited solar projects.



Tri-State G&T Cimarron 30 MW PV Project (Courtesy: First Solar)





**Figure 1: 2010 Annual Solar Megawatts (MW-ac)**

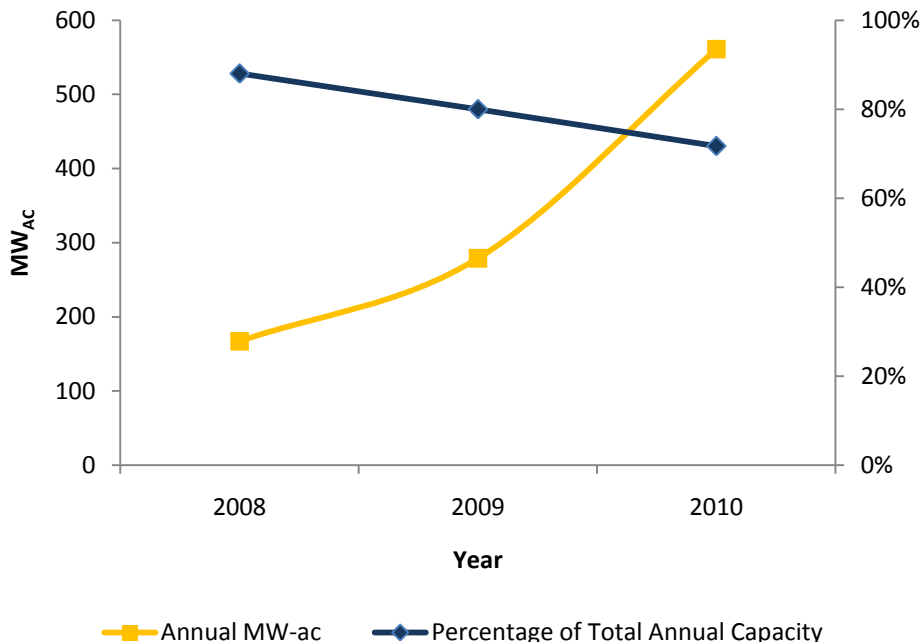
NR = No Rank; the utility either did not participate in or was not ranked in the previous year's rankings.

All but one of this year's Top 10 Solar Megawatt rankings were investor-owned utilities (IOUs), which may be a result of the larger average size of IOUs relative to municipal and cooperative utilities. The top ranked municipal utilities were CPS Energy, in San Antonio, at #11 and the Jacksonville Electric Authority (JEA), in Florida, at #13, both ranked after the completion of larger-sized PV plants under PPAs. After Tri-State G&T, the next ranked cooperative utility was Kauai Island Utility Cooperative in Hawaii at #52 with 0.8 MW.



Xcel Energy Colorado 16 MW Greater Sandhill Solar Farm  
(Courtesy: SunPower Corporation)

The total annual capacity of the Top 10 utilities has grown exponentially over the past three years, rising from 167 MW in 2008 to 561 MW in 2010 (Figure 2). This year's rankings required a minimum of 20 MW for an individual utility to rank in the Top 10. However, the Top 10's share of the overall survey capacity declined from 88% in 2008 to 72% in 2010, indicating a broadening of the market for utilities ranked 11 and higher.



**Figure 2: Top 10 Utilities Annual Capacity (left axis) and Share of Overall Market (right axis)**

Looking at geographic distribution, seven of this year’s Top 10 utilities were from outside of California and four of the top ranking utilities were located in the Eastern region, both increases from prior years. Non-California states’ share of the market has increased from 25% in 2008 to 63% in 2010. Overall, the U.S. solar markets are expanding well beyond California’s borders.

As predicted in last year’s report, 2010 was a growth year for centralized projects. In 2010, eight projects greater than 10 MW, totaling 226 MW, were completed, making up 29% of the market, versus three totaling 62 MW in 2009. This centralized trend in growth is expected to continue through 2011 and beyond, as 24 projects, each greater than 10 MW and totaling more than 1 GW, are already completed or currently under construction in 2011.

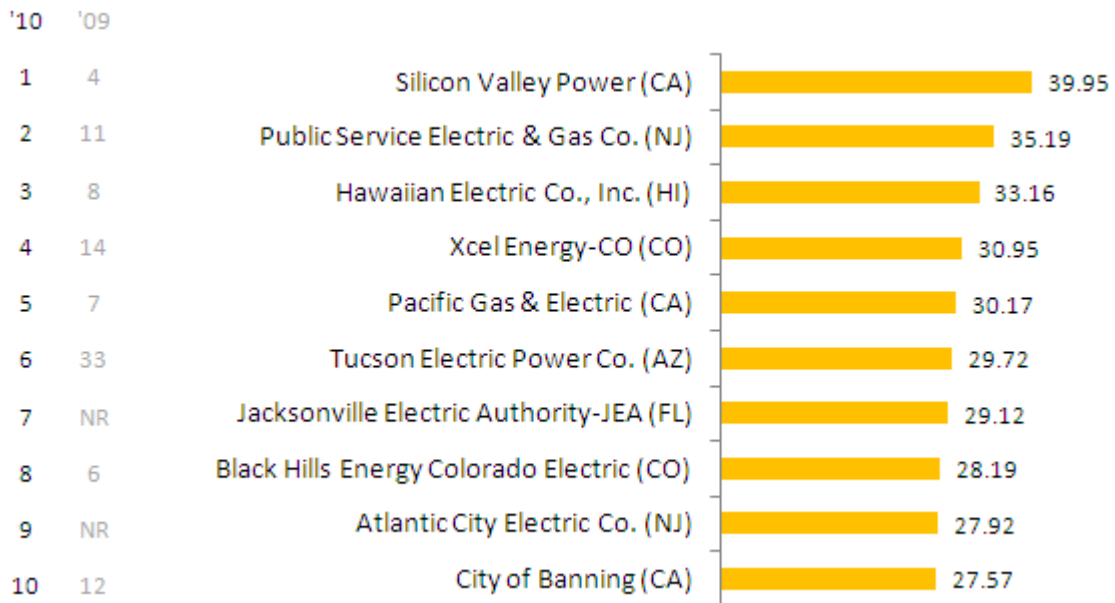
Beyond FPL’s 75 MW CSP project, the rest of the projects and megawatts in the Top 10 were all PV technology—87% of the total. These PV projects, which ranged in size from 1-kilowatt residential installations to 48-megawatt power plants, have much shorter planning horizons and project completion times, along with lesser siting, permitting, financing and transmission requirements at these small- and medium-sized scales. However, larger PV and CSP projects (those greater than 50 MW) require overcoming financing, siting/permitting, and transmission barriers that might emerge at these larger sizes. CSP represents over 6,000 MW of the over 15,000 MW of future solar projects that SEPA is tracking, but there are differences in project development between CSP and PV. PV can be built and sub-sections of the larger project can be energized over time, resulting in lower construction risk and balance-sheet impact. CSP projects need to be completed in full before commissioning, a period which takes several years from start to finish.

Utility ownership was a new impact on this year’s rankings. Thirty utilities reported owning 140 MW of new solar capacity, or 18% of the total market, up from an estimated 30 MW, which represented 9%, in 2009. The Top 10 ranked utilities owned 23% of their total annual capacity, with three utilities owning more than a third—Arizona Public Service, Duke Energy Carolinas, and FPL. While most utilities’ future plans for ownership involve distributed projects, 2010 was the exception due to FPL’s two large centralized projects. The utility ownership trend is expected to continue its growth, with at least 1,100 MW of announced utility-owned projects in the pipeline over the next few years.

**ANNUAL SOLAR WATTS-PER-CUSTOMER**

Silicon Valley Power (CA) ranked first nationally with nearly 40 watts-per-customer, followed by PSE&G with 35.2 Watts-per-customer (Figure 3)<sup>4</sup>. The two utilities are very different. Silicon Valley is a California municipal utility with just under 52,000 customers, average electricity rates and a better-than-average solar resource, which interconnected just over 1.8 MW of PV from 74 distributed customer systems in 2010. PSE&G, in contrast, is a large New Jersey investor-owned utility with more than 2.1 million customers, in a region with higher-than-average electricity rates and a lower-than-average solar resource, which interconnected 75 MW from 1,057 PV systems, of which 13% is utility owned. This comparison shows how standardizing the rankings by the number of customers, levels the playing field between big and small utilities<sup>5</sup>.

The top five utilities were rounded out by Hawaiian Electric Company (HI), Xcel Energy (CO), and PG&E (CA), all investor-owned utilities in the Western region. Two newcomers to this year’s survey, JEA (FL) and Atlantic City Electric (NJ), jumped into the rankings. JEA’s 2010 capacity was attributed to the installation of the Jacksonville Solar facility, a centralized 12-MW facility. In contrast, Atlantic City Electric’s 2010 capacity was 100% distributed customer projects. Kauai Island Utility Cooperative, in Hawaii, and Kit Carson Electric Cooperative, in New Mexico, were the highest ranked cooperative utilities at #12 and #17 respectively. Overall, the median watts-per-customer for the Top 10 utilities increased by 50%, from 20 to nearly 30 Watts-per-Customer between 2009 and 2010, which indicates that annual solar capacities quickly increased this past year.



**Figure 3: 2010 Annual Solar Watts-per-Customer**

NR = No Rank; the utility either did not participate in or was not ranked in the previous year’s rankings.

<sup>4</sup> For reference, Germany, the world’s largest solar market, installed around 7,400 MW in 2010, which translates to around 90 watts-per-capita. While this figure is not exactly the same as watts-per-customer, it is close.

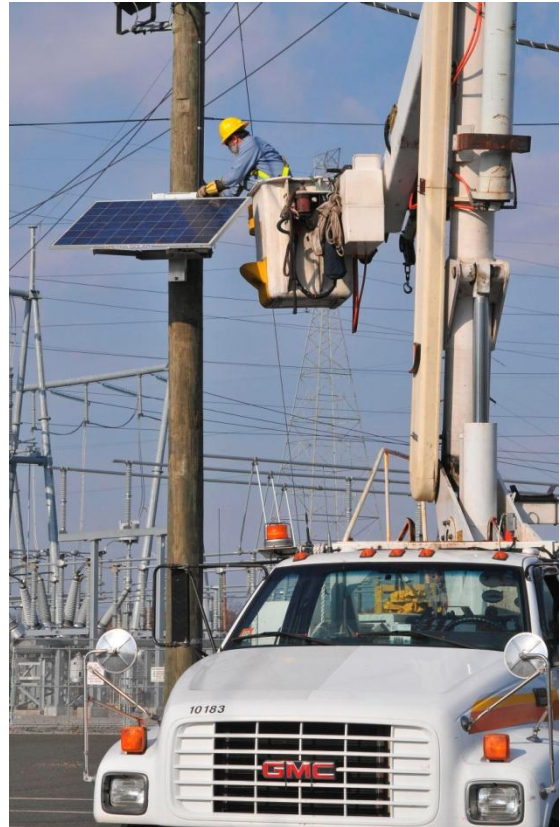
<sup>5</sup> The economic value of the solar electricity is actually greater in New Jersey, even though there is less solar resource (without factoring local, state, and utility incentives). A system in New Jersey will produce about 20% less solar electricity, but electric rates are upwards of 80% higher.

In contrast to prior years, larger utilities are now ranking in this category in greater numbers. In 2009, just three Top 10 utilities had more than 100,000 customers, while this year's list includes seven large utilities—six IOUs and one municipal utility. The rankings of these larger utilities are a testament to the growth of solar— it takes more megawatts to reach these rankings with more customers. However, the Watts-per-Customer rankings can be much more variable than the megawatts rankings since a lower amount of solar from a smaller utility could easily be ranked in future surveys.

There was greater geographic diversity in this year's list, with utilities from six different states making the list, including three from the East. In 2009 there were four different states, of which none were in the East.

Unlike last year, the watts-per-customer utility portfolios were driven by both distributed and centralized generation projects, but this varied significantly by utility—five utilities had exclusively distributed projects, one had exclusively centralized projects (or nearly so), and four had a mixture. For example, more than 55% of Xcel Energy Colorado's 2010 solar portfolio was achieved through centralized projects, including the 16.2 MW Greater Sandhill project, while Black Hills Energy Colorado Electric was entirely distributed and JEA nearly entirely centralized.

Utility ownership played a smaller role in determining the Watts-per-Customer ranking. Two of the ranked utilities, Tucson Electric Power (AZ) and PSE&G, installed utility-owned projects in 2010, in contrast with six in the Top 10 megawatt utilities. This is partially due to the fact that three of the ten are municipal utilities, which for a variety of reasons (primarily tax incentive ineligibility) are less likely to own solar projects.



Public Service Electric and Gas Solar4All Project  
(Courtesy: Public Service Electric and Gas)

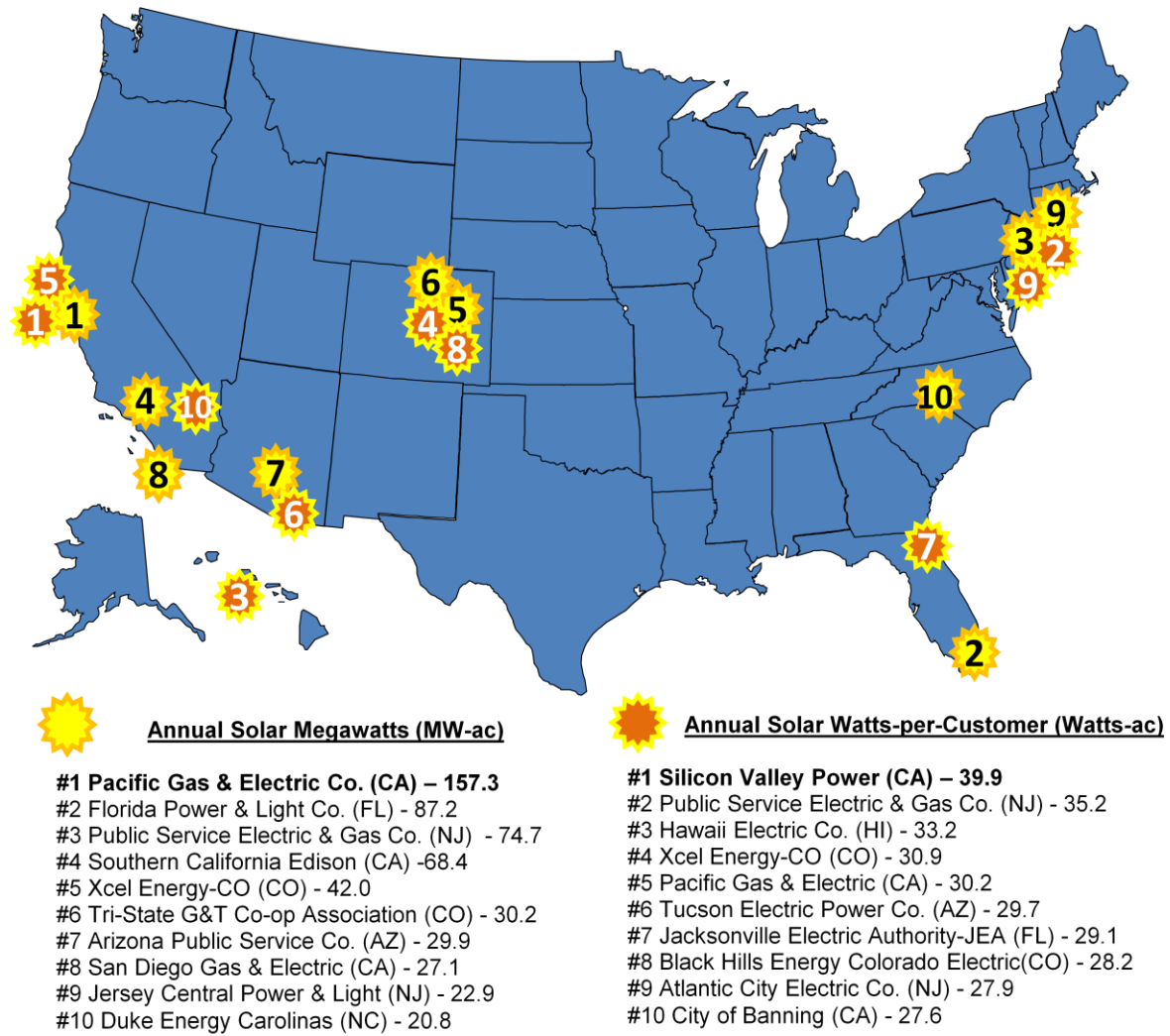


Figure 4: 2010 Annual Utility Solar Rankings



**CUMULATIVE SOLAR MEGAWATTS**

The cumulative national rankings measure a utility’s solar portfolio over time and include solar projects that were interconnected any year before December 31, 2010. Similar to the annual rankings, there are two rankings categories—*Solar Megawatts (MW)* and *Solar Watts-per-Customer (w/c)*.

Southern California Edison (CA) (SCE) and PG&E ranked first and second, respectively, for the third straight year (Table 1), though PG&E is gaining ground. The majority of SCE’s portfolio (62%) is derived from long-standing PPA contracts with the nine SEGS CSP plants, while PG&E’s portfolio is largely distributed, customer-sited systems. PSE&G and FPL were ranked third and fourth respectively, with PSE&G edging FPL by 0.1 MW (0.08% more). A similarly close race was seen between NV Energy (NV) at fifth and San Diego Gas and Electric (CA) (SDG&E) at sixth, with only 0.5 MW separating them (0.6% more). Both pairs are amazingly close given the multi-year solar development they have undertaken in very different state markets.

**Table 1: Cumulative Solar Megawatts (MW-ac)**

'10	'09	Utility	MW <sub>AC</sub>
1	1	Southern California Edison (CA)	578.3
2	2	Pacific Gas & Electric (CA)	476.5
3	6	Public Service Electric & Gas Co. (NJ)	117.4
4	7	Florida Power & Light Co. (FL)	117.3
5	3	NV Energy (NV)	90.0
6	4	San Diego Gas & Electric (CA)	89.5
7	5	Xcel Energy-CO (CO)	85.6
8	8	Arizona Public Service (AZ)	52.5
9	NR	Jersey Central Power & Light (NJ)	51.1
10	NR	Atlantic City Electric Co. (NJ)	35.1
Other Utilities			434.3

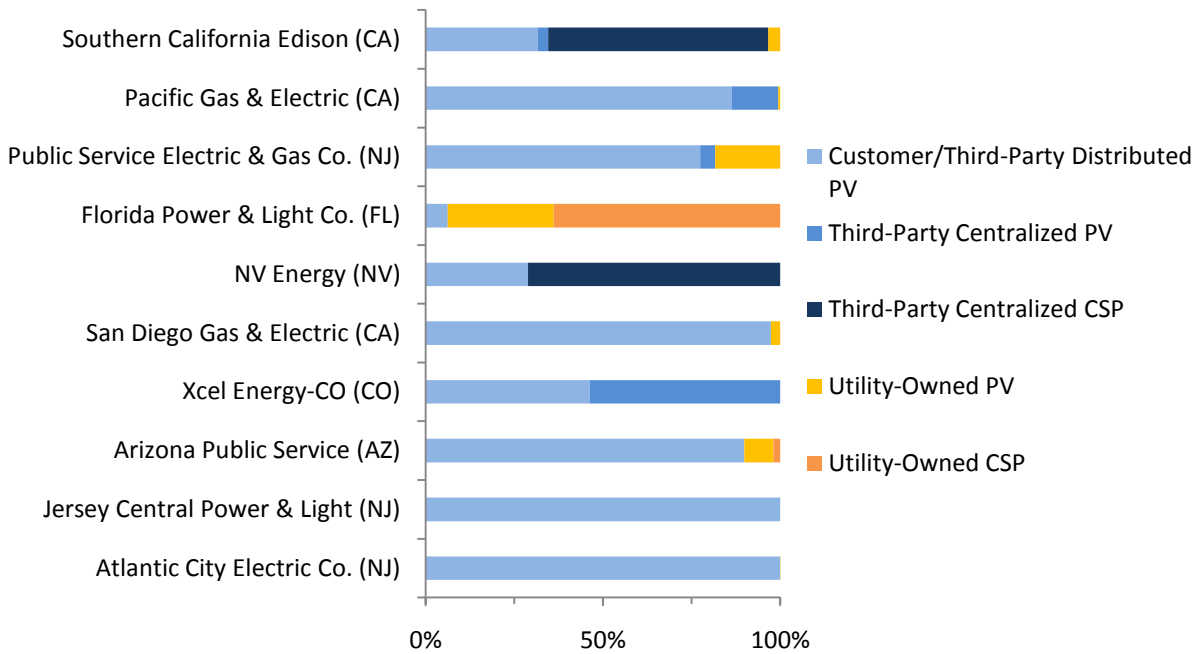
NR = No Rank; the utility either did not participate in or was not ranked in the previous year’s rankings.

Overall, all Top 10 utilities were investor-owned and eight of the ten utilities were in last year’s rankings, with the two newcomers being Atlantic City Electric Company and Jersey Central Power and Light. Both utilities integrated distributed solar for the most part.

Geographically, the Eastern region doubled its representation in this year’s rankings for this category, from two to four. The remaining six Top 10 utilities for this category are all located in the Western region.

It is interesting to break down each of the ten utilities’ full solar portfolios by the technology (PV or CSP), size (distributed or centralized) and ownership (customer, third-party, utility). Each utility has taken very different paths to solar development. Among the findings (Figure 5):

- Only three of the top ranked utilities have significant portions of their portfolios coming from CSP projects—SCE, NV Energy and FPL.
- Six utilities have greater than 80% coming solely from customer or third-party distributed PV systems.
- FPL’s portfolio is nearly entirely based on three utility-owned PV and CSP projects.
- Xcel Energy-Colorado’s portfolio is fairly balanced between distributed and centralized PV projects.
- Seven of the Top 10 utilities already have some amount of utility ownership, and continued growth is expected. In fact, among all survey participants, cumulative utility-owned capacity grew from 52 MW in 2009 to 193 MW in 2010—a nearly 270% increase.



**Figure 5: National Cumulative Top 10 MW Utility Solar Portfolio Distribution**

It will be interesting to see how these utility portfolios continue to change as the emerging areas of utility-ownership, medium-sized PV projects and centralized PV and CSP project development evolve over the coming years. In the meantime, the solar industry would do well to more specifically understand the approaches that individual utilities make to solar acquisition and tailor their market approach.

**CUMULATIVE SOLAR WATTS-PER-CUSTOMER**

The Western region of the country continues to dominate the 2010 cumulative Watts-per-Customer rankings. As in the previous three years, all utilities represented in this category were located within the Western region. The top three utilities remained unchanged from 2009. SCE took the top place for the fourth consecutive year. Kauai Island Utility Cooperative (HI), the Top 10’s highest ranked cooperative utility, followed in second place. Palo Alto Utilities (CA), a municipal utility, maintained its third place ranking for the straight third year. The diversity of utility types in these top three spots is indicative of the more open competition that this category represents.

The Top 10 utilities were made up of seven IOUs, two municipal utilities and one cooperative utility. California was well-represented with five utilities, followed by Hawaii with four and Nevada with one.

Centralized projects accounted for approximately 38% of the Top 10’s cumulative capacity. Utility-owned generation accounted for less than 2% of the Top 10’s cumulative solar portfolios.

**Table 2: Cumulative Solar Watts-per-Customer (Watts-ac)**

'10	'09	Utility	Watts <sub>AC</sub>
1	1	Southern California Edison (CA)	119.1
2	2	Kauai Island Utility Co-op (HI)	100.7
3	3	City of Palo Alto Utilities (CA)	97.0
4	6	Hawaii Electric Light Co. (HI)	93.6
5	5	Maui Electric Co. (HI)	93.5
6	8	Pacific Gas & Electric (CA)	91.4
7	4	NV Energy (NV)	75.4
8	13	Silicon Valley Power (CA)	69.7
9	12	Hawaiian Electric Co., Inc. (HI)	65.7
10	9	San Diego Gas & Electric (CA)	65.3

### A Different Perspective: Penetration Rates

Penetration rate, the *number* of solar systems per customer rather than the solar *capacity* per customer, is another method of comparing the amount of solar utilities have integrated. After analyzing the data, Roseville Electric, a municipal utility in northern California, had about 20 solar systems for every 1,000 customers in its cumulative solar portfolio, followed by Verendrye Electric, a cooperative utility in North Dakota with 19 per thousand. Roseville's results come from the installation of over 1,000 residential systems over the years, while Verendrye has over 200 small, off-grid utility-owned PV projects located at water pumping stations within its territory. Some of the larger utilities, like Pacific Gas and Electric and San Diego Gas and Electric had around 9 per thousand customers.

Table 3: Cumulative # of Solar Systems per 1,000 Customers

'10	'09	Utility	#
1	1	Roseville Electric (CA)	19.9
2	2	Verendrye Electric Co-op (ND)	18.8
3	3	City of Palo Alto Utilities (CA)	14.8
4	6	Maui Electric Co. (HI)	13.8
5	5	Sulphur Springs Valley Electric Co-op (AZ)	11.9
6	8	Hawaiian Electric Co., Inc. (HI)	11.3
7	4	Hawaii Electric Light Co. (HI)	10.7
8	13	City of Banning (CA)	9.1
9	12	Pacific Gas & Electric (CA)	9.0
10	9	San Diego Gas & Electric (CA)	8.6

**Largest Solar Projects - 2010**

**Table 4: 2010 Annual Largest Solar Projects**

	Project	MW	Tech.	Utility Owner/Energy Offtaker
1	Martin Solar Center	75 MW	CSP	Florida Power & Light (FL)
2	Copper Mountain	48 MW	PV	Pacific Gas & Electric (CA)
3	Cimarron 1 Solar	30 MW	PV	Tri-State G&T (CO)
4	Greater Sandhill	16 MW	PV	Xcel Energy-CO (CO)
5	Blue Wing Solar	14.5 MW	PV	CPS Energy (TX)
6	Jacksonville PV Davidson (Phase 2)	12 MW	PV PV	JEA (FL) Duke Energy Carolinas (NC)
7	Wyandot Solar Farm	10.1 MW	PV	Ohio Power-AEP (OH)
8	Space Coast Solar	10 MW	PV	Florida Power & Light (FL)
9	Exelon City Solar	8 MW	PV	Exelon (IL)
10	CalRENEW-1	5 MW	PV	Pacific Gas & Electric (CA)

2010 was a record year for utility-scale solar projects. Florida Power and Light installed the largest solar project with their 75 MW utility-owned hybrid CSP Martin plant (Table 2). Pacific Gas and Electric and Tri-State G&T followed with PPAs for the 48 MW Copper Mountain and 30 MW Cimarron solar projects, respectively. These are currently the nation's two largest PV projects.

Two utilities on the list installed utility-owned projects—Exelon and Florida Power and Light, who combined, installed three utility-owned projects in 2010.



Duke Energy 15.5 MW Davidson PV Project (Courtesy: SunEdison)

**Largest Projects - Cumulative**

**Table 5: Cumulative Largest Projects**

	Project	MW	Tech.	Utility Owner/Energy Offtaker
1	SEGS VIII (1990) SEGS IX (1991)	80 MW	CSP	Southern California Ed. (CA)
2	Martin Solar Center (2010)	75 MW	CSP	Florida Power & Light (FL)
3	Nevada Solar One (2007)	64MW	CSP	NV Energy (NV)
4	Copper Mountain (2010)	48 MW	PV	Pacific Gas & Electric (CA)
5	Cimarron 1 Solar (2010) SEGS II (1986) SEGS III (1987) SEGS IV (1987) SEGS V (1988) SEGS VI (1989) SEGS VII (1989)	30 MW	PV CSP CSP CSP CSP CSP CSP	Tri-State G&T (CO) Southern California Ed. (CA) Southern California Ed. (CA) Southern California Ed. (CA) Southern California Ed. (CA) Southern California Ed. (CA) Southern California Ed. (CA)
6	DeSoto Solar Center (2009)	25 MW	PV	Florida Power & Light (FL)
7	FSE Blythe (2009)	21 MW	PV	Southern California Ed. (CA)
8	Greater Sandhill (2010)	16 MW	PV	Xcel Energy-CO (CO)
9	Davidson 1 & 2 (2010)	15.5 MW	PV	Duke Energy (NC)
10	Blue Wing (2010)	14.5MW	PV	CPS Energy (TX)

Cumulatively, the Martin CSP plant is only slightly smaller than the two 80 MW SEGS CSP plants installed in 1990 and 1991 (Table 3). The Copper Mountain PV project is the fourth largest overall. It is only within the last two years that large scale PV plants have grown significantly to these large sizes.



CSP Energy 14.5 MW Blue Wing PV Project  
(Courtesy: Juwi Solar)



# Regional Rankings

In order to provide utilities with more specialized, geographically relevant assistance, SEPA has divided the US into three regions (Figure 6). Each region has a Regional Director who works to utilities in the region, taking into consideration the territory’s specialized policies, electricity prices, and solar irradiation.

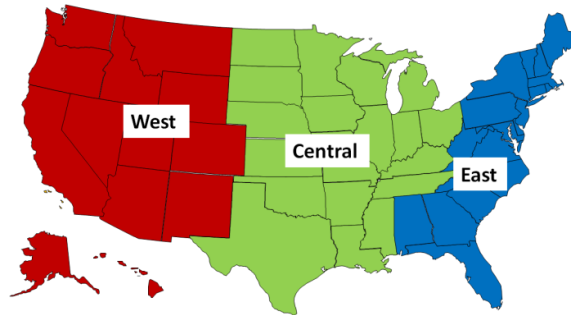


Figure 6: Regional Map

## EASTERN REGION

The Eastern region has quickly grown into a major solar market. In the National rankings, four eastern utilities placed in the Top 10 megawatt category and three in the Top 10 Watts-per-Customer category. The Eastern region made up approximately 37% of the nation’s 2010 annual solar capacity, with approximately 50% of that from centralized projects.

Table 6: Eastern Region 2010 Annual Solar Megawatts

'10	'09	Utility	MW <sub>AC</sub>
1	2	Florida Power & Light Co. (FL)	87.2
2	1	Public Service Electric & Gas Co. (NJ)	74.7
3	NR	Jersey Central Power & Light (NJ)	22.9
4	5	Duke Energy Carolinas (NC)	20.9
5	NR	Atlantic City Electric Co. (NJ)	15.2
6	NR	Jacksonville Electric Authority-JEA (FL)	12.2
7	4	Long Island Power Authority (NY)	8.7
8	NR	PECO Energy Co. (PA)	7.6
9	3	NSTAR Electric (MA)	6.2
10	NR	Metropolitan Edison Co. (PA)	5.0
Other Participating Utilities			25.8
Total			286.4

NR = No Rank; the utility either did not participate in or was not ranked in the previous year’s rankings.

JEA, PECO Energy Company (PA) and Metropolitan Edison Company (PA) represent eight IOUs and two municipal utilities from six states.

## Annual Solar Megawatts

FPL took this year’s top spot after installing two centralized utility-owned solar projects in 2010 (Table 6). Its annual solar capacity increased more than 195% from its 2009 annual solar capacity of 29.5 MW. PSE&G, who can also attribute a large portion of its annual solar capacity to utility-owned projects, followed closely in second place ranking. Additionally, five newcomers placed in this year’s Top 10 for these rankings: Jersey Central Power and Light, Atlantic City Electric Company, Overall, the Top 10

**Annual Solar Watts-per-Customer**

For the second straight year, Public Service Electric and Gas was the top ranked utility in this category in the East with 35 watts-per-customer, more than doubling the 14 in 2009 (Table 7). Following in second and third places respectively are two newcomers to the survey, JEA and Atlantic City Electric Company. There were also four additional newcomers joining the rankings in this category in 2010.

**Table 7: Eastern Region 2010 Annual Solar Watts-per-Customer**

'10	'09	Utility	Watts <sub>AC</sub>
1	1	Public Service Electric & Gas Co. (NJ)	35.2
2	NR	Jacksonville Electric Authority-JEA (FL)	29.1
3	NR	Atlantic City Electric Co. (NJ)	27.9
4	2	Gainesville Regional Utilities (FL)	24.0
5	NR	Jersey Central Power & Light (NJ)	20.8
6	3	Florida Power & Light Co. (FL)	19.4
7	NR	Tri-State Electric Membership Corporation-TVA (GA)	16.0
8	NR	Metropolitan Edison Co. (PA)	9.2
9	13	Duke Energy Carolinas (NC)	8.8
10	NR	Unitil (NH)	7.8

NR = No Rank; the utility either did not participate in or was not ranked in the previous year's rankings.

All of the main utility types are represented in this category with seven IOUs, two municipal utilities and one cooperative utility in the Top 10. There is also strong geographic diversity with six states represented in the Top 10—Florida and New Jersey each contained three and Georgia, Pennsylvania, North Carolina and New Hampshire each contained one.



National Grid's Utility-owned Haverhill Solar Project (Courtesy: National Grid)

**CENTRAL REGION**

The Central region represented less than 6% of the nation’s total annual capacity in 2010. However, the region is displaying strong growth, having increased its annual capacity by 350% between 2009 and 2010. Ohio and Texas are proving to be growing markets.

**Table 8: Central Region 2010 Annual Solar Megawatts**

'10	'09	Utility	MW <sub>AC</sub>
1	5	CPS Energy (TX)	15.5
2	19	Ohio Power-AEP (OH)	10.44
3	1	Oncor Electric Delivery Co. (TX)	5.0
4	6	Detroit Edison-DTE (MI)	1.6
5	3	Austin Energy (TX)	1.4
6	4	We Energies (WI)	1.1
7	NR	Knoxville Utilities Board-TVA (TN)	1.0
8	NR	Xcel Energy-MN (MN)	0.84
9	7	Duke Energy Ohio (OH)	0.70
10	17	Nashville Electric Service-TVA (TN)	0.61
		Other Participating Utilities	4.17
		Total	42.4

NR = No Rank; the utility either did not participate in or was not ranked in the previous year’s rankings.

**Annual Solar Megawatts**

Despite having limited solar RPS requirements within the region, 2010 proved to be a year of tremendous growth for the Central region. This year’s top ranked utility was CPS Energy (TX), the municipal utility for the city of San Antonio, Texas (Table 8). CPS had more than 7 times the annual solar capacity of last year’s highest ranked utility in this category after the completion of the 14.5 MW Blue Wing Solar project. Ohio Power (OH) followed in second place, after signing a PPA for the energy generated by the nearly 10-MW Wyandot Solar facility. These two large projects made up about two-thirds of the total regional capacity.

This year’s top ranked utilities include four municipal utilities, five IOUs, and one wires-only utility across five states within the region.<sup>6</sup> Utility-owned solar did not play a large role in the region during 2010, with less than 1% of the Top 10’s capacity coming from utility-owned solar projects.

**TVA’s Role within the Central Region**

The Tennessee Valley Authority (TVA) holds a unique position within the Central region by offering the optional Generation Partners solar incentive program through the 155 distribution utilities it serves. Customers of the 86 participating distribution utilities install solar and TVA purchases the renewable energy credits from their systems at \$0.12/kWh, which in turn provides supply for their voluntary Green Power Switch program. For this year’s report, TVA reported data on behalf of 86 utilities participating in the Generation Partners program, totaling more than 4.5 MW of solar capacity, or nearly 11% of the region’s total for 2010. These 86 utilities also represented over 37% of the total number of utilities participating in this year’s survey.

<sup>6</sup> A number of states have deregulated markets that include retail competition in areas formerly served by investor-owned utilities with vertically integrated service territories. Solar systems in these areas are attributed to the service-territory of the utility managing the distribution or transmission infrastructure, rather than the retail competitive supplier.

**Annual Solar Watts-per-Customer**

Once again, this region saw large growth in the Watts-per-Customer rankings. This year's top ranked utility, CPS Energy, had 22 watts-per-customer—greater than five and a half times more than year's top ranked utility (Table 9). Additionally, there were six newcomers to this year's rankings, making this year's list nearly unrecognizable from the previous year.

**Table 9: Central Region 2010 Annual Solar Watts-per-Customer**

'10	'09	Utility	Watts <sub>AC</sub>
1	6	CPS Energy (TX)	22.0
2	39	Ohio Power-AEP (OH)	14.7
3	NR	Loudon Utilities Board-TVA (TN)	10.0
4	NR	Knoxville Utilities Board-TVA (TN)	5.2
5	19	Cookeville Electric Department-TVA (TN)	4.1
6	NR	Milan Department of Public Utilities-TVA (TN)	3.6
7	NR	Cumberland Valley Electric (KY)	3.6
8	1	Austin Energy (TX)	3.3
9	NR	Central Electric Power Association-TVA (MS)	2.8
10	NR	Meriwether Lewis Electric Co-op-TVA (TN)	2.5

NR = No Rank; the utility either did not participate in or was not ranked in the previous year's rankings.

The top ranked utilities were spread across five states and were composed of six municipal utilities, three cooperative utilities and one IOU. With the exception of CPS Energy and Ohio Power, the Top 10 utilities were completely driven by distributed PV projects. Austin Energy (TX) is the only utility within the group that installed any utility-owned generation in 2010.



Ohio Power 10.1 MW Wyandot Solar Farm (Courtesy: PSEG Solar Source LLC)



**WESTERN REGION**

The Western region continues to lead the nation in solar capacity, with nearly 57% of the country’s annual installed solar. California contributed 63% of the region’s annual solar capacity in 2010, followed by Colorado (17%), Arizona (11%), and Hawaii (3%). However, many of the remaining states in the region, such as Nevada, Oregon and New Mexico also have active solar markets and utilities.

**Table 10: Western Region 2010 Annual Solar Megawatts**

'10	'09	Utility	MW <sub>AC</sub>
1	1	Pacific Gas & Electric (CA)	157.3
2	2	Southern California Edison (CA)	68.4
3	4	Xcel Energy-CO (CO)	42.0
4	NR	Tri-State G&T Co-op Assoc. (CO)	30.2
5	5	Arizona Public Service (AZ)	29.9
6	3	San Diego Gas & Electric (CA)	27.1
7	15	Tucson Electric Power Co. (AZ)	11.9
8	7	Sacramento Municipal Utility District (CA)	10.7
9	9	Hawaiian Electric Co., Inc. (HI)	9.8
10	8	Los Angeles Dept. of Water & Power (CA)	9.1
		Other Participating Utilities	56.4
		Total	452.8

NR = No Rank; the utility either did not participate in or was not ranked in the previous year’s rankings.

**Annual Solar Megawatts**

PG&E and SCE maintain their number one and two positions respectively on the list (Table 10). Tucson Electric Power climbed onto this year’s list after seeing the installation of a diverse group of both centralized and distributed projects in 2010. Six of the utilities represented in these rankings are also present on the national MW rankings list. The Top 10 changed little from 2009, with eight utilities repeating from last year.

Altogether, this region saw the installation of nearly 29,950 PV projects in 2010. In addition, nearly 30% of the region’s capacity was obtained from centralized projects, all of which were PV.<sup>7</sup>

**Annual Solar Watts-per-Customer**

Silicon Valley Power took this year’s top place, followed by Hawaiian Electric Company and Xcel Energy Colorado (Table 11). Tucson Electric Power and Arizona Public Service made notable climbs since last year to take fifth and eighth place rankings, respectively.

All three of the major utility types are represented in this list, with two municipal utilities, one cooperative, and seven IOUs making up the Top 10. The ranked utilities come from four states: three each from Hawaii and California and two each from Arizona and Colorado. Seven of the utilities in this ranking list are also represented in this year’s National Annual Watt-per-Customer rankings.

Customer-owned and third-party distributed PV installations dominated this group of rankings. Approximately 30% of the annual capacity from the above listed utilities was obtained through centralized PV projects. None of the top ranked utilities in this category had CSP projects installed in 2010. Additionally, only about 1% of the 2010 capacity was utility-owned.

**Table 11: Western Region 2010 Annual Solar Watts-per-Customer**

'10	'09	Utility	Watts <sub>AC</sub>
1	4	Silicon Valley Power (CA)	39.9
2	8	Hawaiian Elec. Co., Inc. (HI)	33.2
3	13	Xcel Energy-CO (CO)	30.9
4	7	Pacific Gas & Elec. (CA)	30.2
5	28	Tucson Electric Power Co. (AZ)	29.7
6	6	Black Hills Energy CO Elec. (CO)	28.2
7	11	City of Banning (CA)	27.6
8	19	Arizona Public Service (AZ)	26.8
9	5	Kauai Island Utility Co-op (HI)	24.4
10	3	Hawaii Elec. Light Co. (HI)	23.1

<sup>7</sup> Xcel Energy installed the 1-MW Cameo Coal-Fired Hybrid Demonstration CSP project in 2010, but the project was for demonstration purposes, was retired before the close of 2010, and is not included in the data.



# Utility Type Rankings

## COOPERATIVE UTILITIES

Cooperative utilities, by the nature of their more rural service territories, are some of the smaller utilities in the country. They have traditionally ranked well within SEPA’s National Watts-per-Customer category. However, with more and more IOUs adding unprecedented amounts of solar to their grids, it has become difficult for the cooperatives to maintain high national rankings.

### Annual Solar Megawatts

In 2010 cooperative utilities increased their total annual solar capacities by nearly 690% in aggregate. Tri-State G&T Co-op Association was this year’s top ranked utility with 30.2 MW of new solar capacity. Kauai Utility Cooperative (HI) was this year’s second ranked utility with nearly 0.8

MW of new solar capacity. North Georgia Electric Membership Corporation (GA), a newcomer to the survey, took third spot with nearly 0.7 MW of 2010 capacity, followed closely in fourth place by another newcomer, Kit Carson Electric Cooperative (NM) with 0.62 MW (Table 12). In fact, this year’s Top 10 utilities included seven new utilities, an indicator that cooperative solar interest is on the rise. Overall, the Top 10 accounted for nearly 97% of all solar capacity installed by cooperatives in 2010.

**Table 12: Cooperative Utilities 2010 Annual Solar Megawatts**

'10	'09	Utility	MW <sub>AC</sub>
1	NR	Tri-State G&T Co-op Association (CO)	30.20
2	2	Kauai Island Utility Co-op (HI)	0.79
3	NR	North Georgia Electric Membership Corp.-TVA (GA)	0.68
4	NR	Kit Carson Electric Co-op, Inc. (NM)	0.62
5	3	Trico Electric Co-op , Inc. (AZ)	0.56
6	1	Sulphur Springs Valley Electric Co-op (AZ)	0.45
7	NR	Holy Cross Energy (CO)	0.42
8	NR	Choptank Electric Co-op (MD)	0.35
9	NR	Middle Tennessee Electric Membership Corp.-TVA (TN)	0.29
10	NR	Tri-State Electric Membership Corp.-TVA (GA)	0.21
Other Participating Utilities			0.98
Total			35.56

NR = No Rank; the utility either did not participate in or was not ranked in the previous year’s rankings.



Kauai Island Utility Cooperative Utility Pole Mounted PV Panels (Courtesy: Kauai Island Utility Cooperative)

Geographically speaking, all three regions were represented in this group of rankings. The Western region had the strongest influence, contributing six utilities, followed by the Eastern region with three utilities and the Central region with one utility. All of the cooperative solar projects were distributed in nature, and all were PV. Utility-ownership has influenced these rankings, with two of the Top 10 installing utility-owned capacity in 2010—Kauai Island Utility Cooperative and Kit Carson. Kit Carson’s portfolio was an impressive 95% utility-owned as a result of five projects installed in 2010 that totaled nearly 600 kW of capacity.

**Table 13: Cooperative Utilities 2010 Annual Solar Watts-per-Customer**

'10	'09	Utility	Watts <sub>AC</sub>
1	2	Kauai Island Utility Co-op (HI)	24.4
2	NR	Kit Carson Electric Co-op, Inc. (NM)	22.2
3	NR	Tri-State Electric Membership Corp.-TVA (GA)	16.0
4	4	Trico Electric Co-op, Inc. (AZ)	14.3
5	1	Sulphur Springs Valley Electric Co-op (AZ)	9.0
6	NR	Holy Cross Energy (CO)	7.7
7	NR	Plumas-Sierra Rural Electric Co-op (CA)	7.4
8	NR	North Georgia Electric Membership Corp.-TVA (GA)	6.9
9	NR	Choptank Electric Co-op (MD)	6.7
10	NR	Consumers Power Inc. (OR)	4.1

NR = No Rank; the utility either did not participate in or was not ranked in the previous year's rankings.

**Annual Solar Watts-per-Customer**

Kauai Island Utility Cooperative similarly was the top-ranked utility for this year's annual Watts-per-Customer category, with 24.4 Watts of new capacity installed per customer in 2010. The Top 10 in this category saw a large increase between 2009 and 2010, with a nearly 40% increase in the median watts-per-customer between 2009 and 2010. Kauai was followed closely by Kit Carson Electric Cooperative, ranked second. Tri-State Electric Membership Corporation (GA), another newcomer to the survey, rounded out the top three in this category.<sup>8</sup>

As was the case with the annual cooperative MW rankings, the Watts-per-Customer category saw seven newcomers rank in the Top 10. However, this group had less geographic diversity, with just two regions represented— seven utilities from the Western region and three from the Eastern region. Distributed PV dominated the top-ranked utilities' portfolios. However, utility-owned generation was a trend. Three of the top-ranked utilities installed utility-owned projects in 2010, including the previously mention Kauai Island Utility Cooperative and Kit Carson, as well as Plumas-Sierra Rural Electric Cooperative (CA).

**INVESTOR-OWNED UTILITIES**

IOUs represent the largest customer-base of the three major utility types—the surveyed IOUs represent over 56 million customers (81% of the survey total). Similarly, they represent the largest share of the nation's annual solar capacity—84%.

**Annual Solar Megawatts**

This year's IOU Top 10 is nearly identical to the national Top 10, with each utility moving up one spot since Tri-State G&T, a co-op, was removed (see previous national discussion for details). The lone exception was Atlantic City Electric (NJ), who ranked tenth on the list and whose 2010 portfolio was

**Table 14: IOU 2010 Annual Solar Megawatts**

'10	'09	Utility	MW <sub>AC</sub>
1	1	Pacific Gas & Electric (CA)	157.3
2	4	Florida Power & Light Co. (FL)	87.2
3	3	Public Service Electric & Gas Co. (NJ)	74.7
4	2	Southern California Edison (CA)	68.4
5	6	Xcel Energy-CO (CO)	42.0
6	7	Arizona Public Service (AZ)	29.9
7	5	San Diego Gas & Electric (CA)	27.1
8	NR	Jersey Central Power & Light (NJ)	22.9
9	10	Duke Energy Carolinas (NC)	20.8
10	NR	Atlantic City Electric Co. (NJ)	15.2
Other Participating Utilities			112.5
Total			658

NR = No Rank; the utility either did not participate in or was not ranked in the previous year's rankings.

<sup>8</sup> No relation to Tri-State G&T featured in the national rankings.

entirely composed of distributed, customer-owned PV projects. IOU utilities ranked 11 and higher made up about 17% of the category total, compared to 11% last year.

**Annual Solar Watts-per-Customer**

The Top 10 list of annual IOU Watts-per-Customer bears a close resemblance to the National Top 10 list discussed above, with three new utilities moving into the rankings. Arizona Public Service, Hawaii Electric Light Company, and Maui Electric Company ranked eight, nine and ten, respectively. All three utilities' 2010 annual solar portfolios were dominated by distributed PV projects. Arizona Public Service was the only utility out of the three to install utility-owned solar generation in 2010. This year's Top 10 median Watts-per-Customer value represented an 88% growth over 2009's median value.

**Table 15: IOU 2010 Annual Solar Watts-per-Customer**

'10	'09	Utility	MW <sub>AC</sub>
1	7	Public Service Electric & Gas Co. (NJ)	35.2
2	5	Hawaiian Electric Co., Inc. (HI)	33.2
3	9	Xcel Energy-CO (CO)	30.9
4	4	Pacific Gas & Electric (CA)	30.2
5	13	Tucson Electric Power Co. (AZ)	29.7
6	3	Black Hills Energy Colorado Electric (CO)	28.2
7	NR	Atlantic City Electric Co. (NJ)	27.9
8	10	Arizona Public Service (AZ)	26.8
9	2	Hawaii Electric Light Co. (HI)	23.1
10	1	Maui Electric Co. (HI)	22.8

NR = No Rank; the utility either did not participate in or was not ranked in the previous year's rankings.

**MUNICIPAL UTILITIES**

Municipal utilities have traditionally ranked in both the National Top 10 lists. While 2010 saw strong municipal solar growth, these utilities only appeared in the national Watts-per-Customer rankings this year, despite installing the fifth and sixth largest solar projects in the U.S. last year.

**Annual Solar Megawatts**

CPS Energy (CPS) took this year's top spot for annual municipal utility MW with an impressive 15.4 MWs—a more than 165% increase from last year's top capacity in this category. CPS can credit most of its annual capacity to the power purchase of the 14.5 MW Blue Wing Solar Project. Newcomer JEA followed in the second spot, also thanks to a PPA with a centralized project. Sacramento Municipal Utility District (CA) (SMUD), took the third spot with nearly 100% of its 2010 portfolio coming from distributed, customer-sited PV projects.

**Table 16: Municipal Utilities 2010 Annual Solar Megawatts**

'10	'09	Utility	MW <sub>AC</sub>
1	12	CPS Energy (TX)	15.4
2	NR	Jacksonville Electric Authority-JEA (FL)	12.2
3	2	Sacramento Municipal Utility District (CA)	10.7
4	3	Los Angeles Department of Water & Power (CA)	9.11
5	1	Salt River Project (AZ)	9.10
6	4	Long Island Power Authority (NY)	8.7
7	NR	San Francisco PUC (CA)	4.0
8	9	Gainesville Regional Utilities (FL)	2.2
9	7	Silicon Valley Power (CA)	2.1
10	NR	Pasadena Water & Power (CA)	1.39
		Other Participating Utilities	12.64
		Total	87.5

NR = No Rank; the utility either did not participate in or was not ranked in the previous year's rankings.

Municipal utilities as a whole had a very strong year for solar. The annual capacity from all participating municipal utilities was 87.5 MW—an increase of more than 165% over the 2009 total. The Top 10 utilities represented all three regions—the Western region led the group with six utilities, followed by the Eastern region with three and the Central region with one.

While PV was the dominant technology in

the Top 10, Salt River Project (AZ) (SRP) contributed the group’s sole CSP project in 2010—the 1.5-MW Maricopa dish-sterling project under a 10-year PPA. SRP is also one the only utility in the municipal Top 10 that installed a small amount of utility-owned generation in 2010.

**Annual Solar Watts-per-Customer**

For the second straight year, Silicon Valley Power ranked first in the annual municipal Watts-per-Customer category, increasing last year’s total by 79%. Newcomer JEA followed in second place, and City of Banning (CA) rounded out the top three. The median watts-per-customer of the Top 10 utilities increased by 106%, from 10.8 in 2009 to 22.2 in 2010. Customer-owned, distributed PV projects dominated this group’s markets in 2010—neither CSP nor utility-owned generation was installed within this group of utilities.

**Table 17: Municipal Utilities 2010 Annual Solar Watts-per-Customer**

'10	'09	Utility	Watts <sub>AC</sub>
1	1	Silicon Valley Power (CA)	39.9
2	NR	Jacksonville Electric Authority-JEA (FL)	29.1
3	2	City of Banning (CA)	27.6
4	5	Gainesville Regional Utilities (FL)	24.0
5	NR	Pasadena Water & Power (CA)	22.3
6	35	CPS Energy (TX)	22.0
7	10	Sacramento Municipal Utility District (CA)	18.0
8	9	Roseville Electric (CA)	17.3
9	4	City of Palo Alto Utilities (CA)	15.6
10	14	Burbank Water & Power (CA)	11.1

NR = No Rank; the utility either did not participate in or was not ranked in the previous year’s rankings.



Salt River Project 1.5 MW Maricopa CSP Project (Courtesy: Sterling Energy Systems)



# Appendix

## A. DEFINITIONS

### *Annual Rankings*

These rankings cover a reporting period of solar electric systems that came online between January 1, 2010, and December 31, 2010.

### *Capacity*

The aggregated nameplate grid capacity of all solar electric systems owned by an electric utility's retail customers, under contract for the purchase of the solar electric output, and/or owned by the electric utility, expressed either in megawatts-ac (MW-ac) or Watts-per-Customer-ac (w/customer).

All photovoltaic direct-current system capacities (MW-dc) have been de-rated 80% to alternating current grid-capacity (MW-ac). All photovoltaic California Energy Center alternating-current system capacities (MW-CEC-AC) have been de-rated to alternating current grid-capacity using the following method:

$$AC=(CEC-AC/IE/PE)*80\%, \text{ where}$$

$$IE=\text{median inverter efficiency}=95.5\%$$

$$PE=\text{median panel efficiency}=89.1\%.$$

### *Concentrating Solar Power Technology (CSP)*

Solar technology that utilizes mirrors or lenses to concentrate sunlight on a point or line and generate high-temperature heat, which is captured to generate electricity in a thermodynamic process.

### *Cumulative Rankings*

These rankings cover a reporting period of solar electric systems that came online anytime before December 31, 2010.

### *Electric Utility*

Regulated investor-owned, municipal, or cooperative (or other public power) utility; wires-only utility; generation and transmission utilities, cooperatives, power agencies, or similar. The solar Watts-per-Customer ranking requires a minimum of 500 customers for ranking eligibility.

### *Photovoltaic Technology (PV)*

Utilizes a photosensitive material to generate electricity directly from sunlight; PV can also be magnified using mirrors or lenses in low- or high-concentrations, known as concentrating photovoltaic technology (CPV).



## B. SURVEY METHODOLOGY

The SEPA utility solar rankings survey was distributed via email in January 2011 to a mixture of 360 utilities nationally. From the total, 230 utilities responded - an increase of 61% from last year's survey (Table 18). Within a period of two months, data was collected, follow-up calls were made, and lastly, utilities were given the opportunity to verify the data they submitted or their peers' data in a review process.

In the survey email, respondents could submit their data in  $MW_{AC}$ ,  $MW_{CEC-AC}$ , or  $MW_{DC}$ . All solar DC and CEC-AC megawatts were converted to AC grid capacity ratings (see definitions).

Stand-alone CSP project capacity is based on the nameplate rating of the facility, while hybrid CSP projects are derated from the thermal nameplate rating of the solar field (even if the power block for the overall project has a higher electric capacity), both using standard industry practices.

The data is self-reported by each individual utility and fact-checking was done with other utilities, third-party data sources and industry experts; no third-party auditing was conducted.

Utility customer numbers for the Watts-per-Customer rankings were obtained from the U.S. Department of Energy's (DOE) Energy Information Administration.

A copy of the survey instrument is listed below.



SEPA is conducting the survey for its fourth annual *Utility Solar Integration Rankings* report which will be released in May 2011.

The annual recurring survey collects utility data on solar electricity installations in the United States, both photovoltaic (PV) and concentrating solar power (CSP), on the customer and utility side of the meter. The resulting rankings have garnered significant media attention from outlets such as the *Wall Street Journal*, *Renewable Energy World*, *Transmission & Distribution World*, and *Reuters* and helps utilities (regardless of rank) to compare their solar data with their peer utilities.

For your reference SEPA's 2009 cumulative data is viewable [here](#).

**Disclaimer :** The data you provide in this survey will be used as reported. Please make sure it is accurate. The information provided in this survey about your utility will be made public and participation in the survey implies consent to do so.

**Deadline:** Please send your answers by February 14<sup>th</sup>, 2011. Early submissions are appreciated!

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## General Utility Information

1.) Please answer the following questions about the utility you are representing.  
***Please note that holding companies with multiple utilities should report the numbers separately for each subsidiary distribution utility.***

Utility Name:

City:

State:

Zip:

Primary Contact First Name:

Primary Contact Last Name:

Primary Contact Email Address:

Primary Contact Phone:

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## Definitions

Residential –sited at a residential location; usually  $\leq 10$  kW

Non-Residential –sited at a commercial, government, educational or other non-residential location; usually 10-2000 kW

Centralized – sited on utility, developer, local, state or federal land; utility or developer owned; typically ground mounted; usually 100-50,000+ kW

**Photovoltaic Technologies-Annual**

**2.) 1/1/10-12/31/10**

	Customer Side of the Meter			Utility Side of the Meter			Off Grid
	Residential	Non-Residential	Centralized	Residential	Non-Residential	Centralized	All
# of Installations							
MW Capacity							
Rating in DC, CEC-AC, or AC?							

**3.) Are any of these totals utility-owned?**

No – Skip to #4

Yes – Fill in below.

	Customer Side of the Meter			Utility Side of the Meter			Off Grid
	Residential	Non-Residential	Centralized	Residential	Non-Residential	Centralized	All
# of Installations							
MW Capacity							
Rating in DC, CEC-AC, or AC?							

**Photovoltaic Technologies-Cumulative**

**4.) All years through 12/31/10**

	Customer Side of the Meter			Utility Side of the Meter			Off Grid
	Residential	Non-Residential	Centralized	Residential	Non-Residential	Centralized	All
# of Installations							
MW Capacity							
Rating in DC, CEC-AC, or AC?							

**5.) Are any of these totals utility-owned?**

No – Skip to #6

Yes – Fill in below.

	Customer Side of the Meter			Utility Side of the Meter			Off Grid
	Residential	Non-Residential	Centralized	Residential	Non-Residential	Centralized	All
# of Installations							
MW Capacity							
Rating in DC, CEC-AC, or AC?							

**Concentrating Solar Power Technologies**

**6.)** Please look at the attached table of CSP projects. Does your utility have any changes/additions to these projects? If so, please provide detailed information below.

**Wholesale/Unregulated Solar Projects**

**7.)** Please look at the attached table of Wholesale/Unregulated PV projects. The output from these PV or CSP projects may be sold directly into a regional wholesale market or on a contract to another utility. Does your utility have any changes/additions to these projects? If so, please provide detailed information below.

**8.) Is any of the information provided in question 7 duplicated elsewhere in this survey?** Yes No

If “yes”, please explain:

**9.) Please answer the following questions:**

	Yes	No
Do you report similar information to a state commission or similar agency? Does the data align with that reporting?	<input type="checkbox"/>	<input type="checkbox"/>

Do you report similar information to the U.S. DOE EIA Form 861? Does the data align with that reporting?	<input type="checkbox"/>	<input type="checkbox"/>
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**10.) Is there an alternate person we can contact in the future if you are unavailable?**

Alternate Contact First Name:

Alternate Contact Last Name:

Alternate Contact Email:

Alternate Contact Phone:

**Certification**

I certify that the information provided above is accurate to the best of my knowledge, and that I have permission to share this information on behalf of my utility.

 Yes No

Thank you for taking our survey!

**About the Solar Electric Power Association:**

SEPA is comprised of over 800 utilities and solar industry members. From national events to one-on-one counseling, SEPA is the go-to resource for unbiased and actionable solar intelligence. Breaking down information overload into business reality, SEPA takes the time and risk out of implementing solar business plans and helps turn new technologies into new opportunities.

[www.solarelectricpower.org](http://www.solarelectricpower.org).

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**C. PARTICIPATING UTILITIES**

Annual and cumulative data through the end of 2010. "NR" indicates "no rank" for utilities with no solar electric capacity.

**Table 18: All Participating Utilities 2010 Cumulative Rankings**

Utility Name	Utility Type	Annual		Cumulative	
		MW <sub>AC</sub>	Watts-per-Customer	MW <sub>AC</sub>	Watts-per-Customer
4-County Electric Power Association-TVA (MS)	Cooperative	0.001 (191)	0.022 (186)	0.003 (198)	0.07 (208)
Adams-Columbia Electric Co-op (WI)	Cooperative	0.041 (115)	1.137 (101)	0.102 (115)	2.829 (91)
AEP Texas Central Co.-AEP (TX)	Investor-owned (Wires Only)	0.242 (84)	NR	0.356 (89)	NR
AEP Texas North Co.-AEP (TX)	Investor-owned (Wires Only)	0.087 (100)	NR	0.195 (103)	NR
Alabama Power Co. (AL)	Investor-owned	0.261 (80)	0.182 (155)	0.326 (92)	0.227 (183)
Alameda Municipal Power (CA)	Municipal	0.263 (79)	7.687 (39)	0.362 (88)	10.553 (58)
Alcorn County Electric Power Authority-TVA (MS)	Cooperative	0 (NR)	0 (NR)	0.002 (211)	0.103 (198)
Ameren Missouri (MO)	Investor-owned	0.374 (70)	0.315 (143)	0.559 (78)	0.471 (161)
Appalachian Electric Co-op-TVA (TN)	Cooperative	0 (NR)	0 (NR)	0.033 (137)	0.739 (149)
Appalachian Power-AEP (WV)	Investor-owned	0.024 (133)	0.025 (185)	0.331 (91)	0.345 (170)
Arizona Public Service (AZ)	Investor-owned	29.94 (7)	26.799 (11)	52.534 (8)	47.023 (18)
Athens Utilities Board-TVA (TN)	Municipal	0.033 (118)	2.464 (74)	0.033 (138)	2.464 (97)
Atlantic City Electric Co. (NJ)	Investor-owned	15.2 (12)	27.918 (9)	35.102 (10)	64.473 (11)
Austin Energy (TX)	Municipal	1.368 (44)	3.341 (66)	4.799 (38)	11.722 (52)
Austin Utilities (MN)	Municipal	0 (NR)	0 (NR)	0.53 (79)	42.646 (20)
Avista Utilities (WA)	Investor-owned	0.124 (93)	0.349 (139)	0.427 (86)	1.203 (128)
Baltimore Gas & Electric (MD)	Investor-owned	3.7 (30)	3.186 (69)	7.845 (26)	6.756 (70)
Benton PUD (WA)	Cooperative	0.008 (157)	0.17 (159)	0.023 (151)	0.489 (159)
Black Hills Energy Colorado Electric (CO)	Investor-owned	2.637 (33)	28.193 (8)	5.701 (34)	60.954 (13)
Blue Ridge Mountain Electric Membership Corporation-TVA (GA)	Cooperative	0.02 (139)	1.201 (96)	0.134 (110)	7.985 (66)
Blue Ridge Mountain Electric Membership Corporation-TVA (NC)	Cooperative	0.005 (171)	0.157 (162)	0.008 (183)	0.252 (181)
Bowling Green Municipal Utilities-TVA (KY)	Municipal	0 (NR)	0 (NR)	0.002 (212)	0.069 (209)
Braintree Electric Light Department (Ma)	Municipal	0.01 (153)	0.656 (121)	0.01 (174)	0.656 (152)
Bristol Tennessee Essential Services-TVA (TN)	Municipal	0.006 (165)	0.181 (156)	0.006 (188)	0.181 (187)
Bryan Texas Utilities (TX)	Municipal	0.058 (110)	1.227 (95)	0.239 (97)	5.058 (75)
Burbank Water & Power (CA)	Municipal	0.57 (62)	11.098 (29)	1.941 (54)	37.796 (23)

Continued from previous page

Utility Name	Utility Type	Annual		Cumulative	
		MW <sub>AC</sub>	Watts-per-Customer	MW <sub>AC</sub>	Watts-per-Customer
Caney Fork Electric Co-op, Inc.-TVA (TN)	Cooperative	0.031 (119)	0.986 (110)	0.031 (139)	0.986 (133)
Carroll County Electric Department-TVA (TN)	Municipal	0.005 (172)	0.312 (144)	0.011 (171)	0.713 (150)
CenterPoint Energy (TX)	Investor-Owned (Wires Only)	0.229 (85)	NR	0.759 (70)	NR
Central Electric Power Association-TVA (MS)	Cooperative	0.099 (98)	2.834 (71)	0.114 (113)	3.283 (88)
Central Hudson Gas & Electric (NY)	Investor-owned	1.91 (38)	6.771 (48)	5.54 (36)	19.641 (36)
Central Valley Electric Co-op (NM)	Cooperative	0.013 (146)	1.005 (107)	0.027 (145)	2.136 (101)
Chelan County Public Utility District (WA)	Municipal	0 (NR)	0 (NR)	0.098 (117)	2.079 (104)
Chickasaw Electric Co-op-TVA (TN)	Cooperative	0.01 (155)	0.606 (122)	0.027 (146)	1.6 (114)
Choptank Electric Co-op (MD)	Cooperative	0.35 (73)	6.712 (49)	0.5 (80)	9.589 (62)
City of Alcoa Electric Department-TVA (TN)	Municipal	0.007 (164)	0.245 (151)	0.024 (148)	0.89 (138)
City of Ames Electric Services (IA)	Municipal	0.004 (176)	0.163 (161)	0.004 (195)	0.163 (188)
City of Anaheim Public Utilities (CA)	Municipal	1.144 (45)	10.136 (30)	2.274 (48)	20.145 (34)
City of Banning (CA)	Municipal	0.325 (74)	27.575 (10)	0.49 (81)	41.484 (21)
City of Bushnell (FL)	Municipal	0 (NR)	0 (NR)	0 (NR)	0 (NR)
City of Clewiston (FL)	Municipal	0 (NR)	0 (NR)	0 (NR)	0 (NR)
City of Dover Public Utilities (DE)	Municipal	0.026 (128)	1.14 (99)	0.087 (121)	3.765 (84)
City of Elizabethton Electric Department-TVA (TN)	Municipal	0.037 (116)	1.406 (91)	0.037 (135)	1.406 (120)
City of Ellensburg (WA)	Municipal	0.046 (113)	4.969 (54)	0.1 (116)	10.795 (55)
City of Florence Utilities-TVA (AL)	Municipal	0.013 (145)	0.271 (149)	0.019 (156)	0.397 (168)
City of Fort Meade (FL)	Municipal	0 (NR)	0 (NR)	0 (NR)	0 (NR)
City of Green Cove Springs (FL)	Municipal	0 (NR)	0 (NR)	0.003 (202)	0.804 (144)
City of Jacksonville Beach (FL)	Municipal	0.101 (97)	3.03 (70)	0.135 (109)	4.045 (81)
City of Lake Worth Utilities (FL)	Municipal	0.029 (122)	1.152 (97)	0.029 (143)	1.152 (129)
City of Leesburg (FL)	Municipal	0.008 (160)	0.354 (138)	0.03 (141)	1.385 (121)
City of Lompoc (CA)	Municipal	0.016 (142)	1.138 (100)	0.214 (102)	14.903 (47)
City of Maryville Electric Department-TVA (TN)	Municipal	0.011 (152)	0.56 (125)	0.012 (166)	0.615 (153)
City of Newberry (FL)	Municipal	0 (NR)	0 (NR)	0.002 (210)	1.327 (124)
City of Oxford Electric Department-TVA (MS)	Municipal	0.005 (169)	0.6 (124)	0.005 (191)	0.6 (154)

Continued from previous page

Utility Name	Utility Type	Annual		Cumulative	
		MW <sub>AC</sub>	Watts-per-Customer	MW <sub>AC</sub>	Watts-per-Customer
City of Palo Alto Utilities (CA)	Municipal	0.45 (66)	15.595 (25)	2.797 (45)	97.021 (3)
City of Saint Peter (MN)	Municipal	0.007 (163)	1.714 (82)	0.007 (187)	1.714 (108)
City of St. George Energy Services Department (UT)	Municipal	0.148 (91)	5.533 (52)	0.283 (93)	10.601 (57)
City of Starke (FL)	Municipal	0 (NR)	0 (NR)	0.024 (149)	8.718 (64)
City of Tallahassee, Utility Services (FL)	Municipal	0.47 (64)	4.145 (59)	0.752 (72)	6.637 (71)
Clarksville Department of Electricity (CDE) Lightband-TVA (TN)	Municipal	0.001 (192)	0.017 (187)	0.001 (217)	0.017 (211)
Clinton Utilities Board-TVA (TN)	Municipal	0.005 (170)	0.17 (158)	0.009 (180)	0.293 (176)
College Station Utilities (TX)	Municipal	0.019 (140)	0.519 (129)	0.019 (158)	0.519 (158)
Colorado Springs Utilities (CO)	Municipal	0.37 (71)	1.764 (80)	0.809 (68)	3.859 (82)
Columbia Power & Water Systems-TVA (TN)	Municipal	0.002 (186)	0.09 (173)	0.002 (205)	0.09 (203)
Columbia Water & Light Department (MO)	Municipal	0.021 (138)	0.468 (130)	0.035 (136)	0.77 (148)
Columbus Southern Power-AEP (OH)	Investor-owned	0.602 (60)	0.803 (117)	0.983 (65)	1.313 (125)
Consolidated Edison Co. of New York (NY)	Investor-owned	4.345 (27)	1.626 (86)	8.381 (24)	3.136 (90)
Consumers Power Inc. (OR)	Cooperative	0.089 (99)	4.079 (61)	0.273 (95)	12.534 (50)
Cookeville Electric Department-TVA (TN)	Municipal	0.065 (106)	4.106 (60)	0.07 (127)	4.449 (78)
CPS Energy (TX)	Municipal	15.449 (11)	22.027 (18)	16.071 (19)	22.914 (32)
Cullman Electric Co-op-TVA (AL)	Cooperative	0.012 (151)	0.272 (148)	0.02 (155)	0.473 (160)
Cumberland Electric Membership Corporation-TVA (TN)	Cooperative	0.008 (158)	0.09 (174)	0.122 (112)	1.369 (123)
Cumberland Valley Electric (KY)	Cooperative	0.084 (102)	3.551 (64)	0.084 (123)	3.551 (86)
Decatur Utilities-TVA (AL)	Municipal	0 (NR)	0 (NR)	0.003 (201)	0.113 (194)
Delmarva Power (DE)	Investor-owned	2. (37)	4.174 (58)	6.6 (29)	13.773 (49)
Detroit Edison (MI)	Investor-owned	1.638 (40)	0.769 (118)	1.812 (57)	0.85 (140)
Dickson Electric Department-TVA (TN)	Municipal	0.044 (114)	1.339 (94)	0.056 (131)	1.702 (109)
Douglas Electric Co-op (OR)	Cooperative	0.023 (136)	2.337 (75)	0.044 (133)	4.56 (77)
Duck River Electric Membership Corporation-TVA (TN)	Cooperative	0.077 (103)	1.093 (104)	0.09 (120)	1.28 (127)
Duke Energy Carolinas (NC)	Investor-owned	20.85 (10)	8.772 (35)	25.484 (14)	10.722 (56)
Duke Energy Indiana (IN)	Investor-owned	0.109 (96)	0.141 (165)	0.335 (90)	0.431 (166)
Duke Energy Kentucky (KY)	Investor-owned	0.034 (117)	0.252 (150)	0.073 (125)	0.541 (157)

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Utility Name	Utility Type	Annual		Cumulative	
		MW <sub>AC</sub>	Watts-per-Customer	MW <sub>AC</sub>	Watts-per-Customer
Duke Energy Ohio (OH)	Investor-owned	0.704 (54)	1.079 (105)	1.836 (55)	2.812 (92)
Duquesne Light Co. (PA)	Investor-owned	0.64 (57)	1.367 (93)	0.67 (74)	1.431 (119)
East Mississippi Electric Power Association-TVA (MS)	Cooperative	0.014 (144)	1.074 (106)	0.014 (162)	1.074 (130)
Electric Power Board of Chattanooga-TVA (GA)	Municipal	0.002 (187)	0.194 (153)	0.002 (206)	0.194 (185)
Electric Power Board of Chattanooga-TVA (TN)	Municipal	0.228 (86)	1.43 (90)	0.269 (96)	1.686 (110)
Emerald People's Utility District (OR)	Municipal	0.066 (105)	3.283 (67)	0.232 (98)	11.529 (53)
Erwin Utilities-TVA (TN)	Municipal	0 (NR)	0 (NR)	0.007 (186)	0.782 (147)
Eugene Water & Electric Board (OR)	Municipal	0.353 (72)	4.063 (62)	2.134 (50)	24.582 (31)
Fayetteville Public Utilities-TVA (TN)	Municipal	0.026 (130)	1.467 (89)	0.026 (147)	1.467 (117)
Florida Power & Light Co. (FL)	Investor-owned	87.192 (2)	19.366 (21)	117.32 (4)	26.057 (30)
Forked Deer Electric Co-op-TVA (TN)	Cooperative	0.001 (193)	0.086 (175)	0.004 (194)	0.445 (164)
Fort Loudoun Electric Co-op-TVA (TN)	Cooperative	0.031 (120)	0.987 (109)	0.031 (140)	0.987 (132)
Fort Pierce Utilities Authority (FL)	Municipal	0.01 (154)	0.362 (136)	0.012 (170)	0.423 (167)
Gainesville Regional Utilities (FL)	Municipal	2.229 (35)	23.951 (13)	3.513 (41)	37.754 (24)
Gibson Electric Membership Corporation-TVA (TN)	Cooperative	0.005 (173)	0.141 (164)	0.005 (192)	0.141 (192)
Glendale Water & Power (CA)	Municipal	0.298 (76)	3.532 (65)	1.263 (60)	14.971 (45)
Grand Marais Public Utilities (MN)	Municipal	0 (NR)	0 (NR)	0 (NR)	0 (NR)
Greenville Light & Power System-TVA (TN)	Municipal	0.012 (148)	0.319 (142)	0.012 (168)	0.319 (172)
Greenwood Utilities (MS)	Municipal	0 (NR)	0 (NR)	0 (NR)	0 (NR)
Harriman Utility Board-TVA (TN)	Municipal	0 (NR)	0 (NR)	0.009 (179)	0.795 (146)
Hawaii Electric Light Co. (HI)	Investor-owned	1.84 (39)	23.093 (14)	7.46 (28)	93.626 (4)
Hawaiian Electric Co., Inc. (HI)	Investor-owned	9.792 (17)	33.162 (3)	19.384 (17)	65.646 (9)
Hickman-Fulton Co. Rural Electric Co-op Corp.-TVA (KY)	Co-op	0.001 (190)	0.359 (137)	0.001 (215)	0.359 (169)
Holston EC-TVA (TN)	Cooperative	0 (NR)	0 (NR)	0.005 (193)	0.16 (189)
Holy Cross Energy (CO)	Cooperative	0.418 (68)	7.656 (40)	1.495 (58)	27.412 (28)
Hopkinsville Electric System-TVA (KY)	Municipal	0.002 (188)	0.155 (163)	0.002 (207)	0.155 (190)
Humboldt Utilities-TVA (TN)	Municipal	0 (NR)	0 (NR)	0.017 (159)	3.773 (83)

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Utility Name	Utility Type	Annual		Cumulative	
		MW <sub>AC</sub>	Watts-per-Customer	MW <sub>AC</sub>	Watts-per-Customer
Huntsville Utilities-TVA (AL)	Municipal	0.005 (174)	0.03 (184)	0.016 (160)	0.101 (200)
Idaho Power Co. (ID)	Investor-owned	0.16 (89)	0.328 (141)	0.477 (82)	0.977 (135)
Indiana Michigan Power-AEP (IN)	Investor-owned	0.022 (137)	0.038 (183)	0.065 (128)	0.111 (196)
Indianapolis Power & Light Co. (IN)	Investor-owned	0.026 (129)	0.056 (180)	0.217 (100)	0.463 (162)
Jackson Energy Authority-TVA (TN)	Municipal	0 (NR)	0 (NR)	0.01 (175)	0.305 (174)
Jacksonville Electric Authority-JEA (FL)	Municipal	12.162 (13)	29.121 (7)	12.487 (22)	29.9 (26)
Jersey Central Power & Light (NJ)	Investor-owned	22.88 (9)	20.838 (19)	51.12 (9)	46.557 (19)
Joe Wheeler Electric Membership Corporation-TVA (AL)	Cooperative	0.012 (147)	0.29 (145)	0.012 (165)	0.29 (177)
Johnson City Power Board-TVA (TN)	Municipal	0.028 (125)	0.369 (135)	0.043 (134)	0.58 (155)
Kauai Island Utility Co-op (HI)	Cooperative	0.788 (52)	24.383 (12)	3.254 (42)	100.702 (2)
Kentucky Power-AEP (KY)	Investor-owned	0 (NR)	0 (NR)	0.001 (219)	0.005 (212)
Keys Energy Services (FL)	Municipal	0.067 (104)	2.251 (77)	0.078 (124)	2.649 (95)
Kissimmee Utility Authority (FL)	Municipal	0.058 (111)	0.928 (113)	0.061 (129)	0.982 (134)
Kit Carson Electric Co-op, Inc. (NM)	Cooperative	0.624 (58)	22.183 (17)	0.754 (71)	26.825 (29)
Knoxville Utilities Board-TVA (TN)	Municipal	1.014 (47)	5.196 (53)	1.06 (63)	5.433 (73)
Lafollette Utilities Board-TVA (TN)	Municipal	0 (NR)	0 (NR)	0 (NR)	0 (NR)
Lakeland Electric (FL)	Municipal	0.253 (82)	2.242 (78)	0.465 (83)	4.115 (80)
Lawrenceburg Utility System-TVA (TN)	Municipal	0 (NR)	0 (NR)	0.002 (208)	0.101 (199)
Lenoir City Utilities Board-TVA (TN)	Municipal	0.064 (107)	1.106 (103)	0.085 (122)	1.467 (116)
Lexington Electric System-TVA (TN)	Municipal	0.007 (161)	0.335 (140)	0.01 (178)	0.449 (163)
Long Island Power Authority (NY)	Municipal	8.704 (20)	7.817 (38)	20.856 (15)	18.731 (38)
Los Angeles Department of Water & Power (CA)	Municipal	9.11 (18)	6.287 (50)	26.44 (13)	18.245 (39)
Loudon Utilities Board-TVA (TN)	Municipal	0.11 (95)	10.038 (31)	0.11 (114)	10.038 (60)
Madison Gas & Electric (WI)	Investor-owned	0.156 (90)	1.115 (102)	0.665 (75)	4.745 (76)
Maui Electric Co. (HI)	Investor-owned	1.53 (41)	22.792 (15)	6.271 (30)	93.447 (5)
McCook Public Power District (NE)	Municipal	0 (NR)	0 (NR)	0 (NR)	0 (NR)
Memphis Light, Gas & Water Division-TVA (TN)	Municipal	0.167 (88)	0.412 (133)	0.281 (94)	0.693 (151)
Meriwether Lewis Electric Co-op-TVA (TN)	Cooperative	0.086 (101)	2.477 (73)	0.094 (118)	2.707 (94)

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Utility Name	Utility Type	Annual		Cumulative	
		MW <sub>AC</sub>	Watts-per-Customer	MW <sub>AC</sub>	Watts-per-Customer
Metropolitan Edison Co. (PA)	Investor-owned	5.032 (25)	9.152 (33)	5.48 (37)	9.967 (61)
Middle Tennessee Electric Membership Corporation-TVA (TN)	Cooperative	0.292 (77)	1.609 (88)	0.45 (84)	2.475 (96)
Milan Department of Public Utilities-TVA (TN)	Municipal	0.029 (121)	3.63 (63)	0.029 (142)	3.63 (85)
Minnesota Power (MN)	Investor-owned	0.059 (108)	0.412 (134)	0.214 (101)	1.491 (115)
Mississippi Power (MS)	Investor-owned	0 (NR)	0 (NR)	0 (NR)	0 (NR)
Morristown Utilities Commission-TVA (TN)	Municipal	0 (NR)	0 (NR)	0 (NR)	0 (NR)
Mountain Electric Co-op, Inc.-TVA (NC)	Cooperative	0.004 (177)	0.121 (167)	0.011 (172)	0.338 (171)
Mountain Electric Co-op, Inc.-TVA (TN)	Cooperative	0.003 (185)	0.192 (154)	0.003 (204)	0.192 (186)
Mountain View Electric Association (CO)	Cooperative	0.118 (94)	2.694 (72)	0.15 (107)	3.424 (87)
Murfreesboro Electric Department-TVA (TN)	Municipal	0.005 (168)	0.103 (170)	0.015 (161)	0.302 (175)
Nashville Electric Service-TVA (TN)	Municipal	0.612 (59)	1.701 (83)	0.778 (69)	2.164 (100)
Natchez Trace Electric Power Association-TVA (MS)	Cooperative	0.002 (189)	0.108 (169)	0.002 (213)	0.108 (197)
National Grid (MA)	Investor-owned	2.683 (32)	2.326 (76)	2.683 (46)	2.326 (98)
Navajo Tribal Utility Authority (AZ)	Municipal	0.027 (126)	0.699 (120)	0.165 (105)	4.241 (79)
New York Power Authority (NY)	G&T (State Public Power)	0.398 (69)	NR	1.004 (64)	NR
Newport Utilities Board-TVA (TN)	Municipal	0.012 (149)	0.553 (126)	0.012 (167)	0.553 (156)
North East Mississippi EPA-TVA (MS)	Cooperative	0 (NR)	0 (NR)	0.002 (209)	0.096 (201)
North Georgia Electric Membership Corporation-TVA (GA)	Cooperative	0.683 (55)	6.935 (45)	0.737 (73)	7.476 (68)
NSTAR Electric (MA)	Investor-owned	6.224 (23)	6.926 (46)	13.56 (21)	15.09 (44)
NV Energy (NV)	Investor-owned	8.337 (21)	6.987 (44)	89.977 (5)	75.413 (7)
Oak Ridge Electric Department-TVA (TN)	Municipal	0 (NR)	0 (NR)	0.001 (214)	0.088 (204)
Ocala Electric Utility (FL)	Municipal	0.026 (131)	0.542 (127)	0.045 (132)	0.934 (137)
Ohio Power-AEP (OH)	Investor-owned	10.438 (16)	14.698 (26)	10.609 (23)	14.939 (46)
Omaha Public Power District (NE)	Municipal	0.142 (92)	0.415 (132)	0.15 (106)	0.438 (165)
Oncor Electric Delivery Co. (TX)	Investor-owned (Wires Only)	5.007 (26)	NR	7.575 (27)	NR
Orlando Utilities Commission (FL)	Municipal	0.25 (83)	1.145 (98)	1.244 (61)	5.689 (72)
Pacific Gas & Electric (CA)	Investor-owned	157.322 (1)	30.166 (5)	476.483 (2)	91.365 (6)

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Utility Name	Utility Type	Annual		Cumulative	
		MW <sub>AC</sub>	Watts-per-Customer	MW <sub>AC</sub>	Watts-per-Customer
Pacific Power (OR)	Investor-owned	2.33 (34)	3.205 (68)	6.079 (33)	8.364 (65)
Paris Board of Public Utilities-TVA (TN)	Municipal	0.028 (123)	1.376 (92)	0.028 (144)	1.376 (122)
Pasadena Water & Power (CA)	Municipal	1.387 (43)	22.32 (16)	2.287 (47)	36.802 (25)
PECO Energy Co. (PA)	Investor-owned	7.62 (22)	4.934 (55)	8.328 (25)	5.392 (74)
Pennyrile Rural Electric Co-op Corporation-TVA (KY)	Cooperative	0.004 (178)	0.081 (176)	0.004 (196)	0.081 (205)
Plumas-Sierra Rural Electric Co-op (CA)	Cooperative	0.058 (109)	7.418 (43)	0.128 (111)	16.272 (42)
Portland General Electric (OR)	Investor-owned	6.182 (24)	7.579 (41)	14.242 (20)	17.461 (40)
Potomac Electric Power Co.-PEPCO (DC)	Investor-owned	3. (31)	4.229 (57)	6.21 (31)	8.755 (63)
Powell Valley Electric Co-op-TVA (TN)	Cooperative	0.019 (141)	0.836 (115)	0.023 (152)	1.03 (131)
Prentiss County EPA-TVA (MS)	Cooperative	0 (NR)	0 (NR)	0.001 (218)	0.075 (207)
Public Service Co. of New Mexico-PNM (NM)	Investor-owned	3.9 (29)	7.878 (36)	6.2 (32)	12.524 (51)
Public Service Co. of Oklahoma-AEP (OK)	Investor-owned	0.026 (132)	0.048 (182)	0.059 (130)	0.112 (195)
Public Service Electric & Gas Co. (NJ)	Investor-owned	74.67 (3)	35.188 (2)	117.407 (3)	55.328 (15)
Public Utility District No.1 of Grays Harbor County Washington (WA)	Municipal	0.003 (180)	0.081 (177)	0.013 (163)	0.313 (173)
Puget Sound Energy (WA)	Investor-owned	0.975 (49)	0.909 (114)	2.96 (43)	2.759 (93)
Pulaski Electric System (PES) Energize-TVA (TN)	Municipal	0.023 (135)	1.643 (85)	0.023 (150)	1.643 (112)
Redding Electric Utility (CA)	Municipal	0.254 (81)	5.916 (51)	0.447 (85)	10.408 (59)
River Falls Municipal Utilities (WI)	Municipal	0.003 (182)	0.533 (128)	0.013 (164)	2.121 (103)
Riverside Public Utilities (CA)	Municipal	0.72 (53)	6.808 (47)	1.984 (53)	18.749 (37)
Rockwood Electric Utility-TVA (TN)	Municipal	0 (NR)	0 (NR)	0.003 (203)	0.208 (184)
Rocky Mountain Power (UT)	Investor-owned	0.994 (48)	1.003 (108)	2.118 (52)	2.136 (102)
Roseville Electric (CA)	Municipal	0.9 (50)	17.263 (23)	2.13 (51)	40.856 (22)
Sacramento Municipal Utility District (CA)	Municipal	10.658 (15)	17.953 (22)	28.26 (12)	47.602 (17)
Salt River Project (AZ)	Municipal	9.1 (19)	9.62 (32)	18.924 (18)	20.006 (35)
San Diego Gas & Electric (CA)	Investor-owned	27.082 (8)	19.759 (20)	89.504 (6)	65.302 (10)

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Utility Name	Utility Type	Annual		Cumulative	
		MW <sub>AC</sub>	Watts-per-Customer	MW <sub>AC</sub>	Watts-per-Customer
San Francisco Public Utilities Commission (CA)	Municipal	4. (28)	NR	5.651 (35)	NR
Sand Mountain Electric Co-op-TVA (AL)	Cooperative	0.003 (184)	0.096 (172)	0.003 (200)	0.096 (202)
Santee Cooper (SC)	Municipal	0.028 (124)	0.169 (160)	0.136 (108)	0.822 (141)
Seattle City Light (WA)	Municipal	0.286 (78)	0.724 (119)	0.911 (66)	2.308 (99)
Sevier County Electric System-TVA (TN)	Municipal	0.005 (167)	0.1 (171)	0.008 (184)	0.147 (191)
Sheffield Utilities-TVA (AL)	Municipal	0.003 (181)	0.17 (157)	0.005 (190)	0.277 (179)
Silicon Valley Power (CA)	Municipal	2.067 (36)	39.948 (1)	3.606 (40)	69.7 (8)
Snohomish County PUD (WA)	Municipal	0.312 (75)	0.977 (111)	0.592 (77)	1.853 (105)
Southern California Edison (CA)	Investor-owned	68.413 (4)	14.091 (28)	578.296 (1)	119.11 (1)
Southwest Tennessee Electric Membership Corporation-TVA (TN)	Cooperative	0.012 (150)	0.243 (152)	0.012 (169)	0.243 (182)
Southwestern Electric Power Co-AEP (LA)	Investor-owned	0.023 (134)	0.049 (181)	0.384 (87)	0.813 (143)
Sulphur Springs Valley Electric Co-op, Inc. (AZ)	Cooperative	0.454 (65)	8.975 (34)	2.912 (44)	57.519 (14)
Tennessee Valley EC-TVA (TN)	Cooperative	0 (NR)	0 (NR)	0.019 (157)	0.968 (136)
Tombigbee Electric Power Association-TVA (MS)	Cooperative	0.003 (183)	0.077 (178)	0.003 (199)	0.077 (206)
Town of Havana (FL)	Municipal	0 (NR)	0 (NR)	0.021 (154)	15.396 (43)
Trico Electric Co-op , Inc. (AZ)	Cooperative	0.561 (63)	14.26 (27)	1.131 (62)	28.763 (27)
Tri-County Electric Membership Corporation-TVA (KY)	Cooperative	0 (NR)	0 (NR)	0.001 (216)	0.046 (210)
Tri-County Electric Membership Corporation-TVA (TN)	Cooperative	0.007 (162)	0.278 (147)	0.007 (185)	0.278 (178)
Tri-State Electric Membership Corporation-TVA (GA)	Cooperative	0.211 (87)	15.979 (24)	0.229 (99)	17.394 (41)
Tri-State Electric Membership Corporation-TVA (NC)	Cooperative	0 (NR)	0 (NR)	0.01 (176)	7.128 (69)
Tri-State Electric Membership Corporation-TVA (TN)	Cooperative	0.006 (166)	1.736 (81)	0.006 (189)	1.736 (107)
Tri-State G&T Co-op Association (CO)	G&T (Cooperative)	30.2 (6)	NR	30.2 (11)	NR
Truckee Donner PUD (CA)	Municipal	0.027 (127)	2.045 (79)	0.186 (104)	14.135 (48)
Tucson Electric Power Co. (AZ)	Investor-owned	11.92 (14)	29.718 (6)	20.072 (16)	50.042 (16)
Turlock Irrigation District (CA)	Municipal	0.426 (67)	4.282 (56)	2.203 (49)	22.149 (33)
Tuscumbia Electricity Department-TVA (AL)	Municipal	0.004 (179)	0.817 (116)	0.004 (197)	0.817 (142)

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Utility Name	Utility Type	Annual		Cumulative	
		MW <sub>AC</sub>	Watts-per-Customer	MW <sub>AC</sub>	Watts-per-Customer
Unitil (NH)	Investor-owned	0.593 (61)	7.831 (37)	0.819 (67)	10.822 (54)
Upper Cumberland Electric Membership Corporation-TVA (TN)	Cooperative	0.014 (143)	0.288 (146)	0.07 (126)	1.461 (118)
Verendrye Electric Co-op (ND)	Cooperative	0.001 (194)	0.069 (179)	0.021 (153)	1.806 (106)
Volunteer Energy Co-op-TVA (TN)	Cooperative	0.051 (112)	0.467 (131)	0.094 (119)	0.855 (139)
Warren Rural Electric Co-op Corporation-TVA (KY)	Cooperative	0.008 (156)	0.136 (166)	0.008 (181)	0.136 (193)
Waseca Electric Utility (MN)	Municipal	0 (NR)	0 (NR)	0 (NR)	0 (NR)
Waverly Light & Power (IA)	Municipal	0.008 (159)	1.61 (87)	0.008 (182)	1.61 (113)
We Energies (WI)	Investor-owned	1.066 (46)	0.955 (112)	3.637 (39)	3.26 (89)
Wells Rural Electric Co. (NV)	Cooperative	0 (NR)	0 (NR)	0 (NR)	0 (NR)
Western Massachusetts Electric Co. (MA)	Investor-owned	1.44 (42)	7.577 (42)	1.44 (59)	7.577 (67)
Wheeling Power-AEP (WV)	Investor-owned	0.005 (175)	0.116 (168)	0.01 (173)	0.252 (180)
Wyandotte Municipal Services (MI)	Municipal	0 (NR)	0 (NR)	0.01 (177)	0.8 (145)
Xcel Energy-CO (CO)	Investor-owned	41.962 (5)	30.945 (4)	85.592 (7)	63.12 (12)
Xcel Energy-MN (MN)	Investor-owned	0.836 (51)	0.604 (123)	1.816 (56)	1.312 (126)
Xcel Energy-NM (NM)	Investor-owned	0.654 (56)	1.652 (84)	0.654 (76)	1.652 (111)

# SEPA Research Report Summaries

## **PV Technology Characterization Review (2010)**

The PV market continues its explosive growth and simultaneously a wide array of commercially available PV technology and application options are emerging. This SEPA report provides a comparative understanding of the PV technologies along with pertinent metrics, from the manufacturing process through deployment in the field across a broad range of upstream and downstream metrics, including manufacturing processes, feedstock and materials availability, module physical and operating characteristics, market applications and environmental characteristics.

## **Utility Solar Business Models Phase II: Developing Value in Solar Markets (2010)**

Utilities, regulators, and solar companies have been thinking creatively about new Utility Solar Business Models (USBM) that better align utility interests with policies favoring solar development. USBMs are distinct in that they offer present or future value to utilities, as well as to utility customers and society, to support utility actions that advance larger renewables and carbon reduction goals. To help in the development of USBM strategies, SEPA has also developed a decision mapping tool that can be used as a complement to this report, or as a stand-alone thought exercise. The accompanying report and

decision mapping tool represents the second phase of this project.

## **National Solar Jobs Census 2010 (2010)**

The National Solar Jobs Census 2010, conducted by The Solar Foundation and Green LMW with technical guidance from SEPA, SEIA, and Cornell University, quantifies the current employment and projected growth of the United States solar industry, including utility jobs within the solar industry, which may grow by more than 20 percent over the next 24 months.

## **EPRI/SEPA Utility Solar Business Model (USBM) Quarterly Bulletin (Q1 2011) (2011)**

This electronic bulletin is part of an ongoing collaborative research effort between SEPA and EPRI to document and examine the expanding range of utility solar business model activities in acquiring solar energy and owning PV assets. The inaugural bulletin includes an article on Emerging Utility Solar Business Models: Providing Utility Experience and Value, and two USBM Case Studies: SMUD SolarShares Program and Arizona Public Service Community Power Project. In addition, it announces the new EPRI SEPA USBM Database.

## **Centralized Solar Projects Quarterly Bulletin (Q1 2011) (2011)**

SEPA's members-only quarterly solar bulletin will provide a summary and commentary on the large-scale PV and CSP project activity in the United States. The Q1 2011 solar bulletin covers 44 projects in various stages of development, from announcements to completions, as well as any cancelations, that have occurred in the first quarter. Also included, the bulletin's featured issue covers project viability.

## **Hybrid Utility Solar Business Models Technical Brief (2011)**

U.S. electric utilities are developing solar projects that employ a variety of utility solar business models (USBMs), including utility ownership, customer programs, financing, or energy purchases. These developments have been well documented in SEPA's prior 2008 and 2010 USBM reports. However, utilities are now combining these approaches in customized 'hybrid' USBMs that combine two or more of these business strategies that are tailored to their specific regulatory and operating environments in ways that increase utility, industry and social benefits. This Technical Brief explores these hybrid USBMs strategies and considers whether it signals an important trend toward greater utility engagement in the solar business.