

# Solar Energy: U.S. Utility Market

COMPANIES: ABG SM, FSLR, S2M GR, SPWRA, STP, SWV GR, 6753 JP, 6764 JP



U.S. UTILITY-  
SCALE SOLAR  
POWER

## Utilities Boosting 2010 Plans

**With financing constraints easing and the 2010 construction deadline looming for federal cash grants, U.S. utilities have boosted their solar plans for next year as they scramble to meet state renewable energy standards.**

- OTR Global's read on U.S. utility-scale solar power is positive; February's baseline report was unrated
- Nearly one-half of sources have increased their solar plans for 2010 in the past six months -- an improvement from February when only 1 source expected stimulus provisions to spur new 2010 projects; plans for 2011, 2012 and beyond less concrete but stable
- Demand driven by state RPSs, falling PV panel prices, desire to diversify load and reduce carbon emissions; sources' near-term focus more on scalable PV projects for which transmission not an issue
- FSLR, SPWRA overwhelmingly favored among utilities, but Tier-1 Chinese competing aggressively in pursuit of share
- Areas to Watch: Trend toward utility ownership of solar projects broadening since February; power tower CSP technology emerging as most promising, but parabolic troughs more established and financeable

### EXECUTIVE SUMMARY

State renewable portfolio standards (RPSs), the prospect of federal carbon legislation and a 2010 construction start deadline required for access to federal grants drove more than one-half of utilities to increase their solar plans for 2010. In OTR Global's February report, only one of 10 utility sources expected the stimulus package to spur new projects in 2010 and nearly one-half had scaled back plans in the six months prior. As transmission remains a major hurdle to large-scale development, utilities' near-term focus is on more scalable PV projects for which transmission and permitting are less burdensome. Among CSP technologies, power tower was cited as the most promising, but it is far less established than parabolic trough technology and has thus been absent from many recent proposals. PV panel prices are down qq and yy, as Tier-1 Chinese suppliers are aggressively dropping prices to compete with preferred vendors **First Solar Inc.** and **SunPower Corp.** First Solar is competing with Tier 1 Chinese "on a daily basis," according to a key source.

### KEY DATA

#### 2010 Solar Plans Up

(number of sources)

	UTILITIES	DEVELOPERS	TOTAL
Increased	9	1	10
Remained the same	10	4	14
Decreased	2	-	2

### SOURCES & BACKGROUND

**27 sources** comprising 21 U.S. utility executives (including 6 of the top 10 U.S. solar power producers) and 6 executives at top solar development companies with 376 MW of installed solar capacity

**REPEATS SOURCES** 15 from OTR Global's February report

**AVERAGES** Straight

**INTERVIEWS** Aug. 10–26

**BACKGROUND** This report on the U.S. utility solar market is a supplement OTR Global's Solar PV Manufacturers report, which primarily covers commercial solar markets in the United States and Europe. Last October, utilities became eligible for the U.S. investment tax credit (ITC) solar subsidy. With the passage of stimulus legislation, builders of renewable projects — including utilities — are eligible for 30% cash grants in lieu of the ITC. Ground must be broken before the end of 2010 to qualify for the grant.

"We grew the amount of planned [solar] megawatts and decided to get most, if not all of it built in 2010."

*U.S. utility executive*

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## 2010 Solar Plans Up

State RPSs, lower panel prices and a 2010 construction deadline required to take advantage of the ITC grant are driving increasing momentum for new solar projects. Nearly one-half of utility sources increased their 2010 solar plans during the last six months, a stark improvement from OTR Global's February report, in which nearly one-half of sources had cut or delayed their plans in the six months prior. Since the cash grant and federal loan guarantees have been clarified in recent months, utilities have added new projects to the 2010 pipeline and accelerated existing projects planned for 2011 and beyond. An executive at one utility that recently boosted its plan and moved up the construction schedule said, "We were going to phase [our solar projects] in over a couple of years, but we want to take advantage of the ITC grant, leverage lower PV prices and respond to the desires of our stakeholders."

Sources said 2009 plans remained on track and relatively stable since six months ago, in line with sources' February predictions. As utilities focus on meeting 2010 construction deadlines their plans for 2011 and beyond have mostly remained unchanged. The three sources who increased plans for 2011 and the five who upped plans for 2012 and beyond attributed the increase not only to the desire to meet state RPSs but also long-term planning for portfolio diversification and the prospect of federal carbon legislation. "There is going to be some carbon tax, whether it's cap-in-trade or what. We are just assuming that it's going to be more expensive to burn fossil fuel than it has been," one said. In contrast, three and four sources, respectively, decreased their 2011 and 2012 plans, as some pulled projects into 2010 to take advantage of the grant provision and others dropped projects when prospects faded for an RPS in Florida.

Sources in states without an RPS or a strong solar resource continue to hesitate to invest in solar power because the cost remains high compared with other renewables as well as traditional sources of energy. "The economics are just not there," one said. "When you look at a simple dollar per kilowatt-hour, the price is still quite a bit higher than other generation. We're sinking our money into wind and other alternatives." Another said, "The cost would be 10 to 20 times our average rates. If we're forced to do renewables, there are other options that make more sense."

## Credit Loosens, Transmission Remains a Hurdle

Although financing constraints remain, the circumstances have been improved considerably by federal loan guarantees and grant options enacted as part of the federal stimulus package. Nearly all developers said their ability to finance projects has improved since six months ago and that the provisions were crucial in keeping short- and long-term plans on track. A top solar development executive said, "The stimulus bill now has an option for the loan guarantee which will help a great deal. The financing picture relative to the start of the meltdown is looking a lot better." Five utility sources also said financing conditions had improved, while only one said it had worsened. One utility source said, "Originally, we were looking at PPAs [for solar projects] because of [difficulty getting credit]. But between the ITC grant and [the prospect of getting approval for higher rates], we're in a better financial position." Many of the 12 utility sources who said the situation has remained the same since six months ago did not cite financing constraints as a major hurdle in February.

With some of the financing constraints alleviated, sources said transmission was the major impediment to large-scale growth for solar power. One developer said, "Financing now we have a handle on because of the stimulus bill, but transmission in general, there just isn't enough of it. The industry is faced with a dire need for more transmission."

"There is going to be some carbon tax, whether it's cap-in-trade or what. We are just assuming that it's going to be more expensive to burn fossil fuel than it has been."

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## Near-Term Plans Focus on PV

Utility sources continue to sign on to large CSP projects and said these will be crucial in meeting long-term renewable energy standards, but several sources said their immediate focus was on more scalable PV projects where transmission was not an issue. One utility chose a large-scale PV array project instead of CSP despite the fact that the CSP project would have been 30% more efficient. "It's a lot sunnier [in the desert area where the CSP plant was slated to be built], but the transmission system costs are going to be unknown and could be high enough to wipe off that 30% savings," the source said.

Sources said the relative costs of PV versus CSP also were a factor. "Our shift away [from CSP] was because of what we needed and what we could afford. You can install PV in more of a modular fashion with small megawatts here and there as you need them," one utility executive said. This trend was also noted in OTR Global's February report, when sources said the adaptability of PV technology to ground-mount or rooftops applications was gaining favor as prices came down.

## Power Tower Promising, Troughs Financeable

Despite concerns about transmission, siting and regulatory hurdles, large-scale CSP projects remain central to major utilities' long-term plans, and several sources have signed PPA agreements for CSP projects to be delivered in 2011, 2012 and beyond. Power tower systems such as those delivered by **Abengoa S.A.** in Spain and on a smaller scale in the United States by **eSolar Inc.** were said to be most promising of the CSP options, since they produce energy at higher temperature and are thus more efficient. However, towers recently have been absent from most proposals, as banks are more hesitant to invest in the newer, less established technology than in parabolic trough, which has been around since the 1980s. "It's readily known that troughs can only get to a certain temperature," one developer said. "I think the reason that most of the plants to be built are troughs has more to do with financeability of a project."

Despite power tower's promise, utilities — most of which are relatively new to planning solar power projects — are aiming in the near-term for the safer route. One utility executive said, "We were more comfortable with trough because of its 20-year history. Tower designs promise higher-level efficiency, but it's more of a technical risk. When new [tower] plants come on in Spain, that will change things."

## Crystalline and Thin Film Work for Utilities

Sources were mostly mixed on their preferences for thin film versus crystalline panels, with four utilities preferring crystalline, two preferring thin film and most saying both were well suited for different types of projects. Crystalline was noted for its proven track record and favorable costs. A large utility source said, "We went with crystalline because of its overall business package in helping us get the best value for our money." Sources said larger-scale and ground-mount installations often were best suited to thin film, while crystalline panels were more suited to rooftops or smaller projects. "We are likely to have both on our system, but larger projects are likely to go thin film because of pricing and the ability to get the modules in the quantity and time frame we need them," one said.

"We were more comfortable with trough because of its 20-year history. Tower designs promise higher-level efficiency, but it's more of a technical risk. When new [tower] plants come on in Spain, that will change things."

*Utility executive*

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## First Solar, SunPower Leading

First Solar overwhelmingly was preferred for utility-scale projects, as nearly one-third of sources were already working with it or were interested in doing so in the future. One source who said his utility did not necessarily favor thin film had chosen First Solar for a large-scale project because of cost. “We are mainly looking at cost, and First Solar is the lowest right now. But if someone will approach us with a lower price, we’ll take it,” the source said. A Southwestern utility source said, “We’re technology agnostic, but the cost per watt is always going to win out over cell efficiency. First Solar’s approach is to look at the cost per installed watt. That’s a good way to go — especially when you’re in a place where land costs are not an issue.” No source raised environmental concerns about cadmium telluride, the base material used in First Solar panels, an issue cited by two German and two U.S. sources in OTR Global’s July **Solar PV Manufacturers** report.

One-fourth of sources favored SunPower, largely because of its efficiency. A source who selected SunPower for a large-scale PV project said, “We would explore any manufacturers that met our No. 1 factor: best overall cost for power produced.”

## Chinese Tenacious

Lesser-known Chinese suppliers were least favored among utilities, mainly because of their reliability. “We got a bunch of bids in with cheap Chinese panels,” one said. “They just weren’t worth the risk.” However, four sources said Tier-1 manufacturers such as **Suntech Power Holdings Co. Ltd.** were aggressively pursuing the market and leading the price wars, a trend noted in the July Solar PV Manufacturers report.

One developer who within the last six months considered Tier-1 Chinese panels for a project for the first time said, “First Solar says they are competing on a daily basis with the Chinese. ... It’s hard to tell if [the Chinese] get a foothold in the utility market. They will if it’s really important to them.” However, the source said even if the Chinese make the U.S. utility market a priority, they may have some challenges. “Most of the projects that are far down the queue for transmission, which is where projects are that are going to get built in the next four to five years have [partnered] with [other] manufacturers already,” he said. “The Chinese will clearly build projects, but the question is how material it will be.”

## PV Panel Prices Down QQ, YY

All 10 sources who responded said PV panel prices had dropped during the last three months, with two pegging the decline at 8%–12%. “Since March or April of ‘09, indications are that prices are down 40¢ a watt,” one utility source said. Excess supply and low polysilicon pricing has nearly all sources who responded expecting further qq price declines in the coming months, with one saying, “We are hopeful that the thin film pricing declines will drive crystalline pricing lower.”

Although the cost of capital still is high, 10 of 12 sources who commented said falling PV prices and increased developer competition were driving down PPA pricing yy. One developer said, “PPA prices are down 5%–10% [yy] because of the supply-demand imbalance making PV cheaper. I don’t know when the shift down in prices happened, but certainly within the last six months.”

“First Solar says they are competing on a daily basis with the Chinese. ... It’s hard to tell if [the Chinese] get a foothold in the utility market. They will if it’s really important to them.”

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## Project Ownership Trend Continues

The trend toward utility ownership of solar projects has expanded since OTR Global's February report, as several sources who only have done PPA arrangements in the past now are planning to finance and build their own installations. A leading solar power utility source said, "We still have to be a low-cost provider, which means we are constrained. PPAs at current prices put upward pressure on rates. This pushes us to be more interested in owning." A municipal utility source signed a PPA agreement with a third-party developer last year for a large-scale project but is planning to own its own projects. "The cost of capital for a municipal utility with a good credit rating like us is less than it was last year," the source said.

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This report was researched and written by **Stefany Moore** with additional reporting by **Lydia Norton** and **Sara Stahl** for OTR Global LLC.

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## ON SOLAR PLANS

"We grew the amount of planned megawatts and decided to get most if not all of it built in 2010." *Utility*

"We are going beyond our state RPS requirements. This is about resource diversity, climate change and in the back of our minds federal mandates were part of the decision making." *Utility*

## ON FINANCING

"With the tax grant, we have to start building in 2010, so we are going to take full advantage of that. That is a big deal. We are planning to take advantage of [the loan guarantees] for our first project and our second project." *Developer*

"The 30% ITC grant caused us to pursue ownership rather than PPAs." *Utility*

## ON TECHNOLOGY

"Utility interest is growing in solar. They won't build nuclear. They are concerned about natural gas prices. What will the carbon policy do? A lot of the utilities are very interested in CSP for a hedging strategy." *Developer*

"We backed off our CSP plans for now; we'll likely reinvigorate it in 2014. Hopefully, the technology will have developed more by then. Right now, we're focused on our immediate plans." *Utility*

"The power towers have a lot of long-term traction and potential. They just have to prove themselves." *Developer*

"We've noticed a trend toward large-scale PV. It's a function of relative costs of solar thermal versus PV." *Utility*

"We're more inclined toward crystalline because it has more of a track record, but we're not opposed to thin film. When you look at the total plant costs, we're not seeing a large cost difference between the two." *Utility*

## ON SUPPLIERS

"Earlier in the year, we had contact with two to three Chinese [PV] companies, and we're continuing to talk to U.S. and European manufacturers. No one is standing out as pushing any harder, although we are getting a lot of requests to meet with us in general." *Utility*

"It just came down to cost and efficiency with SunPower." *Utility*

"Sharp [Corp.] is the only other thin film maker I see showing up anytime soon [to compete]. They're the only ones big enough." *Developer*

"We considered [Tier-1] Chinese [manufacturers] for a project, but they couldn't compete with First Solar. Six months ago, I wouldn't have thought considering them was even worth our time." *Developer*

"Chinese manufacturers are pretty aggressive, but we expect them to be at a disadvantage unless they have local connections such as manufacturing, distribution and suppliers." *Utility*

"We will continue with First Solar because they stand with their customers. They don't want their projects to fail. They're invested in the relationship." *Developer*

## ON PRICES

"We did see [CSP] prices come down 10%–15% [compared with six months ago]. People came in with lower prices as we were backing out of our [CSP plans]. There is a lot of desperation [among CSP firms] to get projects out there." *Utility*

"Some of the thin film suppliers like First Solar are really pushing the market with aggressive pricing." *Utility*

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## 1. What is the status of new solar power generation at your organization?

	UTILITIES	DEVELOPERS
Solar projects up and running, further solar power planned:	11	5
No solar projects in operation, new generation planned:	7	1
Solar projects up and running, no further solar plans:	1	-
Researching solar power generation; no immediate plans:	1	-
Not pursuing solar power at this time:	1	-

## 2a. How will the number of megawatts you are planning to add in 2009 compare with the number of megawatts you added in 2008?

	UTILITIES	DEVELOPERS	TOTAL
Up:	7	2	9
Flat:	10	4	14*
Down:	3	-	3
No response:	1	-	1

\*All 14 sources who said MW additions were flat yy added no MWs in 2008 and have no plans to add any in 2009

## 2b. Have your 2009 plans for new solar power generation increased, decreased or remained the same during the last six months?

Increased:	3	-	3
Remained the same:	14	6	20
Decreased:	3	-	3
No response:	1	-	1

## 3a. Do you expect the number of megawatts you are adding in 2010 to increase, decrease or remain the same compared with the number of megawatts you added in 2009?

Up:	14	1	15
Flat:	4	2	6
Down:	1	1	2
No response:	1	1	2
Don't know:	1	1	2

## 3b. Have your 2010 plans for new solar power generation increased, decreased or remained the same during the last six months?

Increased:	9	1	10
Remained the same:	10	4	14
Decreased:	2	-	2
Not applicable:	-	1	1

## 4a. Do you expect the number of megawatts you are adding in 2011 to increase, decrease or remain the same compared with the number of megawatts you added in 2010?

Up:	5	4	9
Flat:	5	1	6
Down:	8	-	8
Don't know:	2	-	2
No response:	-	1	1
Not applicable:	1	-	1

## 4b. Have your 2011 plans for new solar power generation increased, decreased or remained the same during the last six months?

Increased:	3	2	5
Remained the same:	13	3	16
Decreased:	3	-	3
Don't know:	1	-	1
No response:	1	1	2

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## 5. Have your 2012 and beyond plans for new solar power generation increased, decreased or remained the same during the last six months?

	UTILITIES	DEVELOPERS	TOTAL
Increased:	5	2	7
Remained the same:	12	4	16
Decreased:	4	-	4

## 6a. What issues are helping your solar plans? (Some sources gave more than one answer.)

Meet required renewable energy standards:	13	1	14
Strong demand for solar power:	9	2	11
State and federal incentives:	6	1	7
Potential federal RPS/carbon legislation:	4	3	7
ITC grant option:	3	4	7
None:	4	1	5
Decreasing solar panel prices:	3	1	4
Portfolio diversification:	2	1	3
8-year PTC extension:	1	1	2
DoE loan guarantees:	-	2	2
Other:	3	1	4

## 6b. What issues are hurting your solar plans? (Some sources gave more than one answer.)

Transmission constraints:	3	3	6
Credit crunch:	4	-	4
Lack of state RPS:	4	-	4
Lower energy usage:	4	-	4
Regulatory hurdles:	4	-	4
High cost of solar projects:	3	1	4
Pursuing other renewable sources:	3	-	3
Dramatic drop in energy prices:	2	-	2
Rate recovery unclear:	2	-	2
Slow economy:	2	-	2
Other:	3	2	5
None:	2	2	4

## 7. Is your ability to finance projects better, worse or the same compared with six months ago?

Better:	5	5	10
Same:	12	1	13
Worse:	1	-	1
No response:	1	-	1
Not applicable:	2	-	2

## 8. Has PPA pricing increased, decreased or remained the same yy?

Up 6%–10%:	1	-	1
Up:	1	-	1
Down:	5	1	6
Down 6%–10%:	2	1	3
Down 16%–20%:	1	-	1
Don't know:	5	1	6
No response:	6	3	9

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## 9. Which solar technology does your organization believe to be most promising? (Some sources gave more than one answer.)

	UTILITIES	DEVELOPERS	TOTAL
Solar PV plants:	16	1	17
Distributed generation:	12	1	13
CSP (unspecified):	8	1	9
CSP (parabolic trough):	5	2	7
CSP (power tower):	-	4	4
No response:	2	-	2

## 10. If you're considering PV, do you prefer crystalline or thin film?

Crystalline:	4	-	4
Thin film:	2	-	2
Both/neither:	9	2	11
Don't know:	1	-	1
No response:	2	-	2
Not applicable:	3	4	7

## 11. Have PV panel prices increased, decreased or remained the same compared with three months ago?

Down:	5	3	8
Down 6%–10%:	1	-	1
Down 11%–15%:	1	-	1
Don't know:	12	-	12
No response:	2	2	4
Not applicable:	-	1	1

## 12. Do you expect PV panel prices to increase, decrease or remain the same during the next three months?

Increase:	1	-	1
Remain the same:	1	-	1
Decrease:	6	1	7
Don't know:	11	1	12
No response:	2	3	5
Not applicable:	-	1	1

## 13a. Who are the main solar suppliers that you are using or are most interested in doing business with? (Some sources gave more than one answer while others did not respond.)

First Solar:	8	2	10
SunPower:	7	-	7
Sanyo Electric Co. Ltd.:	3	-	3
Solarworld AG:	3	-	3
Sharp:	2	1	3
Abengoa:	2	-	2
Suntech:	2	-	2
Other:	10	1	11

## 13b. Who are the solar suppliers you are least interested in doing business with? (Some sources gave more than one answer while others did not respond.)

Chinese manufacturers:	3	-	3
No-name Chinese manufacturers:	2	1	3
Ausra Inc.:	1	-	1
Solar Millennium AG:	1	-	1
Unproven companies:	-	1	1

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## 14. If you have not selected a supplier or manufacturer for your solar installation, when do you expect to do so?

	UTILITIES	DEVELOPERS	TOTAL
4Q09:	6	-	6
2H09:	1	-	1
1H10:	1	-	1
2H10:	2	-	2
Don't know:	1	1	2
No response:	-	1	1
Not applicable:	10	4	14

## Developers

### 15. Is your organization developing projects only with PPAs or merchant generation projects?

PPAs only:	5
Not applicable:	1

## Utilities

### 16. Are the projects you have planned utility owned or PPA projects?

Both:	9
PPAs only:	7
Utility owned:	3
Not applicable:	2

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