Solar Finance and Forecast
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M. R. Pamidi, Ph. D.

Sponsored by Greentech Media, this one-day event examined the solar industry worldwide and VCs' outlook.

Power-Purchase Agreements (PPAs) Changing Industry Landscape

Companies offering power-purchase agreements (PPAs) are changing the entire industry landscape, as shown in Figure 1, with a forecasted 75 percent of non-residential solar installations to be driven by PPAs in 2008, according to Jon Guice, a partner at AltaTerra.[1]

> The concept of PPA goes back to the days of Thomas Edison. It is a contract between a supplier or a broker and the consumer to buy power at a fixed or inflation-adjusted rate over a long term.

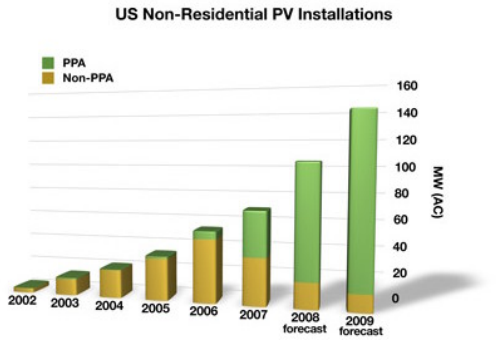

Figure 1. US Non-Residential Photovoltaic Installations[2]

However, uncertainty over renewable-energy tax credits, still under debate in the U. S. Senate, could lower the number of commercial and industrial solar installations financed using these agreements. In fact, SunPower expanded over the past 18 months mostly through PPAs. The cost of financing in PPA deals is crucial. You can't sell solar power at 21 ¢/kWh when you can buy alternative energy at 13 ¢/kWh. PPAs are *simpler* to deal with, but they are not *simple*. They are more like onions than apples: The more layers you peel, the more tears you shed! Most PPAs deals take months to close; however, HP apparently closed a deal in less than a week. Consumers should look at all the players in the PPA food chain. There is more to solar energy that just a spreadsheet. You are investing in a power plant, not just building one. Systems should not be just buildable, but bankable. Pin-striped folks — lawyers and bean counters — just look at the zero-risk aspects of the deal, but solar is the tie-dye tree huggers meeting the pin-stripes and pocket-protector wearing engineers.

Here are some interesting factoids:

- All the major silicon buyers are buying it on 10-year contracts.
- The City of San Francisco is launching the biggest solar initiative in two weeks — $3,000 credit for homeowners.
- PG&E has the largest installed base of solar power in the U. S.
- Under a California law, PG&E must generate 20% of its power from renewables by 2010.
- Germany has ten times the United States' installed solar capacity, but receives 40% less sunlight.
- Hawaii, where 80% of energy comes from oil, has one of the highest energy costs in the U. S. — 25 ¢ to 30 ¢ power kWh.

If the national renewable-energy tax credits aren't extended at the end of the year, solar installers, manufacturers, and companies that finance these installations will all suffer. Most financing companies pay the upfront costs for solar-power projects in exchange for a contract requiring customers to buy the resulting electricity from them.

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[1] http://altaterra.net/

[2] Courtesy of Greentech Media

John Guice also said that tax credits have been a key driver for PPAs and he he expects those agreements to make up only 50% to 65% of non-residential solar installations in 2008 if the credits, set to expire at the end of this year, aren't renewed. PPAs made up 10% of new U.S. installations in 2006 and about 50% of those installations in 2007.

Guice estimated that the share of new installations using PPAs will drop below 50 percent, even in a slowing market. Guice also warned that if tax credits aren't extended by the end of 2008, the situation could get worse next year. "If there is nothing passed at all in 2009, we are actually going to see negative growth" by late 2009, he said.

The solar industry is not standing still. It has been lobbying to extend the credits for anywhere from a year to eight years, but so far has failed to convince the U.S. Senate. It's sad that we are providing all kinds of tax benefits and credits to cash-rich oil companies, but are debating about the benefits of solar power.

Hugh Kuhn, VP of Operations for Solar Power Partners,[3] said solar integrators can expect to see tax-credit contingency clauses appearing in their contracts starting immediately. These clauses typically call for integrators and installers to take *liquidated damage responsibility*. This means they would have to pay the difference if they don't complete the projects in time to take advantage of the national tax credit, Kuhn added.

Ben Cook, Director of Structured Finance for SunPower Corp., said he spends most of his time assisting his customers with financing PPA deals. He suggested that if credits aren't extended soon, companies installing new U. S. projects will have to ask themselves one question, "Do you feel lucky?"

Global Solar Production 'Strong'

According to Travis Bradford, President, Prometheus Institute:

- global manufacturers increased production of solar cells by more than 50% last year
- global solar-cell production grew 50.9% in 2007, reaching 3.7 gigawatts.

Bradford also said producers had the capacity to make 30,075 tons of solar silicon, or enough to manufacture 2.71 gigawatts worth of solar panels, in 2007. This is in contract to its November 2007 lower forecast that predicted silicon makers would have the capacity to make 27,069 metric tons of silicon in 2007. The apparent disparity comes from increases in silicon efficiencies: Less silicon is needed to convert the same amount of sunlight into electricity.

Bradford also denounced the current industry hype that spot prices for silicon have reached more than $400 per kilogram as ridiculous. *DigiTimes* [4] earlier this month reported that spot prices for high-purity silicon had grown more than 10% in the first few months of 2008 to between $450 and $470 per kilogram. He contended that the worst of the silicon shortage is over and prices will drop as silicon capacity keeps growing. In addition to silicon, thin-film production increased 10% in 2007 to reach 434 MW of capacity, Bradford said.

Prometheus expects thin films to grow to at least 3 GW or 4.2 GW of capacity by 2010. He added that even this forecast may be too conservative, because thin-film producers already have the lowest costs and the highest margins. Bradford said he expects solar-power system prices to drop by half over the next two years, reaching $4 per watt including installation and solar panel prices of just over $2 per watt by 2010.

Prometheus expects global solar-panel manufacturers to reach more than 12 GW of production capacity in 2010, up from a previous forecast of about 10 gigawatts.

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[3] http://www.solarpowerpartners.com/
[4] http://www.digitimes.com/index.asp