

Rooftop Solar's Growing Appeal



Don Christensen

As the cost of fossil fuels continues to increase, the cost of deploying solar technology is dropping. The prices of solar photovoltaic panels decreased by an astonishing 50% in 2011 alone. Solar-based green energy alternatives are becoming more mainstream as solar technology prices decrease and solar technology becomes more accessible to consumers. This accessibility, coupled with the availability of innovative financing mechanisms for solar PV projects, has created a growing appeal in and a rapid expansion of the global solar rooftop PV market. This article will specifically address the rooftop solar market in the state of California, the United States of America.

BY DON CHRISTENSEN

According to a recent National Renewable Energy Laboratory study, rooftop solar energy could prove appealing for an additional 13 million Americans who live in households that earn between US\$100,000 and US\$150,000 per year.

Photo by Green Energy International

In the sunshine state of California, the state's innovative Million Solar Roofs Initiative, which is 50% through its government-mandated timeline, is on pace to meet its goal of installing 3 Gigawatts (GW) of solar power by 2016. The state of California just hit the 1 GW milestone for installed rooftop solar power. That is a milestone only five other countries in the world have reached.

California's Million Solar Roofs Initiative was signed into law in 2007 and originally called for one million rooftops to produce 3 GW of solar power by the end of 2016. However, that projection was based on the assumption that the average solar system produced 3 kW of energy. Today's systems are nearly triple that size, as the commercial sector has shown a preference to develop and invest in larger solar PV systems. These fewer, large-scale, solar systems are expected to allow California to meet and surpass its goal of installing 3 GW of rooftop solar power by 2016. However, California will not install a million individual rooftop solar systems since the large-scale, commercial, non-residential market makes up a significant portion of the total number of California's solar installations.

The number of smaller residential solar installations under California's Million Solar Roofs Initiative may get a boost as rooftop solar panels are attracting a new demographic of customers that are selecting solar leases. Solar leases offer low upfront costs and immediate savings. In the United States Department of Energy's National Renewable Energy Laboratory's (NREL) study, 'The Transformation of Southern California's Residential Photovoltaics Market through Third-Party Ownership', NREL analysts found that solar lease models are surging in southern California. Analysts determined that third-party-lease financing models are being adopted in less affluent neighborhoods that previously had few customer-owned solar systems. The third-party-lease financing model for rooftop solar systems allows homeowners to save money the very first month, rather than breaking even years later after an initial investment of tens of thousands of dollars to purchase and install the solar system. California's goal to install 3,000 MW of solar on the state's residential and commercial rooftops by 2016 may get a welcome boost from third-party-leasing in neighborhoods with less affluence than those most likely to go for the customer-owned option that costs tens of thousands of dollars.

The NREL's study found a positive correlation between customers outright purchasing solar energy systems and customers living in neighborhoods where the average household income was US\$150,000 or more. However, with third-party leased photovoltaic panels, that positive correlation appeared in neighborhoods where the average household income was just US\$100,000 or more. If the NREL's study is proven reliable and is also found to be true for the rest of the United States, then rooftop solar energy



Photo by Green Energy International

Suntech, China's biggest solar panel maker, has helped drive the decrease in the costs of solar photovoltaic panels globally.



Photo by Green Energy International

A large-scale, commercial solar rooftop at a California Wal-Mart

could prove appealing for an additional 13 million Americans who live in households that earn between US\$100,000 and US\$150,000 per year.

The interesting part about the NREL's findings in California is that the strong decrease in PV prices (comprised of lower retail costs and stronger federal incentives) didn't pick up a new demographic. However, introducing a third-party-leasing option did pick up a new customer demographic. Homeowners can put as little as US\$3,000 down and see an immediate drop in their electricity costs. However, the real benefits come over the next two decades, when the US\$40 or US\$50 per month they're paying to lease the solar panels stays constant, while, presumably, the cost of electricity goes up. Third-party companies are touting potential customer savings of US\$10,000 to US\$15,000 on their electricity costs over two decades.

The NREL's study also found that third-party leasing usually eliminates the need for home

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equity style financing. Home equity style financing requires significant equity in the home. Without financing constraints, the NREL concluded less affluent neighborhoods are more likely to adopt solar.

With solar access expanding to consumers across all demographics and new potential markets opening for solar developers in the residential rooftop market in southern California, California's Million Solar Roofs Initiative may be credited with the deployment of tens of thousands of megawatts installed on hundreds of thousands of residential and commercial buildings. California's rooftop solar initiative is similar, in many ways, to a recent study by the Massachusetts Institute of Technology (MIT)'s Energy Initiative entitled 'The Future of the Electric Grid'. This MIT study proposes an ambitious 'third-way' that pushes for the deployment of tens of thousands of megawatts installed on millions of residential and commercial buildings. The model proposed by MIT's study is formally known as distributed generation and is already well underway in mature renewable energy markets like Germany and Spain.

Both Germany and Spain gave distributed generation a boost years ago by establishing a national feed-in tariff, which guarantees small power generation projects such as rooftop solar arrays a fair price for the energy they generate. In the U.S., these subsidies are currently limited to a few states, with the result that some parts of the country are well ahead of others when it comes to distributed generation. California's call for the installation of 3,000 megawatts of distributed generation on the state's residential and commercial rooftops by 2016, supported by a state-wide feed-in tariff system implemented by the state government, helps solidify California's position as the leader in the United States solar PV market.

Even with California's ambitious solar initiatives, the state still has tremendous untapped solar energy potential. The National Renewable Energy Laboratory estimates that the state could host more than 80,000 MW of rooftop solar capacity, which could generate more than a third of the electricity that California uses in a year. Other countries have already demonstrated that it is possible to rapidly expand the solar market and



Photo by Green Energy International

Germany is a world leader in installed solar photovoltaic panels and gave distributed generation a boost years ago by establishing a national feed-in tariff.

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▼ San Diego leads the state of California in the number of installations on residential, commercial and government buildings (4,500) and overall capacity (37 MW).

Photo by Green Energy International



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▲ A commercial solar installation in New Jersey, one of the many U.S. states that provide incentives for new solar installations.

achieve ambitious goals. Germany, for example, has already reached 17,000 MWdc of solar capacity through consistent and strong public policy support. That is nearly 17 times California's current total.


The growth of California's local solar power systems has kept the state well ahead of other U.S. states in terms of the total power generated from photovoltaic systems. In 2011, according to a report by Environment California, a solar industry advocacy group, California's total capacity exceeded 1,000 MW—up from less than 10 MW in 2000. But according to the Interstate Renewable Energy Council, the state's lead is shrinking slowly as other states, particularly New Jersey, provide incentives that are leading to a rapid increase in new solar installations. In 2008, California was home to two-thirds of all photovoltaic solar capacity in the United States.

The 2011 report by Environment California pinpoints the areas of California that are home to the most rapid growth of solar power. Larger cities, including Los Angeles, have tripled their solar capacity since 2009. San Diego leads the state in the number of installations on residential, commercial and government buildings (4,500) and overall capacity (37 MW). Los Angeles is a close second in total capacity (36 MW) but has fewer installations (4,000). San Jose ranks third in California with 31 MW capacity and 2,733 installations.

However, solar power has not seen such rapid growth in small and mid-sized California cities. In the mid-sized cities of Santa Cruz and Davis, there are approximately 10 photovoltaic arrays for every 1,000 residents. The Environment California report recommends policy changes to provide

more incentives to developers of small and medium-size photovoltaic systems in California. Specifically, the 2011 Environment California report recommends that residential solar users have a greater share of the financial benefits. Environment California also advocates a feed-in tariff for developers of medium-size solar systems of 10 MW or less. Such a feed-in tariff propelled Germany's growth in solar power systems and won support in France and Britain. Instead of limiting rebates to money already paid to the utility, the tariff permits owners of such systems to continue to receive compensation from utilities, even if it is in excess of the total payments they have made to the utility. The report also supports new financing methods which allow homeowners to share the cost of installation (often more than US\$20,000) with their utilities and to pay off their debt through surcharges on their monthly bills. The policy changes recommended by Environment California, if enacted, should continue to increase solar access not only to consumers in small and

mid-sized Californian cities, but larger cities as well. As discussed, the NREL has already shown that introducing alternative financing mechanisms to consumers can open new potential markets and develop customers in new demographics.

With the cost of fossil fuels continuing to rise and solar becoming more affordable, the rooftop solar PV market in California should continue to shine. The appeal of rooftop solar systems in California and throughout the world should continue to grow as solar energy becomes more affordable and prevalent. The widespread deployment of solar PV systems, or distributed generation, is one renewable energy solution that will reduce the world's dependence on fossil fuels and creates a greener and cleaner environment and planet. 

Don Christensen is the founder, organizer, and chief executive officer of Green Energy International, Inc. (GEI), a renewable energy project developer that specializes in solar energy deployment. GEI (www.geisolar.com) offers renewable energy solutions that reduce the world's dependence on fossil fuels and create a greener and cleaner environment and planet. Christensen is also the managing partner of Reliance Partners, LLC, a privately-owned independent investment bank, headquartered in the United States of America, which provides high caliber investment banking advisory and business consulting services to international and domestic companies.