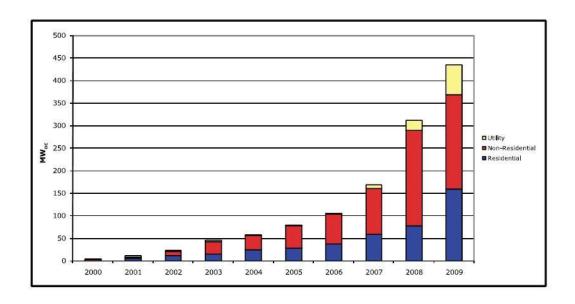# Solar Power's Growth

David Rosengrant

Residential use of solar cells is growing

In the past ten years, the number of solar cells used in private residences has been constantly increasing. Many homes, like the one shown in **Figure a** in Roswell, Georgia, use solar cells to power anything electrical in the house as well as heating water. Part of the reason for the huge growth in the number of homes with solar cells is government incentives.   The U.S. Department of Energy awarded about $17.6 million to photo-voltaic projects in 2008. States such as California, New Jersey and Florida also passed incentives to help spur the growth of PV cells in residences. Finally, like most technologies, as time goes on solar cells become less expensive as the technology improves and mass production increases.
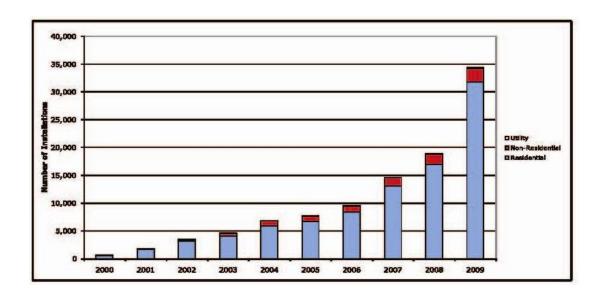

Caption (a): A modern net-zero energy home featuring solar panels on the roof.
Source: http://www.jetsongreen.com/images/2008-small/09/23/roswell.jpg

The growth of solar cells has been almost exponential in both residential and commercial sectors (**Figure b**). New units (solar panels) installed in homes (which you can think of as mini power plants) between 2008 and 2009 nearly doubled **(Figure c)**.

Caption (b): Annual Installed Grid-Connected PV Capacity by Sector (2000-2009).
Source: https://irecusa.org/publications/annual-u-s-solar-market-trends-report/

Caption: Number of Annual US-Grid Connected PV Installations (2000-2009).
Source: https://irecusa.org/publications/annual-u-s-solar-market-trends-report/

Solar cell commercial "power plants" are similarly growing

This growth has been not only in residential units, but also in commercial power plants as four new concentrating solar plants were added to the solar grid in 2009. Though these plants were small, they provide initial data so that the plants can be replicated on a larger scale in the future. In fact there are eleven solar plants that are either under design or are in the planning stages, some of which will be completed between 2011 and 2016. If all of these plants become operational, this will almost provide an additional (at peak operations) 2300 MW.

Every state contributes in some way by adding energy to the grid from photovoltaic cells. However, some states contribute a lot more than others. Part of this reason is simply location. California and Nevada, for example, receive much more sunlight than states like Alaska. The state incentives discussed earlier also play a big role. In 2007, California enacted a 10 year, $3 billion "Go Solar" Campaign. As a result, California is the number one state in PV capacity. To give you an idea, in 2009 the total capacity for the US was 1256 MW, of which California supplied 768 MW. That is about 61% of the total production in the entire U.S.! Georgia brings in only about 0.2 MW, despite favorable sunlight conditions. Also surprising is the growth in PV in the United States in the last few years. The total U.S. capacity increased from 476 MW in 2007 to 1256 MW in 2009. California increased from 328 MW to 768 MW in that same time frame.   New Jersey (127.5 MW), Colorado (59.1 MW), Arizona (46.2 MW) and Florida (38.7 MW) round out the other top 5 states. However, these four states combined are only about a third of what California produces.

Even vehicles can use solar cells

Photovoltaic cells are becoming more and more common in houses but that is not the only place you find them. We previously described how solar cells are being used on planes and automobiles (now you can find them on Toyota's 3rd generation Prius), but now you can find them on bicycles, motorcycles, boats **(Figure)** and even spacecraft!

Caption: Sun21: An experimental catamaran built in 2007.
Source: http://www.soncnaelektrarna.net/soncne-elektrarne/

Hopefully with continued incentives from the government, reduced costs of photovoltaic cells and increased education about PV power, more and more homes will invest in photovoltaic cells to help make American houses more environmentally sustainable.