



Q1 Q2 Q3 Q4 Q4 Q3 Q2 Q1 Q1 Q2 Q3 Q4 Q4 Q3 Q2 Q1 Q1 Q2 Q3 Q4 Q4 Q
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U.S. Solar Market Insight™

3rd Quarter 2010

Executive Summary



U.S. Solar Market Insight™

1 INTRODUCTION

The U.S. solar market is increasingly becoming a central focus of global industry attention, but state-by-state differences in regulations, incentives, utilities, and financing structures introduce more complexities in comparison to other markets. As a result, it has long been difficult to track and understand the changing market dynamics for solar energy in the U.S.

The SEIA/GTM Research U.S. Solar Market Insight™ is our answer to this problem. Each quarter, we survey installers, manufacturers, utilities, and state agencies to collect granular data on photovoltaics (PV), concentrating solar power (CSP), and solar heating and cooling (SHC). This data provides the backbone of Solar Market Insight™, in which we identify and analyze trends in U.S. solar demand, manufacturing, and pricing by state and market segment. We also use this analysis to look forward and forecast demand over the next five years. As the U.S. solar market expands, we hope that Solar Market Insight™ will provide an invaluable decision-making tool for installers, suppliers, policymakers and advocates alike.

2 PHOTOVOLTAICS

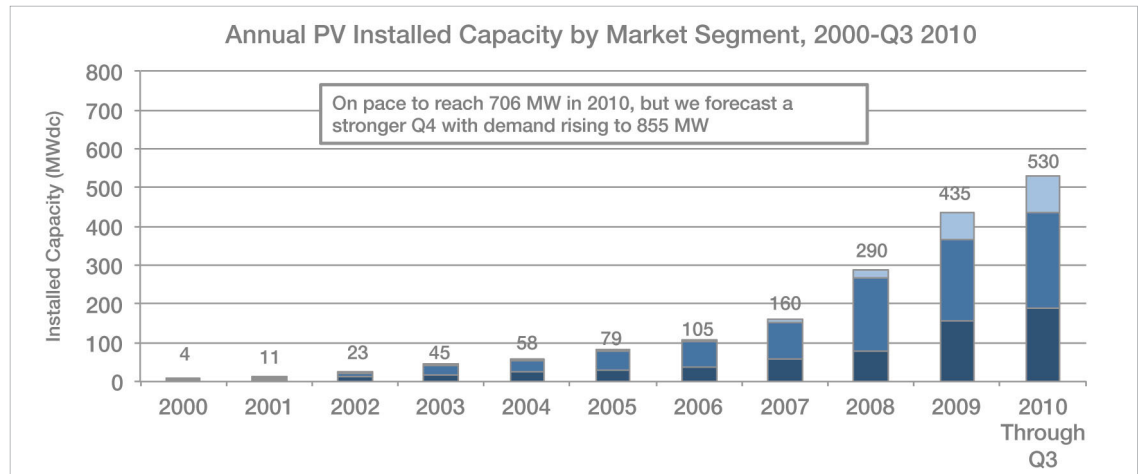
The U.S. PV market has grown at an average annual rate of 69% over the past ten years, rising from just 3.9 megawatts (MW) in 2000 to 435 MW in 2009. Despite this trend, the U.S. constituted only 6.5% of global PV demand in 2009, placing fourth in national installations behind Germany, Italy, and Japan. However, with continued pricing reductions and strong incentives, the U.S. could become the next major PV growth market.

2.1 INSTALLATIONS

As of the end of the third quarter, the U.S. had already achieved a record year for PV installations. 188 MW were installed in the third quarter, resulting in a total of 530 MW for the year to date. Already, this represents 22% growth over the 435 MW installed in 2009 – and the fourth quarter will only add to this total. At a broad level, demand remains driven by the Section 1603 Treasury Cash Grant program, state-level incentives, and improved project economics following a 2009 module price crash amidst the global financial crisis.

If the installation rate through the third quarter were annualized, the U.S. would install a total of 706 MW in 2010, up 62% over 2009. Early fourth-quarter data suggests that there will be a late-year surge in installations, resulting in total 2010 demand of 855 MW, well above the current pace.

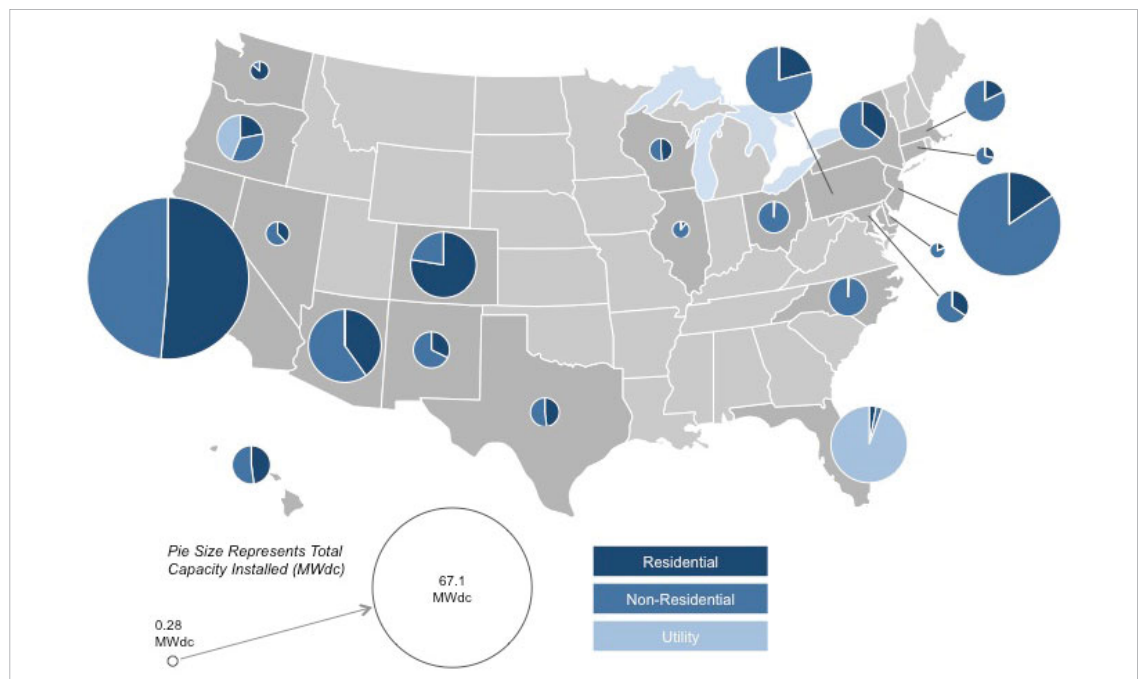
Figure 2-1:
Annual PV Installed Capacity by Market Segment, 2000-Q3 2010



Installations in the U.S. remain relatively concentrated in a few key markets. The **top five state markets in Q3** were California, New Jersey, Florida, Arizona, and Colorado. Together, these states represented 74% of total national demand.

Figure 2-2: Q3 2010 PV Installations by Market Segment by State

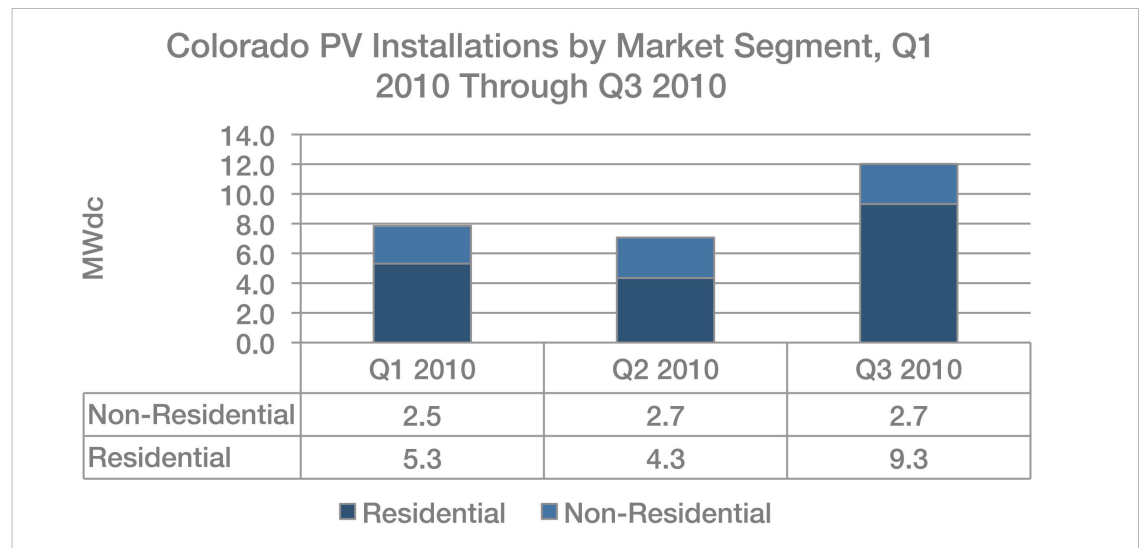
*Full Report Contains Figures for Installations by Market Segment in Each State



STATE FOCUS – COLORADO

Residential installations in Colorado doubled in Q3 to 9.3 MW. This is due largely to the Governor's Energy Office, which offers ARRA-funded rebates of up to \$1.50/W for non-Xcel Energy and non-Black Hills Energy customers that previously had no available rebates. This program, which began in April 2010, is still running, and will continue until the end of 2011 (or until ARRA funding runs dry). We anticipate continued residential market strength in Colorado in the meantime, followed by a likely drop after the program expires.

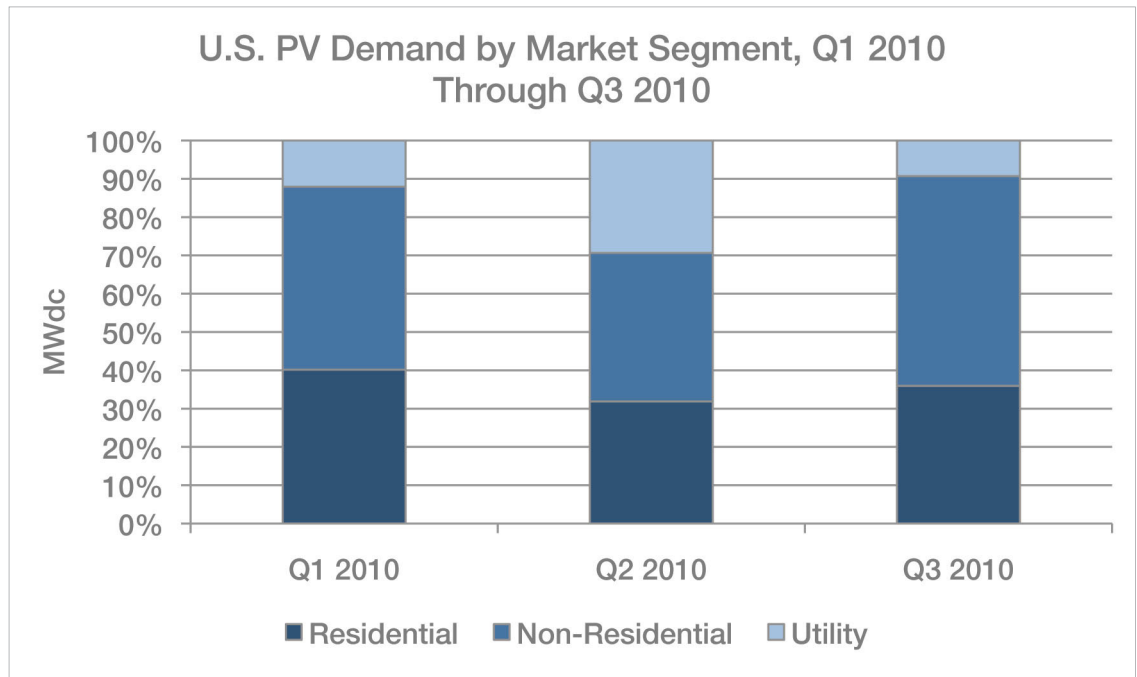
Figure 2-3: Colorado PV Installations by Market Segment, Q1 2010 through Q3 2010



Total installations fell slightly in the third quarter of 2010 from 192 MW to 188 MW. However, this is not indicative of a decline in overall market strength. Figure 2–4 displays demand trends by market segment in the first three quarters of 2010. Clearly, each market segment (residential, non-residential, and utility) has experienced different growth patterns throughout the year.

- **UTILITY** installations fell substantially in the third quarter. Only one large project was connected to the grid during that period. However, utility installations will undoubtedly recover in the fourth quarter.
- **NON-RESIDENTIAL** installations (which includes commercial, public sector, non-profit, and school district) were the main growth driver in the third quarter, growing 38% quarter-over-quarter.
- **RESIDENTIAL** installations have seen the most stability of any market segment in 2010, growing slightly each quarter. The residential market is still experiencing the benefits of funding pockets provided by the American Recovery and Reinvestment Act (ARRA), and the 2008 removal of the cap on the Federal Residential Investment Tax Credit (ITC) remains the primary enabler of residential demand.

Figure 2-4: U.S. PV Demand by Market Segment, Q1 2010 through Q3 2010



2.2 INSTALLED PRICE

Although module pricing has been relatively steady in 2010, system prices have continued to decline each quarter. On a national capacity-weighted basis, system prices stayed flat in Q3 at \$5.87/W. However, this is largely due to the Q3 drop in utility installations – the lowest-price segment. As Figure 2–5 shows, each market segment experienced a decline in system prices in Q3.

Figure 2-5: National Weighted Average System Prices, Q1 2010 through Q3 2010

*Full Report Contains Average System Prices By Market Segment by State

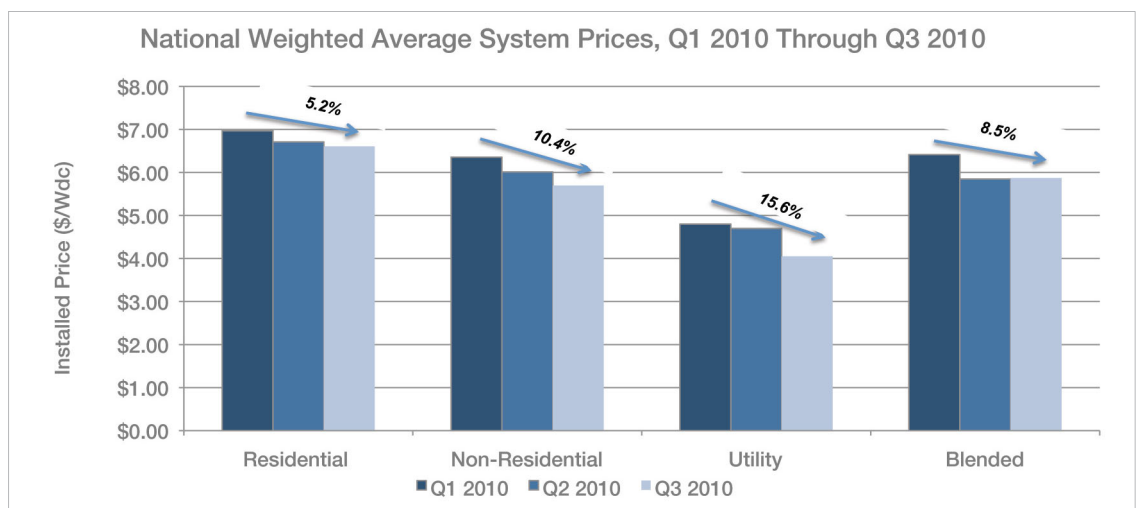
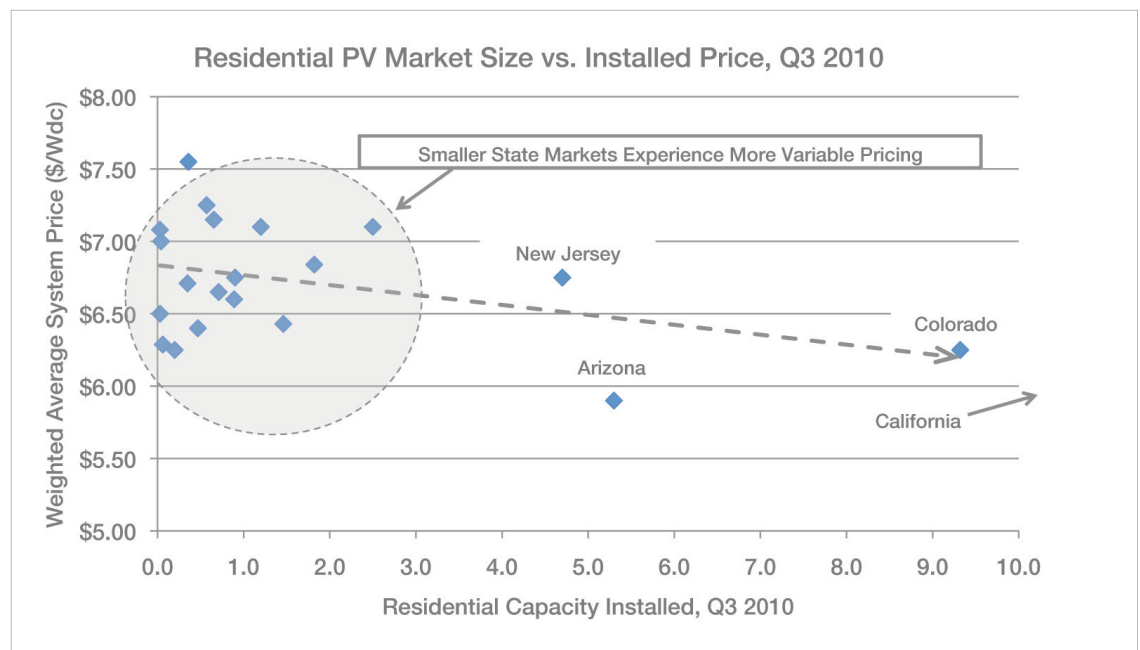


Figure 2–6 examines the relationship between residential market size and installed prices in Q3 2010. Smaller markets show high variability in pricing and larger impacts of the other two factors mentioned above. However, they do tend to have higher overall pricing. As the markets grow in size, pricing tends to come down, as can be seen in Arizona and Colorado. In New Jersey, market maturity has driven prices down to the middle of the pack despite high labor costs and “soft” costs. The arrow in the chart shows a trendline clearly indicating a relationship between market size and installed price.

Figure 2-6:
Residential PV
Market Size vs.
Installed Price, Q3
2010



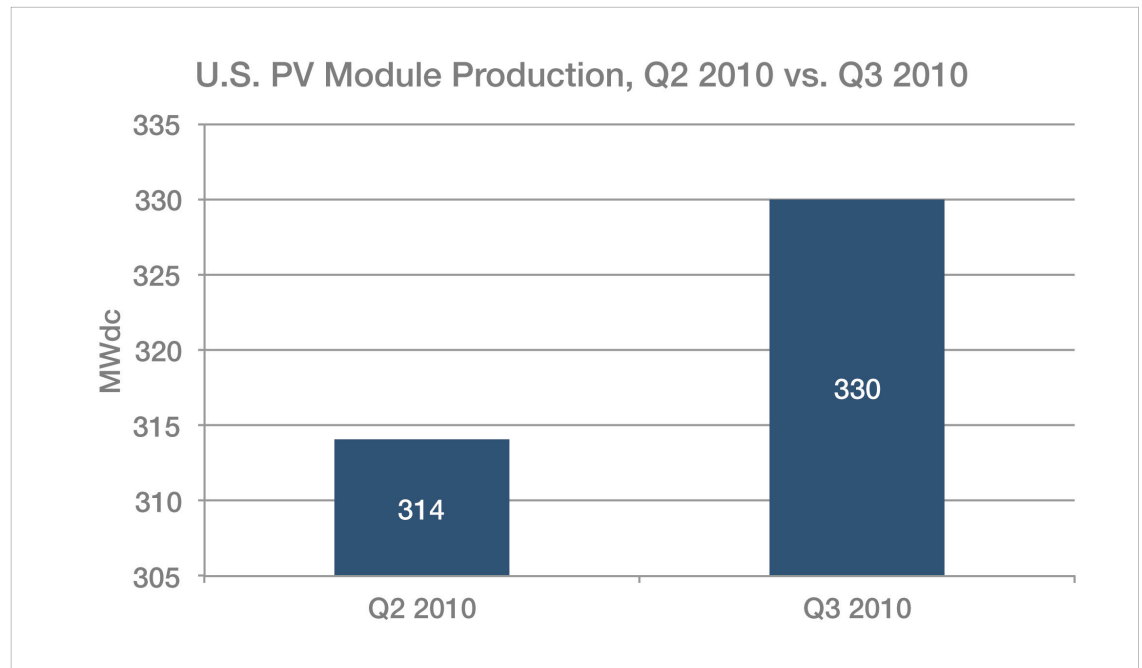
2.3 MANUFACTURING PRODUCTION

The first nine months of the year have witnessed strong growth in global PV installations in key markets, and global demand in 2010 is expected to increase by more than 100% year-over-year, from 7.1 GW in 2009 to more than 14 GW in 2010. As a consequence, manufacturing activity across the entire PV supply chain has been robust, and factory utilizations have been high. Many suppliers reported being sold out for 2010 as early as the first quarter. In the U.S., module production for the third quarter of 2010 amounted to 330 MW, a 6% increase over the second quarter. A robust domestic market and capacity expansions combined with a cooling off of German demand to result in moderate growth in domestic production. The dominant majority of modules

produced in the U.S. in Q3 2010 were either crystalline silicon (62%) or cadmium telluride (20%), with small amounts of CIGS (6%) and amorphous Si (12%) also being produced. Going forward, it is expected that CIGS and c-Si share will expand, given that a number of firms invested in these technologies are yet to ramp up to full utilization.

Figure 2-7: U.S. PV Module Production, Q2 2010 vs. Q3 2010

*Full Report Contains Capacity, Production and Pricing Across the Value Chain



3 CONCENTRATING SOLAR POWER (CSP)

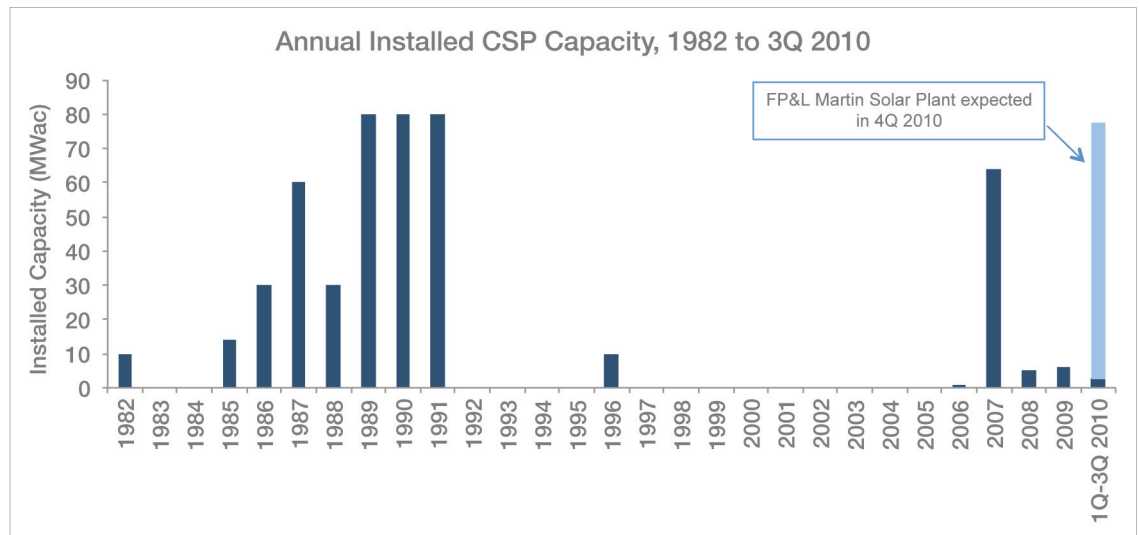
Domestic concentrating solar power (CSP) experienced a burst of project activity in California in the 1980s, and then went quiet for two decades. In the last several years, Spain's feed-in tariff has allowed the country to take the reins as the CSP leader, with over 400 MW operating today. But the U.S. is poised to regain leadership with a CSP project pipeline of 46 projects for a combined 10 GW under development in the Southwest.

3.1 INSTALLATIONS

In the first half of 2010, two CSP projects came online in the U.S. In Q1, the 1.5 MW Tessera/Stirling Maricopa Dish-Engine project was completed in Arizona. In Q2, the 1 MW Abengoa Solar Cameo Hybrid plant (also known as the Colorado Integrated Solar Project) came online in Colorado.

As shown in Figure 3-1 below, the CSP industry in the U.S. was essentially dormant from 1992 to 2006. Since 2006, there has been one project of scale - a 64 MW trough plant built in Nevada in 2007. The last three years have seen the construction of small demonstration plants for various technologies: a 5 MW CLFR plant in California in 2008, a 5 MW tower plant in California in 2009, and a 1 MW micro-CSP plant in Hawaii in 2009. The 75 MW FP&L Martin Solar plant in Indiantown, Florida is expected to come online in the 4th quarter of 2010. The Martin plant is a hybrid plant, as it will connect to an existing combined cycle power plant at the site.

Figure 3-1: CSP Annual Installed Capacity, 1982-3Q 2010



3.2 INSTALLED PRICE

The information that can be gleaned from the installed prices per watt for the two projects completed in 2010 is not particularly useful. The Maricopa plant was a demonstration facility, and as such, its costs were not indicative of the cost per watt that a 100+ MW facility would be able to achieve. The expected cost for a dish-engine project at utility scale is in the range of \$3.00/Wac-\$4.50/Wac. In the case of the Cameo project, the costs per watt are understated relative to standalone trough projects, as the Cameo solar field acts as a booster to an existing power plant and therefore didn't require the construction of a power block. A more typical cost for a trough plant with wet cooling and no storage would be in the range of \$4.50/Wac-\$6.00/Wac.

4 SOLAR HEATING AND COOLING

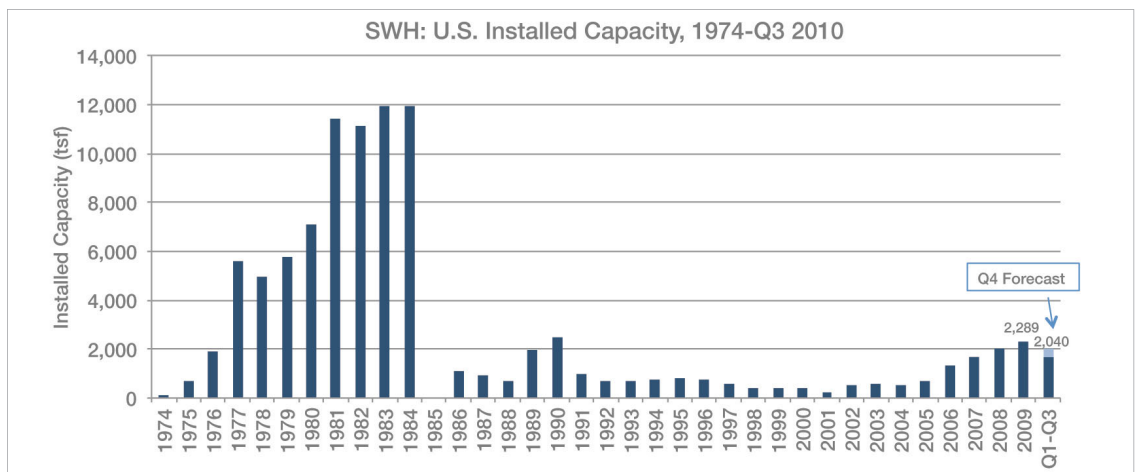
The solar heating and cooling (SHC) category is composed of two distinct markets: solar water and space heating (SWH) and solar pool heating (SPH). The domestic SWH market has grown on an annual basis since 2004, and at mid-year 2010, it appeared that this upward trend would continue. However, after a terrible Q3, it now appears likely that the domestic SWH market will shrink in 2010. The SPH market hit a peak in 2006, and while it shrunk in the period 2007-2009, 2010 could be the year that the market turns the corner.

4.1 SOLAR WATER & SPACE HEATING (SWH)

4.1.1 SWH Installations

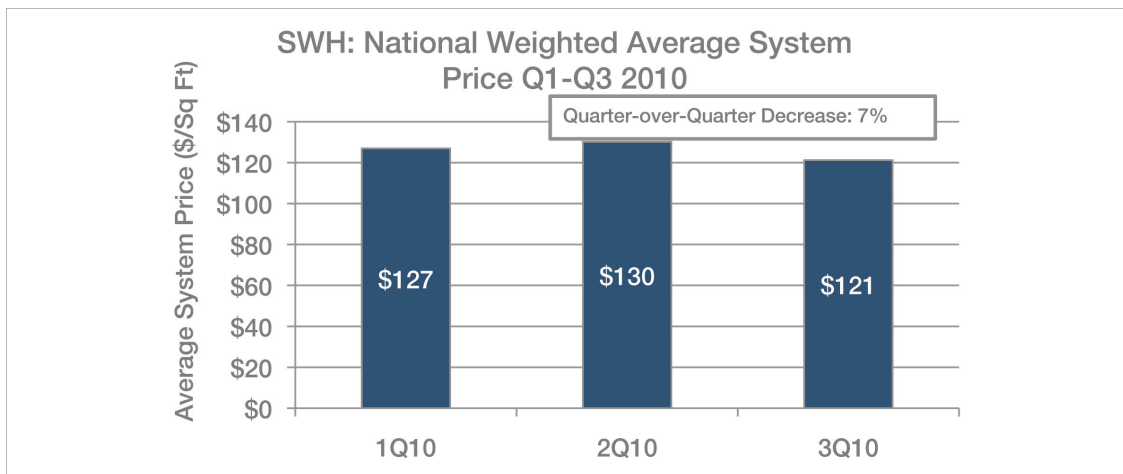
By the close of the third quarter of 2010, 1,660 thousand square feet (tsf) of solar thermal collectors had been installed in the U.S. Should this rate of installation remain constant during Q4 2010, the sector is on track to shrink by 11% from the 2,289 tsf installed in 2009.

Figure 4-1:
SWH: Annual
Installed Capacity,
1974-Q3 2010



The domestic SWH industry is generally driven by markets in five key states: California, Hawaii, Arizona, Puerto Rico and Florida. Combined, these states represent over 50% of national demand. Hawaii, which has historically led the country in installations, has fallen off steeply in 2010, and sits behind California in capacity installed in Q3. The removal of tax credits and rebates for home builders has negatively impacted the market in the Aloha State. Though Puerto Rico also suffered a significant drop in Q3 demand (due mainly to a lag in incentive program implementation), the territory's extremely low installed costs and generous incentives (up to \$1000 per system) bode well for future growth.

Figure 4-2:
SWH: National
Weighted Average
System Price Q1-Q3
2010



4.1.2 Installed Price

Installed prices fell 7% between Q2 and Q3 of this year. Residential prices rose slightly, but the price/sq. ft. of non-residential systems decreased considerably.

4.1.3 Outlook

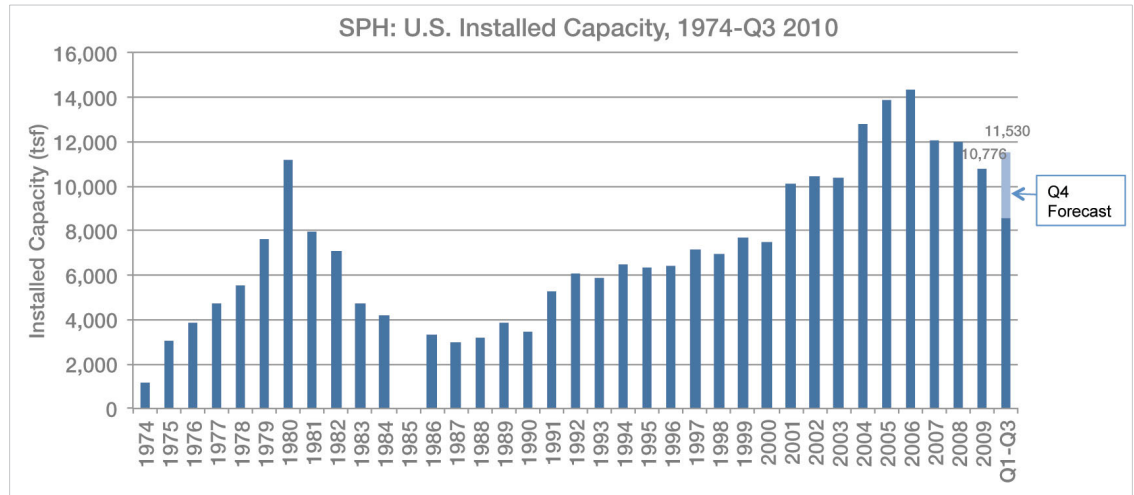
The recovery of the SWH market is dependent on a number of factors. Home heating prices, especially natural gas, are relatively low compared to the \$20 per thousand cubic feet spike in 2008 that helped convince homeowners to install SWH systems in 2009. These low gas rates, combined with a weak economy, have made homeowners reluctant to invest in SWH projects. Nevertheless, we expect the SWH market to bounce back in 2011 and resume a moderate growth rate through 2015.

4.2 SOLAR POOL HEATING

4.2.1 SPH Installations

With almost 8.5 million square feet of SPH installations in the first three quarters of 2010, the market is on track to grow for the first time since 2006. After a steady decline linked to the weak economy and housing market, new installations are on track to grow by 7% to 11.5 million square feet.

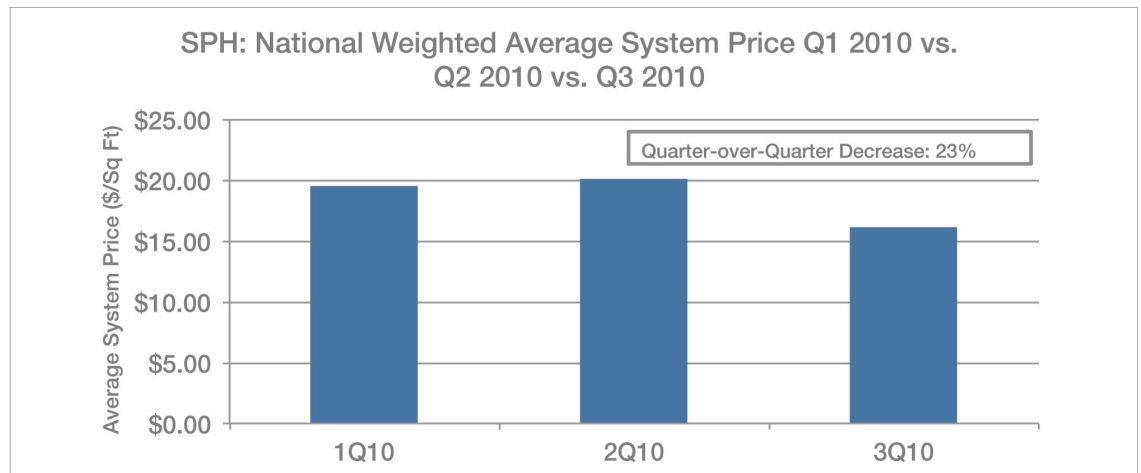
Figure 4-3:
SPH: Annual Installed Capacity, 1974-Q3 2010



4.2.2 Installed Price

The average installed price for solar pool systems dropped significantly in Q3. This is due entirely to the completion of many low price/sq. ft. installations in Florida, the nation's largest market.

Figure 4-4:
SPH: National Weighted Average System Price Q1 2010 – Q3 2010



4.2.3 Outlook

The SPH market appears to be turning around in 2010. While residential installations are up slightly, incentive programs and rebates for large commercial systems have spurred massive growth in that market. Should these incentives continue at their current level, with more states adding similar programs, it can be expected that the market will continue to grow through 2015. Residential applications will also continue to grow, but at a slower pace.

All figures source SEIA/GTM Research. For more detail on methodology and sources, visit www.gtmresearch.com/solarinsight

U.S. Solar Market Insight™

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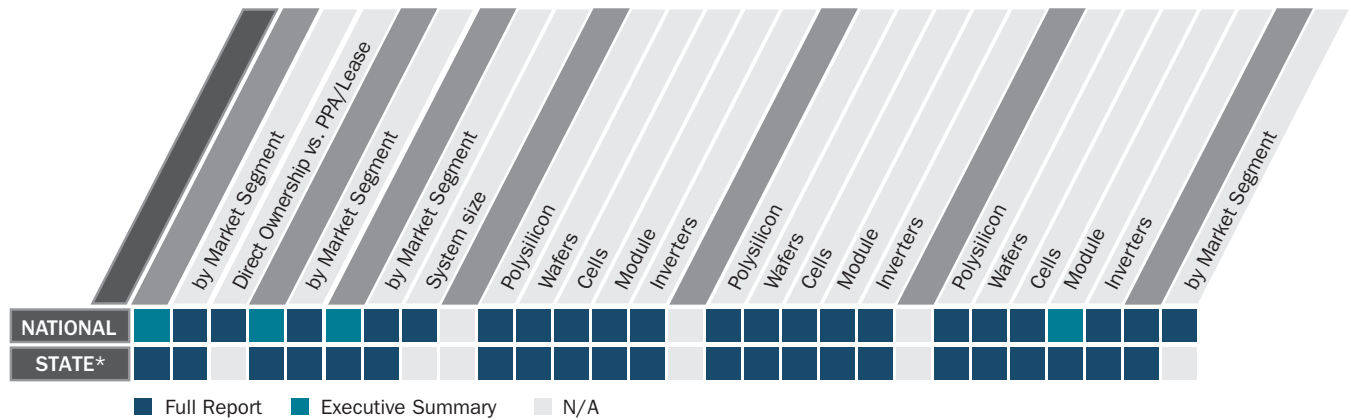
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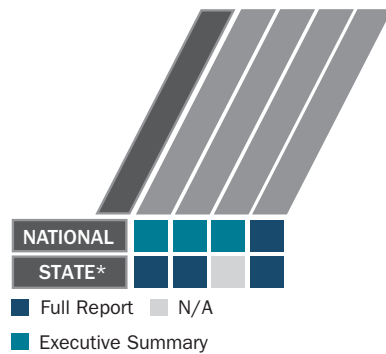
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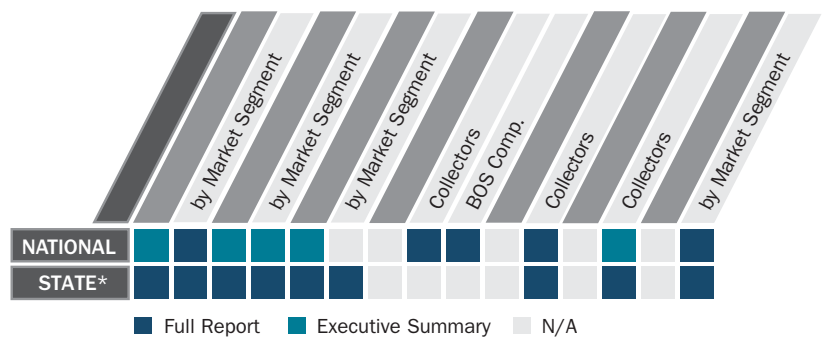
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