



Price development of silicon and solar modules.

The combination of high returns and a cutoff date on the horizon drove the market into a frenzied pace of Spanish project installations. Spot pricing for modules in Spain was as high as 3.50 euros per watt-peak, as compared with 2.80 to 3.00 euros per watt-peak for the same module in Germany. Clearly such a trend was not sustainable, but while it thrived it drove up silicon prices to a much as 450 U.S. dollars per metric ton on the spot market. The balance of supply and demand was extremely tight, but the Spanish government had overspent the budget and implemented a 300 megawatt cap for 2009, which is the same amount shipped at the peak in one month in 2008. Shipments into Spain slowed in July due to the new cap, but the German market had been underserved and had strong seasonality which supported market demand until September. In September the balance of supply and demand shifted, and there was ample supply available. Modules from the Spanish market started to be sold into the Germany spot market.

The U.S. dollar strengthened for many reasons, the primary driver being the perception of the U.S. as a safe haven during times of market instability, although negligence and greed by the top U.S. financial firms actually caused the financial crisis. In the first quarter of 2008, driven by the strength of the euro, most non-European solar companies that previously denominated their sales contracts in U.S. dollars switched primarily to euros. The timing was unfortunate as it closely preceded a collapse in the euro. The reasons for the financial crisis are many, but essentially it was that the U.S. Federal Reserve Bank cut rates from 6.50 percent to one percent in 2001/2002 to offset the tech bubble. This created an even larger real estate bubble built on excessive leverage. In 2002, less than five percent of mortgages initiated were based on variable interest rates, but by 2005 more than 75 percent of mortgages originated had variable interest rates. In 2003, the Securities Exchange Commission (SEC), which regulates the U.S. financial markets, gave investment banks permission to increase their leverage from 12:1 to 30:1. Increased leverage based on more risky assets created a ticking time bomb. There aren't many major financial firms left to collapse in the U.S. so the worst surprises may have

Solar Market Outlook

Market analysis: A price correction threw the PV supply chain into disarray, not least a result of the financial crisis. Overall, the solar energy industry is expected to see many cycles of oversupply and undersupply natural to an industry's early development.

The Solar PV supply chain is currently in a state of disarray due to a price correction that began in September. Spot pricing for modules (in euros) have fallen more than 25 percent from the peak levels seen in Spain this March, concurrent with a 60 percent drop in silicon spot pricing. After 18 months of a pricing environment with flat to rising prices, the current correction shouldn't come as a surprise, but the severity and rapidity of it certainly is astonishing. Over the same period of time the U.S. dollar has strengthened vs. the euro by 20 percent. Most Asian solar companies have a cost basis in dollars but their sales are principally paid in euros which effectively resulted in an incremental 20 percent price drop. The third significant contributing factor to the correction is the financial crisis, which has resulted in the collapse of major U.S. financial institu-

tions including AIG, Fannie Mae, Lehman Brothers, Bear Sterns and many others.

Spain began to boom as a solar end market in the second quarter of 2007. With 50 percent more hours per year of sun, access to inexpensive land, and a similar feed-in tariff (FIT) the returns on projects were significantly higher than Germany. Unlike Germany where the rooftop FIT is higher than the ground-mounted FIT, the Spanish FIT did not differentiate. As a result, more than 95 percent of the installations were ground-mounted systems, typically based in remote locations. Shipments into Spain accelerated in Q3, hitting 85 percent of the planned cap in September of 2007. The government then stated that any systems not registered by September 28, 2008 would not be eligible for an FIT.

already been seen, but there will likely be more issues to play out in 2009 as the ripple effect is seen throughout the globe.

Given that the solar industry is highly drive by project-finance, the financial crisis has resulted in the postponement of many projects planned for the fourth quarter of 2008 or the first half of 2009. The segment of the market impacted most was projects greater than one megawatt in size, rather than the small to mid-size residential and commercial market. In Germany, many of the banks that financed the market in the past have now dropped out of the market.

Module prices have fallen more than 25 percent on the spot market, but if you consider the strengthening of the dollar, the drop in pricing on a U.S. dollar basis is more than 40 percent. With an average profit margin of 15 to 30 percent for the typical solar manufacturer, many companies will be running at a loss in the first quarter of 2009. High cost inventory based on 2008 silicon prices will be another source of losses.

Renewable Analytics estimates that demand will grow by 35 percent in 2009 while supply is estimated to grow by 55 percent. Most of the oversupply will be felt in the first half of the year, and at some point in the second or third quarter demand will strengthen. The solar industry is a standardized product industry with a complicated supply chain. It takes two years to build a silicon plant and six to nine months to add cell production capacity. The solar industry in the years to come will see many cycles of oversupply and undersupply, just as the semiconductor industry did. The cycles early in the development of an industry tend to be the most severe. The positive side of things is that there is currently incredible elasticity of demand. With contracted module pricing likely to be down 15 to 25 percent or more in 2009, the returns on systems will be attractive enough to lure new installations. It is difficult to predict whether enough capital will be available, but we estimate that in a lower interest rate environment, returns of ten percent or more will be attractive enough to attract the necessary capital. This investment will offset the oversupply problem and stabilize pricing. ♦

Renewable Analytics

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focused exclusively on the solar industry.



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