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Clouds over the Solar Power Industry

As oil prices have plunged, solar has become less cost-competitive. And the credit squeeze has made it harder to finance solar projects

By Mark Scott and Chi-Chu Tschang

If the recent five-year boom in solar energy marked the birth of a global industry, the next half-decade should be its coming of age. But like most adolescents, solar is experiencing growing pains. The economic crisis has weakened demand for everything from polysilicon to rooftop panels, just as manufacturers have spent billions expanding production. The overcapacity has caused prices to plummet and left the industry financially exposed. A number of companies—especially startups—

may not survive a shakeout that could last 18 months or longer.

The causes of the downturn are complex and interrelated. As the price of oil plunged from its peak last summer, solar and other forms of renewable energy became relatively less cost-competitive—dampening demand from industrial, commercial, and residential customers. At the same time, the credit squeeze has made it harder for customers, whether power companies or energy-conscious homeowners, to finance solar projects. Some also are holding back in anticipation that solar equipment prices will fall even further.

Consider the story of Peng Xiaofeng, chairman of China's LDK Solar (LDK), a maker of solar wafers. During a recent trip to Europe, he toured major solar projects that have been, in some cases, on the drawing boards for two to three years. "They're all delayed," Peng says."I don't think they'll be ready [even] in 2010 or 2011."

Trimmed Subsidies

The industry impact has been swift. After increasing at roughly 50% annually every year since 2004, the overall market for new solar installations could slow to just 15% growth in 2009, according to analyst estimates. Retail prices for photovoltaic (PV) panels may fall by as much as one-third in 2009 because of a continued glut. Adding to the gloom: Spain and Germany, the world's top two markets for PV panels, have recently trimmed the subsidies they offered to jump-start local

industries. "We're moving from a seller's to a buyer's market," says Adel El Gammal, secretary general of the European Photovoltaic Industry Assn. (EPIA).

Shares in major solar players reflect the brutal turn of events. The Claymore/MAC Global Solar Energy Index (TAN) has dropped 71% since its launch on Apr. 15 this year, and some leading companies have fared even worse. China's SunTech (STP)—founded in 2001 and now the world's largest manufacturer by revenue of PV cells, the basic building-block of panels that convert sunlight to electricity—has seen its stock plunge almost 90% since the start of 2008. Shares in Germany's Q-Cells (QCEG.DE), the global leader in PV cells by volume, have fallen more than 80% over the same period.

Despite this carnage, industry observers remain bullish on solar's longer-term prospects. As the price of panels drops in the next 12 to 18 months, solar power will become more attractive compared with other forms of energy. Consolidation among companies in the industry—especially as weaker players drop out or get acquired—also should lower costs and improve profitability.

All told, figures energy consultancy Navigants (NCI), the total amount of electricity produced worldwide via solar should soar from 3 gigawatts this year to 15 GW in 2012, the equivalent of 19 coal-fired power plants. Beyond the immediate period, says the EPIA's El Gammal, "the fundamentals are intact. There's no option but a very fast

growth rate."

Bellwethers Germany and China

Savvy investors are focusing most of their attention on two regions of the world, Europe and Asia. Sure, the U.S. spearheaded solar heating back in the 1970s and could see a new investment push during the Obama Administration, but over recent years it has been Europeans and Asians, particularly in Germany and China, who have led the pack in new technology, fast-growing startups, and increasing use of solar-generated electricity.

According to Citigroup (C), Germany alone will account for 38% of market demand for solar power equipment this year, while Western Europe as a whole constitutes three-quarters of the market. By comparison, China represents 11% of the market, and the U.S. 9%. Government subsidies, local venture capital, and receptive capital markets helped make stars of companies such as SunTech, Q-Cells, Norway's Renewable Energy Corp. (REC.DE), and Taiwan's Motech (6244Q.F).

But even these highfliers can't escape the economics of the market, which are expected to affect every sector of the solar supply chain over the next 18 months. The problems begin with polysilicon, the raw material from which solar cells are made and that accounts for four-fifths of the cost of a solar module.

When the solar boom began in 2004, polysilicon suppliers couldn't keep up with skyrocketing demand. To satisfy customers and cash in on surging prices—which reached $450 per kilogram on the spot market early this year—suppliers laid ambitious plans to boost output capacity. But with so many piling in at once, suppliers overshot the market, especially after demand softened for solar panels. Polysilicon prices now have fallen below $200 per kg and could drop to $120 per kg by the end of 2009.

Overbuilt for Now

The capacity mismatch won't be fixed anytime soon. Thanks to plants already set to come online, output of polysilicon will double next year, even as production of the solar cells that use it grows by a more modest 34%. And according to market researcher iSuppli, overall polysilicon capacity is set to reach 430,000 metric tons by 2011, up from just 53,500 metric tons at the end of 2007.

Plunging prices and profit margins have put enormous pressure on new suppliers such as China's GCL Silicon Technology. Founded in March 2006 by Zhu Gong Shan, who previously built coal-fired power plants, the company has attracted foreign investors such as Deutsche Bank (DB) and has been ramping up its polysilicon production facilities in Jiangsu province and Inner Mongolia. GCL expects to have 24,000 metric tons of annual polysilicon capacity by the end of 2010 compared

to a 3,000-metric-ton capacity in 2008. That would make GCL one of the world's largest producers.

Yet as global demand for PV panels has slackened, GCL Chief Executive Officer Hunter Jiang says his predominantly Chinese clients want to renegotiate their long-term polysilicon contracts to mirror the declines in the spot market. In particular, China's SunTech is trying to rework its contracts with suppliers to help offset the slump in demand next year.

Jiang says he's willing to renegotiate supply contracts with customers for a lower price, providing they pay more at the back end of the contract so the overall value stays constant. "For 2009, due to the financial crisis, we have got to work together as long-term relationship partners," he says. "But the reason we haven't signed anything is because we still don't feel pricing has gone to the bottom."

Modules and Wafers

The tough environment also extends to companies further down the supply chain, such as makers of solar modules and wafers—the halfway point between raw polysilicon and finished PV panels. According to analyst Henning Wicht of iSuppli, these players are facing increased competition as profit-starved polysilicon suppliers try to move into the higher value-added module and wafer business.

One trying to ride out the storm is SolarFun (SOLF) in Qidong, Jianjsu Province. When times were good, the company had expected to produce 175 megawatts to 190 megawatts of PV cells and modules this year. It also planned to add four cell production lines in 2009 after inking a new three-year supply contract with Germany's Q-Cells. But on Dec. 2, SolarFun reduced its 2008 production target to around or below 175 MW. The expansion plans? Shelved for now. "The first quarter will be relatively slow in the industry," says Henricus Hoskens, SolarFun's CEO.

The problems aren't limited to new entrants. Q-Cells cut its forecast for yearend sales on Dec. 9 because of weakening market demand linked to the current financial crisis. According to the company, roughly 40 to 50 of its 80, predominantly Chinese, customers have postponed orders. That will reduce net income this year from €215 million ($284 million) to €185 million ($244 million). "Due to the deterioration in project financing conditions and the uncertain market situation, we expect demand to remain weak into early 2009," says a company spokesperson.

The jump in financing costs also is hitting the last step of the solar supply chain: End consumers who now can't afford to expand capacity. To date, Western Europe has been the major market for PV panels as governments, particularly in Germany and Spain, offered lucrative incentives (so-called feed-in tariffs) that guarantee above-market

returns on solar projects for up to 20 years.

This year, these state-backed schemes in Germany and Spain were cut by as much as 25%, although France has recently raised its subsidy. That has weakened profits for many independent suppliers that rushed in to profit from the feed-in tariffs, which pay producers higher-than-market prices for electricity produced via solar. "Small companies that have developed renewables could be in trouble," says Colette Lewiner, global energy, utilities, and chemicals leader at consultancy Capgemini (CAPP.PA). "They have overinvested, taken on a lot of debt, and will find it difficult to raise new money."

Market U-Turn

Yet one company's crisis is another's opportunity. According to Ingmar Wilhelm, executive vice-president for development in Italy at Enel Green Power, the renewables division of Italian utility Enel (ENEI.MI), the market was saturated with would-be developers of solar projects just three months ago. That pushed up the cost of everything from choice sites to solar equipment as companies grabbed as many projects as they could.

Now, the market has done a U-turn. Smaller players have rescinded options on future developments, in part because project financing is harder to find. "It has certainly helped us to increase our negotiation position," Wilhelm says. This year, Enel Green Power will install 260

MW of solar capacity, compared to 80 MW in 2007. The utility also plans to double its projects annually to eventually hit 4 GW of solar power by 2013.

The fact that deep-pocketed Enel will probably weather the financial crisis better than smaller competitors just shows that in the solar business, it increasingly pays to be big. Q-Cells, SunTech, and other heavy hitters may be cutting back, but they still have the financial muscle to survive, while many independent firms could go under. Price pressure from stronger players "will accelerate industry consolidation," says Christine Wang, a Taipei-based analyst with HSBC (HBC) who covers solar companies.

Analysts reckon the industry is set for a round of bloodletting in the next 18 months. That will be tough on some firms, but Sak Nayagam, climate change expert in Accenture's (ACN) energy practice, believes it's a necessary step to build the economies of scale for solar to become a mainstream power source. "It's the necessary shift from experimentation to actual project execution," he says.

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