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Solar Photovoltaic in China: Capacity not Excessive, Quality Determines Market (Part 1)



Follow capacity rhythms

In recent years, China's photovoltaic (PV) market has experienced rapid development and expansion, attracting a stampede of Chinese producers from related fields. Leading Chinese PV companies are all planning and implementing large scale expansion projects. In light of such situation, experts commented that although the PV industry has huge potentials, [its technologies](#) and markets are yet to mature, which may lead to the danger of overcapacity. So is this really the case?

When asked about the above possibility, Mr Yan Dazhou from China Enfi Engineering Corp stressed that whether overcapacity exists depends on market demand. According to published policies and planning data, PV demand from the international market in the next 5 years should far exceed projected supply. "China's PV industry is still at an early stage, there shouldn't be any overcapacity issues. But the industry is currently facing issues such as raw materials shortage, talent shortage, policy assistance, technological R&D, domestic market development and product quality. Every aspect of the industry chain, including raw materials supply, requires ongoing policy support from the government", said Mr Yan.

It is an indisputable fact that PV industry has bright future and huge room for growth. Mr Xie Xingmin from [High-tech](#) Industrial Development Zone of Luoyang also thought that it is exactly because of such firm belief over the future of PV, lots of private capital have therefore rushed into the industry. The rhythms of market development and capacity expansion will not be synchronised, and this will lead to temporary capacity surplus in a certain period. But over the long term, in the context of the vast market demand, current capacity is far from sufficient.

Vice CEO of Suntech Power, Mr Long Guozhu, said that from a global market perspective, China's PV development has grown faster than many other countries, but there are also some inevitable problems. "I don't think market size could hinder the development of China's PV industry, I think quality would be a more important issue. As so many companies have participated in China's solar cell projects recently, it is possible to see some overcapacity. But given the positive market trend, such capacity surplus in China is just relative, not absolute. If your products are of good quality, it shouldn't be difficult to sell them", said Mr Long.

Materials still the bottleneck

As the PV market is so huge, solar cell manufacturers in China have enthusiastically expanded their capacities, without considering issues such as tightness of raw materials and market bottlenecks. Mr Yan said that the current industry chain is not balanced, exhibiting a "inverse pyramid shape", that is, PV power generation [system developments](#) have far exceeded development of upstream raw materials industry. Upstream manufacturers have a higher technical barrier for capacity expansion and slower capacity growth, resulting in a fierce shortage of high-purity silicon materials. Such unsynchronisation between market and industry developments have directly pushed up the price of solar-grade polysilicon, a major raw material for PV power generation.

Yan said that due to the sensitive nature of silicon materials in IT and new energy industries, most developed countries currently consider silicon as strategic resources and restrict the transfer of silicon [technologies](#). In order to support the Chinese silicon industry, the government arranged the establishment of China Silicon High-Tech Co Ltd in 2003, a joint venture between Luoyang Monocrystalline Silicon Co, Luoyang Jinfeng Electric Co and China Nonferrous Engineering Institute. Based on technical capabilities of China Nonferrous Engineering Institute, the JV built a polysilicon production line with annual capacity of 300 tonne in 2005. It is the first Chinese polysilicon production line with proprietary intellectual properties.

In addition, as two other large scale projects, namely Sichuan Emei technological transformation project and the kiloton-per-year project in Leshan, along with a few more new projects in China, will come into market in 2008, China's polysilicon output should reach 3,000 tonnes next year. Many international polysilicon companies are also investing in and expanding capacity at the moment, the tightness of raw materials market should be eased to some extent in 2008.

Having said that, development of China's polysilicon materials industry is not as optimistic as it seems. Due to temporary shortage and high profitability of polysilicon materials, more than 40 companies from various provinces have registered their interests in polysilicon projects, totalling more than 60,000 tonnes per year and worth \$80 billion. This could potentially lead to another mania and overheating market.

Polysilicon [production systems](#) consist of flammable and explosive materials, with high technical difficulties such as non-standard equipment, complex [systems](#), strict requirement for temperature balance and most importantly, lack of talent. Beginning projects in a hurry, many companies have chosen to head-hunt talents and introduce incomplete technologies and simplified equipment, resulting in risks in technical reliability, [system security](#), environmental damage, investment and IP disputes. Experts have suggested polysilicon companies to take a cautious approach, in order to reduce and avoid wastage.

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Solar Photovoltaic in China: Capacity not Excessive, Quality Determines Market (Part 2)



Materials still the bottleneck

Mr Yan suggested that Chinese polysilicon companies should follow the international practice of "more expansion, less greenfield". He said the government should support companies with solid technologies and business foundation to expand their technological investments, and narrow the gap with multi-national polysilicon companies.

Mr Xie also believed that polysilicon is indeed a major problem for restricting China's PV industry development and expansion. Normally, the price of PV power generation equipment should continue to go down as technology advances, but the market price in China actually went up during 2006. This is mainly due to the shortage of polysilicon, which has also polarised the whole industry. A few leading companies with technology, brand, market, capital and raw materials advantages continue to prosper, while many small players without sufficient resources have been eliminated by the market. This polarisation process is inevitable in a competitive market, and it helps the healthy development of the whole industry.

Mr Long agreed that the current polysilicon shortage in China is affecting the PV industry. But as there are many expansion projects underway, both domestically and internationally, people have formed an expectation that the current supply tightness would ease some time in the future. "Smart companies had foreseen such tightness long before it came, and prepared for the situation. For example, Suntech had signed 10-year supply agreements with major materials suppliers before market tightness appeared. So locking supply sources has become one of the keys competitive advantages for Suntech's success", said Long.

Quality determines market

Some experts thought that compared to the shortage of raw materials, market is the real troubled spot. The German market remains stable, Japanese and American markets are hard to enter, while the Chinese market is yet to take off. Xie said that the German market is in a fast developing stage, and according to published energy industry planning from Germany, the solar market is still far from mature. On the other hand, due to intensive lobbying from incumbent energy players, the US government had not been actively developing its PV industry until 2005, when environmental pressure and rising energy prices prompted it to focus on alternative energies. So the prospect for US market is huge.

Compared to developed countries, China's market is still too small to for China's PV industry to rely on. Current electricity price in China is much lower than PV generated power, making PV power a less preferable electricity generation means. Thus China's PV power generation market still needs significant policy supports. But in the long term, due to technological advancements and market expansion, PV electricity cost should go down gradually, and PV power replacing coal power is a non-reversible trend.

Although the PV industry has bright prospect, whether a product satisfies the market depends on its quality, cost and services.

Due to polysilicon tightness in China's PV industry, some solar cell manufacturers have chosen to mix high-purity polysilicon with 4N, 5N or even lower grade silicon materials in production process. This could

result in low conversion efficiency and unstable quality, damaging both China's PV industry reputation and Chinese product markets.

Going forward

With polysilicon projects gradually coming into production, polysilicon materials supply should be better ensured. Polysilicon price should also return to a more normal level, reducing downstream raw materials costs. At the same time, China's PV companies will develop technologies such as thinner and larger solar cells, hence improving conversion rates and reducing costs. The overall market will become much different as time goes.

Yan commented that government support will be needed to develop China's solar market. Similar to Japan, US and Europe, Chinese authorities should introduce policies to encourage usage of PV generated power. Some experts even suggested a renewable energy fund by levying energy users. If implemented properly, PV applications in China should blossom in the next few years.

continents proposal, the domestic market needs of the development of the national industrial policy support to be as Japan, the United States and Europe, the introduction of policies to encourage photovoltaic power generation Internet. Experts suggest that the light of the Three Gorges power station construction policy in the electricity from renewable energy sources in the fund to be used to encourage the building of power stations and photovoltaic power generation Internet. So, in a few years, China will flourish photovoltaic applications in China, green, non-polluting, renewable photovoltaic energy in China will play its due role.

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