

CASE STUDY: SUNTECH POWER

Introduction

Suntech Power, a major manufacturer of solar cells and modules, was founded in 2001. In December 2006, the company's production capacity expanded to 300MW, and production capacity is expected to reach 1GW by 2010. Suntech is currently ranked as the No. 3 silicon cell manufacturer worldwide and the largest solar module manufacturer internationally. With four production sites at Wuxi, Luoyang, Qinghai and Shanghai (under construction), Suntech has 4000 global employees. Suntech also owns MSK Corporation, a leading PV module manufacturer and Building-Integrated PV company in Japan.

Suntech's largest markets are (in order): Germany, Spain and the United States. About 80 percent of the company's products are sold in Europe, but the company anticipates a major expansion in the U.S. market in the coming years.

Theme

Suntech demonstrates the potential for manufacturers of solar cell technology to thrive in China, which is on track to become the world's number one PV producer in 2008 with a market share of over 18%. Despite its success in international markets, however, Suntech—and other solar energy companies—have met with difficulties in fully penetrating the Chinese market, and future prospects for continued rapid growth in China are uncertain. While China is making strides towards encouraging its renewable energy industries, significant obstacles for PV manufacturers remain.

Internal Factors

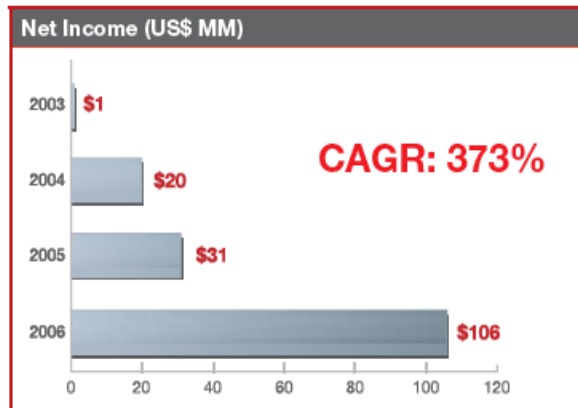
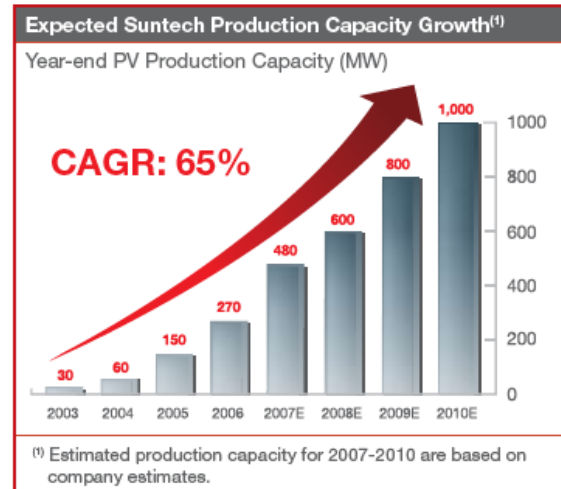
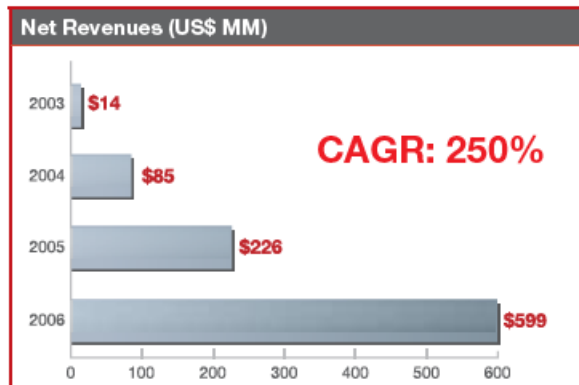
Suntech was founded by Dr. Zhengrong Shi, who also serves as chairman of the board of directors and chief executive officer. Prior to founding Suntech in 2001, he was a research director and executive director of Pacific Solar Pty., Ltd., an Australian PV company engaged in the commercialization of next-generation thin film technology. Dr. Shi brought numerous patented innovations in solar technology to Suntech, which have been a cornerstone of the company's success.

Dr. Shi has also adopted former U.S. Vice President Al Gore's battle against climate change and is encouraging Chinese political leaders and others to attack global warming. Recently, Dr. Shi was recognized as one of China's 2007 Green Persons of the Year for his great contribution to the renewable energy industry in China.

On December 15th, 2005, Suntech successfully completed its IPO in New York Stock Exchange (NYSE). It is China's first high-tech private corporation to attract investment in main international capital markets and earned the highest market value in the world PV industry. As of February 25, 2008, its stock price on the NYSE was \$37.13.

Advantages:

Suntech's 2006 Annual Report reveals impressive results...



“ During 2006, we stayed true to our mission of focusing on the production of clean, efficient solar energy solutions at the lowest cost per watt. ”

Note: CAGR stands for compound annual growth rate.

...and numerous competitive strengths:

- Large-Scale Manufacturing of High-Efficiency PV Cells
- Strong Research and Development Capabilities in PV technology
- Flexible China-based, Low-cost Manufacturing Model
- Established Relationships with Key Customers and Suppliers, including Conergy AG, Atersa, IBC Solar AG, SolarWorld AG and Ibesolar Energia S.A.
- Leading independent developer and manufacturer of PV cells and modules with high growth and profitability

Another major advantage that Suntech enjoys at present is a reduced tax rate. According to Suntech's 2006 Annual Report, the basic enterprise income tax rate for foreign-invested enterprises in China is currently 33.0% (30.0% state tax and 3.0% local tax). The Chinese government has provided various incentives to foreign-invested enterprises and domestic companies operating in a national level economic and technological development zone, including reduced tax rates and other measures. For example, Suntech China, is entitled to a preferential enterprise income tax rate of 15.0% so long as it

continues to operate in the high-tech zone and maintains its “high or new technology enterprise” status.

However, Suntech may not benefit from such a low tax rate in the future. As of 2008, the PRC Enterprise Income Tax Law or the EIT Law will require China to adopt a uniform tax rate of 25.0% for all enterprises. Thanks to a grandfathering provision, this new tax rate will not apply to Suntech for five years, though there are no guarantees that the tax rate will not increase further in the future.

Disadvantages:

Despite the substantial growth it has experienced thus far, Suntech also identifies a number of internal risks in its 2006 Annual Report. These include the following assessments:

- Our failure to further refine our technology and develop and introduce new PV products could render our products uncompetitive or obsolete, and reduce our sales and market share.
- Our dependence on a limited number of suppliers for a substantial portion of silicon and silicon wafers could prevent us from delivering our products in a timely manner to our customers in the required quantities, which could result in order cancellations, decreased revenue and loss of market share.
- Our future success substantially depends on our ability to significantly increase both our manufacturing capacity and output. Our ability to achieve our expansion goals is subject to a number of risks and uncertainties.

In addition to these risks, Suntech remains largely dependent on exports, though domestic sales have improved significantly as a percentage of total revenues since 2004.

| Region | Year Ended December 31, | | | | | |
|-----------------------------------|-------------------------|---------------|--------------------|---------------|--------------------|---------------|
| | 2004 | | 2005 | | 2006 | |
| | Total Net Revenues | % | Total Net Revenues | % | Total Net Revenues | % |
| (in thousands except percentages) | | | | | | |
| Europe | | | | | | |
| Germany | \$61,528 | 72.1% | \$101,590 | 45.0% | \$254,369 | 42.5% |
| Spain | 1,659 | 2.0 | 18,160 | 8.0 | 123,547 | 20.6% |
| Others | 13,033 | 15.3 | 41,537 | 18.4 | 43,784 | 7.3% |
| Europe sub-total | 76,220 | 89.4 | 161,287 | 71.4 | 421,700 | 70.4% |
| China | 6,705 | 7.8 | 56,400 | 25.0 | 129,704 | 21.7% |
| South Africa | 1,345 | 1.6 | 488 | 0.2 | 1,911 | 0.3% |
| Rest of the world | 1,018 | 1.2 | 7,825 | 3.5 | 45,555 | 7.6% |
| Total | \$85,288 | 100.0% | \$226,000 | 100.0% | \$598,870 | 100.0% |

External Factors

Advantages:

China's natural landscape makes it a prime location for the development of solar energy. Two-thirds of China's land area receives more than 2,000 hours of sunlight per year, which is more than either Japan or Europe. China's potential solar energy production is equivalent to 1,700 billion tons of coal.

On February 28 2005, China passed a historic law known as the Law on Renewable Energy Resources, which pledged to use renewable energy resources such as solar, wind and geothermal energy for 10% of energy consumption by 2020. The goal of the law is to "improve China's energy structure, diversify energy supplies, safeguard energy security, protect the environment, and realize the sustainable development of the economy and society." The law encourages the government to promote the use of photo voltaic cells in buildings as a means to promote China's solar energy industry.

Major upcoming events taking place in China, such as the 2008 Olympic Games in Beijing and the 2010 Shanghai Expo, will continue to stimulate the solar energy industry. In 2006, Suntech was awarded an exclusive contract to supply a 130 KW solar energy system for Beijing's Bird's Nest Stadium, the main stadium for the 2008 Beijing Olympic Games. The energy system will be installed at twelve entrances of the stadium.

According to Solar Daily, industry specialists, who asked to remain anonymous, predicted that domestic consumption of solar power should improve in the next few years. As a result, firms are boosting their investments in anticipation of future growth. In addition, one source indicated that the central government would likely introduce policies this year to promote the domestic installation of alternative energies such as solar power.

Disadvantages:

Despite recent progress, China suffers from development challenges and, until recently, a dearth of laws and regulations that support renewable energy. Even with the Law on Renewable Energy Resources, China lacks a comprehensive nationwide plan for photovoltaic energy. "Manufacturers are expanding their capacity, but I don't see a major drive to install solar power domestically," said Wang Xing, a senior program officer at the Energy Foundation's China Sustainable Energy Program. "Right now there is not a very strong incentive program for solar power."¹

A significant obstacle for solar energy is an inability to connect small-scale solar units to the larger power grid. "Currently, solar energy is only combined with power generation grid networks on a trial basis in first-tier cities like Beijing and Shenzhen," said Gao Hu, a researcher with the state-controlled Energy Research Institute². Resource shortages – including the scarcity of adequate facilities, financial resources, and training opportunities—further hinder the development of solar technology.

In its 2006 Annual Report, Suntech describes the following factors as competitive risks, many of which reflect the challenges of operating in China:

¹ Solar Daily

² Id.

- The reduction or elimination of government subsidies and economic incentives for on-grid solar energy applications could have a material adverse effect on our business and prospects. *Note: Because the installed cost of the company's PV modules is upwards of 35¢ per KWh, government subsidies in export nations such as Germany and Japan are crucial to making the modules cost effective.*
- If PV technology is not suitable for widespread adoption, or sufficient demand for PV products does not develop or takes longer to develop than we anticipated, our sales may not continue to increase or may even decline, and we may be unable to sustain profitability.
- We face intense competition from other companies producing solar energy and other renewable energy products. According to Photon International's survey in March 2006, as of the end of 2005, 94 companies in the world produced PV cells and 153 companies produced PV modules.
- The Chinese economy differs from the economies of most developed countries in many respects, including: the amount of government involvement; the level of development; the growth rate; the control of foreign exchange; and the allocation of resources. While the Chinese economy has grown significantly in the past 20 years, the growth has been uneven, both geographically and among various sectors of the economy.
- The PRC government has implemented various measures to encourage economic growth and guide the allocation of resources. Some of these measures benefit the overall Chinese economy, but may also have a negative effect on us. For example, our financial condition and results of operations may be adversely affected by government control over capital investments or changes in tax regulations that are applicable to us.

Conclusion

Suntech's booming growth and strong sales abroad demonstrate the potential for solar energy companies to succeed in China. In recent years, low manufacturing costs, better technology, and efficient production have helped companies like Suntech to remain competitive. The Chinese solar industry has also attracted significant attention worldwide. In September 2007, the International Solar Energy Society hosted its Solar World Congress in Beijing to help promote sustainable development in the solar industry in China and other nations.

Despite all the progress, however, China's installed capacity for PV power is only 80 MW, which is just 0.016 percent of the installed thermal power capacity. Price wars leading to lower quality products and the lack of financial and policy support from government remain as significant barriers. Traditional power companies have also failed to develop their own solar energy technology and to provide solar energy with ready access to the grid. As a result, Suntech and other companies find that domestic sales are less than a quarter of total net revenues, and prospects for growth in the domestic market remain uncertain. Moreover, in international markets, Suntech remains highly dependent on subsidies from governments in developed countries, and any reduction in subsidy

levels would hurt business badly. Still, Rhone Resch, President of Solar Energy Industries Association, says he does not expect those subsidies to go away any time soon. "I think investors recognize that solar, although small, makes sense."³

For solar energy to comprise a higher percentage of growth in domestic Chinese consumption, companies such as Suntech will need to increase efficiency and lower costs associated with PV. In order to do so, they will need to develop technology that can produce more electricity with less land being taken up by solar modules. Currently, a kilowatt-hour of electricity made with coal costs about 4 cents in China. An equivalent amount made from solar energy costs approximately 10 times this much. Electricity from wind energy costs about double, so China's government has recently subsidized wind—and wind investment has soared.

In order to remain competitive, China will need to provide Suntech and other solar companies with subsidies and policy measures that can help them sustain their advantage in manufacturing costs. Wang Wenjing, a solar energy expert at the Chinese Academy of Sciences, says he thinks that solar subsidies are only a year or two away. "The lack of government policy is constraining the use of solar energy," he says. "If the government would just come out with a policy, I'm certain China could very quickly become the world's largest user of solar energy."⁴

While difficulties remain in the short term and domestically, long-term prospects for PV made in China look promising. According to the Research and Markets, from 2020 to 2030, solar energy will enter into mainstream energy markets worldwide on a large scale. Technical progress together with scale effects will steadily reduce the cost of PV batteries. The research firm cites cost curve figures of the PV industry in the past 40 years that have shown that costs will come down 15-20% once accumulated sales volume of PV batteries is doubled. The firm also estimates that solar power generation cost in developed countries will approach electricity prices for the peak period from 2010 to 2030; and it will approach average electricity prices from 2020 to 2050.

To fully take advantage of global demand for solar energy, Suntech must continue to develop new and innovative technologies and increase its production capacity. With the proper support, Suntech should continue to thrive in the years to come.

Sources

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³ Red Herring.

⁴ NPR.

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