

The rapid growth of the Chinese PV Industry

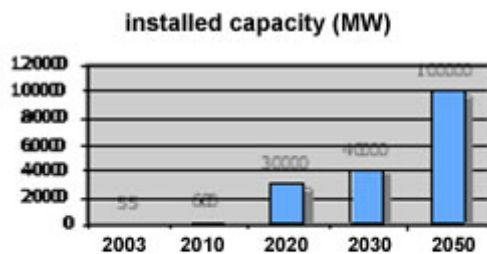
Examples of expected new world leaders

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In April 2006 SolarPlaza organized a PV business tour to China. This article relates some of the experiences and findings of this international PV business tour. Thirty-one business executives from nine different countries participated in this tour. Participants represented all segments of the industry: cell manufacturers, large multinationals potentially interested in solar energy, equipment manufacturers, system integrators, consultants etc.

The Chinese market

The domestic Chinese solar market is interesting because of its enormous growth-potential. If you look only at the numbers of installed solar power in China a trip seems not to be worthwhile at all: The total cumulative amount of installed solar power in 2005 was 70MW, of which only 5 MW was installed in 2005. The total electricity capacity in China is 6,000 times bigger. More than half of the current PV installations are meant for the rural and remote areas, where almost 30 million people do not have access to a conventional electrical network. These areas are mainly located in the western part of China with a lot of solar resources. The applications used are for example small portable 10-20 Wp installations, PV-wind hybrid systems and solar pumps.



The expected installed solar power. Source: REDP

In the next decade this market will change from the smaller systems to larger grid-connected power generating systems, including the larger PV power plants of 10 MW in desert areas and rooftops systems like the 100.000 roofs programme in Shanghai. The short term market potential of these kind of applications is quite interesting, potentially 140 MWp by 2010. The market of solar energy in China is likely to expand because of the Chinese government: In 2005 the Chinese renewable energy law was approved. According to the law, power grid operators should buy renewable-source-generated power at directed prices calculated by the government. The extra costs incurred by this will be shared throughout the overall power network. China's government imposed a national renewable energy requirement that is expected to boost the use of renewable energy capacity up to 10 percent by 2020. The potential growth of the Chinese domestic market looks impressive, but is still an expected growth. The reality is the already rapidly growing Chinese solar industry.

The Chinese solar industry – some examples

The growth of the production capacity of solar wafers, solar cells and solar modules is astonishing. The expectations are that the Chinese production capacity is going to beat Japan and Germany within five years!

Yingli Solar Company

The second largest module manufacturer in China, Yingli Solar produced 16 MW of modules in 2003. Within 2-3 years they expect to produce 600 MW. The SolarPlaza business tour visited Yingli Solar in Baoding. Yingli is a vertically integrated company, which is planning an IPO within the next 12 months. On April 29th, SolarPlaza was invited again for the opening ceremony of what they call their 'third phase project': the installation of a 500 MW production line. The Yingli Solar Company originates from the Tianwei Yingli New Energy Resources Co., Ltd., founded in 1998. Ever since, Yingli Solar kept developing state-of-the-art production lines for wafers, cells and modules. State support and western technology helped Yingli Solar to become one of the hottest PV companies in China at this moment.

From the first phase (May 2004), with 6MW wafers, 10MW cells, 50MW modules to respectively 95/60/100MW in the second phase, complying with IEC, UL, CE and TÜV already are impressive figures and facts. Yingli Solar could well be China's and the internationally fastest growing PV manufacturer. During the SolarPlaza PV business tour the delegates got an impression of the production process, from ingot casting to module assembly. The opening ceremony was impressive with over a 1.000 people being witness. Among many officials there were interesting speeches of the municipal secretary of Baoding, the general director of the Energy Department of the National Development and Reform Commission and various officials of the Hebei Province. The third phase will be completed in 2008 and will require an investment of almost \$300M. Over 330 thousand square meters of premises are reserved for a state-of-the-art PV production plant. Apart from that, the National New Energy Equipment Industrial Base, the Solar Grade Silicon Crystalline Wafer Research Centre and a Professional Training Centre will be founded. The production plant will have a capacity of 500MW wafers/cells and modules. 70% of the facilities should be finished by the end of 2006, boosting 100MW production at that point. By the end of 2008, production should reach 600MW with a turnover of RMB 16 billion (EUR 1.58 billion) and 3,5 billion RMB (EUR 345 million) profit. The Research Centre will keep Yingli Solar on top of the market, developing new technologies, materials and facilities. Yingli will keep on doing such in close cooperation with international manufactures and research laboratories. The PV System research centre will be established to overcome the lack of experience with large (grid connected) systems, whereas the training centre will stand for long-term relationships with universities, research centers and will provide well-trained and high level PV technicians.

Suntech Power

At Suntech Power the SolarPlaza delegation was welcomed by Dr. Zhengrong Shi, the founder and CEO of the company. The history of Suntech power is a young man's dream, which resembles the Silicon Valley success stories in the late nineties of the last century. Suntech Power Holdings Co., Ltd. specializes in the design, development, manufacturing and sale of photovoltaic (PV) cells, modules and systems. Founded in January of 2001 by Dr. Zhengrong Shi, a distinguished PV technology scientist, Suntech has rapidly developed into a leading solar energy company. In less than three years since it started its business operations in May 2002, Suntech has increased its manufacturing capacity by 12 times, becoming one of the world's top 10 manufacturers of PV cells based on production output. Dr.

Zhengrong Shi stated in his presentation given to the SolarPlaza delegation that Suntech is committed to become the lowest cost per watt provider of PV solutions. The Suntech goal is to achieve a cost level of 1US\$ per Wp for a turnkey installation. On December 15th, 2005 Suntech Power went public. The stock price rose over 80% in 4 months. This five years old company is now worth over 5 billion US\$...

Solar wafer and cell production

During the tour a symposium dedicated to solar silicon, wafer and cell production was organized. LDK Solar High Tech Co, a Xinyu, Jiangxi based wafer manufacturer, expects that as the industry scales up and becomes more mature, specialization and focus will be the keys to success rather than vertical integration. The focus of LDK is the production of multi crystalline solar wafers. Although LDK Solar just started with production of trials in February 2006, the company targets on a production capacity of 200 MW by early 2007. Eventually LDK Solar is aiming at achieving a 1000 MW silicon wafer production capacity by 2010. The strategy is to supply the most economic solar wafer to long-term strategic partners. The most economic wafer production will be achieved by focusing on technology and R&D combined with economy of scales. Bigger ingots, thinner wafers, thinner wires and bigger wafers will contribute to a more economic solar wafer production. In the long-term (2010), LDK Solar expects a serious drop (75%) of the wafer price compared to current prices. Another high-flyer is Nanjing CEEG PV-Tech that focuses on solar cell manufacturing. Founder Dr Jianhua Zhao informed the delegates of the business tour that his company started their first 32 MW per year production line in June 2005. By March of this year the company had already reached a capacity of 100 MW/year that will be further extended to 600 MW by 2008. Two thirds of the production is in mono-crystalline CZ cells and, due to their continuous research efforts, cell efficiency has already increased from 15% to 16.2%. CEEG is building its own research laboratory, which will be operational in June 2006. With the R&D effort, cell efficiencies of >20% will be feasible according to CEEG. Unlike LDK or CEEG, Trina Solar is a typical and vertically integrated PV company, like Yingli Solar. The company produces ingots, wafers and modules, with a capacity of 50 MW per year. Cell production with the same capacity is planned for this year. Expanding the production capacity of all these products to 300 MW per year is being foreseen for 2008. With the participation of Trina Solar in several Chinese solar PV projects (for instance power station in western provinces like Tibet), Trina is present in the complete supply chain, except for the production of silicon. The forecast for the sales revenue in 2010 is no less than 2 billion USD! During various sessions of the China tour several Chinese companies presented their plans to extend their production capacity to levels of several hundreds of MW in the coming years. In Beijing and Shanghai 40+ Chinese companies attended brokerage events, where the international delegates could meet their Chinese counterparts and discuss potential business opportunities. Looking at the position and size of the Chinese companies that took part in the PV tour, now is an ideal time to forge your contacts with these industrial players. Delegates benefited from this event by establishing the first fruitful contacts for further collaboration. The delegates and the tour's organizer, SolarPlaza, have expressed their satisfaction with the results of the Chinese PV tour. Therefore a repeat event is very likely to take place either this year or in 2007. On the shorter term the SolarPlaza team is organizing a PV business tour to Spain September 17-22 2006. Further tours being planned for this year will include Germany and Italy. For more information on the Chinese PV market, we refer to the SolarPlaza market report, which is available from our website, www.solarplaza.com