

Modules from China: Chinese freighters loaded with solar technology head into the port at Hamburg with increasing regularity.

Photo: www.mediaserver.hamburg.de/C_Spahn/bier

QUO VADIS SOLAR INDUSTRY?

Growing Criticism of PV Production and the consequences The German photovoltaic industry is coming under increasing pressure. On the one hand, feed-in tariffs are planned to be substantially cut as early as spring and, on the other, Chinese suppliers are beginning to flood the German market with inexpensive yet technically advanced modules. Can German manufacturers still hold their ground?

The fact that the German photovoltaic (PV) industry is willing to make concessions with regard to the production of solar power is an absolute novelty. The industry can cope with the fact that the tariffs laid down in the Renewable Energy Bill (EEG) will be cut by a further five percent over the year, according to Matthias Willenbacher, Board Member at the German Solar Industry Association. The tariffs were already reduced at the turn of the year as scheduled – by nine percent for roof systems and eleven percent for large-scale outdoor power plants.

The reason for this new humility lies in the growing criticism of PV subsidies in Germany, which awakens fears in the industry of a repeat of the recent Spanish debacle. Because the PV market in Spain was growing faster than the government desired, a production limit was introduced to throttle demand. Similarly, Germany is producing many more solar systems than the conservative-liberal coalition government would like to see. Due to the global sales crisis the price of systems has dropped by an average of more than 30 percent since late 2008, while government assistance has declined by “only” 17 to 21 percent in total. Currently the prospect of high returns is driving multitudes of investors onto roofs and outdoors: According to initial estimates, as much as three gigawatts (GW) capacity was erected in 2009 – twice as much as in 2008. In other countries with feed-in compensation, such as France or

Italy, solar energy is growing much less dynamically. There are various reasons for this, including set extension limits, high administrative hurdles and the fact that only certain technologies such as building integrated systems, for example, are being promoted.

Primarily Chinese producers are pushing their capacities onto the German market. According to market researcher pvXchange, the international spot market price for crystalline silicon modules from China dropped by an average of 40.3 percent to hit 1.76 euros per watt between January and September 2009. European companies are hard pressed to keep pace: In the same time period, they reduced their prices an average of 32.9 percent to 2.14 euros per watt. Nonetheless, PV technology “Made in Germany” – is in demand: Warehouses that were full to the brim in summer are long since empty, and lines are running at high



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speed again. "At present we are fully utilizing our 300 MW capacity," states Schott Solar spokesman, Lars Waldmann.

Too many modules

In Germany, solar power plants are becoming increasingly large: While the average capacity – according to the Federal Network Agency – was still 8.7 kilowatts (kW) in January, it was already up to 21.6 kW in July. This is an indication that above all agriculturists with large barn and stable power plants have become active. The farmers' enthusiasm for solar energy is no coincidence: Although the production tariffs were cut back on 1 January, solar power plants in good German locations can still generate attractive returns of ten percent and more. "Prices drop with the degression," explains pvXchange managing director, Kai Malkwitz.

For manufacturers, however, the era of big profits is over. In spite of mass production expansion and technological progress, manufacturing costs have not dropped anywhere near as much as sales prices for the modules. This has shrunk their margins. "The price level is not satisfactory," comments Waldmann. And there is no trend reversal in sight. Since the global module supply is larger than the demand, the industry has no chance to push higher prices through for the time being. While it is true that the boom in Germany is diminishing the huge stocks fabricated by manufacturers during the crisis, they will not disappear entirely. According to market researcher iSupply, 8.55 GW worth of modules were produced in 2009, but only 5.16 GW instal-

led. This leaves 3.39 GW for the international industry to depreciate.

The situation is not likely to ease in 2010: It is expected that 14.56 GW of modules will be manufactured globally and only 8.34 GW installed. And markets continue to develop slowly. Whether France, Italy or Greece, none of the Mediterranean countries will even come close to the GW limit with their annexes. In China and Japan the installation numbers also bob around in the lower three-digit MW region. According to experts, only the USA is on its way to becoming a true mass market: For 2010, the European PV Industry Association (EPIA) expects installations of at least one GW there. But even then a huge number of modules will remain for Germany, as Bernd Schübler, spokesman for Photon magazine emphasizes.

Equipment from Germany

The companies could produce less in order to alleviate pressure – this, however, seems to be taboo. Thin-film market leader First Solar intends to manufacture 1.55 GW in 2010 – 550 MW more than in the previous year. And, after slowed growth in 2009, the Chinese PV concern Suntech plans to increase its production by as much as 900 MW to 1.6 GW of crystalline modules. With their combined 3.15 GW, these two companies alone could saturate the German market, which will – assuming the government goes easy with the EEG – account for three GW in 2010.

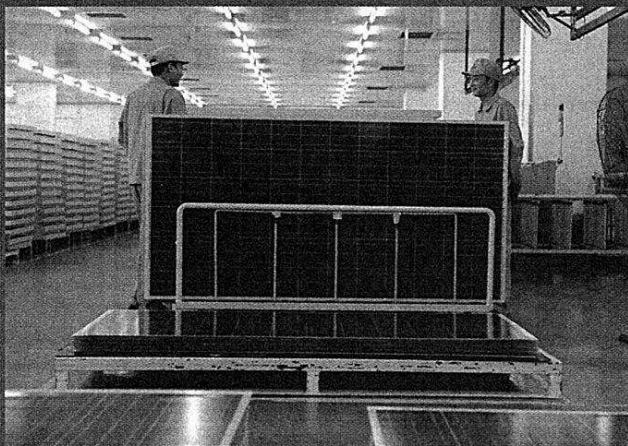
If Berlin curbs annexing with massive additional cuts in solar subsidies, the pressure on the industry will intensify. German companies could easily get crus-

Price Trends and Challenges

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- It is expected that in 2010 14.56 GW of modules will be manufactured globally and only 8.34 GW installed.
- Only the USA is on its way to becoming a true mass market.
- Manufacturers try to meet the challenges with technical developments like more efficient solar cells and reduction of costs.

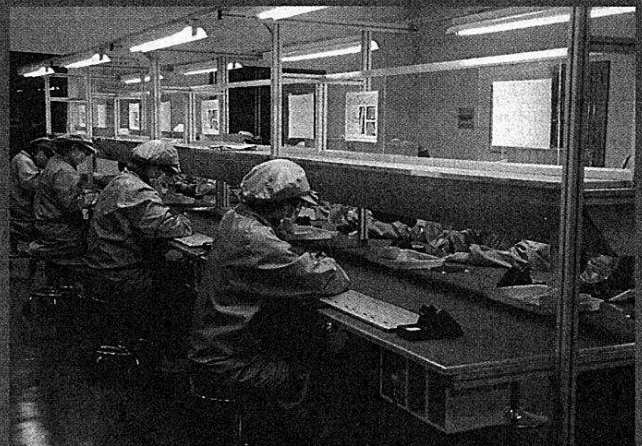
hed between the price-aggressive competitors from East and West in these circumstances. Particularly the Chinese have a decisive competitive advantage: "Companies such as Suntech and Yingli can produce more cost-effectively than their European competitors," explains Jess Pichel, an analyst at the US investment bank Piper Jaffray. This is possible due to lower salaries, as well as a technological advantage with regard to innovation and productivity. "China's top manufacturers produce with state-of-the-art fabrication technology from Germany," states Pichel. And the Asians pit their strength mercilessly in the battle for market shares. Several companies have already announced massive price reductions for 2010.

While it does hold true that US and Chinese rivals are intensifying competition, the German solar industry is not entirely blameless for its difficult situation: "Several companies lost sight of their costs during the boom phase," explains Götz Fischbeck, an analyst with BHF Bank in Frankfurt. They received, for example, sufficient supplies of raw materials at relatively low prices during the silicon shortage thanks to long-term contracts with chemical companies. The Asi-



Ready for export: China's leading module manufacturer, Suntech, produces primarily for the German market.

Photo: Suntech



Inexpensive labour: Due to the low labour costs, many Asian solar cells are still manufactured manually.

Photo: Jianguyin Shine Science and Technology

an newcomers, by contrast, were forced to purchase silicon at much higher prices on the spot market and thus to keep other costs at a minimum in order to operate profitably. "Chinese manufacturers are now profiting from this."

So far the German solar industry has not found an appropriate answer to the Asian market onslaught. The first reaction was to demand measures against alleged price dumping, and quality, social and environmental standards. Meanwhile, however, the industry has recognized that these are false levers. One should not parade the supposed quality advantage like a monstrosity, according to Andreas Hänel, head of system supplier Phönix. Instead, one should press for more innovations and quickly cut costs.

Focus returns to innovation

As one of the biggest losers of the financial crisis with a loss of close to one billion euros in the first three quarters of 2009, Q-Cells plans to proceed by introducing a multi-crystalline "next-generation solar cell" in 2010 that transforms at least 17 percent of sunlight into electricity. Their current multi-cells manage 15.5 to 16.4 percent. At the same time, Q-Cells subsidiary Solibro is creating furore in the thin-film field with the development of a module of copper, indium, gallium and selenium (GICS) that features an efficiency factor of 12.3 percent. No other thin-film panel achieves higher efficiency. "We're doing everything we can to advance our technological leadership," states Q-Cells technologist Peter Wawer. Meanwhile, Solarworld, located in Frei-

burg, is establishing a "technology campus unparalleled in Europe". Next to the already completed wafer technical school, a new cell and module research centre is being set up with the intention of developing "tomorrow's technologies" as of 2010.

During their innovation offensive, the companies can draw on solar scientific input from renowned facilities such as the Fraunhofer Institute for Solar Energy Systems (ISE) in Freiburg, or the Centre for Solar Energy and Hydrogen Research (ZSW) in Stuttgart. In the past few years, researchers at these facilities have developed various new cell concepts that are just waiting for industrial implementation. Manufacturers can find state-of-the-art manufacturing equipment to this end more or less directly in front of their factory doors: German suppliers are in demand around the world for their machines, robots and solutions for turnkey solar plants and could help their neighbouring comrades-in-arms to significantly advance their production technology with their offerings.

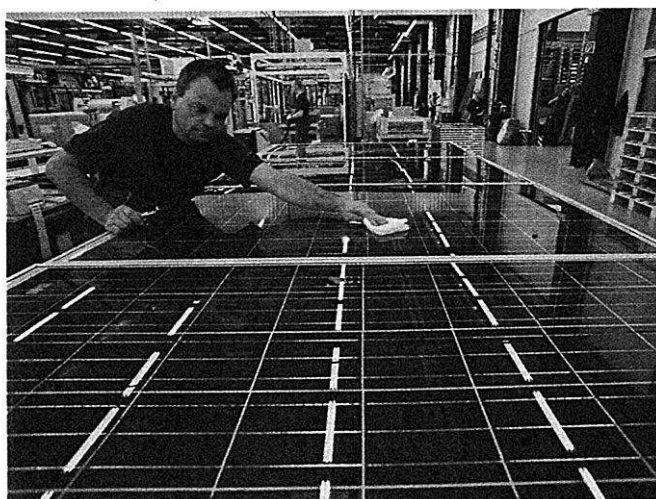
Turnkey supplier Schmid, for example, has developed a print-and-etch technology with which the crystal layer can be manipulated directly on the surface of crystalline silicon cells so that more electricity is generated there. "In this way the efficiency factor can be increased by up to 0.9 percent," states Schmid technologist Helge Haverkamp. In the meantime, Centrotherm could help the German solar industry climb the thin-film Mount Olympus, as the only company worldwide already offering turnkey lines for CIGS

modules. The German PV industry is apparently striving for global technological leadership in this thin-film segment which experts believe to have the highest efficiency potential: In addition to Solibro, various other German companies are now also specialising in these copper-based panels. From 28 September to 1 October 2010, PV manufacturers can gain an impression of the machine and equipment manufacturers' product ranges at "solarpeq – International Trade Fair for Solar Production Equipment". Companies that offer production technology for thin-film or crystalline photovoltaics – whether manufacturers of machines and equipment or suppliers of components and raw materials – will present their goods and services at this venue.

The solar industry's interest in modern equipment "made in Germany" may well already have increased in the short term: Manufacturers have recognised that they must promote innovation with total commitment in order to quickly reduce their costs. Otherwise they will not be able to withstand the competition from the USA and Asia. ■

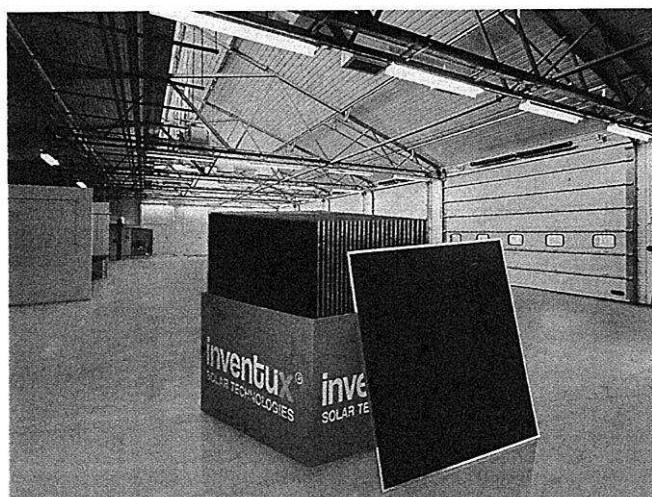
CONTACT www.solarpeq.com

solarpeq, the new trade fair for solar production equipment will take place from 28th of September to 1st of October in Düsseldorf. The event is held concurrently with the world's leading fair glasstec and provides an international forum for all those interested in selling or buying machinery for producing and processing silicon, wafers, solar cells and modules.



Brightly polished: German manufacturers score highly on the global market due to the high quality of their modules.

Photo: BMU/transit/Busse



Empty warehouse: Many German manufacturers were out of stock at the end of 2009 due to high demand.

Photo: Inventux