Audiences at the 7th Solar Grade Silicon Conference in Munich, Germany, in early March were not as large as in the previous year. The market situation has clearly eased off.

Photos (2): Johannes Bernreuter

Unperturbed expansion

Is the silicon industry changing direction from a highly profitable situation of short supply to one of oversupply with very low prices? Opinions on the matter were divided at the 7th Solar Grade Silicon Conference in Munich.

All agreed on one issue at least: the times of great shortage of solar grade silicon are over, at least for now. Prices on the spot market, where quantities are sold at short notice, are a clear sign of the current situation. They sank drastically from sometimes over 500 US$/kg in spring 2008 to currently 100 US$/kg. Also, the fact that the rush of participants to the conference organised by the photovoltaics magazine Photon has not been as frantic as in other years is a sign of more relaxed times. There were 729 participants at the seventh conference in Munich in early March. In the previous year, attendance exceeded 1,000.

Over 100,000 tons in 2009

The arrival of a few successful newcomers, as well as massive expansion amongst established manufactur-

ers have increased production of pure polysilicon for the semiconductor and solar industries. Michael Rogol, Managing Director of Photon Consulting, predicted 110,000 to 122,000 tons for 2009. Silicon expert Richard Winegarner, President of the consultancy company Sage Concepts, suggested a similar figure of 100,000 tons at the conference. They were less unanimous in their forecasts for production volumes in 2012: whilst Rogol expected 389,000 tons as he saw the situation, Winegarner considered a figure of 240,000 to 250,000 tons to be more realistic.

Is the trend now shifting in the direction of oversupply? No, said Rogol, otherwise the silicon spot price would be approaching the marginal costs of production, i.e. approximately 40 US$/kg. Photon Consulting believed the opposite would happen. In the course of 2009 the price will rise again to between 125 and 250 US$/kg, said employee Joonki Song. Host and editor in chief of Photon, Anne Kreutzmann, had the participants openly vote on the estimates. The vast majority disagreed and voted in favour of the forecast that the spot price would continue to sink this year.

When Kreutzmann asked the members of the panel discussion on the subject of the spot price in a year's time, the forecasts varied between 30 and 100 US$/kg, with two exceptions: Gaëtan Borgers, Global Solar Industry Director at Dow Corning, predicted 200 US$/kg, and Rogol suggested approximately 275 US$/kg. The panel found it easier to agree on prices for long-term contracts in a year's time: estimates ranged from 50 to just over 60 US$/kg. According to Rogol, it is currently between 50 and 70 US$/kg.

Uncertainty over demand

Whether an oversupply will occur, of course depends on how demand develops. On this matter, Rogol encountered strong opposition with the most contended of his lofty forecasts. He predicted a change in trends in 2013 at the earliest, when political support in one of the main markets would begin to decline, due to the enormous increase in solar power systems, if not in Germany, then in California or Japan. However, Rogol predicted new installations across the globe amounting to 9 GW for this year, even if there is a heavy drop in project financing. Roof-mounted systems in Germany would make up 4 GW of this figure. It is even possible that the figure be as high as 13 GW, he added. Peter Woditsch, CEO of wafer manufacturer Deutsche Solar AG, argued that the figure of 9 GW would mean a three-fold increase on last year, considering the cap in Spain reduces the value for 2008 from 5 to 3 GW in fact.

As often as Rogol stressed his estimates were based on "hundreds of data points", experienced stakeholders in the photovoltaic industry commented on his forecasts in the breaks with incomprehension and ridicule. It was even conjectured that Photon Consulting might suggest such high figures in the interests of its clients. Götz Fischbeck, analyst from

Oversupply or not? Panel discussions were held by (from right): Gaëtan Borgers (Dow Corning), Peter Fath (Centrotherm Photovoltaics), Goran Bye (co-chair, formerly REC Silicon), Anne Kreutzmann (chair, Photon), Peter Woditsch (Deutsche Solar) and Donato Di Noia (M. Setek); not in the picture, Richard Winegarner (Sage Concepts) and Michael Rogol (Photon Consulting).

BHF Bank, who is making a name for himself in the scene with numerous comments at every large photovoltaic conference, posed the question of whether there might be a conflict of interests.

Richard Winegarner represented the other end of the spectrum. Besides the slump in the semiconductor industry, he predicted the growth rate in the photovoltaic sector would sink from 49 to 33 %. Therefore, the global demand for pure silicon will reach a level of 100,000 tons in 2012, whilst there will be a supply of 240,000 to 250,000 tons. That would mean an oversupply for almost five years. Winegarner predicted the price for long-term contracts would sink from 80 US$/kg last year to 30 US$/kg in 2012. For this reason, the expert warned all the new silicon producers: "The big question is: will your company have enough cash to stay alive until prosperity returns?"

Winegarner pointed out that the silicon industry has already experienced three oversupply phases since 1979, each lasting between five and eight years. Hubert Aulich, Executive Director of German Operations for the wafer manufacturer PV Crystalox Solar plc, argued that these phases were due to saturation in the semiconductor markets, whilst the photovoltaic industry still has a long period of growth potential ahead. Peter Fath, CTO of equipment manufacturer Centrotherm Photovoltaics AG, was also less pessimistic in the panel discussion: "There will be a minimum of oversupply."

Rough winds for UMG silicon

Anyway, silicon producers remain unperturbed in expanding their capacities, none more so than the market leader Hemlock Semiconductor Corporation, which announced an expansion to 70,000 tons by 2015 last December. There was no shortage of big numbers at the conference in Munich either. The Chinese newcomer Daqo New Energy Co., Ltd. hopes to reach a capacity of 15,300 tons by 2012, competitor GCL Silicon claimed 24,000 tons as early as 2010 and the Japanese new entrant M.Setek Co., Ltd. plans for as much as 33,000 tons by 2012 (though only for its inhouse wafer production).

Even manufacturers of upgraded metallurgical grade silicon (UMG) are elbowing into the market. Most have significantly lower investment costs and shorter construction periods compared to traditional silicon plants, which first turn metallurgical grade silicon via chemical reactions into the gases trichlorosilane or monosilane, which are then distilled and pure silicon is extracted. 6N Silicon Inc., a new UMG supplier from Canada, needed less than six months, for example, to build a 2,000 tons plant. Until now, few manufacturers have been able to produce solar cells out of 100 % UMG material without reductions in efficiency. Accordingly, UMG silicon producers have to live with markdowns – at the same time, their production costs are currently not much lower than those of a fully depreciated polysilicon factory, as a voice from the audience pointed out.

Whilst prices for polysilicon were very high, buying cheaper UMG silicon as an admixture was an attractive option for customers. "One year ago, our business model was: we wait for the phone to ring", said René Boisvert, CEO of the Canadian manufacturer Bécancour Silicon Inc., a subsidiary of the metallurgical group Timminco Limited. "The environment is much more difficult right now." Whether UMG silicon will become "the material of choice" for the long term, as Boisvert believes, remains to be seen in this environment of increasing competition.

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Further information:
Photon Consulting: www.photonconsulting.com
Sage Concepts: www.sageconceptsonline.com
Dow Corning: www.dowcorning.com
Deutsche Solar: www.deutschesolar.de
PV Crystalox: www.pvcrystalox.com
Centrotherm Photovoltaics: www.centrotherm-pv.de
Hemlock Semiconductor: www.hscpoly.com
Daqo New Energy: www.daqo.com.cn
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M.Setek: www.msetek.com/en
6N Silicon: www.6nsilicon.com
Timminco: www.timminco.com