

CONFERENCE HIGHLIGHTS

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One of the highlights of this 20th European Photovoltaic Solar Energy Conference and Exhibition was certainly the excellent exhibition, both in size and location. But the technical programme, with its more than 250 oral presentations and almost 750 posters, was the other.

Research, technology and applications of photovoltaic solar energy were presented by the many authors with high quality and professionalism. The fast growth of photovoltaic production as well as the generally improving market conditions give rise to a dynamic technology and application development, with results often not yet reported so far. Therefore, a conference summary can only opt to describe the general trends in photovoltaics, discussed in this conference around two major issues, being the availability of sufficient Si feedstock on one hand and the estimation of future growth in Germany. There were another four important side-events ranging from future PV-concepts and policy scenarios, to architecture and PV applications in developing countries.

Silicon Feedstock Shortage

Currently PV production is with about 50% per year growing faster than anticipated, giving rise to a temporary shortage in silicon feedstock. Whilst this situation is not the first time to occur, the conference reported on a number of efforts to overcome the situation in the short, mid and long term. On solar grade capacities presentations indicated that at least to suppliers invested in new solar grade Si capacities, bringing additional material on the market by 2006/07. Whether the quantities envisaged will be sufficient to resolve the bottleneck of requiring more than 12000 metric tons of Si for producing more than 1000 MW of crystalline PV modules remains to be seen at the next European PV conference in 2006.

But many more presentations approached the problem from the other side: Using Si more efficiently, and consequently this conference featured many presentations on making cells thinner (<200 micron), more efficient (> 20%), but also on increasing production yields and successful results on former approaches like ribbon growths, zone melting of Si-Powders or for instance the SLIVER concept.

Clearly, thin-film solar cell development gained also momentum, and the conference announcement of Würth Solar, to build a 15 MW annual capacity CIS manufacturing plant (CISfab) was one of the indicators. But also the increasing capacities in amorphous Silicon were presented by UNAXIS (CH) and Kaneka (JP). Many other thin-film approaches, such as CdTe and crystalline thin-film Si reach commercialisation or at least 1 MW-size pilot production.

Another trend to resolve the Si shortage issue was observable by the rising number of presentations on concentrating systems. Not only increased the reports on larger pilot installations, but also on concentrating solar cells, which mark efficiency records on concentrating levels of above 200. A full workshop (around the European project FULLSPECTRUM) reported the new approaches. More experience has been demonstrated on the cost structures of such systems, and on anticipated learning curves towards further cost reduction. One may conclude from this conference, that concentrators are becoming again a serious option to provide peak capacity in very sunny regions at bulk power prices.

In short, research and development demonstrated that there are sufficient concepts almost ready to resolve mid-to long term feedstock supply bottlenecks, by

- 1) Increasing Solar-grade Si production
- 2) Achieving better material yields in crystalline Silicon technology
- 3) Accelerating commercialisation of thin-film photovoltaic cells
- 4) Improving costs and reliability of concentrators

Market situation

As Germany is one of the market drivers for the continuous PV growth, the announcement of anticipated elections in Germany gave rise to speculations regarding continuing support to the introduction of PV (by the German feed-in law), in case of a change of government. Presentations in the regarding topics, however concluded that the industry is firmly in place, and as it serves both economic growth and employment, no future government would easily be available to announce major changes in policy. Apart from the specific, German situation, in this conference there have been many other market developments observable indicating more drivers for the sustained growth rate of worldwide PV.

On a European level, the European directive of 2001 to develop electricity generation by renewable resources has its effects in the development of PV as well. Many of the member states implemented a feed-in tariff system similar to the German model, or are considering to introduce it soon. Major growth rates are expected in Spain, Greece and Italy. This has been broadly discussed within the "Policy Scenarios" workshop, and the progress review on above directive scheduled end of 2005 is very much awaited for.

Around the world, China's spring decision on Renewables will certainly increase PV production further, in particular in China itself. From the conference presentations and the exhibition, one can conclude that production will surpass in 2005 the 100 MW/yr level, and growth rates of more than 60% can be anticipated.

Another increasing PV market are the US, and in particular California and the New England states. These emerging markets promise the continuous growth on PV also in future, and it is this confidence which sets both industry and finance markets in a firm place.

There were a number of remarkable side-events during this conference. The special session "PV Integration in Architecture" highlighted some new approaches which give highest visibility to PV as a part of design and function of buildings. The session had many participants, and it seemed that the aspects of aesthetics integration gains momentum gain.

The special session "Power for the world- A contribution to meet the needs of development in the rural and suburban areas" featured numerous experts which reported on their experiences in implementing projects for bringing solar electricity to the poorer of this world. This concerned not only efforts in local capacity-building but also new concepts for access to financing (private equity funds). A highlight was the award of the "Bob Hill Price" to Anit Cabraal of the World Bank group, for his pioneering work on an international level. Also, the Vice-president of the Madascar Parliament presented his country's entry into a renewable energies programme for rural development.

The conference started as it is tradition on Monday morning with the plenary session on latest concepts towards new generations of solar cells featured a fully occupied auditorium, it did not come as a surprise that the special session on "New Solar Cell Concepts" was also very well attended. Organised within the EU-funded "FULSPECTRUM" project the session presented not only early achievements of this joint effort but entered also into quite a debate on concepts for highest possible efficiencies and concentrator cells. With great participation from the audience the future directions in the development of solar cells based on organic semiconductors have been discussed as well, giving also evidence for the remarkable R&D potential photovoltaic solar energy conversion has still ahead.

The European Photovoltaic Solar Energy Conference and Exhibition had in Barcelona its 20th anniversary – and the location was a nice surrounding. The great participation in the presentations and the exhibition was celebration enough. Having served this series of conferences since exactly 10 years as Technical Programme Organiser, the Joint Research Centre of the European Commission feels honoured by the confidence of all participants into this series of PV conferences and thanks the team of WIP Munich for providing for a perfect organisation of the event.