

Day One: Tuesday 10 March 2020

0800-0900 Registration & morning refreshments

0900-0915 Conference welcome

0915-1000 PV manufacturing in 2020: technology, profitability & investment returns

- **Finlay Colville**, Head of Research, **PV-Tech & Solar Media Ltd.**; *The new landscape for solar cell manufacturing in 2020 & trends impacting market-leaders*
- **Other guest speaker to be announced**

The opening session at PV CellTech 2020 features two of the leading and best-known analysts covering the PV sector today. This session will firmly establish the technical and financial frameworks that PV manufacturers operate within today, and how this is assessed, benchmarked and evaluated. The talks will look at historic trends and leading indicators for success in PV manufacturing for the 2020-2021 period.

1000-1100 Morning session 1: China multi-GW pure-play cell producers with 10-GW-plus output

- **Andy Chin**, R&D Manager, **Tongwei Solar**
- **Other speakers to be announced**

A new sub-set of cell-production dominant producers in China has now emerged (including Tongwei, Aiko, Runergy, Lu'an, Sumin, Uniex and Solarspace) with as much as 80GW of effective cell capacity by the end of 2020, mostly based on 5-10GW cell fab designs implemented in the past few years. During 2020, about 30-40% of all c-Si modules supplied globally are likely to use cells produced by one of these Chinese companies listed above. The trend to 10-20GW scale cell makers in China is now one of the major shifts within cell manufacturing globally, and is likely to have strong implications in terms of best-in-class cost structures and technology roadmap implementation.

1100-1130 Morning refreshments & networking

1130-1300 Morning session 2: Roadmaps for c-Si cell production at the multi-GW level

- **Qi Wang**, Chief Scientist, **JinkoSolar**
- **Hongbin Fan**, Director of Technical Marketing, **LONGi Solar**
- **Jörg Müller**, Vice President R&D Cells, **Q CELLS**
- **Sebastian Gatz**, Director Business Development Crystalline PV, **VON ARDENNE**

Vertically-integrated ingot-to-module and cell/module manufacturers have been adjusting in-house cell capacity levels and technologies over the past 12 months, with almost all of the companies above maintaining this realignment phase to the market during 2020. It is now being seen as critical for GW-based global PV module suppliers to have in-house cell production knowledge at the multi-GW level, and most of this assigned today for p-mono PERC operation. This session will hear from many of the leading cell/module producers/suppliers listed above, focusing on company-specific technology roadmaps and the importance to each of having strong in-house cell output capability. CTO from leading cell makers, such as JinkoSolar, JA Solar, Canadian Solar, Hanwha Q CELLS, Trina Solar and LONGi Solar will be speaking during this session.

1300-1400 Lunch break & networking

1400-1530 Afternoon session 1: Heterojunction 2020 status: R&D, tooling & production status

- **Akira Terakawa**, R&D Project Leader, **Panasonic Corporation**
- **Gunter Erfurt**, CTO, **Meyer Burger**
- **Anis Jouini**, CEO, **CEA-INES**
- **Other speaker to be announced**
- **Panel Discussion: Scaling HJT to the 5-10GW level: who will be first?**

Heterojunction is still widely regarded by many companies within the sector today as the natural successor to p-mono PERC, with strong investments seen across Asia and within China, not to mention the early movements from previous a-Si proponents Hevel and ENEL. New capacity continues to be ramped, with REC's recent activities within the company's Singapore facilities being seen as a differentiated-technology play. A number of Chinese p-type cell makers have also announced multi-GW expansion plans for heterojunction, including Tongwei and Risen Energy. PV CellTech 2020 will examine the status of these companies' initial HJT growth phases, and which companies are close to matching Panasonic/Sanyo performance with 2020 cell cost demands for profitability, such as Gold Stone (GS Solar).

1530-1600 *Afternoon refreshments & networking*

1600-1730 Afternoon session 2: Examining the status & performance metrics for cast-mono

- **Guoqiang Xing**, CTO, **Canadian Solar**
- **Yuepeng Wan**, CTO, **GCL-Poly Energy**
- **Other speakers to be announced**

Cast-mono continues to see strong focus in China across ingot/wafer and cell producers with some 50-GW-plus of available casting furnaces ready to be deployed for this technology. Current leaders driving this are Canadian Solar and GCL-Poly, with impressive results suggesting that cast-mono could have a considerable market-share in the coming years. This session will address the current performance levels of cast-mono wafers, cell efficiencies and importantly cost-breakdowns.

1900-2200 *PV CellTech 2020 conference 5-year anniversary dinner reception (ticket-entry only)*

Day Two: Wednesday 11 March 2020

0830-0900 Refreshments

0900-1030 Morning session 1: Technology-transfer for cell efficiencies >25% in mass production

- **Ralf Preu**, Director Division Photovoltaics, **Fraunhofer Institute for Solar Energy Systems**
- **Roland Utama**, Business Development, **Solar Energy Research Institute of Singapore (SERIS)**
- **Brett Hallam**, Research Director - ARENA Crystalline Silicon Photovoltaics Projects, **University of New South Wales (UNSW)**
- **Panel Discussion: Prospects for >25% cell efficiencies in mass production**

Research institutes remain fundamental in moving the industry to the next level after p-mono PERC. This session will include the major R&D institutes currently engaged with technology-transfer across leading and emerging cell powerhouses across Asia.

1030-1100 Morning refreshments & networking

1100-1200 Morning session 2: PV CellTech special: new thin-film production for the 2020-2030 decade

- **Michael Harr**, CEO, **CTF Solar (CNBM)**
- **Other speakers to be announced**

After four years of PV CellTech explaining commercial mass-production cell production trends for c-Si technologies, a one-off special will be included this year to answer the question: what is happening with thin-film investments in China across CIGS and CdTe? In recent years, Chinese conglomerate entities such as CNBM, Shanghai Electric and Hanergy have been touting GW-scale CIGS and CdTe new factory builds in China. What is happening? Who is producing what? Will the products ever leave mainland China in high-volume?

1200-1300 Morning session 3: n-PERT with passivated contacts: the real challenger to p-mono PERC?

- **Wei Shan**, CTO, **JA Solar**
- **Zhifeng Liu**, CTO, **Jolywood Solar Technology**
- **Other speakers to be announced**

Having been somewhat sidelined in the PV industry – mainly due to the excitement surrounding n-type HJT – new investments are coming from the more traditional n-type processing cell type. Previously a niche technology offered by cell producers such as LG Electronics and Yingli, n-PERT variants are seeing GW-scale Chinese investments. Companies such as Jolywood and Linyang were early movers in this space, but now established global manufacturers, such as Jinko, Trina and LONGi, appear to be backing n-PERT over HJT as their competitive placeholder to p-mono PERC.

1300-1345 Lunch break & networking forum

1345-1430 Afternoon session 1: The new southeast Asia GW-scale OEM cell investment cycle

- **Chung-Han Wu, CTO, Boviet Solar**
- **Other speaker to be announced**

Outside mainland China, Southeast Asia remains the go-to region for new cell fabs in 2020. In addition to the global cell/module leaders that are firmly entrenched in Malaysia and Thailand, Vietnam is going through a new cycle of cell fab additions, following the lead from Vina and Boviet in recent years. What is driving this? Are the new fabs just more OEM tolling based options for Chinese module suppliers?

1430-1530 Afternoon session 2: New equipment & materials for high-throughput, fully-automated 10GW cell fabs with 3c/W processing costs

- **Guangyao Jin, Chief Scientist, DuPont Photovoltaic & Advanced Materials**
- **Moritz Meixner, Managing Director, h.a.l.m. elektronik**
- **Other speaker to be announced**

The advent of the 100GW cell manufacturing landscape has ushered in radical changes and improvements in cell lines and factories, especially in China. When the industry was multi-dominated, cell makers were prone to stay loyal to manual labour and keeping very old lines/equipment running. All this has changed in the past 2-3 years, with new equipment/materials and test/inspection/automation now key to growing cell production at the 10GW-plus level. This session will seek to explain what a state-of-the-art 5GW cell fab looks like today and where room for improvement still exists going forward. The role of Chinese, European, Japanese & Korean tool makers will be explored also.

1530-1600 *Afternoon refreshments & networking*

1600-1700 CTO forum panel discussion special: Are cell makers in control of wafer supply today?

- **Panellists to be announced shortly**

Wafer supply is evolving at a rapid pace, sometimes driven by cell producers' demands, but more often by the tactics and strategies of the suppliers. This panel session will discuss the significance of this, how much this helps/hinders common roadmap alignment. Topics will include n-type wafer availability, p-type supply for PERC, wafer dimensions/thickness & wafer ASP/cost outlooks. What will the dimensions of mainstream wafers be by 2021; are 8-inch wafers going to happen soon?

1700-1730 PV CellTech closing session special: the new ITRPV roadmap for 2020

- **Markus Fischer, Co-Chair, ITRPV Steering Committee; ITRPV 11th Edition 2020**

The closing talk at PV CellTech has been allocated to Markus Fischer for the past four years, with Markus using PV CellTech as the industry platform to reveal the findings of the annual ITRPV roadmap for the first time in the year. The slot has turned out to be of great value to the event, in particular as it follows talks from the industry's leading companies driving their own in-house technology roadmaps. The 2020 talk from Markus is eagerly anticipated, especially concerning trends related to wafer size trends and perovskite/tandem adoption rates.

1700-1900 *Evening drinks reception sponsored by Meyer Burger (drinks start during final talk)*