

## **Imec, RENA and SoLayTec improve ALD passivation in industrial PERC Si solar cells achieving 20.1% efficiency**

Leuven (Belgium) – September 27, 2013 - At next week's European Photovoltaic Solar Energy Conference and Exhibition (EUPVSEC, Paris), the Belgian nanoelectronics research center imec, RENA, a leading supplier for wet chemical production tools, and SoLayTec, a supplier of Al<sub>2</sub>O<sub>3</sub> deposition tools, present thin (160µm), large area (156x156mm<sup>2</sup>) industrial PERC-type silicon solar cells achieving a best cell efficiency of 20.1% using atomic layer deposition (ALD) Al<sub>2</sub>O<sub>3</sub> passivation and standard screen printed contacts.

The i-PERC-type silicon solar cells have been manufactured on imec's silicon solar cell pre-pilot line using RENA's InPilot tool for rear-side polishing and emitter removal, and SoLayTec's spatial ALD tool for Al<sub>2</sub>O<sub>3</sub> deposition. These cells reached a best cell conversion efficiency of 20.1% and open circuit voltages up to 655 mV. When applying Cu-plated contacts at the front instead of silver screen printed contacts, a top efficiency of 20.6% was reached.

"Routinely achieving average conversion efficiencies around 20%, imec's industrial PERC pre-pilot line enables the development and validation of novel solar cell processes and concepts, and serves as an excellent platform for system suppliers to benchmark their new tools," states Dr. Joachim John, Photovoltaic R&D projects responsible at imec. "This supports the acceleration of process implementation in next generation high-throughput solar cell manufacturing."

Roger Gortzen, Manager marketing and sales and co-founder of SoLayTec: "Achieving a factor 3 less TMA precursor usage without effecting the cell efficiency on imec's silicon PV processing facilities proves that our novel ALD Al<sub>2</sub>O<sub>3</sub> passivation process, aiming at lower cost of ownership (< 2€ct/layer) without effecting the cell efficiency, is ready to be implemented in an industrial environment."

Franck Delahaye, Product manager solar at RENA: "Collaborating at imec with partners across the value chain enables us to benchmark our tools on the highest performance levels. This way, we can verify the impact of our single tools on the overall cell performance and make sure to offer solutions with a strong positive leverage on the costs per watt. Further, this deepens our understanding of the respective interaction between the process steps and strengthens our ability to support and lead overall process integration at our customer's facilities." ---end---

Leuven, Belgium, September 27<sup>th</sup>, 2013

This press release can be downloaded at [http://www2.imec.be/be\\_en/press/imec-news/imecALDiPERCrenasolaytec.html](http://www2.imec.be/be_en/press/imec-news/imecALDiPERCrenasolaytec.html)



## imec

Imec performs world-leading research in nanoelectronics. Imec leverages its scientific knowledge with the innovative power of its global partnerships in ICT, healthcare and energy. Imec delivers industry-relevant technology solutions. In a unique high-tech environment, its international top talent is committed to providing the building blocks for a better life in a sustainable society. Imec is headquartered in Leuven, Belgium, and has offices in Belgium, the Netherlands, Taiwan, US, China, India and Japan. Its staff of more than 2,000 people includes more than 650 industrial residents and guest researchers. In 2012, imec's revenue (P&L) totaled 320 million euro. Further information on imec can be found at [www.imec.be](http://www.imec.be).

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SoLayTec

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Leuven, Belgium, September 27<sup>th</sup>, 2013

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#### **SoLayTec**

SoLayTec is a spin-off company from the Dutch research organisation TNO and established in 2010. The company develops, delivers and services machines for atomic layer deposition (ALD) on solar cells worldwide. The SoLayTec ALD machines are intended for research and industrial mass production in the solar market. SoLayTec high volume production equipment will be exclusively sold by RENA GmbH on the market.

For more information, please visit [www.solaytec.com](http://www.solaytec.com) or at our booth at EUPVSEC Paris H2 / B9.

#### **RENA GmbH**

RENA is a leading production equipment and plant supplier for the application fields Clean Water, Green Energy, Health and Electronics. Around 50 % of the solar cells worldwide are produced on RENA wet processing equipment. In close cooperation with chosen partners, RENA further provides turnkey systems and technology transfer for the photovoltaic industry. RENA is also the majority shareholder of SoLayTec.

For more information, please visit [www.rena.com](http://www.rena.com) or at our booth at EUPVSEC Paris H2 / B9.

#### **Contact:**

imec

Hanne Degans

Phone: +32 16 28 17 69

Mobile: +32 486 065 175

[Hanne.Degans@imec.be](mailto:Hanne.Degans@imec.be)

RENA GmbH

Norbert Bürger / Michaela Schätzle

Phone: +49 7723 9313-19

[Norbert.Buerger@rena.com](mailto:Norbert.Buerger@rena.com)

SoLayTec

Roger Görtzen

Phone: +31 40 2380220

Mobile number: +31 6 30615719

[Roger.Gortzen@solaytec.com](mailto:Roger.Gortzen@solaytec.com)

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SoLayTec BV  
Dillenburgstraat 9G  
5652 AM Eindhoven  
The Netherlands  
[www.solaytec.com](http://www.solaytec.com)