Imec, Meco present high efficiency and cost-effective copper technology for i-PERC-type Silicon Solar Cells

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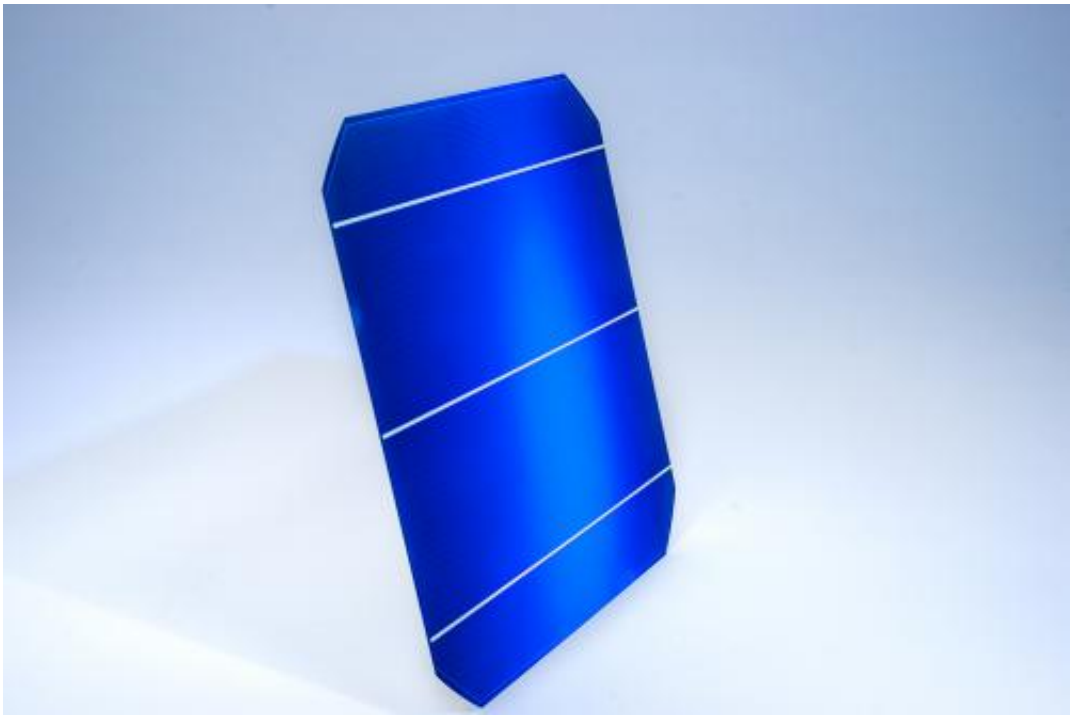

New large area cells (156x156mm2) achieve 20.5% average efficiency using Nickel/Copper plating on p-type Czochralski Silicon (Cz-Si) material.

At this week's European Photovoltaic Solar Energy Conference and Exhibition (EUPVSEC in Paris), imec, a nanoelectronics research center based in Belgium, and Meco, a supplier of plating equipment for semiconductor and solar industry, present large area (156x156 mm^2) i-

PERC-type silicon solar cells with industry-applicable Nickel/Copper (Ni/Cu) plating for the front contacts. Together, the companies achieved an excellent average efficiency of 20.5% on more than 100 cells, and a maximum efficiency of 20.7% (confirmed by ISE callab).

"Not only do these results show a considerable performance improvement compared to state-of-the-art screen-printed PERC cells, but our Cost-of-Ownership analysis also indicates a clear advantage on the financial level," stated Jozef Szlufcik, Department director silicon photovoltaics at imec. "Our results show that Ni/Cu plating is one of the few new technologies that can simultaneously improve the efficiency of PERC solar cells, while reducing processing cost."

The cells were processed on imec's solar cell pilot line using Meco's inline plating tool to deposit the Ni/Cu front contacts. The metallization process of the Ni/Cu stack included Ultraviolet (UV) laser ablation, sequential in-line plating of the metal layers and contact annealing. The resulting i-PERC solar cell achieved an average efficiency of 20.5% on more than 100 cells with a very low standard deviation of only 0.1percent and an average fill factor of 80 percent, validating the high quality of the front contacts.

We now have the advantage of using Meco's industrial plating techniques and tools that were not available to earlier Ni/Cu adopters," stated Richard Russell, Metallization module leader at imec. "This gives us the opportunity to develop a more robust and cheaper process than was previously possible."

"We are elated to have achieved these excellent results in the framework of imec's industrial affiliation program on advanced silicon photovoltaics aiming at a reduction of the cost/Watt-peak (Wp)", stated Martijn Zwegers, Product manager solar at Meco. "Collaborating within imec's industrial ecosystem enables us to accommodate our advanced plating

tools to industrial processing."

Provided by IMEC