Advanced n-Pasha - bifacial passivated contact cells

Publieke samenvatting / Public summary

Aanleiding

Although the mainstream PV technology still relies on wafer-based p-type crystalline silicon at the moment, a gradual but significant shift can be observed towards n-type silicon PV technology. Because of its higher efficiency and lower €/Wp potential many industries are now adopting n-type technology as the next step or are already producing bi-facial n-type cells (Yingli, MSE, PVGS, Motech, Mitsubishi, SSNED, Jinko Solar, LG). These industries ask for ready-to-implement and cost-effective improvements on their current n-type technology

Doelstelling

In the project the partners will research and develop a new, bifacial, n-type cell architecture based on passivated contacts and with a target efficiency of 22.5%. Combining passivated contacts with a bifacial front and rear contacted solar cell is an attractive way to improve the efficiency of existing n-type cells that are now in (pilot) production. Boundary conditions for the processes are low cost, reduction in silver consumption and ready to implement into industry. To assess the latter, the cell concept will be evaluated at two from the top 5 solar cell manufacturers: Yingli and Jinko Solar.

Korte omschrijving

The technical universities TU/e and TUD will focus on the fundamental aspects of surface and contact passivation and optical processes and their interactions on cell and module level. The

Projectinformatie / Project information

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Algemene informatie / General information

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Tempress Systems B.V.

Publicaties en materialen / Publications and attachments

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equipment manufacturers Tempress, Levitech and RRBV will develop and optimize tools for specific processing of selective emitters, poly-Si passivated contacts, passivation and optical dielectric layers. For front and rear metallization, a novel, simultaneous n+ and p+ nickel plating process will be evaluated by ECN and M4SiBV. ECN will design and integrate the new processes into the final cell concept. The cell manufacturers Yingli and Jinko Solar will test new developed processing steps and assess challenges and bottlenecks for the industrialization of the new cell concept, as well as supply the partners with industrial half fabricates to research and develop new processes at the Dutch partners.

Resultaat

The project result will be the architecture and processes the new bifacial n-type solar cell. This cell will feature a diffused, selective emitter combined with passivated contacts at the rear using tunneling oxide and poly silicon n+ layer. The metallization coverage will be reduced to around 5% at both front and rear, which in combination with adjusted poly-Si layer between the contacts, will enable a bifacial cell with rear response around 95% of the front. Due to the lower metal coverage as well as by implementing silver-less (parts of) the metallization, the total costs of the cell concept will be significantly reduced as compared to the current screen printed bifacial n-type cells such as n-Pasha. The total cost of ownership on module level will be reduced from 0.55 €/Wp now to <0.40 €/Wp in 2017.

De data in deze applicatie is afkomstig van de Rijksdienst voor Ondernemend Nederland (RVO) en wordt in samenwerking met de Topsector Energie ontsloten.
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