

tRansparent pAssivating contact Design for Advanced solar cells

Publieke samenvatting / Public summary

Aanleiding

Background Contacts are customarily associated with voltage losses, making their design critically important for the fabrication of high-efficiency c-Si solar cells. Although novel so-called passivating contacts do not induce such voltage losses and have recently enabled solar cells with record-high conversion efficiencies (>25%) they generally do not exhibit a high transparency.

Doelstelling

In this project highly transparent carrier-selective, passivating contacts, based on extrinsically doped metal oxides, poly-SiCx or poly-SiOx will be developed. These materials can be applied at both sides of bifacial solar cells, therewith improving their conversion efficiency and annual energy output so the LCoE of solar electricity is simultaneously reduced.

Korte omschrijving

TU/e and TUD will develop and test transparent passivating contact materials, while the corona charging method from DST will be used for quick testing of the selectivity of these materials. ECN will develop a bifacial solar cell process that optimally exploits the properties of these materials, maximizing the power and energy output. AMOLF will design and test advanced extra transparent metal contacts and light trapping methods for these cells. The deposition processes of the new materials will be tested in the industrial and pilot scale tools of Solmates, Levitech (metal oxides) and ECN (poly-Si).

Projectinformatie / Project information

Projectnummer / Project number
TEUE116905

Subsidiebedrag / Grant amount
€ 998.365,00

Algemene informatie / General information

Penvoerder / Secretariat
Technische Universiteit Eindhoven

Publicaties en materialen / Publications and attachments

- 02.03.2020

Eindrapport TEUE116905

Volg Topsector Energie op X / Follow Topsector Energie on X

@TSEnergie

Besides extensive testing of the materials in half-fabricates, cells and mini-modules, a first practical and economical assessment of the production process of the resulting bifacial cells will be made.

Resultaat

The project will result in novel industrially viable transparent passivating contact materials that enable high-efficiency (>24%) solar cell architectures on both n- and p-type wafers, including upcoming high-efficiency bifacial solar cells. Importantly, the full-area passivating contacts can make high-temperature diffusion and patterning steps redundant, enabling simplified solar cell manufacturing with a small number of processing steps.

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

Voor meer informatie over de Topsector Energie, ga naar www.topsectorenergie.nl.

Voor meer informatie over de TSE / Energie-Innovatie regelingen die RVO aanbiedt, ga naar www.rvo.nl/tse.