

Shadow tolerant customizable thin-film PV panels

Publieke samenvatting / Public summary

Aanleiding

The quality of thin-film modules that are produced in industry is improving and the gap between cell and module efficiency is getting smaller. One of the bottlenecks is the limited conductivity of the front contact, which leads to limited cell size, which in turn reduces the active area. With respect to applications, there is no cost effective way to produce customizable size of panels in the market. Finally, although the thin-film panels are more shadow tolerant as compared to crystalline silicon, the operational robustness can be further improved by implementing multiple bypass diodes per module.

Doelstelling

In this project we propose to combine the knowledge and infrastructure that was developed in previous projects to combine shunt-free interconnection technology for customizable thin film panels with innovative grid application and the introduction of bypass diodes inside the modules. By combining these technologies the shadow tolerance and the efficiency of the modules can be increased simultaneously. The application of grids is expected to result in the possible use of larger cells and hence lesser interconnections per area increasing the geometric fill factor and the output of the modules. The combination of these grids with either wires or electroplated connections to the edge of the module where bypass diodes will be introduced will result in higher (partial) shading tolerance of the produced modules and higher overall energy production. With this the levelized cost of efficiency will decrease and the applicability

Projectinformatie / Project information

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Algemene informatie / General information

Penvoerder / Secretariat

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Publicaties en materialen / Publications and attachments

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in for example BIPV will be increased.

Korte omschrijving

At ECN part of TNO the knowledge that has been developed with partners such as CCM, Meyer Burger and AVANCIS on the application of interconnections after deposition of all functional layers (KIC EIT project EFFIC and TKI project BEAST) will be used. TNO Industry has developed electroplating of grid structures together with Innplate within the TKI project e-mesh. Imec has an excellent position in the screen printing of conductive grids on (crystalline) silicon PV. These metal deposition technologies will be developed for CIGS and further expanded to accommodate needs for conductivity both on top of the individual cells, conductivity in between cells and conductive tracks to connect various panel components.

Resultaat

The combination of the developments in this project will result in a new, customizable panel layout with improved power output and high tolerance to partial shading.

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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