

Photovoltaics for high-performance building integrated electricity production using high-efficiency

Publieke samenvatting / Public summary

Aanleiding

Back contact module technology is the accepted route to higher efficiency PV modules (see e.g. the SEMI PV roadmap). At the same time, back-contact module technology is also perfectly suited for BIPV in which PV elements are integrated into buildings and often have dual functions (serving as electricity generator and construction element) which reduces the balance-of-system costs. For residential rooftop and building integration, the current typical modules are aesthetically unattractive. The much more appealing aesthetics of back-contact modules make them much better suited for BIPV and for residential rooftops. In addition, the PV industry has seen little product diversification to date, and there are commercial opportunities for PV systems other than the current typical flat plate modules mounted on frames or supports.

Doelstelling

The PV4FACADES project aims at the development of low-cost and high-efficiency back-contact cell and module technology and building-integrated PV (BIPV) products based on back contact technology. This will result in higher efficiency PV modules which are perfectly suited for BIPV: much more appealing aesthetics and more suitable electrical, thermal and mechanical characteristics.

Korte omschrijving

Workpackages (WP's) WP1 Development of low-cost

Projectinformatie / Project information

Projectnummer / Project number
TEMW140009

Subsidiebedrag / Grant amount
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Algemene informatie / General information

Penvoerder / Secretariat
Ned. Org. v. toegep.-natuurwetensch.
ond. TNO

Publicaties en materialen / Publications and attachments

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**Eindrapport PV4FACADES 2017
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MWT and IBC cells with efficiency over 22%, suitable and optimised for the module technologies of the later WP's. WP2 Three innovative interconnection techniques will be tested and optimised, leading to a cell to module power loss of 0%, suitable for a module efficiency over 20.5% at lower cost. WP3 Lamination materials and technologies will be developed and optimised, leading to thinner glass, new encapsulants, shorter process time, and lower cost. WP4 Product integration into high-performance building elements is performed by end users Wienerberger and Eternit (roof elements) in collaboration with Soltech. Also, integration of microinverters, for better shadow performance, is developed and tested by Sunlego and Soltech. Market studies and market feedback will be collected, and impact on life cycle analysis will be included. WP5 Analysis and reliability testing is performed by Eliosys, GUNAM, ISFH, imec, and ECN. Performance variations depending on different climates and the built environment, and a test method for partial shading, will be key.

Resultaat

A Low-cost, high-efficiency back-contact cell technologies for industrial take-up. B Back-contact interconnection and lamination technologies, for 156mmx156mm MWT (metal wrap through) and IBC (interdigitated back contact) cells, with improved integrated cell and module architecture and resulting in a lower cell-to-module loss and a lower cost than current industrial back-contact technology. C Back-contact PV technology specifically designed for building integration, with improved aesthetics and resulting in a higher yearly energy yield. D Module technology with thinner glass, improved reliability and lifetime

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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