Transparent and Efficient Solar Windows

Publieke samenvatting / Public summary

Aanleiding

Near Zero Energy Buildings will be required in the near future that generate a substantial part of their electricity demand by renewables. For tall buildings, photovoltaic (PV) systems will not generate sufficient electricity. Opaque or transparent building-integrated PV façades are indispensable, but efficiency of transparent PV is yet too low.

Doelstelling

The goal is to develop transparent solar windows with transparency >60% in the visible part of the solar spectrum with 5% energy conversion efficiency, using the principle of luminescent solar concentrators. This project directly addresses MMIP2a in particular by focusing on flexibility in transparency and color of energy harvesting windows.

Korte omschrijving

The partners in the project will investigate the chemical synthesis of two different nano-sized luminescent species focusing on high photoluminescence quantum yield and zero re-absorption loss. These will be embedded in coatings on glass and combined with solar cell strips on the sides of the glass, thus creating a luminescent solar concentrator. Based on the optical properties of the nanomaterials, extensive computer simulations will guide solar window prototype development and realization. Indoor and outdoor prolonged testing and characterization will validate the goals of 5% device efficiency at >60% transparency. Further, routes will be defined for bringing the TRL level from TRL5 to TRL9, focusing on manufacturability and

Projectinformatie / Project information

Projectnummer / Project number
TKITOE1921203
Subsidiebedrag / Grant amount
€ 286.596,00

Algemene informatie / General information

Penvoerder / Secretariat
UU

Publicaties en materialen / Publications and attachments

- **18.03.2024**

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commercialization.

Resultaat

The project will have developed a prototype demonstrator solar window that has been tested indoors and outdoors and has demonstrated 5% efficiency at >60% transparency having reached TRL5. A clear route for further development is established for visually attractive energy harvesting solar windows.

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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