

organic PhotoVoltaic systems integrated in manufactured building elements

Publieke samenvatting / Public summary

Aanleiding

Heliatek's organic photovoltaic (OPV) cells currently yield record lab efficiencies of 12%. First modules produced on a recently installed roll-to-roll production line yield module efficiencies of 6%. This cell-to-module efficiency gap will be minimized by application of advanced processing methods.

Doelstelling

The objective is to increase module efficiencies to >9% within the next two years. Preliminary cost calculations indicate economic viability of OPV based building integrated photovoltaic (BIPV) applications once modules efficiencies reach 8%. Extrapolated light soak lifetimes (T80) on cell level already yield values in excess of 20 years. The main challenge for OPV is now to prove the technology in real life applications exploiting the unique selling points of this emerging PV-technology.

Korte omschrijving

The PV me project will deliver two types of power producing building elements. For the first building element (BE), based on steel substrates, ThyssenKrupp steel Europe will integrate the OPV modules into their steel substrates before they are formed into façade elements (curtain walls) by Hoesch Bausysteme. These elements will be completed with a protective coating of Akzo Nobel. The second type of BE is glass based, on which AGC will laminate flexible Heliatek OPV modules. Further integration into a glass based BE will be done by SAPA. The organic solar film of the building

Projectinformatie / Project information

Projectnummer / Project number
TEZ0214011

Subsidiebedrag / Grant amount
€ 522.497,00

Algemene informatie / General information

Penvoerder / Secretariat
TNO Earth, Life and Social Sciences

Volg Topsector Energie op X / Follow Topsector Energie on X

@TSEnergie

elements emphasizes the aesthetics of the product without compromising other functions of the construction elements such as thermal insulation and water barrier. Power converters of Heliox and all other electronic components will be integrated in the BE frame to facilitate quick installation and to ensure robust electrical contacts. The BE's will be installed on a public location for demonstration purposes as well as at a test facility to be monitored by Laborelec. The knowledge institutes contribute to process development, system design, correlation of indoor and outdoor data and determination of yields.

Resultaat

The estimated suitable area for BIPV façade elements is over 600 km² in the participating countries of this proposal. However, today the global market for BIPV is still small: growing from 200 MW in 2009 to an estimated 2.5 GW in 2016. This latter study estimates the growth rate to be 31 % for the EU region. OPV may take a significant share of the BIPV market, as this technology is particularly suitable for integration because of tunable transparency, freedom of dimension, conformal shapes and a large variety of colors against acceptable cost in €/m². 'PV me' aims to demonstrate the potential of these BE's to unlock this market. The project will run for 30 months, including 6 months of monitoring, with the following main objectives: A A building with both glass and steel based building elements, containing fully integrated, aesthetically pleasing, state-of-the-art, opaque OPV modules, including micro-converters. B Determine annual yield and stability of grid connected organic BIPV. C Correlate outdoor measurements with accelerated lifetime tests under indoor conditions. D Determine a detailed economic perspective.

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