

Windows to the Future

Publieke samenvatting / Public summary

Aanleiding

Rising temperatures result in an increased demand for air-conditioning, even in The Netherlands. One option for keeping the sun (heat and glare) out of buildings is to apply sun shading measures. The major disadvantages of these are the limited control on the amount of solar radiation entering the room, and the loss of contact of the user with the outside world that can lead to a feeling of “containment”. A possible solution is to use electrochromic (EC) glass, where the optical properties of the glass (tinting) change upon the application of an electric potential in order to realise HVAC energy savings and improve user comfort. This would accommodate permanent contact with the outside world, as well as precise control of solar heat gain and glare in a space. There are two drawbacks which hamper large scale market introduction of EC glass: first the price, resulting from the manufacturing process (sputtering), which is currently between 500-1000 €/m², and secondly the blue colour when tinted, which is perceived unfavourably by many users. Brite has developed its own EC glass production process by means of low cost ink-jet printing, which allows a major price reduction to 100 €/m².

Doelstelling

The main aims are a) to achieve the upscaling of the inkjet printing production process for the manufacturing of EC glass from 50 x 50 cm to 1.2 x 1 m on an industrial pilot production line with a capacity of 100,000 m²/year, b) to demonstrate this EC glass in a typical building environment, and to collect valuable information about the possible energy savings and the user experience it can offer

Projectinformatie / Project information

Projectnummer / Project number

TEUE219006

Subsidiebedrag / Grant amount

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Algemene informatie / General information

Penvoerder / Secretariat

Brite Solar Technologies B.V.

Publicaties en materialen / Publications and attachments

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in everyday practice, and c) to explore the viability of the business case for the end users.

Korte omschrijving

To achieve the project goals, Brite will tune its production process and materials properties in order to ensure industrial-scale production at the required levels of product quality (e.g. uniform colouration when in operation). Si-X will design the insulating glass unit in which the EC glass plates will be installed and will integrate it at the demonstration site. TU Delft will be responsible for the performance measurements. These include measurements of irradiance, glare, energy use for heating/cooling, room temperature, and outdoor weather conditions. The user experience will be determined (TU Delft) by logging user control actions and via questionnaires regarding people's perception of the room temperature and amount of light, colouring of the room, glare, and the use of the EC windows. The project partners will set up the business case, not only based on the measured energy savings, but also by looking into alternative business models such as leasing structures.

Resultaat

The results of the project Windows to the Future can be summarised as follows:

- A set of process parameters for the manufacturing of Brite Solar's low-cost EC glass on an industrial scale by means of inkjet printing;
- A set of guidelines on how to integrate the product in a complete glazing system for use in a typical building;
- Quantification of energy savings achieved under the Dutch conditions via the long-term demonstration of the product in a typical office building environment;
- Insights into user experience;
- A complete business case for use of the product under the Dutch conditions, with insights extending also to other geographical locations; this will include an overview of potentials for new business models, such as product-as-service systems and façade leasing.

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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