

LETITIA (Light and Elevated Temperature Induced Degradation Repair Approach)

Publieke samenvatting / Public summary

Aanleiding

Recently, it has been proven that solar panels are subject to degradation due to the combined effect of light and temperature (LeTID). This degradation mechanism is much more pronounced for high efficiency solar panels that are becoming the mainstream for solar installations in the Netherlands and the degradation kinetic is affected by the specific environment in which the modules are installed (i.e. temperature and irradiances). Newly developed p-type PERC solar module are strongly affected. Performance degradation can be up to 10% during the lifetime of the panel, impacting the financial and energy return of these solar projects. It is essential for solar energy to be acceptable as a reliable energy resource that such degradation is strongly reduced before the start of the PV system installation. In this project, Letitia, the main goal is the final optimization of the technology developed to mitigate such degradation in p-type PERC cells and modules. The technology is available, but the final process optimization is needed for the specific application in the Netherlands and more broadly on North-West Europe.

Doelstelling

Aim of the project is the final optimization of the process to make p-type PERC solar panels free of degradation and specifically tuned for the Dutch climate conditions. This degradation repair process will be applied to SAS solar cells and Elton products and factories. This will lead to an overall increase in energy yield of Elton solar panels by 3% without

Projectinformatie / Project information

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HER20-00199097

Subsidiebedrag / Grant amount
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Algemene informatie / General information

Penvoerder / Secretariat
Nederlandse Organisatie voor toegepast-natuurwetenschappelijk onderzoek TNO

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significant additional process costs. In addition, the outcome will be knowledge build-up and a method for the optimization of the repair process for the Dutch market. This enable to apply the innovation to other commercial realities in the Netherlands and for specific module for the Dutch market from the cell production of SAS after the project. This will lead to a 3% higher energy yield for solar projects developed with SDE+ financing.

Korte omschrijving

Put together protocols and specifications to benchmark and analyze degradation in the Elton's factory, in other cells made available in the Netherlands and in the field (WP1) based on specific regional climate. Enable industrial upscaling of the degradation repair process specific for the Dutch climate. The tool is already available at UNSW and will be made available for the consortium. The activity in the project consists in optimizing the mitigation process based on a variety of these cells. Using this process, several small-scale tests will be performed to determine the effectiveness of the upscaled process and enable the best optimization between process costs and mitigation achieved (WP2). The optimized and upscaled repair process will then be tested at a bigger scale at Elton and SAS to make available enough sample materials to perform a larger scale outdoor test of minimum but meaningful size. These PV modules will be made by Elton and installed by Elton in a sufficiently large-scale field test (Elton's commercial roof top) and they will be monitored for degradation during the remained time of the project (WP3).

Resultaat

The result of the project is threefold. The result is an i) optimized production repair process to produce degradation free solar panels that can be implemented by Elton in commercial production of modules and SAS in commercial production of cells, specific for year average operation temperature and irradiance. The impact of these two results will increase the energy yield of the solar panels produced with this technology. Also, the project will provide ii) sound data from the field test proofing

the effectiveness and reliability of the optimized process. The optimized process to avoid degradation will be implemented in the Dutch solar panel factory of Elton and cell supplier SAS.

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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