Accelerated Lifetime Tests of Solution for Production of Photovoltaic Solar Cells Modules at a Reduced Cost

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Background
The purpose of this innovation is to decrease manufacturing cost, reduce lead usage and increase productivity in PV module production.

- Project funded by the Swedish Energy Agency and Energiforsk
- Duration 3 years, 2014 - March 2017

Comparison

Bus bar free cells = -15% total cost

Less factory space at higher output.

Tape solution.
~ 3600 cells / h.
Placing cells
Placing prepared EVA.
Placing prepared EVA.

Standard solution.
~ 2400 cells / h.
Soldering of cells CTS.
Lay-up station.

Solder all components at once instead of one at a time. - similar to PCB.

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Abstract
The purpose is to reduce the production cost for conventional photovoltaic modules. This is achieved by reducing the amount of silver used in the grid on the photovoltaic cell. An innovative bus bar application process is proposed, which reduces the amount of silver by 50%. All 60 cells of a PV module are connected in a single, automated step. Finally, soldering is completed without the use of lead. The solution furthermore enables the use of more than 3 bus ribbons without the need of adding additional silver to the grid.

Process control
Temperature and pressure are important parameters in the lamination process.

Ongoing long term stability tests
on mini modules, 3 x 4 cells and 3 x 2 cells

No silver bus bars = 50% less silver content

Higher production capacity

No Lead

Low process temperature

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