Pressinformation

BINE Informationsdienst

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Producing solar cells more quickly with lasers

New process for cost-effective and efficient screen-printed solar cells

Before a solar cell can be delivered, it undergoes extensive machining processes. For example, small numbers of foreign atoms have to be specifically introduced at the right places in order to enable an electric current to flow. The BINE-Projektinfo brochure "Processing solar cells with lasers" (08/2015) presents a new manufacturing process for silicon solar cells in which a laser applies 100,000 point contacts on the rear side of screen-printed solar cells in a single operation. Previous methods required not only several steps to achieve this but also environmentally harmful chemicals.

The laser is used to produce the necessary contacts on the rear side of silicon solar cells. Here there is a passivation layer. This needs to remain as intact as possible during the processing to ensure the electrical and optical performance of the cells.

The laser method makes it possible to sparingly perforate every square centimetre of this layer with 400 point contacts in order to connect the active layers of the cells with one another. This is done very precisely and in seconds. The cells produced in this manner have an efficiency of more than 20%. The method has been successfully integrated into the series production of a manufacturer.

The Fraunhofer Institute for Solar Energy Systems (FhG-ISE) has developed the new laser method in cooperation with partners. In 2014, three employees at the Institute were awarded first prize at the international "Innovation Award Laser Technology" competition for this development. In a further project, scientists have also used a laser-based texturing technique that has managed to achieve the record efficiency of 21.7% for industrially produced PERC cells.

The BINE-Projektinfo brochure, which can be obtained free of charge from the BINE Information Service at FIZ Karlsruhe, is available online at www.bine.info or by calling +49 (0)228 92379-0. The brochure cover and additional images can also be downloaded from this web portal in the press section.

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