

HEAVENLY

High-efficiency PERT and IBC cell development focussing on paste and CVD optimization for long term stability

Project duration: from 01.2018 to 01.2021
Report submitted: 10.2019

Publishable Summary

The aim of the project is to move mature silicon based photovoltaic technology into the realms of low cost/high efficiency systems. Focussing on the development of silver pastes for screen printed contacts, chemical vapour deposited layers, solar cell processing and long term solar cell stability. The project will facilitate the transfer of lab proven passivated emitter, rear totally diffused (PERT) technology to an industrial environment. The knowledge gained will then be applied to even more technologically advanced Interdigitated Back Contact (IBC) photovoltaics.

Cell designs will allow for emitter co-diffusion capable of low-cost processing for development of screen-printing pastes and CVD passivation layers for p⁺ or n⁺ doped regions. In a later stage, the possibility for future gain of the paste and CVD layer approach shall be tested on IBC (Interdigitated Back-Contact) cell designs as proof of principle of our findings. The influence of contact formation on cell parameters will be thoroughly investigated. Of special interest is the influence of the contacting scheme and paste composition on the charge carrier lifetime and interactions of the paste with the CVD layers. Both phenomena have already been identified as important aspects in earlier work. Furthermore, degradation effects under solar cell operating conditions will be investigated. IP protection and commercial sales will be sought from the results of the project.

Project consortium

Coordinator and all contact details:

Full name of organisation	Johnson Matthey PLC
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Participating countries and financing:

Country	Number of organisations involved	Project costs in EUR	Public funding in EUR
United Kingdom	1	359'664	179'832
Germany	2	915'838	753'883
<i>Total</i>	3	<i>1'275'502</i>	<i>933'715</i>

Funding agencies involved and contracts

Funding Agency	Contract N° and Title
Innovate UK	File reference: 620139
BMW/PTJ	FKZ 0324226A, HEAVENLY – Hocheffizienz PERT- und IBC-Prozess mit Langzeitstabilitätsstudie zum Einfluss von Pasten- und CVD-Schichten, Teilvorhaben: Entwicklung von simultan kontaktierenden Ag-Pasten auf multifunktionalen CVD-Schichten zur Untersuchung der Langzeitstabilität von hocheffizienten Solarzellen
PtJ GmbH / BMWi	FKZ 0324226B