

Ambi PV Adapted Modules for Bifacial Photovoltaics

Project duration: from 10.2019 to 09.2022

Report submitted: 09.2020

Publishable Summary

The project Ambi PV focuses on new interconnection approaches for bifacial solar cells. The higher current in bifacial modules causes increased ohmic power losses which can be addressed by advanced interconnection techniques such as wired interconnection, shingling, 1/2 cells or combined approaches. The following interconnection technologies are investigated, including related optimizations of the cell/module materials and lay-outs:

- A new wire-based concept for the interconnection of bifacial IBC (Interdigitated Back Contact) cells
- Two shingling interconnection approaches for PERC cells, based on electrically conductive adhesives (ECA) and seamless soldering.

Each of these approaches has specific challenges which are not only related to the interconnection process but also to the respective module and cell design. So, the mechanical stress due to e.g. bending of the laminate will affect the interconnection of shingled cells in a different way than wire connected ones. The tensile or compressive stress on an ECA glued interconnection will be different if the cell matrix is embedded along the neutral fiber in a glass/glass- or in a glass/backsheet- module. Particularly the thermomechanical properties and the thickness of the embedding material and rear layer have to be adapted to the specific conditions as well as the cell layout.

The innovative techniques are compared to standard approaches to reveal their advantages and drawbacks. This allows a benchmarking with regard to module efficiencies, their reliability and related cost. The results will provide a sound basis for further decisions and deliver material for dissemination and publication.

Project consortium

Coordinator and all contact details:

Full name of organisation	Polymer Competence Center Leoben GmbH
First and family name of coordinator:	Gernot Oreski
Full address:	Roseggerstraße 12, 8700 Leoben
E-mail:	gernot.oreski@pccl.at

Participating countries and financing:

Country	Number of organisations involved	Project costs in EUR	Public funding in EUR
Austria	1	171.613	145.871
Switzerland	1	125.833	116.521
Germany	2	298.675	251.904
Israel	1	185.375	115.858
<i>Total</i>	<i>5</i>	<i>781.494</i>	<i>630.154</i>

Funding agencies involved and contracts

Funding Agency	Contract N° and Title
FFG	837780 Adapted Modules for Bifacial Photovoltaics
SFOE	SI/502052-01 Ambi PV II: Adapted Modules for Bifacial Photovoltaics
PTJ	032EE1036 Adapted Modules for Bifacial Photovoltaics
ETN	EFO 0007 Adapted Modules for Bifacial Photovoltaics
Ministry of Energy	AGREEMENT NO. 219-11-082 "High-Efficiency p-PERT Bifacial Cell, as the Core Component for Bifacial Advanced Modules