

BI-FACE High-efficiency bifacial PV Modules and Systems for flat roof applications

*Project duration: from 03.2018 to 02.2020
Report submitted: 04.2019*

Publishable Summary

The scope of the project **BI-FACE** is to develop innovative bifacial modules and systems for flat roofs. The results will include three novel variations for bifacial modules and systems which are tested in three different climate zones: subtropical (Cyprus), temperate (Austria) and maritime temperate (Netherlands) The ultimate design of these systems is challenging due to the large number of parameters that influence the energy yield (tilt and distance between modules, reflecting surfaces, shading, cell spacing, materials used and weather conditions).

A holistic approach to energy performance needs to take the aspect of standardization into account. This standardization is currently lacking for bifacial modules, hindering rapid market introduction. Therefore, critical effort will be put in to harmonize performance characterization of bifacial PV modules in a factory and laboratory setting and correlate this with the outdoor performance. The results will be supplied to the standardization committees.

The layout and mounting design of a bifacial system is critical to obtain the maximum possible performance on flat roofs. The construction demands with respect to wind load, stability, total weight (incl. ballast) and maximum allowed weight on a roof are directly influenced by this and need to be critically examined in parallel. The intended approach will compare theoretical investigations with tests in the laboratory and in the field.

Performance simulations of bifacial modules and systems will be developed and compared to laboratory and in field test results. Finally, all innovations will be summed and validated on a flat roof where the need for lightweight is an additional challenge.

The project BI-FACE aims to develop technically as well as economically novel bifacial PV systems to exploit the enormous potential of this technology. Also, the customer of the “aesthetically beautiful” modules will be in favor of the project BI-FACE.

The expected main results are:

- Novel lightweight bifacial modules and systems for flat roofs for representative climates in Europe
- Innovative, comprehensive models for design and installation of bifacial modules and systems including construction requirements
- Novel manufacturing strategies
- New performance and characterization measurements
- Innovative mounting structures

Project consortium

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Participating countries and financing:

Country	Number of organisations involved	Project costs in EUR	Public funding in EUR
Austria	3	580'905	465'592
The Netherlands	3	568'946	416'182
<i>Total</i>	6	<i>1'149'851</i>	<i>881'774</i>

Funding agencies involved and contracts

Funding Agency	Contract N° and Title
FFG	Förderungsvertrag, Projektnummer: 863515
RVO	Besluit tot verlening subsidie Kenmerk:SOL17BUKZU