HORIZON EUROPE PROGRAMME
TOPIC HORIZON-CL5-2023-D3-01-02

GA No. **101136094**

Sustainable Photovoltaics Integration in buildings and Infrastructure for multiple applications

D6.5 – COST ASSESSMENT OF SPHINX IPV MODULES

Funded by
the European Union

Deliverable No.	D6.5	
Related WP	WP6	
Deliverable Title	Final cost assessment of SPHINX IPV modules	
Deliverable due Date	30/10/2026	
Deliverable Type	Report	
Dissemination level	SEN – Sensitive	
Author(s)	Fraunhofer ICARES/BI/BIE	Oct 2026
Checked by	FSUNS, Fraunhofer, ETW, HLP	28/10/2026
Reviewed by (if applicable)	VOL, UNR, BIE	6/11/2026
Approved by	VOL	6/11/2026
Status	Final	10/11/2026

Document History

Version	Date	Editing done by	Remarks
	20/06/2026	Fraunhofer ISE	DRAFT
	30/10/2026	ICARES/BI/BIE	FINAL DRAFT
	5/11/2026	FSUNS/BIE	UPDATED VERSION

Public Summary

The economic assessment of matrix shingling technology, covering both upstream module manufacturing costs and downstream PV system competitiveness, highlights its potential for deployment across a wide range of photovoltaic applications.

The upstream analysis of the Voltec Carport, Heliup Lightweight and Freesuns Rooftile modules identifies material costs as a major driver of manufacturing costs, emphasising the importance of competitive sourcing and efficient module design. The assessment also highlights opportunities to improve manufacturing competitiveness through the use of smaller solar cells, increased equipment throughput, greater automation and economies of scale. While the specific cost structures vary between module types, these improvements could support more cost-efficient production of matrix shingling modules.

The downstream assessment demonstrates that, under the assumed manufacturing costs and resulting module end-user prices, matrix shingling technology can be integrated into economically competitive PV systems, including rooftop and façade tiles, carports, noise barriers and lightweight rooftops. Economic attractiveness varies depending on the application, system size, electricity yield and electricity valorisation conditions.

Overall, the findings support the economic potential of matrix shingling technology across diverse PV applications, while identifying clear opportunities for further cost optimisation at both module manufacturing and system levels.

8 Acknowledgement

The author(s) would like to thank the partners in the project for their valuable inputs to the presented assessment, as well as comments on previous drafts and for performing the review.

Project partners:

#	Partner short name	Partner Full Name
1	VOL	VOLTEC SOLAR
2	ETW	ETWAY S.R.L.
3	HLP	HELIUP
4	M10	M10 INDUSTRIES AG
5	UNR	UNIRESEARCH BV
6	Fraunhofer	FRAUNHOFER GESELLSCHAFT ZUR FORDERUNG DER ANGEWANDTEN FORSCHUNG EV
7	ICARES	iCARes Consulting SRL
7.1	BI	Becquerel Institute France SAS
7.2	BIE	Becquerel Institute España S.L.
8	CEA	COMMISSARIAT A L ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES
9	FSUNS	Freesuns SA
10	CSEM	CSEM CENTRE SUISSE D'ELECTRONIQUE ET DE MICROTECHNIQUE SA - RECHERCHE ET DEVELOPPEMENT
11	EPFL	ECOLE POLYTECHNIQUE FEDERALE DE LAUSANNE
12	SOP	SOPREMA

Disclaimer/ Acknowledgment

Copyright ©, all rights reserved. This document or any part thereof may not be made public or disclosed, copied or otherwise reproduced or used in any form or by any means, without prior permission in writing from the SPHINX Consortium. Neither the SPHINX Consortium nor any of its members, their officers, employees or agents shall be liable or responsible, in negligence or otherwise, for any loss, damage or expense whatever sustained by any person as a result of the use, in any manner or form, of any knowledge, information or data contained in this document, or due to any inaccuracy, omission or error therein contained.

All Intellectual Property Rights, know-how and information provided by and/or arising from this document, such as designs, documentation, as well as preparatory material in that regard, is and shall remain the exclusive property of the SPHINX Consortium and any of its members or its licensors. Nothing contained in this document shall give, or shall be construed as giving, any right, title, ownership, interest, license or any other right in or to any IP, know-how and information.

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101136094. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union. Neither the European Union nor the granting authority can be held responsible for them.