

# EUROPEAN COMMISSION

Horizon Europe Framework Programme (HORIZON)

HORIZON-EIC HORIZON EIC Grants

HORIZON Action Grant Budget-Based

GA No. 101075725

## TRIUMPH

Triple junction solar modules based on perovskites and silicon for high-performance, low-cost and small environmental footprint



## Deliverable report

**D2.1 - Plan for dissemination, exploitation and communication**

## Disclaimer/ Acknowledgment



Funded by the  
European Union

Funded by the European Union (under grant agreement No. 101075725).

Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or CINEA (European Climate, Infrastructure and Environment Executive Agency). Neither the European Union nor the granting authority can be held responsible for them.

## About TRIUMPH

The TRIUMPH project aims to initiate the development of a future PV cell technology node, based on an advanced triple junction cell concept, that is widely considered to be the next technology node to come after tandems. Presently, there is considerable amount of attention and research and development (R&D) activities devoted to Pk/Si tandems and already promising cell efficiencies, reliability and outdoor performance results have been obtained. The highest efficiency reported for a 2-terminal (2T) Pk/Si tandem is 29.8%, which has already gone past the Auger limit of Si.

Therefore, in TRIUMPH, we plan to venture a step further than tandems by targeting TRIPLE junction devices, that can add the extra “OOMPH” (hence the name TRIUMPH) needed to reach efficiencies even >33%. These 2T triple junction devices will be based on perovskites for the middle and top cells and silicon for the bottom cell and will build on the knowledge garnered in the field of Pk/Si tandems. Additionally, cost-effective processing techniques that are industrially viable will be selected for scale-up developments, with minimal upscaling performance loss and degradation during reliability testing and outdoor monitoring. As we enter the tera-watt (TW) era of PV deployment, using earth-abundant materials and enforcing circularity become necessities. Towards this objective, we not only explore options that reduce critical raw materials (CRM) such as silver (Ag) and indium (In) in the triple junction devices, but also apply design for recycling principles to the triple junction modules. The consortium consists of 14 complementary partners from both research institutions and industry, each bringing their best forte to the table, which will help to establish the pathway and the value chain for future multi-junction modules. In this way, TRIUMPH would help the European Union (EU) to maintain its technological leadership in the PV domain for the future generation of PV technologies.

## TRIUMPH consortium members

No.	Participant Legal name	Acronym	Country
1 (Coord.)	INTERUNIVERSITAIR MICRO-ELECTRONICA CENTRUM	IMEC	BE
2	FRAUNHOFER GESELLSCHAFT ZUR FÖRDERUNG DER ANGEWANDTEN FORSCHUNG E.V	F-ISE	DE
3	L'INSTITUT PHOTOVOLTAÏQUE D'ÎLE-DE-FRANCE	IPVF	FR
3.1	ÉLECTRICITÉ DE FRANCE	EDF	FR
4	NEDERLANDSE ORGANISATIE VOOR TOEGEPAST NATUURWETENSCHAPPELIJK ONDERZOEK	TNO	NL
5	SALD B.V.	SALD	NL
6	DYENAMO AB	DYN	SE
7	CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE	CNRS	FR
7.1	UNIVERSITE PARIS-SACLAY	UPS	FR
8	ALBERT-LUDWIGS UNIVERSITÄT FREIBURG	ALUF	DE
9	HANWHA Q CELLS GMBH	QC	DE
10	RENA TECHNOLOGIES GMBH	RENA	DE
11	ECOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE	EPFL	CH
12	CENTRE SUISSE D'ELECTRONIQUE ET DE MICROTECHNIQUE SA - RECHERCHE ET DÉVELOPPEMENT	CSEM	CH
13	VON ARDENNE GMBH	VA	DE
14	ODTU GUNES ENERJISI UYGULAMA VE ARA STIRMA MERKEZI (ODTU-GUNAM)	OG	TK

## Document information

<b>Deliverable No.</b>	D2.1
<b>Related WP</b>	WP2
<b>Deliverable Title</b>	Plan for dissemination, exploitation and communication
<b>Deliverable Date</b>	30.04.2023
<b>Deliverable Type</b>	Report
<b>Lead Author</b>	Veroni Ballet (IMEC)
<b>Co-Author(s)</b>	-
<b>Reviewed by</b>	Hari Sivaramakrishnan

## Document history

Date	Revision	Prepared by	Approved by	Description
30.04.2023	1	Veroni Ballet	-	First draft
8.02.2024	2	Veroni Ballet	Hari Sivaramakrisnan	Final

## Dissemination level

<b>PU</b>	<b>Public</b>	
<b>SEN</b>	<b>Sensitive</b>	X

## Publishable summary

This deliverable contains the means of communication, as well as the Plans for dissemination and exploitation. These are the results of activities in Work Package 2. The results of these activities (the realisation of the plans) will be reported in the EU-portal and at the end of the project in D2.3 - Final report on dissemination and communication activities and D2.4 - Final report on exploitation plan.