

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

D1.1- Quality assurance and risk management plan

Disclaimer/ Acknowledgment



Funded by the
European Union

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

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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 33.7%, 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

Deliverable No.	D1.1
Related WP	WP1
Deliverable Title	Quality assurance and risk management plan
Deliverable Date	Day – Month - Year
Deliverable Type	Report
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Co-Author(s)	-
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Document history

Date	Revision	Prepared by	Approved by	Description
12.04.2023	1	Veroni Ballet	-	Draft
02.08.2023	2	Veroni Ballet	Florian Hilt	WP reviewed
07.08.2023	3	Veroni Ballet	Felipe Saenz	WP reviewed
02.02.2024	4	Veroni Ballet	Hari Radhakrishnan	Final

Dissemination level

PU	Public	
SEN	Sensitive	X

Publishable summary

Deliverable 1.1 - "Quality Assurance and Risk Management Plan", is a confidential deliverable report related to the project management (WPI) of the TRIUMPH project. It has been developed in the first half year of the project by the Project Coordinator unanimously approved by the Steering Board (SB).

Concerning quality assurance, the plan describes the responsibilities, timeline, and review criteria for each Deliverable. Concerning risk management, the plan first describes the role of the partners. Then, the plan assesses the likelihood and impact of all critical implementation risks, meaning the ones already identified in the Description of Action as well as newly identified ones. Measures for reducing the risk levels, including precautionary and mitigation actions, are also included.

The implementation of the plan is being monitored by the EB during the monthly teleconference meetings and updates to the plan will be made throughout the whole project lifetime in a continuous process. The updated Quality Assurance and Risk Management Plan will be included in the Revised Project Management Plan due by M13 (D1.4) and then in the Final revised Project Management Plan due by M27 (D1.5).