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Newsletter #1, April 2025

New Project advances long-lived and recyclable perovskite photovoltaics as a pivotal part of the Energy transition

Dear Readers,

It is our pleasure to welcome you to the 1st edition of the CIRCULAR-PV Newsletter as a first introduction of our project to the scientific community!

CIRCULAR-PV is an ambitious and innovative project led by the University of Cyprus which will delve on investigating perovskite recycling aspects. It is implemented by a network of five European partners with expertise in material development (Dyenamo AB), perovskite module fabrication (University of Freiburg and Solaronix), testing and aging (University of Cyprus), and recycling/material recovery (Forschungszentrum Jülich).

As our project progresses, we look forward to sharing significant achievements and activities performed by the partnership towards contributing to the challenge of perovskite sustainability and material criticality in the field.

If you would like to keep up to date with all the latest developments and our next steps in CIRCULAR-PV, you can follow us on the project's website and on our social media.

Kind Regards,
Dr. Maria Hadjipanayi (Project Coordinator),
on behalf of the CIRCULAR-PV Consortium

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About CIRCULAR-PV

CIRCULAR-PV is a Clean Energy Transition (CET) Partnership project that targets to develop and test innovative circularity strategies combined with low environmental impact manufacturing of perovskite PV modules to achieve reliable, sustainable, recyclable, and potentially lower cost PV. The consortium comprises of five partners from four countries that bring their expertise together to address the ambitious objectives of this project, namely University of Cyprus (Cyprus), which is also the Coordinator, University of Freiburg (Germany), Forschungszentrum Jülich (Germany), Solaronix (Switzerland), and Dyenamo (Sweden). The partnership will strive to investigate eco-design modules outdoors in terms of their lifetime and stability studying links between material recovery and degradation pathways generated by real field operation. Moreover, it will aim to demonstrate successful material recovery without substantial quality loss. Ultimate target is to achieve effective recycling of eco-friendly perovskite modules without sacrificing long-term stability and efficiency.

CIRCULAR-PV is expected to lead to minimisation of use of critical raw materials, to new circularity-by-design approaches, to the demonstration of the feasibility of scaling up perovskites using sustainable green approaches, circularity designs, and pre-industrial processes, as well as to the demonstration of the technology (in terms of stability and in terms of circularity effectiveness) in different climatic conditions in Cyprus and in Germany. The project's official launch date was January 2025, and it is scheduled to run for 36 months.

Duration: 3 years

Budget: €2.075.709

4 Partner Countries

Objectives

- To investigate the feasibility of using fully eco-friendly perovskite module manufacturing approaches for stable and almost 100% recyclable devices.
- To demonstrate sustainable eco-design perovskite modules with efficiency >18% that pass at 1000h of IEC/ISOS indoor aging.
- To study the field lifetime of eco-design modules through long-term outdoor aging at two different climatic locations.
- To design appropriate aging protocols for circularity strategies for perovskite-based PV.
- To study the link between material recyclability and degradation generated by real field operation.
- To demonstrate successful material recovery (>95%) without substantial quality loss.
- To study the feasibility of re-manufacturing eco-friendly perovskite-based modules using recycled material.

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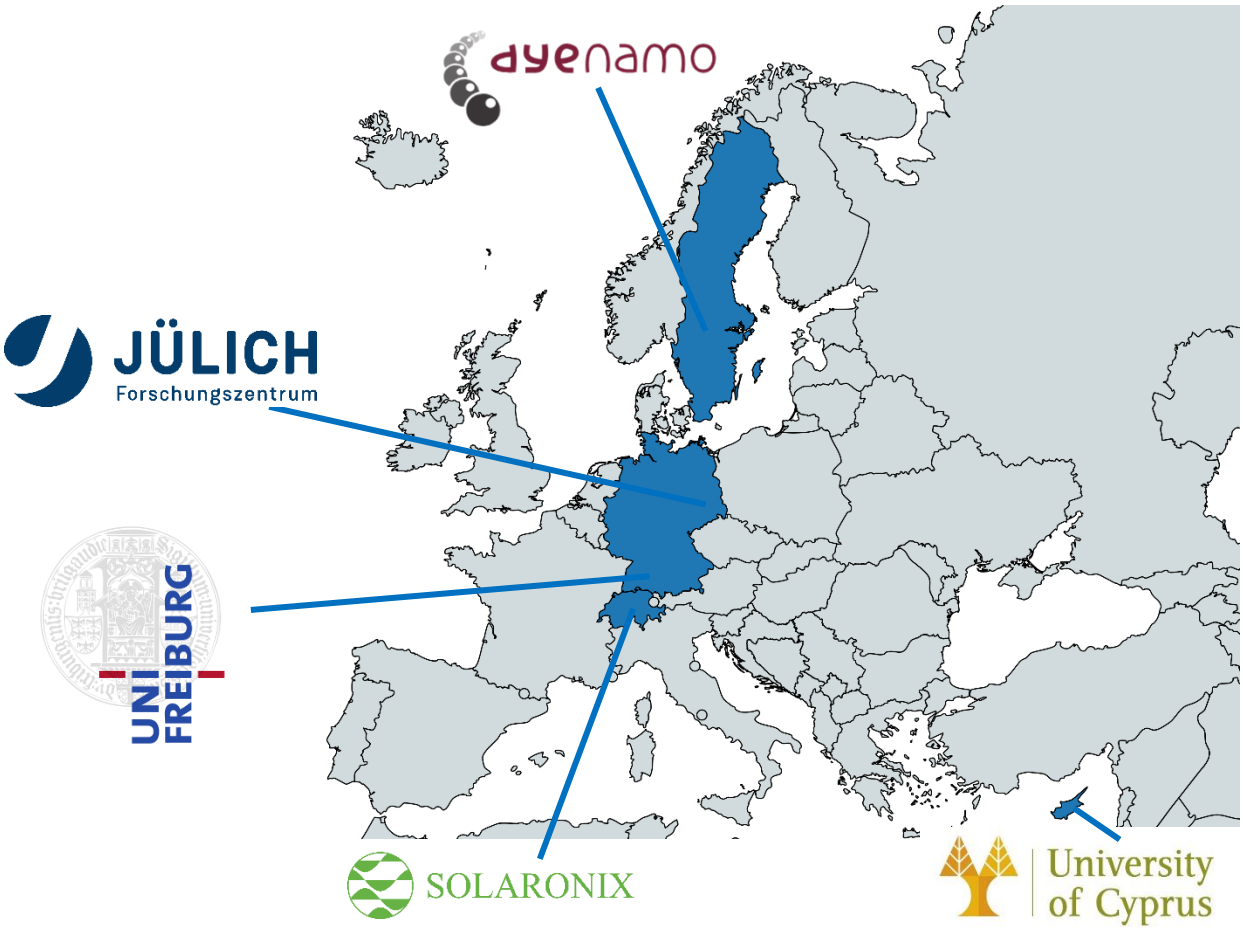
Project consortium



University of Cyprus is the Coordinating institution; its main technical role is in indoor/outdoor aging tests of eco-design perovskite-based devices and in indoor characterization of the modules before/after field testing using advanced optoelectronic techniques.

University of Freiburg's role is in fabrication of encapsulated eco-designed perovskite sub-modules with planar cell architecture and carbon back electrode, in their stability testing indoors and outdoors and detailed characterization.

Forschungszentrum Jülich's role will be mainly in development of the appropriate circularity strategy, the life-cycle analysis (LCA), the eco-module design, and the recycling efforts.

Solaronix will be involved in encapsulated eco-design module manufacturing and indoor stability testing and characterization.

Dyenamo's role is in innovative material development and supply to the manufacturing partners, and for studies in recovered material quality from degraded eco-design modules.

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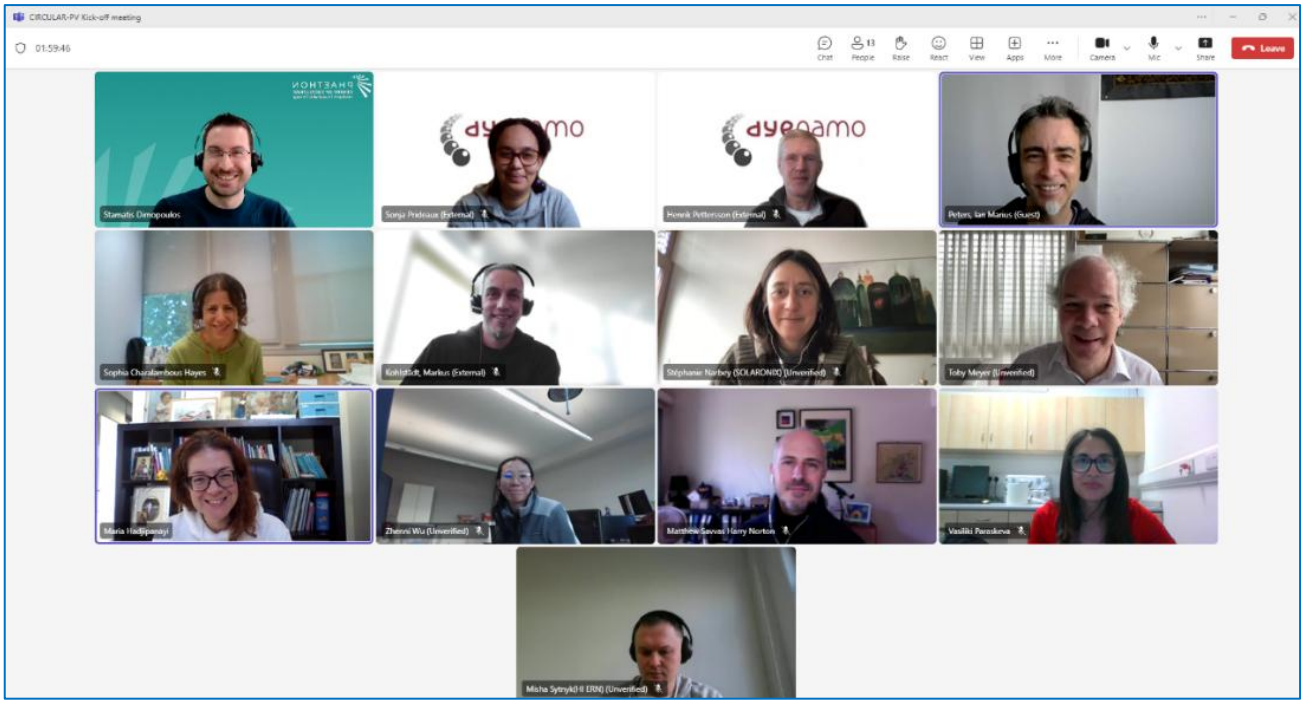
Summary of the project's activities

CIRCULAR-PV Online Kick-off Meeting



The kick-off meeting of the project was held online on the 20th and 24th of January 2025. Representatives from all partners participated.

Upcoming activities

FuturePV workshop, 20-22 May 2025, Nicosia, Cyprus

CIRCULAR-PV project is co-organizing in Cyprus the workshop titled "Future-Proofing Perovskite PV: Innovations in Upscaling, Reliability, and Circularity". The event is a joint initiative between 14 European perovskite projects: TESTARE, LAPERITIVO, DIAMOND, PERSEUS, SMARTLNE-PV, TRIUMPH, SUPERTANDEM, LUMINOSITY, APOLLO, PEARL, CIRCULAR-PV, SOLMATES, NEXUS, and PHOENIX. FuturePV aspires to bring together the perovskite scientific

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community and industry to discuss latest developments in the field and allow for impactful networking as well.

Discussions will delve on the following topics: Technology Upscaling and Industrialisation, Tandem Architecture Optimisation, Measurement Protocols for Metastable Devices, Long-Term Stability, Field Reliability and Performance, Circularity and Life-Cycle Analysis.

This workshop we will also give the floor to major running EU perovskite projects to provide updates on their results as well as next activities in line. For more information and registrations please visit the workshop website: FuturePV

Stay connected

If you are interested in learning more about the project or for potential collaborations,

Visit our website:

CIRCULAR-PV website

Follow us on social media:


Linkedin & X (Tweeter)

Or get in touch via email:

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