

Photovoltaic Innovations for a Sustainable Future in Europe

Paving the Way for Sustainable and circular Photovoltaic Industry

Solar energy has been clearly identified as the best candidate to lead the energy transition and to move forward to the carbon-neutral paradigm. The role of the photovoltaic (PV) industry is decisive in this mission since a massive deployment of photovoltaic energy is expected in the next few decades. Europe, as a leader in the climate fight, has launched several initiatives to coordinate the macroeconomic strategy and specifically for solar energy (Fit for 55, REPowerEU, EU Solar Energy Strategy). More globally, the Circular Economy Action Plan provides guidelines to support European industries in developing sustainable and circular business perspectives.

In this context, the PV industry has to be exemplary in terms of sustainability, fostering economic, environmental and social benefits, and carefully considering the whole value chain. From supply chain to manufacturing, use, decommissioning, and waste management, all stakeholders should work together to develop a collective, inclusive and systemic industry.

Circular model from concept to field experience

PHOTORAMA, ICARUS, CIRCUSOL, TRUST-PV, and RESiLEX are European-funded projects that work together to implement innovative solutions through the whole value chain. The main targets focus on developing eco-design innovations, ensuring sustainable operation and maintenance, experimenting and assessing re-use practices, and providing technological solutions for waste manufacturing and End-of-Life (EoL) management/recycling.



Who benefits?



EU and national leaders, local governments, funders, and policy experts.



Solar Industry in Europe.



Private firms seeking sustainable materials technology

Key Results

New Concepts and Framework for a sustainable EU PV value chain

- ◆ **Circular model & waste management.** PHOTORAMA pioneers circular solutions through the development of seven technologies for efficient end-of-life PV panel management and raw material recovery.
- ◆ **Raw Material Recovery.** ICARUS propels the European PV industry with innovative pilots focused on raw materials and silicon waste conversion.
- ◆ **Circular Business Models.** CIRCUSOL is dedicated to improving economic viability and customer acceptance by refurbishing PV modules for second-life use in the EU, fostering sustainability.
- ◆ **Solar Reliability.** TRUST-PV enhances PV component reuse and plant repowering decisions through improved performance and a decision support system.
- ◆ **Silicon Innovation.** RESiLEX establishes three value chains: mining waste for Critical Raw Materials, recycling end-of-life PV modules for silicon nanopowder used in new polysilicon ingots, and Silicon Anode for Li-ion battery cells.



Photovoltaic Innovations for a Sustainable Future in Europe

Challenges

- ▶ **Promoting industrial symbiosis and circular value chains.** Establishing collectively sustainable value chains and circular practices emphasising their positive impact on the economy, environment, climate, and society is a key challenge.
- ▶ **Enabling Sustainable Energy Solutions.** Securing clean and efficient energy sources is of utmost importance, and brings technological solutions to optimise the use-phase for broader sustainability objectives.
- ▶ **Securing raw materials in the PV value chain.** Building a robust waste management system, developing up-cycling-recycling-practices, and creating a market for secondary materials is crucial.

Join us on the journey towards a sustainable future! Let's collaborate to address these challenges and pave the way for decarbonised, circular, and environmentally responsible production systems. Together, we can make a lasting impact on our economy, environment, and society. Get involved today!

Project Group



PHOTORAMA. PHOTORAMA is an EU-funded innovation action striving to improve recycling of Photovoltaic (PV) panels and recovery of Raw Materials (RM).

photorama-project.eu

GA 958223



ICARUS. The EU-funded ICARUS project will demonstrate at an industrial level eco-efficient modular processing solutions to recover 95% of high-value raw materials from silicon ingot and wafer manufacturing. icarus.eu.com

GA 958365



CIRCUSOL. CIRCUSOL aims to establish solar power as a spearhead sector to demonstrate a path driven by Product-Service System (PSS) business models towards a circular economy in Europe. circusol.eu

GA 776680



TRUST-PV. TRUSTPV will improve the performance reliability of solar power plants, supporting the development of O&M-friendly and grid-friendly solar PV components and solutions in large portfolios of distributed and utility-scale PV. trust-pv.eu

GA 952957



RESiLEX. The RESiLEX project aims to showcase 7 industry-driven solutions across the Silicon value chain, emphasizing the recycling of solar PV panels, mining, raw materials extraction, and Silicon reuse in battery applications. Its goal is to enhance the resilience and sustainability of this critical raw material value chain in Europe.

resilex-project.eu

GA 101058583

