



## D8.3 – Report on EU Synergies and Stakeholder engagement activities: Report on stakeholder workshop



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## Document control sheet

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## Circular Solutions in the PV Industry

Navigating Recycling Challenges and Critical Raw Material Dependencies  
ReSilex x EVERPV workshop

### Executive Summary

Date and time: 23<sup>rd</sup> May 2024, 14:00-16:30

Location: VBO FEB, Rue Ravenstein 4, 1000 Brussels, Belgium - In-person only

Registrations: 125 – Participants: 65

The ReSilex x EVERPV workshop took place on 23<sup>rd</sup> of May 2024, 14.00 – 16.30 in Brussels. To increase the synergies and collaboration with ongoing EU R&I projects, Resilex partnered with the Horizon Europe funded project EVERPV. Through this partnership the expertise and communication and dissemination on the workshop could be enhanced. This was shown particularly in the number of participants. In total 125 persons registered for the workshop and 65 participated in person. Milestone 8 of ReSilex had as target the registration of 50 participants, therefore it was fully accomplished. Furthermore, the high number of industrial representatives proved the interest of the private companies in these projects, facilitating desirable engagement for exploitation, upscaling and technical collaborations.



## Task 8.4 Objectives

The goal of Task 8.4 is to enhance synergies and collaborations with existing and prospective EU research and innovation (R&I) projects and partnerships.

One key event of Task 8.4 is the stakeholder engagement workshop, which took place at M24 in Brussels, Belgium. This workshop aimed to present the project and gather initial feedback on various aspects such as:

- Scientific Breakthrough and Environmental Sustainability: Target audience includes academics and industrial stakeholders.
- Economic Development: Targeted at both private and public European investors.
- Public Acceptance: Focused on engaging civil society.

The objectives of Task 8.4 are closely linked to task 7.4 aiming at creating an open platform that supports continuous stakeholder engagement, policy recommendations, and collaboration. This platform enhances the synergies targeted in Task 8.4 by providing tools, training materials, and events that keep stakeholders, including academics, industrial partners, investors, and civil society, actively involved and informed, thereby amplifying the impact of the stakeholder engagement workshops. To further amplify the impact of the stakeholder engagement platform, flyers containing QR codes were distributed at the workshop to increase awareness of the platform. These flyers received positive feedback, indicating strong interest and engagement from the participants.

## Dissemination and Communication on the workshop

The stakeholder engagement workshop was strategically conducted within the framework of the ETIP PV conference: [Annual Conference 2024 \(PRESENTATIONS AVAILABLE\) - ETIP PV Conference - ETIP PV \(etip-pv.eu\)](#). This alignment allowed for the promotion of the workshop, thereby leveraging the established audience and venue to increase interest and participation in the workshop.

Dissemination efforts were robustly supported through SolarPower Europe's extensive communication channels. This included:

- **Website Promotion:** Detailed information about the workshop was prominently displayed on SolarPower Europe's official website, reaching a wide audience interested in solar power and related technologies.
- **Social Media Campaigns:** posts and updates on the workshop were shared across SolarPower Europe's social media platforms, which collectively have over 50,000 followers. These platforms include LinkedIn, X, where regular updates, engaging content, and reminders about the workshop were posted to maximize visibility
- **Email Outreach:** Emails were sent to over 300 members within the solar power value chain, ensuring that key stakeholders were informed and encouraged to participate.
- **Collaborative Promotions:** The workshop also received promotion through several key partner platforms, broadening its reach and visibility:
  - **Resilex:** posts and announcements about the workshop were made on the Resilex website and associated communication channels.
  - **EverPV:** provided additional promotional support, including website features and social media posts.
  - **ETIP PV:** As the hosting conference, ETIP PV included the workshop in its promotional materials, newsletters, and conference agenda, highlighting the importance of the event.
  - **ETA and Tenerrdis:** contributed by promoting the workshop through their networks, including website postings and social media engagement.



***Navigating Recycling Challenges and Critical Raw Material Dependencies***

**When:** 23<sup>rd</sup> May, 2024 , 14:00 – 16:30

**Where:** Rue Ravenstein 4, 1000 Brussels, Belgium




◆ Events 📅 March 22, 2024

***Navigating Recycling Challenges and Critical Raw Material Dependencies***

<b>12.45 – 13.15</b>	<b>Closing Session</b>
12.45 – 13.00	Closing Keynote Speech and Wrap-up
13.00 – 13.15	<b>Rutger Schlatmann</b> (HZB-Institut PVcomB and ETIP PV Chair), <b>Venizelos Efthymiou</b> (University of Cyprus and conference chair), <b>Pierre-Jean Alet</b> (CSEM and conference chair)
<b>13.15 – 14.00</b>	Lunch Break
<b>14.00 – 16.30</b>	<b>Resilex x EverPV workshop</b>
	The event will present the current status of the Critical Raw Materials Act and feature three roundtable discussions on (1) scaling up the technologies developed by the projects, (2) closed-loop recycling, and (3) open-loop recycling. The discussions will center on challenges and the necessary framework conditions (legal, political, economic, technical), seeking potential solutions for research and innovation to contribute at a technical level to EU policies. Targeting researchers, policymakers, recyclers, project developers, NGOs, and more, the workshop offers diverse stakeholder groups the opportunity to engage in the discussions. you can find more info <a href="#">here</a> and register <a href="#">here</a> .



Last call! Join us for free research and innovation events in Brussels 



SolarPower Europe <info@solarpowereurope.org>

To: Hanna Dittmar



13/05,



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## Join these upcoming free research and innovation events in Brussels

Dear Hanna,

As a valued member of SolarPower Europe, we are delighted to invite you to join the following research and innovation events:

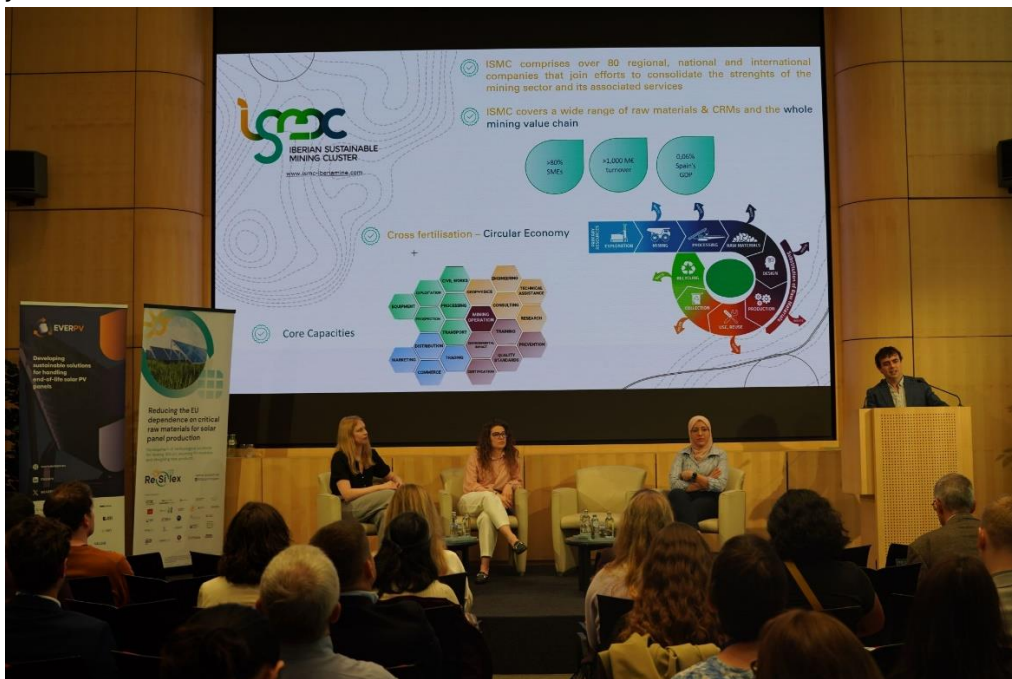
- **22-23 May: ETIP PV Conference**, 'Digitalised & responsive PV: The driver of Grid & Market evolution,' VBO FEB, Rue Ravenstein 4, 1000 Brussels.
- **23 May: EVERPV and RESiLEX joint workshop**: 'Circular Solutions in the PV Industry: Navigating Recycling Challenges and Critical Raw Material Dependencies,' VBO FEB, Rue Ravenstein 4, 1000 Brussels, 14.00 – 16.30, CET.

# Panel discussion on Critical Raw Materials and PV circularity

## Speakers:

- Nouha Gazbour, PV Sustainability Manager, Commissariat à l'énergie atomique et aux énergies alternatives (CEA)
- Francisco J. Luque, Senior Project Manager, Iberian Sustainable Mining Cluster
- Emma Dominici, Policy Advisor on Supply Chains, SolarPower Europe

The event started with input presentations from the speakers. Nouha Gazbour, from CEA, presented the EVERPV project, its expected outcomes, objectives, added value and the different technologies being developed. Francisco J. Luque, coordinator of the ReSilex project, presented ReSilex's objectives and technical progress, especially focusing on silicon recycling. Emma Dominici from SolarPower Europe delivered a comprehensive overview of the Critical Raw Materials Act, emphasising its practical implementation and relevance for the solar sector. She delved into the topic of recycling, discussing EU targets, strategic projects and the role of polysilicon in the PV industry.



## Workshop discussions

Workshop attendees were divided into groups to discuss how the projects can contribute to EU policy objectives. The audience was divided in 3 topical groups:

- (1) scaling up the technology,
- (2) closed loop recycling (within the PV industry),
- (3) open loop recycling (with other industries).

### Scaling up the technology

Discussion questions:

What are the challenges in scaling up the technologies developed in EVERPV and ReSilex and other EU-funded projects?

How to ensure synergies between different HE-funded projects?

Economic challenges.

- The lack of incentives for upcycling is diminishing the sector's profitability and introducing potential risks. Engaging with the right stakeholders and identifying synergies between industries are crucial steps. Implementing a targeted tax on downcycling could enhance sector profitability, provided the secondary materials are of high quality.
- Upscaling technologies developed in Horizon Europe projects requires highly skilled employees. Establishing specific education programmes would help address this need.

Technological challenges.

- Several technical aspects need to be addressed, notably regarding specific components, such as backsheet. The creation of a "material passport" would contribute to solving this issue.
- The lack of standard for PV panel design is another challenge. Through financing, banks can introduce standards.

Legal and regulatory challenges.

- Collection rules for e-waste are not the same in each EU Member State. Unclear definitions and restrictive rules for the circulation of waste to research purposes is another challenge to test and develop recycling technologies within EU-funded projects.

- Developing recycling processes for technologies which are not yet on the market is another challenge, as PV technology is evolving rapidly. Excluding certain materials with eco-design rules would contribute to scaling up technologies developed at R&I project level.

## Closed loop recycling (within the PV industry)

Discussion questions:

What are the challenges to using recovered materials in the PV industry?

How to ensure the use of recovered materials in the PV industry?

Material challenges.

- Reaching high levels of purity with the current recycling processes is challenging, especially for Si. Recycled materials might also have low levels of performance.
- Damaged materials also pose a challenge for recycling. Especially for glass damaged during handling. Material degradation, of polymers notably, is another challenge.
- Some materials are challenging to recover, especially fluoropolymers.
- The complexity of the PV supply chain is a challenge for closed loop recycling.
- Another challenge is the fact that a low number of companies are available to take back the material in Europe, with little manufacturers present on the continent.

Other challenges.

- Another challenge is the high cost associated with reuse and recycling, compounded by the lack of harmonisation of recycling processes at the EU level. The high carbon footprint of recycling processes poses a significant issue.
- The rapid pace of innovation in the PV sector means that recycling processes must continually adapt to evolving technologies.

Opportunities.

- Standardisation and robust legal frameworks are crucial for enabling the closed-loop recycling of PV systems. Standardisation efforts should include comprehensive data access to facilitate efficient recycling processes.
- Implementing incentives and deterrent measures can significantly enhance recycling efforts. For instance, adopting a polluter-pays system with landfill fees can discourage waste disposal and promote recycling. Additionally, creating incentives for on-site recycling facilities can further encourage sustainable practices within the industry.

- Increasing public awareness of the PV industry's efforts to reduce its environmental footprint is essential. Highlighting and supporting recycling initiatives will increase social acceptance and support for PV.
- Optimising recycling processes will contribute to the domestic sourcing of secondary materials in Europe, reducing dependency on external sources and promoting a circular economy.
- Recycling initiatives should also target niche markets beyond standard PV systems to ensure comprehensive and effective recycling solutions across the entire industry.

## Open loop recycling (with other industries)

Discussion questions:

What are the challenges to using recovered materials from PV in other industries?

How to ensure the use of recovered materials from PV in other industries?

### Material Challenges

- Challenges for Si applications: purity. To re-use the recovered Si in batteries, the Si needs to be at least 99.8% pure. Metal industries require less purity of Si, can use alloy AlSi. Another challenge is the fact that a low number of companies are available to take back the material in Europe and the amount of recovered material is still low. A solution would be to upscale the technologies developed in R&I projects and bridge the R&I and industrial upscaling gap through pilots and investments.
- Indium and Gallium: too small quantities in PV.
- Glass: presence of antimony in PV glass not compatible with the flat glass process. Alternative use of recovered glass can be found in road applications, however this will not represent a viable output in the future due to a too high quantity of glass. The EVERPV project is working on defining the maximum acceptable level of antimony for the recovered glass to be reused in flat glass application. A regulatory solution and a change of mind of consumers would allow for glass and other recovered materials to be re-used.
- Backsheet: lack of output.
- Cables, junction box and metals do not represent an issue for open loop recycling.
- Overall, using less components in PV panels would make them easier to recycle. Research should promote eco-conception of panels to be put in place at policy level.

### R&I and industry gap.

- A significant challenge is the lack of connection with industry, which hinders the identification of customers for newly developed technologies and recovered

materials. Additionally, finding investors is challenging due to the extended timelines for return on investment.

- Another issue is the absence of a coherent project pipeline across various European Commission funding programs, which results in missed opportunities for project exploitation once initial funding phases are completed. This gap prevents continuous development and commercialisation of innovative solutions, stalling progress and economic benefits.



## Workshop Conclusions

The main takeaways of the workshop included:

- **Stakeholder engagement:** engaging the right stakeholders is crucial to bridge the gap between research and industry, and to identify synergies across sectors. This is essential due to the limited number of companies in Europe capable of or willing to purchase and exploit recovered materials, especially Silicon.
- **Cost and profitability:** the high costs of the recycling process, managing small quantities of certain materials (Indium and Gallium), and ensuring sufficient waste flows need to be addressed, to enhance the sector's profitability.

- **Standardisation and policy:** standardisation should be implemented at multiple stages, including with eco-design rules to make it easier to recycle PV modules and exclude certain materials, such as fluoropolymers. Recycling processes across the industry should be harmonised. Policy support can help increase the sustainability of the PV industry.

The workshop successfully attracted professionals from the triple helix, with 125 registrations, largely achieving the target of 50 registrations for the stakeholder engagement workshop. During the promotion phase, the workshop actively targeted the scientific community through the EVERPV and Resilex projects, as well as manufacturers and civil society by leveraging the network of SolarPower Europe. However, a summary of the workshop has been published on the website and is publicly disseminated: [Circular solutions in the PV industry: Workshop Highlights – Resilex \(resilex-project.eu\)](https://resilex-project.eu/circular-solutions-in-the-pv-industry-workshop-highlights-resilex)



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