

Impact. Industrial leadership and increased autonomy in key strategic value chains

SOLMATE aims to establish **first industry-driven value chain** covering collection, logistics, characterisation, sorting, reuse of operational electric vehicle (EV) batteries, photovoltaic (PV) panels and waste from electrical and electronic equipment (WEEE) components, as well as refining and purification of secondary raw materials from end-of-life (EoL) EV batteries and PV panels.

Expected mid-term outcomes

- **Advancing waste hierarchy:** SOLMATE will generate knowledge and develop technologies to prevent, reuse, recycle, and recover, minimising waste disposal.
- **Resilient value chain:** The project aims to establish a sustainable reuse and recycling system for PV panels and EV batteries.
- **Economic inclusion:** SOLMATE addresses economic disparities by offering low-cost decentralised energy solutions to economically challenged communities.
- **Reduced carbon footprint:** Reused components reduce carbon footprint compared to new components.

Expected long-term outcomes

- **Reduced CRM demand:** Reusing PV modules and batteries aims to reduce external demand for CRMs.
- **Internal trade:** Through reuse & recycling, SOLMATE strengthens internal trade, contributing to a sustainable and resilient supply chain.
- **Circular practices:** SOLMATE proposes sustainable technologies to manage the waste and resources, building circular practices.

Contact



Coordinator: **VITO**
(Flemish Institute for Technological Research)
info@solmate-project.eu

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€ 7,3 Mil total budget
€ 6,1 Mil EU funding



48 months (started in Jan 2024)



16 partners



From 6 countries



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SOLMATE

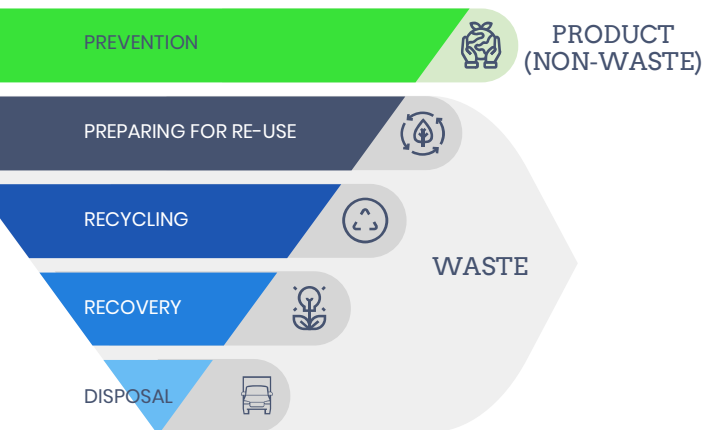
Reuse of SOLar PV Panels and EV Batteries for low-cost decentralised energy solutions and effective Recycling of critical raw MATerials from their EoL products



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Circular economy potential for PV panels and EV batteries

WASTE HIERARCHY



Reusing and recycling end-of-life EV batteries and PV modules, following the Waste Framework Directive, extends their life and ensures proper recycling, moving us closer to zero waste.

SOLMATE introduces a circular approach through 2 core actions:

- **Extending the lifetime** of 'retired' PV panels and EV batteries
- **Resource recovery** when repurposing is not available

Coupling 2nd life batteries and PV panels could establish new sustainable business models. This supports affordable, decentralised energy systems for markets like Agri-PV and low-income communities.

When repurposing is not possible, EV batteries and PV panels are recycled to recover valuable materials.

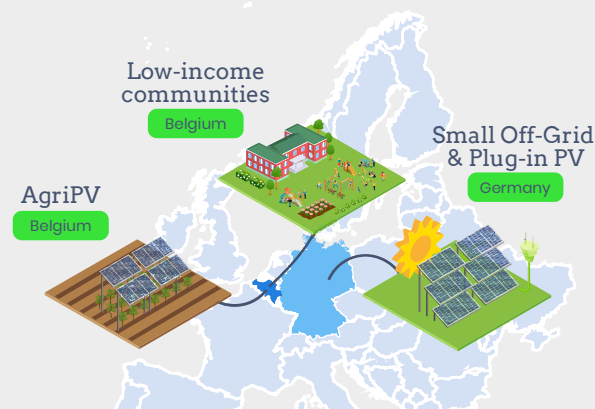
Which challenges will SOLMATE address?

The EU policy context and upcoming availability of resources for reuse/recycling pose challenges that SOLMATE aims to address:

- **Efficient sorting and characterisation of working modules**
- **Low-cost testing and qualification methodologies** (e.g., safety, performance, warranty)
- **Automatic dismantling and sorting technologies**
- **Technological gaps in sorting non-working modules** to facilitate the recycling of materials and their valorisation in high added value products
- **Low cost and reliable testing methodologies for EV batteries and energy management systems**
- **Green and economically viable recycling processes of CRMs available in batteries**

3 Demonstrators, 2 countries

SOLMATE will validate these decentralised energy solutions using 2nd life components across various business models.



Small Off-Grid & Plug-in PV

Plug-in PV systems are made for self-deployment and installation. The small systems serve to reduce the amount of electricity a household needs to buy from the grid.

CHALLENGE

Prepare 2nd life batteries for integration into off-grid products and as extensions to Plug-in PV, enabling owners to significantly increase their self-usage rates.

AgriPV

PV panels serve a dual purpose:

- a) to shield crops from wind/sun, facilitating faster growth
- b) to generate renewable energy for the use of farming sites

CHALLENGE

Prepare Agri-PV setups with a focus on seamless integration into farmer activities.

Low-income communities

Focusing on the reuse of PV panels and EV batteries, this demonstrator aims to provide affordable energy solutions. It will be installed at a school campus in Brussels, showcasing the potential of reused components.

CHALLENGE

Create a qualified, low-cost decentralised energy system utilising reused PV panels and EV batteries.

