

INNOVATION FUND

Deploying innovative net-zero technologies for climate neutrality

RGEn4: Developpment of an innovative process to recover the lithium from end-of-life solid-state lithium-metal batteries (4th generation of battery)

The Innovation Fund is 100% funded by the EU Emissions Trading System

| Project Factsheet

RGEn4 aims to design, develop, and build an innovative process for lithium recycling in line with the latest battery regulations and sustainability objectives. This process will recover metallic lithium from end-of-life solid-state lithium-metal batteries using a technology based on heating and rolling principles. Because the project successfully recovers most of the metallic lithium from the batteries, it directly valorises the recovered lithium as material for specialised alloy manufacturers in Europe, reducing their dependency on Asian supply. Additionally, the project aims to reintroduce lithium into the manufacturing process of new solid-state lithium-metal batteries, enabling the critical lithium resource to enter a cycle of use-recycle-reuse, thereby reducing reliance on its extraction. Compared to the reference scenario, RGen4 will recover metallic lithium with 85% relative greenhouse gas (GHG) emission avoidance. The recycling line can process up to 18 000 Blue Solutions' solid-state battery modules annually.

COORDINATOR
BLUE SOLUTIONS

LOCATION
France

CATEGORY
Energy intensive industries (EII)

SECTOR
Non-ferrous metals

AMOUNT OF INNOVATION FUND GRANT
EUR 6,750,000

EXPECTED GHG EMISSIONS AVOIDANCE
20,447 tonnes CO₂ equivalent

STARTING DATE
01 May, 2024

ENTRY INTO OPERATION DATE
30 April, 2027

FINANCIAL CLOSE DATE
30 September, 2025

* Calculated vs. the [2021-2025 ETS benchmark](#) of 6.84 tCO₂e/tH₂, not taking into account additional carbon abatement due to substitution effects in the H₂ end use application, i.e. conservative estimate.

RGen4 is developing Europe's first pilot line for recycling solid-state lithium-metal batteries. The project addresses resource constraints (chemicals used) and environmental impact (waste management) to create a cleaner recycling process. It is also pioneering a circular value chain for Lithium-Metal-Polymer (LMP) batteries.

Compared to the reference scenario, RGen4 will avoid 20 447 tonnes of CO₂ equivalent GHG emissions over its first ten years of operation, contributing to the European Green Deal's objectives. It will also be able to recover at least 80% of lithium, which is in line with circular economy principles. The project also

contributes to the objectives of the Net-Zero Industry Act (as a battery recycling project that complements the whole battery value chain), the Battery Regulation (by helping to reach the recycling targets by providing a new technology for lithium recovery), and the European Green Deal (by reducing the carbon footprint at the end-of-life of the battery).

The project will create up to 59 direct jobs and 177 indirect jobs. RGen4 will also contribute to developing the skillset in the battery treatment sector by collaborating with national universities and research institutes to share knowledge and build competencies in battery materials.

| Participants

BLUE SOLUTIONS

France