



INNOVATION FUND

Driving clean innovative technologies towards the market

ReLieVe – Recycling Li-ion Batteries for electric Vehicles

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

All images © ReLieVe



Project summary

The ReLieVe (Recycling of Li-ion Batteries for electric Vehicles) project aims to create an innovative end-to-end, European-based integrated solution for the closed loop recycling of 50 000 tons of end-of-life lithium-ion batteries and production waste from battery manufacturing processes per year. The key project innovations involve combining low-impact mechanical pretreatment with innovative hydrometallurgical refining to produce new battery grade salts. The ReLieVe plant, which is scheduled to enter operation in 2027, will produce high quality recycled metal salts for the production of new batteries in Europe, which is expected to achieve 100% relative greenhouse gas (GHG) emission avoidance compared to the reference scenario.

COORDINATOR

Eramet SA

LOCATION

Dunkirk, France

SECTOR

Manufacturing of components for production of renewable energy or energy storage

GHG EMISSION AVOIDANCE

4.2 Mt CO₂ eq

AMOUNT OF THE INNOVATION FUND GRANT

EUR 67 600 000

RELEVANT COSTS:

EUR 112 599 000

ESTIMATED CAPEX

EUR 269 639 000

STARTING DATE

1 April 2022

PLANNED DATE OF ENTRY INTO OPERATION

1 April 2027

Battery recycling: driving the energy transition

Currently, battery recycling methods lack the capacity to achieve high recovery yields of valuable metals, which are key to Europe's supply chain sovereignty in strategic metals needed for the energy transition. The ReLieVe project offers a new innovative approach to recycle lithium-ion batteries and decarbonise their production. In the first ten years of the plant's operation, the project expects to save around 4.2 Mt of CO₂ equivalent.

Through the Eramet Group's cutting-edge research and development programmes, the project features a number of fundamental innovations and breakthrough technologies that go beyond current technological achievements for the battery-recycling process.

The ReLieVe plant, which is scheduled to enter operation in 2027, will disassemble, discharge and shred used electric vehicle batteries in an upstream unit. The shredded materials will be effectively extracted and separated to recover the solvent, plastics, aluminium, copper, as well as the most valuable metals, such as nickel, cobalt and lithium from the electrode material powder, known as "black mass". In a closed-loop approach, this "black mass" is refined in a downstream unit through hydrometallurgical processes to produce metal salts suitable for new battery production.

Developing the circular economy of battery metals in Europe

The implementation of disruptive projects, such as ReLieVe, is necessary to trigger the emergence of large-scale, efficient and low-carbon recycling solutions in Europe. There is almost no production of nickel, cobalt and lithium in Europe, making several European industry sectors entirely dependent on resources from third countries.

Moreover, the project's solution will fit perfectly with the new requirements of the upcoming EU Regulation on battery manufacturing and recycling, thanks to its efficient and high-performance metal recovery process for all key metals, such as nickel, cobalt and lithium. In practice, the production of recycled metal salts will allow battery producers to include a high percentage of recycled material in their production to meet EU obligations.

Building a strong European battery hub

The ReLieVe project is part of a wider development plan to create a European "battery hub" around the French port of Dunkirk. The hub will help to attract and create synergies with other activities related to the battery industry, such as producers of cathode materials (needed for lithium-ion batteries) and battery manufacturers.

This initiative is a unique opportunity for the European battery value chain to access a secondary source of locally produced raw materials without the current geopolitical and logistical challenges. The first phase of ReLieVe will represent around 10% of the estimated European recycling needs by 2030 and can be easily scaled up as the market continues to grow.

