LIFE GRAPhiREC

Co-funded by the European Union

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NEWSLETTER

LIFE GRAPHIREC



Introducing GRAPhiREC: giving graphite a second life

Welcome to the first issue of the GRAPhiREC Newsletter!

GRAPhiREC is an EU LIFE-funded project that aims to recover high-quality graphite from spent batteries and bring it back into the European battery value chain. With raw materials under geopolitical pressure and demand for batteries surging, graphite recycling can help Europe reinforce its supply chain, reduce environmental impacts, and close the loop on battery materials.

This newsletter offers a snapshot of the project's early progress, insights from our partners, and highlights from recent outreach events.

EMPOWERING EUROPE'S BATTERY RECYCLING INDUSTRY

Empowering Europe's battery recycling industry with 8 partners, a 90% recovery rate, 630 tonnes of recycled graphite, and reducing CO2 emissions by 20% by project completion.

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What is GRAPhiREC?

The GRAPhiREC project – short for Waste GRAPhite RECycling for new lithium and alkaline batteries – is a LIFE-funded initiative that aims to revolutionise the way Europe deals with graphite waste from batteries. With demand for lithium-ion batteries surging across e-mobility, renewable energy, and consumer electronics, the European Union faces a major supply chain challenge: graphite, a critical anode material, is almost entirely imported. GRAPhiREC tackles this issue by pioneering the first EU-wide industrial pilot plants for graphite recycling, with a focus on both lithium and alkaline battery streams.



Two pilot plants form the core of the project – one targeting manufacturing scraps from lithium-ion battery production, and the other treating exhausted black mass from alkaline batteries. These installations will use hydrometallurgical and thermal treatment processes to achieve high-purity recycled graphite fit for reuse in battery production. This approach will not only reduce Europe's dependency on imported raw materials but also cut emissions and support the EU's Circular Economy and Green Deal objectives.

The project brings together a strong consortium of companies, research institutions, battery producers, and industrial associations across Italy, Germany, Sweden, and Belgium. It sets ambitious targets: to recover over 600 tonnes of graphite by the end of the project and scale up to 1,800 tonnes five years later. GRAPhiREC also expects to demonstrate the technical and economic viability of circular graphite recovery and help shape future EU policies on battery waste and critical raw materials.

90%

RECOVERY RATE

of graphite from lithium-ion and alkaline batteries.

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"Recycling graphite to make batteries – so we can recycle graphite again. GRAPhiREC is closing the loop."

Enrico Fiori, ORIM S.R.L.

Highlights from the 4th Technical Working Group – Luleå, Sweden

On 9 April 2025, the GRAPhiREC consortium gathered at TALGA's facility in Luleå, Lapland, for its fourth Technical Working Group (TWG). The in-person meeting enabled meaningful exchanges and included a guided tour of the graphite treatment plant. Discussions centred on the thermal treatment of graphite to enhance its electrochemical properties and maximise recovery efficiency. The visit stimulated new ideas and affirmed the value of face-to-face collaboration.

Key updates included:

- The recovery processes for both lithium-ion battery scraps and alkaline battery waste were reviewed, leading to a first draft of the Basic Design Engineering (BDE).
- UNIVAQ and UNICAM are advancing the characterisation of graphite samples pre- and post-treatment, using TGA, Raman, ICP, PSD, and SEM.
- TALGA and VARTA discussed graphite coating and performance standards required for reintroduction into battery cells.
- Delays in deliverables were flagged (e.g. project website and several milestones), and a timeline amendment may be proposed if input materials and permits are not secured by August 2025.

Developing the pilot plant for alkaline batteries

Following the TWG discussions, SIMA and UNIVAQ are working closely on the development of a pilot plant for graphite recovery from exhausted black mass (EABM) of alkaline batteries. SIMA has opted to produce the EABM in-house, ensuring full process control. A new process flow now includes five reactors (initially two), aiming to balance technical requirements and economic viability.

UNIVAQ is leading purification process optimisation to meet the specifications outlined in the project deliverables. Meanwhile, discussions with VARTA Consumer continue on acceptable impurity thresholds to make leaching less environmentally demanding. The pilot plant will build on lessons from the FENIX project, with recovery rates of 90% and graphite purity at 99.5% already achieved in lab-scale trials.

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Great news from the University of Camerino!

UNICAM, a partner of the LIFE GRAPhiREC project and active in WP4, is advancing the chemical and electrochemical characterisation of recycled graphite samples for lithium-ion batteries.

Preliminary results are promising: the recycled graphite retains a high degree of structural ordering and controlled morphology, making it a strong candidate for reuse in new battery cells.

The purification steps developed by UNIVAQ have also proven valuable, effectively removing metallic impurities from the samples and enhancing performance in terms of specific capacity and capacity retention. In particular, metal leaching treatments have shown their importance in eliminating transition metals, which helps reduce the risk of lithium plating and improves charge/discharge behaviour.

These and other key results will be presented and discussed at the next Technical Working Group meeting in July.



GRAPhiREC at Benchmark Giga Europe 2025

The GRAPhiREC project was presented at Benchmark Giga Europe 2025, a premier event addressing Europe's battery value chain. ECGA members from Talga, Tokai COBEX, and Phillips 66 joined expert panels to reinforce the message that securing local graphite supply – both natural and synthetic – is critical for battery sovereignty.

GRAPhiREC's contribution to battery circularity and innovation attracted attention during discussions on next-generation battery materials and sustainable production. Its presence at the event highlighted the importance of investing in European recycling capabilities to mitigate supply risks and improve circularity in battery raw materials.

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ECGA Members' Meetings – Brussels, April 2025

The project was also promoted during the ECGA Members' Meetings in Brussels in April. These regular gatherings of Europe's leading carbon and graphite producers offer a unique chance to inform strategic stakeholders and ensure alignment with industry goals.

Presenting GRAPhiREC in this context helped strengthen partner engagement, showcase innovation within the sector, and position the project as a model of responsible resource use. These meetings also ensure that project progress is visible to policymakers, raw material associations, and potential multipliers within the industry.





Tools to share: GRAPhiREC video and publication

GRAPhiREC has released two new communication tools to raise awareness and make the project's story accessible to a wide audience:
Project Video – A dynamic 2-minute introduction to the project's motivation, technology and expected impact.
Watch and share it here

Project Publication – A short, visually engaging brochure outlining the project's structure, partners, and ambition.
Download here
We invite you to share both tools within your networks, on LinkedIn, and at relevant events.

Where to find us next

Graz Battery Days 2025 (Graz, Austria, 26 – 28 May 2025)

The topic of the event ***"A Sustainable Battery Value Chain as Competitive Advantage for European Economy?"*** is perfectly in line with GRAPhiREC's project goals of establishing an EU-supply-chain based on recycled Graphite. Thus, GRAPhiREC will be featured at this high-level industry-academic event focused on battery research, innovation and industrialisation.

It provides a valuable opportunity to connect with stakeholders working on battery manufacturing, cell design, and sustainability. Showcasing GRAPhiREC here helps underline the project's relevance in real-world battery applications.



Carbon 2025 (Saint-Malo, France, 29 June – 4 July 2025)

This major international conference on carbon materials will provide a platform for GRAPhiREC to share technical insights from its graphite purification work. With attendees from academia and industry, the event is a great opportunity to demonstrate that recycled graphite can match demanding battery-grade specifications. It also opens new channels for collaboration in the carbon science community.

Carbon 2025

Carbon 2025

The World Conference on Carbon

Saint-Malo, Palais du Grand Large
June 29th – July 4th

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Follow us on LinkedIn to stay up to date on our technical progress, results, and upcoming events. We'll also be sharing behind-the-scenes updates from our pilot plants and technical working groups.

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