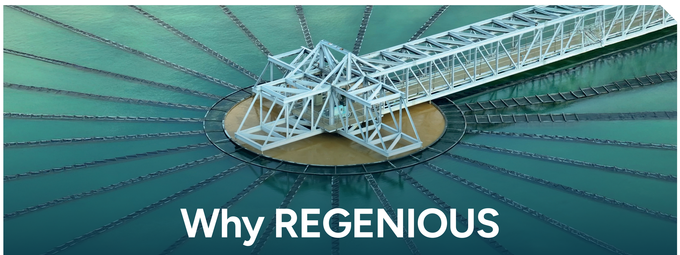
REGENIOUS

RETHINKING THE REGENERATION OF SPENT GRANULAR ACTIVATED CARBON:

first-of-a-kind portable plant for an Industrialised on-site electrochemical regeneration of ubiquitous spent granular activated carbon (GAC)



Why REGENIOUS

REGENIOUS is an EU-funded project developing a portable and modular electrochemical regeneration technology for spent granular activated carbon (GAC), enabling on-site regeneration while reducing energy use, greenhouse gas emissions, transport and waste.

REGENIOUS will also develop predictive tools for GAC lifetime, new indicators for Electrochemical regeneration (ER) performance and proof-of-concept second-life applications for exhausted activated carbon in construction and agriculture. Sustainability assessments, business models, and exploitation strategies will support market uptake and replication across sectors such as food, chemical, and textile industries. By reducing greenhouse gas (GHG) emissions compared to thermal regeneration, REGENIOUS supports the EU Green Deal, the Circular Economy Action Plan, and the Processes4Planet partnership, paving the way for a climate-neutral, circular and competitive European industry.



Our Ambition

- Replace heat-driven regeneration with a more sustainable, energy-efficient, and cost-effective electrochemical technology.
- Refine and scale up the technology into a portable and modular system for on-site regeneration at end-user facilities.
- Develop new indicators for activated carbon characterization performance and pollutant-removal capacity.
- Create predictive tools for activated carbon lifetime and maintenance.
- Explore second-life applications for exhausted activated carbon in agriculture and construction.

REGENIOUS Methodology

- Optimize electrochemical regeneration (ER) technology by using spent carbons from Drinking Water Treatment Plants (DWTP) and Wastewater Treatment Plants (WWTP) across Europe.
- Scale up the technology to a portable and modular full-scale system for on-site regeneration, integrating digital controls, predictive maintenance, electrolyte management and renewable energy.
- Validate the technology in real operational environments at pilot and full scale in drinking water and wastewater treatment plants, as well as in other industrial applications.
- Deliver sustainability and exploitation outcomes, including predictive tools for AC lifetime, environmental, economic and social assessments, proof-of-concept applications of exhausted activated carbon in pavement materials and fertilisers, and market and regulatory roadmaps.

Demonstration campaigns



DEMONSTRATION

Full-scale demonstration of the portable ER system at three drinking water treatment plants.

Location: **Spain**



DEMONSTRATION

Pilot-scale validation using GAC from wastewater treatment and odour-control applications.

Location: **Cyprus**



REPLICATOR

Assessment of replication potential for wastewater treatment applications.

Location: **Germany**



REPLICATOR

Assessment of replication potential in drinking water treatment and chemical industry.

Location: **Portugal**

ABOUT REGENIOUS

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regenious-project

START DATE	01/06/2026
END DATE	31/05/2030
DURATION	48 months
TOTAL BUDGET	€10,071,705.00
EU CONTRIBUTION	€8,425,106.26

Project coordinator:	ENVIROHEMP
Consortium:	16 partners from 6 countries (Spain, Cyprus, Germany, Portugal, Belgium and Egypt)
Call:	HORIZON-CL4-2025-01
Topic:	HORIZON-CL4-INDUSTRY-2025-01-TWIN-TRANSITION-31
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