

Frequently Asked Questions (FAQ)

For use in Citizen Dialogues

1 What is the FIC-Fighters project?

FIC-Fighters is an EU-funded project that develops innovative and sustainable solutions for recycling phosphogypsum (PG), a by-product of the phosphate fertiliser industry. Instead of treating PG as waste, the project will demonstrate how it can become a valuable raw material for products such as construction materials, fertilisers, and detergents.

2 Why is phosphogypsum a problem?

Phosphogypsum is produced in large quantities during fertiliser production. In Europe alone, millions of tonnes are stored in open-air stacks or ponds. These deposits take up land, may contain impurities, and pose environmental and safety concerns.

3 What solutions does the project propose?

FIC-Fighters will demonstrate two solutions for recycling phosphogypsum:

- The first process, the **Sodium Hydroxide Route**, uses sodium hydroxide waste from the aluminium industry to convert phosphogypsum into pure sodium sulfate and katoite (calcium aluminium silicate hydrate) under ambient conditions. Once katoite is obtained, gaseous CO₂ is introduced to produce aluminium hydroxide and calcite (calcium carbonate). These products can be applied in the paper, detergent, and construction industries. This route is patented by the Spanish company CapturaCO₂, S.L., which is a partner in the FIC-Fighters project.
- The second process, the **Ammonia Route**, involves using ammonia and CO₂ gases to convert phosphogypsum into pure ammonium sulfate and calcium carbonate, which are also widely used in agriculture as well as in the paper, detergent, and construction industries. In addition, this process has the potential to recover phosphorus and Rare Earth Elements (REEs), Critical Raw Materials (CRMs) essential for producing batteries and other technologies needed for the energy transition.

Both solutions aim to reduce waste, cut carbon emissions, and create new market opportunities.

4 What are the expected benefits?

- **Environmental:** Reduction of waste volumes and greenhouse gas emissions as well as restoration of land occupied by PG ponds.
- **Economic:** Creation of new business models and opportunities in the circular economy.
- **Policy impact:** Evidence-based recommendations for European waste management and circular economy regulations.
- **Social:** Cleaner cities, safer environments, and community involvement in sustainable practices.

5 What are the case studies, and why are they important?

The project is studying **six phosphogypsum sites** across Europe:

- Barreiro (Portugal)
- Kutina – DEFOS (Croatia)
- Prahovo (Serbia)
- Turnu Magurele (Romania)
- Veles (North Macedonia)
- Cartagena (Spain)

Each site provides unique conditions (e.g. market opportunities, environmental standards, local policies) that help test different valorisation approaches. Insights from these studies will feed into the **Phosphogypsum Exploitation Portal (PEPE)** to ensure replicability elsewhere in Europe.

6 What is the Phosphogypsum Exploitation Portal (PEPE)?

PEPE will be an online platform collecting research results, best practices, case study insights, and guidelines. It will be freely accessible to policymakers, businesses, researchers, and the public, making it easier to apply the project's findings across Europe.

7 How does the project engage with citizens?

Citizen dialogues are a central part of the project. They allow communities near PG sites and the broader public to:

- Learn about the risks and opportunities of PG recycling.
- Share concerns and ideas.
- Contribute to shaping sustainable solutions.

8 What role does policy play in this project?

FIC-Fighters does not only develop technologies but will also provide **policy recommendations** to help EU and national authorities adopt circular economy practices for industrial waste. The aim is to influence regulation in waste management, urban sustainability, and resource recovery.

9 How does the project ensure safety and compliance?

All solutions are tested against European standards for safety, quality, and environmental impact.

10 How does FIC-Fighters contribute to the EU Green Deal?

By turning industrial waste into valuable resources, the project contributes to:

- **Circular economy objectives** (keeping resources in use for longer and creating job opportunities).
- **Zero-pollution goals** (reducing harmful emissions).
- **Sustainable urban development** (cleaner, safer cities).

11 Who is involved in the project?

FIC-Fighters brings together universities, research institutes, industry partners, municipalities, and NGOs from across Europe. Each partner contributes expertise in waste valorisation, environmental protection, business development, or community engagement.

12 What will happen after the project ends?

The project aims to leave behind:

- A tested set of recycling solutions.
- A Community of Practice (CoP) for ongoing knowledge exchange.
- The PEPE portal as a lasting resource.
- Policy and industry recommendations that can be scaled across Europe.

13 More information

- Please visit our website at fic-fighters.eu
- Watch the introductory video at <https://youtu.be/7P0bWxS7w9g?si=syczlF4cZ78euB7L>
- Follow us on LinkedIn, BlueSky, and Instagram: @FICfighters.

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