

# FROM SEWAGE SLUDGE TO PRODUCTS FOR THE INDUSTRY



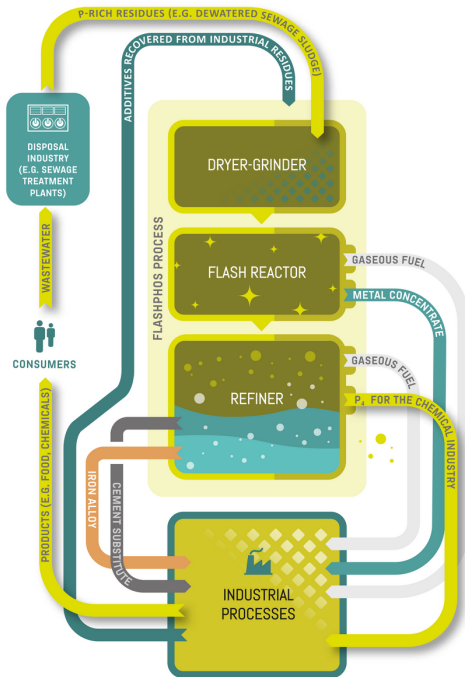
## About

The European Union is largely dependent on imports of white phosphorus ( $P_4$ ), a critical raw material, e.g. for electronics, food and pharmaceutical industries. To tackle this challenge, the four-year EU-funded project FlashPhos will recover at a large scale high-quality white phosphorus and other raw materials using sewage sludge as input material. These raw materials have strategic applications for the European chemical, metal, and cement industry.

## Our vision

FlashPhos is the first process in the world to sustainably produce white phosphorus for the chemical industry in a full circular economy model, surpassing the quality of white phosphorus on the market today.

## Concept



The award-winning FlashPhos process is a high temperature fast reacting (flash) entrained flow gasification of dried and ground sewage sludge and other phosphorus-rich waste streams such as meat-and-bone meal.

The inorganic waste components are melted and the contaminants evaporated. The slag is then separated in a refiner reactor to produce recycled  $P_4$  as the main product. Other output materials of the process are a climate-friendly cement substitute, an iron alloy and a heavy metal concentrate as valuable outputs for the metal industry.

In the gasification, the organic components are converted into heat and a gaseous fuel. This gas and excess heat can be used to substitute fossil fuels.

Consequently, several valuable raw materials will be produced by the innovative and cost-efficient FlashPhos process without generating solid waste.

## Future Impact

During the four-year innovation action, we will demonstrate the industrial FlashPhos process in a pilot plant with up to 250 kg/h dried sewage sludge throughput. After demonstrating the process with the pilot plant, structured action will start to form the necessary industrial consortiums, to develop and build the first full-scale production unit.

## Until 2040



15 FlashPhos plants in operation



Creation of new P-containing products in a fully circular approach



Recycling of 15% of the EU's sewage sludge



Substitution of 50% of  $P_4$  needed in Europe

## Partnership



## Coordination

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