

A VITAL ELEMENT

Phosphorus is essential for all biological life. It can neither be substituted nor synthesised. To put it simply, phosphorus is a bottleneck of life on Earth.

To grow the food we need today, we have to rely on phosphate fertilisers and feed stocks produced by mining rocks with high concentrations of phosphorus minerals. In Europe, we depend on imports for more than 90 percent of our needs. But as the global population grows, so does the competition for such essential resources. We need to prepare for this future and secure our supply.

CRITICAL FOR EU'S FOOD SUPPLY AND ECONOMY

Most of Europe's phosphorus imports are mined in regions with fluctuating political stability, thus raising the worrying prospects of supply problems plus unstable prices.

Securing a reliable source of phosphorus is thus essential to safeguard our food supply. And if this vital role were not enough, the EU has also added phosphorus to its Critical Raw Materials list, thus reflecting its importance for our economic well-being as well. Fortunately, a sustainable solution is now at hand.

CIRCULAR SOLUTION READY FOR MARKET UPTAKE

EasyMining's patented Ash2Phos process extracts more than 90 percent of the phosphorus present in incinerated sewage sludge ash. It's a truly circular method whose quality, volumes and reliability meet commercial uptake demands. The first full-scale plant in Schkopau, Germany, is projected to treat 30,000 tons of ash per year.



Ash2Phos produces high-grade calcium phosphate from sewage sludge ash.

ADVANTAGES OF ASH2™ PHOS

Ash2Phos produces large market volumes of safe domestic phosphorus from sewage sludge ash. It also avoids spreading toxic cadmium via fertiliser produced from mined phosphorus.



Reduces import dependency for an essential and critical element. Greater food security for society.



Over 90% recovery of phosphorus plus other valuable commercial-grade chemicals.



Utilises more than 95% of the ash.



Output product quality (P, Fe, Al) is independent of input ash quality. High flexibility for incinerator operators.



Efficient heavy metal separation detoxifies the nutrient cycle.



Process aligns with EU strategic goals and future legislation for phosphorus recovery and supply.



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The Ash2™-Plus process is developed and patented by EasyMining Sweden AB.



ASH2™ PHOS

FROM SEWAGE SLUDGE ASH TO HIGH-GRADE PHOSPHATES

WHAT IS ASH2™ PHOS?

Ash from mono-incinerated sewage sludge obtained from wastewater treatment plants contains high concentrations of phosphorus as well as other valuable resources such as iron and aluminium. Ash2Phos transforms this ash into a raw material for phosphorus extraction, thereby forming a key part of a circular solution for phosphorus management. Waste reduction is typically greater than 95%.

HOW DOES IT WORK?

The process comprises three steps: a first acidic step, a second alkaline step (where intermediate products are produced), and a final conversion step where the intermediates are processed into final products. Typical recoveries are 90–95% phosphorus, 60–80% aluminium and 10–20% iron.

These successive chemical reactions not only extract the elements of interest as clean, well-defined commercial products, they also separate out unwanted and potentially harmful elements, e.g. cadmium, for safe disposal. Note that the quality of the final products is independent of treatment plant ash quality.

The high-grade phosphorus (purity greater than 98%) extracted by Ash2Phos is converted into a pure, non-crystalline calcium phosphate designated RevoCaP. This can be used as slow-release fertiliser, animal feed phosphate or further processed into conventional fertilisers. Co-products are ferric chloride, aluminium chemicals and sand fraction.



SCALABLE TO MARKET VOLUMES

EasyMining's Ash2Phos process is scalable to different production volumes. The first full-scale plant in Schkopau, Germany, our joint-venture with Gelsenwasser AG, is projected to treat 30,000 tons of ash per year, which will generate 15,000 tons of calcium phosphate.

FUTURE COMPLIANCE WITH EU STRATEGIES

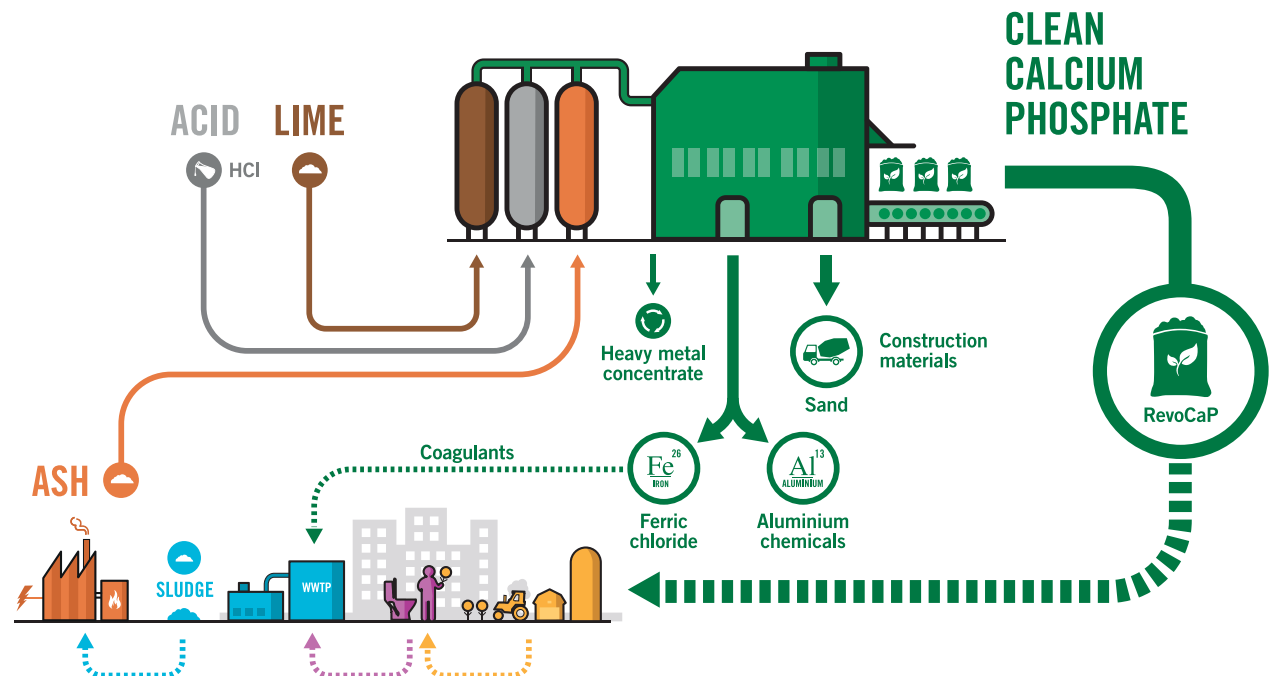
Ash2Phos is well-aligned with key strategic directions for phosphorus recovery now being outlined by the EU. For example, the process will help operators comply with coming regulations already in discussion and meet targets set by the EU taxonomy and zero pollution initiatives to increase the sustainability of our overall nutrient management.

CLEAN PHOSPHORUS 2029



The Clean Phosphorus 2029 (Sauberer Phosphor 2029) initiative champions phosphorus recovery and recycling processes that are environmentally friendly and sustainable. Phosphorgewinnung Schkopau GmbH (PGS), formed by Gelsenwasser and EasyMining to build the world's first full-scale Ash2Phos plant, is one of the initiative's founders.

ASH2PHOS EXTRACTS OVER 90% OF THE PHOSPHORUS PRESENT IN SEWAGE SLUDGE ASH IN A CIRCULAR SUSTAINABLE PROCESS



CALCIUM PHOSPHATE



RevoCaP™

CO-PRODUCTS



Aluminium chemicals



Ferric chloride



Sand fraction