

TRAINING MATERIAL

Title:

Technology for P recovery as calcium-phosphate starting from sewage sludge ashes with “Ash2Phos” process

Training:

What is the product/technology?

EasyMining is focused on creating circular material flows from waste. Via the food cycle, phosphorus ends up in sewage sludge. Incineration of this sludge is today mainly used as a method to reduce the amount of waste to land fill, or destruction if the sludge quality is too low for other uses. The phosphorus content of ash from incinerated sewage sludge is high. EasyMining’s Ash2Phos technology extracts phosphorus and other resources from the incinerated sewage sludge.

Who is the vendor of the product/technology

EasyMining is an innovation company dedicated to closing nutrient cycles. EasyMining is passionate about inventing new technology that uses intelligent chemical solutions to close nutrient cycles. Our objective is to create new circular material flows in an efficient commercial way. EasyMining Sweden was founded in 2007. They are owned by the Swedish environmental company Ragn-Sells.

Which other product/technology are provided by the vendor?

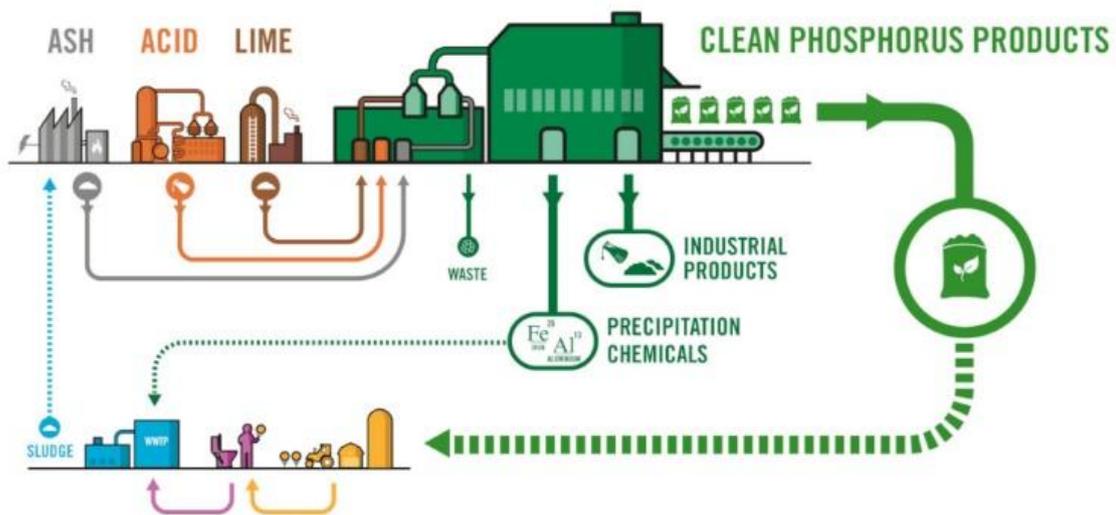
- CleanMAP: this technology extracts ammonium phosphate from mining waste or other sources.
- Ash2Salt: this technology extracts commercial salts from high chloride containing fly ashes.
- Nitrogen Removal Process: this process enables efficient removal and recovery of ammonium from aqueous flows.

Features of the technology

The Ash2Phos process can transform the sludge ash into raw material for phosphorus extraction and thereby be a part of a circular solution for phosphorus management. The process consists of 3 sequential steps: a first acidic step, a second alkaline step (where intermediate products are produced), and finally a conversion step where the intermediates are processed into final products. The process consists of several successive chemical reactions undertaken at room temperature (though one process step may benefit from a temperature of 40°C). There is no need for pressurized vessels or for exceptional materials to be used for the equipment. The mass balance of the process is favourable, since all input chemicals become part of the products.

Which are the advantages of the product and the problems addressed?

- Clean phosphorus products (< 1 mg Cd/kg P)
- Low energy consumption: 30 kton ash plant requires energy equivalent to approximately 80 households
- Favourable mass balance
- More than 90% recovery rate of P from ash
- Can use waste acid from incineration plants
- Low labor intensity
- Recovery of iron & aluminium as precipitation chemicals



Which are the authority permits and in which EU countries? How much does it cost?

Pilots are running in Sweden (Helsingborg and Uppsala, 600 and 50 kg ash per day). Permit application is ongoing for the full scale plant in Sweden (30000 ton ash per year) and Germany (ChemPark Bitterfeld-Wolfen, 60000-90000 ton ash per year). In 2023, 13,000 t/a precipitated calcium phosphate (from 30,000 t ash) will be produced. In 2023, 13,000 t/a PCP (from 30,000 t ash) will be produced.

For more information: https://nutriman.net/farmer-platform/technology/id_317