

RAGN SELLS

Part of the Eco-Cycle



Over 100 sites
Approx. 2300 employees
Annual sales SEK 4.5 billion
5 million tons of waste



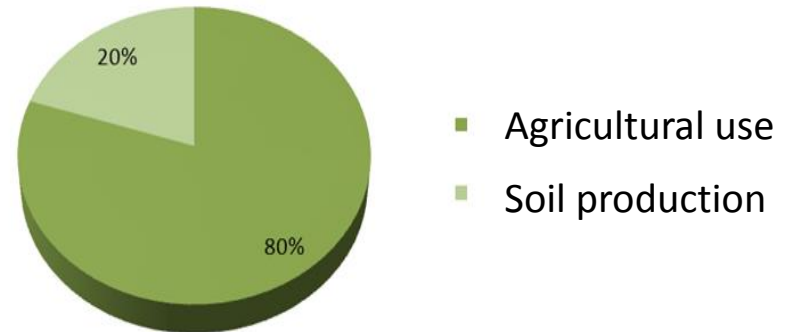
Ragn-Sells is a privately held corporate group operating companies in six countries
Since 1966, we have been involved in waste management, environmental services and recycling

SEWAGE SLUDGE

Ragn-Sells handling about 200 000 tonnes of sewage sludge per year

- Recycling on agricultural land 80%
- Soil production 20%

All sewage sludge is not suitable for direct recycling on agricultural land e.g when the content of heavy metals is too high.



SUSTAINABLE SEWAGE SLUDGE INCINERATION

Extraction of phosphorus from ashes

- As a complement to traditional agricultural use and to achieve an increased recycling of phosphorus from sewage sludge. Ragn-sells has created a concept for sustainable sludge incineration in which the energy demanding sludge drying is omitted and where phosphorus is extracted from the ash.
- Sewage sludge is mixed with dry wood fuels and combusted in existing biofuel incinerators. Phosphorus is then extracted from the ash using a patented method developed by EasyMining Sweden AB.
- Ash is dissolved in acid thereafter phosphorus, iron, aluminum etc. is extracted. Phosphorus is either extracted as ammonium phosphate (fertilizer) or as calcium phosphate (feed phosphates). The phosphate products are pure and well defined. Iron and aluminum is recovered as precipitation chemicals. Heavy metals are separated for disposal.

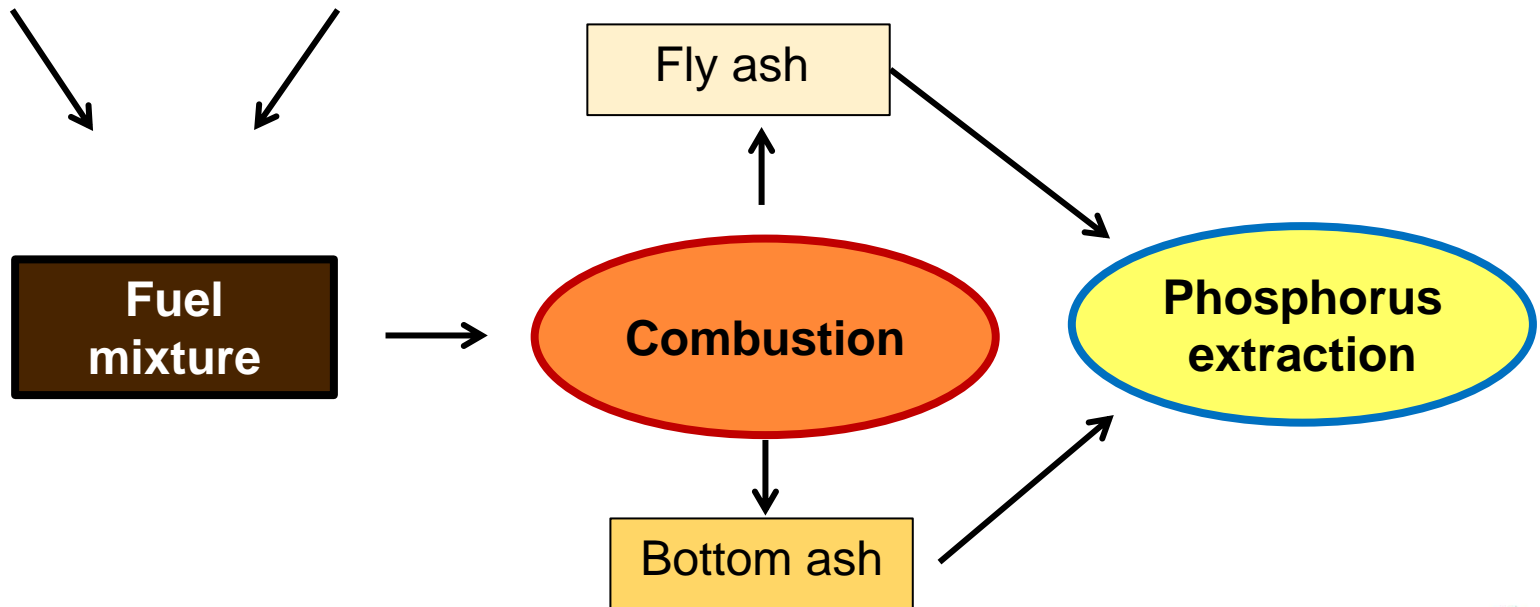
SUSTAINABLE SEWAGE SLUDGE INCINERATION

Extraction of phosphorus from ashes

- Ragn-Sells predict that more sewage sludge will be incinerated due to stricter legislation etc. in Sweden.
- Today only 2-5 % are incinerated.
- In western Europe combustion of sewage sludge are a common method. For example; Copenhagen has three incinerators for only sewage sludge.

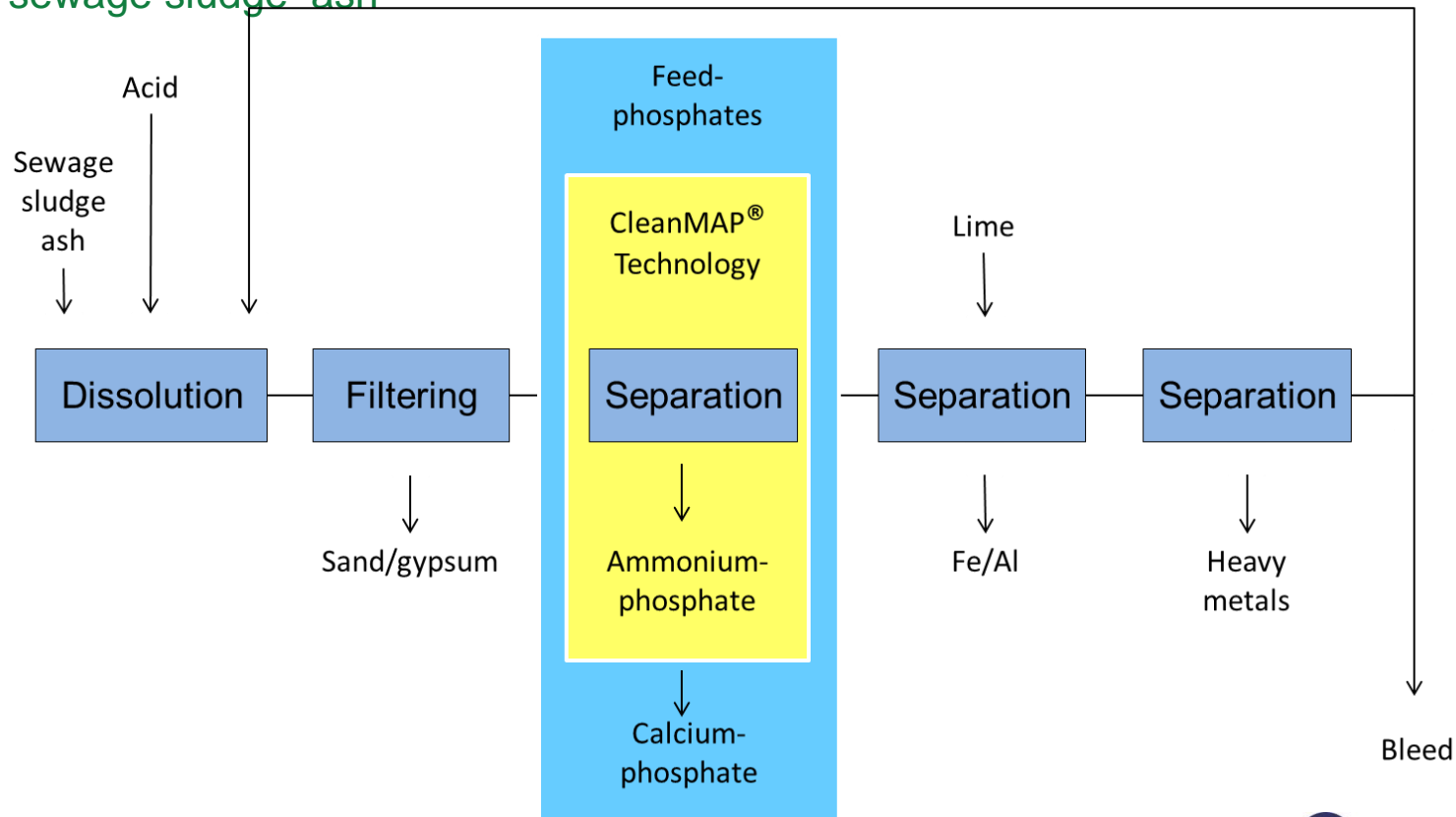
SUSTAINABLE SEWAGE SLUDGE INCINERATION

The process



EXTRACTION OF PHOSPHORUS

Schematic description of EasyMinings process for sewage sludge ash



THANKS FOR LISTENING

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