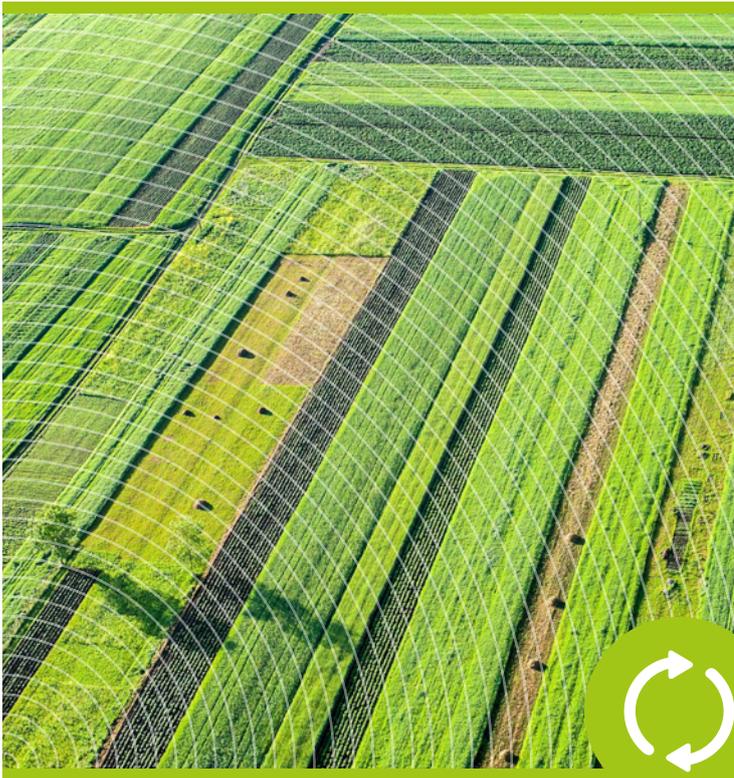




Phosphogreen

recycle phosphorus from effluent to produce a valuable fertilizer

○ municipal / industrial wastewater



up to 90 % recovery of phosphorus from phosphorus-rich effluents

○ **Phosphogreen**

is a process that recovers phosphorus from wastewater and converts it into an agricultural fertilizer: struvite.

○ In wastewater treatment, **Phosphogreen** is used in treatment plants larger than 40,000 PE, with a biological phosphorus removal and anaerobic digestion.

○ **Partner**

Grundfos



production of a **recoverable fertilizer** and **revenue generation**



operational savings on chemicals, energy, maintenance and sludge disposal



ROI from 5 to 10 years

did you know?

- 75% of phosphorus comes from ore extraction. Phosphorus is a non renewable resource, without alternative solution. Depletion is foreseen in 100 years from now.
- Deposits are unequally distributed throughout the world and are sources of important geopolitical issues.
- The European Commission has classified phosphorus among the 20 "critical materials".
- 20% of fertilizer production could be ensured by the recovery of phosphorus from human activity (urine + faeces).



Phosphogreen technology . . .

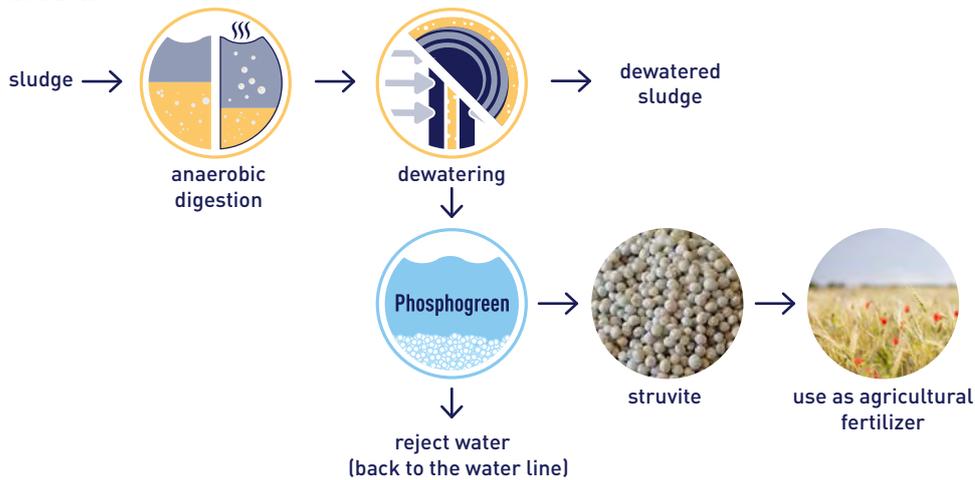
Phosphogreen is a phosphorus recovery process based on a precipitation-crystallization reaction.

Phosphorus is recovered from phosphorus-rich effluents. They are introduced into the Phosphogreen reactor where carbon dioxide is degased by air injection. The pH is measured and adjusted if necessary, by adding sodium hydroxide to optimize the reaction conditions.

The heart of the process consists in injecting magnesium chloride to obtain precipitation-crystallization of struvite. Struvite is then extracted at the bottom of the reactor, washed, drained and dried before being packaged.

The minimum phosphorus concentration in the effluent for the technical and economic viability of the process is 70 mg/l. It is therefore often necessary to have a biological phosphorus removal on the water line.

example of application



. . . what it can do for you

financial revenue



- commercialization of struvite as fertilizer generates revenue
- return on investment: 5 to 10 years



savings on several levels

- reduction of chemicals consumption for phosphorus physicochemical treatment
- less energy consumed for biological treatment (removal of a part of nitrogen by struvite precipitation)
- increase of equipment service life thanks to controlled and localized precipitation of struvite
- reduction of sludge disposal costs by minimization of sludge volumes

a sign of commitment for sustainable development



- resource recycling (phosphorus, nitrogen): contribution to the circular economy
- lower environmental footprint through energy savings, sludge volume reduction, increased equipment service life, reduced chemical consumption

among our references

Villiers-Saint-Frédéric, France
capacity: 42,000 PE

Sausheim-Mulhouse, France
capacity: 490,000 PE

SUEZ treatment infrastructures

contact: **Mathieu Delahaye**

innovation.mailin@degremont.com

www.suez.com