



European Sustainable
Phosphorus Platform



This project has received funding
from the EU Horizon 2020
research and innovation
programme under grant
agreement No. 690323



SMART-Plant

ECOMONDO
THE GREEN TECHNOLOGIES EXPO

22^a Fiera internazionale
del recupero di materia ed energia
e dello sviluppo sostenibile

Green & Circular Economy
6-9 Novembre 2018
Rimini Italy

IN CONTEMPORANEA CON
KEY ENERGY

Sludge incineration and phosphorus recovery by AshDec process

Dr. Tanja Schaaf – Outotec

3rd EUROPEAN NUTRIENT EVENT @ ECOMONDO 2018

8 - 9 November 2018, Rimini, Italy

www.smart-plant.eu/ENE3





European Sustainable
Phosphorus Platform



This project has received funding
from the EU Horizon 2020
research and innovation
programme under grant
agreement No. 690323



SMART-Plant

Italian Phosphorus
Platform

75
ANNI

GRUPPO
HERA

ECOMONDO
THE GREEN TECHNOLOGIES EXPO

Green & Circular Economy

6-9 Novembre 2018
Rimini Italy

22: Fiera Internazionale
del recupero di materia ed energia
e dello sviluppo sostenibile

IN CONTROSPAZIO.COM
KEY ENERGY



Facts and numbers in canton Zürich

- 100 000 t/a sludge formation with 20-40% DM in more than 70 waste water treatment plants
- 70 000 t/a sludge needs to be transported
- Approx. 1.3 Mio ton kilometers per year





European Sustainable
Phosphorus Platform



This project has received funding
from the EU Horizon 2020
research and innovation
programme under grant
agreement No. 690323



SMART-Plant

Italian Phosphorus
Platform

75
ANNI

GRUPPO
HERA

ECOMONDO
THE GREEN TECHNOLOGIES EXPO

Green & Circular Economy
6-9 Novembre 2018
Rimini Italy

22^a Fiera Internazionale
del recupero di materia ed energia
e dello sviluppo sostenibile

IN CONTEMPORANEA CON
KEY ENERGY

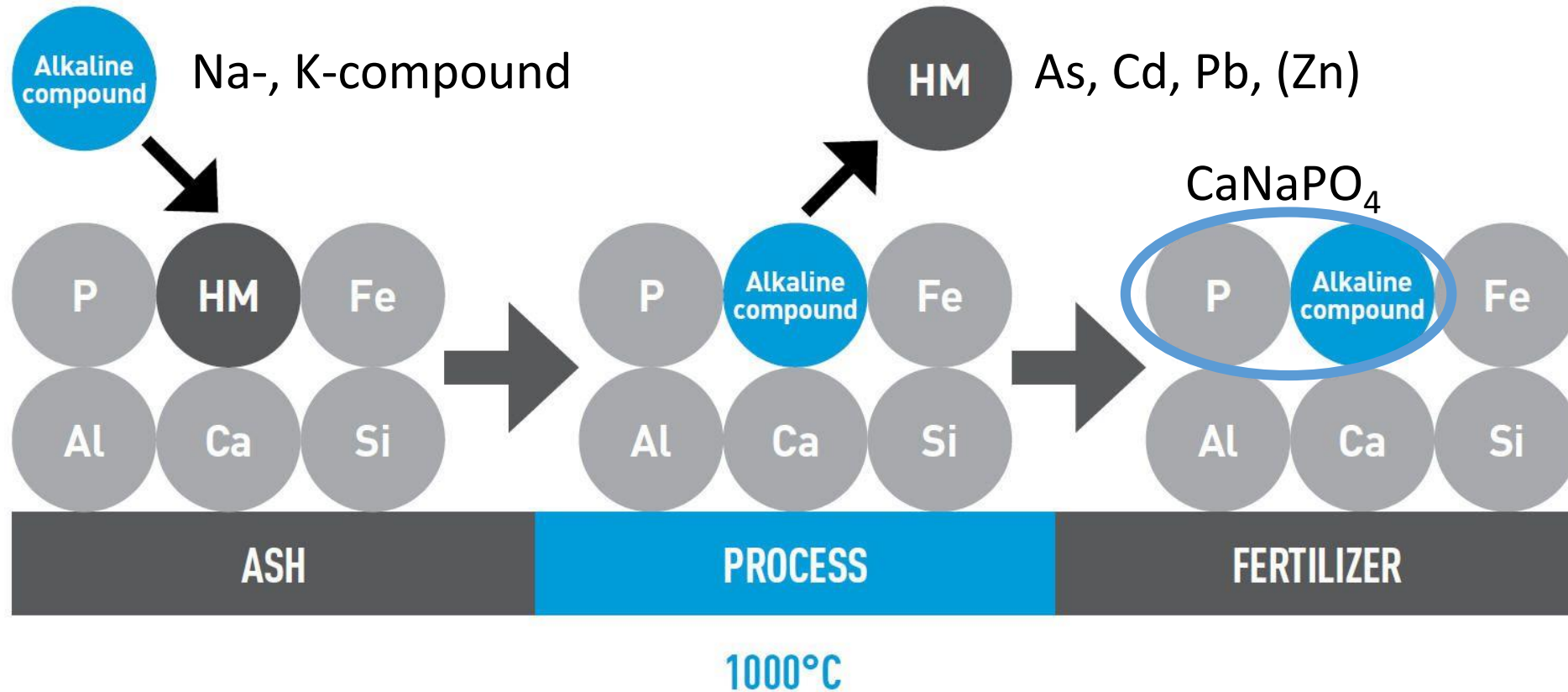


Sewage sludge utilization plant in Zürich





P-Recycling – AshDec Process



Field test (P-REX 2014) - crop yield

Variant	Germany		Chech Republic	
	Sugar	Maize	Sugar	Maize
Control	100 %	100 %	100 %	100 %
TSP	93 %	111 %	80 %	118 %
AshDec	102 %	111 %	102 %	120 %
AirPrex	102 %	127 %	98 %	128 %
Leachphos	102 %	117 %	98 %	139 %
Stuttgart	103 %	111 %	-	-

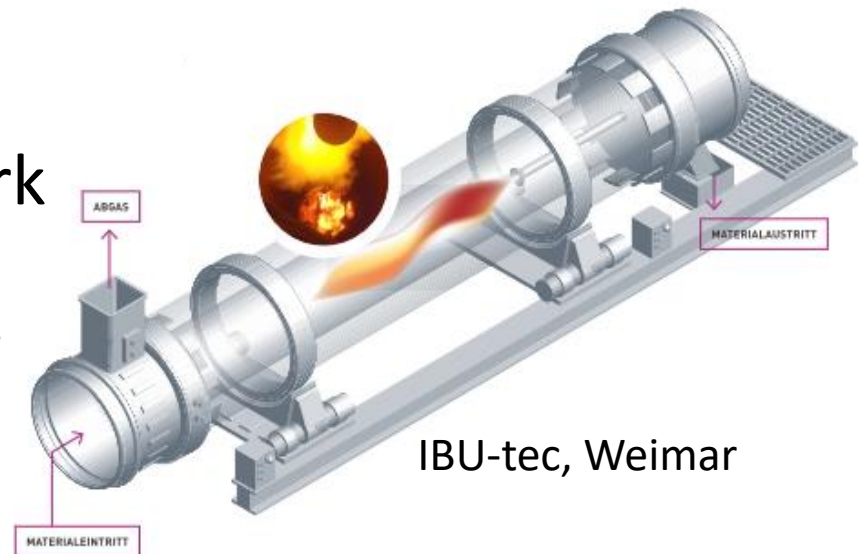




Pilot test work October 2018 (Outotec/BAM)

In the framework of funded project CLOOP*

- Batch test work for process parameter optimizing
- Production of 1,5 t AshDec product
- Temperature: 850 – 1000 °C
- Additive: Natrium-Carbonate
- P_{NAC} extraction + P-Analysis during the test work (3-4 hours between sampling and P_{NAC} result)
→ fast possibility to adjust process parameters



Target

- $P_{NAC} \sim 80 \%$
- Stable conditions during the continuously running

Results

- P_{NAC} - very low variation even with process parameter variation
- **PNAC solubility significantly above 80 %**



Sludge incineration Zürich

- Successful in operation since 2015

AshDec

- Thermochemical process with alkaline compound
- Low residue amount
- Possible integration to incineration plant

- P recovery > 95 %
- $P_{NAC} > 80 \%$

