



P-REX

The P-REX Policy Brief:

Phosphorus Recycling - now!

Building on full-scale practical experiences to
tap the potential in European municipal wastewater

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PHOSPHORUS RECYCLING
FROM PROTOTYPE TO MARKET



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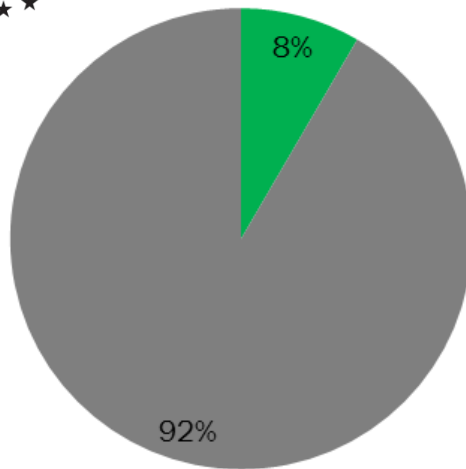


Phosphorus

- Critical Raw Material
- Demand relies on fossil resources
- geopolitically sensitive
- non-substitutable
- Bottleneck for for fertiliser and food supply

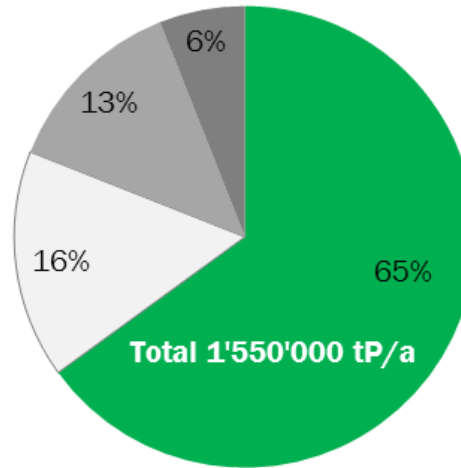


Supply*



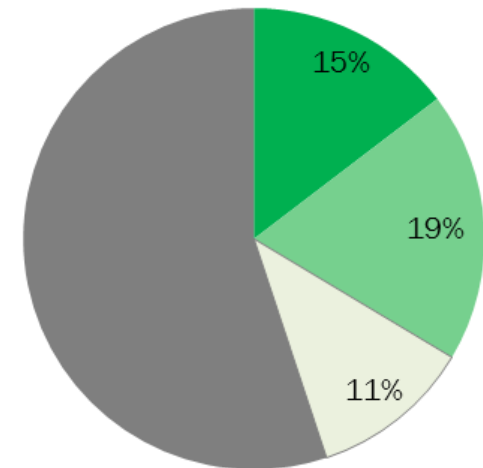
- European fossil P production
- Import

Demand*



- Fertiliser
- Feed additives
- Detergents and soaps
- Other

Recovery potential*



- Municipal sewage sludge
- Slaughterhouse waste
- Food-waste (household and retail)
- Demand uncovered

*of mineral phosphorus in Europe, in comparison to total phosphorus demand 1'550'000 tP/a

What would change

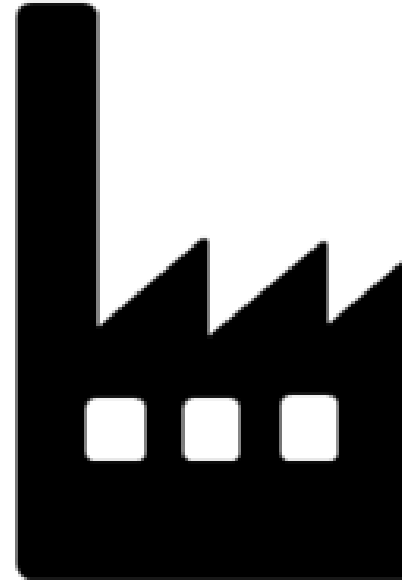
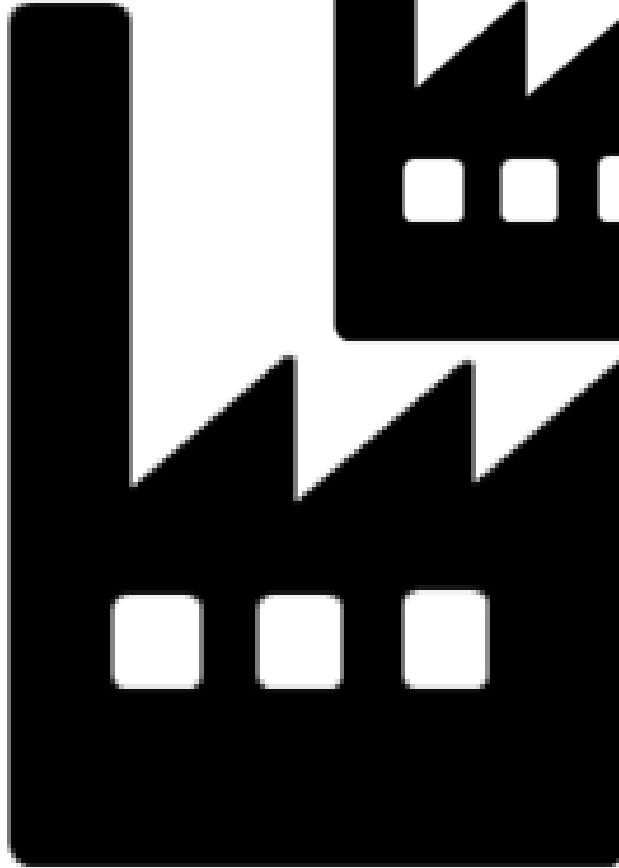
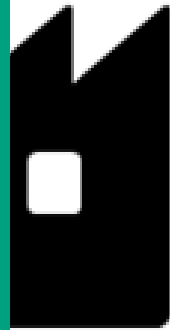
if phosphorus from wastewater stream would be recovered?



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Today

- 5-7 large industrial phosphorus fertiliser producers control the market
- > 50'000 tP/a
- identical starting materials (P-rock)
- starting and end – materials are products



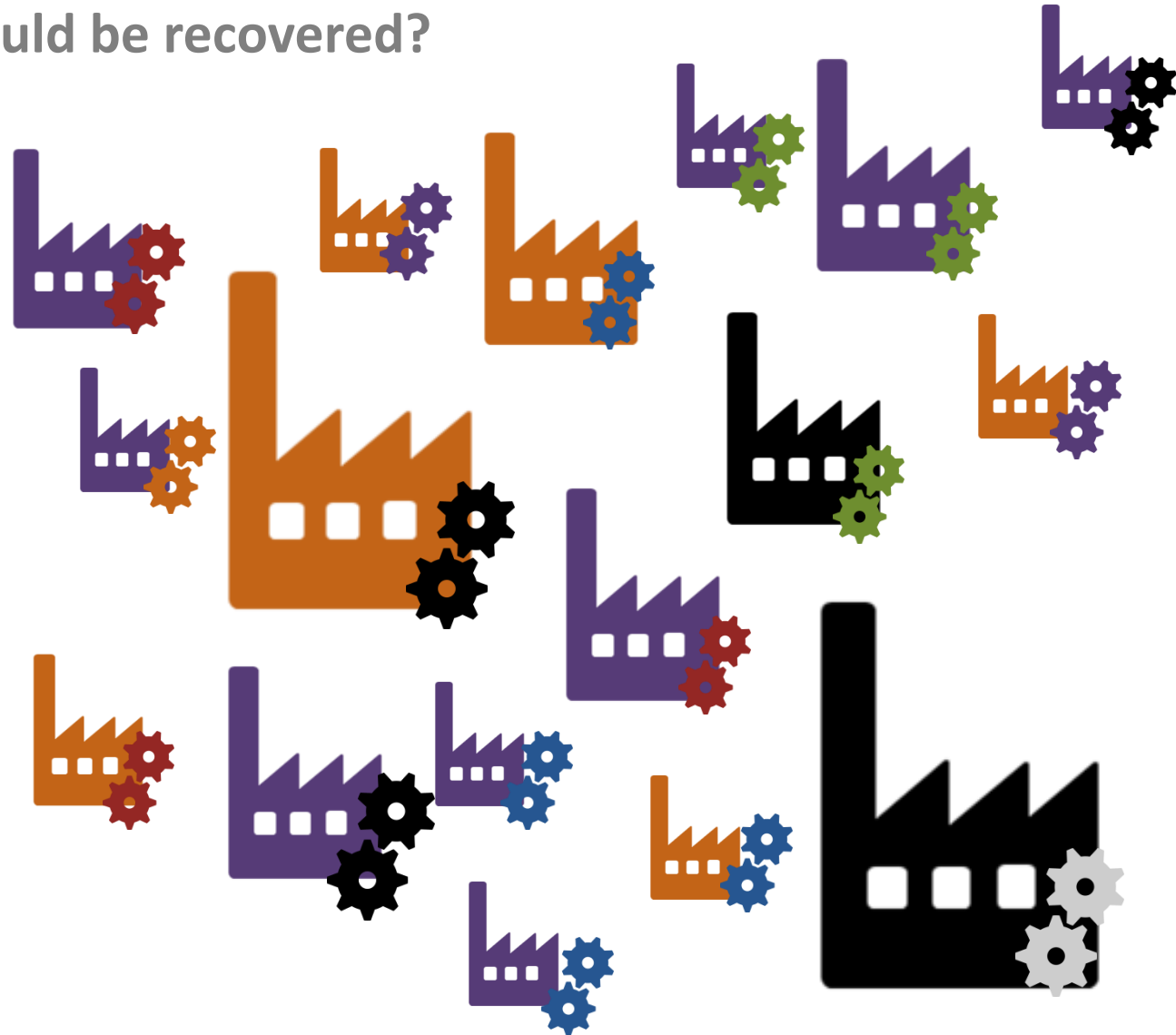
What would change

if phosphorus from wastewater stream
would be recovered?



Tomorrow

- hundreds of small production plants
- 50 - 5'000 tP/a
- WWTP, technology start-ups, fertiliser industry
- Different starting materials (sludge, ash, other)
- several different processes
- starting (and end) materials with waste status



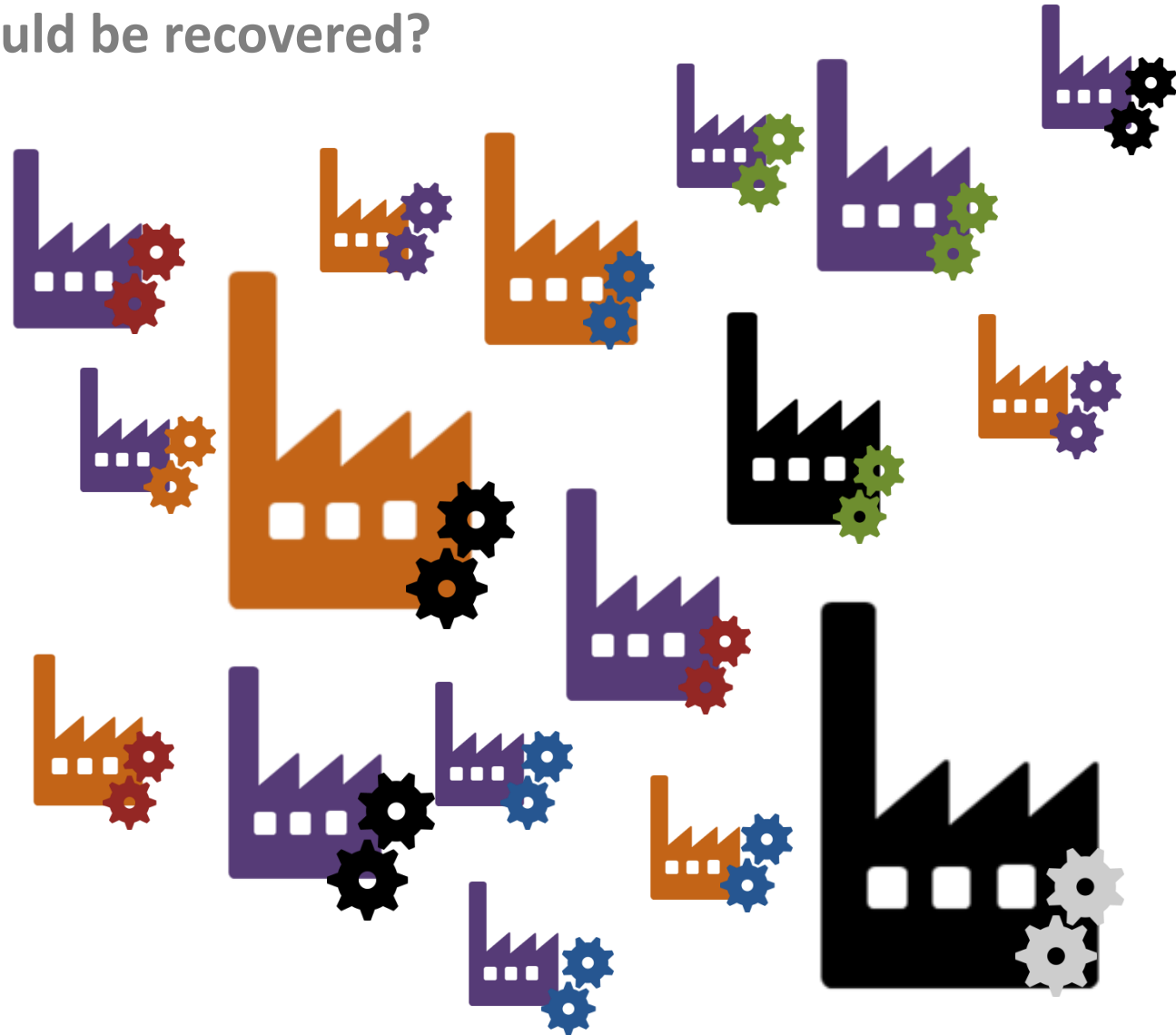
What would change



if phosphorus from wastewater stream would be recovered?

Challenges

- **Market access**, if fertilisers not key business
- **Legal obligations** extensive (Waste Framework directive, REACH, Fertilisers Regulation), but interpretation varies!
- **Narrow definitions** for fertilisers
- **Economies of scale**
- **Acceptance**



- Market entry of recycled nutrients

possible already today

(in “right” place with “right” end-products)

- But, if recovery efforts are scaled up

There are legal, societal and market challenges to overcome

Why?

Long-term advantages of recycling efforts:

- supply security
- internalized environmental costs
 - not accounted for in market-based decision-making

Needed:

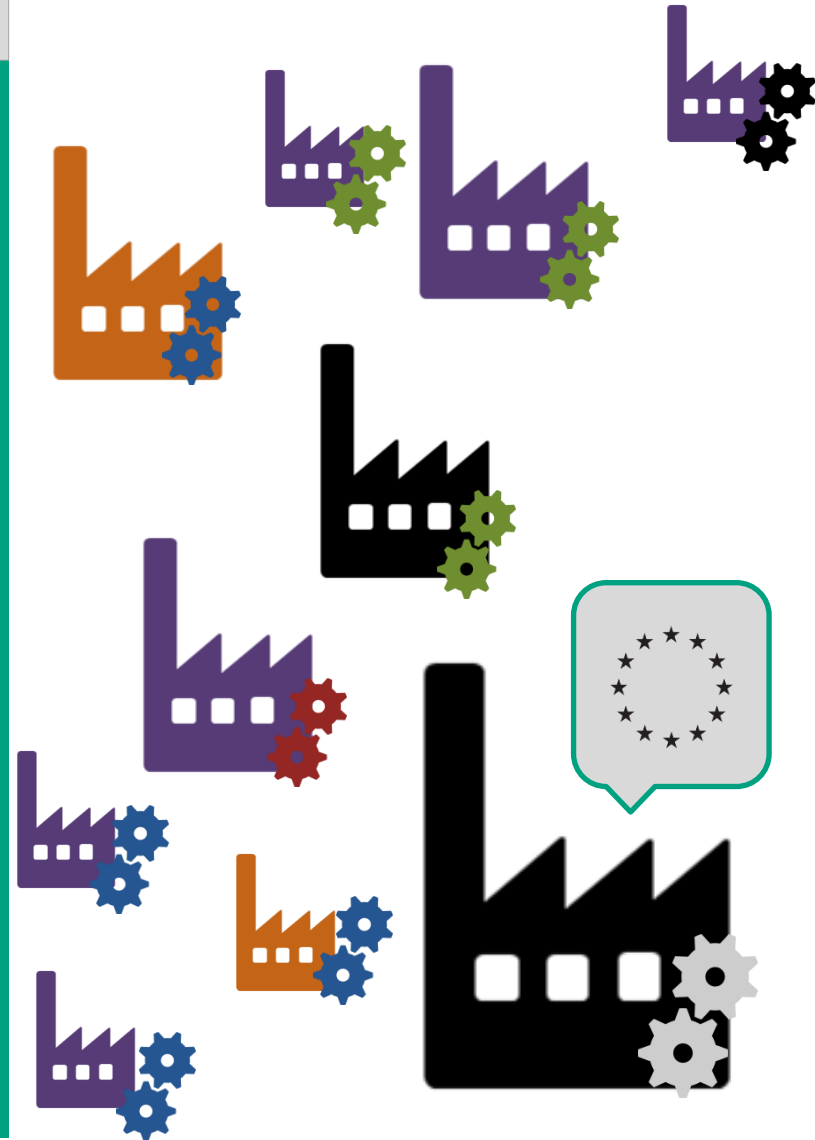
- Market drivers, long-term stability of the legal environment
- Systemic change from exclusive use of fossil P to a mix of fossil & recovered P

→ **New market players and investments**

Policy Message 1

Realistic and reliable European phosphorus recovery target, especially from wastewater.

It should be combined with a **European overall road map** and defining Best Available Technologies for phosphorus recovery and recycling.

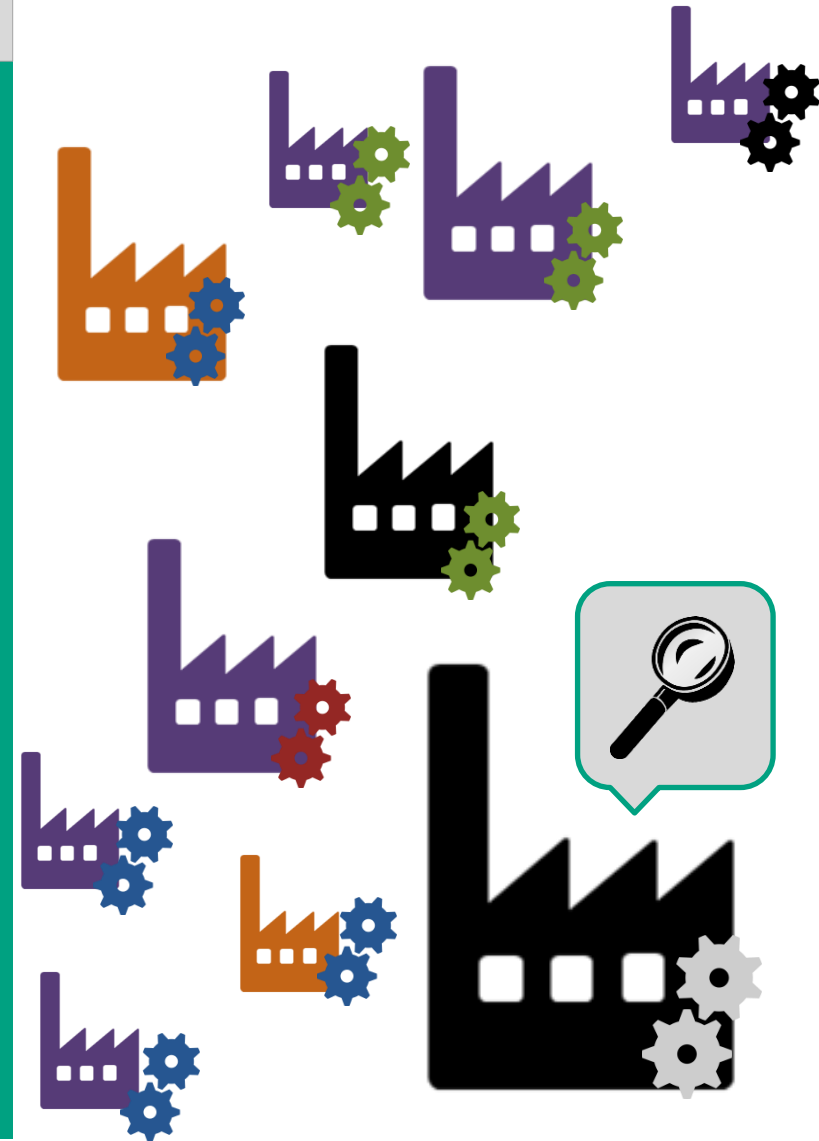


Why?

- Infrastructure, logistic, demand differences
- National coordination for efficiency
 - Synergies with existing EPBR or mono-incineration
 - Sludge management (raw material supply) optimisation
- Treatment train steps beneficial for recovery have additional cost but can be overcome by value chains

Policy Message 2

Obligation for national or regional action plans for phosphorus recovery, in line with the European goals, implementing technical recovery of phosphorus and/or agricultural valorisation of high quality sludge.



How to grant market access over Europe and increase acceptance?

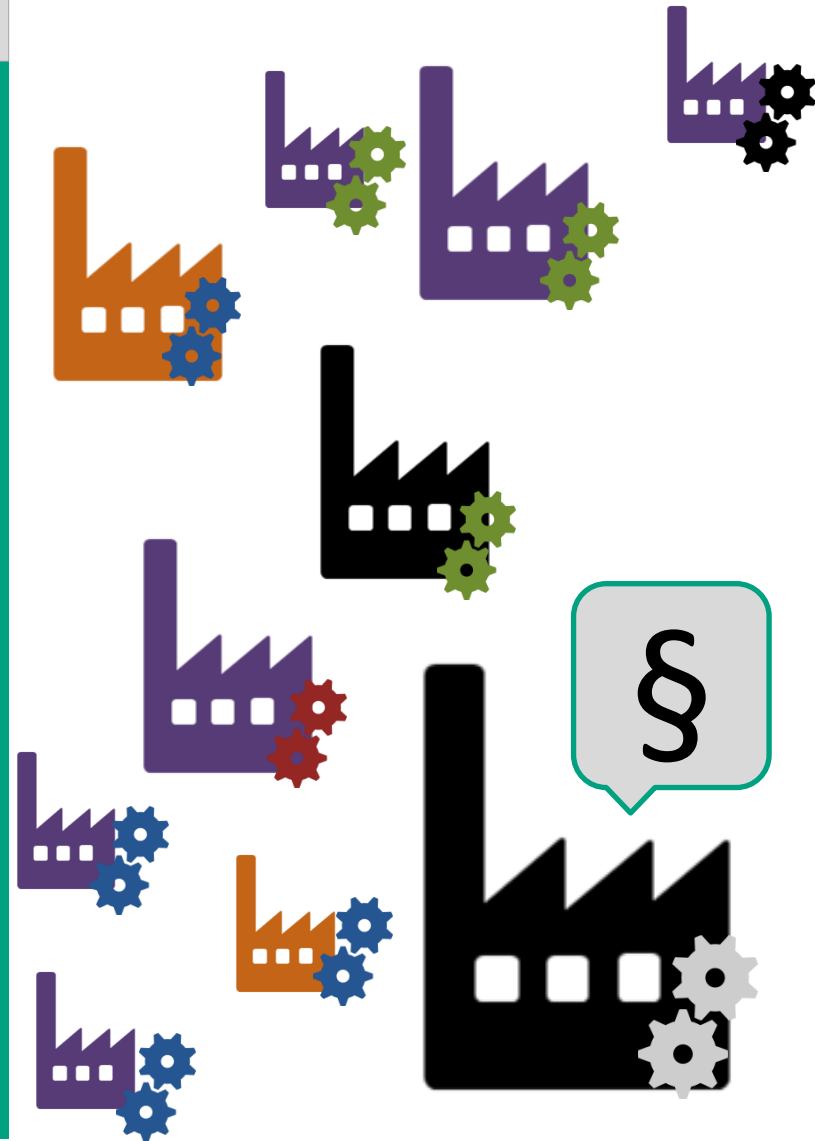
Why?

- Contradictory interpretation of legislation in member states
- Quality standards are lacking
- Fertiliser Regulation focuses on conventional sources and limits the number of start materials

Policy Message 3

Clear guidelines stopping contradictory national interpretation of the current European legislation around recycling of phosphorus from waste, especially into fertilisers.

Better integration of secondary raw materials and introduction of quality standards including end-of-waste criteria to the European Fertilisers Regulation.



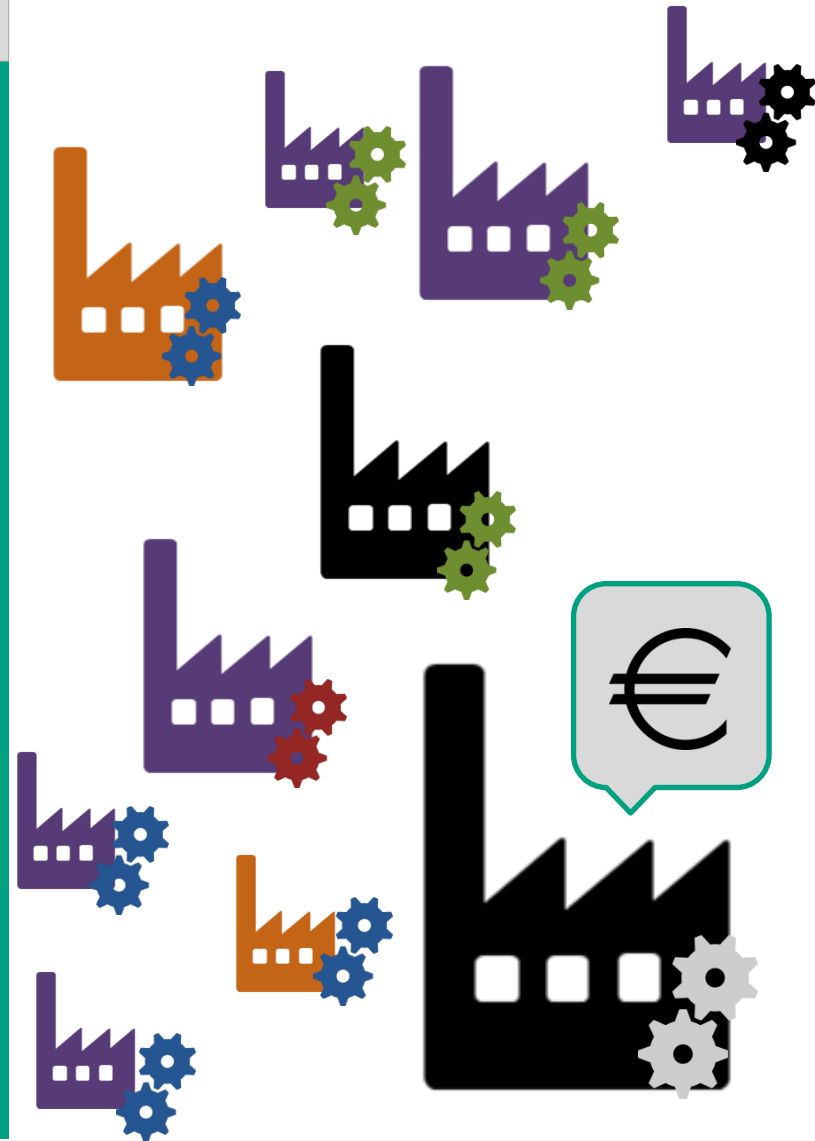
Why?

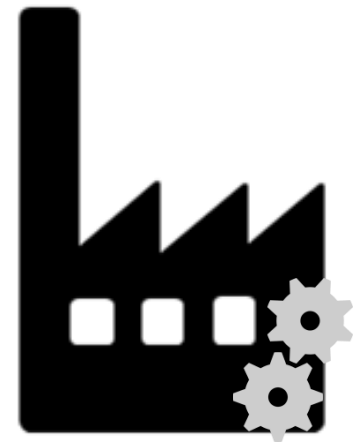
- Phosphorus recovery benefits society as a whole and comes with a cost
- First Movers Risk
 - large investment
 - a competitor implements a second generation technology and profits from changes made

Policy Message 4

National mechanisms for fair distribution of the cost of phosphorus recovery (e.g. fertilizer mixing quota, recovery obligations).

Financing of demonstration projects, since references are obligatory for market penetration of innovative technologies and products.







Thank you:

Louis Herrmann for summing up the relevant legal aspects on EU level and current business cases of phosphorus recycling.

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