Opportunities and challenges to closing the Phosphorus supply chain through Phosphorus recycling from wastewater in European urban areas

Case studies from Stockholm, Sweden and Budapest, Hungary

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P is a limited yet essential resource, but heavy reliance on imports in Europe (92%)

- Linear supply chain, changing from resource to pollutant.
- P is starting to be on the political agenda (e.g. CEP)
- Demonstrated potential of P recovery & recycling.

Questions:

1. Which are the dynamics governing P recycling in Europe?
2. Where in the system can we identify leverage points for intervention?
Methods

- Stockholm and Budapest chosen for the study - W&N Europe / CEE, similar urban areas in size and population, relatively easy to acquire contacts. Visit also to a WWTP in Norway.

- Semi-structured interviews with a mix of stakeholders: farmer association, wastewater association, WWTP staff, decision makers at municipal and national level, academics, entrepreneurs.

- System analysis used to conceptualise the system.
Results

- Differences in perception on P removal, P recovery and P recycling;
- Good overview of P recycling economics;
- Political agenda focus representative for Europe at the moment;
- Identification of social barriers to P recycling and potential facilitation;
- Pharmaceuticals and other chemicals as the most debated component.
Conclusions

- Contrasting agendas, need for EU-wide regulations;
- Potential for diversification and financial viability at WWTP level;
- Composite nutrient - market value, better circularity, more resilience;
- Land-use pressure vs. reinventing the role of WWTP in urban areas;
- Clear statement on pharmaceuticals needed to start system optimisation;