Interreg North-West Europe Phos4You
European Regional Development Fund

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P-REX

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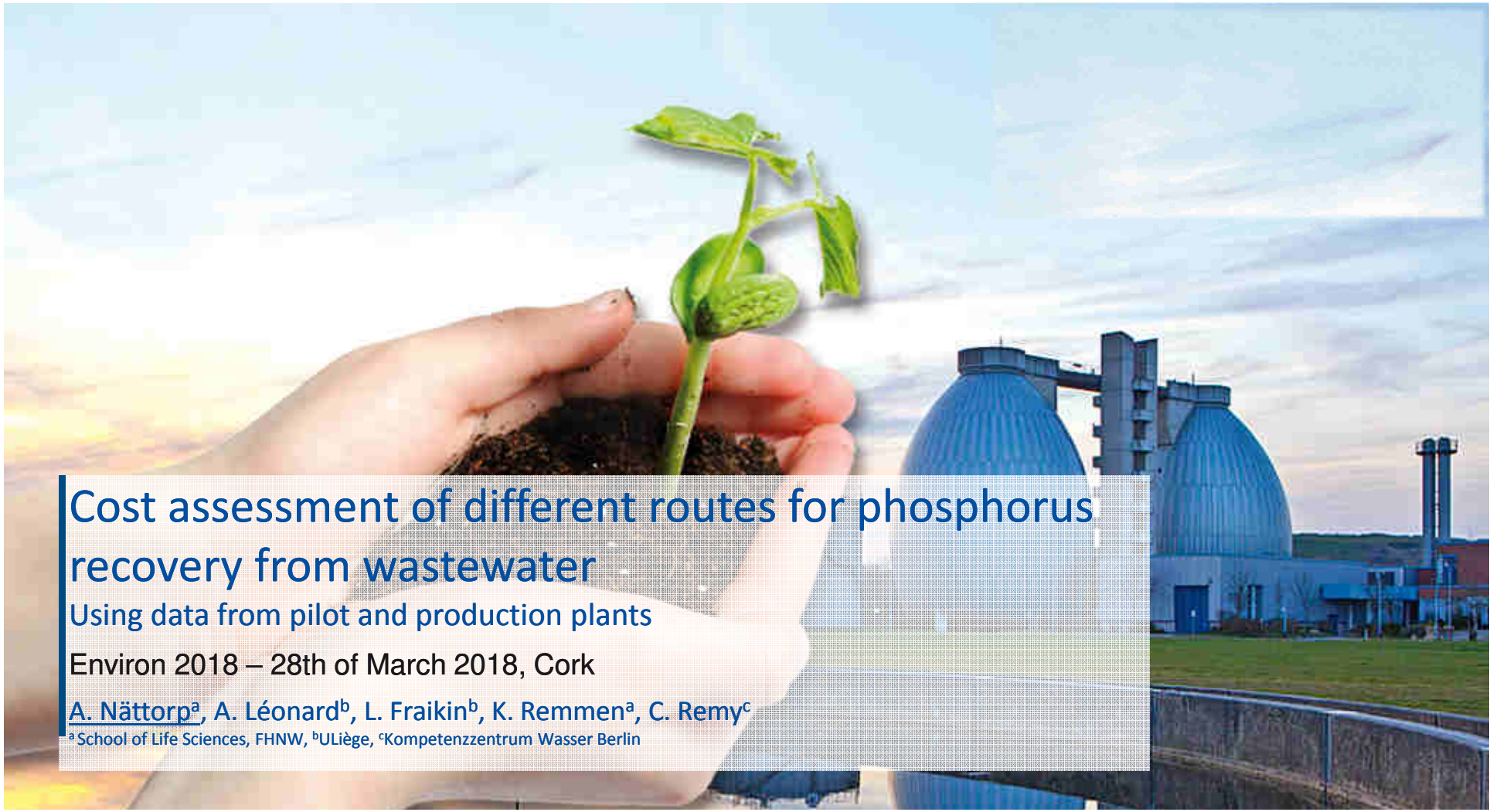

Cost assessment of different routes for phosphorus recovery from wastewater

Using data from pilot and production plants

Environ 2018 – 28th of March 2018, Cork

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Outline

1. Our motivation and objectives
2. Cost assessment in P-REX
3. Methodology in Phos4You
4. Expected impacts for a sustainable future

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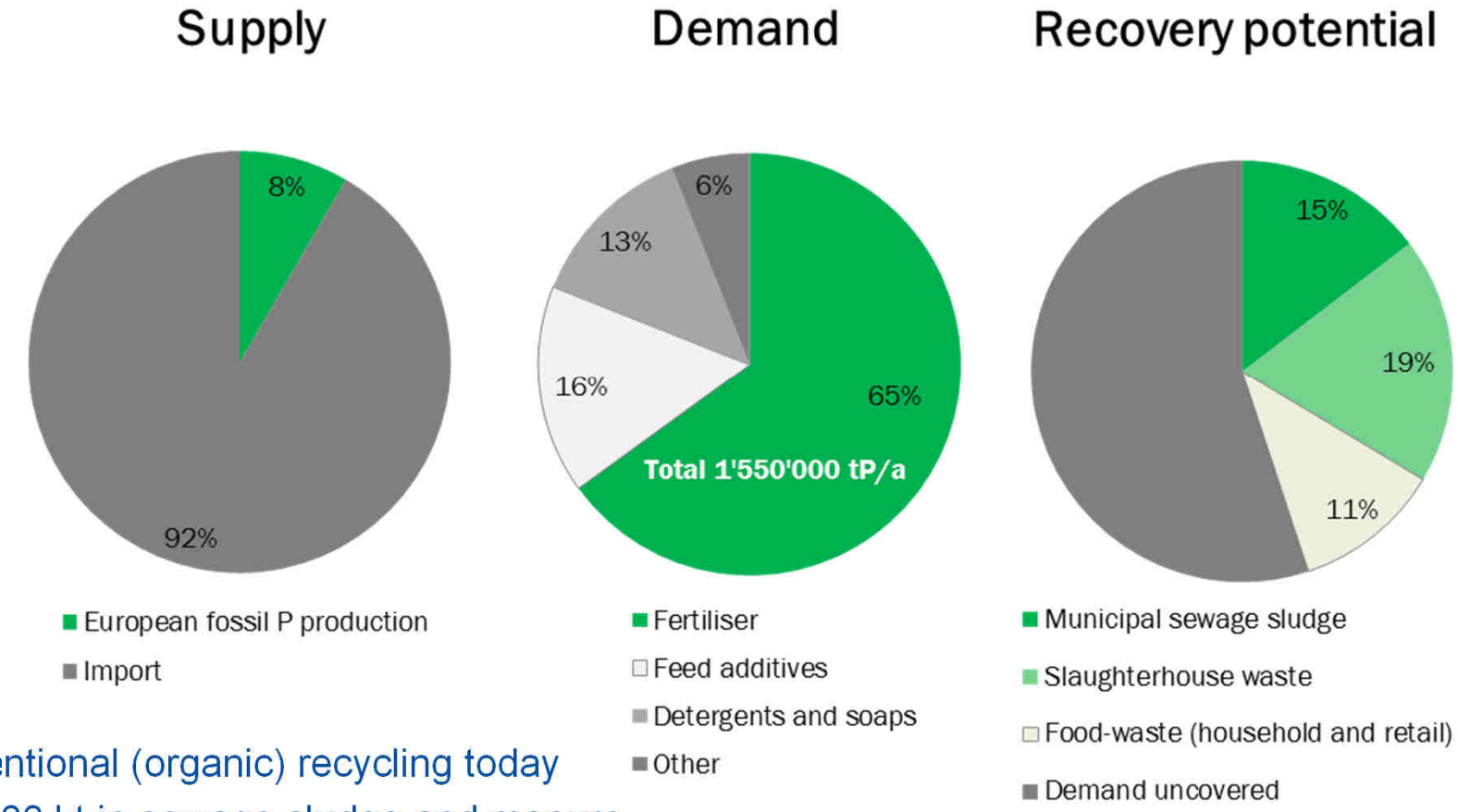
EU could improve mineral P supply security through technical recycling



Conventional (organic) recycling today

- 1800 kt in sewage sludge and manure

Sources: P-REX policy brief http://doi.org/10.5281/zenodo.242550
Van Dijk et al http://www.sciencedirect.com/science/article/pii/S0048969715305519

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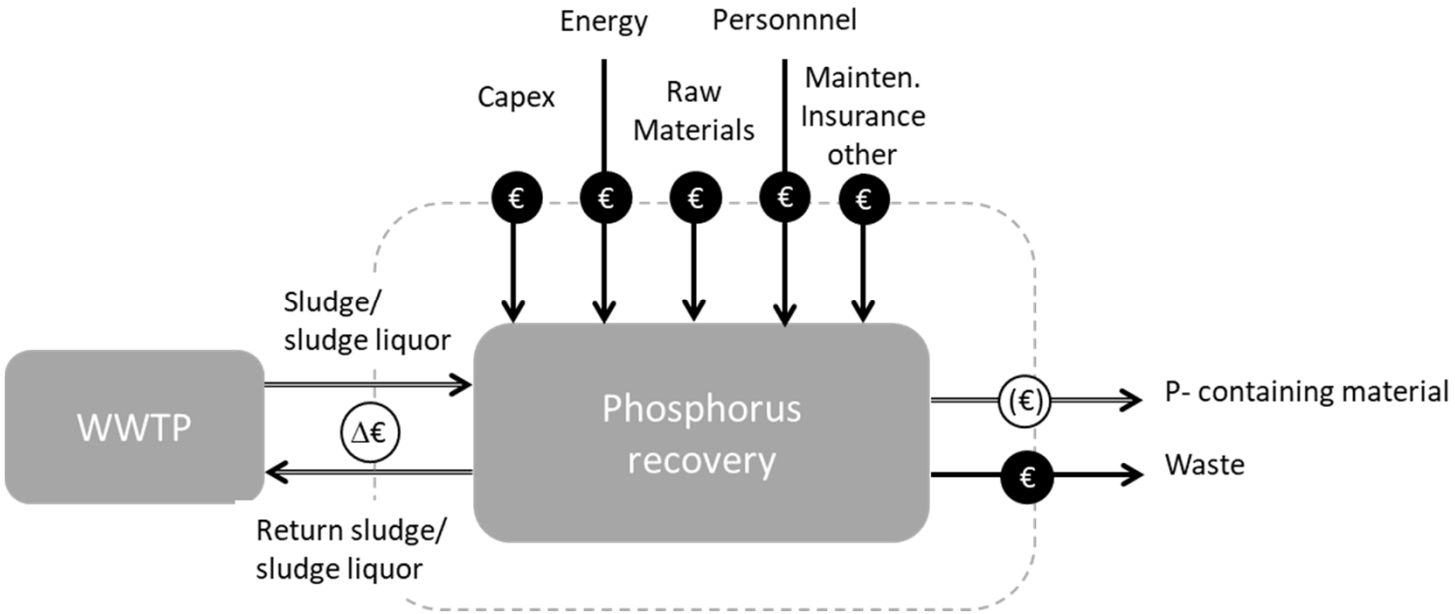
Projects and objectives

- FP7 European Research and demonstration project
- Period: 2012-2015
- 15 partners from 8 countries
- Objective: EU-wide implementation of phosphorus recovery and recycling from wastewater considering regional conditions

- Period: 2016-2020
- 12 partners from 7 countries
- Objective: Prepare the deployment of P-Recycling to enhance EU-sovereignty on P

P-REX Methodology

LCC (LCA) system for sludge/-water processes



Source: Nättorp et al (2017) https://doi.org/10.2166/wst.2017.212

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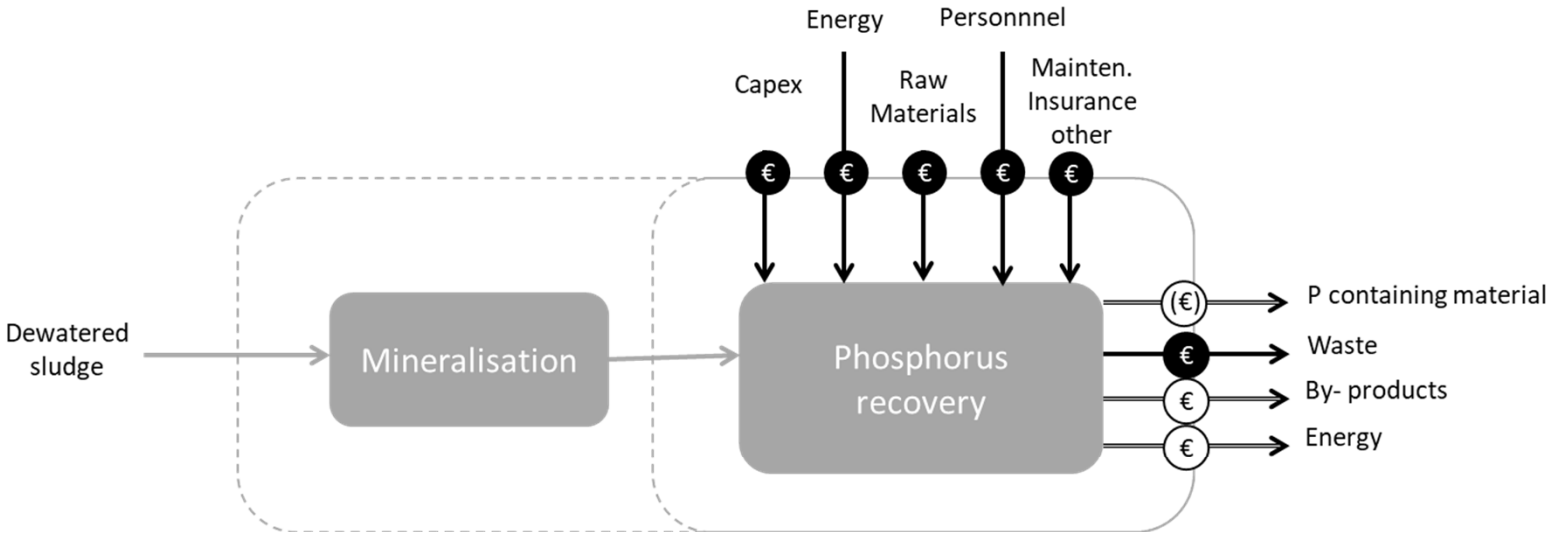
P-REX Methodology

LCC (LCA) system for thermal/ash process



Source: Nättorp et al (2017) https://doi.org/10.2166/wst.2017.212

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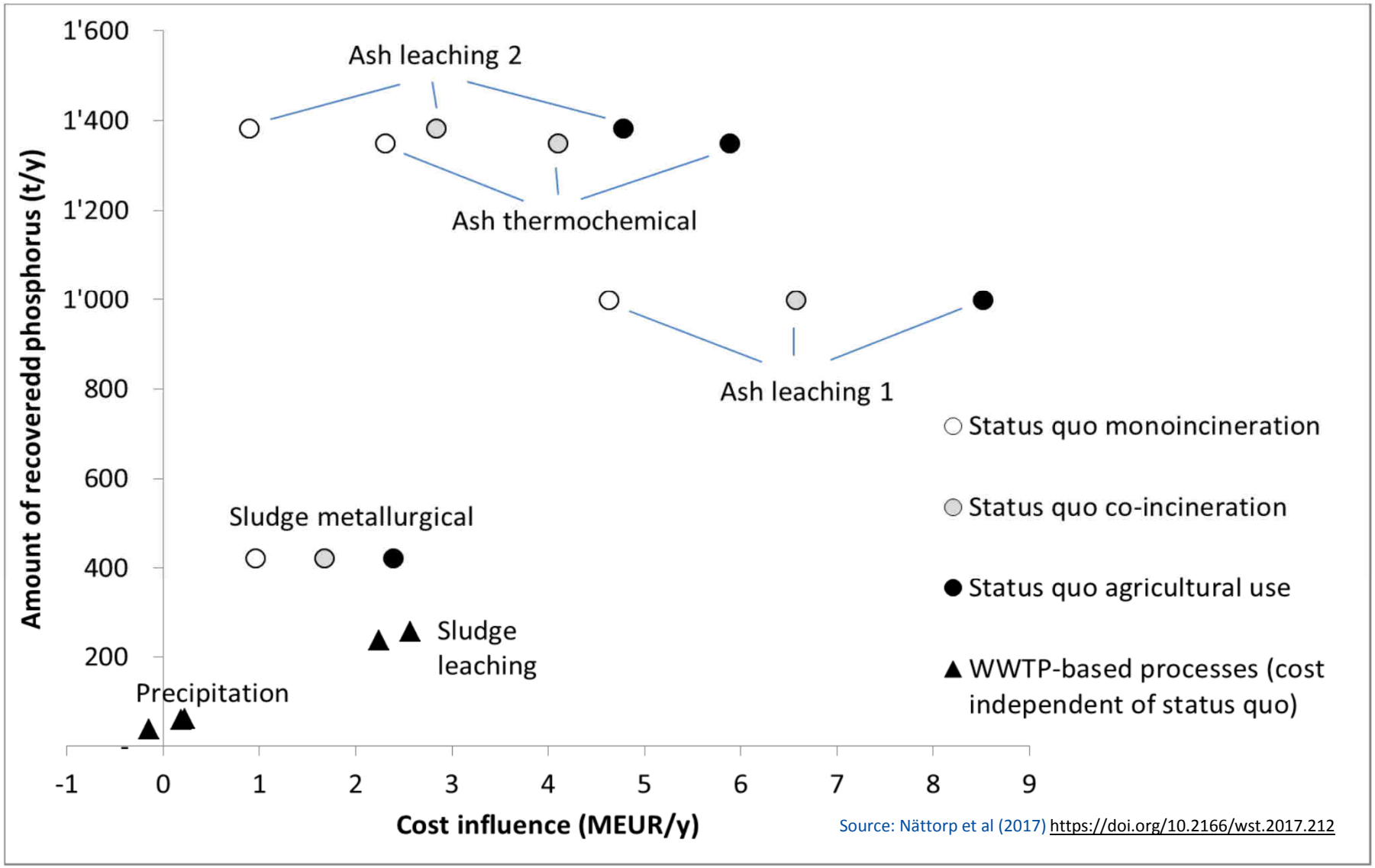
Cost influence vs recovered P

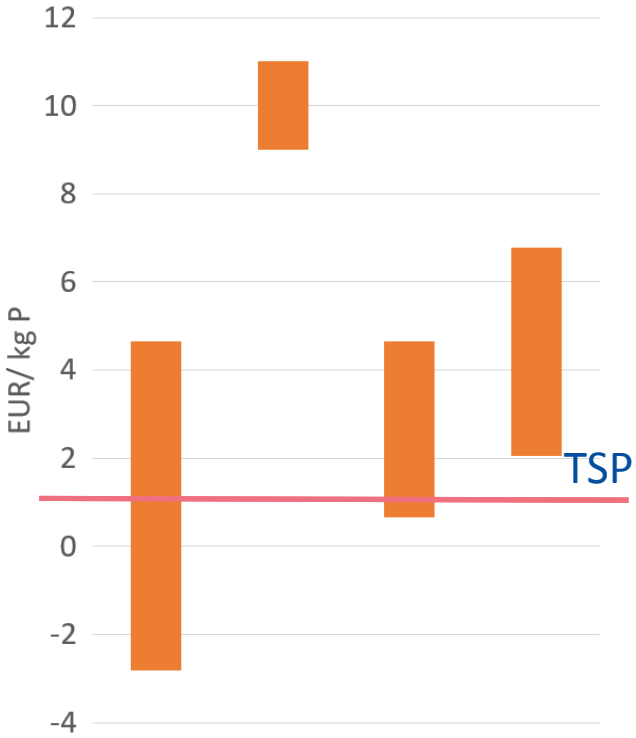
Different Reference scenarios

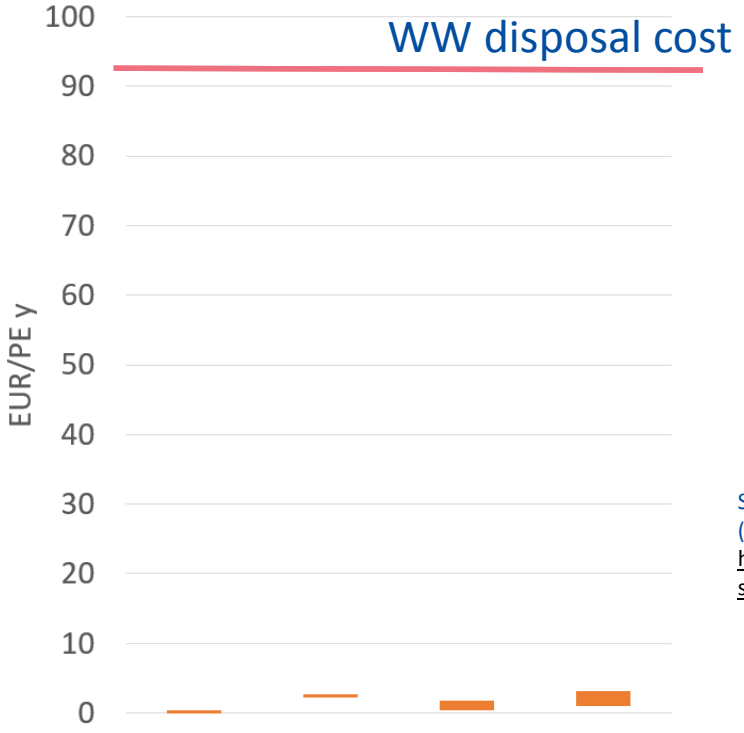


Source: Nättorp et al (2017) https://doi.org/10.2166/wst.2017.212

Cost ranges for process groups

- Precipitation processes
- Sludge leaching
- Dry sludge, ash treatment, mono-incineration existing
- Dry sludge, ash treatment, no existing mono-incineration





Source: Nättorp et al (2017) https://doi.org/10.2166/wst.2017.212

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Methodology
Phos4You vs P-REX

- Same
  - System including interactions with up- / downstream- processes
  - Reference scenario (Status Quo)
  - Collect solid data from pilot/demo plants
  - Crosscheck and validate along the process
- New/different in Phos4You
  - Different settings (urban to household)

  ➔ One reference scenario per setting

  ➔ Comparison of limited set of suitable technologies for each setting

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Conclusions for a sustainable future

- Background
  - Phosphorus EU critical raw material, necessary for food security
  - P-REX provides uniform LCC (and LCA) for 9 recovery processes based on pilot and full scale data
  - Cost of technical recycling is affordable 3 % of WW disposal cost
- Target
  - Phos4You will update end extend LCC/LCA considering very variable settings in Northwestern Europe

  ➔Support Water utilities technology and investment decisions

  ➔Support policymaking for phosphorus recycling

Thank you for your attention!

P-REX

Main P-REX deliverables @ Zenodo:
http://doi.org/10.5281/zenodo.242550

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Swiss Phosphorus Network:
http://www.pxch.ch/

We cooperate to close the P-cycle

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