



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



Green & Circular Economy

6-9 Novembre 2018

Rimini Italy

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KEY ENERGY

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

1 year after - phosphorus recycling in Germany

Daniel Frank
German Phosphorus-Platform DPP

3rd EUROPEAN NUTRIENT EVENT @ ECOMONDO 2018

8 - 9 November 2018, Rimini, Italy

www.smart-plant.eu/ENE3





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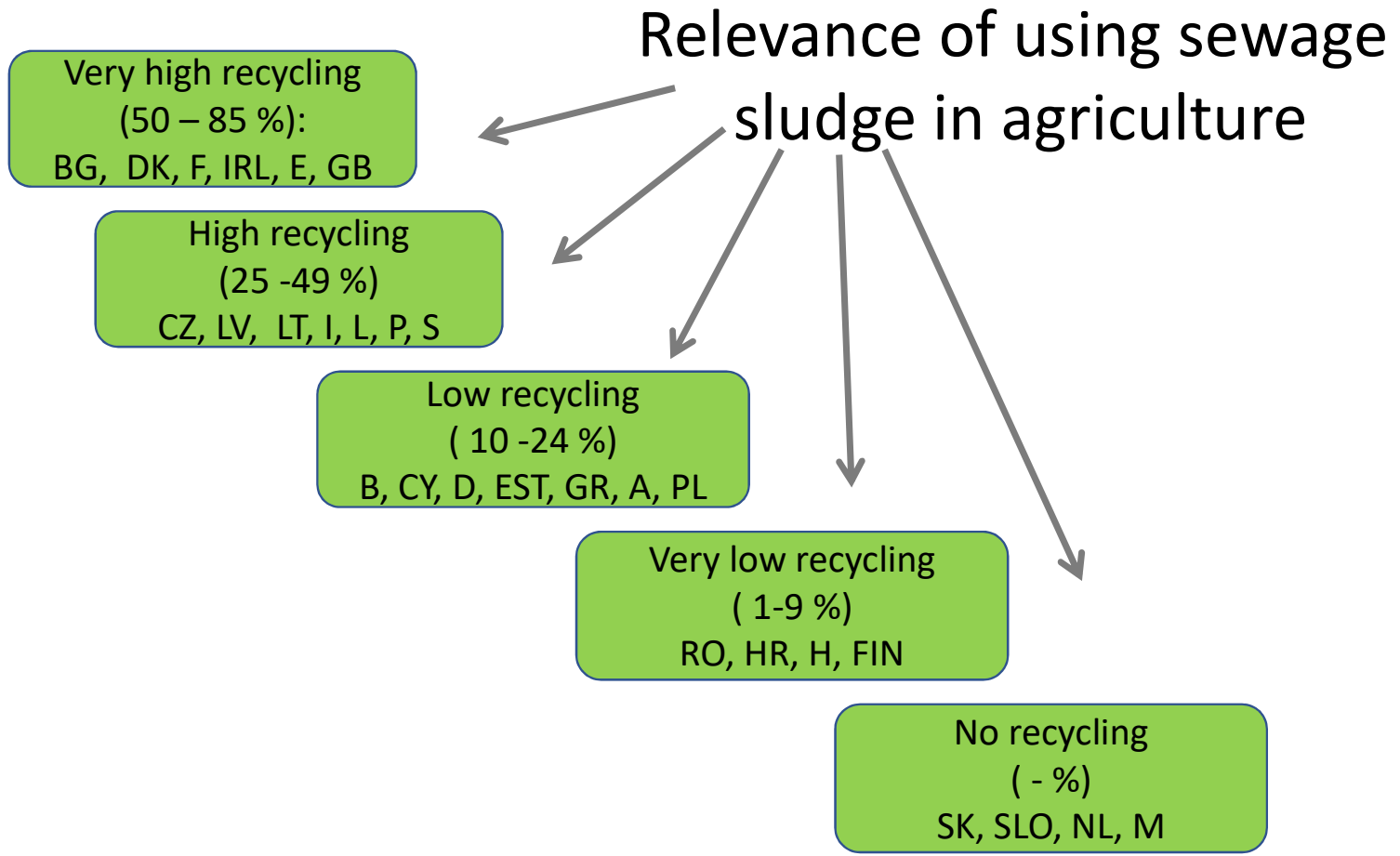
The European perspective



- **Total production** of sewage sludge from municipal wwtp:
 - 9.360 mio t (2015)/ 9.697mio t (2010)
- **Sludge recycling** – use in agriculture:
 - 3.709 mio t = 39.6% (2015)/ 45.2% (2010)

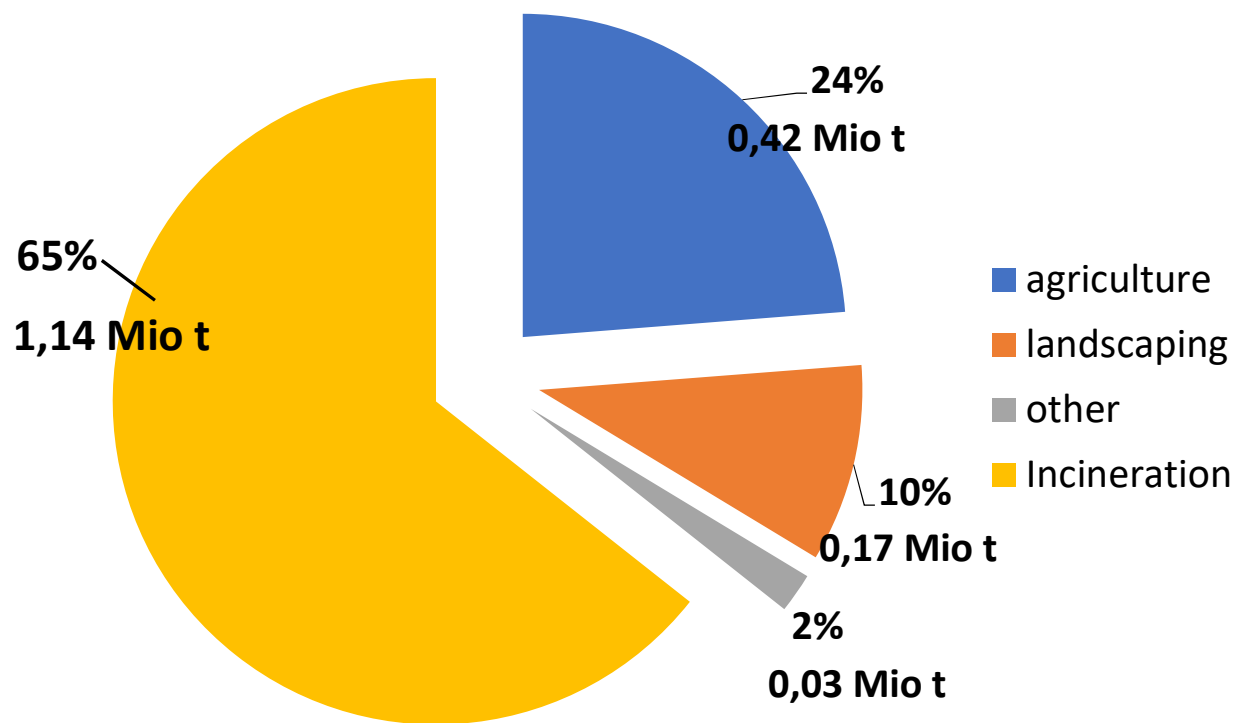
(Source: Eurostat, Sewage sludge production and disposal, last update 15.09.2017)

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Disposal pathways of sewage sludge in Germany (municipal WWTP)



**Disposal
2016 in total: 1,77 Mio. t**



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New Sewage Sludge Ordinance: Consequences

Revision of the sewage sludge ordinance includes:

- WWTPs with a capacity of more than 100.000 person equivalents have to recycle phosphorus after a transition period of 12 years
- WWTPs with a capacity of more than 50.000 person equivalents have to recycle phosphorus after a transition period of 15 years
- direct use of sewage sludge as fertiliser is not allowed after the transition period of 12/15 years (for the types of WWTP mentioned above)
- Exemptions for WWTP <50.000 PE - these WWTPs can use sewage sludge even after the transition period as fertiliser, or apply a P-recovery step





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New Sewage Sludge Ordinance: Consequences

Possibilities to recover phosphorus:

- I. No co-incineration of sludges with more than 20 g P/kg DM
– Phosphorus recycling is obligatory before thermal treatment
- II. Ashes from mono incineration plants
- have to be treated further to produce fertilising materials, intermediates for further processing (input materials) or acid
- III. or
- have to be **stored** separately to recover phosphorus later

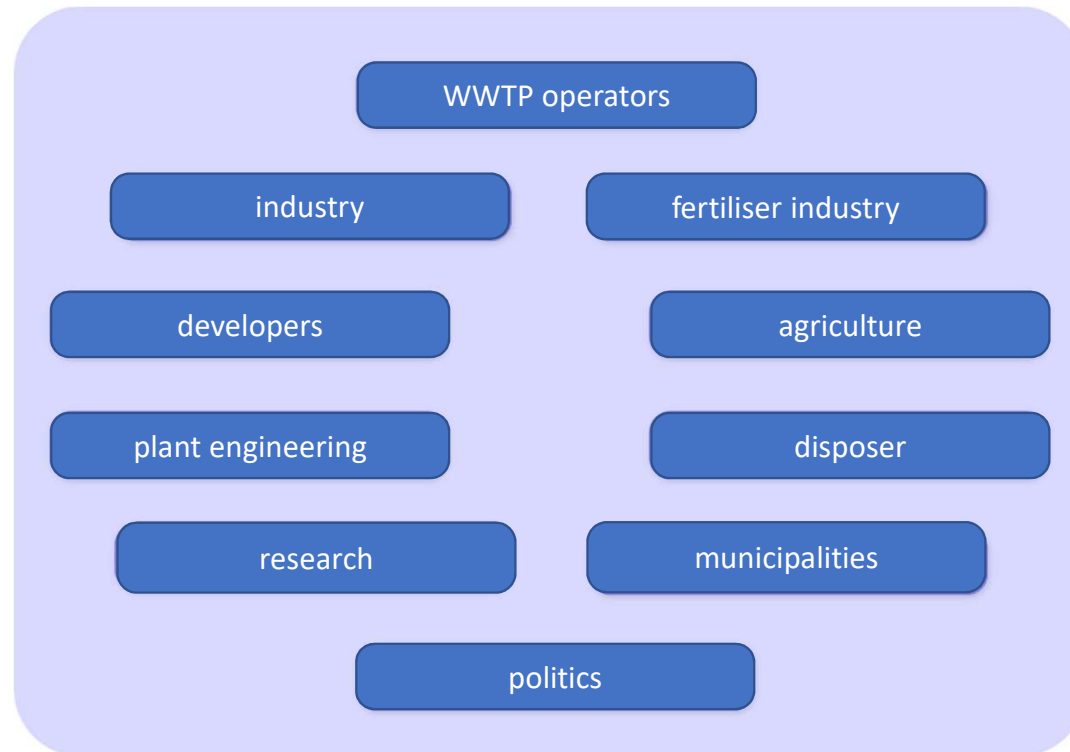




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Cooperation is essential!



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Thermal treatment facilities (2016)⁽³⁾

- **31 Mono incineration plants (sewage sludge)** ca. 650.000 t/a TS
→ No free capacity (2018)
- **21 Coal power plants** ca. 420.000 t/a TS
→ Capacity stagnating and future reduction (2035+) (2018)
- **34 Cement plants** ca. 120.000 t/a TS
→ capacity increasing (2018)
- **97 Waste incineration plants** ca. 80.000 t/a TS
→ capacity diminishing (2018)

➤ roughly 1,27 Mio. TS are treated thermally





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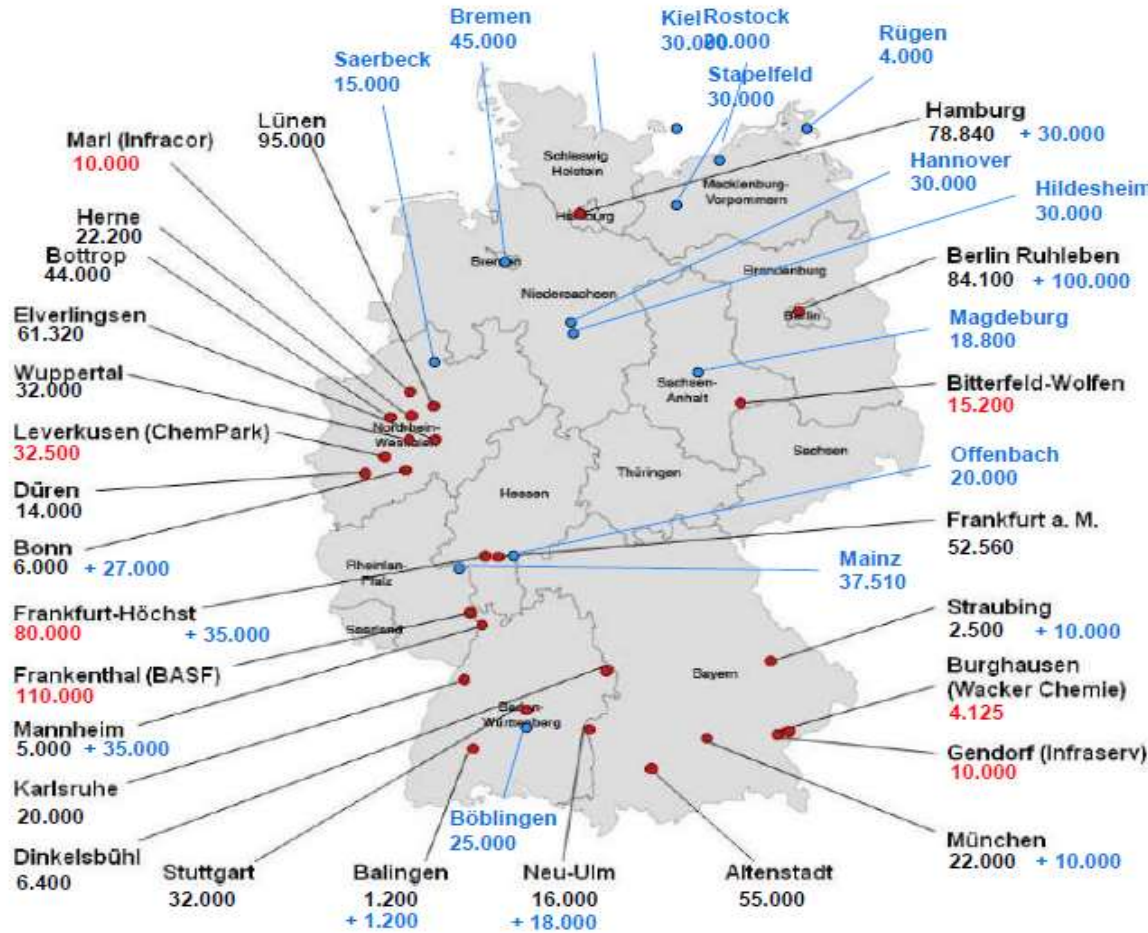
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Situation Deutschland		Quote thermisch 62%
Bestand industriell	281.825	t TM/a
Bestand kommunal	652.120	t TM/a
Neubau, Erweiterung	691.510	t TM/a
Gesamtmenge KKS	1.800.000	
Bestand	652.120	kommunal
Neubau/Erweiterung	691.510	
Summe Mono	1.243.630	
Rest	556.370	Mitverbrennung nach P Entfrachtung
Mitverbrennung derzeit	615.600	



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- Situation to face:
 - Incineration capacity needed!
 - Mono vs. co → no clear preference, but some hurdles
- Mono-incineration plants need:
 - Construction time
 - Investments needed
- Co-incineration facilities:
 - Coal is fading out
 - Cement works are at the moment not considering taking all sewage sludge; lack of communication!





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- Even more obstacles:

- Interim storage capacities for sewage sludge
- Enforcement aid for the sewage sludge ordinance still under preparation
- P-recovery technologies are still under development
 - Large scale operation is missing
- Operators are not ready to invest
→ who wants to be the first?
- Market for the materials?
 - Farmers need guarantees and strong legal guidelines as supportive measurement





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- All bad?
 - Not at all!
- Typical behaviour upfront a technology adaptation
- Networks can facilitate the lack of communication; DPP provides all needed information (data sheets, FAQs)
- Germany can become world wide exporter for P-recovery technologies

