Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

IWAMA Interactive Water Management

Interreg Baltic Sea Region

EUROPEAN REGIONAL DEVELOPMENT FUND

EUROPEAN UNION

EU perspective and German legislation concerning sludge

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For the Federal Ministry for the Environment

Department WR II 4 - Municipal Waste –

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Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

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- Sewage sludge – general remarks (EU)
- European legislative aspects
- German legislation and strategies

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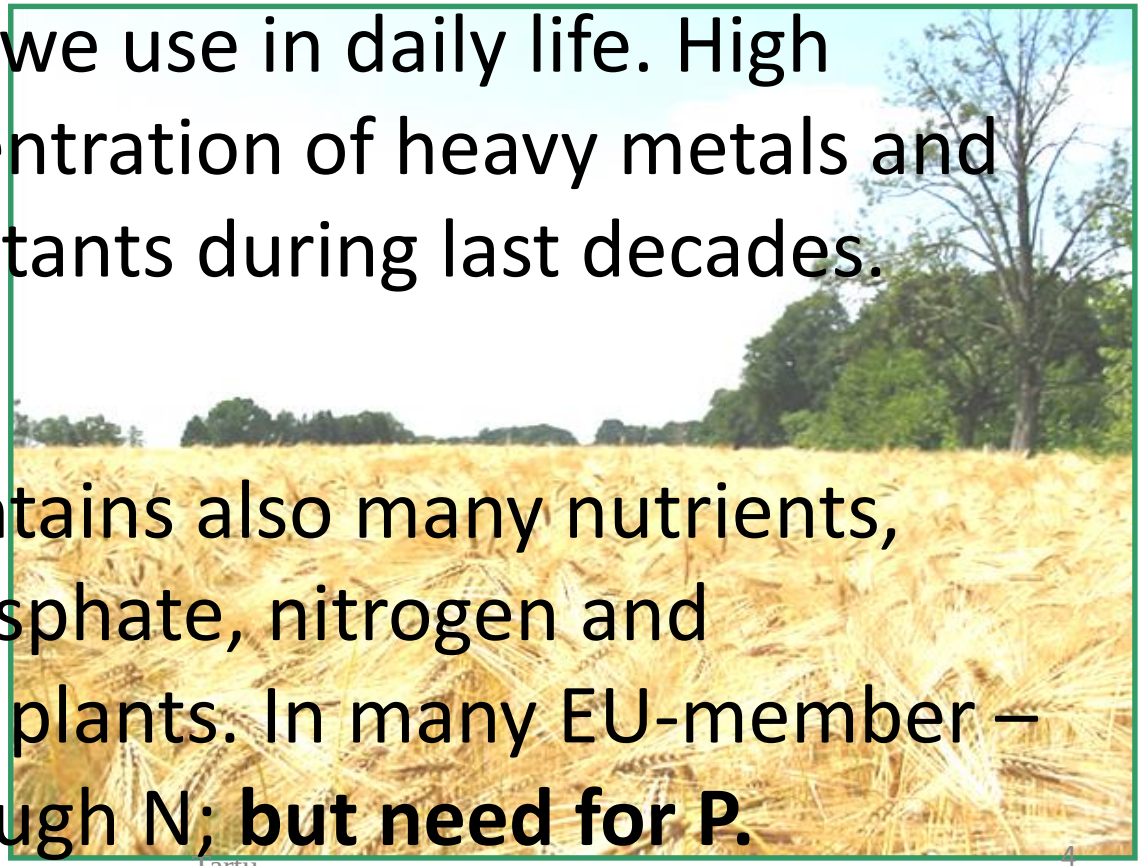
Sewage sludge – a sink for pollutants or nutrients (phosphorus)?

- Sewage sludge can contain all heavy metals and organic pollutants we use in daily life. High reduction of concentration of heavy metals and organic micropollutants during last decades.

but

- Sewage sludge contains also many nutrients, among others phosphate, nitrogen and micronutrients for plants. In many EU-member – states there is enough N; **but need for P.**



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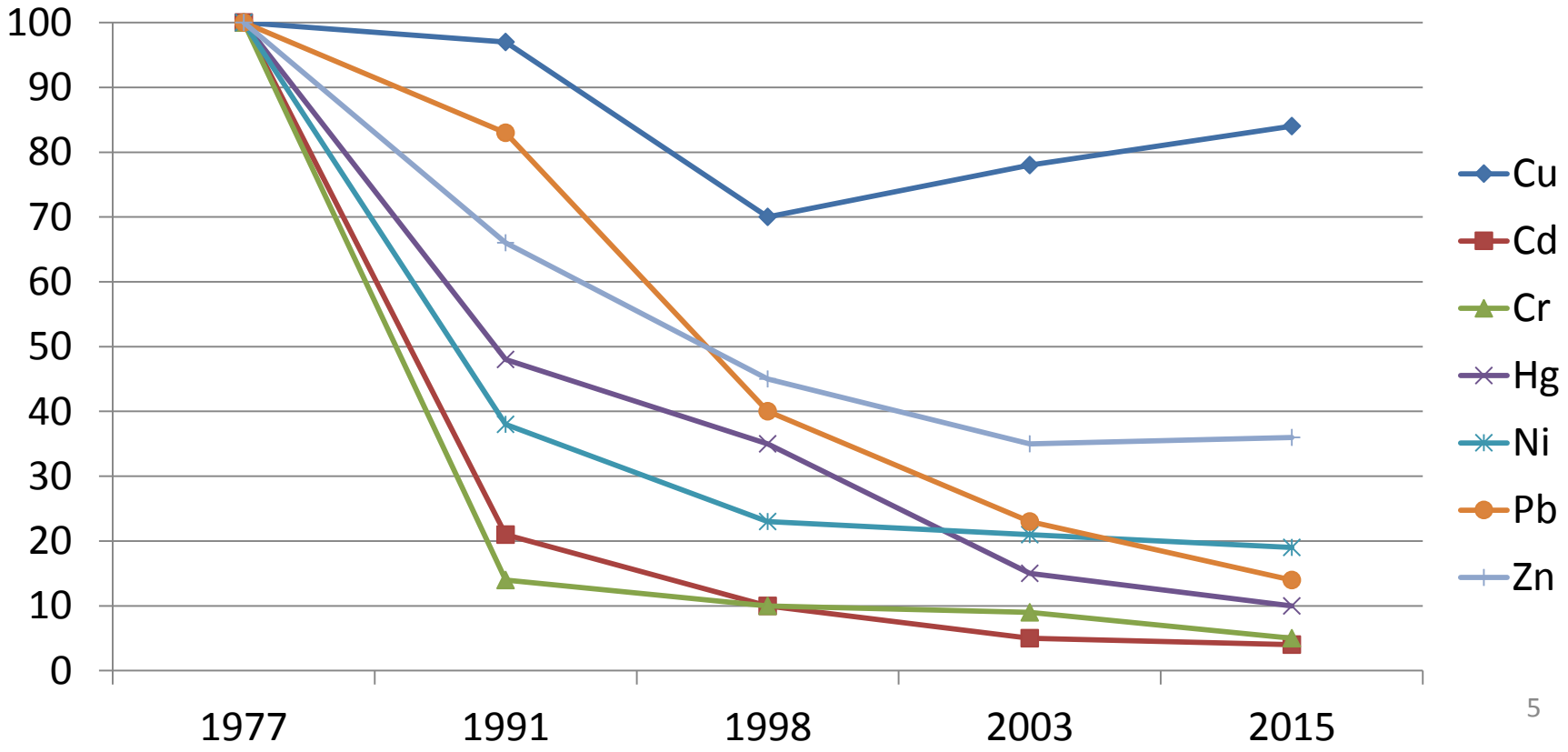
Heavy metals (Germany)

Development of the heavy metal concentrations in sewage sludge (%)



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European aspects (EU 28)

- **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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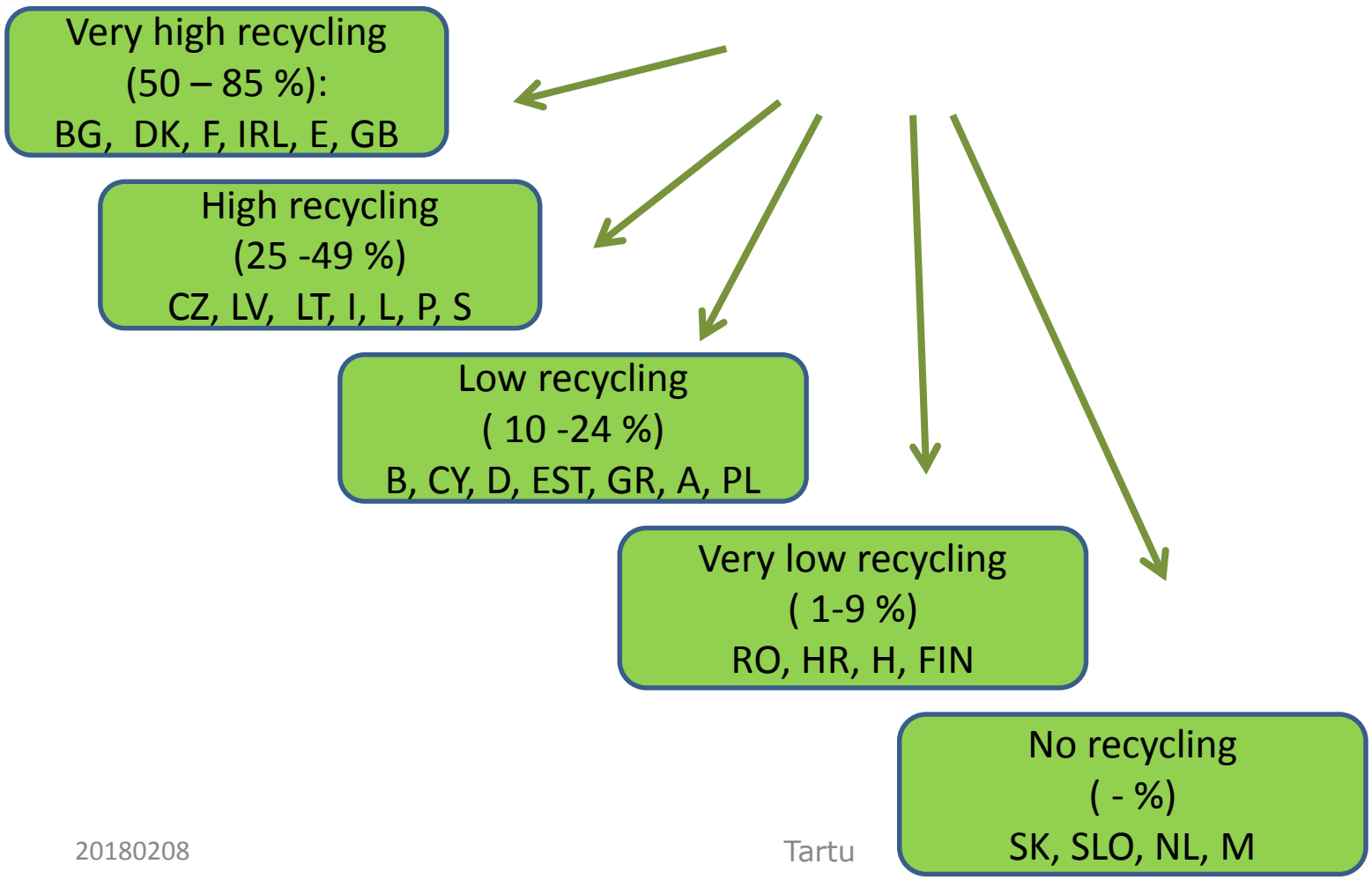
Relevance of using sewage sludge as fertilizer



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§ § § European aspects - legislation

Legislation

- Since 1986: Directive 86/278/EEC on sewage – sludge (if used as fertilizer)
- Since 1998: Landfill – Directive 1999/31/EC in case sewage sludge is disposed of as residual waste
- In preparation: revision of Fertilizer-Directive with standards for struvite and fertilizers from ashes of sewage- sludge incineration

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§ § § European aspects - legislation

§ Directive for sewage sludge used as fertilizer:

§ *„Council Directive of 12 June 1986 on the protection of the environment , and in particular of the soil, when sewage sludge is used in agriculture* ***(86/278/EEC)“***

§ Central features:

- Limit values (concentration ranges and maximum loads) for heavy metals in sludge and
- limit values for heavy metals (concentration ranges) in soils

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§ § § European aspects - legislation

Limit values (concentrations) of Dir. 86/278/EEC for sludge (mg/kg dw):

Cd	Cr	Cu	Hg	Ni	Pb	Zn
20 - 40	-	1000 - 1750	16 - 25	300 - 400	750 – 1200	2500 - 4000

Limit values (concentrations) of Dir. 86/278/EEC for soils (mg/kg dw):

Cd	Cr	Cu	Hg	Ni	Pb	Zn
1 - 3	-	50 - 140	1 – 1,5	30 - 75	50 - 300	150 - 300

- No revision to date of Dir. 86/278 – no revision planned (as far as we know).
- „Fitness – checks“ were carried out in 2001 and 2010 (compare *Milieu-WRC- RPA –report, dating 10th February 2010)*

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Limit values for heavy metals in EU- countries (mg/kg d.m.)

Country	Cd	Cr	Cu	Hg	Ni	Pb	Zn
EU 86/278	**20-40**	**-**	**1000-1750**	**16-25**	**300-400**	**750-1200**	**2500-4000**
Denmark	0.8	100	1000	0.8	30	120	4000
Estonia	15	1200	800	16	400	900	2900
France	10	1000	1000	10	200	800	3000
Germany	1,5	2(Cr-VI)	900	1	80	150	4000
Ireland	20	-	1000	16	300	750	2500
Italy	20	-	1000	10	300	750	2500
Portugal	20	1000	1000	16	300	750	2500
Spain	20-40	1000-1750	1000-1750	16-25	300-400	750-1200	2500-4000
Czech Rep	5	200	500	4	100	200	2500
Sweden	2	100	600	2.5	50	100	800
Poland	10	500	800	5	100	500	2500
Belg. (W.)	10	500	600	10	100	500	2000
Netherl.	1.25	75	75	0.75	30	100	-

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European aspects - other activities with influence to sewage sludge (extraction of phosphorus)

Research

- As part of “Horizon 2020” there are some projects financially supported to develop methods to extract phosphorus from sewage sludge (f.e. the project “P-REX” in the program “New Life for sewage sludge”)

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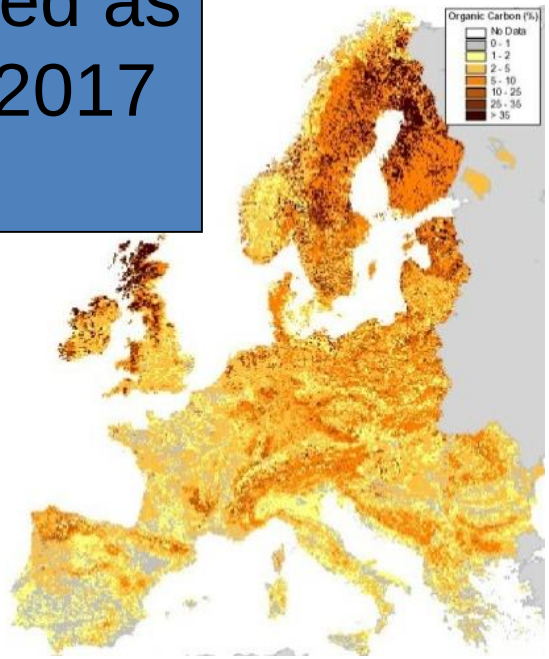
European aspects - other activities with influence to sewage sludge (extraction of phosphorus)

Political decision

- Phosphorus/Phosphate rock is listed as Critical Raw Material in 2014 and 2017



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European aspects - other activities with influence to sewage sludge (extraction of phosphorus)

Papers for discussion (EU/Commission)

- Consultative Communication on the Sustainable Use of Phosphorus , Brussels 8.7.2013 (Com(2013) 517 final):

The purpose of the Consultative Communication is to draw attention to the sustainability of phosphorus use and to initiate a debate on the state of play and the actions that should be considered. It is not designed with specific legislation on phosphorus in mind.

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Germany:

Sewage sludge management in 2016

(compared to 1998)

Agriculture: *(32 %)* ↘ **24 %**

Landscaping: *(29 %)* ↘ **10 %**

Incineration: *(16 %)* ↗ **64 %**

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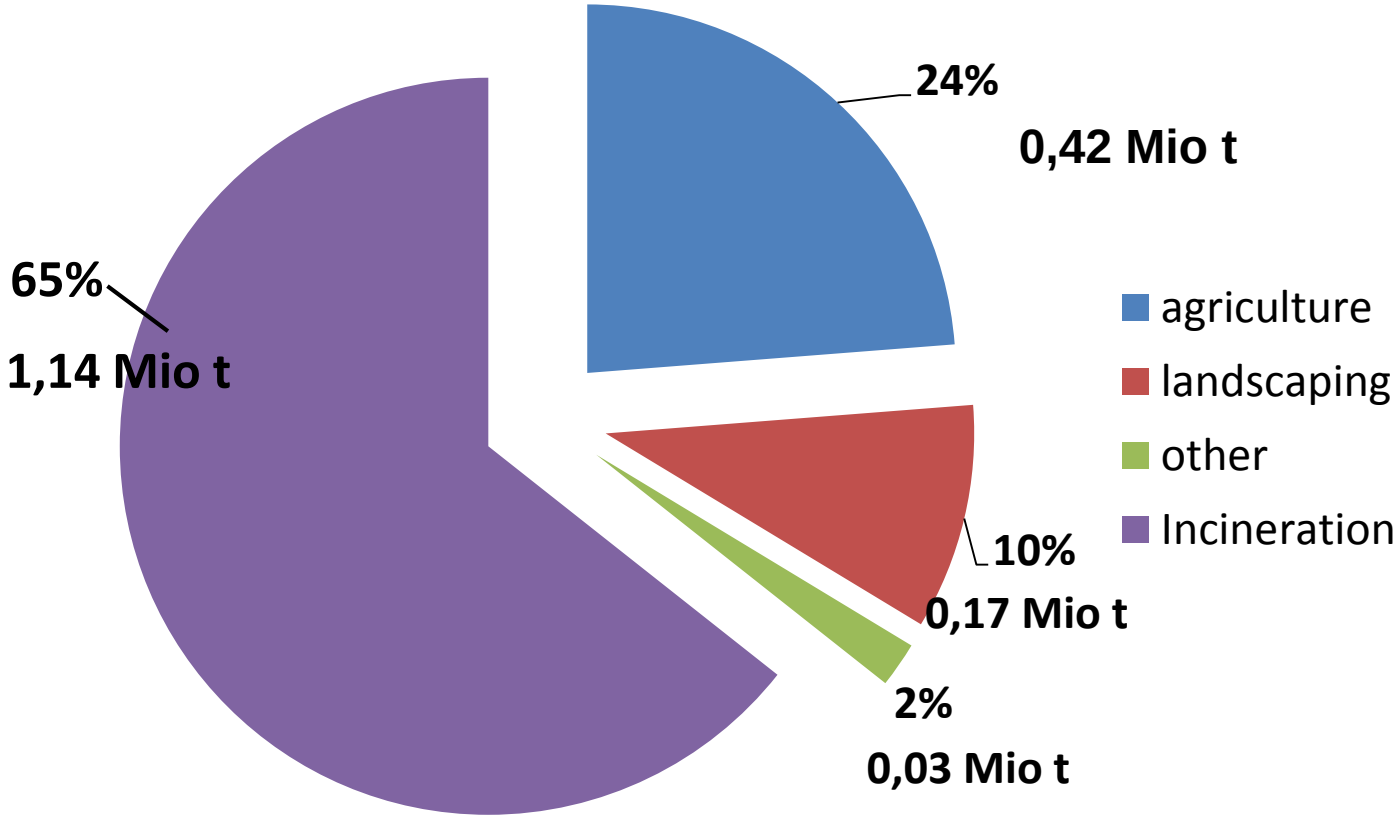
Disposal pathways of sewage sludge in Germany (municipal WWTP)



Disposal
2016 in total: 1,77 Mio. t

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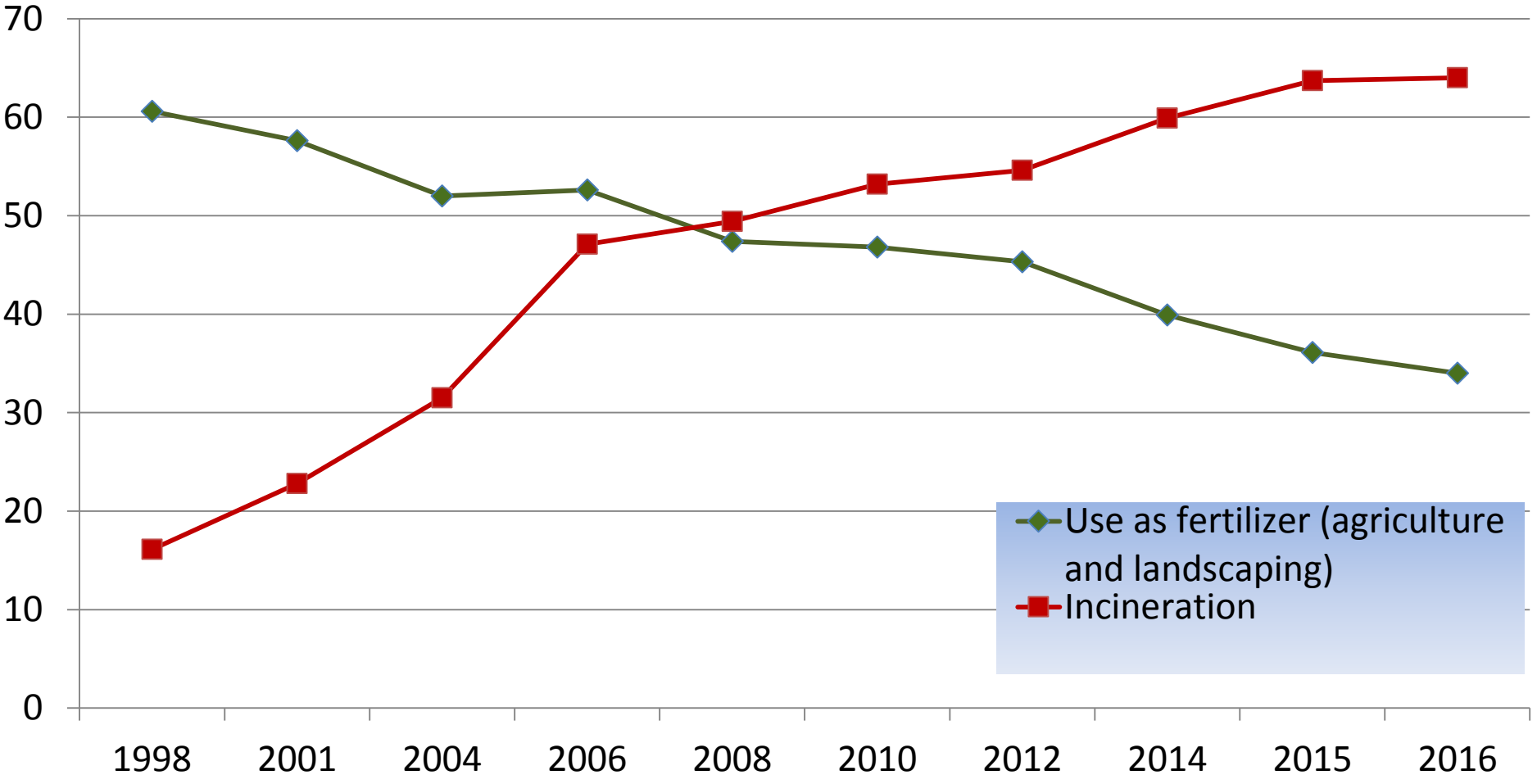
Sewage sludge disposal routes 1998 – 2016 (%), Germany



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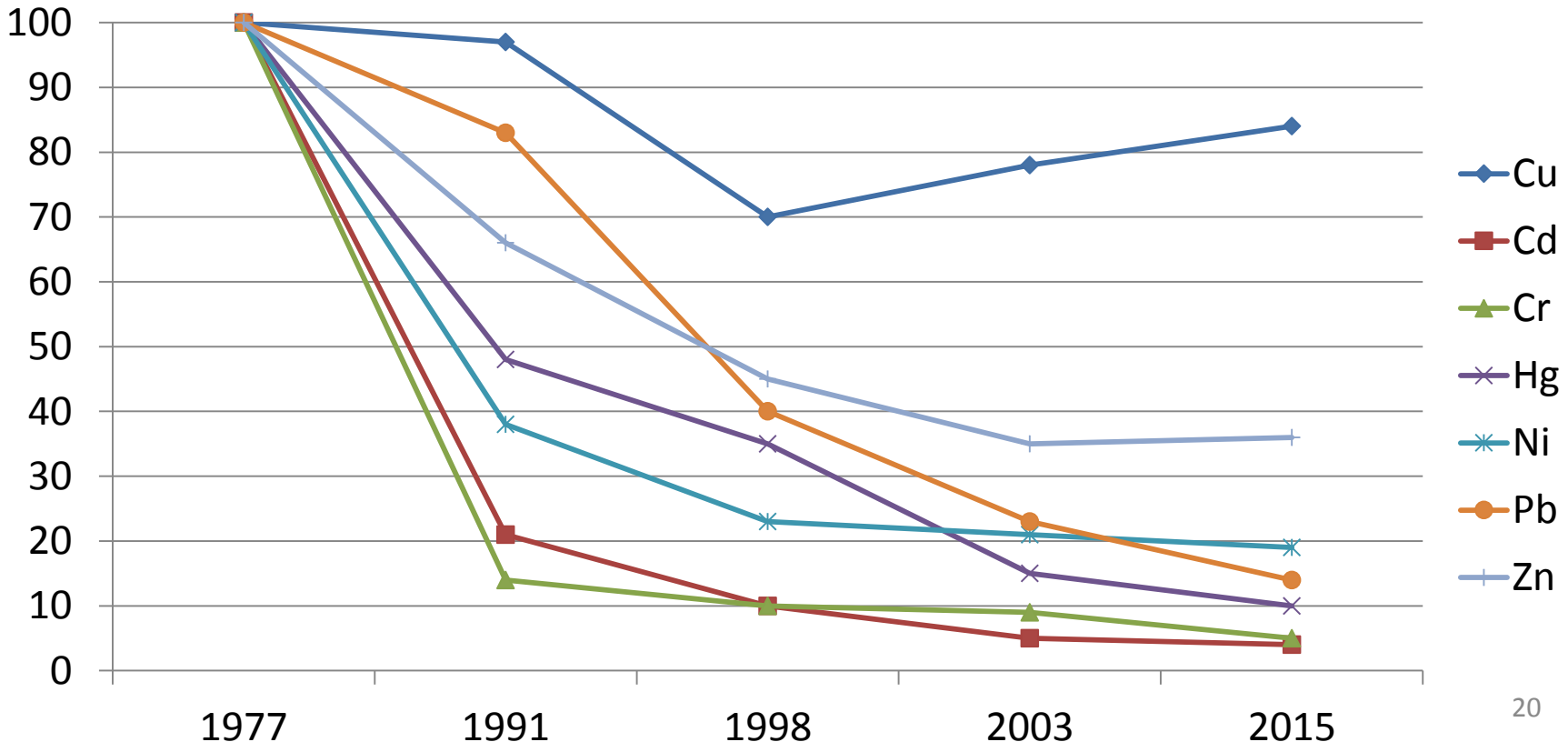

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Political situation in Germany with regard to sewage sludge from municipal wwtp

Federal government and federal states actually are in favour of Phosphorus recycling….

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Coalition agreement of the federal government of Germany, 11/ 2013:

*„We will face out the direct use of sewage sludge as a fertiliser on land and promote the recycling of **Phosphorus** and other nutrients“*

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Reasons to recycle Phosphorus

→ **P**

→ **resp. P_2O_5**

Approx. 360 years of supply through primary Phosphorus sources – What sense to recycle?

Main reasons to recycle phosphorus are….

- Geopolitical uncertainty
  (risk of distribution battles, monopolization)

- Increase of demand (world population, energy crops, consumption of meat) – essential for human beings, animals and plants (no life without P)

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Sources and potential of P-recycling in Germany

Recycled phosphorus from wastewater (and sewage sludge) could – in theory - substitute up to 60% of imports of **mineral phosphorus**

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New Sewage Sludge Ordinance: Consequences

Revision of the sewage sludge ordinance („Klär-schlammverordnung“) includes as main regulations:

- WWTPs with a capacity of more than 100.000 inhabitants (or equivalents) have to recycle phosphorus after a transition period of 12 years
- WWTPs with a capacity of more than 50.000 inhabitants (or equivalents) have to recycle phosphorus after a transition period of 15 years
- Direct use of sewage sludge as fertilizer is not allowed after the transition period of 12/15 years
- Exemptions for small and medium WWTP - these WWTP can use sewage sludge even after the transition period as fertilizer

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Main routes to recover phosphorus:
- chemical precipitation
- mono-incineration

Alternatives to recover phosphorus:

I. No co- incineration of sludges containing more than 20 g of phosphorus (per kg of sewage sludge dm) – chemical precipitation of MAP (struvite) is obligatory before thermal treatment

II. Ashes from sludges being treated in special sludge incinerators (sewage sludge mono incinerators)
- have to be recovered to mineral fertilizer

or

- have to be stored separately in order to recover to fertilizer later on

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The revision of the sewage sludge ordinance

- „Notification“ by the European Commission (September 27th till december 27th) was successful
- Federal government agreed to the draft by January 18th 2017
- Federal Parliament agreed by March 9th 2017
- Federal countries („Bundesrat“) agreed by mid of may 2017
- The ordinance became effective by October 2017

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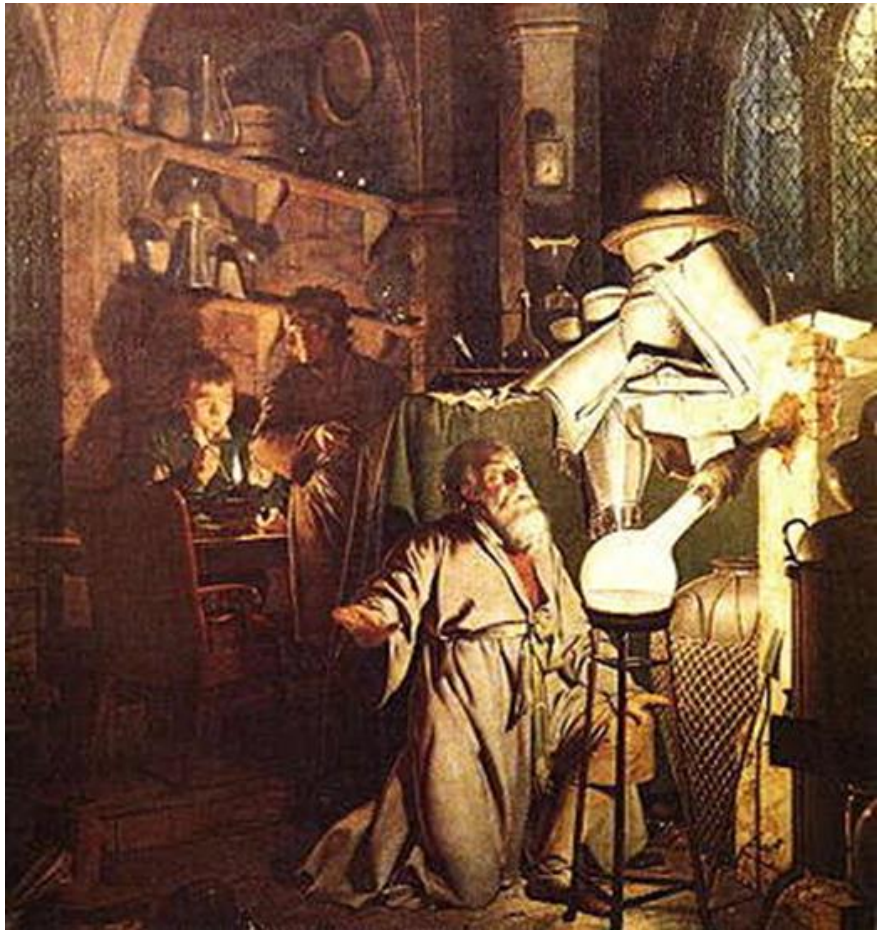

Thank you for your attention!

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