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IWAMA
Interactive Water Management

Interreg
Baltic Sea Region

EUROPEAN UNION
EUROPEAN REGIONAL DEVELOPMENT FUND

Sludge legislation in Finland : sludge based fertiliser products for agricultural use

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Municipal waste water treatment and sludge

- **Municipal waste water treatment plants**
  - ~520 P.E. ≥ 100 (with environmental permit)
    - ~170 P.E. ≥ 2 000 (reported according to the UWWTD)
    - 74 P.E. ≥ 10 000 (nitrogen removal in UWWTD)
    - 13 P.E. ≥ 100 000 (E-PRTR)
- 500 million m^3/a waste water
- **Sludge**
- Annually 1 million m^3, 160 000 ton DS
  - Nutrient content: P ~4 %, N ~4,5 %

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Sludge treatment

- **Stabilisation and hygienisation**
- **Recycling and recovery of nutrients**
  - Fertiliser products for agriculture and green areas
- **Disposal**
  - Landscaping of landfills
  - Energy recovery

- **Environmental Protection Act (527/2014)**
- **Waste Act (646/2011), Waste Incineration Decree (151/2013)**
- **Fertiliser Products Act (539/2006)**
- **Fertiliser Products Decrees (24/11, 11/12)**

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Sludge recycling

- **Fertiliser Product Act 539/2006**
  - **Only fertiliser products with type designation can be on the market**
    - National type designation list of fertiliser products
    - A new type designations can be added
    - Product must be beneficial for plants or significantly improve plant growth (Finnish Food Safety Authority)
  - **Approved establishments**
    - Manufacturing, technically processing or storing organic fertilizer products or their raw materials must be approved by the Finnish Food Safety Authority before it starts its operations

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Sludge recycling

- **Quality of the sludge**
  - Limit values for heavy metals

	mg/kgTS	mg/kgTS (ashes)
As	25	40
Hg	1,0	1,0
Cd	1,5	25
Cr	300	300
Cu	600	700
Pb	100	150
Ni	100	150
Zn	1500	4500

  - Limit values for pathogens

Salmonella	NA (25 g sample)
Escherichia coli	< 1000 cfu/g (< 100 cfu/g)

- **Sampling and analyzing of sludge**
  - According to the fertiliser product decree and waste decree

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Sludge treatment

Situation in 2015 – 2016

Treatment		units
Digestion	at WWTP	16
	co-digestion	18
Composting	composting plants	14
	windrow piles	95
Lime stabilisation		1
Oxidative chemical treatment		4
Incineration		1-2
	In total	~150

producing fertiliser products

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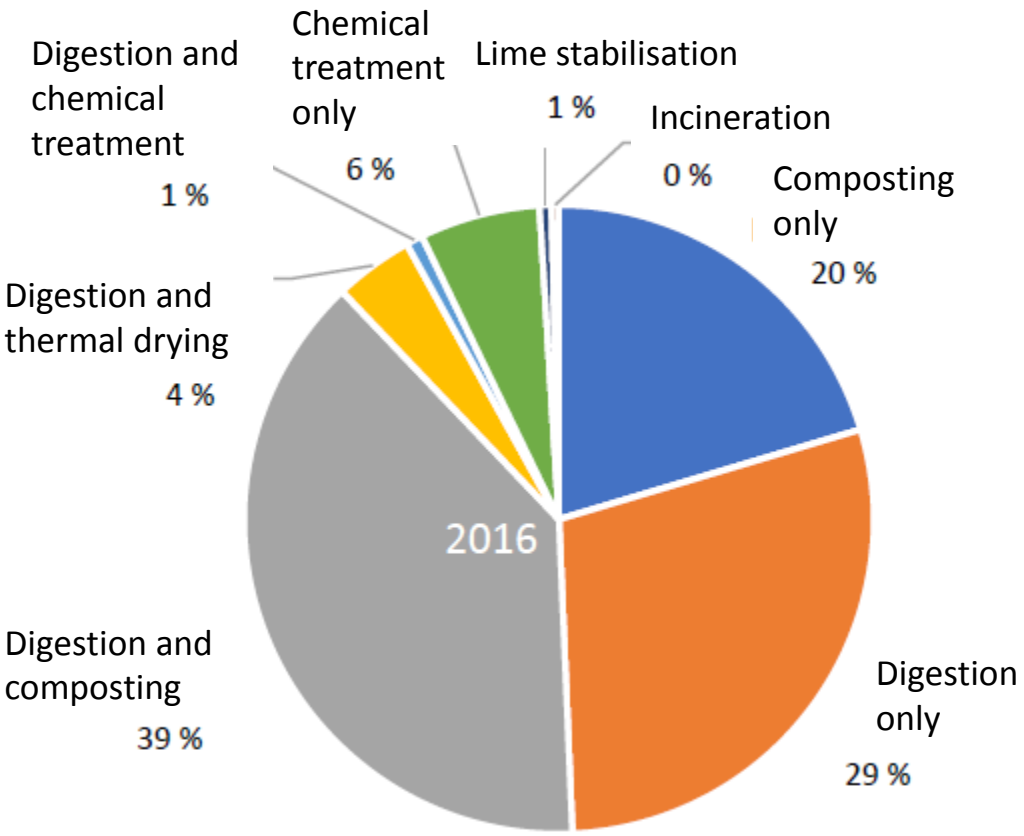
Sludge treatment



The proportional amounts of sewage sludge treatment methods 2016

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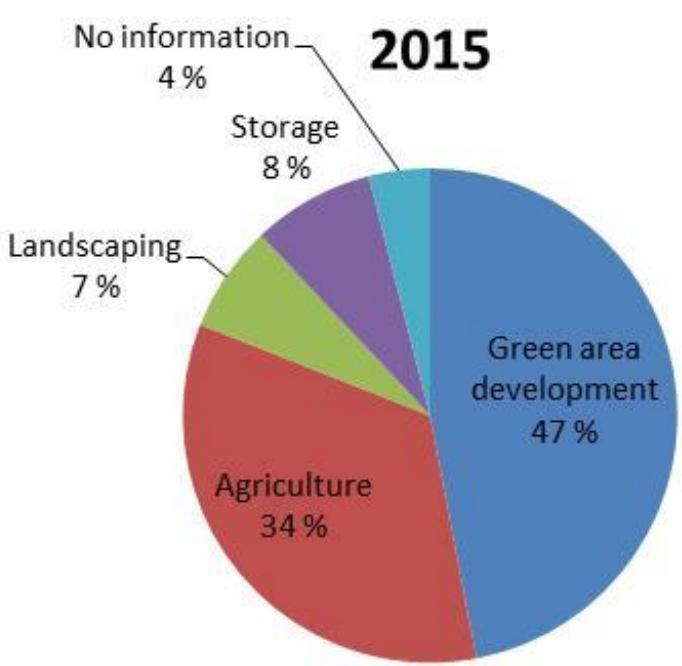
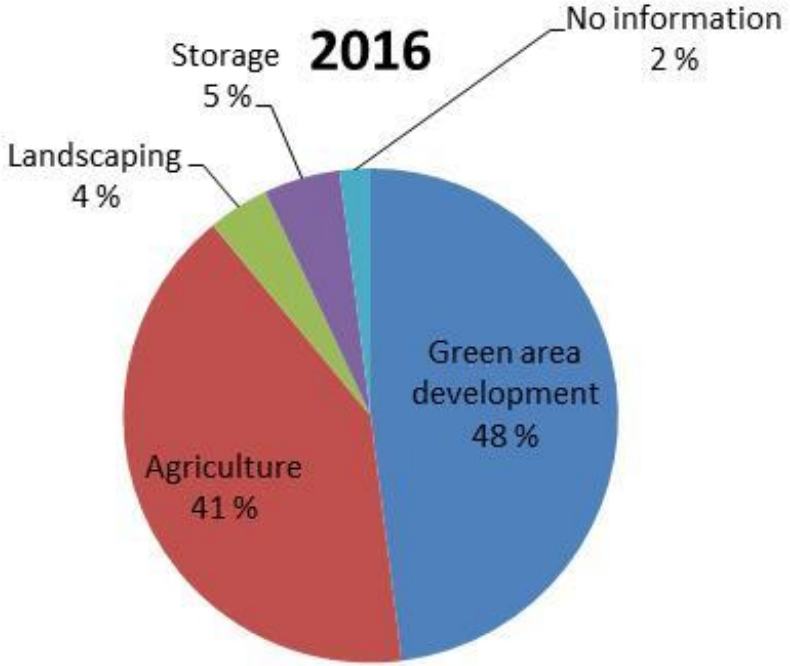
Sludge utilisation





The proportional amounts of sewage sludge utilisation 2015 and 2016

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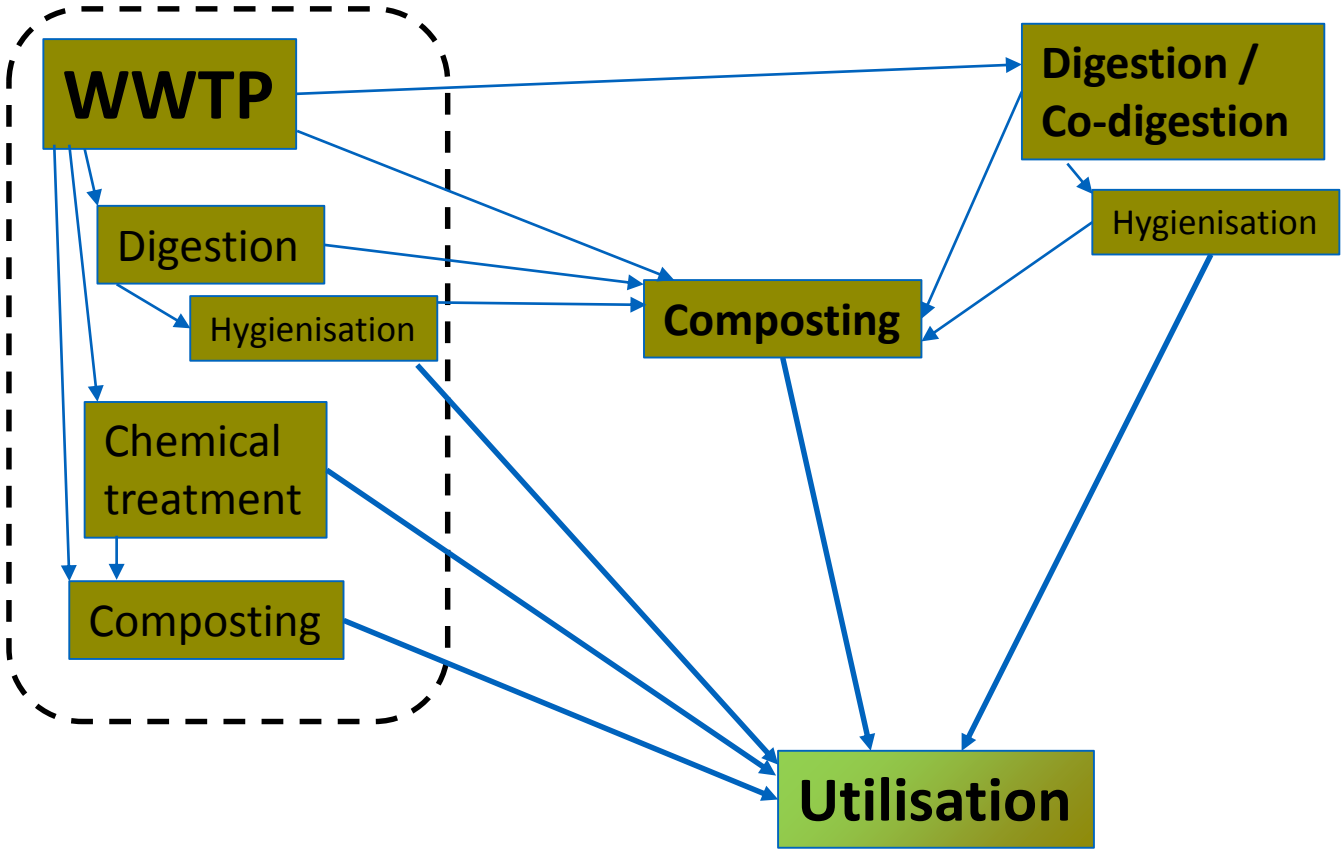
Sewage sludge treatment chains



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Sludge recycling 100 %

- **Recycling according to the fertiliser product act**
  - **Stricter than the sewage sludge directive 86/278/EEC**
- **Limit values for heavy metals**
  - **No limit values nor recommendations concerning other micropollutants**
- **Legislation and other policy instruments**
  - **Leachate control, soil protection, agri-environment support schemes**

Food industry related prohibitions on the use of sewage sludge in agriculture

Availability of chemically bound phosphorus to plants

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Nutrient recycling & recovery

- **Technology development for sustainable sewage sludge handling - government platform**
  - **Case by case**
    - 2 - 3 full scale (20 000 - 50 000 PE WWTP) plants for sludge treatment demonstration units
    - Innovative clean-tech -processes
  - **Ministry is funding several R&D innovation projects**
    - Recovery of nutrients
    - Role and elimination of micropollutants
- **No ready-made solutions**
  - **Local applications**
- **Fertiliser products**
  - **Quality / Applicability**
  - **Doubts / Confidence**

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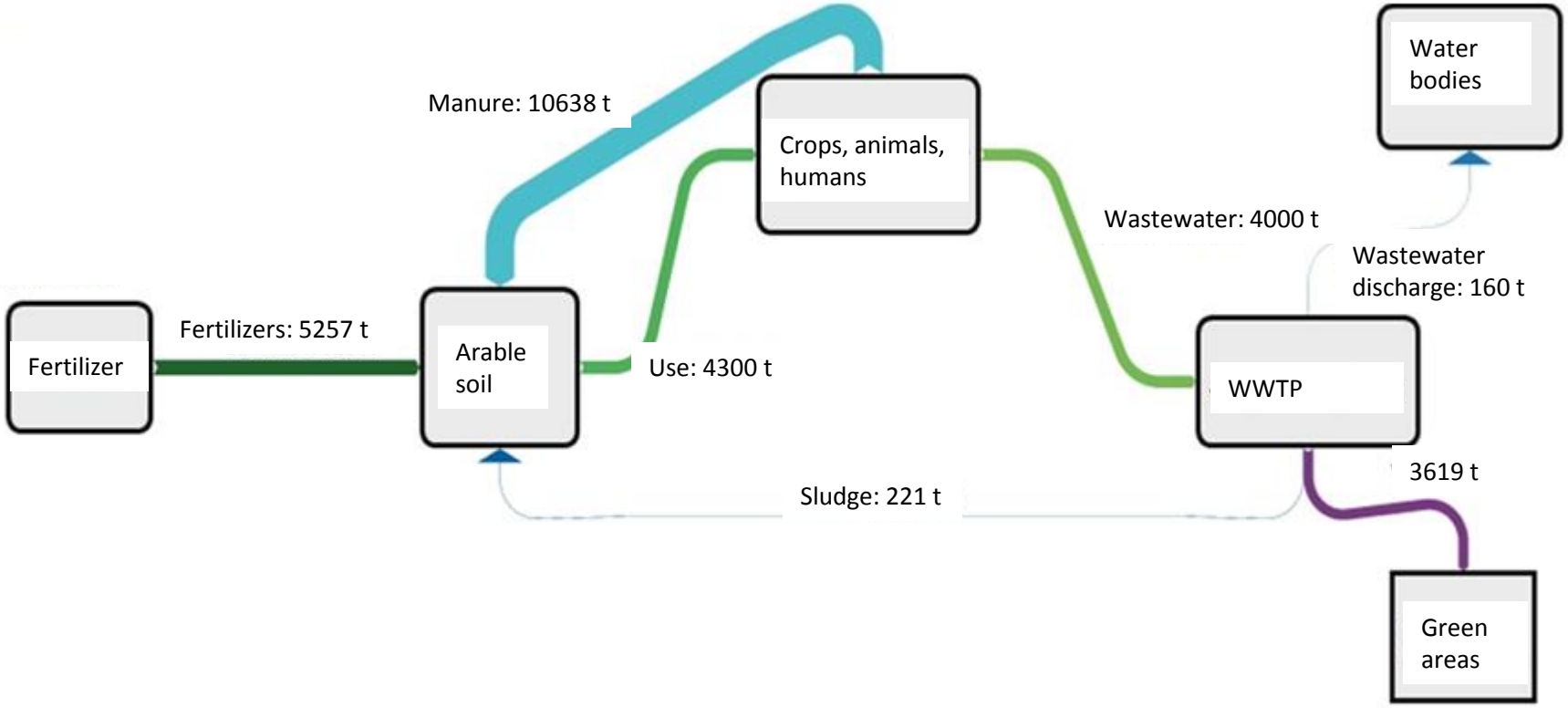
Phosphorus streams in Finland



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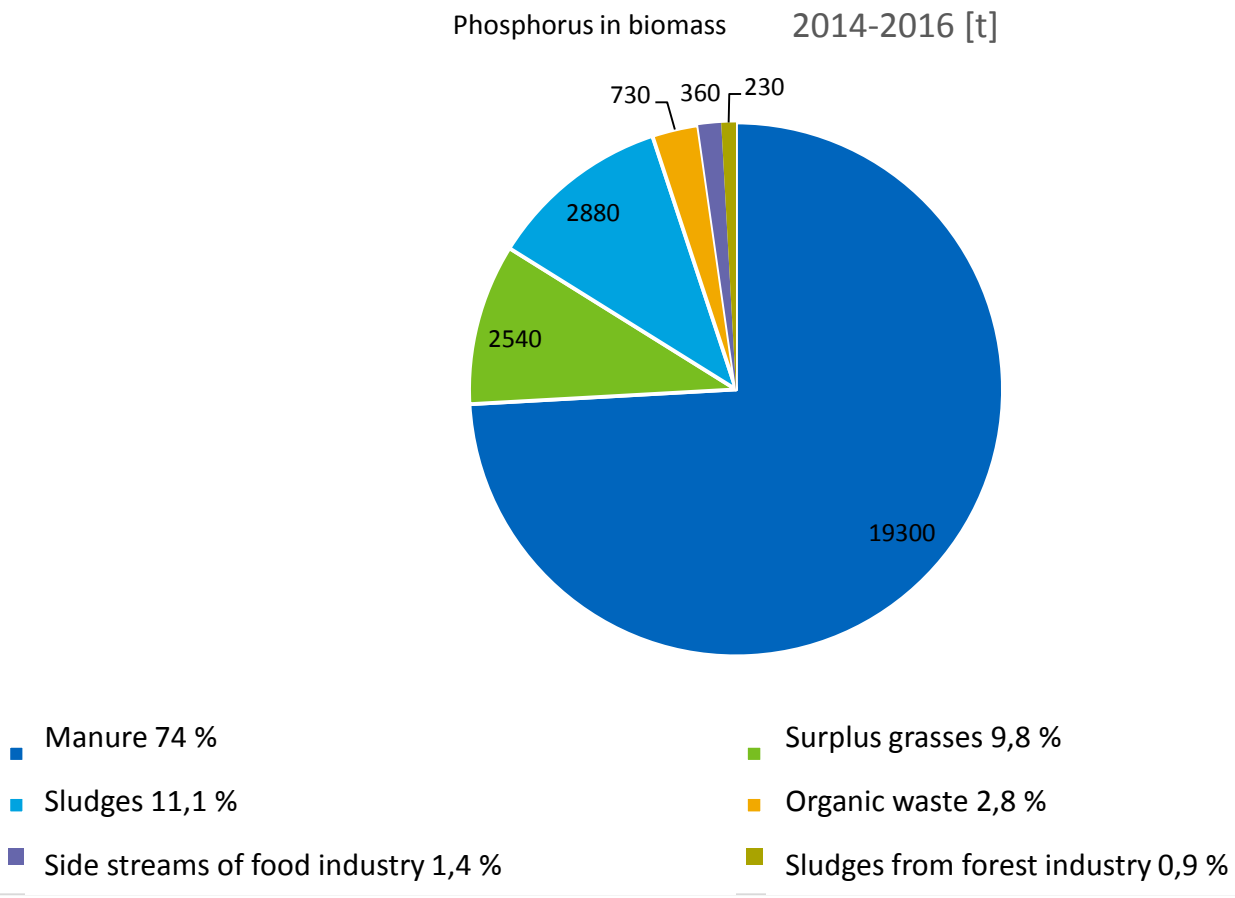
Phosphorus in waste



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Sludge threats

- **End of utilisation in agriculture?**
  - **Daily 1100 t sludge without utilisation or disposal**
  - **Storage problems**
- **Doubts in green areas utilisation**
  - **”Is there something wrong in sludge as the farmers don’t use it?”**
- **Urgent need for solutions**

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Sludge projects and research in Finland

- **Risk assessment based evaluation of the micropollutants in the sludge**
  - **Norwegian risk assessment**
  - **Screening of organic pollutants in sewage sludge amended soils (Sweden)**
- **Quality assurance system for the safe use of sludge**
  - **Swedish REVAQ**
  - **Estonian EJKL certification**
- **Sludge treatment to eliminate micropollutants**
  - **Oxidative**
  - **Thermal**

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Policy instruments

- **Study on policy instruments**
  - **Legislation**
  - **Economic**
- **To develop techniques**
  - **To make products that are applicable and generally accepted**
- **To enhance the utilisation**
  - **Of the applicable and generally accepted products**
- ***Funding, obligations, taxation, voluntary agreements…***

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Sludge, now and in the future

- **Pollutants in sewage sludge is a major concern**
  - Agricultural use of sludge is about to end
- **Farmers are not against in principle**
  - Good soil conditioner and nutrient source
- **Building the trust**
  - QAQC, Risk assessment
- **Applicable use of sludge based fertiliser products**
- **Nutrient recovery**

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Thank you!

Ari Kangas, Ministry of the Environment