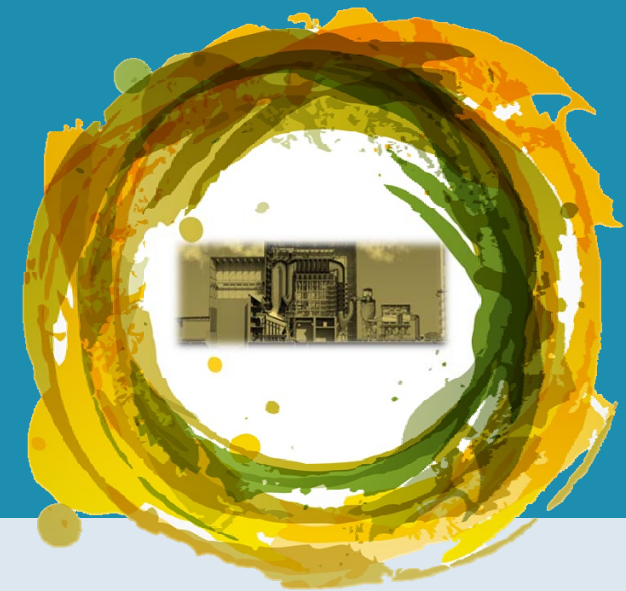


How waste-to-energy plays an essential role in the circular economy

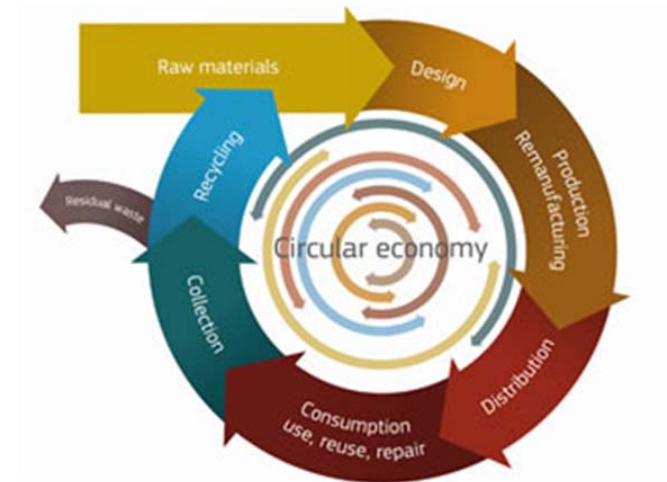


Jo Van Caneghem

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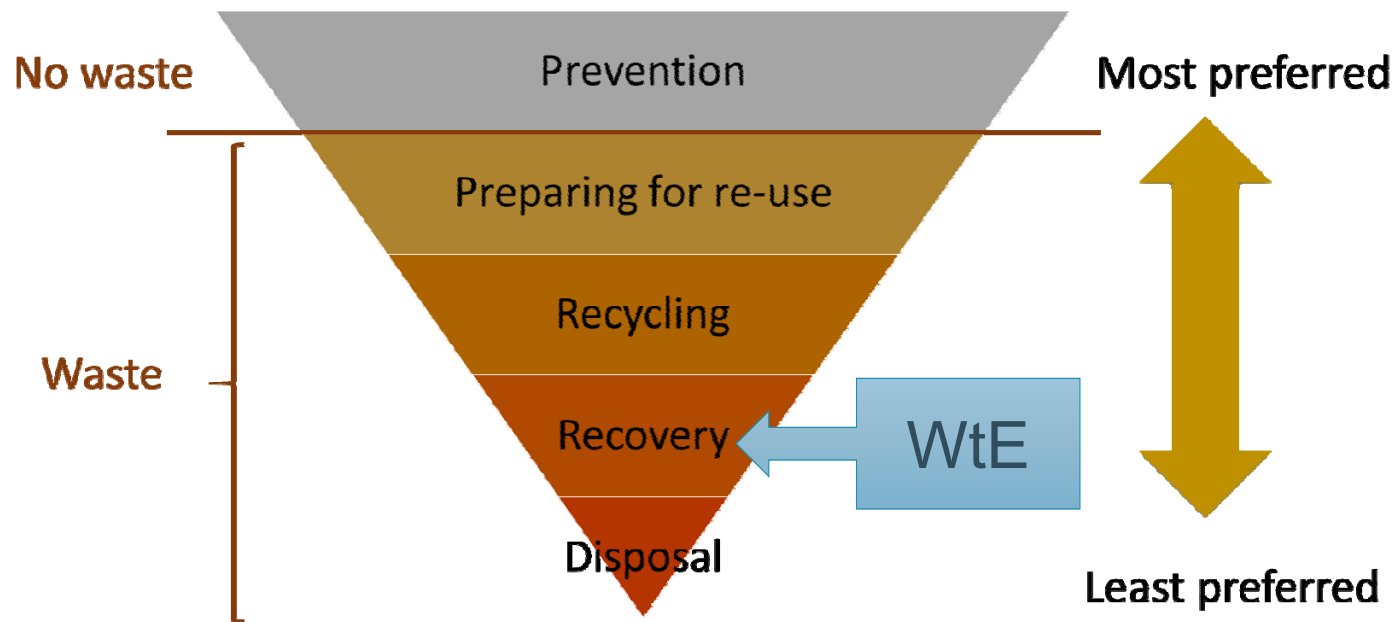
What is a circular economy?

- *Circular economy package (CEP)*
 - European commission 2015
- An economy where
 - Value of products, materials and resources is maintained in the economy for as long as possible
 - Generation of waste is minimised



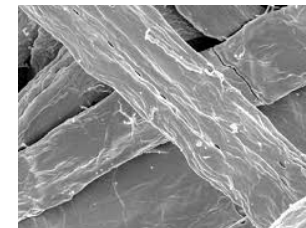
European waste hierarchy

- According to European waste frame directive (2008/98/EC)

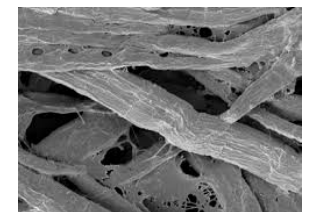


1. WtE treats only non-recyclable waste

- Recycling not or no longer possible due to **technical** and **economic reasons**
 - Mixed materials due to insufficient or impossible source separation
 - Contamination of waste
 - Material degradation upon recycling e.g. degradation of fibres (paper, plastics)
 - Cost of recycling higher than cost of production from virgin materials

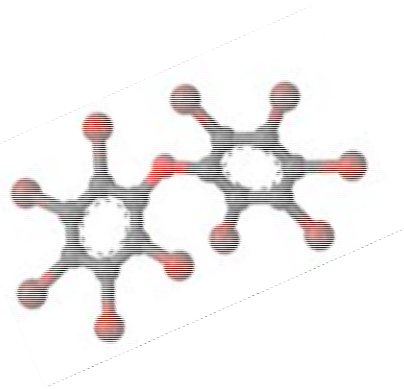


Source: Geffertová and Geffert, 2012



1. WtE treats only non-recyclable waste

- Recycling not possible due to **environmental** and/or **health reasons**
 - Presence of toxic substances e.g. POPs



vrtnws NWS

wo 18 okt 10°C 73km file

nl menu zoeken net binnen

Binnenland

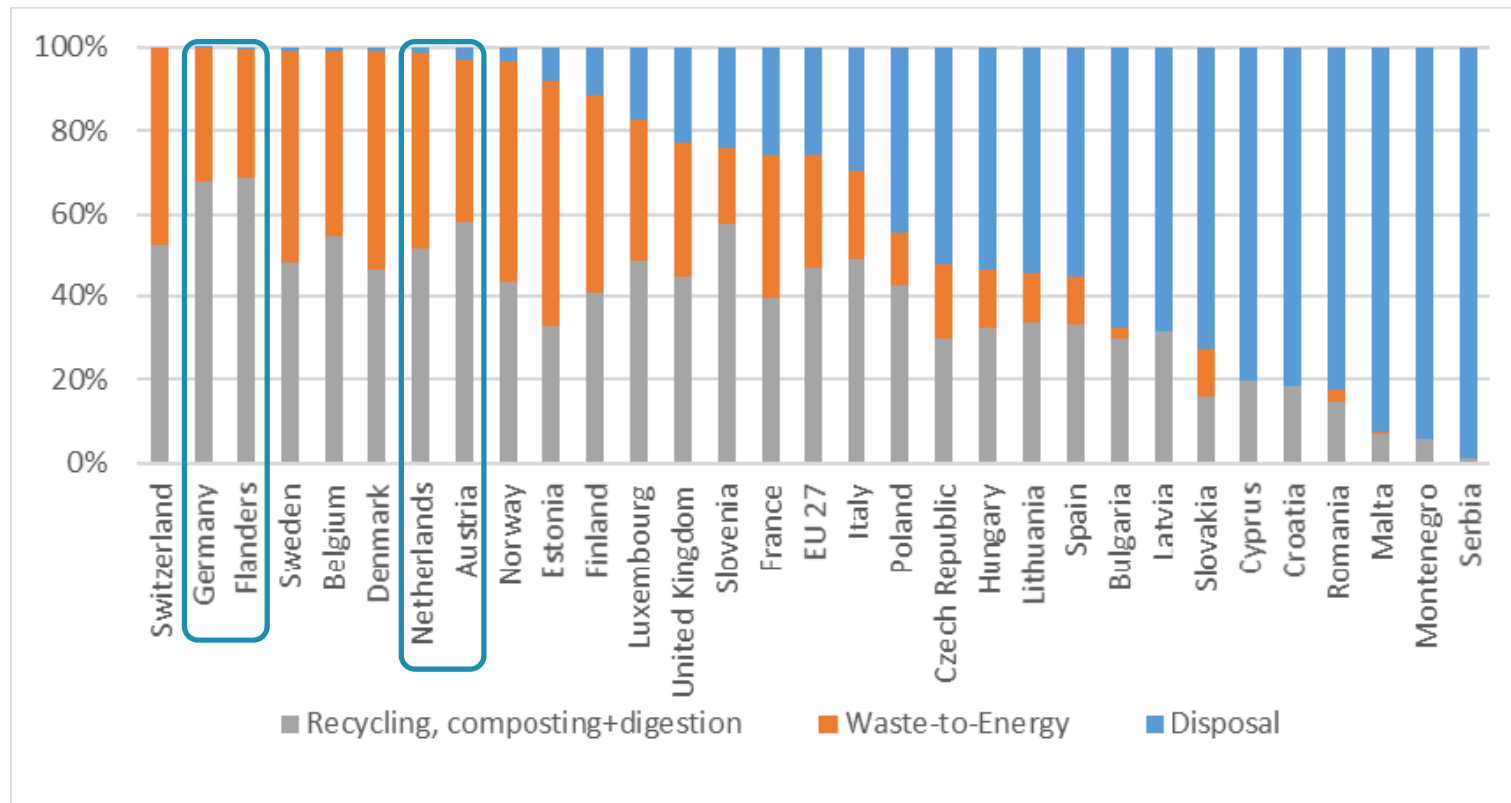
Besmette eieren van biobedrijf uit de handel gehaald

Joppe Matyn

Bij een controle in een bedrijf met biologische leghennen bleek dat de norm voor PCB's overschreden werd. Volgens het Federaal Agentschap voor de veiligheid van de voedselketen (FAVV) bestaat er een risico voor de consument en wordt het bedrijf daarom geblokkeerd.

Source: VRT NWS, 18/10/2017

2. WtE does not compete with recycling, but with landfill

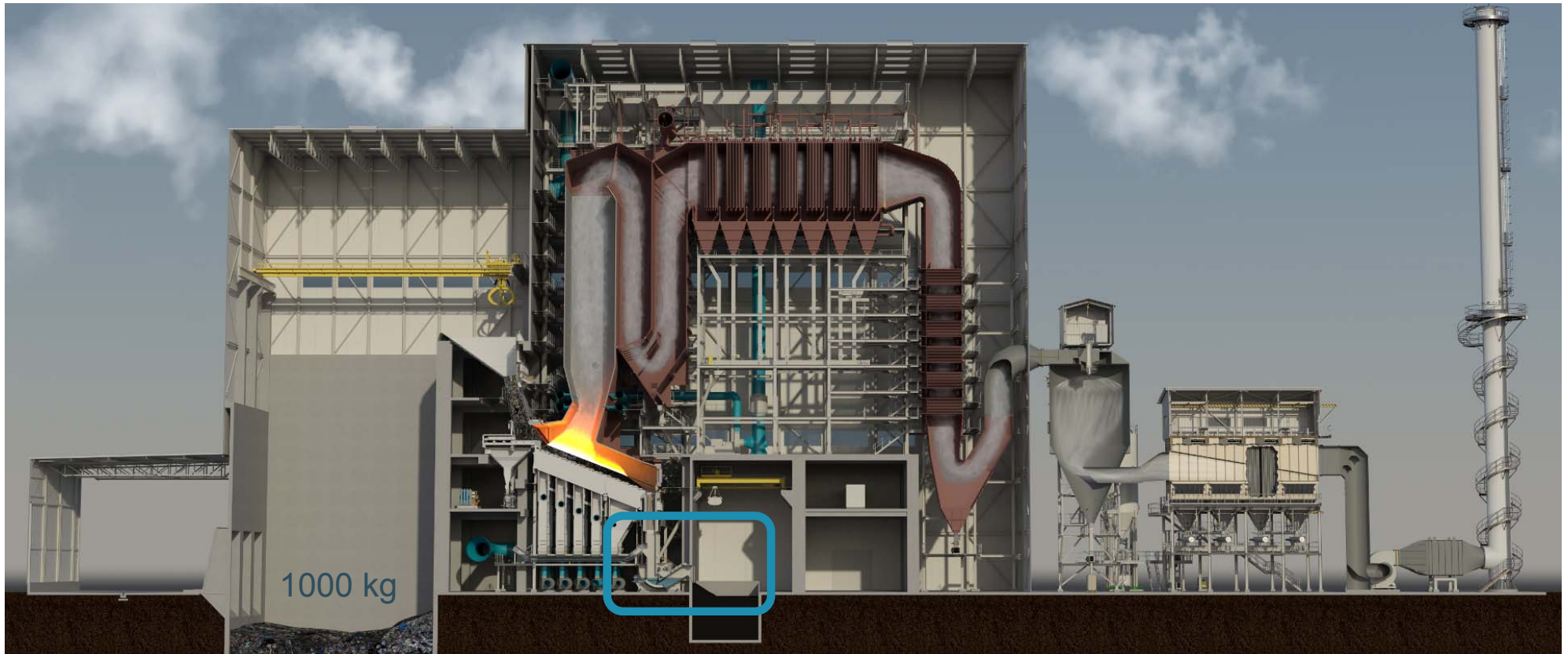


Source: Eurostat, 2018

3. WtE keeps materials and the environment free from toxic substances

- Destruction of organic toxic substances e.g. POPs
 - IED directive: ≥ 2 s at ≥ 850 °C
 - DREs $> 99.9999\%$ achievable
- Heavy metals retained in solid residues
 - S/S \rightarrow hazardous waste landfill
 - $< 1\%$ of input waste mass

4. WtE allows for material recovery and recycling



Bottom ash
220 kg

4. WtE allows for material recovery and recycling

220 kg/t

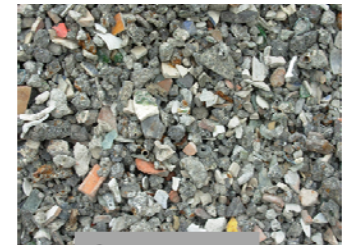


- Ferrous and non-ferrous scrap

- Building material



10 – 60 kg/t ferrous
1 – 30 kg/t non-ferrous



Granulates



Sand

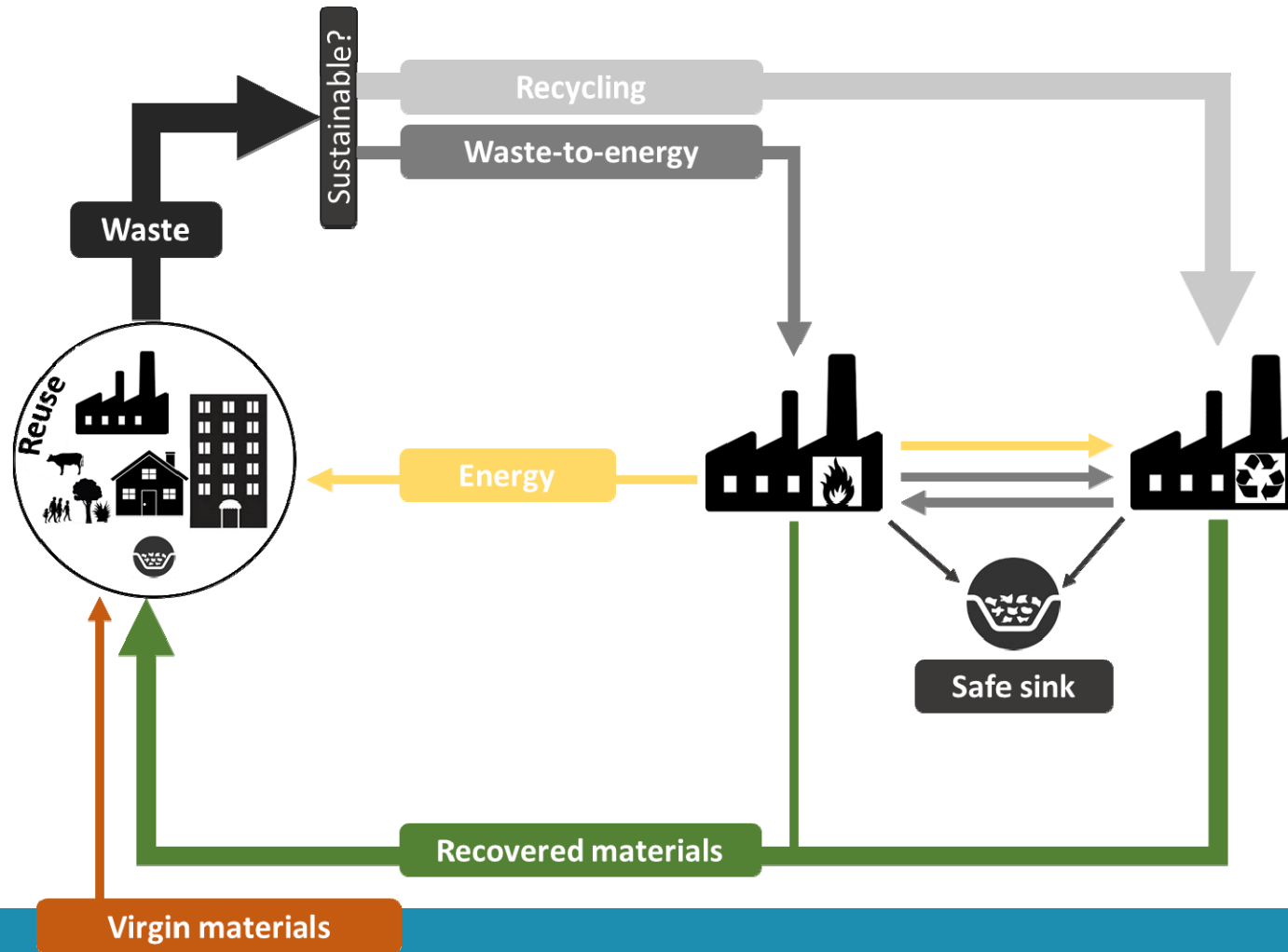
Up to 150 kg/t

5. WtE can generate energy with high efficiency

- Electrical efficiency limited to +/- 25% (complex chemical composition of waste)
- Overall energy efficiency can be increased by applying produced steam as a heat source
 - Directly, e.g. heating or steam networks
 - E.g. Ecluse steam network in Waaslandhaven fed by 6 waste incinerators
 - Combined Heat and Power
 - Recover heat from steam outlet turbine



The essential role of WtE in the Circular Economy



Thank you for your attention!

Questions?