Impact of municipal waste management on climate change

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ZERO WASTE EUROPE

Implementing the Paris Agreement and Tackling Climate Challenges in Central and Eastern Europe, Warsaw, November 3-4, 2016

How does waste contribute to climate change?

- The wastes we generate always require transportation to treatment or disposal facility:
  - A standard waste truck of 7 tons load will emit per each km and 1 tone of waste carried:
    - CO_2 0,392 g
    - + NO_2 0,855 g
    - + SO_2 0,068 g
    - + PAH 0,006 g
    - + PMx 0,079 g

How does waste contribute to climate change?

- Most typical waste treatment or disposal methods are not carbon neutral:
  - Open windrow composting ➲ 50 kg CO_2 eq/t
  - Mechanical-biological treatment (MBT) ➲ 150 kg CO_2 eq/t
  - Incineration ➲ 321 - 455 kg CO_2 eq/t
  - Landfill without off-gas treatment ➲ 986 kg CO_2 eq/t
  - Landfill with off-gas treatment ➲ 640 kg CO_2 eq/t

+ hundreds of other pollutants

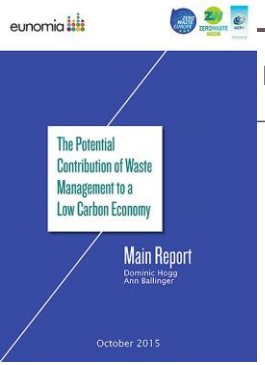



Reduced GHG emission

- There are also methods that allow to reduce the potentiality of GHG emission thankful of gas capture and it utilisation or conservation of energy contained in a material thus significant decrease of virgin material extraction and processing:
  - In-vessel composting ➲ -50 kg CO_2 eq/t
  - Anaerobic digestion (fermentation) ➲ -50 kg CO_2 eq/t
  - Recycling ➲ -106 up to -12,868 kg CO_2 eq/t




Summary of climate impact of waste management scenarios (excl. CO_2 from biogenic sources)



RESIDUAL WASTE TREATMENT

RECYCLING&COMPOSTING

AVOIDED PRODUCTION (WASTE PREVENTION)

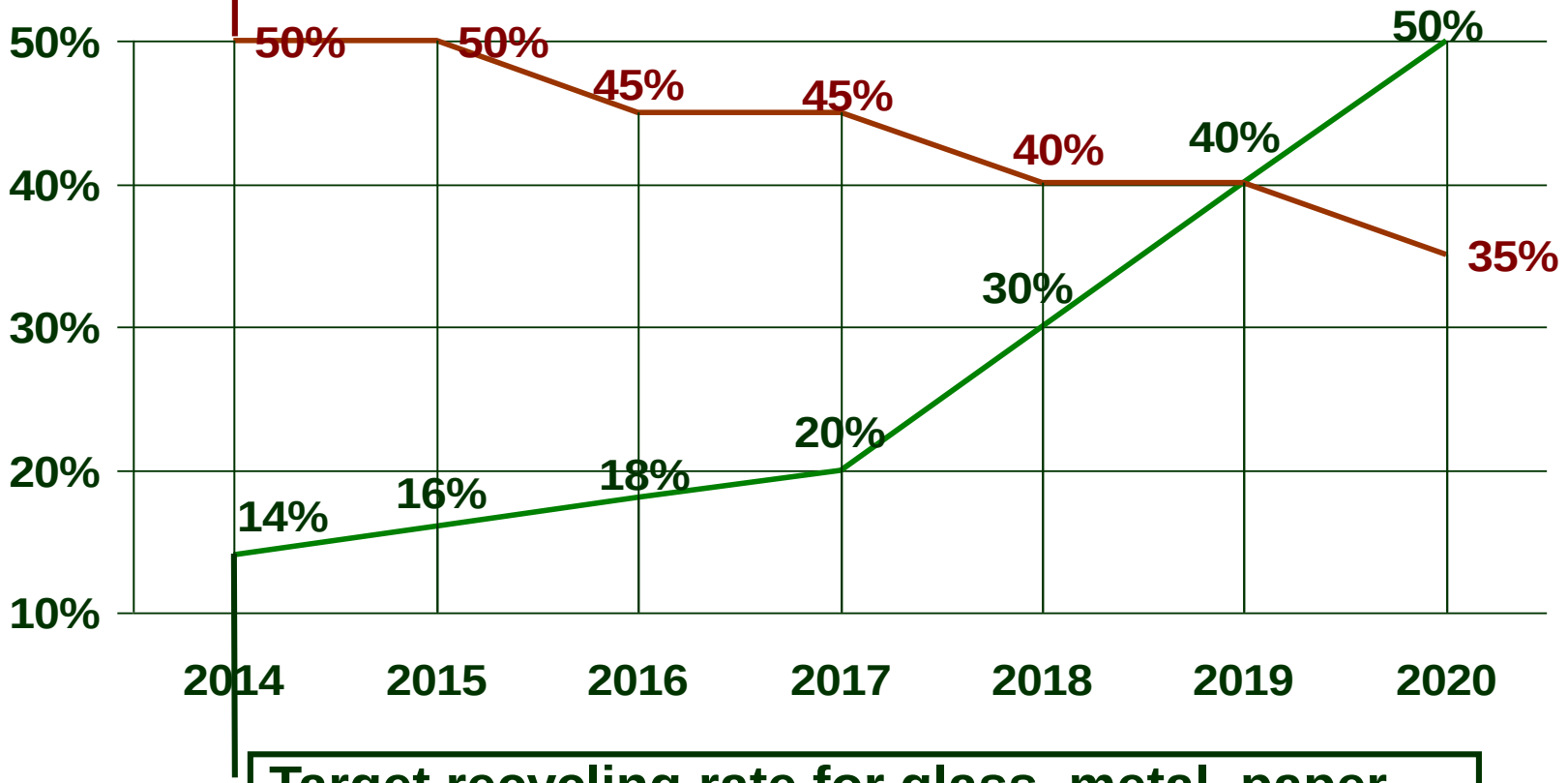
Incineration
Landfill
Others
WEEE
Food Waste (AD)
Garden (composting)
Aluminium
Steel
Textiles
Glass
Plastic
Paper/card
Others
WEEE
Food Waste (AD)
Garden (composting)
Aluminium
Steel
Textiles
Glass
Plastic
Paper/card

- 23,000
- 18,000
- 13,000
- 8,000
- 3,000
2,000

Emissions, Kg CO_2 equivalent per tonne of waste managed

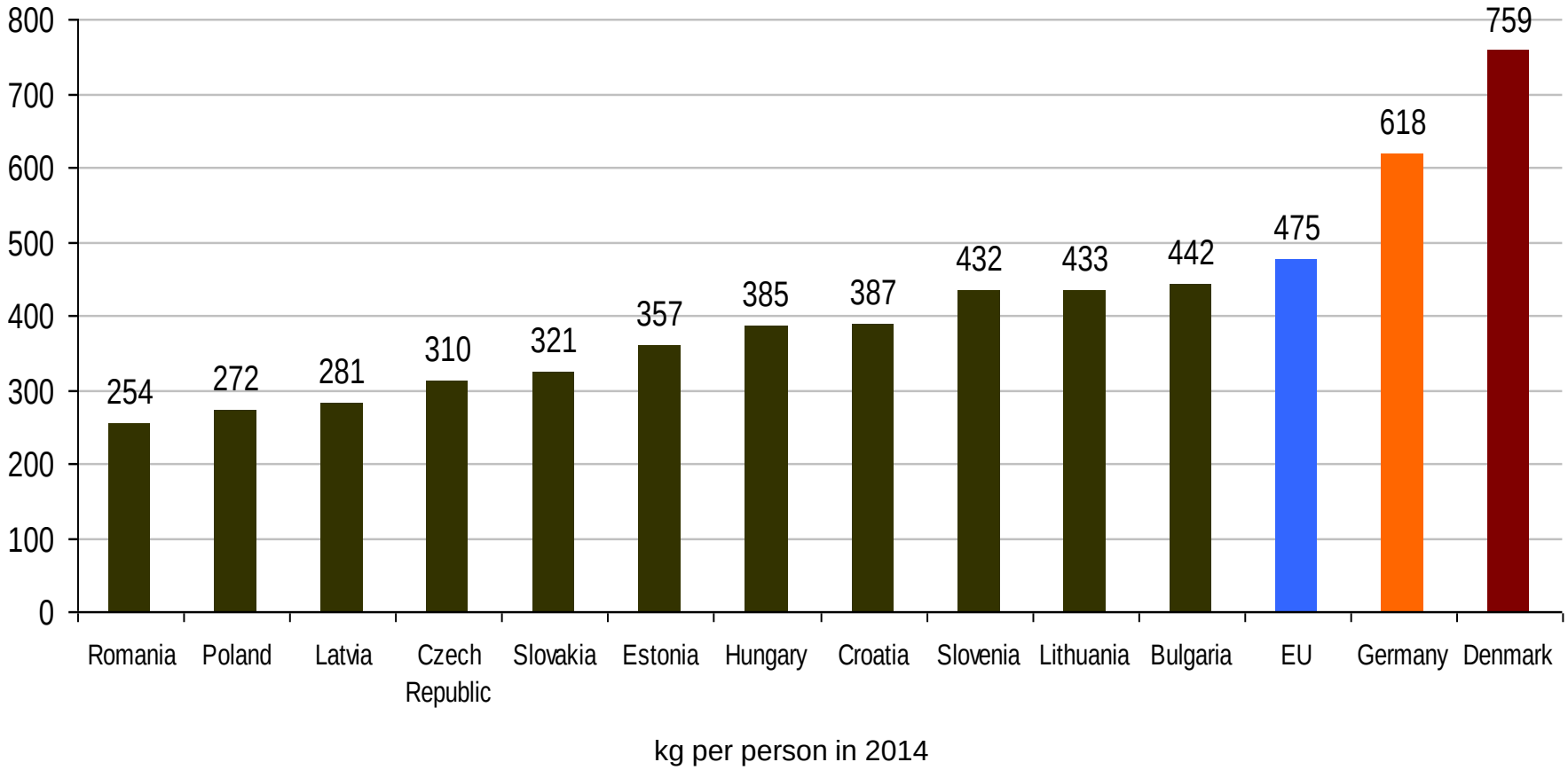
Current targets of municipal waste management

Reduction of biodegradable waste landfilling in comparison with amount disposed in 1995



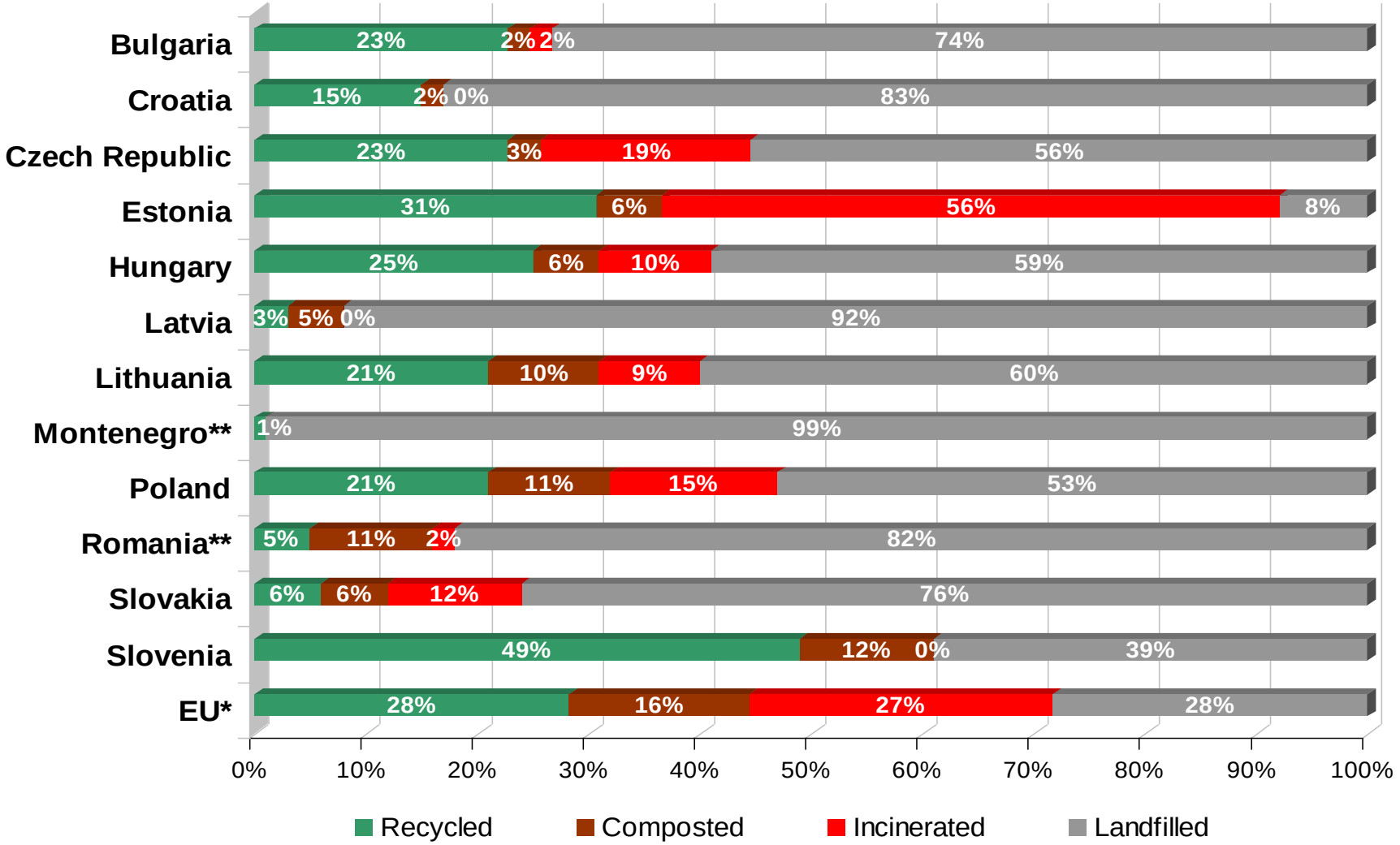
Target recycling rate for glass, metal, paper & plastics only!

MSW generation in CEE



EUROSTAT, 2014

Statistics of MSW management in CEE



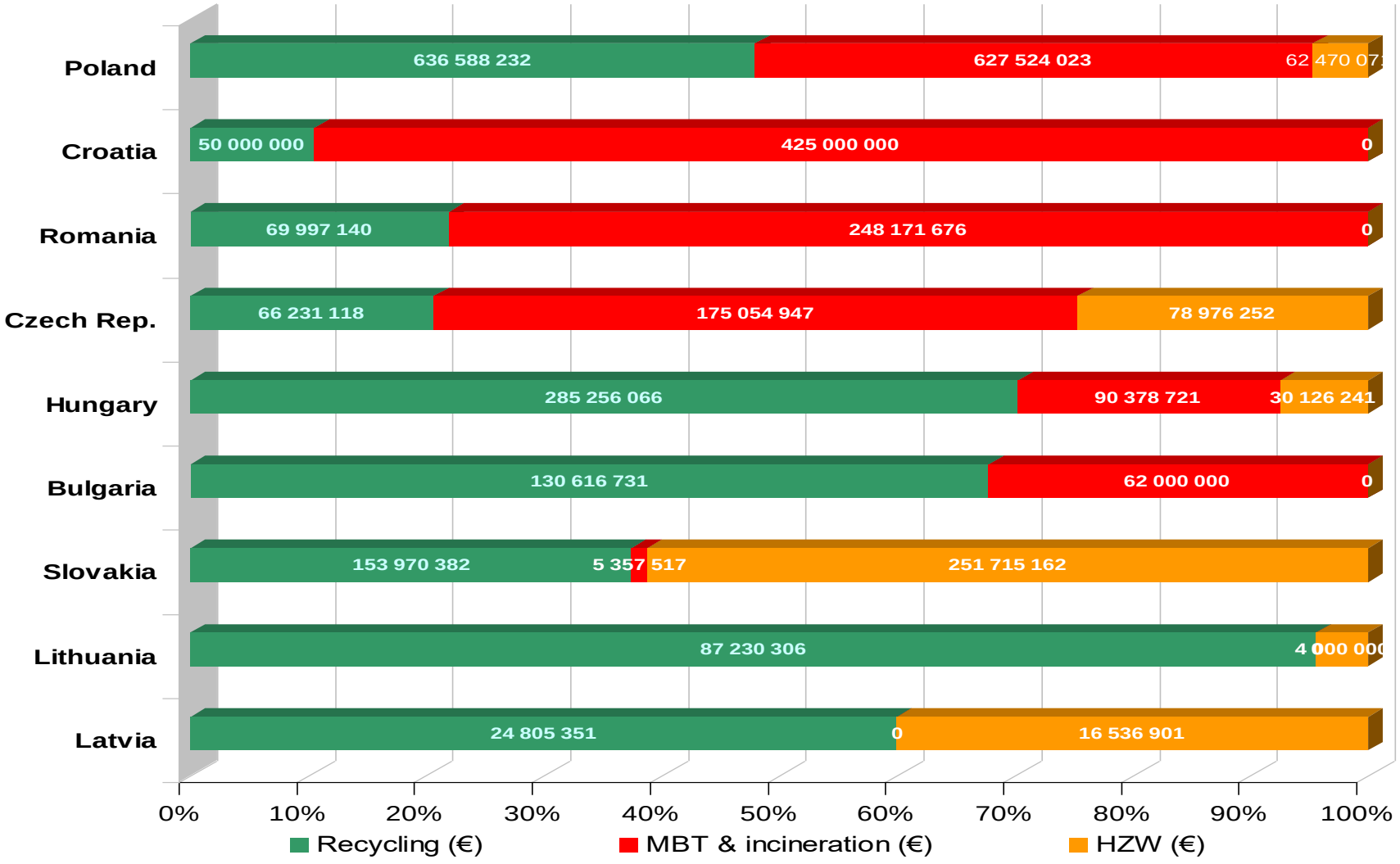
Please read with caution! It's not accurate yet

EUROSTAT, 2014

Financial support of WM in CEE by EU

- European Commission provides money for development of waste management infrastructure from two funds:
  - **Cohesion Fund** (CF) which for the **2014-2020** period concerns 15 countries only: Bulgaria, Croatia, Cyprus, the Czech Republic, Estonia, Greece, Hungary, Latvia, Lithuania, Malta, Poland, Portugal, Romania, Slovakia and Slovenia.
  - **European Regional Development Fund** (ERDF) which supports projects in CEE as well as in some well developed countries in Western Europe
  - Both funds deliver approx. **5 438 914 693 €** for various waste management projects in 16 EU countries

Financial support of WM in CEE by EU



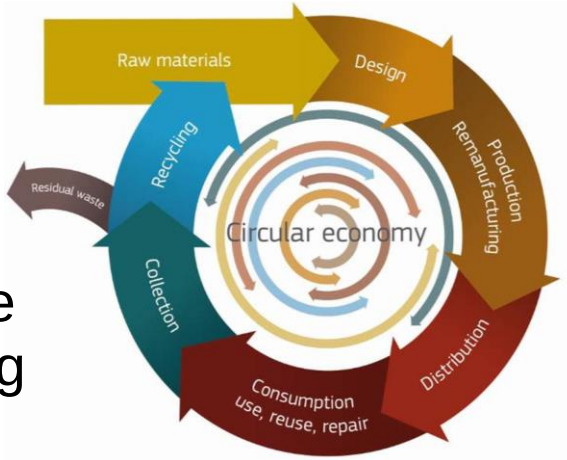
Cohesion Fund and European Regional Development Fund for the period of 2014-2020

Paradigm change: Circular Economy

- On December 2, 2015 European Commission started negotiation of a package of strategic legislation called Circular Economy

- It aim is change linear economy into circular one by closing product loop on all its stages - starting from extraction of virgin materials, design, production, use, and recover and recycling when it becomes *waste* (secondary raw material)

- It should strengthen and make more coherent implementation of compliance in waste policy, products policy, guidance on industrial emissions, consumers protection against unfair practices, interface between waste, products and chemicals legislations



Slow
long life products

Tight
no superfluous use of resources, and waste generation

Local
territorial hierarchy

Clean
non toxic

Proposed new targets

- Only one method of counting the targets:
  - by 2025 60% recycling of MSW, and 65% of packaging
  - by 2030 65% recycling of MSW, and 70% of packaging
  - by 2030 max 10% landfilling of MSW
  - *limit of waste incineration up to 30%*
- Separate collection of bio-waste *where technically, environmentally and economically practicable*

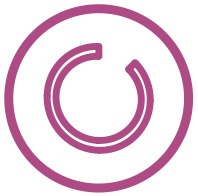
- By 2030 reduction of (plastic) marine litter, and food waste [*both by 50% from 2014 levels*]
- *Overall waste prevention target?*

Expected benefits of CEP up to 2030

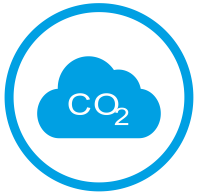
170 000 new jobs

600 billion of costs savings for EU business

> 3% increase of GDP



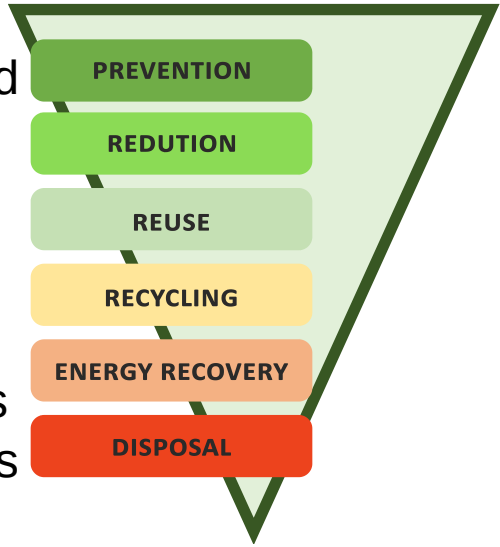
20% reduction of virgin materials use



500 million tons of GHG reduction

Recommendations (overall)

- Recognise the particular policies governing the waste sector, and ensure that the ESR targets take into account the climate mitigation that will be achieved through the waste related targets i.e. set by Circular Economy Package
- Establish the ESR in alignment with the waste hierarchy and scientific research, by including explicit language of support to waste reduction, reuse, recycling, composting and sustainable consumption and production as key mitigation strategies in the waste sector
- Introduce accounting mechanisms to quantify the emissions savings from waste recycling and waste prevention activities at national level, even if only as information notes in the national inventories. This simple action would allow a much more accurate representation of climate mitigation achieved through recycling and waste prevention activities and therefore would provide an incentive to increase the virtuous cycle.



Recommendations for CEE: please DO

- Introduce mandatory separate waste collection, including biowaste
  - improves quality of the collected secondary raw materials, and supports production of high quality compost thus minimises costs of waste management
  - allows quickly rise recovery and recycling rate
  - creates 4 to 13 times more jobs than methods based on mixed waste
- Introduce financial incentives based on real costs of waste management
  - Improved Extended Producer Responsibility
  - Deposit system for beverage packaging
  - Pays as you throw
  - Taxes on virgin materials, and primary resources
  - Landfill, and incineration tax

Recommendations for CEE: please DO NOT

- Support waste incineration, and particularly a concept that waste is renewable energy source when burnt
  - biowaste requires more energy to be dried than it produces
  - plastics are produced from oil
- Support anaerobic digestion of crops cultivated solely for such purpose
  - there is more than enough wastes from agriculture and municipal sources to be utilised
  - waste of land and water, and possible new pollutions from pesticides
- System that rely on mechanical-biological treatment of mixed waste
  - on average it allows to recover 7% of waste suitable for recycling, and the rest is ‘good’ for disposal only

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Thank you for your attention!

ESR Policy Briefing:

https://www.zerowasteeurope.eu/2016/05/policy-briefing-the-waste-sector-under-the-effort-sharing-decision/