



**cewep**

Confederation of European  
Waste-to-Energy Plants

# Waste-to-Energy Roadmap towards 2035

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**Brussels, 24<sup>th</sup> September 2019**

Torino WtE plant, Italy



# The Recycling Society vs. the Circular Economy

## Recycling Society

- ▶ **Focus on quantitative key performance indicators** – KPIs (recycling targets in weight percent)
- ▶ **Less focus on sustainability**
- ▶ **Relies on export** to countries with lower environmental standards or poor labour conditions (export of liabilities, not of wealth)

## Circular Economy

- ▶ **Focus on qualitative, quantitative and financial KPIs**
- ▶ **‘Circular’** = sustainable, environmentally friendly, **‘Economy’** = value creation
- ▶ **Will strengthen the competitiveness of European economy**
  - ▶ innovation in technology and business models
  - ▶ entrepreneurship (identify business opportunities)
- ▶ **Catalysts:**
  - ▶ **ambitious quality standards** (products from waste need to have the same quality as products from virgin materials)
  - ▶ **landfill diversion**

# Waste management in the Circular Economy

## The waste concept remains important, also within the CE:

-  Residues, used goods, objects without any (subjective) value for the holder should be taken care of
-  Waste regulation needs to assure that those materials will not be spread in the environment and will be recovered/reused as much as possible



waste will also exist within the CE

## The role of waste companies within the CE:

-  a logistic role (collect small amounts at different locations and deliver the necessary quantities to the production/treatment sites)
-  Pre-treatment in order to remove unwanted and/or hazardous components:
  -  inorganic (Hg, As, Cd,...)  treatment and safe sink
  -  Organics  WtE

## Keep the materials clean and safe.



# Waste-to-Energy - Enabler of Circular Economy

- ■ Turns non-recyclable waste in an environmentally safe way into secure energy and valuable raw materials;
- ■ Keeps the circle clean by dealing with unwanted organic components in the material cycles (act as a pollutant sink, fulfilling a hygienic task for the society).





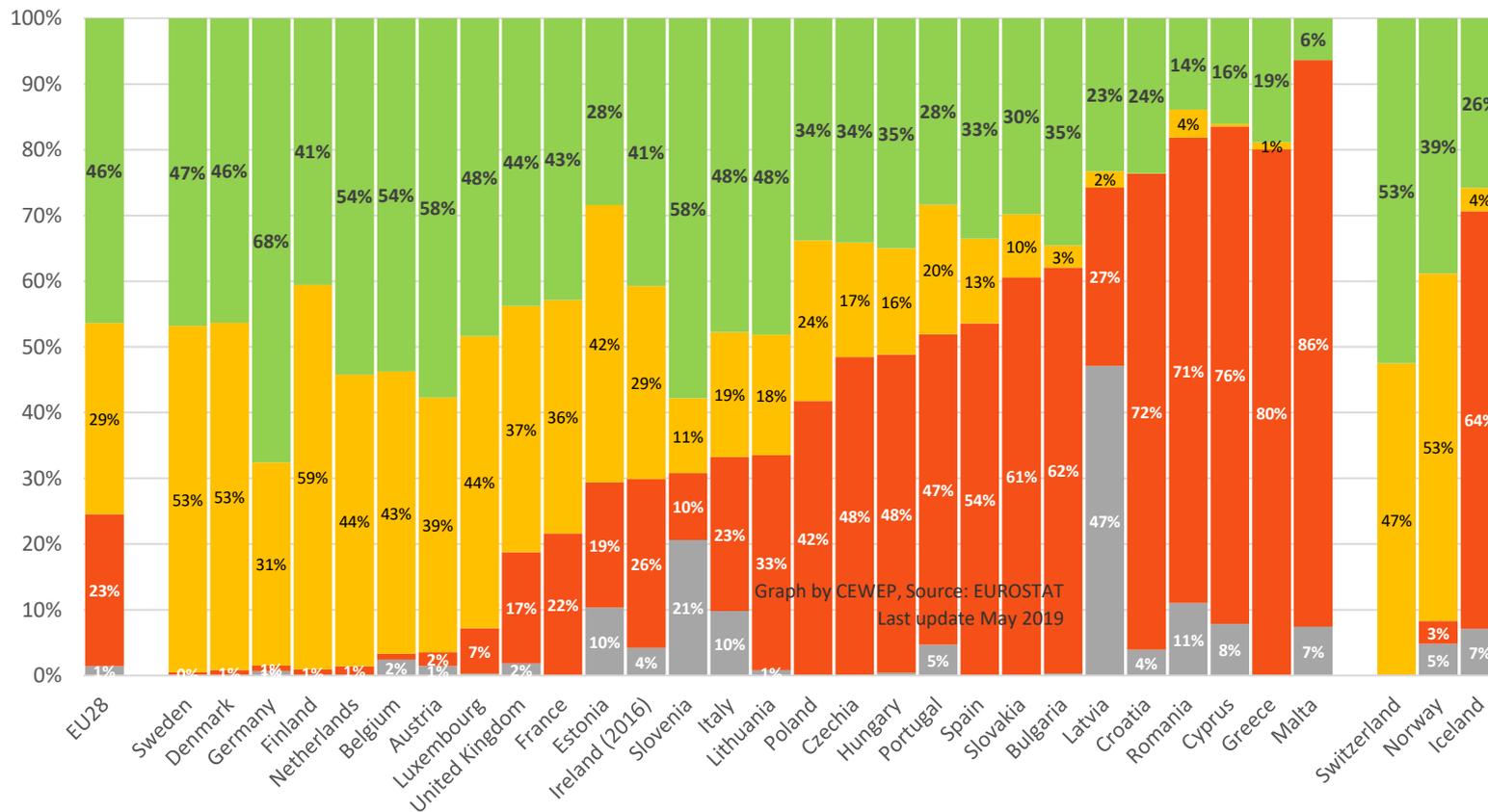
## The Circular Economy and Climate mitigation – How to make it happen in reality?

- ■ **How to treat mixed waste**, waste of complex composition, degraded or contaminated material?
- ■ **How to ensure a reliable treatment** not only for municipal but also for **commercial and industrial waste**?
- ■ How to secure finite raw materials? **How to tackle resource efficiency**?
- ■ **How to phase out landfilling** as soon as possible?
- ■ How to **decrease greenhouse gas emissions**? How to ensure **production of baseload sustainable energy**?



# Municipal waste treatment in 2017

EU 28 + Switzerland, Norway and Iceland



Graph by CEWEP, Source: EUROSTAT  
Last update May 2019

- Landfill
- Waste-to-Energy
- Recycling + Composting
- Missing data



Percentages are calculated based on the municipal waste reported as generated in the country



## What about commercial and industrial waste?

- How to ensure a reliable treatment not only for municipal but also for commercial and industrial waste?

Municipal waste is less than 10% of the whole waste volume.



*"In the absence of current treatment or disposal options respectively in incineration with or without waste-to-energy or final disposal for the fractions with high calorific value, **some recycling companies have been forced to stop their entire mechanical recycling operations, permanently or temporary.**"*

EuRIC, June 2019



## What about commercial and industrial waste?

- How to ensure a reliable treatment not only for municipal but also for commercial and industrial waste?

Municipal waste is less than 10% of the whole waste volume.



- WtE securely treats municipal as well as similar commercial and industrial waste, 24 hours a day, all year round.**





## Where are we heading? Circular Economy targets

### Landfill targets

	2035	2040
Without extension	10%	
With 5 years extension	25%	10 %

Criteria: landfilled > 60% in 2013

Extension possible for:

Bulgaria, Croatia, Cyprus, Greece, Hungary, Latvia, Lithuania, Malta, Romania and Slovakia

### Recycling targets

	2025	2030	2035
Without extension	55%	60 %	65 %
With 5 years extension	50%	55%	60 %

Criteria: landfilled > 60%  
or recycled < 20 % } in 2013

Extension possible for:

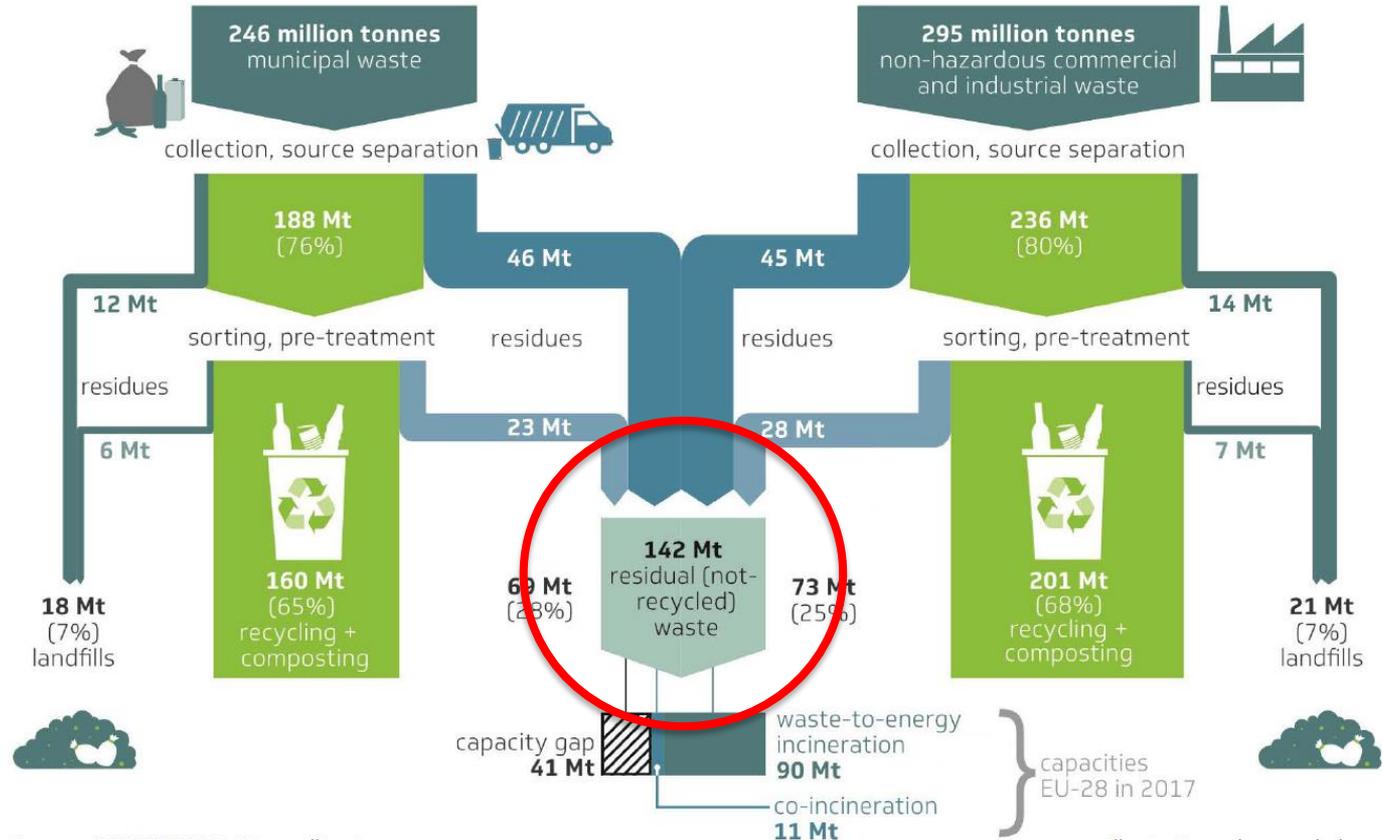
Croatia, Cyprus, Estonia, Greece, Latvia, Malta, Romania and Slovakia

***What will be the result of the Circular Economy package if we realise all the ambitious targets???***





# Residual waste treatment in 2035



Source: CEWEP 2019; Mt = million tonnes

Illustration: ahnenenkel.com



# European WtE Plants

## **Generating sustainable and reliable energy - Boosting Energy Efficiency and GHG Mitigation**

Use even more energy from waste in the form of heat, if the appropriate linking of heat (or process steam) customers to WtE Plants would be encouraged. The energy gains from WtE can be increased by improving access to power grids for WtE Plants.

## **Generating value from Waste-to-Energy bottom ash**

Recycling the metals and using the mineral parts in construction works to replace use of virgin materials.

## **Supporting Quality Recycling**

WtE prevents dirty or contaminated waste from entering the recycling chain and adversely impacting quality and offers sustainable outlet for recycling residue's in Europe.

## **Reducing dependence on landfills**

Recycling and energy recovery are complementary options in order to divert waste from landfilling.





## Reducing Greenhouse Gases:

- How to decrease greenhouse gas emissions?



**More than 153 million tonnes of additional CO<sub>2</sub>eq savings could be achieved by:**

- Diverting waste that is currently landfilled to quality recycling and Waste-to-Energy
- By substituting fossil fuels used for the generation of energy with Waste-to-Energy

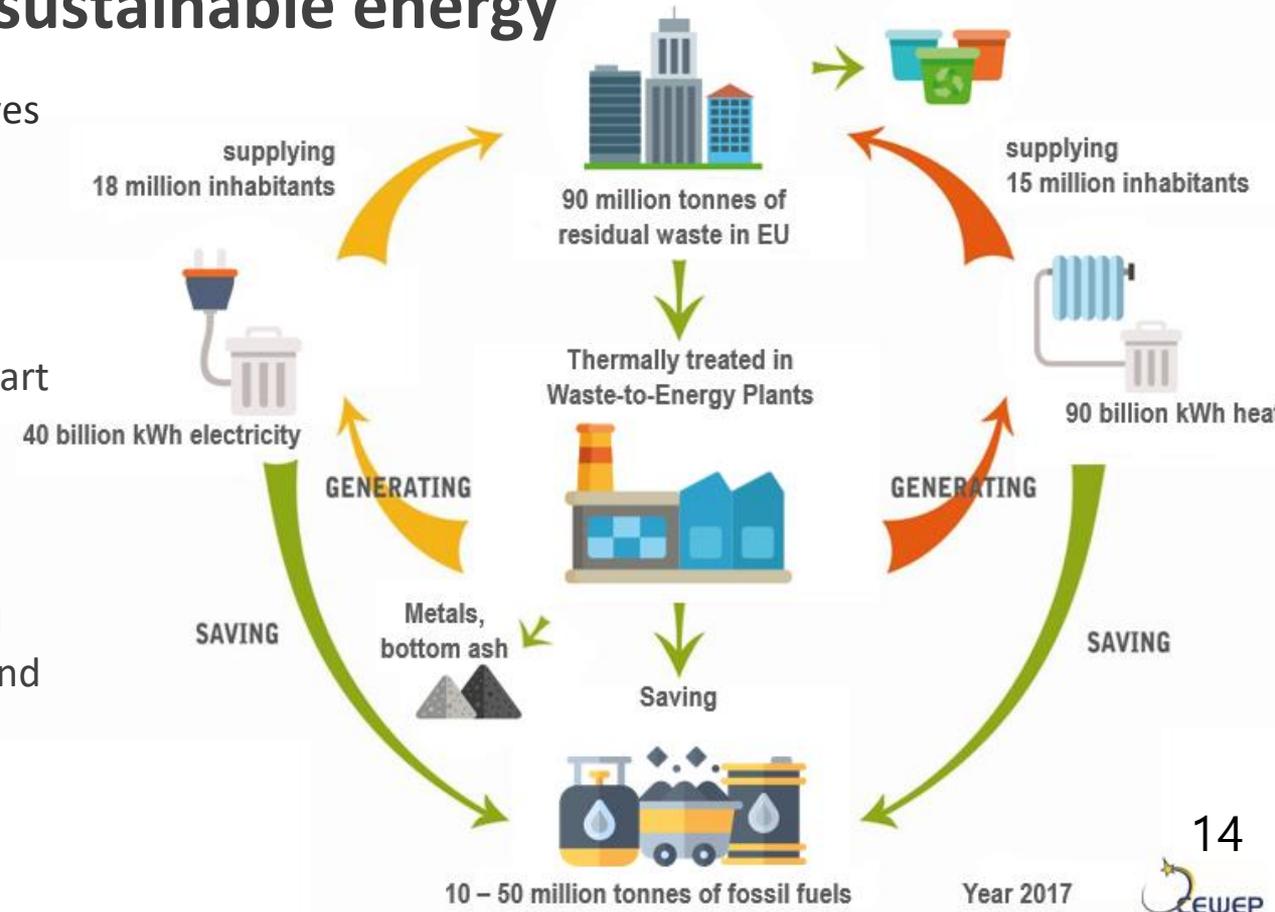
# Producing local sustainable energy

Energy production from waste saves greenhouse gas emissions:

- ▶ It replaces conventional fossil fuels
- ▶ The biodegradable (organic) part of waste is renewable

It also:

- ▶ Helps to avoid marine and soil pollution with nano-, micro- and macroplastics





# What about air quality?

- Connecting the WtE plant to a District Heating network in urban areas...



City of Umeå, Sweden in 1960s and 2000s

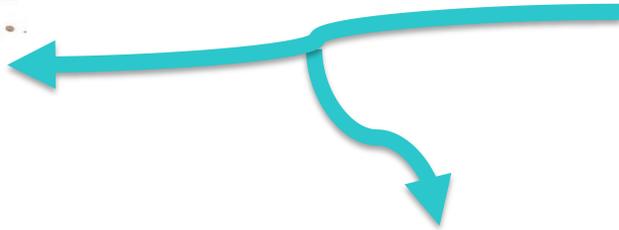
- European Pollutant Release and Transfer Register (2016):** dioxin emissions from WtE represent 0.2% of the total industrial dioxin emissions (excluding transport)



# Bottom Ash recycling



1 tonne of bottom ash contains between **10-12% metals**



Approx. 1.5 million tonnes of iron present in EU bottom ash = 6,000 wind turbines

× **6,000**

Minerals can be used as secondary aggregates (**road construction** or in **building products**)





# Case Studies

 Netherlands: Green Deal on Bottom Ash



 Belgium: Industrial Symbiosis



 Germany: Cleaner Air with Hydrogen





# Waste-to-Energy sector in 2035

## Integrated waste management system

Valuable resources are kept out of landfills, non-recyclables are treated in Waste-to-Energy plants.

## Resource-efficient technology and processes

Clean minerals and metals are recycled from bottom ash. CO<sub>2</sub> is captured and used, when appropriate and sustainable. The industry will continue to pursue best practices and to implement best available techniques.

## Full integration into clean local energy infrastructure

Waste-to-Energy is recognised as a reliable clean energy source, and the sector engages in dialogues with local communities to learn more about their needs and to discuss the social and economic benefits it can bring.





## In order to achieve this the WtE sector needs:

- ■ **Debate on the residual waste** that will still need treatment in 2035.
- ■ Recognition that **WtE goes** hand in hand with **Quality recycling in the EU** and **plays a key role by treating waste that is contaminated with substances** which are not fit for recycling.
- ■ Appropriate **infrastructure linking heat or process steam customers to WtE plants** in order to utilise energy from waste even more efficiently.
- ■ **Recognition of the recycling of the mineral fraction of bottom ash.**
- ■ Future EU waste legislation that sets **targets for landfill diversion**



# Thank you for your attention



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