

What is the role of energy in waste management?



LIGHEA SPEZIALE
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CEWEP - Confederation of European Waste-to-Energy Plants

CEWEP is the umbrella association of the operators of Waste-to-Energy Plants across Europe.

They thermally treat **household and similar commercial & industrial waste** that remains after waste prevention, reuse and recycling and generate energy out of it.



Uddevalla WtE plant, Sweden



Padua WtE plant, Italy

2014

CEWEP Members: 69.1 M tonnes;
386 plants

Europe: 88.6 M tonnes; 483 plants

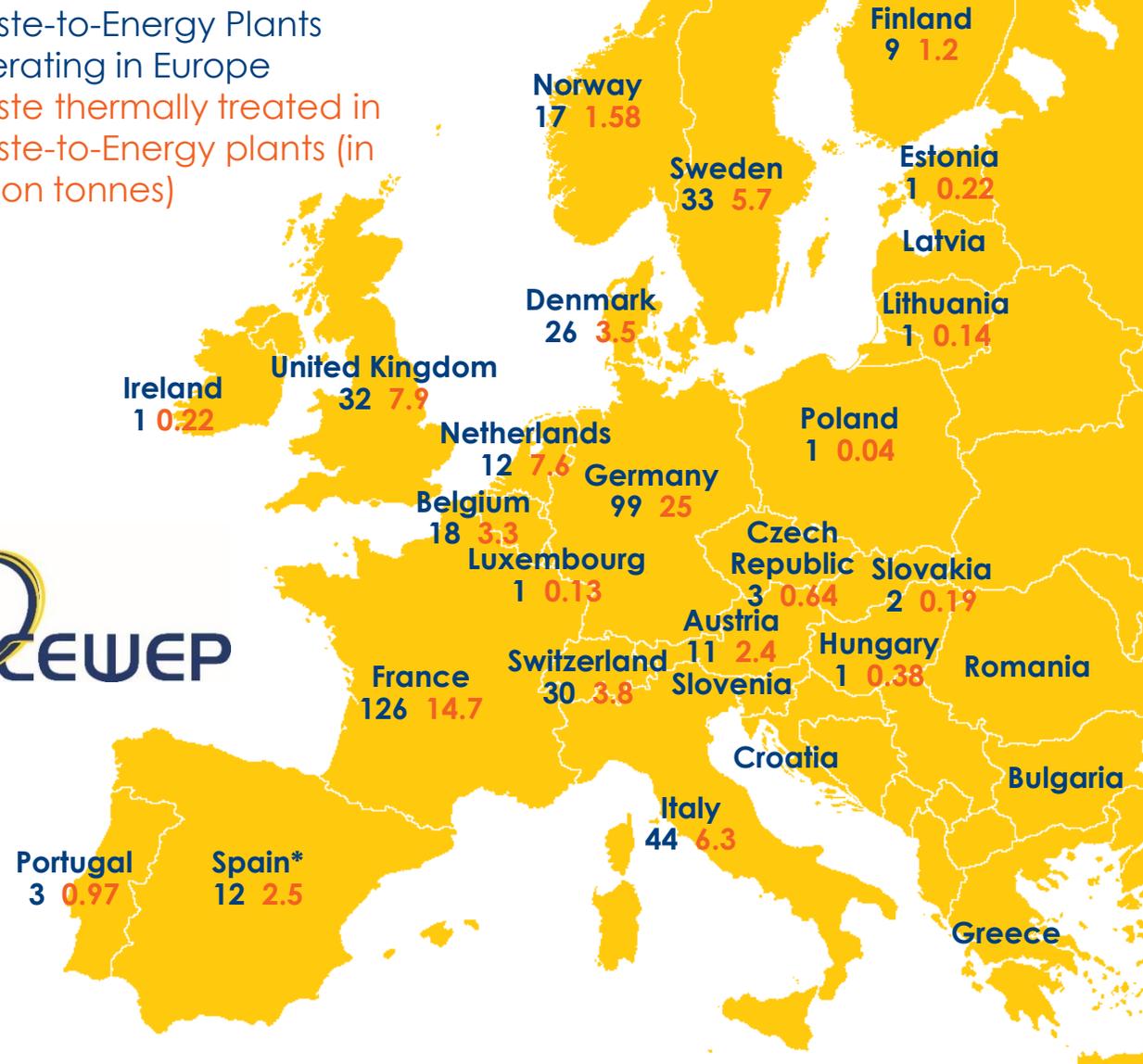
Waste-to-Energy in Europe in 2014

483 plants
88.6 M tonnes capacity

treating household and commercial & industrial waste that remains after waste prevention, reuse and recycling

Legend:

- Waste-to-Energy Plants operating in Europe
- Waste thermally treated in Waste-to-Energy plants (in million tonnes)

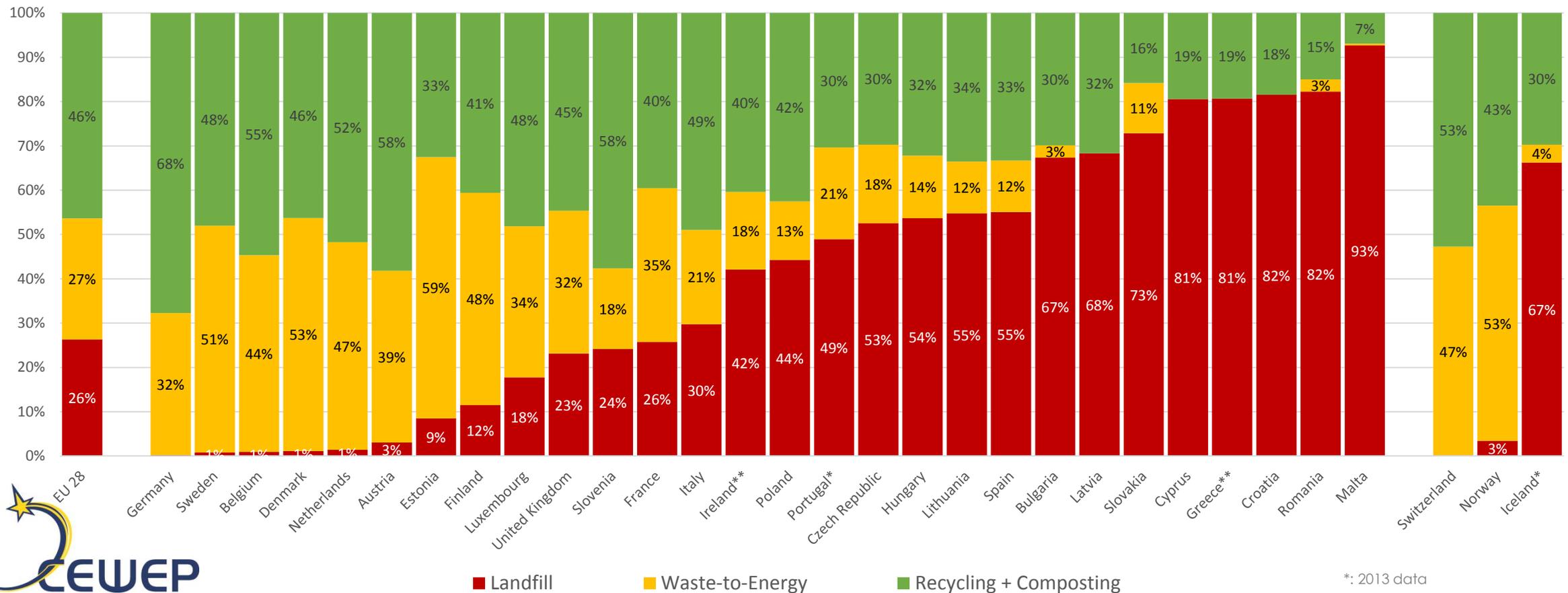


Data supplied by CEWEP members and national sources

* Includes plant in Andorra

Municipal waste treatment in 2015

EU 28 + Switzerland, Norway and Iceland



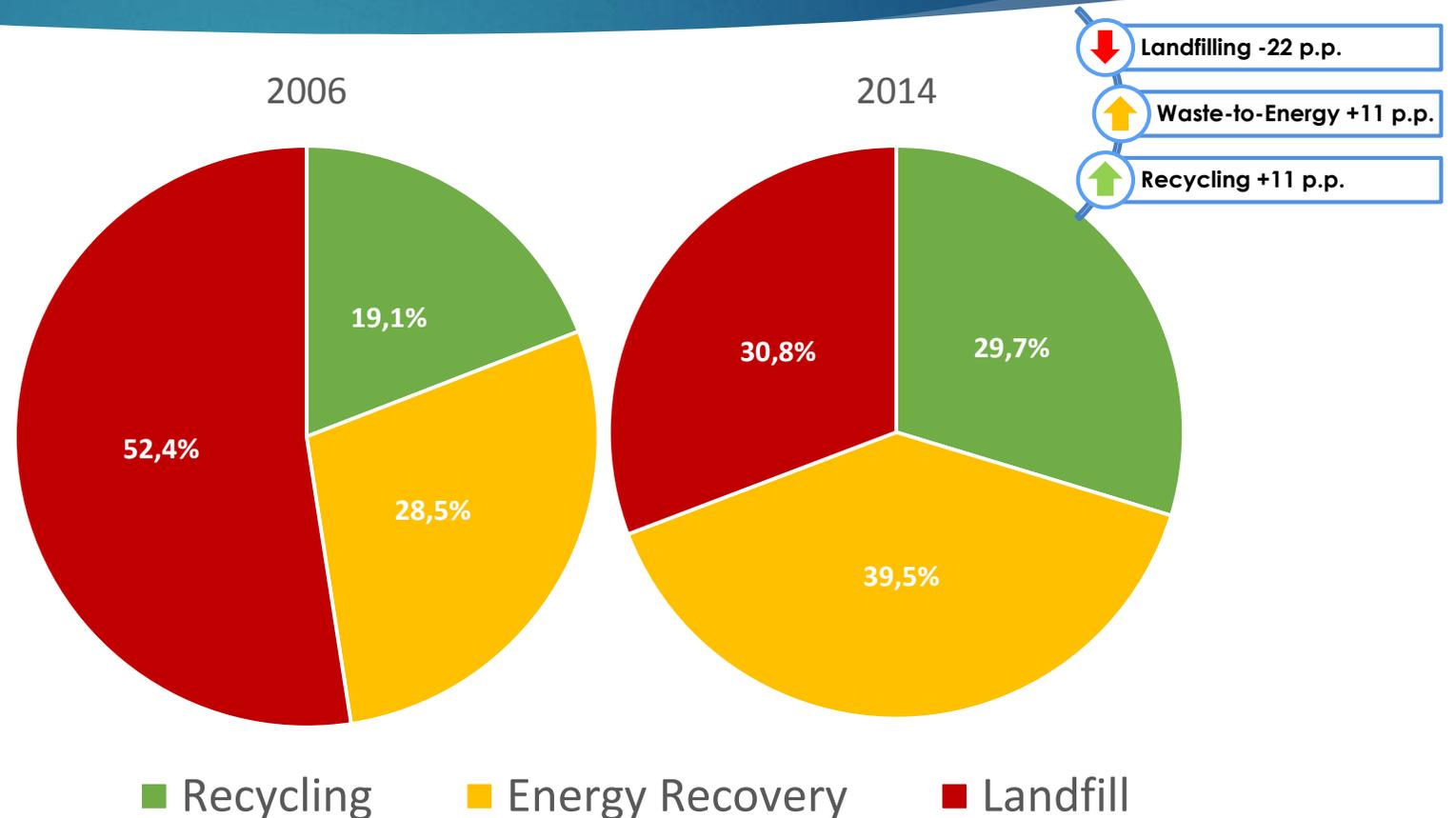
*: 2013 data

Graph by CEWEP, Source: EUROSTAT

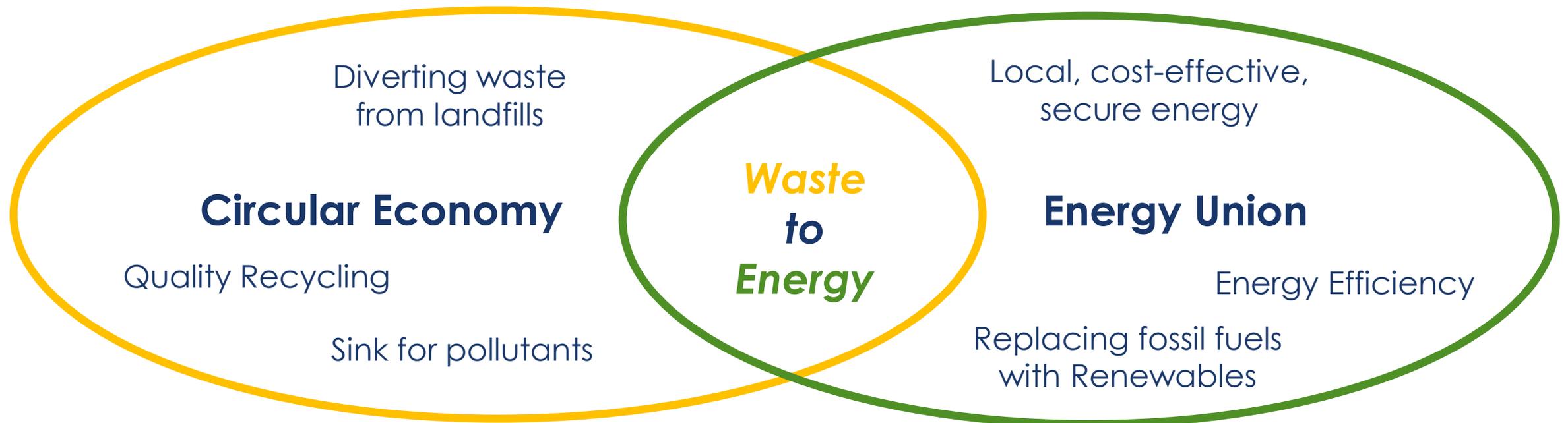
Plastic waste treatment 2006 – 2014

EU28 + Norway and Switzerland

- ▶ Waste-to-Energy helps to keep non-recyclable plastic out of landfills
- ▶ Produces affordable energy for citizens and local industry
- ▶ Recycling and Waste-to-Energy grow hand-in-hand to reduce landfilling



Where does Waste-to-Energy stand?



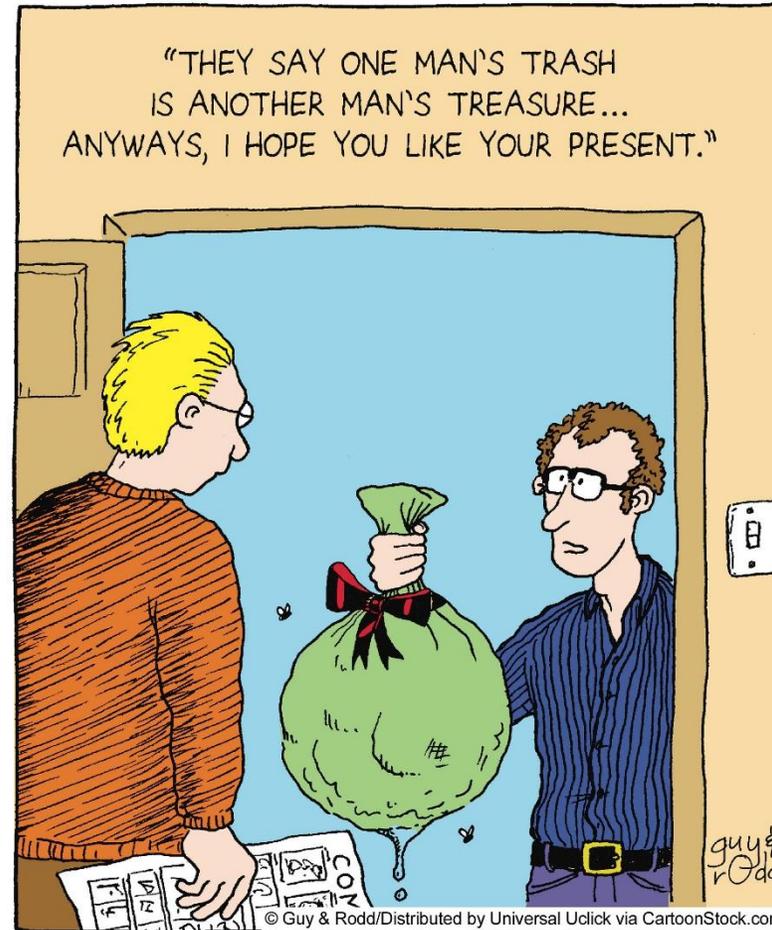
What to do with:

Dirty, contaminated materials?

Mixed and composite materials?

Degraded materials after multiple recycling cycles?

Materials containing substances of high concern?

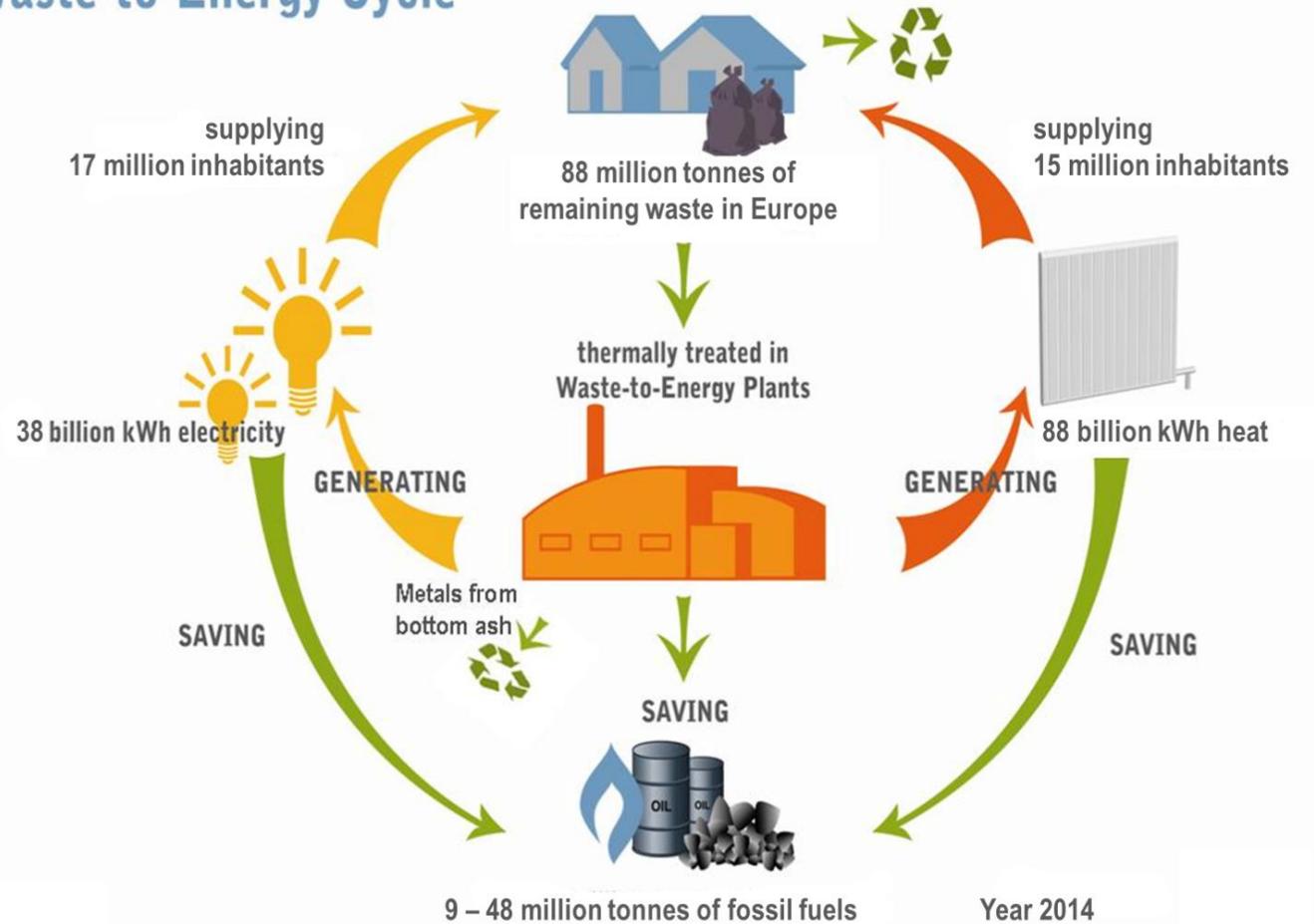


...the average European family still produces 10 kg of residual waste per week

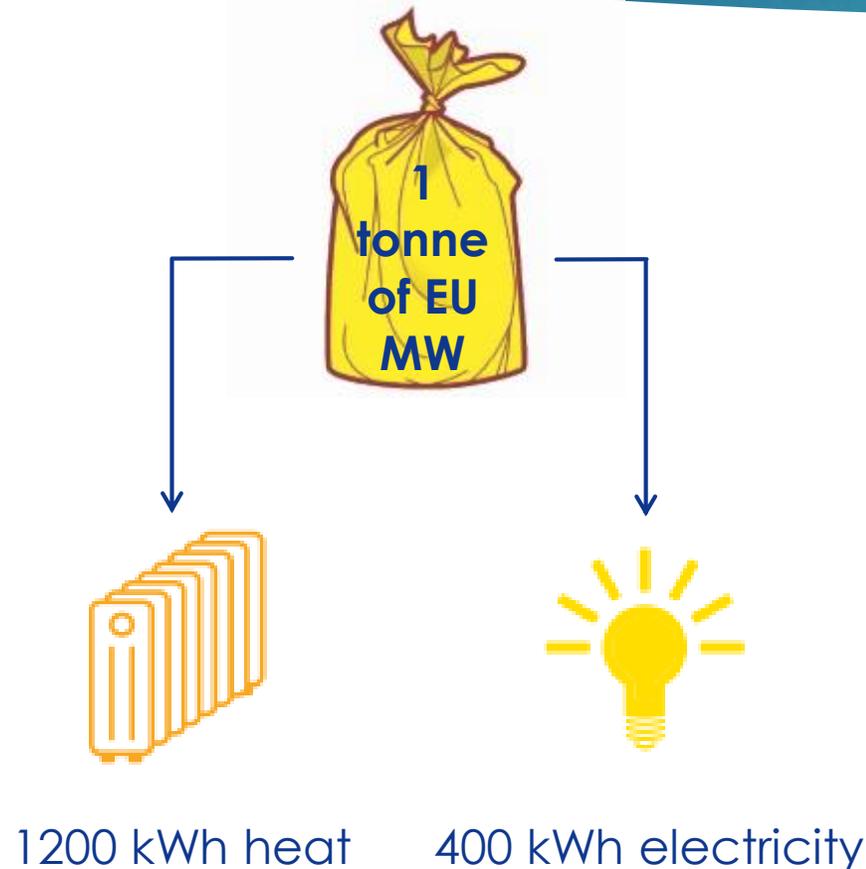
Waste-to-Energy treats residual waste and makes:

- **Electricity** fed into the grid and distributed to end-users
- **Steam** for nearby industry in production processes
- **Hot water** sent to district heating (or cooling) network to heat (or cool) homes, hospitals, offices etc.

Waste-to-Energy Cycle



How much energy?



- In Europe recovered energy from waste for District Heating systems represents 50 TWh per year, i.e. around 10% of the total heat delivered through DH systems.
- Studies suggest that the potential for using heat from waste equals to 200 TWh per year by 2050.

... And WtE contributes to metal recycling

Metals can be extracted from bottom ash and recycled into new products, e.g. aluminium castings for the automotive industry.

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

1 tonne of recycled metals from bottom ash saves 2 tonnes of CO₂_{equ} emissions

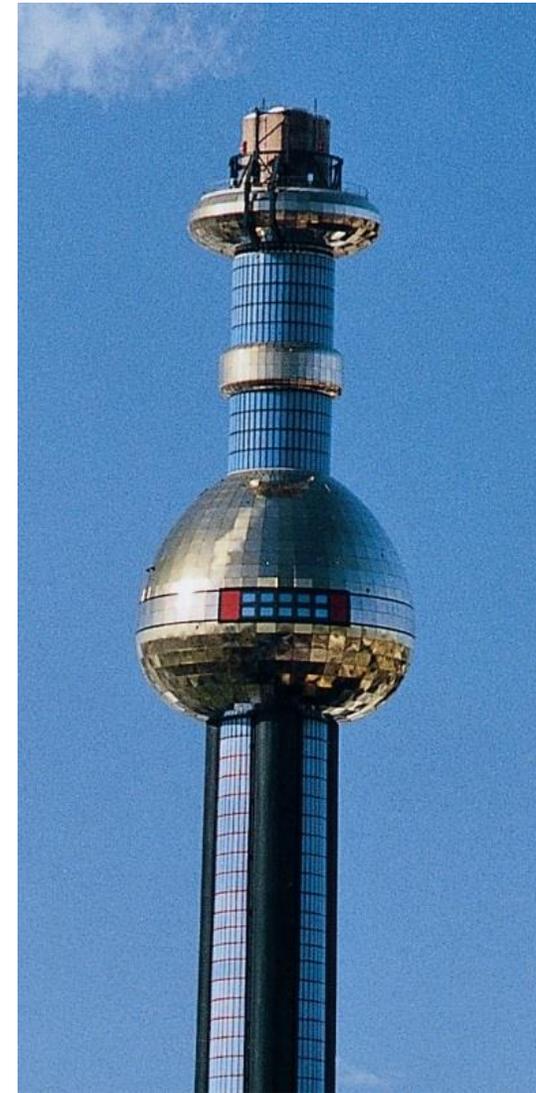


3.2 million tonnes CO₂ eq emission savings from metal recycling through BA in Europe

Example:

The **Spittelau WtE Plant in Vienna** provides cooling and heating to the Vienna hospital as well as heating for over 60,000 households.

It treats 250,000 tonnes of waste yearly.



Example: in **Antwerp** the **ECLUSE project** connects 2 WtE plants and a number of chemical companies through a 5 km pipeline system to provide steam.

The project received the Port of Antwerp Sustainability Award in November 2016.



What about air quality?

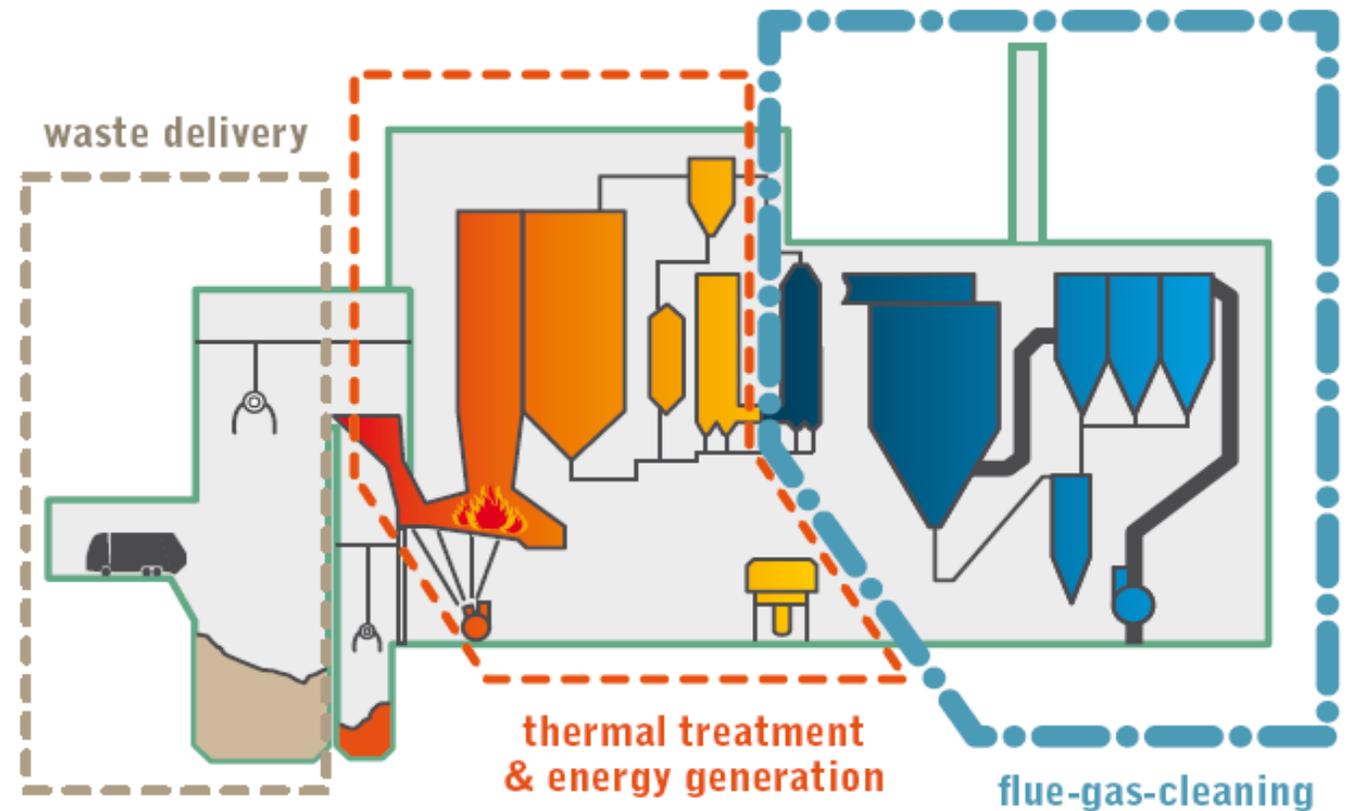
Waste-to-Energy Plants are equipped with sophisticated filtering devices to deal with the pollutants that are in the waste and minimise emissions into the atmosphere.

“Directive 2000/76/EC on the incineration of waste makes the incineration of waste one of the most stringently regulated and controlled industrial activities.”

Answer given by Mr. Potočnik, Environment Commissioner,
to a Parliamentary Question on 10th June 2010

Inside a Waste-to-Energy Plant
sophisticated flue gas cleaning system

Waste-to-Energy Plant



What about air quality?

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



City of Umeå, Sweden in 1960s and 2000s

Capacity Planning

For responsible capacity planning we need to take into account:

Efforts on waste prevention and recycling

Statistics

Input in WtE: Municipal waste and industrial and commercial waste; in industrial countries often 50/50



Europe as a whole

Almost 1/2 of EU Member States landfill >50% of their municipal waste
= 67 million tonnes, just MW

Recycling residues

WtE capacity for rejects and residues from sorting and recycling plants



APPLYING EU28 CIRCULAR ECONOMY TARGETS FOR 2030



**Municipal
Waste
generated
243 Mt¹**

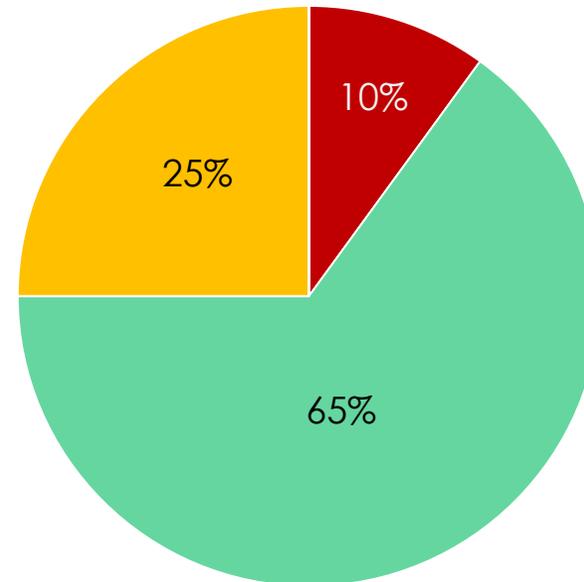


1. Assumed as equal to EUROSTAT 2014
2. Conservative assumption considering that some Member States landfill already less than 10%
3. Total WtE capacity in EU28 is 83 Mt (2015). In industrialised countries the input is split 50/50 between MW and C&I waste.

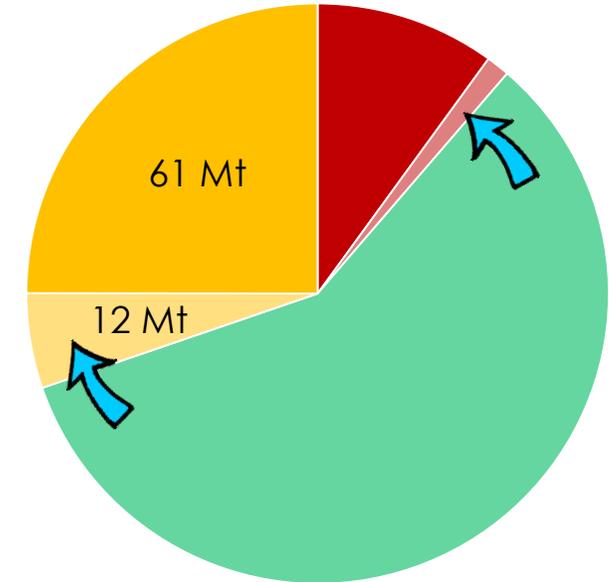
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Considering that 2030 targets are:

- Landfill down to **10%**²
- Recycling up to **65%**



Considering that **2%** of the rejects out of the recycling process will go to landfill and **8%** to WtE



Europe will still need to treat 73 Mt of Municipal Waste through WtE. Our current WtE capacity dedicated to Municipal Waste is 64 Mt³.

Summary: How does WtE contribute to a Clean Circular Economy and Energy Union?

- ▶ Helps to **divert** waste from landfills
- ▶ Treats **rejects** from recycling (quality recycling)
- ▶ Acts as a goal keeper **preventing pollutants** from re-entering the cycle
- ▶ **Recycles** metals from bottom ash and uses the mineral part as secondary raw material
- ▶ Produces cost-effective **energy** for citizens and local industry
- ▶ Contributes to **security** of energy supply
- ▶ Helps achieving **Air Quality** objectives

Thank you!

Any questions?



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Plants

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