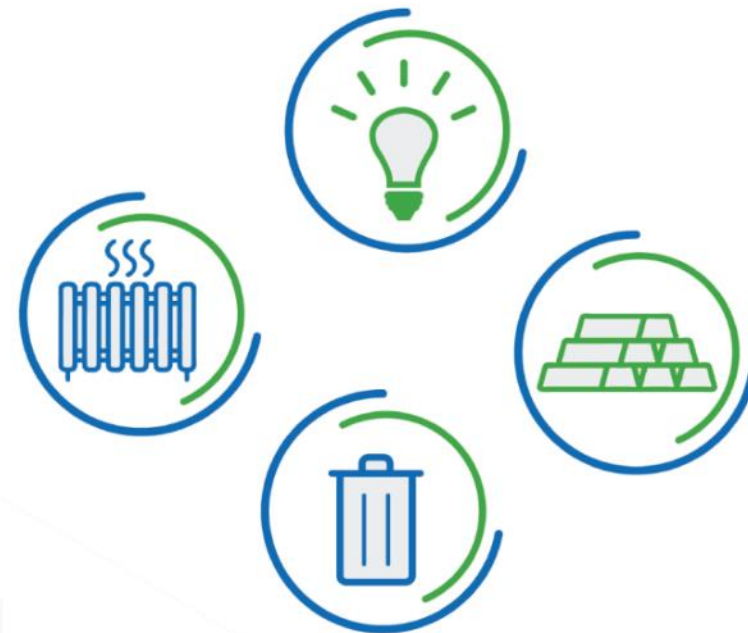


Waste-to-Energy: a Sustainable Waste Management Solution



ESWET Members



How is Municipal Solid Waste treated in Europe?



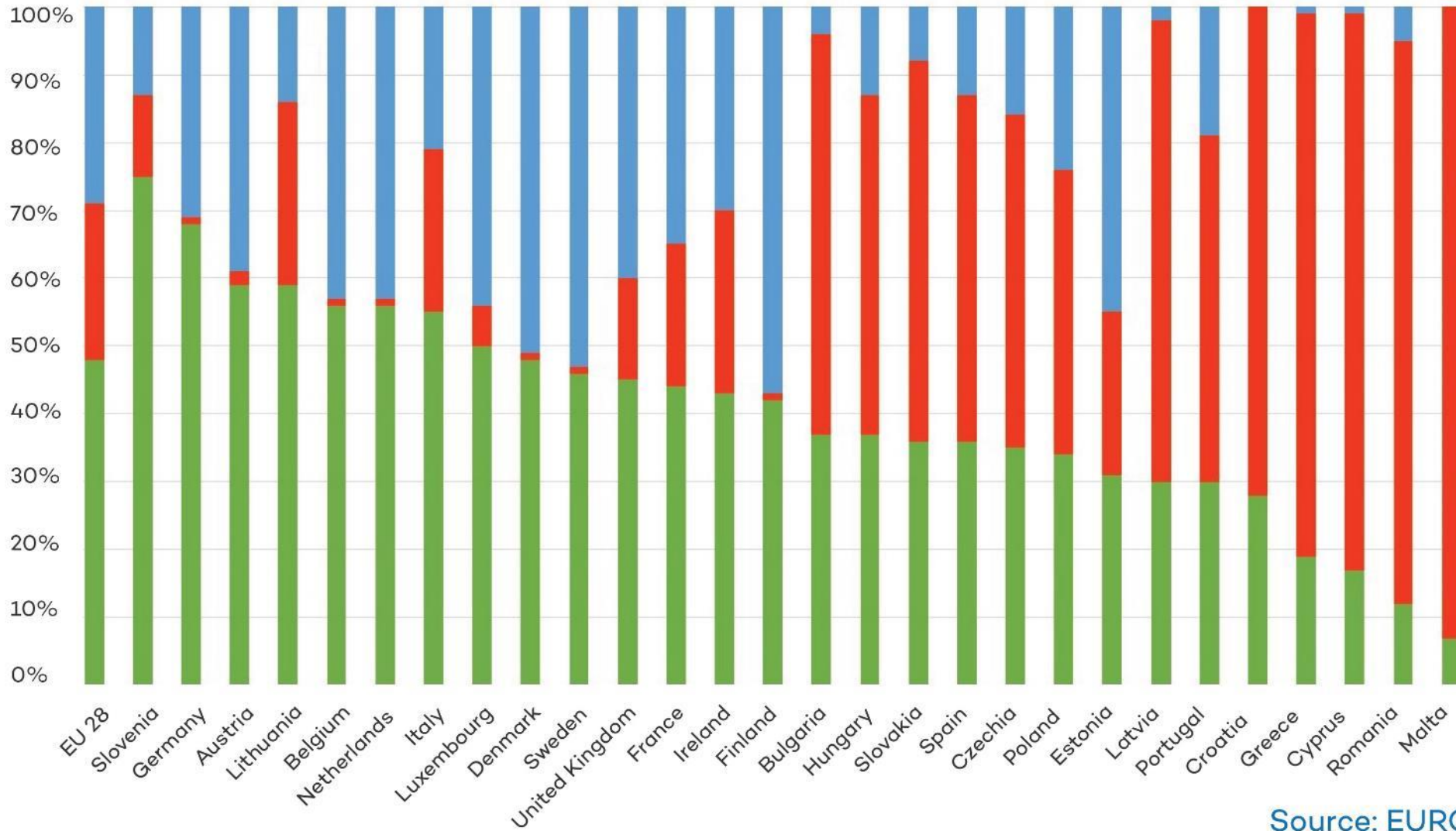
2018

EU-28:

48%
Recycling

29%
Waste-to-
Energy

23%
Landfills



Source: EUROSTAT

Residual waste



- Not every waste is recyclable – for many reasons: recycled too many times, polluted waste, made of composite products...
- Waste which is not suitable for recycling is called residual waste

Then, what happens to this residual waste?



For too long, landfilling has been the preferred option for residual waste.

Even today, about half of EU countries still landfill more than 40% of their waste!



Impact of landfills



Landfilling comes with an environmental cost:

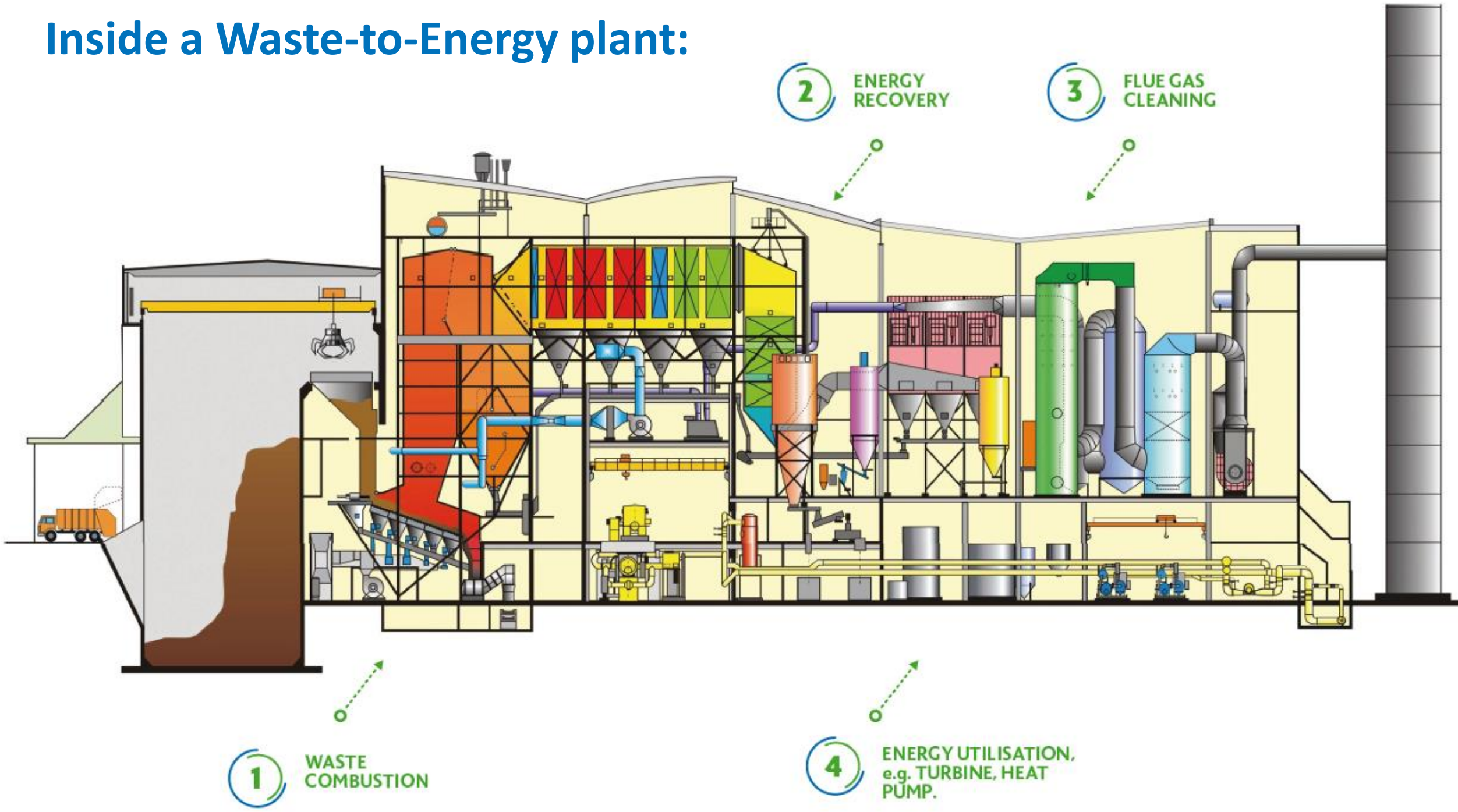
- Landfills are responsible for methane emissions, and methane is a greenhouse gas up to 84 times more potent than CO₂ over a 20-year period!
- Landfills risk to pollute soil and water; they occupy land and emit odor nuisance
- Waste dumped in landfills does not generate any added value!

The advantages of Waste-to-Energy



- In Waste-to-Energy plants, residual waste is **used as a resource**:
 - **Recovery of energy** turned into electricity and heat;
 - **Recovery of secondary raw material** re-injected in the economy.
- In 2018 in Europe, 18 million citizens received electricity from Waste-to-Energy plants, and 15 millions received heat, all generated from non-recyclable waste.
- Waste-to-Energy is **complementary to recycling**. Waste-to-Energy treats waste that cannot be recycled or re-used.
- No methane emissions are released with Waste-to-Energy

Inside a Waste-to-Energy plant:



Outside a Waste-to-Energy plant:



Outside a Waste-to-Energy plant:



Waste-to-Energy: What goes out



Energy: Electricity and Heat

- In 2019 in Europe, Waste-to-Energy plants generated around 40 billion kWh electricity and 90 billion kWh heat.
- As a result, 18 millions of European citizens received electricity and 15 millions received heat from residual waste.

An example?

About half of the Paris' district heating network, including all the hospitals of the French capital, is supplied by energy recovered in Waste-to-Energy plants.



Waste-to-Energy: What goes out



Steam

- Waste-to-Energy plants supply steam at suitable pressure and temperature for **industrial purposes**.

An example?

The ECLUSE network in Belgium supplies steam to six chemical companies at the port of Antwerp. It replaces the use of steam boilers, **saving up to 100,000 tonnes of CO₂** emissions per year!



Waste-to-Energy: What goes out



Materials

- The **bottom ash** from waste incineration contains **metals** recovered from the plants and then **recovered**.
- Bottom ashes are used in **construction** or for roads as an aggregate for concrete which prevents the use of virgin gravel and sand.



An example?

- One golden ring can be recovered from the residual waste generated annually by about 20 Europeans citizens.

WASTE-TO-ENERGY IN EUROPE 2017

 WtE plants operating in Europe (not including hazardous waste incineration plants)

 Waste thermally treated in WtE plants (in million tonnes)

Data supplied by CEWEP members and national sources.

*Includes plant in Andorra and SAICA plant

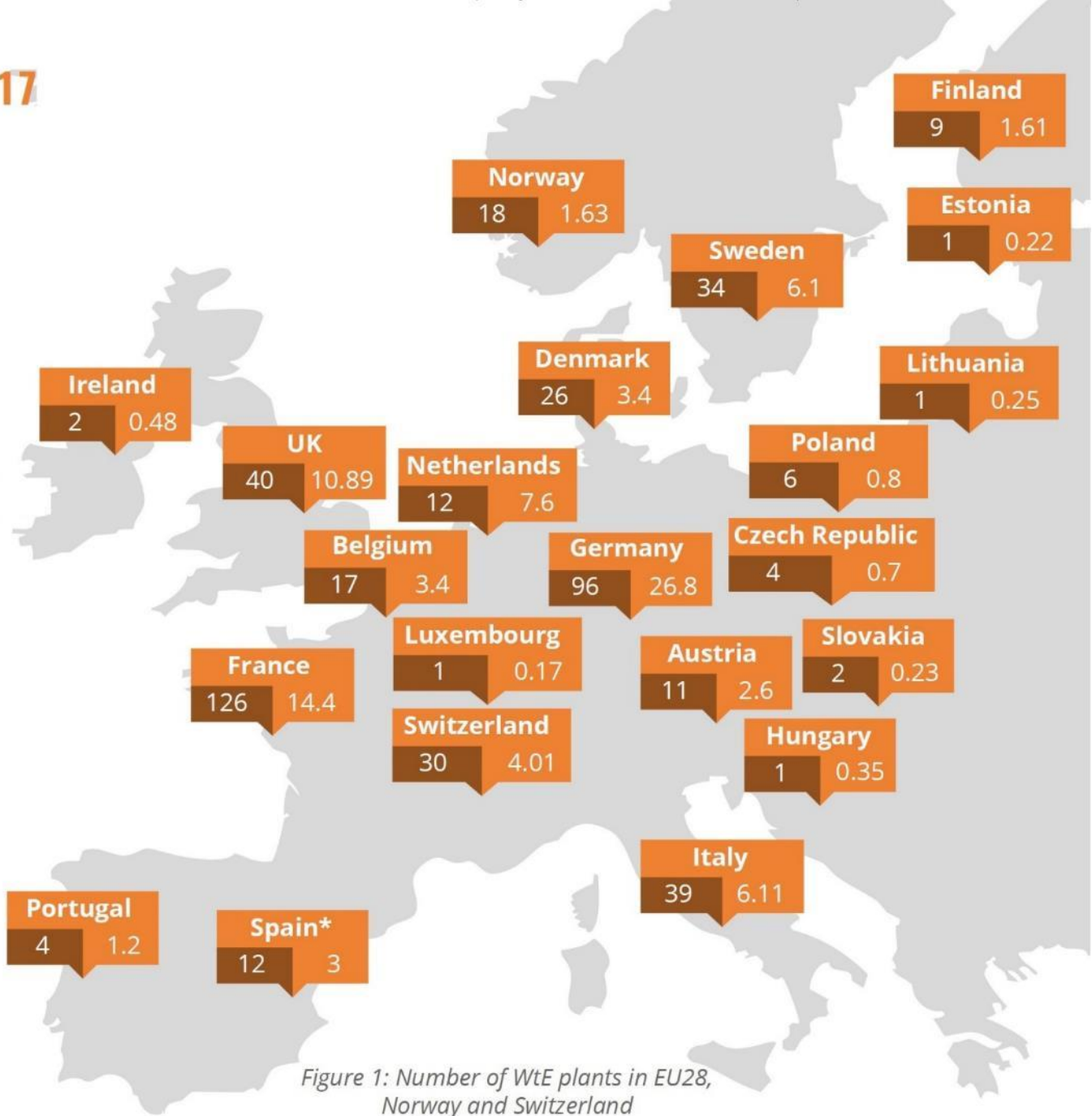


Figure 1: Number of WtE plants in EU28, Norway and Switzerland

Frequently asked questions



Does Waste-to-Energy discourage recycling?

Not at all. Recycling and Waste-to-Energy have different roles to play and are complementary in sustainable waste management.

[EUROSTAT data](#) confirm that the European countries performing well with recycling normally send their non-recyclable waste to Waste-to-Energy plants.



Frequently asked questions



Are Waste-to-Energy plants harmful?

Waste-to-Energy plants meet the strictest industrial emissions requirements placed on any EU industry in terms of pollutants monitored, emission limit values and operating conditions.

In 2019, [a review](#) of the published research focused on understanding environmental and human health impacts nearby waste-to-energy plants *“found no studies indicating that modern-technology waste incineration plants, which comply with the legislation on emissions, are a cancer risk factor”*.



Frequently asked questions



Why Waste-to-Energy plants offset greenhouse gas emissions?

- Non-recyclable waste does not end up in landfills anymore.
- WtE plants recover and supply energy.
- WtE plants recover metals and minerals, preventing the extraction of further materials.

Between 1995 and 2017, the total amount of municipal waste treated in Europe increased by 13% but greenhouse gas emissions from waste dropped by 42%, thanks to the reduction of the amount of landfilled waste by 60%.



Frequently asked questions



Is the energy recovered by Waste-to-Energy plants renewable?

Around half of the energy generated in Waste-to-Energy plants is renewable as it is of biogenic origin (e.g. contaminated wood waste, residues from composting or anaerobic digestion processes, etc.).

This waste is therefore biomass and thereby helps Member States to meet their renewable energy targets.



Frequently asked questions



Is waste generation declining?

According to the World Bank report of 2018, "[What a Waste 2.0](#)": *“By 2050, waste generation across the world is expected to reach 3.40 billion tonnes”*, almost doubling the current numbers. 70% of the world's waste ends up today in dumps and landfills.

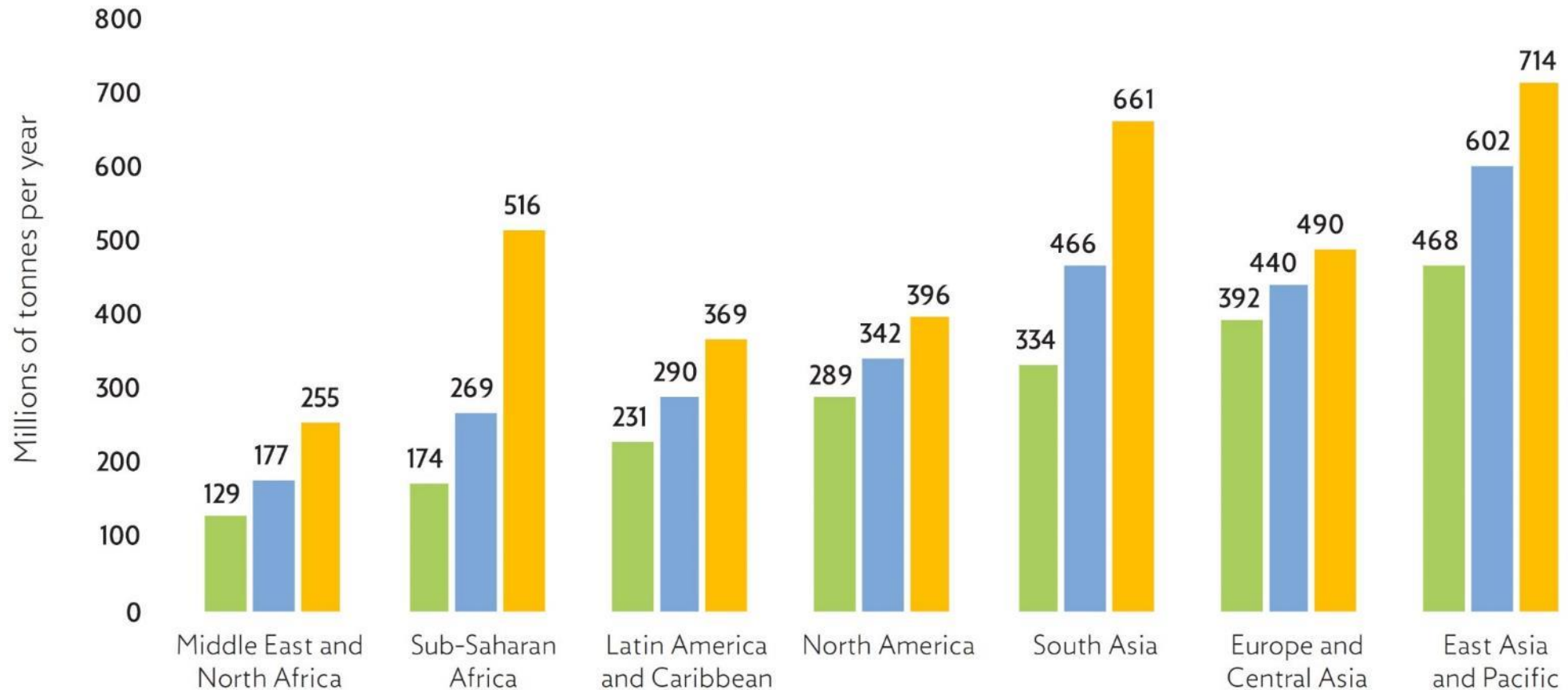
In 2018, the European citizens generated around 220 million tonnes of municipal waste (almost 500 kg per citizen), following a constant trend over the last ten years. Half of this number (116 million tonnes) was made of non-recyclable waste, which can only be treated by Waste-to-Energy or landfilled.

Waste is a global problem

Projected waste generation by region

2016 2030 2050

Source: World Bank report "What a Waste 2.0".



2019

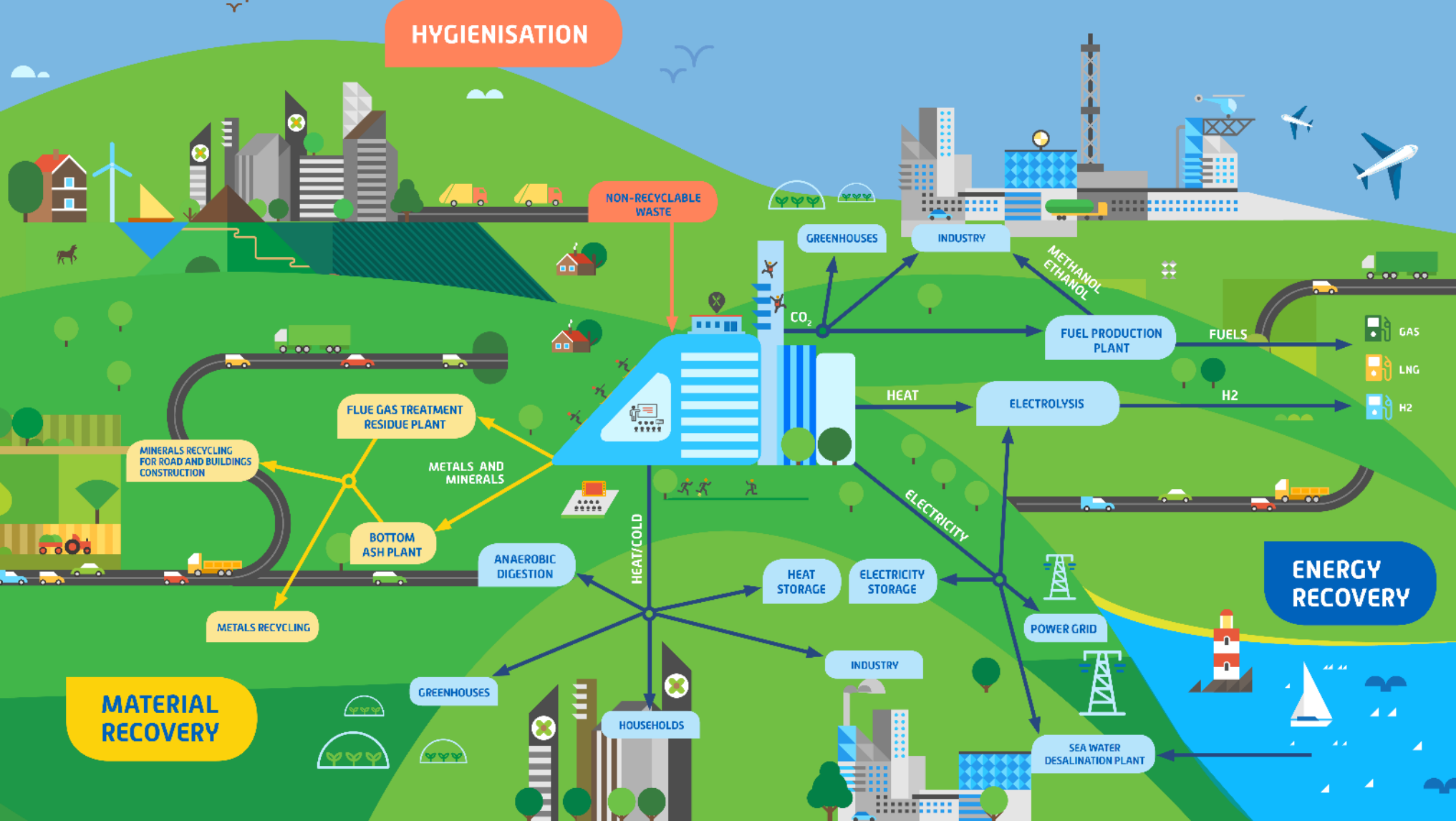
70% of
waste
generated
worldwide
is dumped!

2050

**Global waste
generation
will increase
by around
60%**

THE WASTE-TO-ENERGY PLANT OF THE FUTURE

The future of Waste To Energy





**Would you like to
know more?**

Contact Us!

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Thank you for you attention!

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