

Energising waste ▶ a win-win situation

CEWEP would like to highlight the role Waste-to-Energy (WtE) plays in producing

▶ Sustainable ▶ Low Carbon ▶ Cost-Effective ▶ Reliable ▶ Local Energy

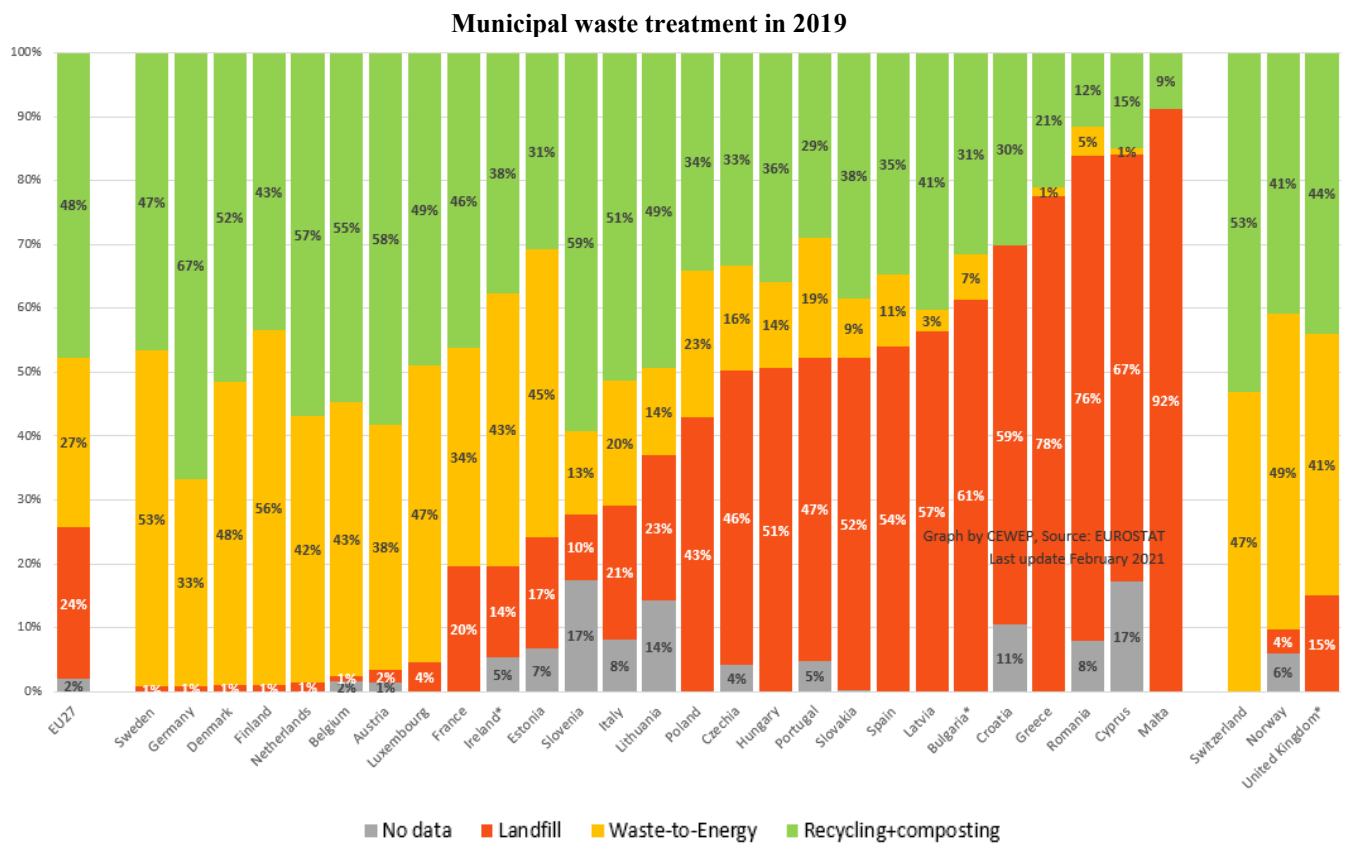
while replacing fossil fuels and helping to divert waste from landfills

Waste-to-Energy Plants (waste incineration with energy recovery) thermally treat waste, which is not suitable for recycling and which would otherwise be sent to landfills and transform it into sustainable energy. CEWEP respects the priority given to prevention, reuse and recycling according to the waste hierarchy.

Waste-to-Energy has a role to play in both:

Sustainable Waste Management and Energy supply

Recycling and Waste-to-Energy in combination for sustainable waste management



Graph by CEWEP, Source: EUROSTAT 2021

As Eurostat figures show Member States who have most successfully reduced landfilling, achieve good recycling rates which go hand-in-hand with Waste-to-Energy. They have worked towards a complementary waste management system where **both recycling and Waste-to-Energy play a complementary role in diverting waste from landfills.**

Waste-to-Energy is the link between resource and energy efficiency

Waste-to-Energy also provides synergies between the Circular Economy and Energy Union goals, helping to reduce dependence on landfills and their greenhouse gas emissions and replacing fossil fuels used by conventional power plants.

Applying the Circular Economy targets included in the Waste Framework Directive and the Landfill Directive¹, the total amount of energy (renewable + carbon components) produced by Waste-to-Energy plants would potentially reach 186 TWh by 2035, enough to replace 10% of the energy supplied by the coal sector^{2*}.

Waste-to-Energy replaces fossil fuels and produces sustainable energy

Waste-to-Energy plants put the energy content of residual waste, not suitable for sustainable recycling, to good use: producing electricity and heat from a locally available energy source.

Waste-to-Energy technology is one of the most robust and effective alternative energy options to reduce CO₂ emissions and to save limited fossil fuel resources that would otherwise be used to produce the energy.

Waste-to-Energy Plants in the EU can supply 18 million inhabitants with electricity and 15 million inhabitants with heat. This is based on 90 million tonnes of residual household and similar waste that was treated in 2017 in the EU. Between 10 and 50 million tonnes of fossil fuels (gas, oil, hard coal and lignite) can be substituted annually, which would emit 24 - 49 million tonnes of CO₂.

Waste-to-Energy helps to achieve **low-carbon policy** objectives and to ensure **security of energy supply**.



Waste-to-Energy generates reliable (base-load) Renewable Energy

¹ Circular Economy targets:

- Reuse + Recycling: 65% of municipal waste by 2035
- Landfill: maximum 10% of municipal waste by 2035

² Heat Roadmap Europe 2050 (Second pre-study for the EU27), May 2013

Waste-to-Energy also helps to achieve the EU's **renewable energy objectives** to cover 20% and 32% of the whole energy consumption by 2020 and 2030 respectively, since about 50% of the energy produced by Waste-to-Energy plants comes from biodegradable biomass.

Waste-to-Energy provides base-load renewable energy supply, contributing to the stability of the grid and security of supply.

Waste-to-Energy is a cost-effective energy source

The [UNEP report "District Energy in Cities states: Unlocking the Potential of Energy Efficiency and Renewable Energy"](#)³ identifies modern district energy as the most effective approach for many cities in transition to sustainable heating and cooling, by improving energy efficiency and enabling higher shares of renewables. Energy from waste is presented as a way to produce low-cost heat and often initiate development of a city's district heating network, utilising the energy content in non-recyclable, combustible waste.

► Waste-to-Energy Success Stories

Cleaner air for Wuppertal (Germany)

Wuppertal Stadtwerke put ten new fuel cell-powered buses on the road in 2019 (part of JIVE project). The vehicles use emission-free hydrogen gas produced locally, using electrolyzers powered by the AWG Waste-to-Energy plant in Wuppertal. The hydrogen filling station is located near the plant. This development is an important first step towards diesel-free public transportation and electromobility and improving air quality.



This is not the first time AWG Waste-to-Energy plant has aimed for better air quality and greater energy efficiency. In 2018, the district heating network in Wuppertal was connected to the Waste-to-Energy plant. At the same time, a coal-fired power plant in the Wuppertal valley was shut down. The combined effect was a considerable reduction in CO₂ emissions and other pollutants.

Industrial symbiosis delivers renewable heat

In the Port of Antwerp, Waste-to-Energy facilities process 1 million tonnes of waste annually, converting the waste into energy and materials. Electricity is supplied to 170,000 households, but until recently only some of the excess heat was used.

Until 2019, the chemical industries in the Port of Antwerp were using individual gas-fired boilers in their processes. These boilers were responsible for thousands of tonnes of CO₂ emissions. ECLUSE



is a collaborative project to deliver steam from local WtE plants to six industrial companies through a high-pressure pipeline. The project which came online in 2019 replaces fossil-based energy with steam from WtE, improving the efficiency of the WtE plants and ensuring a cost-effective and long-term energy supply for neighbouring industries.

ECLUSE supplies at least 5% of the renewable heat produced in the Flanders region, ensuring CO₂ savings of at least 100,000 tonnes each year, similar to the CO₂ savings from 50 standard 2.3 MW wind turbines.

³ District Energy in cities: Unlocking the Potential of Energy Efficiency and Renewable Energy", a report by United Nations Environment Programme http://unep.org/energy/portals/50177/DES_District_Energy_Report_full_02_d.pdf

More than 40% of **Paris'** district heating network, including the famous Louvre museum, is supplied by 3 Waste-to-Energy Plants.

These Waste-to-Energy Plants are: St Ouen, Issy-les-Moulineaux and Ivry/Seine.

The plants treat the household waste, which is not suitable for recycling, of the 6.5 million inhabitants of Paris and its inner ring area. By treating this waste they prevent the consumption of 220,000 tonnes of oil equivalents and the release of some 700,000 tonnes of CO₂ into the atmosphere each year.



The **Waste-to-Energy Plant in Malmö** (Sweden) supplies 60% of the heat demand of the city

and the **Brescia Waste-to-** (Italy) provides more than 50% of demand.



Energy Plant the city's heat

► **And Waste-to-Energy is COOL...**

A district **cooling** system has been set up in the centre of Copenhagen, as well as at other WtE Plants in Denmark, to supply cooling to nearby shopping centres, hospitals or other buildings with a high cooling demand.



While the **Spittelau WtE Plant in Vienna** provides cooling and heating to the Vienna General hospital.

This is in addition to providing heating for over 60,000 households in the city each year.

The plant processes around 200,000 t/year of household waste from Vienna.

Some other cities are harnessing waste for cooling
... coming to a city near you?

Brussels, April 2021

For further information, please contact: CEWEP info@cewep.eu

CEWEP is the umbrella association of the operators of Waste-to-Energy plants across Europe. They thermally treat household and similar waste that remains after waste prevention, reuse and recycling by generating energy from it. This is how they replace fossil fuels, such as coal, gas and oil, used by conventional power plants. At the same time Waste-to-Energy plants help to reduce Greenhouse gas emissions by diverting waste from landfills.