

**Waste-to-Energy:**

- Is a secure and cost-effective energy source
- Replaces fossil fuels and produces sustainable energy
- Forms a link between energy and resource efficiency
- Works hand-in-hand with recycling to minimise landfilling

**Waste-to-Energy Plants (WtE - waste incineration with energy recovery) thermally treat municipal and similar commercial and industrial waste which is not suitable for recycling. This waste would otherwise be consigned to landfills, while WtE transforms it into sustainable, climate-friendly energy.**

**Key energy facts:**

- WtE produces reliable energy (baseload, all around the clock)
- WtE supplies District Heating networks. In cities with good District Heating infrastructure in place (e.g. Brescia, Malmö), WtE covers 50 % or more of the cities’ heat demand.
- From the waste treated today in Europe<sup>1</sup>, WtE plants can supply the equivalent of the population of Finland, Denmark, Latvia and Lithuania with electricity or heat.
- The amount of primary energy produced by WtE in 2019 was equivalent to 13.8 billion m<sup>3</sup> of natural gas. This corresponds to 9% of the natural gas imports to the EU from Russia<sup>2</sup>
- WtE plants could produce 189 TWh of useful energy per year by 2035<sup>3</sup>, which would be equivalent to 19.4 billion m<sup>3</sup> of natural gas in terms of primary energy.

The [United Nations Environment Programme](#) 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 embedded in the waste.

**Key climate facts:**

- The energy content of the waste treated today in Europe<sup>1</sup> can substitute between 10 and 54 million tonnes of fossil fuels (gas, oil, hard coal and lignite) annually, which would emit 27 - 54 million tonnes of CO<sub>2</sub>.
- Diverting waste from landfills leads to additional greenhouse gas emission savings by avoiding methane emissions (a greenhouse gas that is 28 times more potent than CO<sub>2</sub> on a 100-year perspective and 86 times more on a 20-year perspective).
- Also, metal recycling from the bottom ash of WtE plants saves CO<sub>2</sub> emissions<sup>4</sup>.
- Around 50% of energy from waste is renewable as it comes from the biodegradable fraction of waste.



**Conclusion:**

Waste-to-Energy constitutes a link between climate, energy and circular economy policies. It contributes to climate goals by using non-recyclable waste that would otherwise be landfilled. At the same time, Waste-to-Energy supplies secure and local energy in line with the EU’s Energy policy goals.

<sup>1</sup> Residual, non-recyclable waste treated in WtE plants in Europe in 2019 (99 million tonnes). Data: CEWEP members.  
<sup>2</sup> International Energy Agency, [How Europe can cut natural gas imports from Russia significantly within a year](#), 3<sup>rd</sup> March 2022  
<sup>3</sup> Assuming that the Circular Economy targets are applied not only to municipal waste, but also to commercial and industrial waste  
<sup>4</sup> See [CEWEP bottom ash factsheet](#)

**Examples of good practice**

- Steam network "ECLUSE", for industry in Doel, Belgium
- Delivering heat and reducing environmental pollution in Klaipėda, Lithuania
- Reducing fossil fuel consumption for heating and cooling in Barcelona, Spain

**ECLUSE Steam network, Doel, Belgium**

This network commissioned in 2019 has replaced the energy supply of chemical companies in the Waasland port by a steam network, powered by the INDAVER/SLECO Waste-to-Energy plants.

The 5 km steam network has a thermal capacity of 160 MW. Decommissioning the old individual gas-fired boilers has led to yearly savings of 100,000 tonnes of CO<sub>2</sub> emissions. In the future the network can be extended to other companies, which would lead to savings up to 200,000 tonnes of CO<sub>2</sub> emissions, equivalent to the savings brought by 100 wind turbines. [www.ecluse.be](http://www.ecluse.be)

**Fortum Waste-to-Energy plant, Klaipėda, Lithuania**

Commissioned in 2013, the Klaipėda Combined Heat and Power (CHP) plant has an energy efficiency of 90%. It treats 250,000 tonnes of waste yearly and in 2018 provided 146 GWh of electricity and 391 GWh of heat. This covers 50% of the city district heating needs and replaces natural gas-fired heat production, leading to 100,000 tonnes of CO<sub>2</sub> emissions savings yearly.

**Districlima, district heating and cooling in Barcelona, Spain**

Commissioned in 2004 and in constant extension since then, the district heating and cooling network of Barcelona now serves 109 clients, including hotels, hospitals, convention and education centres. TERSA Waste-to-Energy plant produces the main share of the heat for this 19.5 km long network, which helped the city reduce its fossil fuel consumption by 73% and save CO<sub>2</sub> emissions of 22,965 tonnes yearly. Because of the reduced CO<sub>2</sub> emissions in heating and cooling compared to fossil fuels, the energy performance of the buildings served by Districlima improved from

99.83 kgCO<sub>2</sub>/m<sup>2</sup> (E-label) to 55.14 kg CO<sub>2</sub>/m<sup>2</sup> (C-label).

[www.districtclima.com](http://www.districtclima.com)

**For more information, please contact: Confederation of European Waste-to-Energy Plants**

[www.cewep.eu](http://www.cewep.eu)

