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 minimize 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, and Waste-to-Energy transforms it into sustainable, climate-friendly energy.

Key energy facts:

- Waste-to-Energy produces reliable energy (base-load, 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[1], WtE plants can supply the equivalent of the population of Finland, Denmark and all the Baltic States with electricity or heat.
- WtE plants could produce 189 TWh of useful energy by 2030[2]. This is enough to replace 10% of the energy supplied by the coal sector.
- WtE is the first waste treatment for which an efficiency criterion (the R1 formula) has been introduced in the Waste Framework Directive. The R1 criterion has proved to be an effective instrument for achieving quality (energy) recovery and developing investments in efficiency.

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[1] can substitute between 9 and 48 million tonnes of fossil fuels (gas, oil, hard coal and lignite) annually, which would emit 22 - 48 million tonnes of CO_2.
- Diverting waste from landfills leads to additional greenhouse gas emission savings by avoiding methane emissions (methane is a greenhouse gas 25 times more potent than CO_2).
- Also, metal recycling from the bottom ash of WtE plants saves CO_2 emissions[3].
- 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 Energy Union 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 EU's Energy policy goals.

[1] Residual, non-recyclable waste treated in WtE plants in 2014 (88 million tonnes). Based on Eurostat 2016.

[2] Assuming that the Circular Economy targets are applied not only to municipal waste, but also to commercial and industrial waste

[3] 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 project aims to replace the energy supply of chemical companies in the Waasland port by a steam network, powered by the INDAVER/ SLECO Waste-to-Energy plant.

The plant can produce about 250 MW of steam. Decommissioning the current individual gas-fired boilers will lead to a yearly saving of 100,000 tonnes of CO_2 emissions. The network can extend to other companies, which would lead to savings up to 200,000 tonnes of CO_2 emissions, equivalent to the savings brought by 100 wind turbines. 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 2015 provided 143 GWh of electricity and 416 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_2 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 95 clients, including hotels, hospitals, convention centres, and education centres. TERSA Waste-to-Energy plant produces the main share of the heat for this 16.8 km long network, which helped the city reduce its fossil fuel consumption by 58% and save CO_2 emissions of 18,903 tonnes yearly. Because of the reduced CO_2 emissions in heating and cooling compared to fossil fuels, the energy performance of the buildings served by Districlima improved from 99.83 kgCO2/m² (E-label) to 55.14 kg CO2/m² (C-label).
www.districlima.com

For more information, please contact:

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