Waste-to-Energy's contribution to the "Long-term EU greenhouse gas emissions reductions strategy"

ESWET

European Suppliers of Waste-to-Energy Technology

CEWEP

The Confederation of European Waste-to-Energy Plants

In light of the EU's long-term greenhouse gas (GHG) emissions reductions strategy, the Waste-to-Energy sector would like to outline some key directions the EU should take in order to decarbonise waste management as well as the energy sector.

Waste-to-Energy provides an environmentally sound and cost-effective way to treat residual waste. It is an important tool to safeguard true and environmentally sound recycling by taking care of materials which due to their consistency cannot or should not be recycled.

Waste-to-Energy plants also help materialise the effective landfill restrictions outlined in the Circular Economy Package, thereby contributing to limiting the use of land resources.

When looking at emissions performance in general, the sector has already complied with the most stringent environmental regulations for more than 10 years: sometimes the emissions are even at such low levels that it is difficult to measure them with the appropriate accuracy.

When looking at GHG emissions specifically, one can notice that emissions from waste management have shown a strong decrease, in particular thanks to the development of recycling and other recovery processes, including Waste-to-Energy. This has led to increased landfill diversion and a subsequent decrease in methane emissions.

However, much more is possible: with proper waste management in place far more than 200 million tonnes of CO_2 eq can be avoided annually.

About 60 million tonnes of municipal waste are still landfilled in Europe (Eurostat 2018, data of 2016), and almost 200 million tonnes considering all the waste streams (except mineral waste).

To divert these waste streams to Waste-to-Energy instead would prevent around 875 kg of CO_2 eq/tonne.[1]

Considering that a significant part of it could be also recycled, a total saving of more than 175 million tonnes of CO_2 eq (more than the annual CO_2 emissions from fossil fuels of the Netherlands) could be achieved every year by shifting waste from landfilling to a higher treatment in the waste hierarchy.

Additionally, up to 50 million tonnes of emissions of CO_2 eq are avoided in Europe annually as Waste-to-Energy recovers about 39 TWh of electricity and 90 TWh of heat from waste, a strategic local recovered energy source, saving up to 50 million tonnes of imported fossil fuels that would have been used in conventional power plants. Waste-to-Energy plants can also supply efficient district heating and cooling to households and process steam to industries.

In cities where the infrastructure is in place, Waste-to-Energy covers 50% and more of the local heat demand. Moreover, half of this energy is renewable, as it comes from waste of biological origin, and therefore helps Member States to achieve the targets of the Renewable Energy Directive. The remaining half, although fossil, is recovered as a waste treatment service to society.

At the end of the combustion process metals such as iron, aluminium, copper and zinc can be recycled from the bottom ash, this way saving the greenhouse gas emissions (more than 3 million tonnes of CO_2 eq)[2] that otherwise would have been emitted in the production process.

1) Estimation made on the assumption of the study of German UBA: The Climate Change Mitigation potential of the waste sector – 2015 http://bit.ly/2P1eKMA

2) CEWEP Bottom Ash Factsheet: http://bit.ly/2Sc3n6w

General policy recommendation

Along the life cycle of a raw material, residual waste, meaning waste than cannot be recycled, must be minimised. However, once it is produced, it has to be managed in an environmentally sound way considering life cycle thinking.

While the waste hierarchy is the natural driver for decision-making, the impact for the environment must also be taken into account, as stated in the Waste Framework Directive, while keeping costs in check.

Waste legislation

Today, Waste-to-Energy plants are a huge, although often untapped source of secondary raw materials. Incineration ashes contain a lot of valuable, and sometimes critical, metals and minerals.

The sorting and subsequent recycling of these materials do not only offset GHG emissions incurred by metal and mineral extraction but also contribute to strengthened security of supply of raw materials.

Therefore, an enabling framework that allows metals and minerals from incinerator ashes to be taken up by the market should be promoted by the EU.

CO_2 emissions legislation

Instruments like the EU Emissions Trading System or taxes do not fit for Waste-to-Energy because:

- Markets will re-direct specific waste streams to less environmentally sound routes (landfills, export to third countries with lower environmental and social standards, 'recycling' of polluted materials to avoid paying for their treatment, marine litter etc.).
- Waste-to-Energy serves the society by treating polluted substances in an environmentally sound manner (hygienic task);
- Fuel switching, e.g. from coal to gas, is one of the key measures to achieve GHG reductions under the EU ETS. This option is not possible for WtE.
- Other CO_2 emissions reductions, enabled by improved energy efficiency for example, are already required under other sets of rules, e.g. the Industrial Emissions Directive, the Waste Framework Directive, etc.

Therefore, the Waste-to-Energy sector calls upon the EU to enable full accounting of the trade-offs in waste management that can yield the best contribution to climate protection.

Non-CO_2 GHG emissions legislation

Solid waste accounts for 14% of non-CO_2 emissions and most of these emissions are caused by methane emitted by landfills.

Methane is a GHG which, over a 20-year period, is 72 to 86 times more potent than CO_2 and, without short-term actions to reduce its emissions, global temperature rise would be exacerbated.

Therefore, the Waste-to-Energy sector calls upon the EU to recognise the global warming potential of methane by prioritising measures to minimise methane emissions from landfilling while acknowledging that Waste-to-Energy is the only climate efficient treatment option for residual waste.

Renewables

Residual waste treated in Waste-to-Energy plants will continue to contain a biogenic fraction derived from the cascading use of products and waste such as residues from composting. Otherwise, too short, non-recyclable paper fibres or rejects from anaerobic digestion would be spread on the fields despite their impurities.

Therefore, the Waste-to-Energy sector calls on the EU, in its future revisions of the market design and renewable energy legislation, to take into account the fact that the above-mentioned waste fraction is not only renewable, but also continues to comply with sustainability requirements since no virgin material is used.

Many Member States are in the process of drafting carbon neutral plans, and one of the main measures is the phase out of coal-fired power plants that are currently supplying base load power.

With the phase out of coal there is a need for other sources of base load power.
Waste-to-Energy can contribute to that.

Synergies between industries

in order to achieve further GHG emissions reductions, industries will have a growing need to share their infrastructure and materials and waste inputs/outputs, either through "unplanned symbiosis" (e.g. the Kalundborg industrial site in Denmark)[3] or through "structured networks" (e.g. the Port of Rotterdam)[4].

The Waste-to-Energy sector encourages the EU to do more in order to promote industrial symbiosis more broadly to avoid wasting valuable resources.

Infrastructure

The technologies of tomorrow will require an updated infrastructure, meaning that infrastructure that connects Waste-to-Energy with district heating (or cooling) and the delivery of process steam from plants to nearby industry should be promoted.

This would significantly contribute to decarbonise the heating and cooling sector and to achieve the aims of the Paris Agreement.

Research & Innovation

The Waste-to-Energy sector has already achieved major improvements in the energy efficiency of its plants, sometimes reaching efficiencies of over 90% with state-of-the-art technology, and, hence, reducing the level of GHG emissions.

Tomorrow, Waste-to-Energy could be able to further decarbonise thanks to advanced CO_2 recovery systems.

The Waste-to-Energy sector is working constantly on optimising energy efficiency, on new concepts for sector coupling (classic CHP, drying processes, greenhouses heating and fertilisation), pioneering Power-to-X processes (hydrogen for buses, CO_2 as basic chemical, etc.), and improving resource efficiency.

3) Kalundborg Symbiosis website: http://bit.ly/2TSf3x0
4) Port of Rotterdam - Energy Infrastructure: http://bit.ly/2TPakfc

Waste-to-Energy plants serve society, protect the environment and the climate by reducing the volume of waste, treating polluted substances in an environmentally sound way and recovering climate-friendly energy and materials in the process.

They are a carbon sink and provide CO_2 savings in the waste management sector. They also reduce the need for fossil fuels for energy production.

Waste-to-Energy plants have to fulfill an important task to society:

- Treating the waste safely,
- Avoiding landfilling
- Helping quality recycling
- Treating the rejects from recycling and at the same time providing secure and local energy while protecting the climate.

In view of the above, supporting Waste-to-Energy plants' role in an integrated waste management system will contribute to the reduction of GHG emissions in the long term.

ESWET - The European Suppliers of Waste-to-Energy Technology - is the European Association representing manufacturers in the field of Waste-to-Energy technology.

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