Waste-to-Energy - Making Circular Economy Happen

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The Circular Economy

‘Circular’ = sustainable, environmentally friendly
‘Economy’ = value creation
Waste management in the Circular Economy

The waste concept remains important, also within the CE

- Residues, used goods, objects without any (subjective) value for the holder should be taken care of
- Waste regulation needs to assure that those materials will not be spread in the environment and will be recovered/reused as much as possible

=> waste will also exist within the CE

The role of waste companies within the CE

- a logistic role (collect small amounts at different locations and deliver the necessary quantities to the production/treatment sites)
- pretreatment in order to remove unwanted and/or hazardous components:
  - inorganic (Hg, As, Cd,...) => treatment and safe sink
  - organics => WtE

KEEP THE MATERIAL CYCLES CLEAN AND SAFE
The role of Waste-to-Energy in the CE

- Turns non-recyclable waste in an environmentally safe way into secure energy and valuable raw materials;
- Keeps the circle clean by dealing with unwanted organic components in the material cycles (act as a pollutant sink, fulfilling a hygienic task for the society).
WtE acts as a pollutant sink preventing pollutants from re-entering the cycle

Sophisticated flue gas cleaning systems guarantee low emissions
More energy and materials from our waste

This energy can be in the form of steam, electricity or hot water:

- **Electricity** is fed into the grid and distributed to the end-users.
- **Hot water** can be sent to a nearby district heating (or cooling) network to heat (or cool) homes, hospitals, offices etc.
- **Steam** can be used by nearby industry in production processes.
CEWEP – Confederation of European WtE Plants

Under one umbrella

CEWEP is the umbrella association of the operators of Waste-to-Energy (WtE) Plants across Europe.

They thermally treat household and similar commercial & industrial waste that remains after waste prevention, reuse and recycling and generate energy out of it.

2016 - CEWEP Members: 80 M tonnes; 410 plants
- Europe: 94 M tonnes; 521 plants
Reducing dependence on landfills

Recycling and energy recovery are complementary options in order to divert waste from landfilling.

Supporting Quality Recycling

WtE prevents dirty or contaminated waste from entering the recycling chain and adversely impacting quality.

Generating value from Waste-to-Energy bottom ash

Recycling the metals and using the mineral parts in construction works to replace use of virgin materials.

Generating sustainable and reliable energy - Boosting Energy Efficiency

Use even more energy from waste in the form of heat, if the appropriate linking of heat (or process steam) customers to WtE Plants would be encouraged. The energy gains from WtE can be increased by improving access to power grids for WtE Plants.
Municipal waste treatment 2001-2016 EU 28

EU 28

Recycling and WtE go hand in hand

Landfill -31%
Waste-to-Energy +11%
Recycling +19%
The CE package scenario with ambitious targets for commercial waste 1/2

Estimation of Total input available for Waste-to-Energy in EU28 in 2035

129'637 ktonnes
The CE package scenario with ambitious targets for commercial waste 2/2

Energy production and CO₂ savings

**Energy Production scenario 2035**

<table>
<thead>
<tr>
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<th>2015</th>
<th>2035</th>
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<tbody>
<tr>
<td>Heat production [MWh]</td>
<td>90'090</td>
<td>129'767</td>
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<tr>
<td>Electricity production [MWh]</td>
<td>38'790</td>
<td>55'874</td>
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**Total potential CO₂ saving in 2035**

113'821'358 tonnes CO₂eq

**Supplying heat for:**

21'881'090 inhabitants

**Supplying power for:**

27'498'775 inhabitants

**Belgium in 2015 emitted 97'002'000 tonnes of CO₂ from fossil fuels (wikipedia)**

117% of the belgian CO₂ emissions from fossil fuels

**Recycling** 383'825

**WtE** 129'637

**Landfilling** 44'333

+ 84'235 ktonnes waste recycled
The Waste-to-Energy roadmap

Making the circular economy happen

Recycling and energy recovery are complementary options in order to divert waste from landfilling.

Contributing to climate protection

Diverting waste from landfill and replacing fossil fuels for energy production helps to reduce greenhouse gas emissions.
Thank you for your attention