

## Position paper on sustainable energy 4 from waste

### Waste-to-Energy

#### 4 A cost effective and reliable sustainable energy source

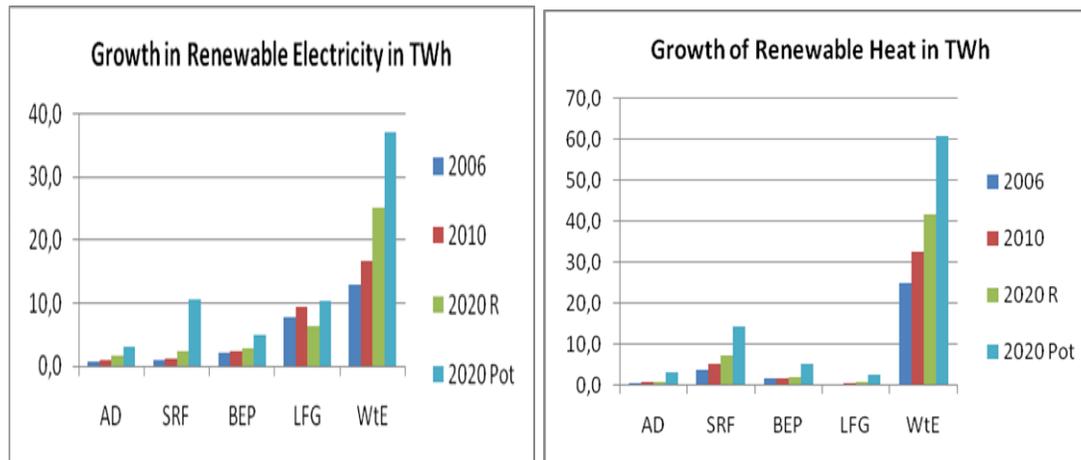
Waste processing is already a significant source of renewable energy in many countries and there is major potential for additional renewable energy which can be exploited from municipal solid waste (MSW) and comparable waste by 2020.

CEWEP made an analysis of the various waste processing methods<sup>1</sup> for the years 2006/2007 (representing the actual situation), an estimate for 2010 and a projection for 2020 (a Realistic, and a Potential Scenario, the latter could be achieved if the policy recommendations below are followed and waste policy would be even more ambitious, replacing landfilling).

Both the supply of renewable electricity and renewable heat has been considered.

Waste-to-Energy (incineration with energy recovery abbreviated as WtE) in 2006 provided by far the largest quantity of renewable energy. Other waste processing methods, which follow at a distance, are energy from Landfill Gas (LFG) extraction, co-incineration of SRF (Solid Recovered Fuel) as a fuel in both cement kilns and power plants, dedicated Biomass Energy Plants (BEP) incinerating waste wood, and Anaerobic Digestion (AD) of both source separated domestic biowaste and sorted biowaste from MSW.

The following graphs give a quantitative summary of developments mentioned above.



#### Growth in Renewable Electricity and Heat in TWh across Europe

AD – Anaerobic Digestion; SRF – Solid Recovered Fuel; BEP – Biomass Energy Plants; LFG – Landfill Gas; WtE – Waste-to-Energy

<sup>1</sup> Excluding agricultural and industrial food waste and grown biomass (e.g. forestry).

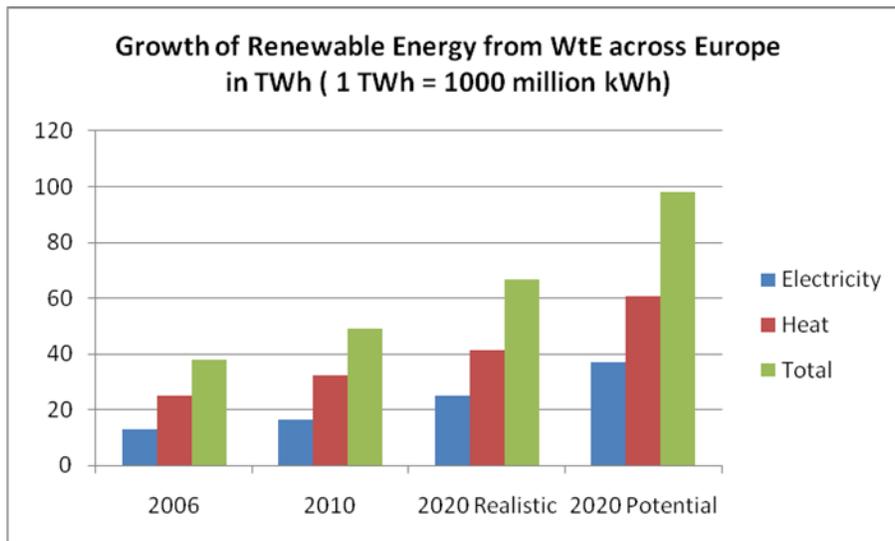
It is also evident that all of these categories of energy generation from waste represent a relatively low cost source of sustainable energy.

The EU 27's renewable energy gap to be filled (between the 2005 situation and that set by the 2020 binding targets) amounts to about 1500 TWh<sup>2</sup>. We estimate that about 95 TWh of this gap could potentially be provided by Energy from Waste (using a combination of all the abovementioned methods), around 60 TWh could come from Waste-to-Energy (4%).

Waste-to-Energy in Europe already supplies a considerable amount of renewable energy, some 38 billion kilowatt-hours in 2006, and by 2020 this amount will grow to at least 67 billion kilowatt-hours, but potentially reach 98 billion kilowatt-hours. This will be, in the latter case, enough to supply 22.9 million inhabitants with renewable electricity and 12.1 million inhabitants with renewable heat<sup>3</sup>.

In fact, Waste-to-Energy plants produce TWICE this amount of energy as their energy output is estimated to be about 50% Renewable. According to the European Directive on Renewable Energy Sources the biodegradable fraction of municipal and industrial waste is considered biomass, thus a renewable energy source.

**Summary of the overall development of Renewable Energy from Waste-to-Energy for EU 27:**



WtE's share of the Total Renewable Energy produced by a country can be significant as it was shown during 2006 for the following countries:

The Netherlands (14.3 %), Belgium (13.3 %), Denmark (12.5 %), Germany (7.5 %). Also in Sweden and France WtE makes a considerable contribution and has a substantial potential.

<sup>2</sup> The entire Renewable Energy target for the EU 27 is ca 2700 TWh by 2020, and the waste sector could supply by 2020 up to 147 TWh in total.

<sup>3</sup> Based on the assumption that electricity demand per capita equals 1.62 MWh/capita/yr and heat demand per capita equals 5.03 MWh/capita/yr.

## Policy recommendations

Waste-to-Energy can make a significant contribution to achieving renewable energy targets, ensuring security of energy supply as well as treating waste that is not otherwise recyclable in an environmentally sound way. In order to improve the contribution WtE can make towards climate protection, we recommend the following to decision makers:

- **Diverting waste from landfills** - burying waste means wasting precious energy. The EU Landfill Directive is a good tool to protect the climate, but it must be implemented properly. It is worth noting that some countries have gone further and reduced dependence on landfills dramatically (below 5%) using a combination of Recycling and WtE (Germany, the Netherlands, Belgium, Sweden, Denmark).

- **Policies to foster Energy Efficiency** - European policy focuses on the generation of renewable energy. However, distribution is also a key element in order to improve energy efficiency, reduce CO<sub>2</sub> emissions and ensure security of energy supply. There is a major opportunity to use even more energy from waste in the form of heat, if the appropriate linking of heat customers to WtE plants would be encouraged. Therefore we need drivers for improving **infrastructure for district heating and cooling** in addition to **incentives to maximize electricity production from waste**.

- **Electricity grid access** – Waste-to-Energy plants should not be put at a disadvantage in comparison to other renewable energy sources.

- **Recognise that energy from Waste-to-Energy plants is - at least in part – a renewable energy source** (about 50%) as the European Directive on Renewable Energy Sources' definition of biomass includes the biodegradable part of municipal and industrial waste.

CEWEP represents about 380 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.

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