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Waste-to-Energy in the Circular Economy and the Energy Union
by E. Stengler

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Waste-to-Energy in the Circular Economy and the Energy Union

Ella Stengler[1]

Abstract

Waste-to-Energy (WtE) is the link between two important EU policies currently under discussion, the Circular Economy and the Energy Union.

Regarding the waste targets aimed for in the Circular Economy, WtE (in the meaning of incineration with energy recovery) helps to divert waste from landfills. It also treats the waste that is not suitable for quality recycling and produces energy from the residual waste. This helps to make Europe less dependent on fossil fuel imports and contributes to security of energy supply, a major goal of the Energy Union policy.

The European Commission is aware of the two fold role of WtE and announced to publish by the end of 2016 a communication focused on Waste-to-Energy aiming to explore the opportunities offered by Waste-to-Energy, particularly with regard to synergies between resource and energy efficiencies by the end of 2016.

The article gives an overview of WtE's capacities to treat residual waste and its potential to save greenhouse gas emissions and produce reliable (base-load) renewable energy in decentralised facilities, contributing to the stability of the grid and security of supply.

The article also tackles discussions on End-of-Waste (EoW) status for waste derived fuels.

1 About Waste-to-Energy

Waste-to-Energy as referred to in this article is the incineration of waste while producing energy in the form of heat, electricity or steam, which can be delivered to homes and industry. The input is the fraction of residual municipal and similar commercial and industrial waste which is not suitable for recycling and which would otherwise be consigned to landfills. In industrialised countries the ratio between municipal and commercial/industrial waste can be 50/50.

Currently, there are about 88 million tonnes of waste treated in ca. 480 WtE plants Europe (reference year 2014)[2].

Capacities are unevenly spread. Generally, there is a higher density of WtE capacity in Northern European countries than in Southern and Eastern European countries. The graph below refers to 2014 figures from Eurostat and gives an indication of municipal waste management capacities. The figures illustrate that Member States who have most successfully reduced landfilling achieve good recycling rates, which shoes that recycling goes hand-in-hand with Waste-to-Energy. They have worked towards a complementary waste management

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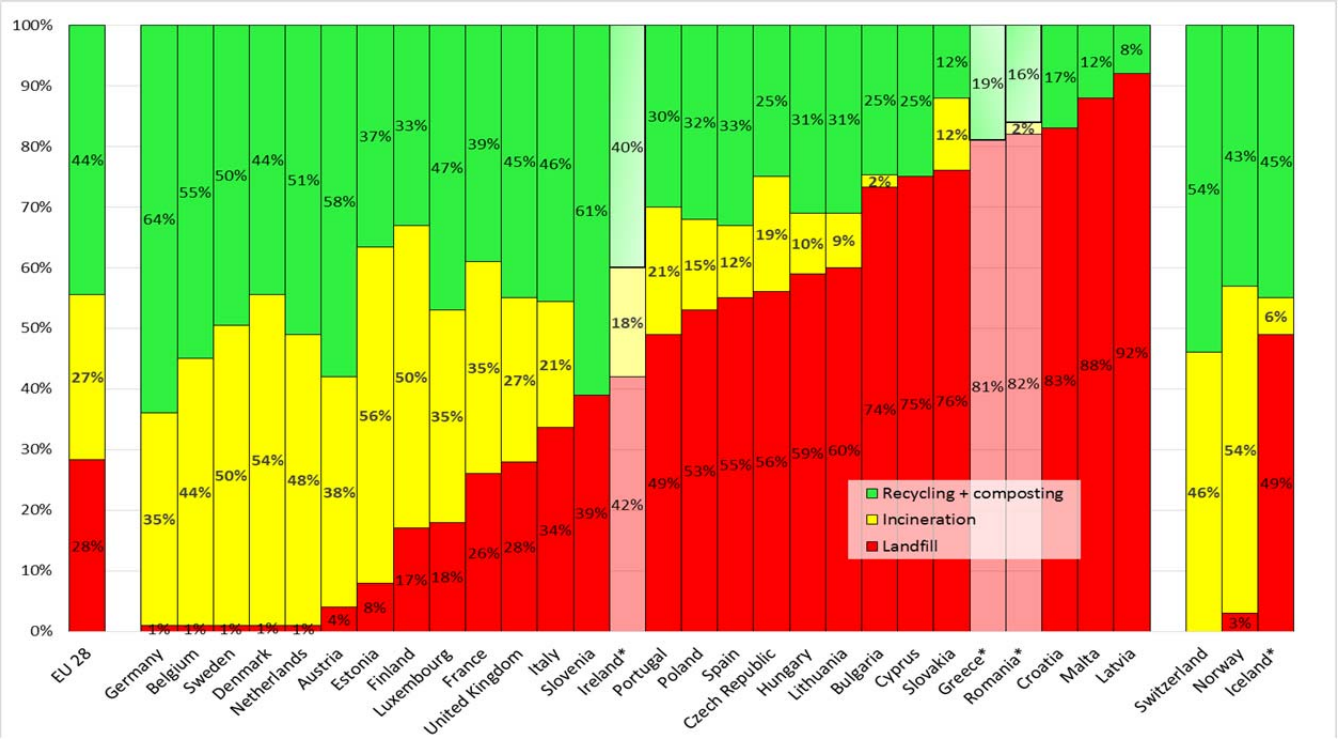
[2] CEWEP, Waste-to-Energy Plants in Europe in 2014 (March 2016), http://www.cewep.eu/information/data/studies/m_1488.

system where both Recycling and Waste-to-Energy play a complementary role in diverting waste from landfills.

Recycling and Waste-to-Energy in combination for sustainable waste management

Municipal waste treatment in 2014



*Source: EUROSTAT; *data refer to 2013*

2 Waste-to-Energy and the Circular Economy Package

2.1 Landfill diversion target

The European Commission's proposal in the Circular Economy Package from 2nd December 2015[3] introduces a landfill cap, at 10 percent maximum of the total amount of municipal waste generated, to be reached by 2030. It offers five additional years for a few countries in order to lower their landfill rates to this cap. A legally binding target to reduce landfilling waste that can be recovered is an important step in order to achieve a circular economy.

A substantial amount of municipal waste is still landfilled in Europe with negative impacts: loss of energy potential, methane emissions, and potential danger for the groundwater due to leakage. A recent study suggests that, "*Diversion from landfill is the main contributor to greenhouse gas mitigation in the waste management sector*", and estimates that 92 million

[3] European Commission, Proposal for a Directive of the European Parliament and of the Council, amending Directive 1999/31/EC on the landfill of waste (2nd December 2015), http://ec.europa.eu/priorities/jobs-growth-and-investment/towards-circular-economy_en.

tonnes of CO_2 emissions could be saved by 2030 in the EU-28 if all the municipal waste would be diverted from landfill[4].

Following the Paris agreement of the COP 21, one could have expected more ambition from the European Commission. Aiming at 10 percent of landfilling still leaves around 24 million tonnes of municipal waste to decompose in landfills, releasing methane – a greenhouse gas 25 times more potent in mass than CO_2 – and wasting its full potential. The 10 percent target is said to be more realistic and indeed, considering that today only 7 Member States landfill less than 10 percent and 9 Member States still landfill 60% or more of their municipal waste, there is a long way to go.

However, the European decision makers should be more ambitious regarding the scope of the targets. Currently, the focus is very much on municipal waste, when there is also a huge potential for commercial and industrial waste to be better utilized within the circular economy.

Diverting more waste from landfill would be an incentive to improve the recycling efforts of European countries, and would allow the production of more energy with the residual non-recyclable waste. The quality of the recycled waste is crucial, and the package introduces measures in this direction.

2.2 Recycling targets

The package[5] updates the recycling targets set by the Waste Framework Directive. They are as follows:

Municipal waste:

- 60% preparing for reuse and recycling by 2025,
- 65% by 2030.

Packaging waste:

- 65% reuse or recycling by 2025,
- 75% by 2030.

The Commission proposes to base the reporting on the input of the final recycling process. Member States may take the recycling of metals from incinerator bottom ash into account.

Waste-to-Energy helps the EU to achieve the recycling targets by extracting metals from the bottom ash. Ferrous and non-ferrous metals, once extracted, can be recycled into new products such as aluminium castings. This proposal will give Waste-to-Energy plant operators an additional incentive to improve metal recycling from bottom ash, which helps to avoid emissions of about 2000 kg of CO_2 equivalent per tonne of metal recycled, compared to

[4] Institute for Applied Ecology (Öko-Institut) and the Institute for Energy and Environmental Research (IFEU) on behalf of German Federal Environment Agency (UBA), "The Climate Change Mitigation Potential of the Waste Sector" (July 2015), http://www.umweltbundesamt.de/publikationen/the-climate-change-mitigation-potential-of-the.

[5] In particular here, the proposals to amend Directive 2008/98/EC on waste and Directive 94/62/EC on packaging and packaging waste (2nd December 2015), http://ec.europa.eu/priorities/jobs-growth-and-investment/towards-circular-economy_en.

primary production[6]. In 2014, European Waste-to-Energy plants produced approximately 18 million tonnes of bottom ash containing around 10-12 percent metals, both ferrous and non-ferrous. This leads to saving the emissions of circa 3.2 million tonnes of CO_2 equivalent into the atmosphere[7].

As for the metal recovered from the bottom ash the same year, respectively 20,000 and 17,000 tonnes of aluminium were recovered from bottom ash in both the Netherlands and France. This metal was mainly used in castings for the automotive industry (engine blocks, etc.)

Other remaining minerals can be used as secondary aggregates, e.g. in road construction or building products.

2.3 Harmonised definitions and quality criteria for Secondary Raw Materials

The new package proposes a harmonised definition of municipal waste and rules to monitor recycling. It adds a definition for 'final recycling' and inserts as a general rule: the reporting on the attainment of the recycling targets must be based on the input to the final recycling process. Under certain conditions, Member States should be allowed to report recycling rates on the basis of the output of sorting facilities.

The proposals for harmonisation of definitions and calculation of recycling rates are imposed to allow better comparison between countries, and to ensure traceability as well as quality of the recycled materials.

The Commission announces that it will tackle quality criteria for secondary raw materials. Plastic waste, for instance, is one of the waste streams that will be reviewed.

Focusing on quality rather than just quantity allows Waste-to-Energy to contribute efficiently to a clean circular economy by keeping the polluted waste – unsuitable for recycling – out of the circle. Following the waste hierarchy, Waste-to-Energy will help closing the circle by dealing with the waste that cannot be recycled in an environmentally sound or economically feasible way.

In the context of energy recovery (e.g. waste incineration and co-incineration) it is important to note that waste that is used as fuel is not considered as recycling. The 'recycling' definition of Article 3 (17) of the current Waste Framework Directive (WFD) 2008/98/EC[8] – untouched by the Commission's new Circular Economy proposal, states: *'recycling' means any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations;*

[6] EdDE-Dokumentation, 17 (October 2015).
[7] See CEWEP, Bottom ash fact sheet (19th May 2016), http://www.cewep.eu/information/recycling/waste-to-energyandresourceefficiency/m_1485.
[8] Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste, OJ L 312, 22.11.2008, p. 3–30.

Although using waste as a fuel is not considered as recycling, there are discussions if waste derived fuels can cease to be waste[9].

3 End-of-Waste (EOW) Criteria for Waste Derived Fuels

3.1 EU Criteria

Over the last decades, the European Union has adopted environmental legislation on waste handling and treatment, with the specific purpose of protecting human health and the environment. This legislation naturally applies to waste. If a waste ceases to be waste and becomes a product, waste legislation does not apply any longer. Therefore, Article 6 of the Waste Framework Directive (WFD) 2008/98/EC that regulates the criteria when a waste ceases to be a waste deserves specific attention.

According to Article 6 (1) WFD certain specified wastes shall cease to be waste when they have undergone a recovery operation and they comply with specific criteria to be developed in accordance with the following cumulative conditions (a) – (d):

> *(a) the substance or object is commonly used for specific purposes;*
> *(b) a market or demand exists for such a substance or object;*
> *(c) the substance or object fulfils the technical requirements for the specific purposes and meets the existing legislation and standards applicable to products; and*
> *(d) the use of the substance or object will not lead to overall adverse environmental or human health impacts. The criteria shall include limit values for pollutants where necessary and shall take into account any possible adverse environmental effects of the substance or object.*

The European Commission's proposal in the Circular Economy Package from 2nd December 2015[10] seems to weaken condition a) in Article 6 (a):

Whereas the WFD requires that the substance or object **is commonly used for specific purposes**, in the Circular Economy proposal it is sufficient

> *if the substance or object **can** be used for specific purposes.*

Certainly, we need room for innovation to develop new outlets which are not yet commonly used, however as end-of-waste status has significant legal consequences, i.e. strict waste laws do not apply to non-waste, it must be avoided that the criteria when waste ceases to be a waste are watered down to a theoretical "can be used" somewhere sometime. Without the requirement that a beneficial use is sure/subsequently established and proven, one could risk losing track of the material, ending up in facilities and/or countries without environmentally

[9] Waste considered to have ceased to be waste in accordance with Art. 6 (1) WFD may be counted as prepared for reuse, recycled or recovered for the purpose of the calculation of the achievement of the targets set out in Directive 2008/98/EC, Directive 94/62/EC, Directive 2000/53/EC, Directive 2006/66/EC and Directive 2012/19/EU of the European Parliament and of the Council respectively if it has been subject to a preparing for reuse, recycling or recovery in accordance with those Directives.

[10] European Commission, Proposal for a Directive of the European Parliament and of the Council, amending Directive 2008/98/EC on waste – Article 1 (5) (2nd December 2015), http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52015PC0595.

sound treatment as the Waste Shipment Regulation (EC) 1013/2006 and other EU waste laws do not apply to non-waste.

On the other hand criterion b), requiring that *a market or demand exists for such a substance or object* might compensate a weaker condition in point a) as long as it is assumed that the existence of a market means that the material in question has a positive price. If there is a negative price for the material, there is a danger of bypassing strict waste legislation on the detriment of the environment.

The requirement of the existence of a market and demand according to Article 6 (1) b) WFD also plays a role in the discussion if waste derived fuels should become End-of-Waste (EoW).

Waste derived fuels in the form of RDF (Refuse Derived Fuel) or SRF (Solid Recovered Fuel) have in most cases a negative market price. Generally, the producer of waste derived fuels pays to get rid of it, e.g. to Waste-to-Energy plants (waste incineration with energy recovery) which can, due to their flue gas cleaning system, accept heterogeneous waste that does not need pre-treatment, or co-incineration plants (e.g. cement kilns), which have to be more careful regarding their waste derived fuel input in order to avoid negative environmental impact and to make sure that their product (e.g. cement) is not polluted.

Only if certain strict quality criteria are met, it can be assumed that the producer of waste derived fuels receives money for it.

3.2 Refuse Derived Fuel (RDF) and Solid Recovered Fuel (SRF)

There is no legal definition of RDF or SRF.

For SRF a European Standard EN 15359 exists which determines classifications for the use in co-incineration plants (e.g. cement kilns and power stations) based on the calorific value, chloride and mercury content. EN 15359 does not determine criteria for EoW. It is not driven by environmental requirements (although the limit of mercury has of course an environmental relevance), but by the need of the receiving co-incineration plants in order to avoid damage to the plant.

RDF (mixed non-hazardous waste) is in general more heterogeneous than SRF.

3.3 Environmental Criterion

As SRF and RDF are fuels derived from waste and used in thermal processes the following provisions have to be considered in the discussion of its EoW status: The emission limit values encompassed in the Waste Incineration Directive 2000/76/EC[11], now merged into the Industrial Emissions Directive 2010/75/EU[12] and the techniques described in the respective

[11] Directive 2000/76/EC of the European Parliament and of the Council of 4 December 2000 on the incineration of waste, OJ L 332, 28.12.2000, p. 91–111.

[12] Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control), OJ L 334, 17.12.2010, p. 17–119.

Best Available Technique Reference documents as well as the Waste Shipment Regulation EC (No) 1013/2006[13].

The legislation, which sets requirements in order to protect human health and the environment, only apply for waste, not for EoW.

Therefore, the probably most important EoW criterion of Article 6 WFD is the environmental condition mentioned in Article 6 (d) of the WFD:

> (d) *the use of the substance or object will not lead to overall adverse environmental or human health impacts*

Incineration and co-incineration of SRF and RDF help to replace fossil fuels and divert waste from landfills. The Industrial Emissions Directive 2010/75/EU sets in Chapter IV and Annex VI strict environmental requirements that have to be applied by dedicated Waste-to-Energy incineration plants and industrial plants (e.g. cement kilns) that co-incinerate waste.

If RDF/SRF is incinerated as non-waste in plants not covered by the requirements of the Industrial Emissions Directive, Chapter IV and Annex VI, higher air emissions have to be expected as in this case they could be burned in poorly designed and inadequately controlled boilers. This could result in largely unregulated emissions and poorly burnt-out ash, to the detriment of the environment.

They could be used as fuel in any facility, or even in homes, which could thereby generate the high levels of harmful emissions that the Industrial Emissions Directive seeks to prevent through its strict controls and emission limits.

It is essential therefore, that RDF and SRF are considered waste and continue to be burnt in facilities that comply with the requirements of the Industrial Emission Directive for waste incineration and waste co-incineration, providing a *high level of environmental protection* as required by the Waste Framework Directive for End-of-Waste criteria (Recital 22 WFD), ensuring that this would *not lead to overall adverse environmental or human health impacts* (Article 6 (1) (d) WFD).

Classifying waste derived fuels as non-waste would also remove controls over their destination and where they might end-up as a feedstock. This is particularly relevant with regard to the Waste Shipment Regulation and its provision for notification of transboundary waste shipments. If RDF receives EoW status, the Waste Shipment Regulation would no longer apply and there would be no traceability regarding the final destination of this material.

3.4 EU versus National Regulations of EoW

In the lack of European Regulations on EoW status for waste derived fuels (a study that has been undertaken by the Austrian Environmental Protection Agency on behalf of the European Commission's Joint Research Centre was not published), some Member States (e.g. Austria and Italy) went ahead developing their own national criteria for the EoW status of waste

[13] Regulation (EC) No 1013/2006 of the European Parliament and of the Council of 14 June 2006 on shipments of waste, OJ L 190, 12.7.2006, p. 1–98.

derived fuels. These national initiatives must comply with the conditions set in Article 6 (1) WFD and particularly with the environmental criteria d) of the WFD.

According to Article 6 (4) WFD *Member States may decide case by case whether certain waste has ceased to be waste taking into account the applicable case law* (of the Court of Justice of the European Union) where criteria have not been set at EU level. They shall notify the Commission of such decisions in accordance with Directive 98/34/EC.

Article 6 (2) WFD foresees that EoW specific criteria should be considered, *among others, at least for aggregates, paper, glass, metal, tyres and textiles*. The European Commission has adopted criteria for some waste streams, such as scrap metals[14] and glass[15], but lost "appetite" to continue with EoW criteria after its draft proposal for waste paper failed to be adopted.

In its proposal for the Circular Economy from 2nd December 2015 the European Commission seems to give the responsibility (partly) back to the national level. They suggest: "*Member States shall ensure that waste which has undergone a recovery operation is considered to have ceased to be waste"* if it complies with the conditions set in Article 6 (1) a-d WFD.

Whereas some items are better tackled on national level, for the EoW status a harmonized European approach would be preferable, mainly because the EoW status decides about the application of the Waste Shipment Regulation. What happens in case of transboundary shipments if one Member State (e.g. the one of destination) classifies something as waste and the other Member State (e.g. the one of dispatch) considers it as non-waste?

Article 28 of the Waste Shipment Regulation foresees that *if the competent authorities of dispatch and of destination cannot agree on the classification as regards the distinction between waste and non-waste, the subject matter shall be treated as if it were waste.*

However, will the authorities of dispatch ask for notification for transport, and will the authority of destination get knowledge about the shipment? If the authority of destination considers it as waste, but is not informed about the transboundary waste shipment, does it have the means to object or ask for notification?

The application of waste legislation prevents damage to health and the environment from the burning of heterogeneous material in unregulated facilities lacking proper flue gas treatment.

Any classification of SRF/RDF should include necessary controls over its destination and where it might end up as a feedstock. This is ensured by the application of the Waste Shipment Regulation and its provision for notification of transboundary waste shipments.

Waste policy is one of the fields where European legislation is preferable to national regulations in order to protect the overall environment as much as possible. National decisions by Member States should not allow the circumvention of this legislation.

[14] Council Regulation (EU) No 333/2011 of 31 March 2011 establishing criteria determining when certain types of scrap metal cease to be waste under Directive 2008/98/EC of the European Parliament and of the Council, OJ L 94, 8.4.2011, p. 2–11.

[15] Commission Regulation (EU) No 1179/2012 of 10 December 2012 establishing criteria determining when glass cullet ceases to be waste under Directive 2008/98/EC of the European Parliament and of the Council, OJ L 337, 11.12.2012, p. 31–36.

European decision makers should ensure that burning waste derived fuels meets the requirements in relation to traceability, control of transboundary waste shipments and comply with air pollution control legislation and Best Available Techniques as set for waste incineration and co-incineration. This would avoid an overall adverse human health or environmental impact which Article 6 (1) (d) of the WFD has been constructed to protect.

4 Waste-to-Energy's Contribution to an Energy Union

In February 2015, the European Commission launched its Energy Union strategy[16]. As one of the core priorities of the Commission for the next five years, the Energy Union aims to create a unique European energy market that would "*ensure secure, affordable and climate-friendly energy for citizens and businesses*".

On 16th February 2016, the Commission presented its new Sustainable Energy Security Package[17] in the framework of the Energy Union. The package aims at strengthening *"the EU's resilience to gas supply disruptions. These measures include moderating energy demand, increasing energy production in Europe (including from renewables), further developing a well-functioning and fully integrated internal energy market, as well as diversification of energy sources, suppliers and routes."*

This package consists of four documents. For WtE, the most relevant is the Heating and Cooling Strategy. Following the above-mentioned objectives, this strategy suggests – among other ideas – to increase the share of renewable energy solutions in buildings, to reuse the excess energy from industry via district heating systems, to develop cooling via cogeneration and to extend infrastructure.

Waste-to-Energy has a role to play within all of these topics.

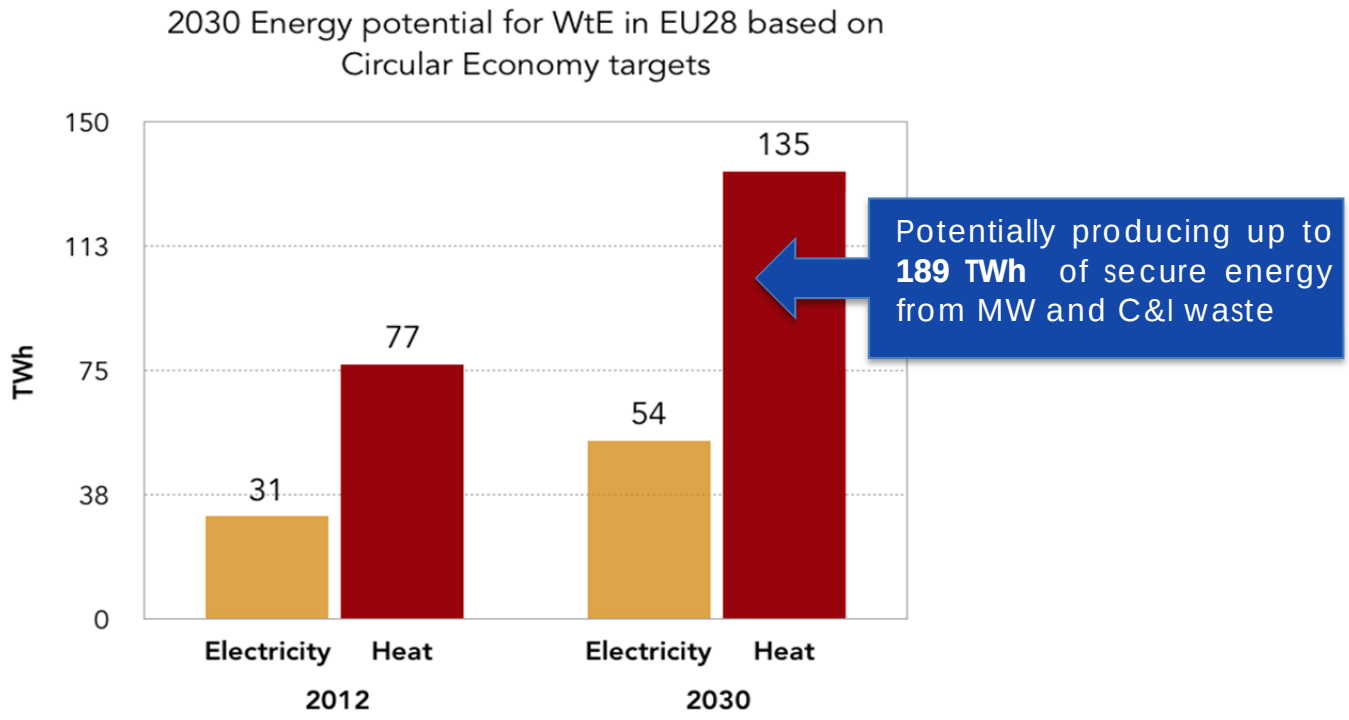
4.1 Waste-to-Energy Generates Reliable (base-load) Renewable Energy

Waste-to-Energy is a (partly) renewable energy source, as indicated by the Renewable Energy Sources Directive 2009/28/EC[18]. EU legislation considers the biodegradable fraction of municipal and industrial waste to be biomass and thereby a source of renewable energy. About 50 percent of the energy produced by Waste-to-Energy plants comes from biodegradable parts of the waste. Therefore, about half of the energy produced is considered renewable. Hence, Waste-to-Energy helps EU Member States to reach their targets in share of renewables in the energy consumption. WtE provides base-load energy and contributes to stability of the grid.

Applying the Circular Economy targets for 2030 as proposed by the European Commission (reuse and recycling 65 percent, landfill maximum 10 percent) to municipal and commercial and industrial waste, the total amount of energy (renewable and carbon components)

[16] Communication (COM/2015/080) A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy (February 2015), http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2015:80:FIN.
[17] Towards Energy Union: The Commission presents sustainable energy security package (16th February 2016), http://europa.eu/rapid/press-release_IP-16-307_en.htm.
[18] Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources, OJ L 140, 5.6.2009, p. 16–62.

produced by Waste-to-Energy plants would potentially reach 189 TWh by 2030, enough to replace 10 percent of the energy supplied by the coal sector[19].



This potential can only be realized if waste is diverted from landfilling and what is not suitable for recycling is processed by efficient Waste-to-Energy plants.

For Waste-to-Energy plants, energy efficiency, access to the grid and local infrastructure for heating and cooling is of tremendous importance.

If the potentials that are particularly huge if District Heating/Cooling is supplied by waste are realised, Waste-to-Energy can make a significant contribution to sustainable energy, reducing Europe's high dependency on fossil fuel imports as well as treating waste that is otherwise not recyclable in an environmentally sound way.

4.2 Waste-to-Energy as a Resource for Efficient District Heating and Cooling

The renewable energy potential, in particular, is highly under-exploited for District Heating and Cooling, which can play a key role in decarbonisation of the energy sector.

Already in some European cities, Waste-to-Energy provides 50% or more of the local heat demand. Waste-to-Energy could even contribute more, if the appropriate connection to heat (or steam) customers would be stimulated. Studies[20] suggest that the potential for using heat from waste can quadruple (from 50 to 200 billion kWh per year) by 2050, which shows that major opportunities exist for a further development of Waste-to-Energy in Europe.

[19] Calculation based on Heat Roadmap Europe 2050 (Second pre-study for the EU27), May 2013.
[20] Heat Roadmap Europe 2050 (Second pre-study for the EU27), May 2013.

For example in Eastern Europe, where district heating infrastructures (often) already exist, but only fossil fuels are used, where heat from Waste-to-Energy plants could be exploited.

In many countries and cities, Waste-to-Energy already reaches a high share of renewables in the energy mix. The WtE plant in Malmö (Sweden) for instance supplies 60% of the heat demand of the city, and the Brescia WtE plant in Italy provides more than 50% of the city's heat demand.

The energy produced by Waste-to-Energy plants can be used by both citizens and businesses as it is the case in Rotterdam, where the AVR Rozenburg plant supplies steam to the industry located in the Rotterdam harbour, and heat to the District Heating network of the city. This helps Rotterdam reduce its CO_2 emissions by 200,000 tonnes a year. The current pipeline, opened in 2015, provides heat to 95,000 households. When fully implemented, the network will lead to up to 400,000 tonnes of CO_2 emissions savings yearly.

In Canton Lucerne, Switzerland, a newly opened Waste-to-Energy plant presents an important value for the local industry. Not only does the plant produce enough electricity to fulfil the need of 38,000 households per year, but it also provides heat to the nearby paper mill in order to dry the paper during the production line. The proximity of the two facilities allows an energy efficiency of 70%. By using heat from waste rather than from fossil fuels, the mill reduces the costs of its heating process, and saves 40 million litres of oil per year.

Replacing individual boiler heating (fuelled by fossil fuels) with District Heating, supplied inter alia by energy from waste[21], would also improve air quality and help cities to comply with clean air standards.

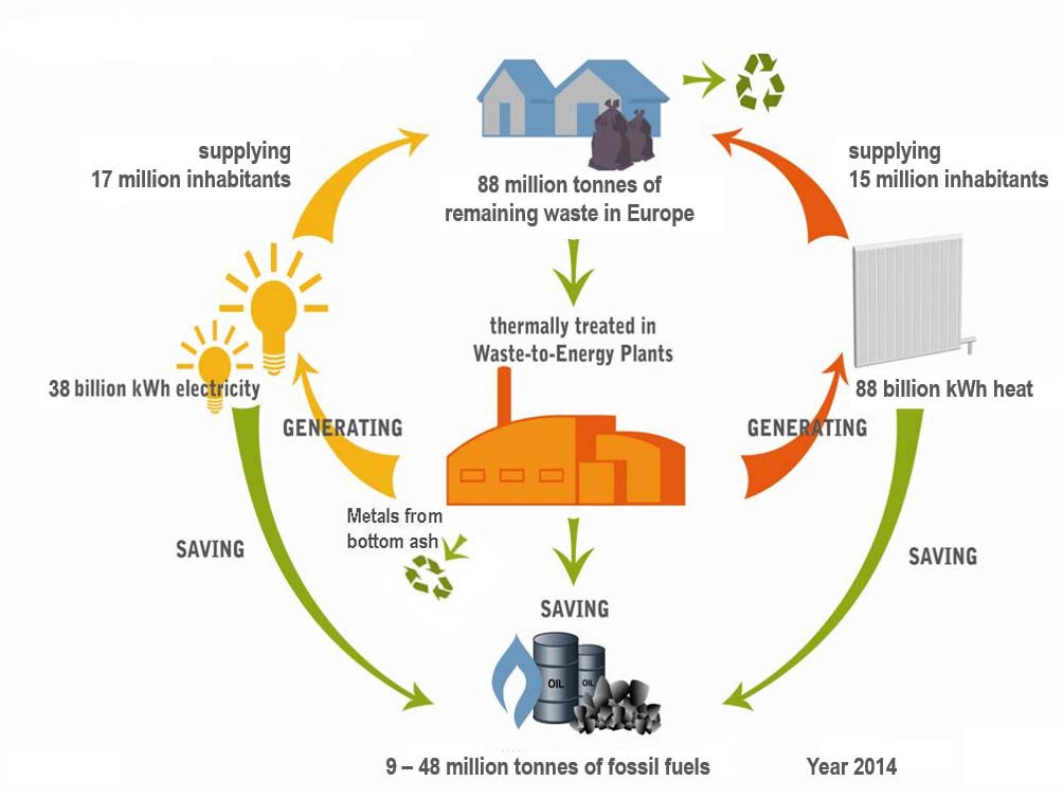
5 Waste-to-Energy Replaces Fossil Fuels and Contributes to Security of Supply

Waste-to-Energy Plants in Europe can supply 17 million inhabitants with electricity and 15 million inhabitants with heat. This is based on 88 million tonnes of residual household and similar waste that was treated in 2014 in Europe in about 480 WtE plants. Then between 9 and 48 million tonnes of fossil fuels (gas, oil, hard coal and lignite) can be substituted annually, which would emit 22 - 48 million tonnes of CO_2.

The energy content of the waste treated by Waste-to-Energy plants in Europe amounts to 19% of the gas imports from Russia in 2012[22].

[21] See also CEWEP, „Warmth from Waste" http://www.cewep.eu/information/energyclimate/warmthfromwaste/1115.Warmth_from_Waste_A_Win-Win_Synergy.html.

[22] Eurostat (2012), Table nrg_124a - Imports - gas - annual data. Retrieved from http://ec.europa.eu/eurostat/web/energy/data/database.



6 The European Commission's Waste-to-Energy Communication

In the framework of the Energy Union, the European Commission is drafting a communication focused on Waste-to-Energy. The communication will be published at the end of 2016 together with the reviewed Renewable Energy Directive.

According to the Commission's roadmap, the WtE Communication will aim to tackle the following issues:

- Lack of synergies between the Waste-to-Energy sector and EU Policies
- Energy efficiency of the existing Waste-to-Energy processes
- Uneven capacity
- Untapped potential of waste-derived fuels
- Lack of clarity with regards to the Waste Hierarchy

A draft technical report was presented to stakeholders in March 2016. It focused on the current waste streams for energy recovery, the technology and the possibilities to improve energy efficiency. Ideally, this communication would focus on two key issues: higher energy efficiency and better waste management, looking into the most relevant waste streams and into mature technologies.

In order to reach higher energy efficiency in the Waste-to-Energy sector, an acknowledgment of the synergies with existing and future exploitation of District Heating and Cooling systems and industrial heat use is essential. To further this efficiency, the European Commission should also emphasize the key role of grid access. Waste-to-Energy should not be put at a disadvantage in comparison to intermittent other renewable energy sources. Waste-to-Energy plants indeed achieve two tasks: to produce energy and to treat waste in an environmentally

sound way. During peak energy supply from other sources, the plants cannot easily stop to process the waste that they receive as they still have to fulfil an important sanitary task to treat the waste in an environmentally sound way. However, during peak times from other energy sources, this could result in the loss of energy from Waste-to-Energy plants, and reduces the overall efficiency of the sector.

Waste-to-Energy is also an important ambassador towards a better waste management. In order to further define this role, the upcoming communication should emphasise that Waste-to-Energy is necessary in order to achieve quality recycling and divert waste from landfills.

The Commission's communication paper will also tackle Waste-to-Energy capacities in Europe and how to use existing waste treatment capacities, e.g. shipping waste from countries which would otherwise landfill the waste.

The Communication paper should also address public perception of WtE. Waste-to-Energy plants are most efficient if they are located close to heat and steam consumers. This is often not the case due to some negative public perception fearing emissions from these plants. It is necessary to continue informing the public about the huge progress that has been made in filter devices for Waste-to-Energy plants in the last decades.

Today, Waste-to-Energy is one of the most stringently regulated and controlled industrial activities and achieves very low emissions[23], based on EU legislation (IED Regulation, chapter IV, Annex VI and BREF (Best Available Technology REFerence Document) Waste Incineration). It is together with recycling complimentary to treat waste that could not be avoided and to divert it from landfills.

7 Summary and Outlook

With the new Circular Economy Package, the European Commission vows to boost recycling and reduce landfilling of municipal waste. The proposal focusses on municipal waste, but European decision makers should not miss the opportunity to approach the potential for commercial & industrial waste.

Concerning Waste-to-Energy, the package proposes to include metal recovery from bottom ash as counting towards the recycling targets. This will give WtE plant operators additional incentives to recycle even more metals from the bottom ash.

Waste-to-Energy is also a cornerstone between the Circular Economy and the Energy Union strategy, as it provides an opportunity for a better use of residual waste while producing reliable, affordable, local energy that is 50 percent renewable. It answers to both challenges of increasing the EU's share of renewable energy while improving energy security.

CEWEP is the umbrella association of the operators of 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.

[23] For more information, see http://www.cewep.eu/information/healthandenvironment/index.html.