ESWET's contribution to the call for evidence on the European Critical Raw Materials Act

ESWET – the European Suppliers of Waste-to-Energy Technology represents companies that have built and supplied over 95% of the Waste-to-Energy plants in operation in Europe. It seeks to promote the technologies which recover both energy and materials from non-recyclable waste that would otherwise end up in landfills.

ESWET welcomes the Commission's call for evidence on the European Critical Raw Materials Act, as announced during the State of the Union address. Raw materials and critical raw materials will be essential to ensure the success of the twin digital and energy transition, especially in the deployment of renewable energy and the decarbonisation of hard-to-abate sectors such as transport.

To this aim, more emphasis needs to be put on the **use of critical and non-critical secondary raw materials and recycled materials**. Following the waste hierarchy (Article 4, Directive 2008/98), priority needs to be given to waste reduction; preparing for re-use and recycling. However, not every waste is recyclable. Waste can be contaminated or polluted, and most materials cannot be recycled indefinitely – and have to be recovered, or as a last resort, disposed of in landfills.

Policy recommendations

1. Consider both critical raw materials and non-critical raw materials as both will be the keys to accelerate the energy transition
2. Recognise the role of Waste-to-Energy in the circular economy as the sector contributes to the supply of secondary raw materials (both metals and minerals)
3. Address the untapped potential of EU supply by facilitating the use of materials from waste streams
4. Provide regulatory and financial incentives to increase the EU's material circularity

Waste-to-Energy in the circular economy

Waste-to-Energy (WtE) plants treat municipal non-recyclable waste as a resource by turning it into heat and electricity used by communities and industries, hence contributing to the circular economy. In 2019 in Europe, WtE generated 43 billion kWh of electricity and 99 billion kWh of heat, which provided 20 million citizens with electricity and 17 million citizens with heat.[1] As about half of the waste treated

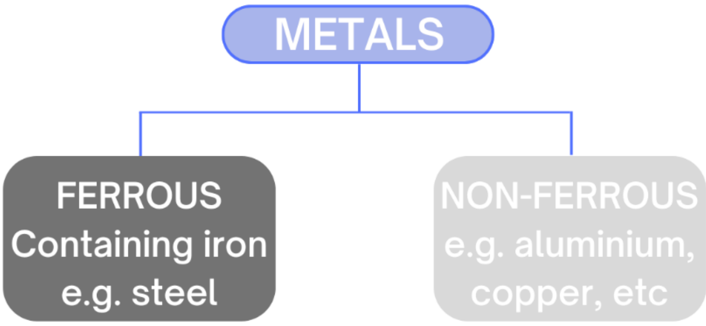
[1] Based on CEWEP data, see their 2022 Climate roadmap, page 5.

is of biogenic origin (such as contaminated paper), WtE is partly renewable[2] and represents a reliable and local source of energy in Europe.

This role in the circular economy was already acknowledged by the European Commission in 2017 in a Communication. However, the full contribution of the sector is often overlooked.

Indeed, non-recyclable waste still holds valuable materials that can be recovered **by treating and extracting specific materials from incineration bottom ashes** (IBA), the main solid residues of the thermal process.

IBA is composed of 80 to 85% of minerals, 10 to 12% of ferrous metals and 2 to 5% of non-ferrous metals.



Metals separated and recycled from IBA are currently included in the amount of municipal waste recycled and contribute to the Member states' waste management targets.[3] For minerals, depending on Member states' legislation and practices, they are utilised up to 100% as secondary raw materials in construction.[4] IBA is also well suited for construction and can be used as an aggregate for base layers, for example in roads or parking areas.[5]

There are however **significant discrepancies** in the utilisation of IBA from one European country to another, due to issues of regulation, availability of primary raw materials or public acceptance. Furthermore, both metals and minerals recovered from IBA contribute to avoiding the polluting extraction and processing of virgin materials. Indeed, the recovery of metals alone saves about 60kg of CO_2eq per tonne of waste treated.[6] Plants can recover both ferrous and non-ferrous metals (copper, aluminium, etc), which also helps to reduce the reliance on third countries for raw materials.

[2] As recognised by the current Renewable Energy Directive 2018/2001 still in force, the biodegradable fraction of waste is classified as biomass (Article 3 (24)).
[3] Article 3 (7), Commission implementing decision 2019/1004.
[4] Blasenbauer et al. (2020), *Legal situation and current practices of waste incineration bottom ash utilisation in Europe*, available here.
[5] In Denmark, for instance, after the recovery of recyclable metals, almost 99% of the bottom ash is used for construction. *Factsheet from the Danish Ministry of Environment*, available here.
[6] CEWEP (2022), *Climate roadmap*, technical annex, available here.

Contribution in the supply of critical raw materials

Aside from incineration bottom ash, which is a non-hazardous material, essential materials can also be recovered from another residue of combustion: fly ashes. Fly ashes are classified as hazardous in the majority of EU countries and represent a smaller amount compared to IBA, but several state-of-the-art treatment plants are able to recover materials from it such as heavy metals. Thanks to advanced acidic washing technologies facilities in Denmark, Sweden and Switzerland can recover zinc, lead and copper, but also **cadmium**, which is considered as a Critical Raw Material (CRM).[7]

This type of process is not commonly applied in the European WtE sector, but they could be more widely deployed if a market for those secondary raw materials were to develop.

Benefits of materials from waste

While most of the materials recovered from IBA are not classified as CRM, **they are still essential in achieving the energy and digital transition**. Metals and precious metals such as copper, gold, silver and nickel are key elements in the manufacturing of batteries, solar thermal panels or wind turbine blades. While the amount is smaller for those specific materials, they can also be recovered from WtE in some state-of-the-art treatment plants.[8]

Considering the urgency of tackling climate change, **all supplies of important raw materials have to be taken into account**, and **especially secondary raw materials** as their utilisation fits in the circular economy frame.

With materials from waste, however, there are indeed many bottlenecks and obstacles remaining that a new approach should aim to solve. The utilisation of recovered and recycled materials at large should be facilitated at EU level, through both regulation and access to funding for innovative projects. Raising awareness of the **environmental and societal benefits of secondary raw materials** will also help to respond to issues of public acceptance, by shifting the perception of waste to be seen as a valuable resource.[9]

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[7] See for instance, the SwissZinc project; the HALOSEP project funded by LIFE; and RENOVA Gothenburg.
[8] See or instance the ZAV Recycling plant in Switzerland, more details here.
[9] While reducing waste at the source is the most preferable solution, municipal waste generation is still on the rise in Europe, with the latest Eurostat data estimating that citizens produced about 517kg per capita of municipal waste in 2020, compared to 504kg in 2019.