ESWET
European Suppliers of Waste-to-Energy Technology

Hosted by
European Committee of the Regions

Waste-to-Energy
& the City

Generating value for Communities

Q&A from the Conference
(answers to questions submitted online during the Conference and not answered live)

Disclaimer

The wording of the questions and the comments contained in this document is a direct transcription of the content shared by the attendees of the Waste-to-Energy & the City Conference, organised in collaboration with the Committee of the Regions on 16 May 2023 in Brussels and online.

The responses provided herein reflect ESWET official position on the particular subjects. For further details regarding ESWET and its activities, please refer to www.eswet.eu.

Q: What can be done and what are the hurdles to increase/maximize the metal recovery in bottom ashes? What is the potential and the hurdles to leverage the mineral fraction as secondary materials as opposed to disposing them to landfill? Where we have WtE plants in place, what can we do to improve mineral and metal recovery from bottom ash to recycle as much of valuable materials as possible?

A: Material recovery has a significant role to play in the circular economy and the decarbonisation by providing secondary raw materials and chemicals.

The recovery of metals from plants is currently recognised as recycling at EU level, and constitutes an additional source of revenue. However, the utilisation rate of materials from IBA differs significantly among Member States as there is no harmonisation at EU level. It appears that the utilisation rate is rather a result of political commitment for IBA recycling.

While almost all metals in IBA are effectively recovered and recycled, the utilisation of minerals highly depends on the country or region. This means that there is an opportunity to significantly increase, and improve, the recovery yield of minerals and their use in construction materials, aggregates, etc., instead of being disposed off in landfills.

Various treatment methods of fly ash exist and can be further deployed. These include neutral and acidic washing, thermal treatment, pyrolysis processes, hydrothermal treatment, solidification/ stabilisation (S/S) method, and leaching processes. Some of these processes enable the recovery of valuable resources such as silicates. With washing processes, commercial salts (potassium chloride, sodium chloride, etc) are extracted from the fly ash and utilised in other industries.

You can find more information here: https://eswet.eu/giving-ash-a-new-life-waste-to-energy-and-material-recovery/

Q: Are any communities moving forward with BECCS (i.e.: blending of biomass fuels carbon capture and sequestration) initiatives?

A: Bioenergy with Carbon Capture and Storage (BECCS) involves the utilisation of biomass as an energy source and the capture and permanent storage of the CO_2 produced. The Intergovernmental Panel on Climate Change acknowledges that Carbon Dioxide Removal, including BECCS, is necessary to limit warming to 1.5°C. While BECCS has primarily been associated with biomass power generation, it is applied in Waste-to-Energy processes as well, as they treat partly biogenic waste, producing partly bioenergy. Therefore, incorporating BECCS in WtE processes has the potential to achieve carbon neutrality or even negative emissions, contributing to climate change mitigation efforts.

In Europe, BECCS is applied in the Hengelo WtE plant (The Netherlands), operated by Twence, and the Duiven WtE Plant (The Netherlands), operated by AVR. Those plants already capture part of their emissions. Other plants are still in development, including the Klemetsrud in Oslo (Norway), which is part of the large-scale Longship project supported by the Norwegian government, and the Amager Resource Center in Copenhagen (Denmark). There are also several other projects that are more oriented towards carbon utilisation, including in Belgium, in Portugal, and in Finland.

You can find more information here: https://eswet.eu/documents/from-carbon-neutral-to-carbon-negative-ccus-on-the-path-to-ccus/

Q: Plastic recycling policy appears to avoid the reality that most types of plastic waste (other than packaging waste) is not amenable to recycling efforts. It is no surprise that many countries, continue to dispose of such waste streams in landfills. Is the inertia of policymakers adding to the lack of discretion in assigning financial incentives for switching to more effective solutions?

A: The challenges surrounding plastic waste management and recycling can be very complex. Plastic packaging waste often receives more attention due to its visibility, its environmental impact, and its potential for recycling, while other plastic wastes that can be more challenging to handle effectively, is left with limited attention and support. Cases of inertia of policymakers in addressing these issues or of lack of discretion in assigning financial incentives for switching to more effective solutions can be a result of factors like lack of appropriate recycling facilities and processes to effectively recycle these types of plastic waste, or lack of economic viability for certain plastic wastes. Addressing these challenges requires a holistic waste management approach, whereby the entire lifecycle of plastic products is considered, and alternative waste management options, such as advanced waste-to-energy technologies and reduction of plastic consumption through product design and substitution are utilised and incentivised.

Comment from the audience: We must distinguish between plastics that easily can be recycled and plastic that cannot, the latter due to many reasons (toxic elements, additives, low quality, mixed qualities). Plastic is a complex issue! WtE with high energy utilization and, in the future with CCUS, should be a good alternative for these volumes of plastics (and similar other waste streams), for many years to come. But of course, after waste reduction!

Q: How does the WtE plant in Vienna relate to the communities? Beyond the technical contribution in waste management, what is the vision for this type of facility and how do you get communities to understand the importance of these facilities?

A: The WtE plant in Vienna, beyond its technical contribution to waste management, is designed to serve the vision for a sustainable and livable city. It aims to support the circular economy by maximising the recovery of resources (material and energy) from waste and minimising environmental impacts. The plant seeks to constantly demonstrate its positive contribution to the community's well-being and environmental sustainability, by highlighting its environmental achievements and organising various initiatives to raise awareness about waste management and the role of the facility in the city. It also offers job opportunities and training, and it collaborates closely with local stakeholders, engaging with the local communities and addressing concerns while providing updates on the plant's performance. Overall, the WtE plant in Vienna as a successful case of WtE in the city, aims to create a shared understanding of its importance and the role it plays in sustainable waste management in a city landscape.

Q: What avenues exist to bring forward innovative WtE solutions in a timely manner, that are not considered in current policy directions? The climate change crisis should allow for more efficient access for such solutions, but it seems as if local officials refer to European Policy restrictions for such innovative solutions, including non-incineration WtE technologies.

A: Non-incineration WtE technologies are normally referring to pyrolysis and gasification. The main role of WtE as in incineration is to take care from a hygienisation and recovery point of view of residual mixed municipal waste, meaning the fraction of all the waste that is non-recyclable. There have been several trials in the past to treat residual mixed municipal waste through pyrolysis or gasification. Until now, none of these technologies have been able to grow to industrial scale for this waste stream. For a pure waste stream (e.g., waste wood, non-recyclable homogenous manufacturing waste, etc.), pyrolysis and gasification did in turn show to function on industrial scale. It is therefore important to always improve and modernise WtE technologies, but at the same time it is important to recognise the potential for energy and material recovery from residual mixed waste.

By realising the full potential of the waste management hierarchy, we can combine waste minimisation, recycling, composting, anaerobic digestion, advanced biological treatment, Waste-to-Energy, and emerging technologies, and achieve a more sustainable waste management approach that supports district heating systems and contributes to a circular and low-carbon economy.

Follow-up Q: Landfills are to be avoided but incineration pollutes as well. Zero emission waste-to-energy solutions exist and can also feed district heating systems but are barely used due to vested interests, including vested interests of local communities (investments to be recuperated, profits, contracts awarded for long periods after public procurement etc.). How can we break the chain?

We are not familiar with zero emission WtE solution on industrial scale, therefore we cannot provide insights on the motives of those who oppose such solutions. However, we can offer our perspective on this matter in the following manner:

Waste incineration with energy recovery is a proven and technologically mature process and has been widely implemented for many years in various regions, demonstrating its effectiveness in waste management and energy generation. Incineration facilities can produce a steady and reliable supply of electricity and heat, which can be utilised for local energy needs or integrated into district heating systems. This contributes to energy security and supports the transition to a more sustainable energy mix. Waste incineration is also covered by stringent regulations and emissions standards in Europe, ensuring that the environmental impact is carefully managed and monitored. Last but not least, it is already carbon neutral when considering the avoided emissions from landfill diversion, material and energy recovery, and when coupled with CCUS, and has the potential to become carbon negative.

Choosing between the available options should be based on careful evaluation of local conditions, waste composition, environmental targets, and economic deliberations. It is crucial to conduct in-depth feasibility studies and assess the fitness of each technology to determine the most appropriate waste management solution for a specific region or community. The policy framework should foster such approach and not hinder it.

Q: What about the smell from waste in WtE plants? How can it be avoided to not create discomfort both for the workers and the citizens who are living in the area?

The odour in WtE plants normally comes from the delivered waste to the plant. Modern, state-of-the-art WtE plants employ advanced technologies and operational practices to minimise those odors from the waste handling activities. Among others, they use advanced emission control technologies, such as scrubbers, fabric filters, and activated carbon systems, to capture, treat, and remove odorous gases and pollutants, thus preventing them from spreading around the plant. Regular maintenance and monitoring of equipment and procedures is also essential. By complying with stringent regulatory requirements and applying best practices, WtE plants effectively control and mitigate odors, creating a more comfortable and sustainable environment for workers and nearby residents.

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For any further information, please contact:

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www.eswet.eu/waste-to-energy-the-city-generating-value-for-communities