ESWET Activity Report 2023–2025

Achievements and Outlook

About this report

This activity report was prepared by the ESWET Secretariat. It provides an overview of the association's main actions and achievements from 2023 to 2025.

Acknowledgments

The ESWET Secretariat warmly thanks its members for their contributions, including the images which illustrate Waste-to-Energy plants operating across Europe.

Disclaimer

The content of this report reflects the views of ESWET as an association. It does not necessarily represent the positions of individual members.

Written by the ESWET Secretariat, Brussels, December 2025
Cover Photo 1:WtE plant in Brescia, Italy. Courtesy: Martin GmbH

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ESWET MISSION AND VALUES

ESWET is the European association representing manufacturers in the field of Waste-to-Energy.

Founded in 2008, the association raises awareness of the benefits of Waste-to-Energy, such as sustainable waste management, clean and reliable energy, and environmental protection. In addition, ESWET promotes the development and dissemination of Waste-to-Energy technologies at the European level.

Technology provided by ESWET members lies at the core of most Waste-to-Energy plants in Europe and around the world. It enables the recovery of energy and materials from non-recyclable waste that would otherwise be consigned to landfill.

ESWET members contribute to the evolution of waste management infrastructure and the pursuit of more sustainable waste treatment methods, helping to shape a greener future.

ESWET is committed to advancing and promoting Waste-to-Energy's benefits, including:

1. **Safe treatment of non-recyclable waste, in accordance with the waste hierarchy**
2. **Minimising residual waste's environmental impact**
3. **Contributing to resource efficiency and the circular economy**

ESWET values

1. **Commitment to the sustainable waste management chain and EU environmental goals**
2. **Quality in providing accurate and reliable data on Waste-to-Energy**
3. **Reliability and transparency through credible and constructive engagement in EU decision-making**

02
FOREWORDS

Quo vadis Waste-to-Energy (WtE)?

It is striking to reflect on how much has changed in Europe and around the world since our last activity report. Our hope was that economic conditions would return to normal and, more importantly, that disruptive developments, such as the war in Ukraine, would come to an end.

By Dr. Siegfried Scholz

President of ESWET

Reality, however, has defied wishful thinking; these hopes have not materialised. Despite all efforts from the European Commission and the industry to harmonise waste treatment, recycling, and emission standards across the EU, practices remain fragmented. In some markets, capacities for Waste-to-Energy (WtE) are saturated and no significant new facilities are expected. In others, WtE infrastructure is yet to be developed.

In this multifaceted context, one fact is clear: countries with high recycling rates also demonstrate high utilisation of WtE (see the relevant chapter on waste statistics in this report).

To reduce GHG emissions (such as methane and carbon dioxide) and toxic emissions (such as PFAS and dioxins) from the waste management sector, it is essential to avoid the landfilling of biodegradable waste wherever this has not yet been achieved.

To put this into perspective: over a 20-year horizon, methane is a greenhouse gas about 82 times as potent as carbon dioxide, as reported by the Intergovernmental Panel on Climate Change (IPCC), 6th Assessment Report. Considering that 20% of anthropogenic methane emissions stem from landfill operations, and that methane and CO_2 are nearly on par in terms of climate impact, landfills alone account for approximately 10% of man-made climate change.

Treating biodegradable waste responsibly, therefore, demands immediate action. Some waste can be processed through

composting or anaerobic digestion plants, while the remainder should be treated in WtE plants.

Yet these facts are still overlooked in some circles. WtE remains unrecognised under the EU Taxonomy, often for purely ideological reasons. This must change, not only for Europe but also because such positions cast doubt in regions outside the EU where WtE is crucial to overcoming public health challenges and energy shortages.

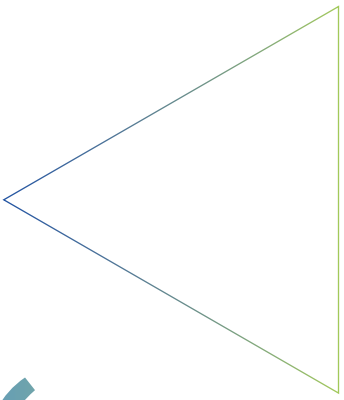
Meanwhile, the EU Emissions Trading System, looms on the horizon. A carbon tax could be introduced across the EU from 2028. To prevent more biogenic waste from being landfilled, equivalent incentives must be applied, creating a level playing field and ensuring that emissions are assessed and monitored according to the same quality criteria as WtE.

Another aspect to consider is the requirement for operators to comply with the revised Industrial Emissions Directive (IED). While the Best Available Techniques (BAT) conclusions for Waste Incineration (WI) are still being developed, competent authorities have already begun applying the most stringent emission limits. While cross-media effects are to be considered and local adjustments allowed, we hope common sense will prevail, ensuring the requirements remain practicable for operators and contractors. A plant forced to shut down for temporarily exceeding negligible emission thresholds would treat less waste, and ironically, could cause more harm to the environment.

So how can we, as ESWET members, contribute to a cleaner planet?

There is no doubt that WtE can evolve into Integrated Resource-Recovery Facilities or Waste-to-X (WtX) to further benefit the climate. What would this entail? For a start, WtX plants, properly located and financially supported, can capture up to 90% of their CO_2 emissions, resulting in a net-negative carbon footprint due to the biogenic fraction of the waste.

Additionally, bottom ash and fly ash treatment must be rethought to feed all fractions back into the circular economy. Many WtE plants already supply heat to industrial or municipal users, but large absorption heat



There is no doubt that WtE can evolve into Integrated Resource-Recovery Facilities or Waste-to-X (WtX) to further benefit the climate.

pumps must be integrated to boost efficiency and support carbon capture's energy demands.

Further WtX innovations include the production of sustainable fuels such as hydrogen, methane, ammonia, or methanol.

In short, there is plenty of work ahead for ESWET members' engineers to develop and market innovative solutions. At ESWET, we are committed to supporting both policymakers and members to establish and maintain the right regulatory framework.

Over time, facts will triumph over misconceptions about WtE. Once grounded in evidence rather than ideology, thermal waste treatment - whether WtE or WtX - will continue to play a vital role in future waste management, energy, and material recovery systems.

Finally, I would like to express my sincere gratitude to all members supporting our efforts, to those who take responsibility in ESWET's working groups and Board, and to the ESWET Secretariat, which keeps everything running so smoothly.

Photo 02

WtE plant in Clermont-Ferrand, France. Courtesy: VINCI

Waste-to-Energy facilities helping Europe recover more materials

By Ulrich Martin

ESWET Vice-President

If you are enthusiastic about hidden gems and precious materials, Waste-to-Energy plants might just be your thing.

Modern Waste-to-Energy (WtE) plants generate a variety of recoverable materials at different stages of the treatment process. Non-recyclable waste entering WtE plants is a heterogeneous mixture of materials, including contaminated fractions that cannot be processed through recycling. During combustion, these waste streams undergo high-temperature treatment that stabilises the remaining residues – incineration bottom ash and fly ash – and prepares them for further recovery processes.

After combustion, the remaining residues contain recoverable minerals, metals and salts that can be separated and processed for reuse. Volatile substances, including heavy metals, are captured through the flue-gas cleaning system; they are then treated in a controlled manner to ensure safe handling and, where appropriate, recovery.

The recovery of secondary materials reduces the need for primary raw materials and supports the transition to a more circular economy. By enabling the safe treatment of non-recyclable waste and the recovery of valuable resources, WtE plants contribute to resource efficiency and help reduce the environmental footprint of material supply.

This is a call to unlock the full potential of our waste: old broken dishes could end up as fresh new paving tiles; rings accidentally thrown away could contribute to brand-new smartphones; soluble salts can be treated and reused in various industrial applications.
If this sounds exciting, please read on in this report to learn how WtE facilities contribute to a greener and more circular world.

In closing, I would like to thank all ESWET members for their great engagement and wonderful ideas towards more sustainable waste management.

Photo 03

WtE plant in Aalborg, Denmark.
Courtesy LAB

Carbon Capture and the future of Waste-to-Energy

Waste-to-Energy (WtE) facilities can make a significant contribution to the EU's climate targets. Through the integration of Carbon Capture, Utilisation and Storage (CCUS), WtE plants can capture and utilise or store the CO_2 emitted during combustion. Carbon capture can substantially reduce the net carbon emissions of these facilities. The storage of biogenic CO_2 results in net negative emissions, making WtE installations with Carbon Capture and Storage (CCS) effective carbon removal solutions.

By Ivan Christiaens

ESWET Vice-President

The first commercial-scale carbon capture facility in a European WtE plant began operations in recent years. Today, an increasing number of WtE operators are evaluating the technical and economic feasibility of CCUS; plans are already being announced to invest in CCUS installations with annual CO_2 capture capacities ranging from several tens of thousands of tonnes to up to one million tonnes. In fact, in Europe alone, experts from the Intergovernmental Panel on Climate Change (IPCC) estimate that integrating CCS with WtE facilities has the potential to capture about 60 to 70 million tonnes of carbon dioxide annually.

The legislative framework for the decarbonisation of the European WtE industry is developing rapidly. An important milestone will be the potential inclusion of the WtE sector in the EU Emissions Trading System (ETS), with a decision expected in 2026. Other legislative initiatives address the monitoring of CO_2 emissions, as well as the transport, utilisation and storage of CO_2.

ESWET is at the forefront of these developments. ESWET's CCUS Working Group assesses the main technical and regulatory challenges and opportunities to expand CCUS applications and to position the WtE sector as a driver for carbon capture in Europe. Additionally, the Working Group promotes the unique role of WtE with CCUS as one of the few large-scale, ready-to-deploy carbon removal solutions.

Alongside these efforts, we are pleased to see that several ESWET members are actively developing CCUS integration capabilities and working on energy-efficient WtE plant designs that either incorporate CO_2 capture or are carbon-capture ready.

Despite the clear potential of CCUS, we should not forget that the most effective way to reduce CO_2 emissions is to avoid producing waste in the first place. Once waste becomes non-recyclable, treating it in a WtE plant prevents the release of methane emissions generated in landfills. This remains the best quick win currently available for sustainable waste treatment.

WtE is increasingly recognised as a key component of the transition to a low-carbon economy, and ESWET is committed to supporting this transformation towards a carbon-neutral – or even carbon-negative – waste industry. Our members are working hard to make this vision a reality.

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Leading the way for Waste-to-Energy in Europe

The main platform within ESWET for gathering expert input from professionals in the Waste-to-Energy (WtE) sector is, without a doubt, the Technical Committee, which I have the honour and pride to lead. Through quarterly meetings, we have the opportunity to discuss upcoming regulations and European policies, helping to shape the future of the WtE sector.

By Désiré Bendahan

Chairman of ESWET's Technical Committee

The past three years (2023-2025) have been particularly active, presenting both unique challenges and opportunities for our industry, especially in light of significant developments in the EU's environmental, climate, and energy policy framework. Against this background, the Technical Committee has addressed several key issues:

Revision of the Industrial Emissions Directive (IED)

The 2024 revision of the IED introduced stricter requirements, including the enforcement of the most stringent achievable emission limits and binding environmental performance levels (BAT-AEPLs). These changes are designed to align with the EU's climate goals but pose challenges for WtE plants as they work to meet more rigorous monitoring and compliance standards.

Emissions Trading System (ETS) and CO_2 Accounting

As you know, there is ongoing discussion about including WtE within the EU ETS. A central issue has been evaluating the potential impact of this inclusion on our sector, particularly in relation to the Monitoring, Reporting, and Verification (MRV) of emissions. ESWET members have actively contributed technical solutions that are already applicable today. The inclusion of WtE in the ETS remains one of the most critical and yet undefined challenges facing the sector.

Waste Framework Directive (WFD) Revision

The Technical Committee, together with ESWET staff, continues to advocate for clear and balanced criteria that affirm WtE's role in the EU waste management hierarchy. Sorting and recycling activities are essential and must not be overlooked or bypassed. Separately collecting the bio-waste fraction is, in my view, a highly efficient way to produce energy whilst creating a by-product that can enrich soil. However, WtE will always be necessary for treating residual waste, and our ambition is to process only non-recyclable materials in WtE facilities.

PFAS (Per- and Polyfluoroalkyl Substances) and Waste Management

PFAS has received considerable media attention lately. The word PFAS refers to a group of synthetic substances now recognised as harmful and widespread. Regulatory focus on PFAS in waste streams is increasing. As these substances are found in many products, it is difficult to isolate their origin to a single industrial activity, making control at the waste stream level essential. Although we have identified 256 PFAS substances, estimates suggest there could be between 4,000 and 14,000. University studies have shown that WtE is an effective method of mitigating the risks posed by these "forever chemicals", as high-temperature combustion destroys over 99% of PFAS compounds.

Renewable Energy Directive (RED) and Waste Heat Utilisation

The 2023 revision of the RED confirmed the role of WtE in Europe's renewable energy landscape. The Directive maintains the classification of WtE's biogenic fraction as renewable, while introducing stricter sustainability criteria for biofuels produced from waste. This update is crucial in recognising WtE's contribution to the EU's renewable energy targets. We are also actively discussing the classification of recovered heat from WtE as "waste heat" to facilitate better integration into district heating systems.

As this overview demonstrates, the future challenges for the WtE sector are considerable and complex. We aim to remain proactive, not only by observing the evolution of EU environmental policy, but also by actively shaping it.

The ESWET Technical Committee remains an effective and productive platform for discussing these developments and ensuring that WtE remains central to both waste management and climate strategies.

I would like to sincerely thank all Committee members for their time, dedication, and the valuable insights they have shared. Special thanks also go to the ESWET Secretariat and its representatives for their outstanding work and unwavering commitment throughout the year.

Lastly, I would like to express my gratitude to all external stakeholders for their contributions and support in helping us navigate this complex regulatory landscape.

Bridging the gap between public perception and Waste-to-Energy

By Ole Hedegaard Madsen

Chairman of ESWET's Public Relations Committee

The past two years have been marked by significant progress, innovation and, unfortunately, persistent misconceptions that continue to cloud the public's understanding of the critical role Waste-to-Energy (WtE) plays in our waste management systems.

As Chairman of ESWET's Public Relations Committee, I believe it is imperative to address these misunderstandings head-on. We need to clarify the facts and highlight the immense value that WtE brings to both energy production and environmental sustainability.

One of the most pressing issues for our sector is the spread of misinformation about WtE plants. Contrary to the false narratives often circulated, WtE is not only one of the most heavily regulated sectors, but also operates under some of the highest environmental and safety standards in the world. From stringent emissions controls to continuous monitoring and reporting, the WtE industry adheres to rigorous protocols that ensure we minimise environmental impact while maximising energy recovery. These standards are designed not only to protect public health, but also to align with global sustainability goals.

Another misconception is the idea that WtE competes with recycling, rather than serving as a crucial component of the waste management hierarchy. It is important to understand that WtE is not in opposition to recycling; in fact, it complements it. While recycling is essential for diverting valuable materials from landfill, the process itself generates residual waste that cannot be recycled. This is where WtE steps in, providing a solution for these non-recyclable materials, preventing them from ending up in landfills and contributing to greenhouse gas emissions. WtE plays a critical role in managing this output, ensuring that waste is converted into energy rather than contributing to environmental degradation.

Moreover, WtE is far more than just a method of energy production. It also contributes to material recycling by recovering metals and other valuable materials that can be reused in various industries. Additionally, WtE serves as a foundation for carbon capture technologies, which are increasingly recognised as vital in our collective efforts to combat climate change. By combining WtE with carbon capture, we have a powerful solution for future waste management that not only reduces waste, but also captures and stores carbon emissions, contributing to a more sustainable and circular economy.

Despite these clear benefits, gaining political support for WtE remains a significant challenge. Misinformation and the complexity of the waste management system often lead to hesitation among policymakers. It is our responsibility to continue advocating for WtE, providing clear, factual information, and demonstrating how it fits within broader environmental and energy strategies. By educating the public and our leaders, we can help shift the narrative and secure the necessary support to expand and enhance WtE facilities.In closing, I want to reiterate the essential role WtE plays in our waste management systems. It is not a competitor to recycling, but a partner in a holistic approach to waste. It is not merely a means of energy production, but a multifaceted solution that also addresses material recovery and carbon emissions. As we move forward, let us work together to combat misinformation, promote understanding, and advocate for the continued development of WtE as a cornerstone of sustainable waste management.

By educating the public and our leaders, we can help shift the narrative and secure the necessary support to expand and enhance WtE facilities.

Waste-to-Energy and CCUS as a solution

By Dr. Tom Croymans

Chairman of ESWET's Carbon Capture, Utilisation and Storage (CCUS) Working Group *

At the current rate of greenhouse gas (GHG) emissions, the carbon budget for limiting global warming to 1.5°C will be exhausted within a decade, while the 2°C threshold will be reached in two decades. This urgency underscores the need for immediate action in both reducing and removing CO_2 emissions. Europe is at the forefront of achieving net zero and beyond, not only within its own borders but also by exporting its legislation and expertise to support others in following its lead.

As a standalone solution, Waste-to-Energy (WtE) contributes to carbon reduction. However, when combined with Carbon Capture, Utilisation, and Storage (CCUS), WtE becomes a technology for carbon recycling or removal. This transformation solidifies WtE with CCUS as an essential part of the solution, enabling Europe to meet its ambitious climate targets.

Regulations are shaping a new reality, one where CO_2 has a price, can be transported across Europe, transformed into fuels or products, or stored permanently. Many sectors have been incentivised to decarbonise through regulatory frameworks. As a hard-to-abate sector that cannot switch fuels, WtE has largely been exempt from these changes, but this is set to change.

Although the full regulatory framework is not yet in place, the direction is clear. The introduction of Monitoring, Reporting, and Verification (MRV) for WtE operators in 2024, the upcoming impact assessment on WtE inclusion in the EU Emissions Trading System (ETS), and the EU's Industrial Carbon Management Strategy all signal a changing landscape.

To make the Green Deal happen, regulators rely on industry, and the industry, in turn, depends on regulators to ensure a feasible transition.

While the deployment of CCUS across the legislative landscape is progressing rapidly, challenges remain. For WtE with CCUS to be viable, policymakers must address the following key considerations:

* Since January 2025, Tom Croymans has transitioned to a new professional role outside ESWET. Dr. Kai Lieball is now the Chairman of ESWET's CCUS Working Group, with Alain Bill of Andritz and Vincent Grossjean of Paprec serving as Vice-Chairs.

01

Preserving the waste management chain:

The inclusion of WtE in the ETS must be handled carefully to avoid unintended consequences, such as making landfilling more economically attractive or increasing illegal waste exports.

02

Impact on WtE's business model:

The ETS puts a price on each tonne of fossil CO_2 emitted, thereby increasing the cost of waste treatment. While the ETS creates a market for carbon capture, its variable nature introduces financial uncertainty for long-term investments.

03

Financial realities of voluntary carbon markets (VCMs):

Unlike the ETS, voluntary carbon markets provide stable, long-term contracts for negative emissions, covering the costs of CCUS. Private sector investment in these credits often outweighs the ETS, driving structured methodologies to ensure effective decarbonisation.

04

Fossil CO_2 and carbon recycling:

The mixed fossil and biogenic nature of WtE's CO_2 emissions complicates its role in renewable fuel production. Regulatory uncertainty beyond 2036 or 2041 hampers investment decisions, as long-term infrastructure requires stability.

05

Coordinating infrastructure rollout:

CCUS relies on an interconnected system of capture, transport, storage, and utilisation. A missing component at any stage disrupts the entire process.

For years, WtE was misperceived as a polluter, but in reality, it is part of the solution. ESWET has observed a notable shift in perception, with WtE increasingly recognised as essential to achieving climate targets.

WtE with CCUS is one of the most accessible solutions for generating negative emissions and recycling CO_2 back into the economy. According to the Intergovernmental Panel on Climate Change (IPCC), integrating CCS with WtE in Europe could capture approximately 60 to 70 million tonnes of CO_2 annually. This potential is materialising, with numerous projects underway capturing hundreds of thousands of tonnes of CO_2

Policymakers increasingly acknowledge WtE as a key player in achieving net zero and beyond. ESWET is committed to ensuring that WtE's role in decarbonisation is viable and well-supported.

The ESWET CCUS Working Group remains focused on collaborating with stakeholders to advance WtE's integration into the climate agenda. This is achieved through:

- **Monitoring and shaping EU policy developments:** Engaging in discussions on MRV, EU-ETS, the Carbon Removal Certification Framework (CRCF), the Net-Zero Industry Act (NZIA), and more.
- **Contributing to regulatory development:** Participating in consultations, such as the impact assessment on WtE inclusion in the UK ETS.
- **Engaging with CCUS stakeholders:** Collaborating with the European Commission, industry associations, research institutions, and CCUS project developers.
- **Advocating for WtE with CCUS:** Promoting the sector's role in conferences and public forums.

While WtE with CCUS provides a final-resort solution for society's waste and CO_2 challenges, the ultimate answer lies elsewhere. The best way to reduce CO_2 is to prevent its production through sustainable manufacturing and consumption practices. Achieving the Green Deal requires participation from all stakeholders. As WtE technology providers, we are preparing for a future where CO_2 capture becomes the norm. WtE with CCUS will play a critical role in addressing both waste and emissions, ensuring cleaner air, a healthier environment, and a more sustainable future. However, it is essential to remember that true progress starts with reducing waste generation at its source.

Driving circular innovation: the strategic role of Waste-to-Hydrogen and Waste-to-Fuel

By Dr. Kai Lieball

Chairman of ESWET's Waste-to-Hydrogen Working Group*

The past two years have marked a defining period for the Waste-to-Hydrogen (WtH) and Waste-to-Fuel (WtF) Working Group. As the EU sharpened its focus on decarbonisation and industrial transformation, our group worked at the intersection of climate ambition, clean energy policy, and waste valorisation.

We examined in-depth the opportunities for Waste-to-Energy (WtE) to serve as a reliable provider of renewable and low-carbon hydrogen, and as a crucial enabler of synthetic fuel production through captured CO_2. Our efforts focused on navigating a complex and rapidly evolving regulatory landscape, most notably the Renewable Energy Directive (RED III) implementation, the Renewable Fuels of Non-Biological Origin (RFNBO) and low-carbon fuels Delegated Acts, and the EU Taxonomy.

Through technical exchanges, policy input, and dialogue with EU institutions, we sought to clarify the role of WtE in this new value chain. We helped to highlight the dual environmental and energy contribution of WtH and WtF solutions, particularly in decarbonising hard-to-abate sectors like aviation, maritime transport, and industry.

ESWET remains committed to supporting a policy environment that enables innovation, values circularity, and recognises the full decarbonisation potential of WtE-based hydrogen and fuels.

*Since February 2025, the WtH Working Group has been integrated into the CCUS Working Group.

Material Recovery from WtE: maximising the value of incineration residues

By Dr. Johan Heiszwolf

Chairman of ESWET's Material Recovery Working Group

As Chairman of the Material Recovery Working Group at ESWET, I believe it is paramount to highlight the crucial role that material recovery from Waste-to-Energy (WtE) plays in supporting Europe's circular economy and ensuring access to secondary raw materials.

ESWET's Material Recovery Working Group is dedicated to advancing the recovery of valuable materials from incineration residues, with a particular focus on incineration bottom ash (IBA) and, where feasible, fly ash.

Incineration bottom ash, which results from the thermal treatment of non-recyclable waste, contains significant quantities of recoverable metals and useful mineral fractions. Through well-established treatment technologies, ferrous and non-ferrous metals can be effectively extracted from the IBA and returned to industrial value chains. Meanwhile, the remaining mineral components, once processed, serve as sustainable substitutes for natural aggregates in construction. Today, the processing of ash residues is practiced in nearly all European countries with a variety of technologies and at different levels. In addition, academic institutions continue developing new and improved processing routes to maximise valuable material recovery from the residue streams.

The Material Recovery Working Group serves as an information exchange platform for ESWET members and key experts in the field of material recovery. The Group's meetings have been enriched by contributions from guest speakers from the academic and industrial sectors, who have shared the latest innovations in material recovery as applied to WtE.

Contributions from guest speakers IEM FörderTechnikGmbH, HaloSep AB, HeidemannRecycling GmbH, Fraunhofer Institute for Building Physics, ODA Officina dell'Ambiente, have led to lively discussions during the Working Group's meetings.

Recognising the value of ash residues is not merely a technical matter; it is a strategic imperative. At a time of growing pressure on natural resources and increasing demand for critical raw materials, WtE has a key role to play beyond energy generation. By recovering materials from residues that would otherwise be landfilled, WtE contributes to resource security, supporting Europe's climate and industrial objectives.

ESWET's Material Recovery Working Group continues to call for regulatory recognition of incineration residues as a source of secondary raw materials. Clear and harmonised end-of-waste criteria, investment in innovation, and support for high-quality treatment processes are essential to fully unlock secondary raw materials' value. Material Recovery Working Group's participants firmly believe that material recovery from WtE is not only compatible with Europe's circular economy goals - it is essential to achieving them.

Clear and harmonised end-of-waste criteria, investment in innovation, and support for high-quality treatment processes are essential to fully unlock secondary raw materials' value.

Optimising heat utilisation in Waste-to-Energy plants

By Jens Kitzhofer

Chairman of ESWET's Heat Task Force Working Group

At the end of 2023, ESWET launched the Heat Task Force to discuss energy efficiency and heat recovery in the Waste-to-Energy (WtE) sector. Initially formed with participants from 11 companies, the task force has rapidly grown to include 18 companies. The group meets twice a year.

The Heat Task Force's mission includes:

- **Identifying heat applications to increase the energy efficiency of WtE plants.** Flue gas cleaning systems usually require specific flue gas temperature ranges for effective treatment. The integration of heat exchangers (gas-gas reheaters or coolers) in these systems reduces the energy required for flue gas cleaning. The unused residual heat in the flue gas, which is typically released via the stack, has significant potential to be utilised in district heating and cooling systems, thereby improving the energy efficiency of WtE plants;

- **Reviewing the EU legal framework on heat recovery, waste heat, and cogeneration** to ensure WtE plants are recognised as partly waste heat and partly renewable, in line with the Renewable Energy Directive (RED III). According to the definition of waste heat in RED II, the unavoidable process is the thermal treatment of non-recyclable waste, which produces waste heat as a by-product, partly fossil and partly biogenic. The biogenic fraction is already recognised as renewable, while the fossil fraction should be acknowledged as waste heat;

- **Identifying obstacles and opportunities in heat recovery,** and assessing the associated costs, investments, and available subsidies. Currently, once deep cooling of flue gas begins to maximise energy recovery, the associated equipment often encounters serious issues such as acid condensation and corrosion.

However, the latest technological developments and ongoing research show promising solutions to address these challenges;

- **Assessing the technical requirements for cost- and energy-efficient cogeneration, district heating, and cooling systems.** Deep cooling of the flue gas below the water dew point enables the recovery of a substantial amount of latent heat released during water condensation. A promising cooling method uses water from district heating systems. Depending on the return temperature of the district heating water and the flue gas water dew point, a heat exchanger (direct or indirect), or a combination of a heat pump and heat exchanger, can be applied;

- **Investigating the integration of the latest technologies,** such as carbon capture and thermal energy storage systems in WtE plants, with respect to energy efficiency and heat recovery. One notable synergy involves combining heat recovery from flue gas treatment systems with carbon capture technologies. Integrating carbon capture not only mitigates greenhouse gas emissions but also enhances the overall environmental performance of WtE facilities. Additionally, the recovered heat can be strategically used in thermal energy storage systems and/or for district heating, addressing the intermittency of renewable energy sources and balancing seasonal heat demand by providing a reliable, continuous supply. Other examples include heat recovery from Waste-to-Hydrogen and Waste-to-Fuel processes;

- **Promoting the WtE sector as a vital component of energy generation (electricity and heat),** while underlining its role as an essential link in the circular economy.

> **Recovered heat can be strategically used in thermal energy storage systems and/or for district heating**

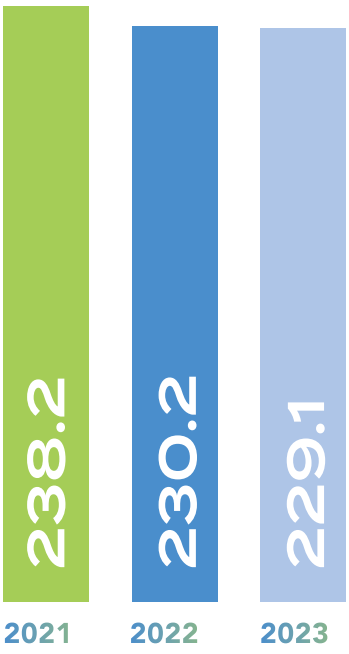
03

EU MUNICIPAL WASTE MANAGEMENT STATISTICS

Municipal waste treatment in the European Union continues to evolve in line with circular economy principles, though progress varies significantly among Member States. Data from 2022 and 2023 (published by Eurostat in 2024 and 2025 respectively) highlight both positive trends and persistent challenges in waste reduction and treatment diversification.

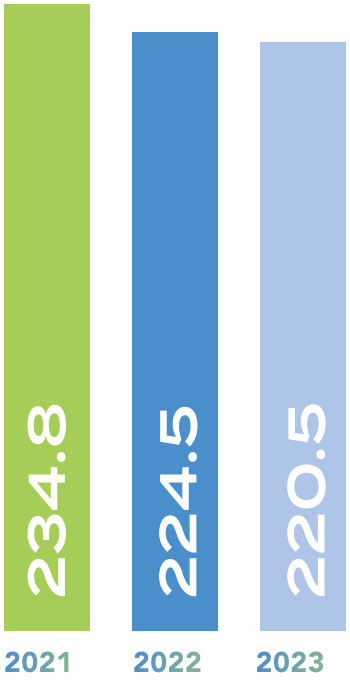
Declining waste generation and treatment volumes

Municipal waste generation in the EU has decreased for the third consecutive year:



Muncipal Waste Generation in the EU (million tonnes)

While this downward trend may suggest gradual success in waste prevention measures, consumer behaviour change, and resource efficiency strategies, it is also followed by a decrease in total municipal waste treated:



Muncipal Waste Treated (million tonnes)

The narrowing gap between waste generated and treated indicates a more responsive system, with fewer backlogs and more synchronised collection and processing.

Overview of waste volumes per waste treatment

According to the latest figures:

- **Recycling** accounted for **113,100 thousand tonnes in 2022**, falling to **110,000 thousand tonnes in 2023;**
- **Waste-to-Energy (WtE)** treatment also fell, from **57,334 thousand tonnes to 56,772 thousand tonnes;**
- **Landfilling saw a reduction, dropping from 52,445 thousand tonnes in 2022 to 51,380 thousand tonnes in 2023, a positive development in line with EU waste hierarchy goals.**

Photo 04

WtE plant in Oslo, Norway. Courtesy: Kanadevia Inova

Long-Term Trends

Over nearly three decades, the EU has made dramatic progress in transforming its waste treatment model:

- **Landfilling** dropped from over 60% of municipal waste in 1995 to just above 20% in 2023;
- **Recycling** rose from below 20% to over 50%, driven by policy mandates and growing public participation;
- **Waste-to-Energy** increased steadily, stabilising around 25% in recent years.

Municipal waste treatment, EU, 1995–2023

(in %)

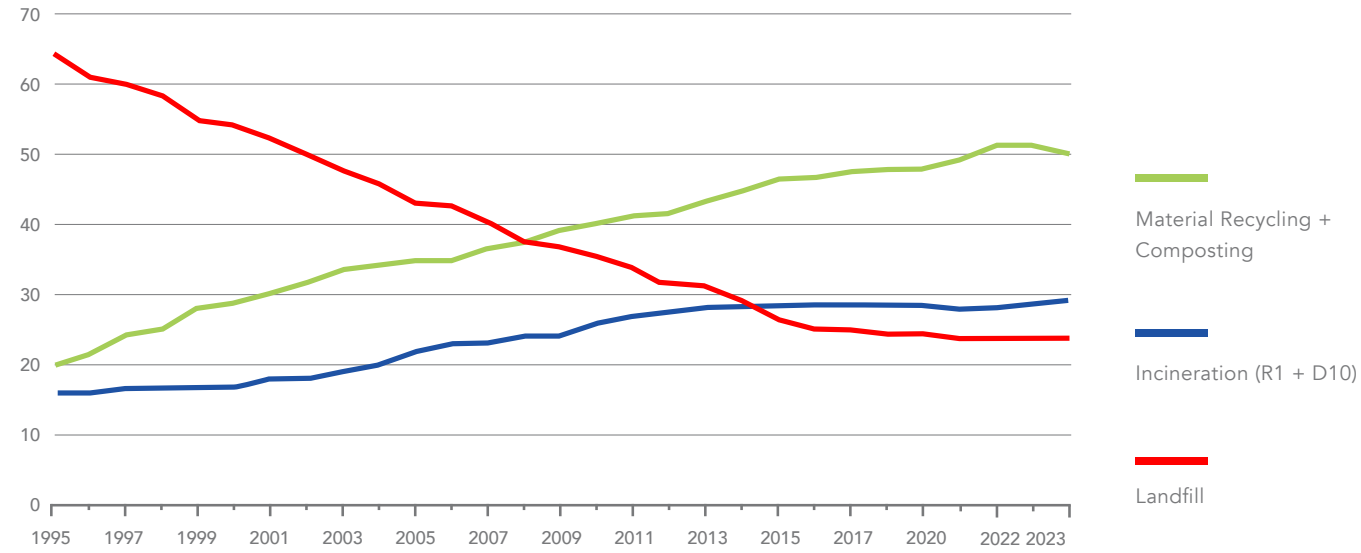


Figure 01: Trends in Municipal Waste Treatment in the EU (1995–2023). Source: ESWET, with data from Eurostat.

Figure 1 above illustrates the long-term shift in municipal waste management across the EU, underscoring the effectiveness of EU waste directives and national implementation efforts. It also shows the success of coordinated policy tools, including landfill taxes, recycling targets, and support for WtE infrastructure, which together have driven down landfill rates. Importantly, the trends prove that Waste-to-Energy functions as a complementary pillar to recycling in the transition away from disposal. Essentially, WtE ensures safe and efficient treatment of residual, non-recyclable waste that would otherwise end up in landfills.

Recycling: stable but stalling

In 2023, the EU recycled 110.5 million tonnes of municipal waste, accounting for 50.1% of all waste treated. While this reflects a high level of material recovery, it also marks a slight decline from the 50.6% peak in 2021. After years of steady gains, recycling rates appear to be plateauing, pointing to structural and behavioural limits in current systems.
To advance beyond this plateau, Member States will need to address sorting quality, improve extended producer responsibility schemes, and foster robust end-markets for secondary materials.

Waste-to-Energy: a necessary role in sustainable waste management

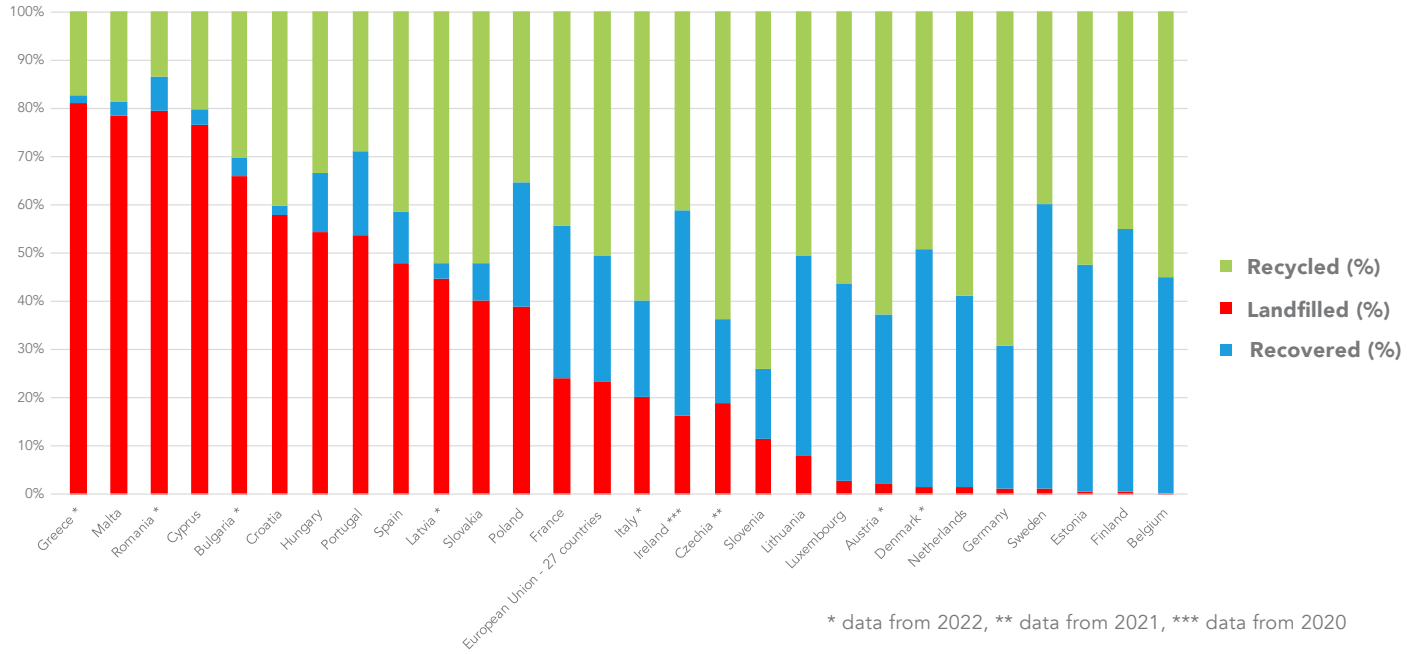
Waste-to-Energy remains a vital outlet for non-recyclable waste. In 2023, 56.8 million tonnes — about 25.8% of treated municipal waste — were processed via WtE.

WtE complements recycling by handling residual waste that cannot be economically or technically recycled. Countries like Sweden, Denmark, and the Netherlands exemplify how high recycling rates can coexist with effective WtE use. Their models show that WtE is most effective when integrated into a system focused on waste prevention and resource recovery.

Landfilling in retreat — but not for all

Landfilling has continued its long-term decline across the EU, but recent progress has slowed. In 2022, EU Member States landfilled 52.4 million

Municipal waste treatment in the EU-27



* data from 2022, ** data from 2021, *** data from 2020

Figure 02: Municipal waste treatment in the EU-27. Source: ESWET, with data from Eurostat.

tonnes, or 23.3%. This marginal improvement suggests that while the overall trend remains positive, additional policy efforts are needed to accelerate landfill diversion — particularly in Member States where landfilling remains the predominant treatment method.

As seen in Figure 2 above, many EU Member States remain heavily reliant on this method.

Figure 2 shows stark disparities. Countries such as Romania, Bulgaria, Greece, and Malta continue to landfill more than half of their municipal waste, even going beyond that 80%.

This presents a critical challenge: under the Waste Framework Directive, Member States must reduce landfilling of municipal waste to no more than 10% by 2035. For high-landfill countries, achieving this target will require transformative change.

Addressing these challenges will demand EU support, both financial and technical, as well as strong national commitment to systemic reform.

Moving up the waste hierarchy

The EU's success in reducing landfill and promoting recycling over the years is clear, but future gains will require strategic shifts higher up the waste hierarchy, with among others:

Eco-design rules and Extended Producer Responsibility (EPR) schemes, mandatory "EU-made" recycled contents, preferential treatment for recycled materials, mandatory Green Public Procurement rules, and harmonised End-of-Waste Criteria — measures that can reduce waste at source and boost circular demand.

Meanwhile, WtE must be recognised as a necessary process in a sustainable waste management system — providing secure, environmentally controlled treatment for waste that cannot be otherwise recovered.

Photo 05

WtE plant in Olsztyn, Poland.
Photo by: Doosan Lentjes

> **WtE must be recognised as a necessary process in a sustainable waste management system — providing secure, environmentally controlled treatment for waste that cannot be otherwise recovered**

04
KEY TOPICS IN ESWET'S WORK

EU Emissions Trading System (EU ETS)

The European Union Emissions Trading System (EU ETS) has undergone a significant evolution since 2023, with the waste management sector and Waste-to-Energy (WtE) in particular, increasingly drawn into the centre of the carbon pricing debate. For ESWET and its members, the issue of ETS inclusion is the most strategically important file of the reporting period, affecting the sector's operational costs, investment signals, and decarbonisation roadmap for the next decades. Over the past two years (and well before that), ESWET has played a central role in monitoring, analysing, and responding to the ongoing legislative and political developments surrounding the potential inclusion of municipal WtE plants in the EU ETS by 2028.

Legislative milestones

The revised EU ETS Directive was adopted in May 2023 as part of the Fit for 55 package. While the Directive did not yet extend the ETS to municipal waste incineration, it mandated an impact assessment by July 2026 to evaluate the feasibility and implications of doing so. This assessment is to explore environmental benefits, risks of market distortions, landfill diversion, and waste exports, as well as consistency with the waste hierarchy. If deemed feasible, WtE could be included from 2028, with an opt-out clause available to Member States until 2030.

In parallel, the UK announced that WtE would be included in its own ETS from 2028, while in the EU, Monitoring, Reporting, and Verification (MRV) obligations for WtE plants started in 2024. These require facilities to submit annual CO_2 emissions reports to their national authorities, marking the first formal step in aligning the sector with ETS requirements. ESWET actively contributed to shaping the MRV rules for CO_2 emissions from WtE plants, and has strongly advocated for sector-specific flexibilities.

Throughout this period, ESWET has been highly active in engaging with EU policymakers and key institutional stakeholders through meetings, bilateral exchanges, workshops, and written input. ESWET also responded in detail to the UK government's impact assessment on including WtE in the UK ETS, offering sectoral insights and cautioning against unintended consequences of poorly designed carbon pricing frameworks.

Policy concerns: fairness, feasibility, and system integrity

ESWET's engagement throughout the ETS review and its follow-up centred on a key principle: any potential inclusion of WtE in the ETS must be fair, proportionate, and designed to deliver real environmental benefit without undermining the waste hierarchy or public service obligations for residual waste management.

A central concern has been the misapplication of the Polluter Pays Principle (PPP). WtE operators do not produce waste; they treat it under legal obligation. Penalising them under ETS rules for emissions they cannot control - particularly the fossil CO_2 content of plastic waste - shifts the cost away from upstream producers and weakens accountability.

Moreover, WtE cannot switch fuels or decarbonise through fuel substitution. Its carbon footprint is determined by the composition of residual waste, which is largely outside the operator's control. Thus, inclusion in the ETS without addressing plastic generation and design upstream risks making WtE financially unsustainable, while failing to reduce overall emissions.

Crucially, ESWET maintains that all waste management options must remain under the same legislative instrument to protect the integrity of the waste system. Splitting them between different frameworks (e.g., putting WtE in the ETS while keeping landfilling under the current EU Effort Sharing Regulation) creates distortions that encourage landfill use, increase methane emissions, undermine recycling, and risk illegal waste exports.

A central concern has been the misapplication of the Polluter Pays Principle (PPP).

Economic and environmental risks

Drawing on real-world examples, ESWET flagged the challenges faced by operators in Sweden and Denmark, where WtE was already included in national ETS schemes. These included:

- **Inability to pass on the cost of allowances to municipalities**
- **Sharp increases in gate fees and cost burdens**
- **Waste diversion to landfills or exports, undermining both ETS objectives and circular economy targets.**

ESWET warned that a poorly designed inclusion of WtE in the ETS could significantly increase operational costs for municipal waste management authorities. These costs - arising from the need to purchase emissions allowances - may lead to higher waste treatment fees for citizens, place financial strain on local budgets, and reduce municipalities' ability to invest in more sustainable waste management infrastructure. In the absence of targeted safeguards, these pressures could lead to unintended consequences, including the diversion of residual waste to landfills, which are generally cheaper and remain largely unregulated in terms of GHG pricing. This would undermine both the environmental objectives of the ETS and the waste hierarchy, which ranks landfill as the least preferred option.

Moreover, landfills carry their own significant environmental burdens, including methane emissions, a potent greenhouse gas, as well as long-term risks of soil and groundwater pollution due to leachate and subsurface instability. The climate and environmental trade-offs of such a shift would be substantial.

Further, the cost disparity created by the ETS could encourage the export of waste to jurisdictions with lower environmental standards, or worse, incentivise diversion into unregulated or illegal treatment routes. These practices not only risk serious environmental harm but also compromise public health and weaken the credibility of EU enforcement.

It is therefore essential that ETS implementation is accompanied

by robust safeguards and complementary policies to preserve the integrity of Europe's waste management system and uphold its climate and circularity goals. These risks are magnified by the absence of corresponding measures to curb plastic waste production or reward energy and material recovery.

A Role for carbon capture and removal

If WtE is to be included in the EU ETS, one of the few viable pathways lies in the sector's increasing engagement with Carbon Capture, Utilisation and Storage (CCUS). WtE facilities are increasingly being explored as prime candidates for Bioenergy with Carbon Capture and Storage (BECCS), which can deliver permanent carbon removals thanks to the high biogenic share of emissions.

As documented in ESWET's publications, EU-level policy instruments such as the EU Industrial Carbon Management Strategy and the Carbon Removal Certification Framework (CRCF) have begun to acknowledge this potential. However, inclusion of WtE in the ETS without pre-existing support for CCUS deployment would likely lock the sector into compliance costs, without the financial tools to decarbonise.

It is essential to underline that the inclusion of Waste-to-Energy in the EU ETS cannot be justified simply by the potential availability of CCUS. While CCUS may be a necessary component of decarbonisation for the WtE sector - particularly because WtE plants treat residual waste and cannot switch fuels - it is only one element in a broader set of preconditions that must be met before ETS coverage could be considered viable. Unlike other industrial sectors that can decarbonise through fuel substitution, WtE operators are structurally constrained by the nature of the waste they treat. If they are to be asked to reduce fossil CO_2 emissions, they must rely heavily on CCUS solutions. However, these technologies come with significant technical, spatial, logistical, and financial barriers, including the need for access to transport and storage infrastructure, long permitting timelines, and uncertain funding streams. Therefore, any ETS inclusion must be assessed in the context of real-world deployment feasibility, appropriate transition periods, and a regulatory framework that reflects the essential public service role that WtE plays in sustainable waste management.

In light of this background, ESWET has consistently called for:

- **Upfront financial support for CCUS, through mechanisms like the EU Innovation Fund and national contracts for difference, and**
- **Recognition of WtE + CCUS under the Taxonomy as a sustainable activity.**

Only with such provisions can the ETS function as a driver of innovation rather than a punitive mechanism.

Looking ahead: impact assessment and public debate

The Commission's impact assessment on WtE inclusion is now underway, with results due in 2026. Overall, the EU ETS is one of the Union's most powerful climate tools, but its extension to WtE is problematic for multiple reasons. ESWET's engagement over 2023-2025 has focused on advocating for a balanced approach that ensures environmental integrity while respecting the sector's role in public service and circular economy objectives.

Crucially, keeping all waste management options under a single legislative instrument is the only way to preserve the coherence of the system. Such an integrated approach is essential to avoid perverse incentives, ensure climate fairness, and protect the waste hierarchy from fragmentation.

As the regulatory debate unfolds, ESWET remains committed to shaping a policy framework that reflects the realities of WtE operations and supports the EU's broader climate ambition in a just and effective way.

Photo 06

WtE plant in Gdansk.
Copyright: Maciej Hekso

Industrial Emissions Directive and Waste Incineration BREF

The revision of the Industrial Emissions Directive (IED) and the ongoing implementation of the Waste Incineration Best Available Techniques Reference Document (WI BREF) remained key policy priorities for the Waste-to-Energy (WtE) sector throughout 2023 and 2024. As Europe's main legal framework for regulating pollution from large industrial activities, the IED defines the permitting conditions, environmental performance standards, and reporting obligations applicable to all WtE facilities.

In March 2024, the European Parliament adopted the revised Industrial Emissions Directive, ushering in a new regulatory phase aimed at enhancing environmental performance and fostering innovation across industrial sectors. ESWET welcomed the outcome, recognising both the opportunities and challenges presented by the updated provisions.

A central reform in the revised IED is the obligation for competent authorities to impose the strictest achievable emission limit values (ELVs)—moving beyond compliance with BAT-AELs alone, and instead requiring active pursuit of the lowest feasible emissions. The Directive also introduces binding ranges for environmental performance levels in areas such as water use, and indicative benchmarks for waste and resource efficiency.

While supporting the ambition of the revision, ESWET has emphasised the importance of:

- **Ensuring clarity of terminology,** particularly with regard to the distinction between binding and indicative performance levels in future BAT conclusions;
- **Preventing unintended cross-media effects,** where efforts to reduce air emissions could inadvertently increase energy consumption or reagent use—potentially creating tension between BAT-AELs and BAT-AEPLs;
- **Maintaining implementation fairness,** by ensuring that new requirements only apply after the adoption of updated BREFs, thus preserving predictability for operators.

WI BREF Implementation

The revised Waste Incineration BREF, adopted in late 2019, entered full implementation during the reporting period. ESWET continued to support its members in aligning with the new performance benchmarks and enhanced monitoring standards.

Through its Technical Committee meetings, ESWET fostered peer learning, shared good practices, and facilitated exchanges on the application of new sampling and monitoring techniques.

Addressing emerging pollutants and safeguarding technological neutrality

During the reporting period, growing attention was paid to emerging pollutants—particularly PFAS and microplastics—at both EU and national levels. ESWET underlined that:

- WtE already contributes to the destruction of persistent organic pollutants that cannot be safely recycled;
- Regulatory approaches must remain **technologically neutral,** avoiding unintended penalties for thermal treatment, which often provides a controlled and safe end-of-life option for hazardous and complex waste;
- Any future obligations concerning emerging pollutants must **be science-based and proportionate to risk,** especially where proven abatement technologies are not yet commercially viable.

Outlook

With the IED revision now adopted, attention is turning to implementation and the continued development of the WI BREF. In the coming period, ESWET will:

- Actively engage in the forthcoming revision of the WI BREF;
- Clarify the implications of new provisions on environmental performance levels and non-standard conditions for WtE;
- Support harmonised and proportionate application of the revised rules across Member States;
- Advocate for continued recognition of WtE as a technology that contributes to pollution prevention, the circular economy, and the EU's climate objectives.

As Europe advances its zero-pollution ambition, ESWET remains committed to supporting its members in the development and application of advanced WtE technologies that meet the highest environmental standards and contribute meaningfully to the green transition.

Renewable Energy Directive (RED)

The revision and implementation of the EU Renewable Energy Directive (RED III) in 2023–2025 has continued to shape Europe's trajectory towards increasing the share of renewables in the EU energy mix. For ESWET, the RED remains a critical framework, given its implications for Waste-to-Energy (WtE) technologies, particularly in securing recognition of their contribution to renewable energy generation and in supporting their role within a circular, decarbonised energy system.

Any topics relating to hydrogen and fuels are addressed in a dedicated chapter. Likewise, aspects specific to heat from WtE are elaborated in the relevant section of this report.

RED III and Waste-to-Energy

Adopted in 2023, RED III raised the EU's binding target for renewable energy to 42.5% by 2030, with an aspiration to reach 45%. These targets must be met through contributions from all sectors (power, heating and cooling, transport, and industry) necessitating clarity on how renewable energy is defined and measured across different technologies. ESWET has focused its efforts on ensuring that the renewable share of WtE – derived from the biogenic fraction of municipal solid waste – is fully recognised and supported within the Directive's framework.

Throughout 2023 and 2024, ESWET engaged with EU policymakers to clarify the classification of WtE-produced energy under RED III, particularly in relation to heating and cooling targets and the role of district heating. In EU Member States where WtE plants supply heat to urban networks, the biogenic contribution can represent a significant share of renewable supply. However, ESWET observed inconsistencies in how Member States reported or supported this renewable content, resulting in both regulatory and investment uncertainty.

District heating and the role of residual waste

WtE facilities play a key role in providing stable, local, and renewable heat to district heating systems. The share of energy produced from the biogenic fraction of residual waste – typically 50% or more – qualifies as renewable under RED. Consequently, WtE contributes significantly to national renewable energy targets, especially those related to heating and cooling.

On every appropriate occasion, ESWET has sought to raise awareness of this contribution with EU institutions and national authorities. However, challenges persist in ensuring that this renewable energy source is consistently recognised and properly accounted for in Member States' reporting and support schemes.

Despite WtE's role in enabling renewable heating, ESWET has highlighted difficulties in aligning EU and national policies, particularly when WtE is viewed narrowly as incineration rather than energy recovery. ESWET has called for a technology-neutral approach that values the renewable output and environmental performance of energy-producing facilities, regardless of feedstock origin, as long as operations are in line with the waste hierarchy and broader sustainability objectives.

Implementation challenges and opportunities

Several aspects of RED III implementation are particularly relevant for the WtE sector:

- **Accounting for renewable energy from mixed waste:** Accurately quantifying the biogenic share of energy from WtE is essential to determine eligibility under RED. ESWET has stressed the need for pragmatic methodologies that reflect operational realities;
- **Integration with energy system planning:** ESWET has emphasised the importance of integrating WtE into local and national energy strategies, particularly in decarbonising heating systems, where WtE can effectively replace fossil fuels in district heating networks;
- **Avoiding policy fragmentation:** ESWET has advocated for coherence between RED III and other EU legislation, including the EU Emissions Trading System (EU ETS), the Energy Efficiency Directive (EED), and the Taxonomy Regulation. A lack of alignment could undermine investment certainty and marginalise WtE's renewable energy contributions.

Promoting the role of WtE in the clean energy transition

Throughout 2023–2024, ESWET has consistently conveyed the message that WtE, when aligned with the waste hierarchy, meaningfully contributes to both waste management and clean energy goals. This dual role is particularly important as Member States work to scale up renewable energy while maintaining energy system reliability.

In meetings with policymakers and public consultations, ESWET has advocated for the recognition of residual waste as a valuable resource, one that provides renewable heat and power, prevents landfilling, and reduces reliance on fossil fuels. The organisation has also emphasised the potential for WtE plants to incorporate emerging technologies such as carbon capture, utilisation and storage (CCUS), which could transform them into net-negative emitters while maintaining renewable energy production.

Outlook

Looking ahead, the effective implementation of RED III will depend on clear, harmonised methodologies and national policies that recognise all forms of renewable contribution. ESWET will continue to:

- Advocate for transparent, science-based accounting of the biogenic content in WtE;
- Promote the role of WtE in national heating decarbonisation strategies, particularly through National Energy and Climate Plans (NECPs);
- Engage in RED-related delegated acts and secondary legislation to ensure the proper inclusion of WtE;
- Support Member States in correctly transposing RED III provisions related to waste-derived renewable energy.

As the EU advances towards its 2030 and 2050 climate targets, ESWET remains committed to ensuring that WtE is properly acknowledged for its renewable energy potential and is integrated into Europe's broader clean energy and circular economy strategies.

Photo 07

WtE plant in Brescia, Italy. Courtesy: Martin GmbH

Waste-to-Hydrogen and Waste-to-Fuels

Waste-to-Energy technologies can contribute to hydrogen and fuel production in two complementary ways:

- By providing renewable and low-carbon electricity for electrolysis;
- By supplying captured CO_2 as feedstock for synthetic fuels via Carbon Capture and Utilisation (CCU) pathways.

Several projects across Europe have explored or initiated pilot schemes in which municipal solid waste, through thermal treatment or gasification, provides energy for hydrogen production. Additionally, captured carbon – both biogenic and fossil – from WtE can be combined with renewable hydrogen to produce e-fuels such as methanol or e-kerosene. These fuels can support decarbonisation in hard-to-abate sectors, including transport and heavy industry.

As WtE energy is partially renewable, the hydrogen and fuels it helps produce can qualify accordingly, provided that the relevant sustainability and emissions-saving criteria under RED III and the applicable Delegated Acts are met.

In 2023, ESWET dedicated substantial efforts to analysing the Delegated Acts on Renewable Fuels of Non-Biological Origin (RFNBOs), a key element in the implementation of RED. These acts introduced complex eligibility conditions and sustainability thresholds, which risk hindering the development of hydrogen and fuels derived from waste sources.

ESWET worked closely with stakeholders – including policymakers, project developers, and other industry associations – to clarify how waste-derived hydrogen and fuels fit into the emerging regulatory framework. Particular focus was placed on:

- Securing visibility for Waste-to-Hydrogen and Waste-to-Fuels technologies within the renewable fuels agenda;
- Addressing methodological challenges related to life-cycle emissions, feedstock classification, and energy input accounting;
- Ensuring consistency between RED and Gas Directive provisions, as well as alignment with broader climate and circular economy objectives.

In 2024, ESWET submitted a detailed response to the European Commission's consultation on the proposed Delegated Act concerning greenhouse gas savings for low-carbon fuels. The draft legislation raised several concerns for the WtE sector, particularly in relation to:

- **Recognition of CCU from WtE:**

  ESWET called for carbon capture and Utilisation to be prioritised as a viable emissions reduction strategy, especially where Carbon Capture and Storage (CCS) is impractical due to cost, geographical constraints, or lack of infrastructure.

- **Eligibility of biogenic CO_2:**

  A need was identified for clearer language confirming that biogenic CO_2 from WtE qualifies as an acceptable input for low-carbon fuel pathways;

- **Sunset clause concerns:**

  Arbitrary time limits on the use of captured fossil CO_2 could jeopardise the viability of WtE projects, which typically involve long-term investment cycles;

- **Avoided emissions:**

  ESWET urged that avoided landfill emissions – including methane and CO_2 – be appropriately factored into lifecycle assessments, in line with Innovation Fund methodologies.

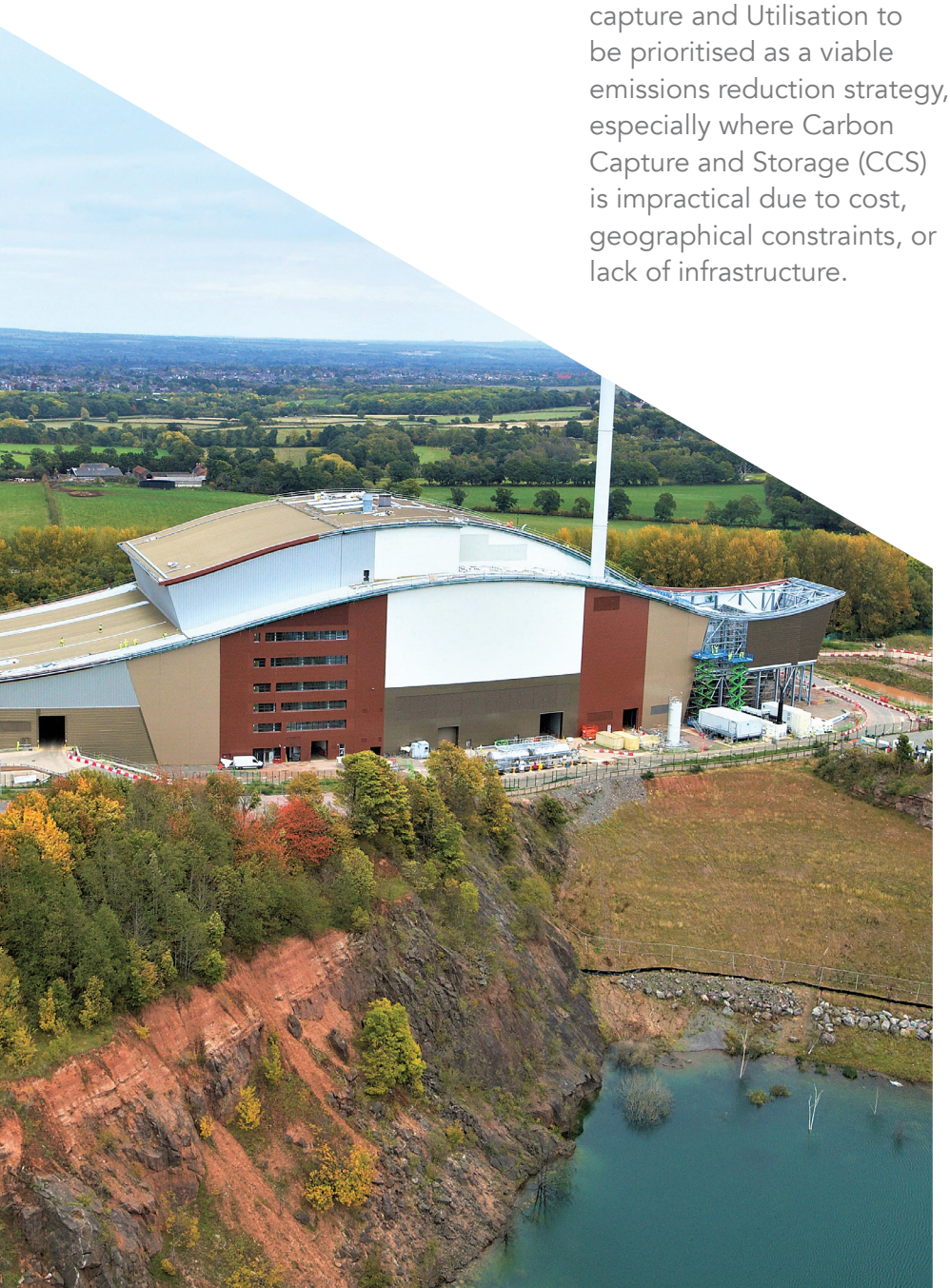


Photo 08

WtE plant in Newhurst, UK.
Courtesy: Kanadevia Inova

ESWET emphasised the importance of legislative clarity, coherence across RED, the Gas Directive, the EU Emissions Trading System (ETS), and the EU Taxonomy, and recognition of the realities of waste management to unlock investment.

WtE's potential as a fuel and hydrogen provider

ESWET has advocated for a policy environment that supports:

- Recognition of WtE-based hydrogen as renewable or low-carbon, depending on the waste input and energy source;
- Inclusion of WtE-derived CO_2 as a valid feedstock for synthetic fuel production;
- Lifecycle-based methodologies that account for the environmental benefits of landfill diversion and unavoidable emissions from non-recyclable plastics.

By enabling Waste-to-Hydrogen and Waste-to-Fuel solutions, the EU can access local, reliable sources of energy while addressing its waste challenges. WtH and WtF can support:

- Hydrogen-powered municipal services, such as refuse trucks and public buses;
- Sustainable aviation fuels (SAF) and maritime decarbonisation;
- Circular carbon strategies aligned with the EU's broader climate and resource efficiency goals.

Outlook

In the years ahead, delegated acts and secondary legislation under the RED and the Gas Directive will continue to shape eligibility and methodologies for renewable and low-carbon fuels. ESWET will:

- Monitor and respond to policy developments affecting WtE's role in hydrogen and fuel production;
- Promote a flexible regulatory framework enabling WtE participation in renewable and low-carbon fuel markets;
- Advocate for the removal of policy barriers that limit WtE engagement in CCU and hydrogen initiatives;
- Work to ensure policy coherence so that WtE is recognised for its dual role in waste treatment and clean energy generation.

The integration of WtE into hydrogen and fuel strategies is a logical extension of its contribution to decarbonisation. By capturing and repurposing carbon while generating partially renewable energy, WtE supports the EU's climate neutrality, circular economy, and energy resilience objectives.

Carbon Capture, Utilisation and Storage (CCUS)

The world is currently emitting approximately 60 gigatonnes of CO_2-equivalent greenhouse gas (GHG) emissions annually. These emissions continue to rise, and the consequences of climate change are becoming increasingly clear each year.

At the same time, global waste generation is also growing, with projections being consistently revised upwards. As a result, effective waste management – and its role in climate change mitigation – is receiving growing international attention.

Waste-to-Energy (WtE) plants, which treat residual, non-recyclable waste, can contribute to emissions reductions by avoiding GHG emissions at the source, preventing methane emissions from landfills, reducing reliance on fossil-based energy sources, and recovering materials that displace virgin raw materials.

These GHG reductions can be significantly enhanced through the deployment of carbon capture (CC) technology. By treating waste while capturing carbon, WtE can support society's efforts not just to reach net zero, but to go beyond it, achieving net-negative emissions. WtE with CC contributes to carbon reductions when capturing and storing fossil CO_2 or using captured CO_2, and to carbon removals when biogenic CO_2 is permanently stored.

Approximately 60% of CO_2 emissions from WtE plants are biogenic. When Carbon Capture and Storage (CCS) is applied, these biogenic emissions are permanently removed from the atmosphere. According to the Intergovernmental Panel on Climate Change (IPCC), integrating CCS into European WtE facilities could enable the capture of 60–70 million tonnes of CO_2 annually.

WtE emissions are hard to abate. WtE plants serve a hygienic function by treating non-recyclable waste and, unlike other industrial facilities, cannot simply switch fuels to decarbonise. Effective waste separation at source is essential to divert recyclables and ensure that only true residual waste is sent to WtE. For this waste fraction, WtE remains a key solution, and carbon capture offers a critical pathway to further emission reductions.

Carbon capture technology already exists and is being deployed. Yet deployment must accelerate. Modern carbon capture systems can remove over 95% of CO_2 emissions, and some WtE plants in Europe are already capturing thousands of tonnes of carbon annually. Over 60 carbon capture projects are currently in development at European WtE facilities.

Government support is vital for carbon capture continuous development. Countries like the Netherlands and Denmark have made notable progress thanks to public investment in infrastructure and bilateral agreements for CO_2 storage.

Similar action is now needed across Europe and beyond to reduce and remove carbon emissions on the scale required to meet the Paris Agreement targets of limiting global warming to 1.5°C or 2°C.

Against this background, EU legislation is rapidly evolving, in an effort to capitalise on carbon capture's potential to advance climate goal.

The Industrial Carbon Management Strategy

In February 2024, the European Commission launched the Industrial Carbon Management Strategy (ICMS), a comprehensive plan to scale up carbon management across the EU. It outlines actions at both EU and national levels to develop a unified CO_2 market and foster an investment-friendly environment for carbon management technologies.

Key objectives of the ICMS include:

- Scaling up CCUS technologies, especially in hard-to-abate sectors such as WtE;
- Establishing CO_2 infrastructure, including robust transport and storage networks;
- Creating a single EU CO_2 market through harmonised regulations and certification.

Thanks to contributions from its members, ESWET participated in the Commission's public consultation on the ICMS by responding to detailed questions and submitting a Position Paper. The Commission's ambition is welcome, and ESWET remains committed to supporting the development of the necessary legislative frameworks to dramatically scale up CCUS.

Carbon Removal and Carbon Farming Certification Framework

In December 2024, the EU adopted the Carbon Removals and Carbon Farming Regulation (EU/2024/3012), which sets a framework for certifying carbon removals, both industrial (including CCUS) and nature-based. WtE is particularly well-positioned to deliver certified carbon removals due to the biogenic share of its emissions. The regulation introduces EU-wide quality criteria and monitoring requirements to ensure the credibility of carbon removal credits and prevent greenwashing. This legislative foundation will strengthen the business case for WtE with CCUS and help ESWET members contribute meaningfully to the EU's net zero goal.

Material Recovery from WtE plants

Rising from the ashes: successful progress for recycling technologies

ESWET's incineration bottom ash (IBA) Working Group explored the latest treatment and utilisation technologies for bottom ash, along with their practical applications. Established in 2022, the Working Group is chaired by Johan Heiszwolf from ESWET member Lhoist.

In 2023–2025, the group examined how recovering waste and other secondary raw materials contributes to CO_2 emissions reductions by avoiding the energy-intensive extraction of virgin resources. Discussions were enriched by guest speakers from the Waste-to-Energy (WtE) sector and the academic community.

In 2024, the group broadened its scope and adopted a new name: the Material Recovery Working Group. This rebranding reflects the inclusion of fly ash alongside incineration bottom ash, signalling a more holistic approach to material recovery and sustainability.

To raise awareness of the benefits of bottom ash recovery and influence public opinion, the ESWET Secretariat launched several public campaigns, including the Integrated-Resource Facility report and the New Perspectives campaign. In parallel, the Secretariat advocated for the inclusion of bottom ash recovery in key EU legislative frameworks such as the EU Taxonomy, the Critical Raw Materials Act (CRMA), and the Net-Zero Industry Act (NZIA).

Encouraging signals are emerging from EU policy debates. In the final text of the CRMA, ambitious recycling targets were agreed, and EU institutions reaffirmed the importance of progressively integrating waste into these targets. This

> **Encouraging signals are emerging from EU policy debates.**

approach aims to enhance the EU's resilience and reduce dependency on third countries. Meanwhile, in the ongoing NZIA discussions, the European Parliament has proposed including recycling technologies on the list of net zero technologies — a move that could significantly enhance their potential and foster a more harmonised legislative framework across Europe.

Adding further momentum, the European Commission has acknowledged the carbon sequestration potential of incineration bottom ash, which can permanently store CO_2 through its natural maturation process. Similarly, the European Economic and Social Committee (EESC) has underlined the importance of recovering materials from incineration residues — such as bottom and fly ash — as a vital step towards a more resource-efficient and sustainable waste management system.

To fully realise this potential, the EESC has called for:

- Stronger legislation;
- Financial incentives, including the recognition of WtE in the EU Taxonomy Delegated Acts;
- Harmonised standards across Member States.

Embracing these developments is not merely an opportunity – it is essential. They pave the way for a truly circular economy, where waste is not discarded but transformed into a valuable resource.

Focusing on Heat

Heat from waste, waste heat, and more: a new task force at work

Heat, waste heat, and the technologies enabling the recycling, recovery, and utilisation of heat can significantly reduce energy consumption in the EU. These technologies enhance the efficiency and sustainability of energy systems and applications, reduce energy imports and dependency, minimise costs, and accelerate Europe's progress towards carbon neutrality. EU legislators are taking note.

Following a decision by its Technical Committee, in 2023 ESWET launched a new Heat Task Force to explore this emerging and increasingly relevant topic at the EU level.

Chaired by Jens Kitzhofer of ESWET member APEX Group, the Task Force aims to advocate for and explore the potential of heat recovery and utilisation, while also assessing the benefits of broadening the definition of waste heat.

The European Commission's current guidelines on heating and cooling clarify the provisions introduced under the revised Renewable Energy Directive (RED III) and the Energy Efficiency Directive (EED). These include an expanded interpretation of waste heat within the Renewable Energy Directive framework, emphasising its role in achieving the EU's renewable energy and decarbonisation objectives. By capturing and utilising waste heat, Waste-to-Energy (WtE) plants complement renewable energy systems and enhance energy efficiency in district heating and cooling networks.

Looking ahead, the European Commission is preparing a comprehensive Heating and Cooling Strategy, expected in early 2026. This strategy is anticipated to highlight the synergies between waste heat recovery, the deployment of heat pumps, and other clean technologies.

By integrating waste heat with heat pump solutions, there is potential to maximise energy recovery and achieve greater efficiency in heating and cooling systems across Europe. The strategy will set out the policy direction for scaling up sustainable heating and cooling, recognising the key role of waste heat and renewable energy in reducing reliance on fossil fuels and advancing the transition to carbon neutrality.

By focusing on the potential of heat recovery and utilisation, the Heat Task Force aligns with the EU's strategic objectives, supporting energy security, sustainability, and decarbonisation. Integrating waste heat into energy systems presents a critical opportunity to improve resource efficiency, minimise environmental impact, and contribute to a more resilient and sustainable energy landscape across Europe.

EU Taxonomy

The EU Taxonomy Regulation continued to evolve throughout 2023–2025, aiming to steer sustainable investments towards economic activities that make a substantial contribution to climate and environmental objectives. For the Waste-to-Energy (WtE) sector, the development of the Taxonomy has raised strategic concerns, particularly due to its current design, which overlooks the sector's role in circularity and decarbonisation and limits its access to sustainable finance.

Clarifying the role of Waste-to-Energy in Sustainable Finance

The application of the Taxonomy to WtE has historically been uncertain. WtE was excluded from the first two Climate Delegated Acts (on mitigation and adaptation) and remained subject to debate under subsequent workstreams. Throughout 2023–2025, ESWET closely monitored developments and provided feedback on several occasions, both through public consultations and targeted stakeholder engagement.

Among the highlights, ESWET submitted input via the 2023 call for feedback on the Environmental Delegated Act and the Taxonomy Stakeholder Request Mechanism, clearly advocating for the following:

- **Material recovery** from Incinerator Bottom Ash (IBA) – including metals and aggregates – must be recognised for its contribution to the circular economy;
- **Energy recovery** should be treated on an equal footing with landfill remediation, when serving the same purpose of managing non-recyclable waste and preventing methane emissions;
- **The lack of Taxonomy coverage for WtE investments risks creating policy asymmetries**, particularly where investments in landfilling are allowed but those in modern, energy-efficient incineration are not;
- **Criteria should reflect real-world decarbonisation potential**, including where WtE facilities are equipped with CCUS or are capture-ready by design;
- **A comprehensive life cycle approach** must account for system-level benefits such as avoided landfilling and the recovery of valuable resources.

Importantly, ESWET welcomed the fact that the final Environmental Delegated Act acknowledged the importance of IBA recovery and committed to considering its inclusion in the next revision of the framework. This represented a small but significant step towards greater recognition of the WtE sector's role in the circular economy.

EU Platform on Sustanable Finance and the EU Commission

ESWET followed the work of the EU Platform on Sustainable Finance, particularly its development of technical screening criteria on the circular economy and pollution prevention. The association shared feedback with both the Platform and the European Commission, emphasising that WtE:

- Prevents landfilling and the associated methane emissions and environmental risks;
- Facilitates resource recovery – such as metals and aggregates – from bottom ash;
- Can serve as a net zero or even net-negative emissions solution when integrated with CCUS;
- Plays a critical role in a balanced waste management system.

Through its advocacy, ESWET has consistently called for greater visibility of WtE in sustainable finance frameworks, and for an integrated approach that recognises the sector's essential role in waste treatment, depollution, circular economy targets, and climate mitigation.

Investment implications and the need for clarity

The absence of clear inclusion criteria for WtE in the EU Taxonomy has had tangible consequences for project development and financing. ESWET has raised concerns that the exclusion – or ambiguous treatment – of WtE sends misleading signals to investors, despite the sector's alignment with EU climate and circular economy goals.

As financial institutions increasingly align their lending portfolios with Taxonomy-compliant activities, WtE projects risk being deprioritised or facing higher financing costs unless their role is formally acknowledged. This results in an uneven playing field compared to other infrastructure investments that may not deliver equivalent environmental benefits.

To address this, ESWET has urged the Commission to:

- Develop clear, activity-specific screening criteria for WtE, consistent with waste and energy legislation;
- Ensure CCUS-equipped WtE facilities qualify under both climate mitigation and transition criteria;
- Consider Taxonomy alignment not only from a "green" starting point, but also in light of the broader role of transition activities in hard-to-abate sectors.

Outlook

ESWET will continue to monitor the development of future Delegated Acts under the EU Taxonomy, including the upcoming work on transition activities. The association will:

- Provide input to consultations and calls for evidence;
- Engage with the Platform and Commission on technical screening criteria relevant to WtE;
- Advocate for consistent recognition of WtE's role in sustainable waste management and decarbonisation.

Ensuring that WtE is fairly treated in the sustainable finance framework is vital to maintaining investment flows, supporting technological innovation, and advancing the EU's 2030 and 2050 climate objectives.

Net-Zero Industry Act

The Net-Zero Industry Act (NZIA), adopted by the European Union in June 2024, is a pivotal component of the European Green Deal. It aims to strengthen the EU's manufacturing capacity for clean technologies and support the transition to climate neutrality by 2050.

Key objectives of the NZIA

- **Enhancing manufacturing capacity:** The Act sets a target for the EU to meet at least 40% of its annual deployment needs for net zero technologies through domestic manufacturing by 2030;
- **Simplifying regulatory frameworks:** To attract investment and facilitate market access for clean technologies, the NZIA proposes streamlined permitting procedures and reduced administrative burdens for net zero technology manufacturing projects;
- **Promoting strategic projects:** The Act introduces the concept of 'net zero projects', which are essential for enhancing the resilience and competitiveness of the EU's net zero industry. These projects are granted priority status, ensuring expedited administrative handling and faster permitting;

Many of these net zero technologies are already present in WtE plants, including:

- Carbon Capture, Utilisation and Storage (CCUS)
- Hydrogen technologies
- Heat pumps
- Sustainable alternative fuels (SAF)
- Sustainable biogas and biomethane

This diversity of net-zero projects illustrates the many ways in which WtE can contribute to the net zero transition while enhancing European competitiveness.

Waste Framework Directive

The revision of the Waste Framework Directive (WFD), with a particular focus on textiles and food waste, emerged as a significant policy development in 2023 - 2025. ESWET has been closely monitoring these developments, assessing their potential impacts on the Waste-to-Energy (WtE) sector and advocating for an integrated, hierarchy-respecting approach to waste management, one that avoids unintended consequences such as increased landfilling or illegal exports.

Textile and food waste

The targeted revision of the WFD included new provisions to strengthen the management of textile and food waste. For textiles, the proposal introduced Extended Producer Responsibility (EPR) schemes and strengthened the obligation for separate collection. For food waste, the proposed revision reinforced prevention measures and sought to improve the separate collection of bio-waste throughout the value chain.

While these efforts align with broader circular economy goals, they also pose notable implementation challenges. These include the need for adequate sorting and treatment infrastructure, addressing contamination in collected food waste streams, and managing the fraction of waste that remains unsuitable for biological treatment. In many cases, local authorities will need to adapt collection logistics, public engagement strategies, and treatment capacity to meet the new requirements both efficiently and effectively.

Avoiding policy fragmentation and upholding the waste hierarchy

A central theme in ESWET's contribution to the WFD revision was the importance of maintaining coherence across EU waste legislation. It is essential to ensure that new requirements under the WFD do not inadvertently disrupt

established treatment pathways or penalise high-performing systems.

Key messages included:

- The role of WtE in managing non-recyclable or contaminated textile and food waste must be formally acknowledged;
- While waste prevention and recycling should remain top priorities, energy recovery is a necessary safeguard to protect environmental and human health;
- Clear definitions and quality standards are needed to distinguish recyclable fractions from residual waste.

ESWET also raised concerns about the risk of diverting non-recyclable waste to landfill or third countries, especially if policy changes undermine the current role of WtE as an established and essential part of the waste management system.

Outlook

Following the finalisation of the WFD revision in September 2025, ESWET will continue to engage with EU institutions to ensure balanced and coherent outcomes. In parallel, work will begin on the broader revision of the WFD and the forthcoming Circular Economy Act. ESWET will:

- Advocate for a systems-based approach that upholds the integrity of the waste hierarchy;
- Push for legislative alignment with the EU Green Deal, Taxonomy Regulation, and waste export rules;
- Promote the inclusion of mineral recovery and broader recognition of WtE's contribution to resource efficiency.

Ensuring that residual waste streams are managed sustainably and efficiently is essential to achieving the EU's broader climate, resource efficiency, and pollution prevention objectives. ESWET will continue to work to ensure that WtE remains a reliable and integrated part of the solution.

PFAS

ESWET is actively engaged in addressing environmental concerns associated with per- and polyfluoroalkyl substances (PFAS) and plastics within the WtE sector. The association's activities in this area are centred around supporting research into the incineration of plastic waste and maintaining involvement in EU policy developments.

Research initiatives on PFAS emissions

Recognising the persistence and potential health risks of PFAS, often referred to as "forever chemicals," ESWET has supported research to understand their behaviour during waste incineration. A notable study conducted by the Karlsruhe Institute of Technology examined the combustion of fluoropolymers under conditions representative of European municipal waste combustors. The findings indicated that with appropriate combustion parameters, the degradation of fluoropolymers can be effectively managed, resulting in minimal PFAS emissions. This research underscores the importance of maintaining optimal incineration conditions to mitigate environmental impacts.

Advocacy for advanced waste management

ESWET advocates for the integration of advanced technologies in WtE plants to enhance the treatment of plastic waste, including those containing PFAS. By promoting high-efficiency flue gas cleaning systems and continuous monitoring, ESWET aims to ensure that emissions remain well below regulatory limits, thereby protecting both humans and the environment.

Engagement with regulatory developments

In light of evolving regulations, such as the European Union's proposed ban on PFAS in consumer products, ESWET emphasises the role of modern WtE facilities in safely processing PFAS-containing materials. By providing a controlled environment for the thermal destruction of these substances, WtE plants can greatly reduce the emissions of PFAS into the environment when compared to landfilling.

Commitment to sustainable practices

Through ongoing research, technological innovation, and active participation in policy discussions, ESWET is committed to reducing PFAS pollution to protect both people and the environment.

2040 Climate Targets: WtE as a strategic contributor

In February 2024, the European Commission proposed a new milestone in EU climate policy: a binding target to reduce greenhouse gas emissions by 90% by 2040. While this proposal has generated wide debate, and it remains to be seen whether the target will be formally enshrined in the EU Climate Law in 2025, ESWET has strongly welcomed the ambition and supports the overall direction of travel.

This initiative sets the tone for the next phase of the EU's climate strategy and reflects growing momentum around long-term decarbonisation planning. However, ESWET recognises that a heated political and policy discussion is expected in 2025, as the target is considered for legal adoption.

The WtE sector stands ready to play an active role in delivering on the 2040 vision. WtE technologies already contribute to climate mitigation by offering a sustainable outlet for non-recyclable waste, producing energy, and recovering materials that would otherwise be landfilled. To fully unleash WtE's potential, ESWET has called for:

- A supportive regulatory and financing framework for innovation and deployment;
- Promotion of heat recovery applications, especially in district heating and cooling;
- Clearer carbon pricing rules and recognition of WtE in carbon management strategies;
- Investment in enabling infrastructure and simplified permitting procedures;
- Scaled-up R&D funding with a technology-neutral approach;
- Stronger collaboration between industry, policymakers, and citizens to drive awareness and social acceptance.

As highlighted by ESWET Secretary-General Patrick Clerens:

> **"We are poised to support the transition towards a green economy through innovative and efficient Waste-to-Energy technologies. Our sector is uniquely positioned to contribute to the EU's ambitious goals, providing a reliable and clean energy source that supports environmental sustainability."**

ESWET and its members remain committed to helping realise the EU's 2040 climate ambition by offering practical, scalable, and circular solutions at the intersection of waste, energy, and climate policy.

05 ESWET ADVOCACY TIMELINE

Between 2023 and 2025, ESWET has expanded its outreach to promote Waste-to-Energy as an essential component of Europe's sustainable waste management and decarbonisation strategies.

Through articles, policy publications, organisation of dedicated events, media partnerships, speaking engagements, and active participation in external forums, ESWET has strengthened the visibility and role of the WtE sector in advancing circular economy and climate objectives within an evolving energy landscape.

02 February

- Published report: "From carbon neutral to carbon negative: Waste to Energy on the path to CCUS"
- Published press release: "Ready to contribute to EU 2040 climate targets"
- Published press release welcoming the WtE inclusion in the Carbon Removals Certification Framework
- ESWET's Policy Officer, a, spoke at Bio360 Expo, in Nantes

03 March

- Launched the report "Recovering the non-recyclable: the Integrated Resource-Recovery Facility"
- Published position paper on the Net-Zero Industry Act (NZIA) proposal
- ESWET at the Energy from Waste Conference, in London, UK

04 April

- Published article: "Discovering the potential of Waste-to-Energy for climate change mitigation"
- Published press release welcoming the EU Parliament's vote on the NZIA
- ESWET Secretary-General, Patrick Clerens, spoke about WtE and the EU Taxonomy at ESWET member Steinmüller Engineering's Jubilee Conference in Gummersbach, Germany

05 May

- Co-organised Waste to Energy & the City – Generating Value for Communities Conference with the European Committee of the Regions

2023

06 June

- ESWET at CEWEP Congress in Berlin, Germany

08 August

- ESWET joined ENZA - European Net Zero Alliance

09 September

- Position Papers published on:
  - Net-Zero Industry Act
  - Industrial Carbon Management
  - Heat Pumps Action Plan
  - Revision of rules on Monitoring, Reporting, and Verification of GHG emissions
- ESWET Secretary-General, Patrick Clerens spoke at the International Recycling and Recovery Congress in Vienna, Austria
- ESWET Secretary-General, Patrick Clerens spoke at the 27th Dreiländertreffen in Würzburg, Germany

10 October

- ESWET President, Dr. Siegfried Scholz, represented ESWET at Pollutec in Lyon, France

11 November

- ESWET launched its Heat Task Force, with Jens Kitzhofer of Apex Group leading the works
- ESWET Head of Policy, Charoula Melliou, spoke about the Integrated Resource - Recovery Facility at Ecomondo, in Rimini, Italy
- ESWET Head of Policy, Charoula Melliou, spoke at ESWET member ENVEA's event at Ecomondo, in Rimini, Italy
- ESWET Secretary-General, Patrick Clerens, at Enlit in Paris, France

12 December

- Published article: "From rubbish to resources: how Waste-to-Energy plants contribute to the circular economy"

2024

01 January

- ESWET organised a joint booth at the Bio360 Expo in Nantes, France, together with ESWET members ANDRITZ, ENVEA, LAB, and Steinmüller Engineering GmbH
- ESWET hosted event at Bio360 Expo in Nantes, France: "Decarbonising the Future: Waste-to-Energy's Vital Role as Part of the BIO-ecosystem". ESWET Policy Officer, Antonella Del Figliolo moderated the panel, which included ESWET members and other sector experts
- ESWET at the BKAWE Berlin Conference

02 February

- Published press releases:
  - "Industrial Carbon Management Strategy: need for robust regulation"
  - "European WtE technology suppliers ready for EU 2040" climate targets
  - "WtE included in Carbon Removals Certification Framework"
- ESWET published statement in support of Brazilian Association for Energy Recovery of Waste (ABREN) in its efforts to promote sustainable waste management practices in Brazil.

03 March

- Issued Press Release: "Industrial Emissions Directive: a step towards enhanced environmental compliance"

04 April

- Issued press release "ESWET welcomed landmark EU Parliament vote on Net-Zero Industry Act"
- Published article: "A look inside a Waste-to-Energy Plant"
- ESWET organised conference session at Waste Management Europe in Bergamo, Italy, Italy: "Revolutionising Waste Management: Unleashing the Potential of Integrated Resource-Recovery Facilities". ESWET Head of Policy Charoula Melliou moderated the panel
- ESWET booth at Waste Management Europe Expo in Bergamo, Italy, co-organised with ESWET member IEM

05 May

- ESWET's General Assembly and Executive Board meetings organised within IFAT in Munich, Germany
- ESWET Head of Policy, Charoula Melliou spoke at an expert hearing titled "From waste plants to resource plants" organised by the European Economic and Social Committee, in Brussels, Belgium

06

- Published articles:
  - "The limits of biomonitoring in assessing WtE emissions"
  - "Heat pumps: the missing piece of the puzzle"
  - "The UN is right, we need innovative waste management solutions"
- ESWET Secretary-General, Patrick Clerens, participated in the workshop organised by the Belgian Presidency in Mechelen, Belgium: "A futureproof Waste Framework Directive"
- ESWET Head of Policy, Charoula Melliou, spoke to Foresight's "The Jolt" podcast about the role of the WtE sector in sustainable waste management and climate mitigation
- ESWET Head of Policy, Charoula Melliou, spoke at a webinar on CCUS for the WtE sector, organised by the Energy from Waste Network
- ESWET Head of Policy, Charoula Melliou, spoke about CO_2 accounting for WtE plants at an event event organised by ESWET member ENVEA with the participation of Italy's National Research Centre, in Rome and online
- ESWET President, Dr. Siegfried Scholz, and Secretary-General, Patrick Clerens, attended the launch event of the European Innovation Centre for Industrial Transformation and Emissions (INCITE), in Seville, Spain

2024

07 July

- Responded to European Commission consultation on permanent CCU
- Responded to the European Commission's proposed revision of the MRV rules under the EU ETS

08 August

- Responded to the UK ETS Authority's consultation on the inclusion of Energy-from-Waste in the UK ETS
- Published article: "How Waste-to-Energy played a role at the Olympics"

09 September

- Published article: "Riding the innovation wave: new technologies drive change in WtE"
- ESWET Junior Policy Officer, Robert Doyle, spoke about CCUS in the WtE sector, at EFD – the Energy, Fuels & Decarbonisation Expo, in Birmingham, UK
- ESWET joins the Operational Optimisation conference in Birmingham, UK

10 October

- ESWET hosted a delegation from Oman's Authority for Public Services Regulation in Brussels, Belgium
- Published press release in rebuttal to BBC article highly critical of WtE in the UK: "Waste-to-Energy: what the BBC missed (and should have not)"
- Replied to European Commission consultation on the methodology for assessing the GHG emission savings of low-carbon fuels
- Published articles on:
  - "The hazards in landfills and the promise of Waste-to-Energy"
  - "EU funds acknowledge carbon capture's potential"
- ESWET at the Carbon Capture Technology Expo, in Hamburg, Germany

11 November

- Issued press release: "The European Economic and Social Committee is right, we need to prioritise resource recovery in WtE"
- Published article: "Waste-to-Energy destroys Persistent Organic Pollutants (POPs), study shows"
- ESWET Head of Policy, Charoula Melliou, spoke at Pollutec in Paris, France
- ESWET Junior Policy Officer Robert Doyle spoke at the Ecomondo expo in Rimini, Italy
- ESWET attended the Conference "Essential, Responsible, Made in EU: Industrial Minerals at the Heart of the New Industrial Deal" in Brussels, Belgium

12 December

- ESWET Head of Policy, Charoula Melliou, spoke at a panel dedicated to the potential inclusion of WtE in the EU ETS at the Energy from Waste conference in London, UK
- ESWET co-authored ENZA's 100 measures for 100 days roadmap for the first 100 days of the new European Commission

enza
European Net Zero Alliance
100 measures for 100 days
Solutions and recommendations from the European Net Zero Alliance for the first 100 days of the new European Commission

2025

2025

01 January

- ESWET Head of Policy, Charoula Melliou, shared her expert opinion on the solid waste management and energy recovery sector in an interview ahead of the BIO360 expo

02 February

- ESWET CCUS Working Group Chair, Dr. Kai Lieball, spoke at the BIO360 Expo in Nantes, France, in the panel "Game changers: unlocking the environmental and climate potential of Waste-to-Energy equipped with carbon capture technology"
- Issued press release welcoming the Clean Industrial Deal
- Issued press release: "Waste-to-Energy reduces methane emission, new EEA report says"

03 March

- Published factsheet on How Waste-to-Energy provides clean power to cities and homes
- ESWET at the Energy from Waste Conference, in London, UK
- ESWET held a session at the EfW Conference in London, UK, on "Carbon pricing - how to achieve a level playing field for landfill and waste-to-energy", with ESWET President, Dr. Siegfried Scholz, taking the stage

04 April

- ESWET President, Dr. Siegfried Scholz, spoke at the ISWA Energy Recovery Working Group in Athens, Greece
- Contributed to the Landfill BREF frontloading survey
- Responded to the proposed revision of IED Article 13 and BREF Guidance

05 May

- ESWET at the first AEVERSU Global Summit on Energy Recovery, in Madrid, Spain
- ESWET President, Dr. Siegfried Scholtz, spoke at the Prague Waste-to-Energy Conference, in Prague, Czech Republic

06 June

- ESWET at the CEWEP Congress in Gdansk, Poland
- ESWET Head of Policy, Charoula Melliou, and ESWET member SPIG-GMAB's Dr. Max Biermann, spoke at a panel on Waste-to-Energy at the Waste Management Europe Expo in Bologna, Italy
- ESWET booth at Waste Management Europe Expo in Bologna, Italy, co-organised with ESWET members Apex Group, Bonnenberg & Drescher, General Kinematics, and LAB
- ESWET Head of Policy, Charoula Melliou, moderated a panel on zero waste practices at Waste Management Europe Expo in Bologna, Italy

2025

07 July

- ESWET responded to the EU Commission consultations on the EU ETS and the Industrial Decarbonisation Accelerator Act
- ESWET responded to the EU Commission consultation on the proposed Delegated Act
- ESWET met Croatian and Slovenian waste management delegations in Brussels, Belgium
- ESWET held an online meeting with the Moldovan authorities on energy and waste management

08 August

- ESWET co-signed European Net Zero Alliance (ENZA)'s "Recommendations on the Clean Industrial Deal: Accelerating Europe's Sustainable Industrial Transition: ENZA's Vision for a Competitive and Net Zero Economy"
- ESWET responded to the EU Commission consultation on CO_2 transportation infrastructure and markets

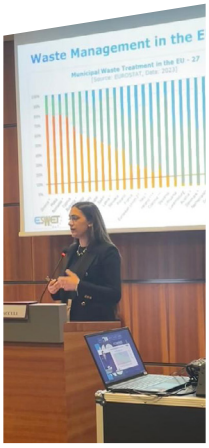
09 September

- ESWET Junior Policy Officer, Luigi Ferrieri Caputi, spoke about the application of CCUS to Waste-to-Energy, at EFD – the Energy, Fuels & Decarbonisation Expo, in Birmingham, UK
- ESWET responded to the EU Commission consultation on the 2040 climate targets
- ESWET took part in the event "Addressing the Staggering Costs of PFAS Pollution", organised by Hazardous Waste Europe, the European Environmental Bureau, and the Permanent Representation of France in the EU, in Brussels, Belgium

10 October

- ESWET Secretary-General, Patrick Clerens, and Technical Officer, Dimitris Zikopoulos, together with Jürgen Reinmann from ESWET member ENVEA, represented ESWET at the kick-off meeting of the landfill BREF, in Seville, Spain
- ESWET Head of Policy, Charoula Melliou, spoke at Pollutec Lyon about "Closing the circular economy loop: the role of Waste-to-Energy in residual waste treatment"
- ESWET joint booth co-organised with members Luehr Filter and Jaipur Robotics at Pollutec, in Lyon, France
- ESWET responded to the European Commission's Calls for Evidence on the Heating and Cooling Strategy and the Electrification Action Plan
- ESWET met representatives from ABREN (Brazilian Association for Energy Recovery from Waste) and other Brazilian officials
- ESWET CCUS Working Group Chair, Dr. Kai Lieball, moderated a panel titled "Germany's New Leadership and the Future of CCUS", at the Carbon Capture Technology Expo, in Hamburg, Germany
- ESWET at Carbon Capture Technology Expo, in Hamburg, Germany
- ESWET President, Dr. Siegfried Scholz, spoke at the ISWA 2025 World Congress, in Buenos Aires, Argentina

11 November



- ESWET Junior Policy Officer, Paola Macculi, spoke at Ecomondo, in Rimini, Italy
- ESWET responded to the EU Commission consultation on the upcoming Circular Economy Act
- ESWET at the Euroheat & Power Congress 2025, in Brussels, Belgium
- ESWET President, Dr Siegfried Scholz, represented the association at COP30 in Belém, Brazil
- ESWET President, Dr. Siegfried Scholz, spoke at the Energy from Waste Middle East Conference, in Dubai, United Arab Emirates

12 December

- ESWET Head of Policy, Charoula Melliou, gave a speech on the EU policy framework for WtE at the Energy from Waste conference in London, UK

06

THE INTEGRATED RESOURCE-RECOVERY FACILITIES

In 2023, ESWET released a comprehensive report outlining the evolution from traditional Waste-to-Energy (WtE) plants to Integrated Resource-Recovery Facilities (IRRFs).

IRRFs possess cutting-edge technologies to treat non-recyclable waste sustainably, while supporting EU decarbonisation goals and circular economy objectives.

Key Highlights:

1

Carbon Savings:

IRRFs play a crucial role in reducing greenhouse gas emissions by diverting waste from landfills, which emit methane. With technologies such as carbon capture and material recovery, WtE can evolve from carbon-neutral to carbon-negative;

2

Energy Security:

WtE generates reliable, partially renewable energy that replaces fossil fuel imports. By expanding into hydrogen and synthetic fuel production, IRRFs enhance Europe's energy independence while contributing to the decarbonisation of transport;

3

Material Recovery:

Modern IRRFs recover valuable metals and minerals from incineration bottom ash (IBA) and fly ash, reducing dependence on virgin raw materials. Innovations include using recovered materials in construction and extracting heavy metals for industrial reuse;

4

Hydrogen and Synthetic Fuels:

Technologies such as Waste-to-Hydrogen (WtH) and Waste-to-Fuel (WtF) contribute to decarbonising the transport sector and industrial processes. Projects in Wuppertal (Germany) and Dietikon (Switzerland), for example, demonstrate hydrogen and methane production as efficient, renewable alternatives;

5

Carbon Capture, Utilisation and Storage (CCUS):

The implementation of CCUS technologies enables IRRFs to capture CO_2 for storage or reuse in products such as fertilisers, fuels, and aggregates.

Policy Recommendations:

- Recognise IRRFs' renewable contributions in EU energy and recycling policies;
- Incentivise carbon capture and advanced material recovery technologies;
- Provide financial and legislative support to integrate cutting-edge technologies into WtE systems;

This report demonstrates to policymakers and the public the benefits of state-of-the-art waste treatment, where waste is no longer seen as a liability but as a valuable resource for energy, materials, and innovation.

07

WASTE-TO-ENERGY & THE CITY: GENERATING VALUE FOR COMMUNITIES

The role of Waste-to-Energy (WtE) in addressing urban challenges and contributing to EU energy and sustainability goals took centre stage at an ESWET conference held in Brussels and online on 16 May 2023.

The event was co-hosted by the European Committee of the Regions and featured high-level speakers, including:

- **Eero Ailio,** Adviser to the Director on the Global Covenant of Mayors and Energy Climate Initiative, DG Energy, European Commission
- **Kata Tüttő,** Deputy Mayor of Budapest, Vice-President of the Committee of the Regions (CoR) ENVE Commission, and CoR Rapporteur on the role of WtE in the circular economy
- **Andries Gryffroy,** Member of the Flemish Parliament, Vice-President of the Belgian Senate, Member of the Council of Europe, and Vice-President of the Committee of the Regions ENVE Commission
- **Dr Thanos Bourtsalas,** Acting Director, Earth Engineering Center, Columbia University
- **Ana Šerdoner,** Senior Manager, Industry & Energy Systems, Bellona Environmental Foundation

The cities–WtE connection

Waste management is a pressing challenge for cities worldwide. With waste production expected to rise significantly in the coming years, European municipalities have taken a leading role in developing innovative solutions —including Waste-to-Energy (WtE).

WtE serves as an ally to cities by reliably treating household and industrial waste that cannot be recycled. It significantly reduces the amount of waste sent to landfills, thereby lowering soil and groundwater contamination as well as harmful emissions into the atmosphere and waterways.

Energy recovery: how WtE energises our cities

WtE plants convert non-recyclable waste into energy — such as heat, steam, electricity, and fuels — which is then distributed to end-users. This clean energy source reduces cities' dependence on fossil fuels and helps them meet renewable energy targets.

In many EU cities, WtE already supplies more than half of local energy demand, powering and heating not only homes but also offices, schools, hospitals, and industries.

Moreover, the energy produced by WtE plants complements other renewable sources — such as wind and solar — which are variable by nature and cannot always be relied upon.

Climate change mitigation

WtE acts as a carbon sink. In addition to reducing greenhouse gas emissions through fossil fuel substitution, WtE mitigates pollution by diverting waste

Conference

ESWET
European Suppliers of Waste-to-Energy Technology

Waste-to-Energy & the City

Hosted by
European Committee of the Regions

Generating value for Communities

16 May 2023, 14:00 - 17:30 CEST

Brussels, Committee of the Regions (hybrid)

from landfills and recovering materials from the combustion process.

The Intergovernmental Panel on Climate Change explicitly acknowledged the role of WtE in reducing GHG emissions in their 2022 report: "When WtE technologies are equipped with proper air pollution reduction facilities, they can contribute to clean electricity production and reduction of GHG emissions." ESWET members supply state-of-the-art technology to make emission reduction possible in Waste-to-Energy in the EU, the UK and globally.

Several WtE plants across Europe are exploring Carbon Capture, Utilisation, and Storage (CCUS) technologies to further reduce the sector's carbon footprint.

Empowering communities: job creation and shifting public perception

Investments in WtE infrastructure stimulate local economies. The construction, operation, and maintenance of WtE plants generate employment, support communities, and drive regional growth.

Public perception of WtE has improved in recent years, largely due to advancements in emissions control technology and growing environmental awareness. Cities are increasingly focusing on transparent communication and public engagement to foster trust and ensure local support for WtE projects.

"Waste-to-Energy? Yes in my backyard!"

Europe is home to over 500 WtE plants, many of which are located in major capitals such as Paris, Dublin, Vienna, Copenhagen, and Barcelona. These facilities are often well integrated into their surroundings. By turning residual waste into clean energy, these cities are leading the way in sustainable urban development, offering practical solutions to growing waste volumes. As technology continues to evolve, WtE is poised to play an even greater role in Europe's sustainable future.

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ESWET ORGANISATIONAL STRUCTURE

PRESIDENCY

The Presidency provides leadership and strategic guidance for ESWET. It is held by representatives elected from the Executive Board.

EXECUTIVE BOARD

The Executive Board defines ESWET's priorities. It includes representatives from ESWET's full members.

GENERAL ASSEMBLY

The General Assembly is ESWET's decision-making body. It is responsible for major strategic and governance decisions. The General Assembly includes representatives from all ESWET members.

TECHNICAL COMMITTEE

The Technical Committee oversees the policy, legal and technical work of ESWET. It implements ESWET's policy positions and provides input to the work of the EU institutions.

PUBLIC RELATIONS COMMITTEE

The Public Relations Committee defines and reviews ESWET's communication strategy and activities. It sets out public advocacy actions that promote ESWET's mission and priorities.

CCUS WORKING GROUP

The CCUS Working Group monitors policy and technological developments in carbon removal and emissions reduction. It develops ESWET's positions on CCUS-related legislation, and promotes the integration of carbon capture solutions across the sector.

MATERIAL RECOVERY WORKING GROUP

The Working Group promotes the recovery of valuable materials – such as metals and minerals – from incineration bottom ash (IBA) and other residues from Waste-to-Energy processes. The group monitors regulatory developments, supports best practices, and contributes to ESWET's advocacy on circular economy policies.

HEAT TASK FORCE

The Heat Task Force focuses on advancing the role of Waste-to-Energy facilities in delivering efficient and sustainable heat solutions. It works to promote the integration of WtE heat recovery into district heating networks and supports regulatory frameworks that encourage heat utilisation.

THE SECRETARIAT

The ESWET Secretariat is the operational hub of the organisation and represents members' interests at the EU level. The Secretariat coordinates ESWET's policy and communication activities, organises technical working groups and association meetings, promotes knowledge-sharing among members, monitors regulatory and technological developments in the Waste-to-Energy field, among other actions.

ESWET STRUCTURE

ESWET Presidency

PRESIDENT
Siegfried Scholz

VICE-PRESIDENT
Ulrich Martin

VICE-PRESIDENT
Ivan Christiaens

ESWET Working Groups

TECHNICAL COMMITTEE
Désiré Bendahan
Chairman

PUBLIC RELATIONS COMMITTEE
Ole Madsen
Chairman

CCUS WORKING GROUP
Kai Lieball
Chairman

MATERIAL RECOVERY WORKING GROUP
Johan Heiszwolf
Chairman

HEAT TASK FORCE
Jens Kitzhofer
Chairman

ESWET Secretariat

SECRETARY-GENERAL
Patrick Clerens

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ESWET MEMBERS

FULL MEMBERS

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* As of December 2025

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BECOME AN ESWET MEMBER

ESWET's mission is to raise awareness of the positive implications of Waste-to-Energy technology, such as sustainable waste management, clean and reliable energy, and environmental protection

ESWET members' research and innovation are at the heart of most of Waste-to-Energy plants in Europe and across the world.

Find more information on membership categories and fees on our website: **www.eswet.eu/members**

The ESWET Secretariat is available for introductory meetings with potential members. Find our contact details on our website: **www.eswet.eu/contact**

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ESWET PARTNERS

In recent years, ESWET significantly expanded its collaboration with key stakeholders across Europe and beyond, strengthening partnerships and enhancing synergies to address challenges in sustainable waste management and energy recovery.

These collaborations have been instrumental in shaping the policy landscape, promoting best practices, and driving innovation within the Waste-to-Energy (WtE) sector.

- **ENZA (European Net Zero Alliance)**
  As an active member of ENZA, ESWET contributed to discussions and initiatives focused on achieving net zero emissions by 2050. Through this partnership, ESWET highlighted the potential of WtE technologies to reduce greenhouse gas emissions by diverting non-recyclable waste from landfills and recovering energy and materials. ENZA's multi-stakeholder platform enabled ESWET to advocate for the integration of WtE into broader decarbonisation strategies, in line with EU objectives for renewable energy and the circular economy transition.

- **CEWEP (Confederation of European Waste-to-Energy Plants)**
  A longstanding partner, CEWEP continued to work closely with ESWET to advance the priorities of the WtE sector. In 2023–2025, the organisations collaborated on several key initiatives, including position papers and responses to EU consultations on waste management and energy policy. Together, CEWEP and ESWET advocated for the recognition of waste heat from WtE plants as a critical resource for district heating and cooling systems. This collaboration played a key role in influencing the European Commission's guidance on the interpretation of waste heat under the RED III framework.

- **WtERT (Waste-to-Energy Research and Technology Council)**
  ESWET's partnership with WtERT focused on promoting innovation and knowledge-sharing in WtE technologies. Joint workshops and webinars held in 2023 and 2024 facilitated dialogue on best practices, advancements in carbon capture, and the integration of WtE with other renewable energy systems. By leveraging WtERT's global network, ESWET amplified its message on the environmental and energy benefits of WtE, engaging stakeholders from academia, industry, and government.

- In 2024, ESWET, **CEWEP and WtERT created the WtE+X Knowledge Alliance**, a strategic partnership promoting the adoption of Waste-to-Energy (WtE) technologies. The Alliance focuses on reducing methane emissions in the WtE sector, diverting recoverable waste from landfills, combating misinformation and supporting the United Nations' Sustainable Development Goals. The Alliance brings together academics and leading organisations working in waste management, energy and sustainability.

- **ABREN (Brazilian Association for Energy Recovery from Waste)**
  ESWET's collaboration with ABREN gained momentum in 2023 and 2024, reflecting the growing recognition of WtE as a global solution for sustainable waste management. Through this partnership, ESWET extended its reach beyond Europe, exchanging expertise and promoting technology transfer. The two organisations worked together to demonstrate how WtE can address waste challenges in emerging economies while contributing to energy security and decarbonisation.

These collaborations reflect ESWET's commitment to fostering partnerships that drive progress and innovation in the WtE industry. By working with a diverse range of stakeholders across Europe and internationally, ESWET continues to promote sustainable waste management practices and contributes to EU climate and energy goals.

European Suppliers of Waste-to-Energy Technology

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