ESWET contribution to the call for evidence on the certification of carbon removals

ESWET – the European Suppliers of Waste-to-Energy Technology represents companies that have built and supplied over 95% of the Waste-to-Energy plants in operation in Europe. It seeks to promote the technology which, within the frame of the waste hierarchy, safely treats municipal non-recyclable waste that would otherwise end up in landfills (which are a significant source of methane emissions), and plays an essential hygienic role. Besides this mission in pollution prevention, Waste-to-Energy plants also recover energy by using non-recyclable waste as a resource, thus playing a **role in the circular economy**.[1]

ESWET welcomes the Commission's roadmap and would like to stress that supporting the implementation of CCUS in Waste-to-Energy (WtE) **could provide an opportunity for the WtE sector to contribute to the EU decarbonisation targets via carbon negative emissions.**

WtE plants represent a **local and reliable source of energy** that complements intermittent sources such as wind or solar. Plants in Europe generate enough electricity to supply almost 19 million people per year, and about 10% of the energy provided to district heating networks. In 2019, the generation of Waste-to-Energy was also equivalent to 13.8 billion m^3 of natural gas[2].

Policy recommendations

1. Clear legislative framework and standards with no contradiction with other decarbonisation regulations
2. Development of carbon storage capacity is a pre-requisite to the full-scale deployment of carbon capture and the effectiveness of carbon removals
3. Clear business case and financial incentive for removals of both fossil & biogenic CO_2 emissions as Waste-to-Energy plants emit both
4. Development of a transport network and infrastructure: Waste-to-Energy plants are not always located nearby storage or utilisation sites, and require access to a safe, reliable transport infrastructure
5. Access to public funding at EU and Member state level
6. Assessment of an end-of-waste status of CO_2 from Waste-to-Energy: captured CO_2 from waste streams should be on a level-playing field with CO_2 captured from any other sector
7. Avoidance of double counting: clear relation between the certification scheme and existing voluntary CCS schemes

[1] Communication on "the role of Waste-to-Energy in the circular economy", COM/2017/034 final, available here.
[2] CEWEP, Energy and climate factsheet, updated in March 2022 and available here.

Waste-to-Energy already acts as a carbon sink

Due to the composition of the non-recyclable waste treated, Waste-to-Energy plants emit two types of CO_2 emissions: fossil CO_2 (coming for instance from non-recyclable plastic), **and biogenic CO_2** (coming from biomass). Biogenic CO_2 is carbon that was originally present in the atmosphere, and for example taken up by trees and ending up in a WtE plant, as for example non-recyclable paper. When emitted, this CO_2 is considered as carbon neutral.

With CCS integrated in a WtE plant, this biogenic carbon can be captured and stored permanently, meaning that it becomes carbon negative.

Furthermore, CO_2 offsets need to be taken into account when considering the sector. Indeed, WtE mitigates GHG emissions by diverting waste from landfills, a significant source of methane emissions, and by recycling metals from incineration bottom ash[3].

According to the IEA, Waste-to-Energy acts as a carbon sink when considering its benefits in both energy and material recovery, and the integration of CCS could make even make the sector carbon negative.[4]

Waste-to-Energy can become carbon negative

As it is not an option to switch to an alternative fuel, which would mean to stop treating non-recyclable waste, carbon capture, storage and utilisation (CCUS) technologies are a key solution for the sector to significantly decarbonise, and can be successfully implemented in large-scale plants. As acknowledged by the IPCC's latest report[5], **the integration of Waste-to-Energy and CCS "could enable waste to be a net zero or even net negative emissions energy source".**

Moreover, in Europe, it has "the potential to capture about 60 to 70 million tons of carbon dioxides annually", half of those emissions being biogenic. The IPCC also recognises the necessity to use carbon removal in order to limit global warming to 1.5°C[6].

Projects in the Waste-to-Energy sector have been developing at a rapid pace over the last few years, and have proven that the technology works in this context, making its application mature. The Duiven plant in the

[3] From internal calculations based on this study, when taking into account all plants in Europe, there is a potential to recover almost 1.2 million tonnes of iron and 250,000 tonnes of aluminum per year.

[4] IEA GHG, *CCS on Waste to Energy*, (2020) p.6-7, available here.

[5] Intergovernmental Panel on Climate Change (IPCC). (2022). *Climate Change 2022: Mitigation of Climate Change.* Working Group III contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, p. 990. Available here.

[6] As pointed out by the Global CCS Institute in their report *Waste-to-Energy with CCS: A pathway to carbon-negative power generation* (2019), available here.

Netherlands can already capture up to 100,000 tons of CO_2 per year and sell it to nearby greenhouses to promote plant growth[7], while the plant in Twence is ready to start operations at the end of 2023[8]. Other projects are fairly advanced, such as the Klemetsrud plant, part of the Longship project supported by the Norwegian government[9], which will capture up 400,000 tons of CO_2 per year[10].

Another project at the Amager Bakke plant is planning to capture up to 500,000 tonnes per year by 2025[11]. In the UK, a recent Eunomia report highlighted how CCS implementation in Waste-to-Energy plants is cost-competitive, especially taking into account the prospect of negative emissions associated with the storage of biogenic CO_2, and could foster the national Net Zero strategy.[12]

Although those projects demonstrate the feasibility of integrating CCUS and the commitment of the Waste-to-Energy sector to contribute to the decarbonisation efforts in the EU, **many regulatory and financial obstacles remain and can hinder the successful implementation of CCUS**. A solid carbon removals certification (CRC) scheme absolutely is needed to incentivize CCS, but will also allow to facilitate the full CCUS value chain, including carbon storage and utilisation, and provide the framework for a viable business case for operators of WtE plants.

The need for clear regulation and standards

To ensure the economic viability of CCUS, including in the Waste-to-Energy sector but not only, a clear framework on removal standards is essential. Investments in projects require visibility and a clear view in the short term. Clear rules also contribute to incentivize the deployment of current technologies, and the development of storage capacities and a transport network, including by removing regulatory barriers

A clear **timeline on how CCUS can be fully deployed in Europe is necessary, with clear objectives within a realistic time frame**.

Utilisation of carbon will also depend on **removal standards, and the development of the recycled CO_2 market will rely on this certification scheme.**

[7] Newest-CCUS article (2022), "No time to waste: WtE operators in the Netherlands turn up the heat on decarbonisation", available here.
[8] Energy Digital article (2021), « Aker Carbon Capture to deliver carbon capture to Twence », available here.
[9] See for instance The Beauty in the Beast campaign (2021), "Oslo has the clue", article and video available here.
[10] "Fortum Oslo Varme and our carbon capture project", article available here.
[11] Press release from the ARC on the project (2021), available here.
[12] Eunomia (2021), commissioned by Viridor, *CCUS development pathway for the EfW sector*, available here.

A solid business case will avoid increasing the price of waste management and provide the right opportunity for willing operators and municipalities to invest in CCUS.

As there is already an existing decarbonisation legislative framework at EU level, it is crucial to avoid any contradiction with the (CRC) scheme. The Emissions Trading System (ETS), for instance, allows for the trading of carbon allowances, and could overlap with the CRC. However, the ETS and the CRC markets should remain distinct from each other.

Moreover, the current monitoring requirements for installations covered by the ETS do not fit with the specificities of Waste-to-Energy. Indeed, monitoring frequencies set by the ETS for the activity 'Municipal waste incineration'[13] (as applied in Sweden, for instance) are neither compatible nor viable for WtE plants.

A well-functioning CRC scheme requires clear rules and monitoring standards suitable to Waste-to-Energy and the variable nature of its feedstock, which is mixed non-recyclable waste. As the composition of municipal waste can change depending on various factors, the average share of 50% of fossil emissions and 50% of biogenic emissions[14] should be recognised as to not burden operators with lengthy administrative processes.

Double counting of emissions captured is also a risk, considering the current voluntary carbon markets. In this respect, consistency with other relevant pieces of EU legislation, in particular the ETS and the Renewable Energy Directive, is needed.

CCUS requires financial support

CCUS need to be made economically viable on all processes that have unpreventable CO_2 emissions, including Waste-to-Energy. Aside from a business case relying on the EU regulation, access to funding, such as the EU Innovation Fund or the ERDF, need to be open for the sector based on a technology-neutral approach. Investments in the integration of carbon capture technologies in WtE will benefit to the community as plants play a role in hygienisation and contrary to other economic sectors, are not at risk at being relocated in third countries outside of Europe.

[13] According to Article 35, Implementing regulation 2018/2066, operators shall apply minimum frequencies for fuels and materials "every 5,000 tonnes of waste and at least four times a year", which for an average plant would result in one every 8 days. As municipal waste incineration is already covered by the ETS for a few Member states, a plant in Sweden tried to follow this guideline, however it took already three days to make the analysis.

[14] According to a recent study from the French agency ADEME, *Détermination des contenus biogène et fossile des ordures ménagères résiduelles et d'un CSR, à partir d'une analyse 14c du CO_2 des gaz de post-combustion*, available here (FR).

More support is also needed to **develop carbon storage capacities**, a pre-requisite to the full-scale deployment of carbon capture and the effectiveness of carbon removals. As Waste-to-Energy plants are not always located nearby storage sites, access to a safe, **reliable transport infrastructure is crucial**. However, this network is still under development, and investments will be necessary in the EU, including for CCUS hubs to achieve economies of scale.

Carbon utilisation cannot be overlooked

Scaling up carbon removals will require to either store CO_2 in geological formations, or utilise it in products or fuels. While the EU already provides rules on carbon storage[15], **there is a lack of standards and regulation on carbon utilisation**. As recognised by the Commission in the Sustainable Carbon Cycles Communication, captured CO_2 will need to be used as a "feedstock for the production of fuels, chemicals and materials that still require carbon"[16]. Waste-to-Energy plants can provide recycled carbon, to be used in chemical processes.

Like any other carbon, CO_2 from waste streams is safe and can be used in any other industry, such as greenhouses. The application of **an end-of-waste criterion[17] to carbon captured from Waste-to-Energy plants** will facilitate its utilisation by classifying it as a product, and should be considered in upcoming regulation following the CRC.

In short

While **Waste-to-Energy already acts as a carbon sink**, CCUS can allow large-scale plants in Europe to become carbon negative, and significantly contribute to the decarbonisation objective. However, **a clear regulatory framework on carbon removals certification is needed to incentivize the uptake of CCUS technologies**. Beyond the certification of removals, **access to funding**, **clarification on end-of-waste status for CO_2 from waste** and standards adapted to the **specificities of Waste-to-Energy** are necessary to ensure the successful implementation of CCUS.

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[15] See Directive 2009/31 on the geological storage of carbon dioxide, available here.
[16] "Sustainable carbon cycles" COM (2021)/800 final, available here.
[17] For instance, carbon captured from the Duiven plant in the Netherlands was given the end-of-waste status in March 2022, see press release here (DE).