

ZERO WASTE EUROPE

The missing carbon price signal

How free allocation could blunt the EU ETS signal for incineration

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Executive summary

The European Commission has proposed to bring municipal waste incineration into the EU Emissions Trading System, EU ETS, from 2031, as part of its broader ETS review package published on 17 July 2026. This is an important milestone: for the first time, burning municipal waste will carry a carbon price, extending the polluter-pays principle to the fossil CO_2 released when plastics and other fossil-based materials are combusted.

However, two design features of the proposal substantially reduce the effectiveness of that price signal:

- a gradual phase-in of the EU ETS surrender obligation, meaning that operators must pay for an increasing share of their verified emissions, from 25% in 2031 to 100% in 2034;
- eligibility for free allocation of emission allowances for waste-to-energy plants that supply district heating, allowances that are only phased out gradually, disappearing completely in 2040, six years after operators start paying the full carbon price.

Around 60% of European waste-to-energy plants operate in combined heat and power (CHP) mode, supplying district heating networks[1]. Under the Commission's proposal, these plants remain eligible for free allowances calculated against the EU ETS heat benchmark. Free allocation to district heating would decrease by equal amounts after 2030, reaching zero in 2040. For illustrative purposes, this brief models this as a linear phase-out of the applicable free-allocation factor, from 90% in 2031 to 80% in 2032, 70% in 2033 and 60% in 2034. The actual number of allowances received by an installation may also vary with benchmark values and eligible activity levels.

This brief develops a transparent, illustrative model of the effective ETS cost per tonne of waste faced by three representative plant archetypes: an electricity-only plant, an average Combined Heat and Power (CHP) plant, and a high-heat CHP plant, between 2031 and 2034. The calculation of free allocation for municipal waste incineration installations under the provisions on district heating is proportional to the effective carbon cost exposure of those installations, corresponding to the share of the surrender obligation during the phase-in period. The model therefore combines the incineration-specific phase-in with the gradual 2030-2040 phase-out of district-heating free allocation. In practice, this means that as the share of emissions for which plants must surrender ETS allowances increases, the amount of free allocation available to eligible CHP plants decreases, allowing the model to estimate the resulting effective ETS cost over the phase-in period.

[1] CEWEP (2022), *Waste-to-Energy Climate Roadmap*.

The central finding is that the combination of these two mechanisms produces a particularly weak carbon price signal in the early years. At an illustrative EU Allowance (EUA) price of €80/tCO_2 and using the Commission's fossil emission factor of 0.50 tCO_2 per tonne of waste, an electricity-only plant would face an ETS cost of €10/t of waste in 2031. An average CHP plant would face around €7.5/t, while a high-heat CHP plant would face only around €5.8/t.

By 2034, when incinerators reach the full surrender obligation, district-heating free allocation would still stand at 60% of its 2030 level. The model estimates an effective ETS cost of around €40/t for an electricity-only plant, €33/t for an average CHP plant and €29/t for a high-heat CHP plant.

The difference matters for investment decisions. Secondary sorting of residual waste is estimated to cost around €39-50 per tonne of waste treated. Electricity-only plants would approach this level only once the phase-in is complete. CHP plants would remain substantially below it throughout the phase-in, particularly those exporting large volumes of heat.

Zero Waste Europe welcomes the inclusion of municipal waste incineration in the EU ETS as a necessary and overdue step. But as currently designed, the proposal risks reinforcing rather than correcting Europe's estimated 60 million tonnes of excess incineration capacity, and delaying investment in secondary sorting of residual waste, plastics removal and higher recycling rates precisely where the carbon price is meant to bite hardest.

The Commission proposal: an important first step

On 17 July 2026, the European Commission published[2] its proposal to extend the EU ETS to non-hazardous waste incineration and co-incineration installations with a capacity above 3 tonnes of waste per hour, a threshold that effectively captures municipal-scale waste-to-energy plants in the EU.

The surrender obligation, i.e. the share of verified emissions for which operators must hold and surrender allowances, is phased in gradually:

Table 1. Phase-in of the surrender obligation for municipal waste incineration under COM(2026) 616.

YEAR	SHARE OF VERIFIED EMISSIONS TO BE SURRENDERED
2031	25%
2032	50%
2033	75%
2034 onwards	100%

The proposed start date of 2031 is **four years later than the 2028 date foreseen under the current ETS Directive's review clause**. The proposal also allows Member States to seek a national opt-out if they can demonstrate that they already apply "equivalent measures". In practice, this means meeting at least two of three conditions: a national carbon tax covering waste incineration that is higher than the average EU ETS auction price for the relevant year (taking into account the gradual phase-in); being on track to meet the EU municipal waste recycling targets of 60% by 2030 and 65% by 2035; or being on track to meet the EU landfill target of no more than 10% of municipal waste landfilled by 2035.

[2] EUR-LEX (2026), *Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Directive 2003/87/EC and Decision (EU) 2015/1814 as regards driving competitiveness and cost-effective decarbonisation*.

In addition, installations in the EU's outermost regions would benefit from a separate exemption until the end of 2035.

Why the carbon price matters

When municipal waste is burned, most of its climate impact comes from fossil-based materials, mainly plastics, rather than from food, paper or other organic waste, which are treated as carbon-neutral under EU rules. Depending on what is actually in the waste, published estimates put this "fossil share" at somewhere between 0.4 and 0.7 tonnes of CO_2 for every tonne of waste burned; this brief uses 0.5 tonnes, which is the same figure the European Commission uses in its impact assessment[3].

At EUA prices of around €80 per tonne of CO_2, broadly where the market has traded through July 2026, this translates into a theoretical ETS cost of roughly €40 per tonne of waste once the phase-in is complete and no free allocation applies.

A carbon cost of this order begins to change investment decisions. Secondary sorting of residual waste, that is, mechanically sorting recyclables and fossil plastics out of residual waste immediately before it is incinerated, is estimated to cost in the area of €39–50 per tonne of waste treated[4]. A carbon price of €40/t therefore falls within the range at which investment into sorting becomes commercially rational purely on the basis of avoided ETS costs, before counting the additional value of recovered recyclables.

It is worth making clear, however, that secondary sorting is one of the more expensive ways to reduce the fossil carbon content of waste sent for incineration. Improving separation at the kerbside, through door-to-door collection and using existing collection vehicles and crews rather than new sorting infrastructure, can require little to no additional cost. Waste prevention and re-use avoid both treatment and carbon costs entirely, since the waste is never generated in the first place. Secondary sorting remains important because it can recover material that source separation misses, but this evidence suggests it should be seen as a costlier, complementary tool rather than the default response to a stronger carbon price signal.

This is the basic logic of carbon pricing: it rewards the lowest-cost emission reductions first, and its effectiveness depends on operators actually facing a price close to the full cost. **The question this brief investigates is how much of that "theoretical" €40/t operators will actually pay.**

[3] European Commission (2026), Impact Assessment Report accompanying the proposals for the revision of the EU ETS, *SWD(2026) 616 final*, Annex 13, Section 1.3, 17 July 2026.
[4] Equanimator (2023), *Nothing left behind: modelling Material Recovery and Biological Treatment's contribution to resource recovery and fighting climate change*.

Why the proposal weakens the investment signal

Gradual implementation

The phased introduction of incinerators into the EU ETS delays the full carbon cost until 2034. Between 2031 and 2033, operators will face only part of the carbon cost of their emissions.

At an illustrative EUA price of €80/tCO_2 and a fossil emission factor of 0.50 tCO_2 per tonne of waste, the gross ETS cost increases as follows:

Table 2. Illustrative ETS cost per tonne of waste, 2031–2034

YEAR	GROSS ETS COST PER TONNE OF WASTE
2031	€10
2032	€20
2033	€30
2034 onwards	€40

This weakens the investment signal during a period when operators could otherwise be planning investments in sorting and plastics-removal infrastructure ahead of the full carbon price taking effect in 2034.

Free allocation for district heating

The second design feature is that waste-to-energy installations supplying district heating would remain eligible for free allowances under the proposal, based on the EU ETS heat benchmark.

The Commission proposal amends Article 10b(4) to provide that:

Free allocation to district heating shall decrease by equal amounts after 2030 so as to reach a level of no free allocation in 2040.

The proposal, therefore, establishes a gradual phase-out of free allocation for district heating from 2031 to 2040. For the purposes of this illustrative model, "decrease by equal amounts" is interpreted as a linear reduction in the applicable free-allocation factor over the ten-year period:

Table 3. Illustrative linear phase-out factors used in this model, based on the proposal that free allocation to district heating should decrease by equal amounts after 2030 and reach zero in 2040.

YEAR	ILLUSTRATIVE FREE-ALLOCATION FACTOR USED IN THE MODEL
2030	100%
2031	90%
2032	80%
2033	70%
2034	60%
2035	50%
2036	40%
2037	30%
2038	20%
2039	10%
2040	0%

These percentages should not be interpreted to mean that an installation will necessarily receive exactly 90%, 80%, 70% or 60% of the number of allowances it received in 2030. The actual allocation in each period will also depend on the applicable benchmark values and eligible activity levels. The factors are used here solely to illustrate the effect of the proposed linear phase-out on the benchmark-based allocation.

Around 60% of European waste-to-energy plants operate in CHP mode, supplying district heating networks. For these plants, free allocation will reduce the effective carbon price relative to the nominal EUA price throughout the incineration phase-in and beyond it.

The timing is particularly important. Municipal waste incinerators would reach their full surrender obligation in 2034, **while the modelled district-heating free-allocation factor would still stand at 60% of its 2030 starting level**. Free allocation would then continue to decline until reaching zero in 2040.

Unlike the industrial sectors for which free allocation was originally designed, municipal waste incineration is a local public service. It does not compete internationally in the way that steel, cement or chemicals production does, and is not exposed to carbon leakage in the same way; waste cannot simply be imported from a lower-carbon-cost jurisdiction to be burned elsewhere. The rationale for extending free allocation to this sector is therefore considerably weaker than for a genuinely trade-exposed industry.

It is worth being precise about how free allocation applies within a single plant. Electricity generation is not itself eligible for free allocation under the EU ETS. Only eligible heat output can be covered by free allocation, calculated against the applicable heat benchmark. This means that an electricity-only plant faces the full phased-in carbon price, while a CHP plant's effective cost is reduced according to the amount of eligible heat it exports.

During the municipal waste incineration phase-in, the calculation of free allocation for MWI installations under the provisions on district heating is proportionate to the effective carbon cost exposure of those installations, corresponding to the share of the surrender obligation applicable in a given year.

The result is that CHP plants benefit from two mechanisms that reduce their exposure to the nominal carbon price during the early years: the gradual increase in the surrender obligation and the continued availability of district-heating free allocation.

Quantifying the effective carbon price: an illustrative model

To assess how much of the nominal theoretical carbon price incinerators will actually face, we model the effective ETS cost per tonne of waste for three representative plant archetypes, combining:

- the phase-in of the surrender obligation for municipal waste incineration; and
- the gradual phase-out of district-heating free allocation between 2030 and 2040.

Method and assumptions

The model is illustrative rather than a plant-by-plant empirical estimate. It uses representative parameters drawn from published EU ETS rules and sector-level performance data, set out transparently below so that the underlying assumptions can be checked, challenged and refined with better data as it becomes available.

Table 4. Representative parameters used in the effective ETS cost model. Heat export figures are illustrative plant archetypes, not EU-wide averages.

PARAMETER	VALUE USED AND SOURCE
EUA price	€80/tCO_2, representative of ICE EUA prices through July 2026
Fossil emission factor	0.50 tCO_2 fossil/tonne waste, following the Commission's impact assessment
Heat benchmark	31.2 tCO_2/TJ, 0.0312 tCO_2/GJ, the EU ETS heat fallback benchmark adopted for 2026-2030, used here as a proxy pending publication of the benchmark applicable from 2031
Electricity-only plant	0 GJ heat exported per tonne of waste, therefore, no heat-based free allocation
Average CHP plant	c. 4.5 GJ heat exported per tonne of waste
High-heat CHP plant	c. 7.5 GJ heat exported per tonne of waste, representative of well-integrated district-heating schemes
Incineration surrender obligation	25% in 2031, 50% in 2032, 75% in 2033 and 100% from 2034

PARAMETER	VALUE USED AND SOURCE
District-heating free-allocation phase-out	The proposal requires free allocation to district heating to decrease by equal amounts after 2030 and reach zero in 2040. For illustrative purposes, the model applies a linear free-allocation factor of 90% in 2031, 80% in 2032, 70% in 2033 and 60% in 2034. These are modelling factors applied to the benchmark-based allocation, not predictions of the actual number of allowances received compared with 2030.
Proration during the incineration phase-in	Free allocation for MWI installations is proportionate to effective carbon cost exposure, corresponding to the applicable share of the surrender obligation

Two mechanisms combine to determine the effective cost. First, the surrender obligation applies to an installation's verified emissions and increases from 25% in 2031 to 100% in 2034. Second, eligible district-heating output is allocated free of charge based on the applicable heat benchmark. The Commission proposal requires this free allocation to decrease by equal amounts after 2030 and reach zero in 2040. For the purposes of this illustrative model, this is represented by a linear reduction in the applicable free-allocation factor, from 90% in 2031 to 60% in 2034.

During the municipal waste incineration phase-in, the calculation of free allocation is also proportionate to the installation's effective carbon cost exposure, corresponding to the applicable share of the surrender obligation.

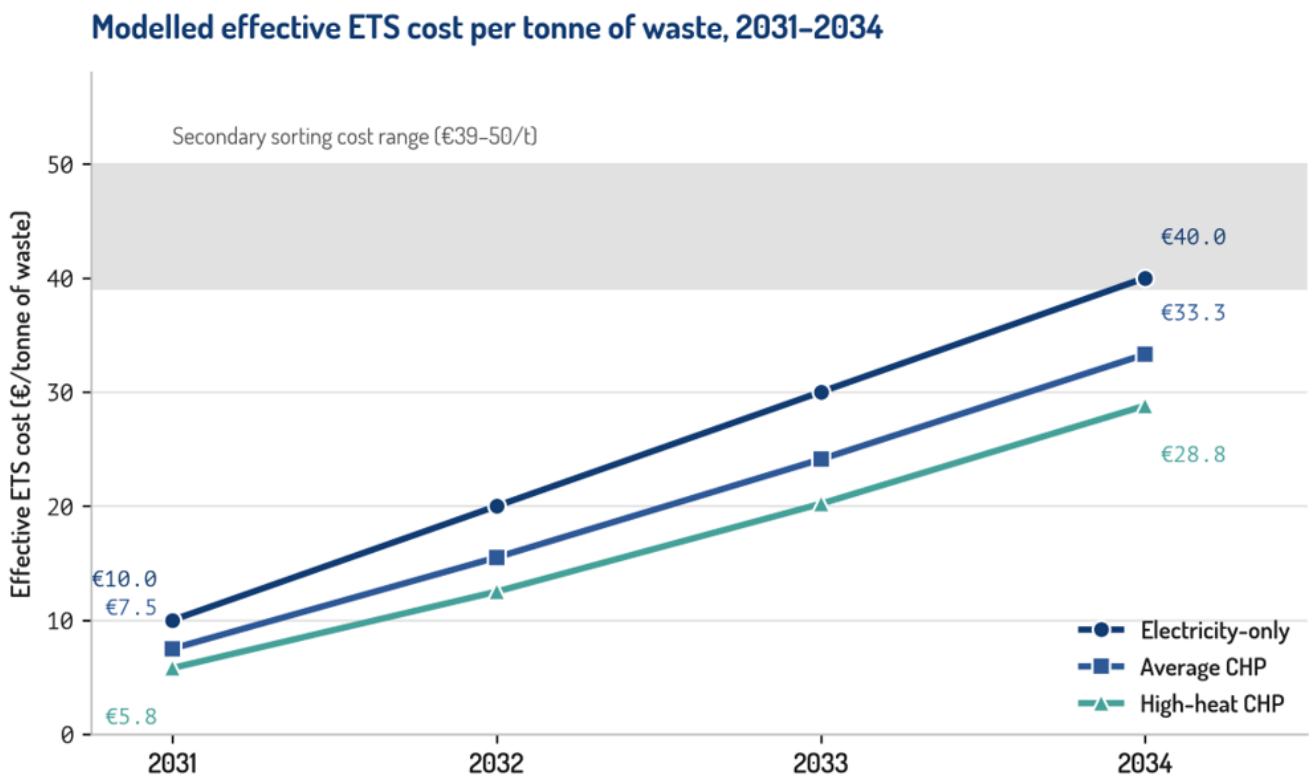
The model therefore applies both the municipal waste incineration phase-in and the illustrative district-heating phase-out factor to the benchmark-based allocation. The resulting figures are indicative and will depend in practice on the benchmark values applicable to the 2031-2035 allocation period, eligible heat output and other installation-specific factors.

Results

Figure 1 shows the resulting effective ETS cost per tonne of waste for each archetype, against the reference range for secondary sorting of residual waste costs.

Figure 1. Modelled effective ETS cost per tonne of waste input, 2031-2034, at an illustrative EUA price of €80/tCO$_2$. The model combines the municipal waste

incineration surrender-obligation phase-in with the proposed gradual phase-out of district-heating free allocation. Grey band: estimated cost range of secondary sorting of residual waste.



Three findings stand out.

- **Electricity-only plants** face the full phased-in carbon price, rising from €10/t in 2031 to €40/t in 2034. Only once the phase-in is complete does their carbon cost reach the range estimated for secondary sorting of residual waste.
- **Average CHP plants** face a substantially lower effective cost, rising from approximately **€7.5/t in 2031** to **€15.5/t in 2032**, **€24.1/t in 2033** and around **€33.3/t in 2034**. Even when the surrender obligation reaches 100%, the continued availability of 60% of the 2030 district-heating free-allocation level keeps the effective cost below the estimated €39–50/t cost range for secondary sorting.
- **High-heat CHP plants** benefit most. Their effective ETS cost rises from only approximately **€5.8/t in 2031** to **€12.5/t in 2032**, **€20.2/t in 2033** and around **€28.8/t in 2034**.

The early years are particularly striking. At an EUA price of €80/tCO_2, the full theoretical carbon cost associated with the fossil emissions of one tonne of waste is €40. **Yet a high-heat CHP plant is modelled to face an effective cost of less than €6/t in 2031.**

Table 5. Modelled effective ETS cost per tonne of waste, at an illustrative EUA price of €80/tCO2.

YEAR	ELECTRICITY-ONLY	AVERAGE CHP	HIGH-HEAT CHP
2031	€10.0	€7.5	€5.8
2032	€20.0	€15.5	€12.5
2033	€30.0	€24.1	€20.2
2034	€40.0	€33.3	€28.8

In other words, CHP plants are modelled to face a substantially weaker carbon price signal than electricity-only incinerators throughout the phase-in. The difference is largest for installations exporting large volumes of heat to district-heating networks.

The phase-in is not the only reason for the weak signal. By 2034, when incinerators reach the full surrender obligation, the model still applies a 60% free-allocation phase-out factor to the benchmark-based district-heating allocation. The actual number of allowances received will depend on the benchmark and the eligible activity level applicable at that time.

What municipalities can do: evidence on cost-effective interventions

Secondary sorting of residual waste is one way municipalities can reduce their exposure to ETS costs, but it is not the only option, and often not the first or most cost-effective one. Useful evidence comes from the UK national emissions trading scheme, which is also being extended to energy-from-waste from 2028. A 2025 industry study[5], based on a dataset of 30 million waste composition records, models how local authorities' carbon exposure can be reduced and by how much.

That scheme differs from the EU proposal in one important respect: it currently has no free allocation, meaning that operators are expected to face the full carbon cost from the start. The findings, therefore, provide a useful indication of what municipalities and waste operators can achieve when the carbon price creates a clear financial incentive to reduce the amount of fossil carbon sent to incineration.

The findings broadly follow the waste hierarchy, and importantly, they do not depend on new technologies:

- Waste prevention and re-use avoid the carbon cost entirely, because the waste is never sent for treatment. The study found these to be the highest-value interventions per tonne, avoiding both treatment and carbon cost.
- Improving kerbside (door-to-door) collection and recycling was found to be the most cost-effective option for many local authorities. It can be done using existing collection vehicles and crews, without building new infrastructure. In the model, local authorities could offset 37–56% of their additional ETS costs through better recycling capture and quality, with the greatest potential in areas starting from lower recycling rates.
- Reducing residual waste collection frequency or bin capacity could reduce residual waste by up to 6% on its own. This can simultaneously save collection, treatment and carbon costs, while freeing up resources for further waste prevention and recycling measures.
- Recovering recyclables at civic amenity sites provides another opportunity beyond kerbside collection. An audit of "black bag" waste brought to household waste recycling centres found that 58% was potentially recyclable. A comparable programme run by a regional waste authority was estimated to generate around €345,000 in annual net savings for an additional operating cost of only €41,000, largely by using existing staff to help residents sort their waste correctly.

[5] Suez (2025), *Strategic approaches to minimising emissions trading scheme costs for waste producers*.

- Targeting materials with high fossil carbon content can deliver particularly large carbon savings. These include plastics and plastic packaging, waste electrical and electronic equipment (WEEE), synthetic textiles and absorbent hygiene products. The modelling found that textiles alone contained 60–70% fossil carbon, making them a particularly important target once kerbside collection has been improved.
- Secondary sorting of residual waste can also play a role, particularly in difficult situations such as high-density housing, where participation in separate collection is low. However, the modelling found it generally less cost-effective than separating materials at source, partly because contaminated materials recovered from residual waste have lower quality and market value.
- Acting early increases the benefits. Savings achieved while the carbon price is still relatively low can be reinvested in further waste prevention and recycling measures before the cost of incineration rises. Delaying action reduces the time available for these investments to pay back.

These measures are not dependent on the specific design of a particular emissions trading scheme. They work by reducing the amount of fossil carbon that is ultimately sent for incineration, thereby reducing ETS exposure regardless of the phase-in or free allocation rules.

For EU municipalities, this provides a set of practical measures that can be implemented alongside secondary sorting to reduce exposure to the ETS costs modelled in Section 4. They also underline an important point: a stronger carbon price should encourage municipalities to reduce and better sort residual waste, rather than simply make incineration more expensive.

Implications for district heating and decarbonisation

Carbon pricing is intended to change behaviour, but investment decisions depend on the price actually faced by the emitter, not the nominal EUA price. The results show that the early investment signal could be particularly weak. In 2031, a high-heat CHP plant is modelled to face an effective ETS cost of less than €6 per tonne of waste, despite a nominal carbon price equivalent to €40 per tonne once fully exposed.

Even in 2034, when municipal waste incinerators reach the full surrender obligation, continued benchmark-based district-heating free allocation, modelled here using a 60% phase-out factor, keeps the effective ETS cost for CHP plants substantially below the nominal carbon price.

If the effective ETS cost remains well below the cost of available abatement measures, **operators are less likely to invest in secondary sorting of residual waste, removal of fossil plastics, and higher recycling rates**. They may instead treat the ETS as a relatively modest operating cost.

The same dynamic can distort competition in the heating sector. Renewable and low-carbon heat technologies, such as geothermal energy, recovered industrial waste heat and large-scale heat pumps, must compete for district-heating market share against incinerator heat, which continues to benefit from free allowances. Reducing the effective carbon cost of incinerator heat relative to these alternatives risks slowing investment in cleaner district-heating infrastructure at exactly the moment the EU is trying to accelerate it.

The proposed gradual phase-out until 2040 does eventually remove this advantage, but the timing matters. Investment decisions about district-heating infrastructure made in the early and mid-2030s can lock in assets for decades.

A risk of reinforcing overcapacity

This carbon price question comes on top of an already over-built incineration system. Zero Waste Europe's assessment estimates around 60 million tonnes of excess municipal waste incineration capacity across the EU.[6] This does not include facilities that are currently planned or under construction, which could bring the total to more than 70 million tonnes.

[6] Equanimator (2023), *Enough is enough: The case for a moratorium on incineration*.

A weak carbon price signal risks keeping existing incinerators economically viable for longer, reducing the incentive to invest in better waste management options such as prevention, reuse, recycling and further sorting. **It could also lock in excess incineration capacity that will need to be fed with waste well into the 2030s and 2040s, making it harder for the EU to meet its recycling and waste prevention targets under the Circular Economy Act and the Waste Framework Directive.**

Policy recommendations

The Commission proposal is an important first step in recognising that waste incineration must be part of Europe's climate policy. Its effectiveness as an investment signal could be strengthened by:

- removing the gradual phase-in of the surrender obligation, so that the effective carbon price is not artificially suppressed in the early years of the scheme;
- ending free allocation for municipal waste incinerators supplying district heating by 2034 at the latest, when the sector reaches its full surrender obligation, rather than allowing the district-heating free-allocation regime to continue until 2040;
- directing EU ETS revenues from waste incineration towards waste prevention and re-use, kerbside recycling capture and quality, household waste recycling centre interception, separate collection of fossil-carbon-intensive streams such as textiles and WEEE, secondary sorting of residual waste infrastructure, and genuinely low-carbon district heating; and
- publishing the heat and fuel benchmark values applicable to waste incineration from 2031 as early as possible, so that operators, investors and civil society can assess the real strength of the price signal ahead of trilogue negotiations.

Zero Waste Europe (ZWE) is the European network of communities, local leaders, experts, and change agents working towards a better use of resources and the elimination of waste in our society. We advocate for sustainable systems; for the redesign of our relationship with resources; and for a global shift towards environmental justice, accelerating a just transition towards zero waste for the benefit of people and the planet. www.zerowasteeurope.eu

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