Department for Energy Security & Net Zero

# Analytical annex to the UK Emissions Trading Scheme (ETS) scope expansion: waste – Interim Authority Response

## Annex to an interim joint response of the UK Government, the Scottish Government, the Welsh Government and the Department of Agriculture, Environment and Rural Affairs for Northern Ireland

July 2025

# Contents

# Analytical Annex

*This annex provides background to the 'interim' Authority Response following the 2024 consultation on the expansion of the UK Emissions Trading Scheme (ETS) to the waste sector. The accompanying interim Authority Response to the consultation sets out a phasing-in period from 2026, prior to the full scheme expansion, where operators in the sector can voluntarily monitor, report and verify (MRV) their fossil carbon dioxide (CO2) emissions. This annex gives an overview of the evidence base underpinning those policy details laid out in the interim Authority Response, as well as an estimate of any cost associated. It is not intended to reflect the full evidence base on which decisions will be taken, nor the full evidence base on which proposals have been developed to date. It is not a formal impact assessment.*

*The Authority will produce a subsequent response to the 2024 consultation prior to expansion of the UK ETS to the sector. In this, the UK ETS Authority, hereafter 'the Authority', made up of the UK Government, Scottish Government, Welsh Government and the Department of Agriculture, Environment and Rural Affairs in Northern Ireland will set out impacts of combined proposals, considering the interaction of proposed options and overall scheme impacts. Where we identify specific risks of options, we will set out the actions we will take to appropriately mitigate any such impacts where it is necessary to do so.*

# Section 1: UK ETS Overview

## Characteristics of the UK ETS

1. To consider the context of scope expansion, this section sets out characteristics of the existing UK ETS.

### Scope/size of market

2. The UK ETS covers approximately 25% of UK territorial emissions based on the latest 2023 data[1]. The scheme covers the UK's power sector (not including Energy from Waste), energy-intensive industry, and emissions from domestic flights, flights from the UK to the European Economic Area (EEA), flights from GB to Switzerland, and flights between the UK and Gibraltar.
3. The UK ETS covers CO2 emissions for all activities with the addition of perfluorocarbons for aluminium production and nitrous oxide produced in the production of nitric, adipic, glyoxal and glyoxylic acid.
4. In 2023, the Authority signalled its intention[2] to expand the scope of the scheme to waste incineration by 2028, preceded by a phasing-in period where operators monitor, report and verify (MRV) their emissions without exposure to the carbon price. Upon full inclusion in the scheme, the sector would come under the UK ETS, capping a greater proportion of UK emissions to further contribute to delivering net zero and UK carbon reduction targets at lowest cost for industry. Further details will be confirmed in a subsequent Authority Response in due course.

### Emissions

5. In 2023, UK ETS-covered emissions amounted to 97 million tonnes of CO2 equivalent (MtCO2e) – of which stationary installations accounted for 88 MtCO2e and aircraft operators 9 MtCO2e. This represents a year-on-year decrease in UK ETS emissions of 13.9 mtCO2e since 2022, which was largely driven by a substantial decrease in power sector emissions from 48 MtCO2e in 2022 to 37 MtCO2e in 2023. This compares to total UK territorial emissions of 384 mtCO2e in 2023[3].

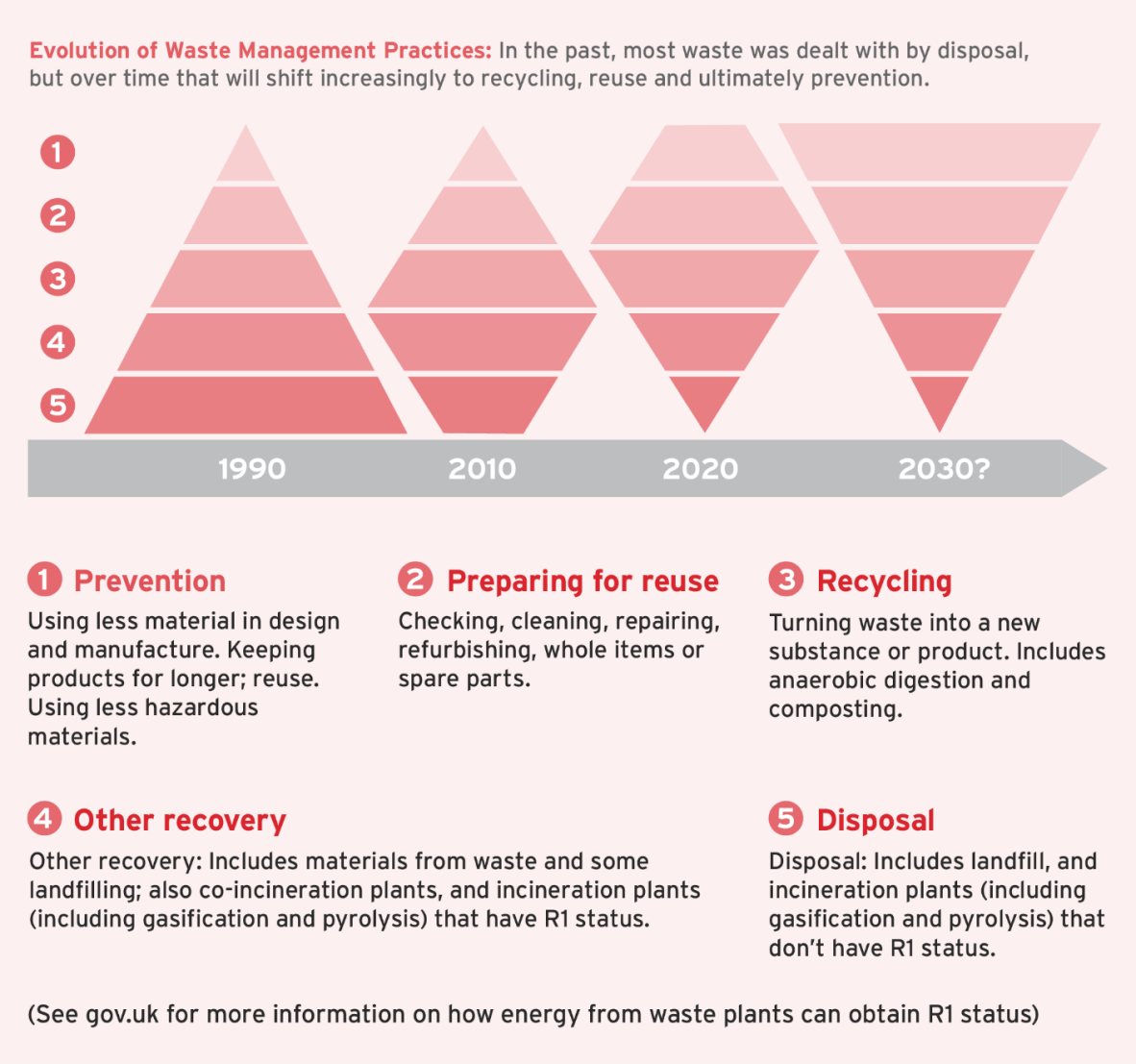
[1] DESNZ analysis based on DESNZ (2024), 'Provisional UK greenhouse gas emissions national statistics 2023', https://www.gov.uk/government/statistics/provisional-uk-greenhouse-gas-emissions-national-statistics-2023
[2] DESNZ, Welsh Government, The Scottish Government, and Department of Agriculture, Environment and Rural Affairs (Northern Ireland) (2023), 'Developing the UK Emissions Trading Scheme: main response', https://www.gov.uk/government/consultations/developing-the-uk-emissions-trading-scheme-uk-ets
[3] DESNZ analysis based on DESNZ (2024), 'Provisional UK greenhouse gas emissions national statistics 2023', https://www.gov.uk/government/statistics/provisional-uk-greenhouse-gas-emissions-national-statistics-2023

# Section 2: Energy from waste and waste incineration

## Overview

6. The waste regulations, introduced in varying forms across the four nations of the UK in 2011, provide for a "waste hierarchy". This hierarchy sets out the order of priority to apply to products and waste, giving top priority to waste prevention. When waste is created, it gives priority to preparing it for re-use, then recycling, then energy recovery, and lastly disposal (such as landfill and incineration where there is no energy recovery). The hierarchy is illustrated in figure 1 – note it is illustrative only and the changing structure of waste management should not be seen as indicative of government policy or of the true evolution of the sector.

**Figure 1: The waste hierarchy[4]**




[4] Defra (2021), 'Waste Management Plan for England 2021', https://www.gov.uk/government/publications/waste-management-plan-for-england-2021

7. Energy from Waste (EfW) refers to processes that recover energy from waste materials, most commonly through high-temperature incineration (>850°C) that generates heat or electricity. Other thermal treatment methods, such as gasification and pyrolysis can also be used to recover energy. In the waste hierarchy EfW is categorised as other recovery, whilst waste incineration without energy recovery is regarded as disposal. This is because it is a less efficient process given none of the potential energy byproducts are extracted from the waste.

## Rationale for expanding the UK ETS to the waste incineration sector

8. The rationale for UK ETS expansion to the waste incineration sector is to address negative externalities[5] associated with the emissions arising from the production and management of waste. In the absence of a carbon pricing mechanism, the negative externalities associated with carbon emissions from waste treatment are not reflected in the sector's market prices. As a result, these prices account only for the costs borne by operators, not the full environmental cost of emissions.
9. Emissions trading sets a clear cap on emissions and provides an enduring long-term price signal. This helps drive investment and innovation, giving the sector confidence in the future cost of carbon.
10. It is expected that waste incineration operators will pass through ETS costs to their customers, which include local authorities – their largest customers – and commercial and industrial firms. Passed-through ETS costs will alter the relative costs of the waste hierarchy for these customers, further making recycling, reuse, and prevention relatively cheaper options compared to EfW and waste incineration. This will likely incentivise reduction of fossil carbon content in the waste that customers send to incineration installations.
11. Commercial and industrial customers of EfW and waste incineration will be able to act on this incentive. They could change their procurement practices to reduce fossil waste, or improve their waste management practices, for example by increasing recycling. They may also pass costs onto their customers, incentivising decarbonisation elsewhere in the value chain. Unlike these firms, local authorities cannot directly influence their municipal waste stream, which is collected as an essential service, and have limited viable levers to pass on costs.
12. Stakeholder engagement has identified some decarbonisation activities that local authorities could adopt, namely awareness-building campaigns to promote waste management activities further up the waste hierarchy[6], introducing waste collection for different materials including recyclables, and utilising mixed waste sorting technology pre-incineration to extract recyclable materials. Some of these are already being addressed through Government policies, e.g., Simpler Recycling in England. However, whilst these levers, and their impacts, are likely to have some success, they are unlikely in isolation to

[5] Negative externalities are costs imposed on society or the environment by an activity that are not reflected in the market price.
[6] See section 2.

be able to decarbonise the entire residual waste stream, meaning local authorities will require support to manage passed-through ETS costs until effective decarbonisation pathways are established. This issue is discussed in more detail in Section 5.

13. The UK ETS will work alongside other government policies in the waste sector designed to change the composition of the waste stream. These include Extended Producer Responsibility[7] for packaging (pEPR) and a Deposit Returns Scheme[8] (DRS) for drinks containers.

## Rationale for an MRV-only period in the waste incineration sector

14. The UK ETS Authority proposes a voluntary monitoring, reporting and verification (MRV) only period for EfW and waste incineration installations beginning in 2026, before full inclusion within the UK ETS. This is a transitional phase, serving several key purposes.
    - Data collection and accuracy: The voluntary MRV-only period allows for the collection of emissions data from EfW and incineration installations. This data is crucial for future policy decisions and development (see below).
    - Operational Preparedness: Operators will gain time to develop and implement the necessary monitoring and reporting systems, ensuring a smooth transition to full compliance with UK ETS requirements once obligations begin.
    - Deployment of novel technologies: Inclusion of waste incineration in the UK ETS requires novel MRV approaches which should be tested. The voluntary MRV-only period will allow operators who are new to this type of monitoring to learn before they'd be subject to cost exposure. The sector also needs time to install carbon-14 monitoring equipment and develop capacity within specialist carbon-14 analytical laboratories.
    - Development of decarbonisation policies and pathways: In the 2024 technical consultation, the Authority committed to plan collectively for the implementation of UK ETS in the EfW and waste incineration sector by 2028, particularly focussing on fossil fuel derived wastes that do not currently have a decarbonisation pathway or a cost recovery mechanism. A voluntary MRV-only period allows for data collection to inform and refine policies and decisions made to support decarbonisation of residual waste streams, as well as the time to develop these policies.
15. Participation in the initial MRV-only period will be voluntary, to avoid overly burdensome requirements on the sector whilst still providing the necessary data for policy development.

[7] EPR is expected to allow customers of waste incineration operators to pass UK ETS costs back to the producers of packaging, thereby placing the incentive on packaging producers to reduce the fossil carbon content in their packaging products.

[8] The DRS will place a redeemable deposit on specific drinks containers that can be claimed when the item is returned to a collection point, incentivising recycling.

# Section 3: Scope of the scheme expansion

16. This section lays out relevant evidence associated with the scope of the UK ETS waste scheme expansion as detailed in the interim Authority Response document. It does not include any analysis of the costs or benefits associated with the proposed scope. This analysis will instead form part of the impact assessment accompanying a subsequent Authority Response to the consultation on UK ETS expansion to the waste incineration sector. To note, coverage and exemption decisions dictate the conditions of the voluntary MRV-only period for operators in the sector, and therefore the cost estimates presented in Section 4.

## Coverage

17. The interim Authority Response states that the UK ETS will apply to direct emissions from energy-from-waste and waste incineration processes. This includes advanced thermal treatments (ATT) and advanced conversion technologies (ACT), such as gasification- and pyrolysis-based processes, including where the outputs of these processes are combusted on-site, and where these processes are undertaken for the purposes of producing fuels, such as Sustainable Aviation Fuel (SAF).
18. These proposals only price fossil CO2 emissions, which are defined as substances derived from fossil fuels such as coal, oil and natural gas. In the context of waste incineration, this includes plastics, synthetic textiles and other petroleum-based products. Emissions from biogenic CO2 will not be priced under the UK ETS because they are considered 'short cycle' carbon. These emissions are naturally sequestered and would be released back into the atmosphere through natural decomposition anyway.

**Table 1: Number of UK EfW and incineration without recovery sites by permitted capacity, tonnage of waste per annum, 2024**

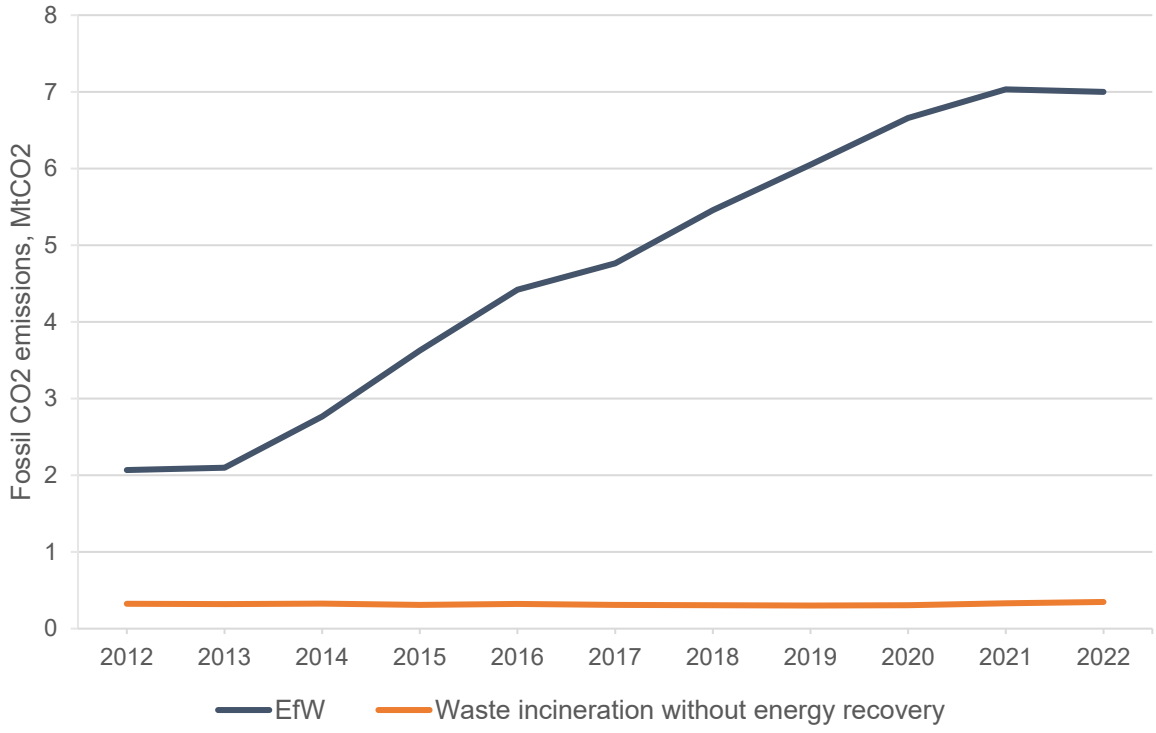
| Permitted capacity (tonnes of waste p.a.) | EfW installations | Incinerators without recovery |
|---|---|---|
| ≤ 25,000 | 0 | 19 |
| > 25,000 to ≤ 250,000 | 33 | 3 |
| > 250,000 to ≤ 500,000 | 20 | 0 |
| > 500,000 | 9 | 0 |
| **Total** | **62** | **22** |

Source: Internal DESNZ analysis, compiling data from Defra, Devolved Governments, and UK environmental regulators.

19. EfW is the largest component of the proposed additional scope of the UK ETS in the waste incineration sector, with 62 currently operational installations. A further 17 EfW installations are under construction, with 16 anticipated to be operational in 2026, and one in 2027. The waste incineration without recovery sub-sector, which includes installations that manage clinical and hazardous waste, makes up the remainder of the waste incineration sector covered in UK ETS scope expansion proposals. It comprises of 22 operational installations, 16 of which are clinical waste incinerators, and six of which are hazardous waste incinerators. There are no incinerators without recovery under construction.
20. The permitted capacity[9] of these installations – the maximum tonnage of waste they are permitted by regulators to process annually – varies significantly, especially amongst EfW installations. 19 incinerators without recovery have a capacity below 25,000 tonnes p.a. and only three have a capacity between 25,000 and 250,000 tonnes p.a. In contrast, there are no EfW installations with a capacity below 25,000 tonnes p.a., and over half have a capacity between 25,000 and 250,000 tonnes p.a. There are also several larger capacity EfW sites, with nine having a capacity over 500,000 tonnes p.a.
21. There are currently seven operational ATT and ACT sites within the EfW sub-sector, with an average capacity of 173,000 tonnes p.a. In 2024, EfW plants in the UK had an average capacity of 301,000 tonnes, while incinerators without recovery had an average capacity of 15,000 tonnes.

[9] Any further reference to capacity of installations refers to permitted capacity rather than maximum operational capacity.

**Figure 2: EfW and waste incineration without recovery fossil CO2 emissions, 2012-22**

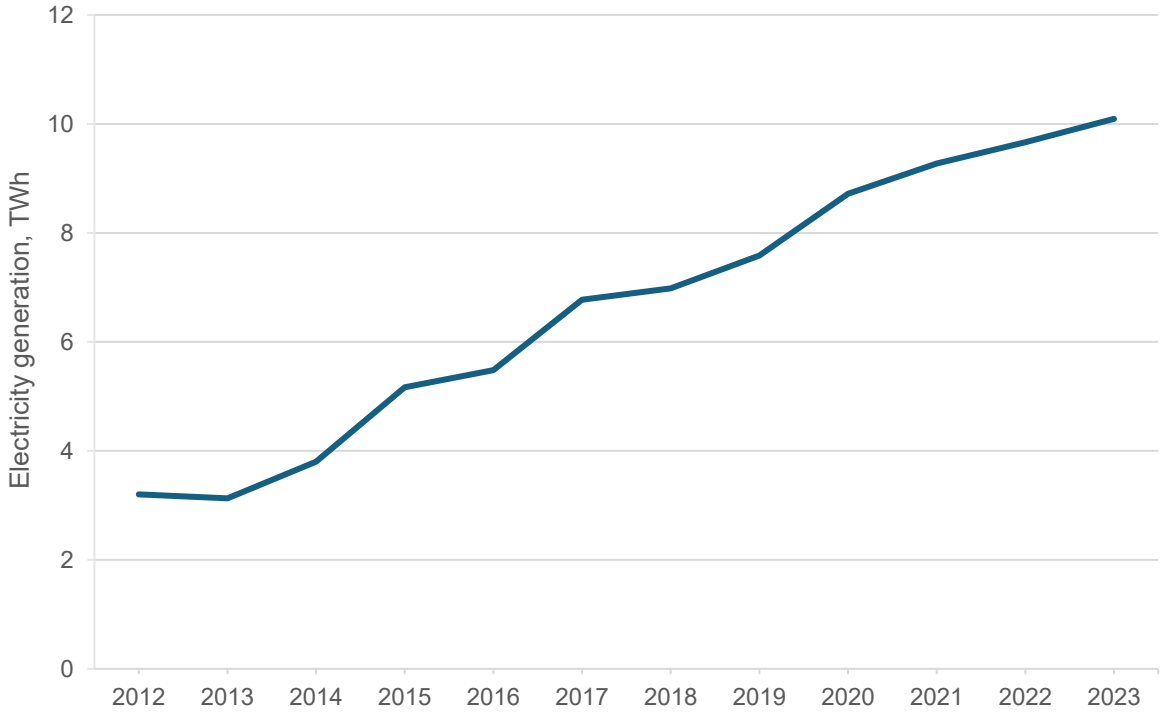



Source: Final UK greenhouse gas emissions statistics: 1990 to 2022[10]

22. From 2012 to 2021, there has been a steady increase in fossil CO2 emissions associated with EfW installations that would be within the scope of the UK ETS expansion to waste. Over the period, emissions increased from c.2Mt to c.7Mt. This has been driven by increased EfW plant deployment and the diversion of residual waste from landfill to EfW. These emissions appear to have stabilised in 2022; however, this may not indicate the end of growth, but rather a temporary pause in the broader trend. Annual fossil CO2 emissions from incineration without recovery remained relatively constant over the period.

[10]DESNZ (2024), 'Final UK greenhouse gas emissions statistics: 1990 to 2022', https://www.gov.uk/government/statistics/final-uk-greenhouse-gas-emissions-national-statistics-1990-to-2022

**Figure 3: Electricity generation from EfW, 2012-2023**




Source: Digest of UK Energy Statistics (DUKES): renewable sources of energy[11]

23. Electricity generation by these same installations has increased year on year since 2013, aligned with the increase in emissions in the sector over the same period. Again, this has primarily been driven by increasing deployment of EfW installations and the substitution of landfill for EfW. Between 2012 and 2023, EfW electricity generation increased from 3.2TWh to 10.1TWh.
24. As noted above, emissions from EfW remained stable between 2021 and 2022, while electricity generation continued to increase. This discrepancy could be due to several factors, including (but not limited to) improvements in plant efficiency, changes in the composition of residual waste — such as an increase in biogenic material — or updates to how emissions are measured and reported.
25. End use of the electricity generation in EfW plants is hard to identify and will vary depending on the operator. Some plants are connected to the grid; these enhance the UK's energy security by providing a stable and partially low-carbon electricity source and contributing to a more resilient and diversified energy mix. Some plants will also utilise energy produced on-site or supply it directly to nearby industries, an approach often part of a Combined Heat and Power (CHP) system.

[11] DESNZ (2024), 'Digest of UK Energy Statistics (DUKES): renewable sources of energy', https://www.gov.uk/government/statistics/renewable-sources-of-energy-chapter-6-digest-of-united-kingdom-energy-statistics-dukes

# Inclusion Threshold

26. The Authority is not intending to exempt installations under the usual UK ETS 20MW thermal input threshold, as the heterogeneous nature of waste feedstock means that the power output per tonne varies significantly, unlike other power generation sectors.
27. All installations that exceed a tonnage-based throughput threshold based on the Small Waste Incineration Plant (SWIP) threshold in the Environmental Permitting Regulation (EPR), will be included within the scope of the voluntary MRV-only period. On this basis, operators of waste incinerators and waste-to-fuel installations processing three tonnes an hour or more of non-hazardous waste, or 10 tonnes a day or more of hazardous waste, will be in scope[12].
28. Stakeholder engagement has indicated the costs of meeting broader permitting requirements for waste incineration can only be met with significant economies of scale, and there is therefore a limited risk of installations being built under the SWIP threshold to avoid ETS costs. As such, it is expected that none of the plants referenced above as being within scope of the UK ETS expansion to the waste sector would fall below the inclusion threshold. Different UK ETS inclusion thresholds for EfW installations versus the rest of the power sector could create competitive imbalances. If EfW operators are subject to a carbon price while similar operators in other power generation sectors are not, this could create a competitive disadvantage for EfW plants, and vice versa.
29. Despite these concerns, we expect that the risk of significant market distortion is unlikely. As referenced above, the economies of scale required to make EfW plants viable mean that smaller operators are less common in this sector. Therefore, the removal of the threshold addresses a potential regulatory issue without significantly impacting the sector.
30. The Authority will review the impact of this threshold on the UK incineration market and, if there is evidence of perverse incentives, market distortions, or gaming of the threshold, will consider adjustments.

# Hospitals and Small Emitters

31. For the purposes of the voluntary MRV only period, the Authority intends that the existing HSE/USE eligibility criteria of 25,000/2,500 tonnes fossil CO2 per year will apply to waste installations upon the inclusion of the waste sector in the UK ETS. These criteria refer to the annual tonnage of fossil CO2 emissions that an installation releases through the combustion and incineration of waste, which is distinct from the tonnage of waste processed referenced above.
32. Cost-benefit analysis accompanying the subsequent Authority Response will assess how reduced obligations under the HSE and USE schemes may affect the impacts of the UK ETS waste sector expansion.

[12] See the corresponding section of the interim Authority Response for more detail.

# Exemptions

33. Several factors influence the decision to exempt an incinerator type from the voluntary MRV-only period of the UK ETS:
    - **HSE and USE status**: If an incinerator type would wholly or mostly be eligible for HSE or USE status, then an exemption may not be necessary due to reduced cost exposure (see above).
    - **Limited decarbonisation options**: If there are no alternative treatment options available which shift waste higher up the waste hierarchy, or no feasible method to capture carbon, there may be a greater case for an exemption.
    - **Perverse incentives**: The risk of mislabelling or deliberate contamination in order to avoid ETS costs through exemptions.
    - **Export risk**: Whether there is an increased risk of waste being diverted to other countries.
34. It is worth noting that hazardous and clinical waste incinerators each make up less than 1% of total UK waste incinerator permitted capacity across the UK[13]. Any exemptions of such waste will not have a significant impact on emissions coverage associated with the UK ETS expansion to the waste sector.

## Clinical Waste

35. All specialist Clinical Waste Incinerators (CWIs) are expected to be eligible for USE or HSE status[14]. Operators in the USE scheme would not face any direct carbon pricing. Operators in the HSE scheme would be subject to emissions reduction targets applicable across the whole installation (not just the CWI).
36. Some clinical waste or clinical waste flock is treated at regular municipal waste incinerators and will be exposed to carbon pricing.
37. Some decarbonisation pathways do exist for clinical waste, with the primary decarbonisation option being to lower the volume of fossil waste sent for incineration by reducing the use of plastics and single-use items, and improved sorting. Furthermore, not all clinical waste is required to be incinerated.
38. High temperature CWIs have a high gate fee (the charge per tonne of waste disposed) relative to EfW installations. In 2023/24, the mean UK gate fee for waste sent to EfW installations was £117 per tonne (with a range of £66 to £189 per tonne)[15]. In contrast, NHS England[16] reported that the average price per tonne of managing clinical waste through high-temperature incineration was £617 in 2019/20.This indicates there will be little incentive for operators to contaminate or mislabel non-clinical health waste in order to be exempt from ETS costs.
39. Clinical waste is also likely to be at low risk of export. Most incinerators would be facing limited cost exposure from UK ETS due to HSE or USE status. Furthermore, exporting

[13] Internal DESNZ analysis compiling data from Defra, Devolved Governments, and UK environmental regulators.
[14] Internal DESNZ analysis. See section 4 for more detail.
[15] Waste and Resources Action Programme (WRAP) (2024), 'Gate Fees Report 2023/24', https://www.wrap.ngo/resources/report/uk-gate-fees-report-2023-24
[16] NHS England (2023), 'Appendices to the NHS Clinical Waste Strategy', https://www.england.nhs.uk/wp-content/uploads/2023/03/B2159ii-appendices-nhs-clinical-waste-strategy.pdf

waste would require establishing new supply chains, and healthcare waste is typically low density, increasing transport costs.

40. Given limited cost exposure associated with USE and HSE status, limited export risk, and the possibility of ETS inclusion to incentivise improved waste management, clinical waste incineration will be included within the scope of the voluntary MRV-only period. This will enable the Authority to better understand any potential impacts on the health sector, particularly through clinical waste incinerated at regular municipal waste incinerators and reassess if necessary.

### Hazardous Waste

41. Three of the six hazardous waste incinerators in the UK are projected to produce emissions above the HSE or USE threshold[17], meaning they would be subject to full UK ETS obligations.
42. For most hazardous waste there are no disposal options further up the waste hierarchy[18].
43. Given the cost exposure associated with hazardous waste without HSE or USE status, there may be a financial incentive to export hazardous waste. This is incentive is further heightened by the exemption of hazardous waste incinerators from the EU ETS MRV-only period from 2024[19]. It is worth noting, however, that exports of hazardous waste from the UK are permitted only for energy recovery[20], which could limit disposal options abroad.
44. Given the lack of commercially viable decarbonisation options, high-cost exposure, risks of misalignment with the EU and increased risk of export, hazardous waste will be exempt from UK ETS.
45. Persistent Organic Pollutants (POPs) will be included in the UK ETS voluntary MRV-only period.[21] However, concerns raised around exemption of this waste in the consultation have been noted and this position will remain under review during the voluntary MRV-only period, considering the risk of mislabelling and the development of robust methods to properly segregate POPs waste.

## Anticipated scheme scope under the proposed thresholds and exemptions

46. Under the thresholds and exemptions described above, the expected scope of the voluntary MRV-only period in 2026 for the UK ETS expansion to the waste incineration sector is as follows.

[17] Internal DESNZ analysis. See section 4 for more detail.
[18] Guidance on applying the waste hierarchy to hazardous waste - GOV.UK
[19] European Commission (2023), 'Guidance on Interpretation of Annex I of the EU ETS Directive (excl. aviation and maritime activities): Update Applicable from 2024, 19 December 2023', https://climate.ec.europa.eu/document/download/edc93136-82a0-482c-bf47-39ecaf13b318_en?filename=policy_ets_gd0_annex_i_euets_directive_en.pdf
[20] Waste: export and import - GOV.UK
[21] See corresponding section of the accompanying interim Authority Response for more detail.

**Table 2: Number of waste incineration installations in each UK nation expected to be in the main UK ETS or HSE/USE-eligible during the voluntary MRV-only period in 2026, based on projected annual fossil CO2 emissions (Mt CO2)**

| Nation | Main Scheme | HSE-eligible | USE-eligible |
|---|---|---|---|
| England | 56 | 13 | 7 |
| Scotland | 12 | 1 | 0 |
| Wales | 2 | 1 | 0 |
| Northern Ireland | 1 | 0 | 0 |
| **UK** | **71** | **15** | **7** |

Source: Internal DESNZ analysis, compiling data from Defra, Devolved Governments, and UK environmental regulators.

47. Out of the 93 total waste incineration installations in the UK, it is anticipated that 15 (16%) will be eligible for HSE status when the voluntary MRV-only period begins in 2026 – 6 EfW installations and 9 clinical waste incinerators. The remaining 7 clinical waste incinerators (8% of the total number of installations) are expected to be eligible for USE status. All but two of the 22 installations anticipated to be HSE or USE-eligible in 2026 are in England, with Wales and Scotland housing one each.
48. 71 EfW operators are projected to emit above the HSE threshold and therefore be subject to the main scheme. The majority (60) of these are in England, 12 are in Scotland, two in Wales, and one in Northern Ireland. It is important to note that the number of plants in each category depends on the tonnage of waste processed and the commissioning of new plants, or decommissioning of old plants, and is therefore subject to change.

# Section 4: Monitoring, Reporting and Verification (MRV) of Emissions

49. The Authority recognises the value of an MRV-only period for operators of incineration installations, their customers, and the broader waste supply chain. As such, there will be a voluntary MRV-only period before full cost exposure, beginning in January 2026.
50. As participation in the MRV-only period is voluntary, waste incineration operators face no mandatory costs during this period. For this analysis, full participation in the voluntary MRV-only period is assumed. Whilst actual uptake is uncertain, this assumption is justified for two reasons.
    - First, it is assumed a rational economic actor would participate, as doing so provides valuable emissions data, enabling operators to better understand future cost exposure and prepare accordingly.
    - Second, assuming full participation presents a conservative upper-bound estimate of costs to industry, ensuring potential financial impacts of the MRV-only period are not understated.
51. Future full scope expansion will bring additional costs due to the requirement for waste incineration operators to purchase UKAs to cover their emissions, which are likely to be much larger than their MRV costs. These costs will be considered in the impact assessment produced alongside the subsequent Authority Response for UK ETS scope expansion to the waste sector.

## MRV costs to operators

52. Main scheme waste incineration operators participating in the voluntary MRV-only period will be expected to monitor emissions using Continuous Emissions Monitoring Systems (CEMS) and equipment, with exceptions subject to regulatory approval[22]. CEMS measures the total CO2 emitted by the installation. Analysis can then determine the biogenic-fossil fuel content of the CO2 emissions from waste using the half-life of the carbon-14 isotope.
53. Evidence from Ricardo[23] published alongside the 2024 consultation indicated that CEMS and carbon-14 analysis would cost waste incineration operators between £30,000 and £80,000 per line to install and £10,000 to £20,000 to operate annually, with the analysis of each sample approximately costing between £400 and £650. The cost estimates below take the upper bound of the Ricardo estimates and assume that all main scheme operators undertake CEMS and carbon-14 monitoring, to present a reasonable maximum that operators are likely to face.
54. Operators who participate in the voluntary MRV-only period will also be subject to administrative costs. This includes costs associated with determining whether an

[22] See corresponding section of the interim Authority Response for more detail.
[23] Ricardo (2024), 'MRV options for inclusion of Energy from Waste plants and Waste Incinerators within the UK ETS. Project report and findings', https://www.gov.uk/government/publications/climate-services-for-a-net-zero-resilient-world/cs-n0w-overview

installation is in scope, storing and accessing information required to participate in the MRV-only period, and appointing verifiers to verify reported emissions. For main scheme operators participating in the voluntary MRV-only period in 2026, the central estimate of administrative costs is £18,100[24]. This is made up of £9,100 in one-off costs, and £9,000 in recurring annual costs. The corresponding cost estimate for HSE and USE operators is £6,500 in total – £5,800 of one-off costs and £760 of annual costs.

55. Therefore, CEMS and carbon-14 analysis will account for the majority of costs to the waste incineration sector during the voluntary MRV-only period, making up 90% of main scheme operators' estimated total one-off costs (£89,000), and 69% of their estimated total annual costs (£29,000). As HSE and USE operators will not be required to undertake CEMS and carbon-14 analysis during the voluntary MRV-only period, they are expected to face much lower overall costs. They will only be subject to the costs associated with administrative activities.

**Table 3: Estimated costs to the UK waste incineration sector over the voluntary MRV-only period in 2026, assuming all eligible operators opt to participate.**

| Nation | MRV and administrative costs (£, 2024 prices) | | |
|---|---|---|---|
| | One-off | Annual | Total for voluntary MRV-only period (2026) |
| England | £5.10m | £1.60m | £6.70m |
| Scotland | £1.10m | £0.35m | £1.40m |
| Wales | £0.18m | £0.06m | £0.24m |
| Northern Ireland | £0.09m | £0.03m | £0.12m |
| **UK** | **£6.40m** | **£2.10m** | **£8.50m** |

Source: Internal DESNZ analysis of the number of waste incineration installations expected to be eligible for voluntary MRV in 2026[25], and cost estimates from Ricardo[26] and DECC[27].

Note: Totals for the UK and the MRV-only period may not match the sum of corresponding figures due to rounding.

56. Table 3 presents the costs to the UK waste incineration sector associated if all operators in scope of the UK ETS expansion opted to participate in the voluntary MRV-period in 2026. The total cost to the sector across the UK would be an estimated £8.5m, which is made up of £6.4m in one-off setup costs, and £2.1m in annual costs. As noted above, main scheme operators face the majority of the total costs to the sector (c.98%), which is driven by the requirement to undertake CEMS and carbon-14 monitoring.

[24] Based on DESNZ analysis of DECC (2016) 'Assessment of costs to UK participants of compliance with Phase III of the EU emissions trading system', https://assets.publishing.service.gov.uk/media/5ccb1d40e5274a34eb6b991f/Cost_of_Compliance_Report.pdf. Estimates are illustrative, and costs may vary between operators. Figures are in 2024 prices.
[25] See Section 3.
[26] See footnote 23.
[27] See footnote 24.

57. Of the four nations, English operators face the bulk (c.79%) of the costs of the voluntary MRV-only period, as most the UK's waste incineration operators are located there (both main scheme and HSE/USE). Scottish installations expected to be operational in 2026 (all but one of which are main scheme) will bear an estimated £1.4m in costs, 17% of the total.
58. Stakeholder engagement and consultation responses have suggested that MRV costs will be minimal compared to operational costs and revenues of larger EfW operators. As noted in section 3, all clinical waste incinerators are expected to be eligible for HSE or USE status and will therefore face the relatively small costs detailed above.
59. Full ETS expansion will bring additional administrative costs, such as those associated with surrendering and trading of UKAs, and registration and subsistence fees paid to regulators.

### Non-Quantifiable MRV Costs

60. Additional costs arising from MRV and compliance activities will increase the overall costs to waste incineration operators, which may affect their competitiveness.
61. There may also be an indirect impact on the commercial and industrial sectors if operators pass through costs to other firms. This may also put upwards pressure on landfill costs to mitigate the risk of waste transference. In this case, commercial and industrial customers of waste incineration operators in the UK would face additional costs of waste disposal due to the additional MRV and administrative costs to operators, which could impact their competitiveness. However, as noted above, these MRV costs are relatively small. The potential impact on competitiveness is likely to be much greater when carbon pricing is introduced with full scheme expansion to the sector.

## Costs to Governments – Regulator fees

62. The voluntary MRV-only period will have full regulator engagement, with regulator costs funded by respective governments. Regulators charge fees for applications and annual subsistence. These fees differ across the four nations and depend on the scale of an installation's emissions.

**Table 4: UK ETS application and subsistence fees charged by regulators in the four UK nations**

| Nation | Application charge (£) | | Subsistence charge (£) | |
|---|---|---|---|---|
| | Category B (50-500kt CO2 p.a.) | Category A (25-50kt CO2 p.a.) | Category B (50-500kt CO2 p.a.) | Category A (25-50kt CO2 p.a.) |
| England | 720 | 720 | 2,300 | 2,300 |
| Scotland | 4,700 | 2,800 | 5,300 | 4,000 |
| Wales | 7,500 | 5,600 | 3,100 | 2,700 |
| Northern Ireland | 3,300 | 1,800 | 4,400 | 3,400 |

Source: Latest published or consulted on regulator charging schemes[28].

[28] England: https://consult.environment-agency.gov.uk/environment-and-business/ets/

Note: Category C (>500kt CO2 p.a.) charges omitted from the table, as no waste incineration operators are anticipated to fall into this category. HSE and USE charges are also omitted as HSE/USE status will be determined during the voluntary MRV-only period[29].

63. In all four UK nations, larger emitters pay higher fees. For all emissions categories, application fees are highest in Wales, whilst subsistence fees are highest in Scotland. Only the Environment Agency (the English regulator) has announced a charging scheme specific to waste incineration, with lower fees in the voluntary MRV-only period due to the removal of charges related to the UK ETS registry[30].

**Table 5: Maximum estimated regulator costs to governments in each UK nation during the voluntary MRV-only period in 2026.**

| Nation | Total regulator costs, 2024 prices (£) | | |
|---|---|---|---|
| | One-off | Subsistence | *Total* |
| England | 53,000 | 171,000 | *225,000* |
| Scotland | 54,000 | 61,000 | *115,000* |
| Wales | 21,000 | 8,000 | *29,000* |
| Northern Ireland | 2,000 | 3,000 | *5,000* |
| **UK** | **130,000** | **245,000** | ***374,000*** |

Source: Internal DESNZ analysis of environmental regulator charging schemes[31] and data from Defra, Devolved Governments, and UK environmental regulators.

Note: Totals for the UK and regulator costs may not match the sum of corresponding figures due to rounding.

64. If all eligible English operators signed up to the voluntary MRV-only period in 2026, DESNZ would have to cover an estimated c.£225,000 in regulator fees. In Scotland, the corresponding cost estimate is c.£115,000, in Wales it is c.£29,000, and in Northern Ireland it is c.£5,000.

Scotland: https://www.sepa.org.uk/media/kh0pswqe/charging-scheme-fees-2025-2026.xlsx
Wales: https://ymgynghori.cyfoethnaturiol.cymru/sroc/nrw-charge-consultation-2025-26/
Northern Ireland: https://www.daera-ni.gov.uk/articles/emissions-trading-schemes-fees-charges-and-civil-penalties

[29] See corresponding section of the interim Authority Response for more detail.
[30] Environment Agency charge proposals for April 2025, https://consult.environment-agency.gov.uk/environment-and-business/ets/supporting_documents/Consultation%20greenhouse%20gas%20emissions%20schemes%20FINAL.docx
[31] See footnote 26.

# Section 5: Further Analytical Considerations for the subsequent Scope Expansion Authority Response

65. While this interim Authority Response solely sets out the voluntary MRV-only period, a subsequent Authority Response will be published prior to introduction of ETS cost exposure in the UK waste incineration sector. This will be accompanied by a full impact assessment of the expansion, which will assess the following considerations:

## Emissions trajectory and cap adjustment

66. The 2024 consultation analytical annex provided initial analysis of the emissions trajectory in the waste sector out to 2030. It stated that further modelling would be undertaken to refine the trajectory, which will inform the adjustment to the overall scheme cap to reflect the additional waste incineration emissions brought into scope. This work is underway across the Authority, and the cap adjustment will be confirmed in the subsequent waste incineration scope expansion Authority Response.

## Emissions reductions, carbon prices, and wider environmental impacts

67. Expanding the UK ETS to the waste incineration sector has the potential to drive emissions reductions, although where this abatement occurs will depend on the carbon price and the relative cost of abatement. If abatement in the waste sector is relatively low-cost compared to other sectors already covered by the ETS, waste operators may reduce emissions rather than purchase allowances. However, if abatement is more expensive, the impact on emissions in the waste sector specifically may be more limited, particularly in the near term.
68. Changes to the carbon price resulting from inclusion of the waste incineration sector in the UK ETS could also influence the decarbonisation pathway of the existing traded sector. A higher price could incentivise additional abatement across the market, while a lower price may reduce the incentive. The subsequent Authority Response will assess these dynamics using modelling based on marginal abatement cost curves (MACCs), business-as-usual emissions, and the updated cap trajectory. Where possible, we will also consider broader environmental impacts.

## Local Authority and other customer impacts

69. As noted in the 2024 consultation analytical annex, qualifying change in law (QCiL) clauses in waste incineration installations' customer contracts may allow operators to pass UK ETS

costs to their customers[32]. Local authorities are the largest customers for waste incineration installations, but they currently have limited options to decarbonise their waste streams or pass through costs to waste producers. Therefore, we anticipate that local authorities would be exposed to a large share of the ETS costs in the waste incineration sector. In the 2024 technical consultation, the Authority committed to plan collectively for the implementation of UK ETS in this sector. This included a commitment to consider decarbonisation opportunities for fossil fuel derived wastes that do not currently have a decarbonisation pathway or a cost recovery mechanism. We will consider the findings of this work and the voluntary MRV-only period before confirming details for full inclusion.

70. The 2024 consultation analytical annex presented initial analysis of the potential ETS costs of waste incineration that local authorities across the four UK nations could face. It was acknowledged that further work is needed to refine the assumptions underpinning the cost estimates, and to incorporate the impact of upcoming policies from the UK Government and Devolved Governments, which are expected to affect the amount of waste being incinerated. We will work with relevant stakeholders to update our analysis to make more accurate predictions about the costs to local authorities and publish a full impact assessment alongside the subsequent Authority Response.
71. Commercial and industrial customers, which currently account for around 20% of waste sent to EfW, will also be affected by the expansion of the UK ETS. We will undergo further analysis before the subsequent Authority Response to better understand the impacts on businesses and to identify which sectors will be most exposed.

## Landfill and waste export risks

72. Expanding the UK ETS to the waste incineration sector will require operators to purchase UKAs to cover their emissions, which they are likely to pass onto their customers. By increasing the relative price of waste incineration, this risks the diversion of waste to landfill, or the export of waste after further processing into refuse derived fuel (RDF) and solid recovered fuel (SRF).

### Landfill

73. The landfilling of waste is lower in the waste hierarchy than energy recovery and has worse environmental outcomes than EfW. If the total cost for EfW and incinerators without recovery were to rise above the combination of landfill tax and landfill gate fee, then we may see the substitution of waste incineration for landfill – depending on capacity and logistical availability. The 2024 consultation presented a comparison of these costs associated with waste disposal by incineration and landfill and outlined two options to mitigate the risk of increased landfill: the use of landfill taxes, and potential inclusion of landfill emissions in the ETS. The subsequent Authority Response to the consultation will provide more detailed analysis on the future risk of diversion of waste from incineration to landfill upon expansion of the ETS to the waste sector.

[32] QCiL will only apply once legislation on UK ETS expansion to the waste incineration sector comes into force.

### Refuse derived fuel (RDF) and solid recovered fuel (SRF) export

74. Residual waste can also be exported in the form of RDF and SRF to generate energy in power installations or cement kilns abroad. This may result in emissions in other countries increasing and therefore no overall reduction in global emissions, subject to decarbonisation policies in these countries. Like the risks associated with substitution of waste incineration for landfill, if the price of processing waste to RDF and SRF and exporting this for energy recovery overseas became lower than that of incineration in the UK then we may see substitution of waste incineration for RDF or SRF export. The 2024 consultation compared average EfW gate fees to the average cost of exporting RDF, which includes transport and importer gate fees. The subsequent Authority Response will provide more detailed analysis on the future risk of diversion of waste from incineration to SRF or RDF export upon expansion of the ETS to the waste sector.

## Equality group breakdowns

75. Where relevant and possible with available data, the subsequent Authority Response will assess the impact of the scheme expansion on equality groups, in line with the Public Sector Equalities Duty (PSED).

This publication is available from: www.gov.uk/government/consultations/uk-emissions-trading-scheme-scope-expansion-waste

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