LOCAL NEWS PARTNERSHIPS

The rise in incineration across the UK

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Please note this pack and accompanying dataset may be subject to edit

What's the story?

Councils across the UK are bound into decades worth of contracts with companies to burn black bag waste - even though experts now say incineration is a "disaster" for the environment.

Over the past 10 years, local authorities have greatly reduced the amount of household waste they send to landfill.

But the the BBC Climate and Science team's investigation alongside the Shared Data Unit - .shows the alternative many have found may not the green solution it has been sold as.

Instead, councils are burning millions of tonnes more than they did a decade ago in large "energy from waste" facillities - most often situated in the poorest parts of the UK.

These incinerators generate electricity for the National Grid, but are pumping out levels of harmful greenhouse gases at a rising rate.

In one of the largest studies of its kind, we can reveal:

- The amount of harmful greenhouse gases pumped out of England's network of 52 major incinerators has increased by 40.4% in just five years.
- Tonne-for-tonne, the pollution from those sites has been on a par with coal in terms of emissions produced
- **Yet councils are bound into more than £30billion of contracts with incinerator operators, which some are tied in to for 20 more years. Some councils incinerate more than two thirds of their waste.**
- **Waste is overwhelmingly more likely to be burned in the most deprived parts of England than in the least deprived.**
- Five councils did not incinerate waste in 2014 and by 2023 were incinerating more than 60% of their waste.
- Energy from waste operators often sell the energy they produce from burning waste to the national grid - only a third of councils said they receive any of the money from this.
- Waste is travelling long distances to be burned. Some local waste authorities use networks of more than a dozen different incinerators around the country to dispose of household rubbish. Half a million tonnes was sent to other European nations for incineration in 22-23 alone.
- On average, these incinerators breach their permits 5-6 times annually. The permit breaches include for the release of harmful gases like carbon monoxide above safe limits

Today we can share with you

- **This data tool showing the rise in incinerator use in your area -** how your local authority incinerates in England, Scotland and Wales compared to 2014 when the data first became available.

- The data tool also provides details of the contracts local councils hold with incinerator operators - showing the years left on their contract, the value and whether your council receives any clawback money back from the contractor.

- Our full analysis below, with expert quotes from top scientists including Professor Ian Williams and Dr Dominic Hogg, plus rights of reply from DEFRA and the industry body the Environmental Services Association. All the information in this pack can be used in building your local stories.

Background

In 2011 the government committed that, by 2020, at least 50% by weight of waste from households is prepared for re-use or recycled, and a further target was later added for 65% of municipal waste to be recycled by 2035.

But over the last five years, the government has reported that, while the tonnage of waste sent to landfill has significantly reduced, recycling rates have stagnated, never reaching the 50% mark in England and Scotland.

Instead, and with councils struggling from dwindling resources, incineration has proved a cheaper alternative to both recycling and landfill.

Yet critics argue the harmful effects of burning waste have not been fully explored.

Much of the concern raised by local communities around incinerators relates to the levels of particulate matter - harmful particles linked to disease - released from the facilities. However, Public Health England (PHE) maintains that "modern, well run and regulated municipal waste incinerators are not a significant risk to public health". It said that, while it is not possible to rule out adverse health effects from these incinerators completely, any potential effect for people living close by is likely to be very small.

Burning waste also produces greenhouse gases such as carbon dioxide, and organisations such as the Green Alliance and the UK Without Incinerators Network (UKWIN) say continued investment in incineration is preventing all but a few councils from making meaningful improvements to the way they recycle and reuse.

Governments are starting to consider the impact of incineration in the UK.

The rapid rise in the planning and building of facilities prompted both Wales and Scotland to place a moratorium on building new incinerators since 2021.

In April, Defra paused the granting of new incineration permits to allow officials to lead a piece of work considering the role of incineration in the management of residual waste in England. That moratorium lapsed in May and the department has yet to release any findings from that report. Since then, the government has approved the building of the Portland Port incinerator in Dorset - despite it being refused initially by Dorset Council.

Conservative councillor for Dorset Council Laura Beddow said: "Dorset Council has amazing recycling rates, less than 2% of our waste goes to landfill. The government minister has decided that the Jurassic Coast is a great place to deal with other people's waste."

More recent stories on incinerators from the Local Democracy Reporting Service

- **Halifax Courier**
- **Reading Chronicle**
- **Grimsby Telegraph**
- **Peterborough Today**
- **Farnham Herald**
- **Hackney Citizen**

What we found

England

A mixture of upper-tier local authorities, combined waste authorities and unitary authorities are responsible for disposing household waste in England.

In the latest available data, those 123 authorities disposed of a combined 24.6 million tonnes of household waste.

But the method by which England disposes of waste has changed greatly over the last decade.

Local authority data on waste disposal destinations started to be collected in the 2014-15 financial year.

Back then:

- ***43% of waste was recycled***
- ***30% was incinerated with energy recovery***

- ***25% was landfilled***

In the latest available data from 22-23

- ***41% of waste was recycled***
- ***49% was incinerated with energy recovery***
- ***7% was landfilled***

Incineration has become the main method of waste disposal, whereas the proportion we recycle has fallen by 2% during that time.

In total, 103 out of 123 councils (84%) have increased the proportion of waste they incinerate since 2014-15.

Some councils have changed the way they dispose of waste drastically. Five authorities have gone from disposing 0% of waste through incineration in 2014 to over 60% in 2023.

Authorities with the biggest rise in proportion of waste incinerated:

SOURCE: ENV18 - Local authority collected waste: annual results tables (Historical)

Local authority	2014-15	2022-23	Percentage point change between 2014 and 2023
Blackburn with Darwen Borough Council	0%	69%	69%
Plymouth City Council	0%	66%	66%
Cornwall	0%	65%	65%
Torbay Council	0%	63%	63%
Council of the Isles of Scilly	0%	60%	60%

Which councils burn the most?

A large proportion of incinerated waste comes from the capital. Nearly 19% of all waste incinerated last year originated from London.

London waste authorities also make up six of the 10 waste authorities to incinerate the most proportionally.
Top ten councils to burn the most waste proportionally:

Row Labels	Proportion of household waste incinerated in 2022-23
Lewisham LB	80%
Western Riverside Waste Authority	80%
Westminster City Council	79%
Birmingham City Council	77%
Slough Borough Council	77%
Tower Hamlets LB	75%
City of London	75%
Thurrock Council	71%
Southampton City Council	70%
Greenwich LB	70%

Where does it all go?

Councils report the movement of their household waste and the final destination on a quarterly basis. This is summarised in WasteDataFlow which has been analysed.

In the 22-23 financial year, the Runcorn Energy from Waste facility, run by Viridor, processed the most local authority waste (household waste) through incineration than any other facility - approximately 686,000 tonnes.

Second is the Teesside energy from waste plant, processing nearly 597,000 tonnes.

However, third in the list are sites outside of Europe, simply listed in the data as “outside UK-within the EU”. About 568,000 tonnes is sent to such destinations.

NOTE: The actual waste received at each site and combusted is higher than that shown in WasteDataFlow as facilities can take waste from the other nations and commercial waste. The emissions calculations addressed further down are calculated using the annual monitoring reports from each site which record this total waste.

Incinerators taking the most household waste in 2022-23:

SOURCE: *WasteDataFlow*

Address listed	Name of incinerator listed	Total tonnes of household waste sent to incinerator from local authorities in England	Percentage of local authority incinerated waste in England sent to that facility
Runcorn EFW, Barlow Way, Cheshire	Viridor Waste Management Ltd	686159.446	5.9%
Teesside energy from Waste Plant, Haverton Hill Road, Cleveland,	SUEZ Recycling and Recovery UK Ltd	597427.547	5.2%
Outside UK-EU (multiple sites)	Outside UK-EU	567609.356	4.9%
Eco Park, Advent Way, Edmonton	London Waste Ltd	478272.77	4.1%
Ferrybridge Multifuel facility, Ferrybridge Power Station, Ferrybridge, West Yorkshire,	Ferrybridge MFE limited	474990.299	4.1%
Allington Quarry, Laverstoke Road, Maidstone, Kent	Kent Enviropower Ltd	436549.66	3.8%
Wilton 11 EfW Plant, Wilton International, Middlesbrough, Cleveland	Suez Recycling and Recovery UK Ltd	370103.174	3.2%

The Kennels Site, Landmann Way, Lewisham	South East London Combined Heat and Power Limited	360586.736	3.1%
Tyseley Waste Disposal Ltd, James Road, Tyseley, Birmingham, West Midlands	Veolia ES Birmingham Limited	340657.44	2.9%
Severside Energy Recovery Centre, Severn Road, Hallen, Avon	SUEZ Recycling and Recovery UK Ltd	323520.67	2.8%

Waste is more likely to be incinerated in poorer areas

- ***Our study found waste in England is more likely to be incinerated in areas with higher levels of deprivation.***

In order to find this out, we mapped the location of every incinerator (where possible) used by English authorities to the Indices of Multiple Deprivation (IMD). The IMD ranks small areas in England (known as Lower Super Output Areas or LSOAs) from 1 to 10, based on the levels of poverty within that area. A score of 1 would mean that area is in the top 10% for the most deprived areas in the country.

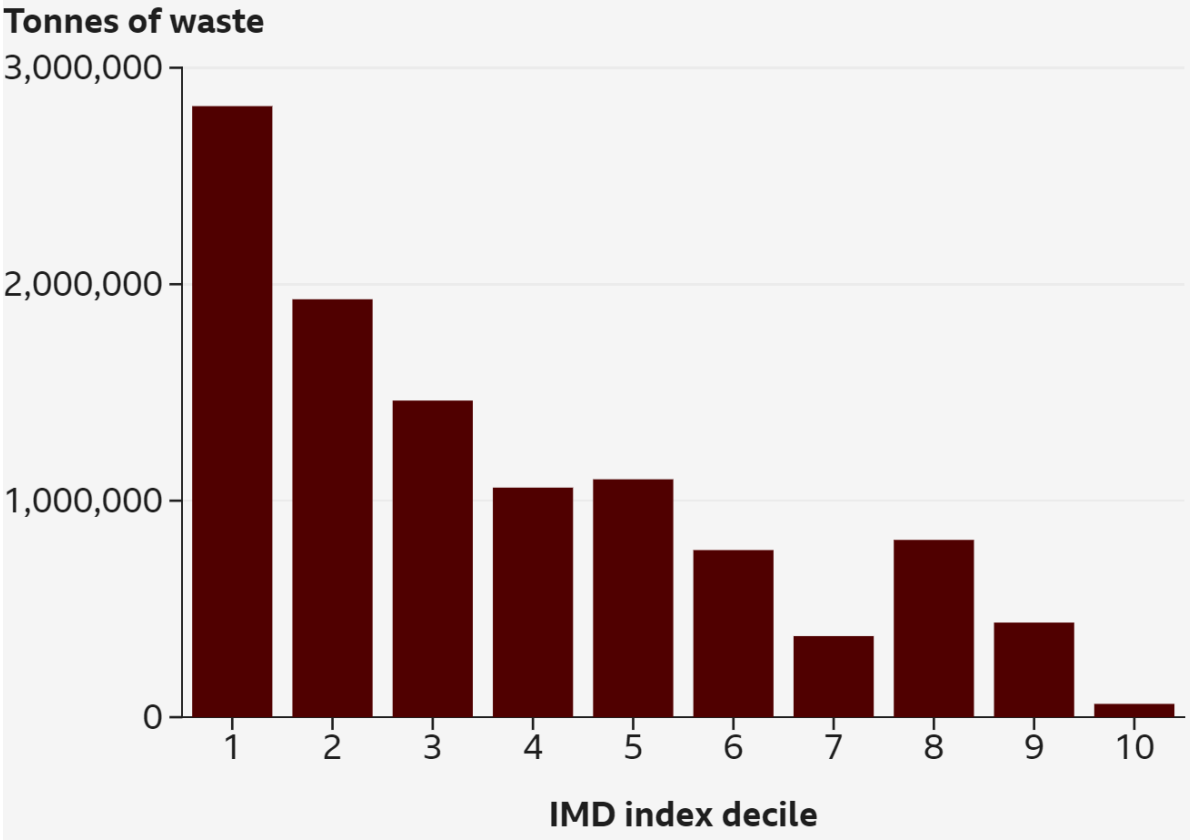
The IMD can be found here.

By calculating the amount of waste sent to each decile, we can see waste is most commonly incinerated in the 10% most deprived areas.

https://public.flourish.studio/visualisation/18422203/

More waste is incinerated in the most deprived areas in England

Total tonnes of waste incinerated in each Index of Multiple Deprivation (IMD) decile



Source: WasteDataFlow, Office for National Statistics Indeces of Multiple Deprivation (2019) •

BBC

The IMD ranks areas of between 1000 and 3000 residents between 1 and 10 based on a number of factors. A lower score indicates higher levels of deprivation.

Councils use multiple sites

Almost every local authority uses multiple incinerators to dispose of waste - but some use more than others. For example, Derbyshire used a network of 19 different incinerators around the country in 2022-23.You can see a visulisation of that here.

Councils using the most individual incinerators to dispose of waste in the latest year of data:

Council	Number of incinerators used in 2022-23
Derbyshire County Council	19
Merseyside WDA (MBC)	16
Isle of Wight Council	15
Bournemouth, Christchurch and Poole Council	14
Leeds City Council MBC	14

What is the emissions impact?

Incinerators or energy from waste plants (where energy is produced from burning the rubbish and often exported) produce greenhouse gas emissions during the process of burning rubbish. These greenhouse gas emissions are carbon dioxide and nitrous oxide. **The total tonnes of these gases emitted can be expressed as a single figure known as CO2e.**

Each incinerator in England records the amount of CO2e produced in their annual monitoring reports.

These emissions are either calculated from on-site monitoring equipment or by multiplying the total tonnes of waste burned by a factor.

The factor used is 0.992 - it is more accurate for incinerators to record actual emissions but in lieu of this a factor is used.

The BBC has summed the emissions produced by incinerators across the UK from 2019 - 2023.

These years have been compared but fluctuations in results between these years is likely due to the impact of COVID-19 on production.

Emissions are measured in CO2e - which means the total amount of greenhouse gases released by that site as an equivalent of carbon dioxide.

The BBC found the following:

- **CO2e emissions from incinerators have grown 40.4% between 2019 and 2023**
- **In 2023, incinerators were responsible for 14.58 million tonnes of CO2e**

In each monitoring report, the incinerators also record the amount of energy produced from burning the rubbish.

The BBC divided the total emissions but the measure of power produced (kWh) to calculate a “carbon content” i.e. how much greenhouse gas emissions are produced for each unit of power.

- The energy produced by incinerators has grown 56% in the same period (2019-2023)
- In 2023 the median carbon content of the energy exported from incinerators was 1514gCO2e/kWh.
- In 2023 incinerators were producing 0.97 tonnes of CO2e per tonne of waste burned on average (median)
- This is an increase of 8% since 2019 - suggesting efficiency is not improving

Wales

Single-tier authorities in Wales collect and dispose of waste.

In the latest available data, the 22 local authorities in Wales generated 1.4 million tonnes of household waste.

A combined 438,000 tonnes of household waste was sent to to incineration facilities with energy recovery.

Wales has a much higher recycling rate and incinerates a lot less waste proportionally compared to England - however, like England, its use of incinerators has still grown since 2014-15

Back in 2014-15

- ***56.25% was recycled***
- ***11.85% was incinerated with energy recovery***
- ***29.38% was landfilled.***

In 2022-23

- ***65.71% was recycled***
- ***31.30% was incinerated with energy recovery***
- ***1.59% was landfilled***

Some councils incinerate more proportionally than others. Anglesey incinerated 39% of its waste in 22-23 compared to just 12% in 2014-15.

Councils that incinerate the largest proportion of waste in Wales (22-23)

Council	Proprtion of waste incinerated in 2014-15	Proportion of waste incinerated in 2022-23	Percentage point difference between 14-15 an 22-23
Anglesey	12%	39%	27%
Merthyr	1%	38%	37%
Gwynedd	14%	37%	23%
Vale of Glamorgan	1%	34%	34%
Cardiff	0%	34%	34%

Where does Wales send its waste for incineration?

Unlike England, councils send waste to fewer facilities overall. Nearly half of all the waste sent for incineration in Wales is sent to one facility - the large Viridor plant in Cardiff. However, nearly a quarter of all Welsh residual waste sent for incineration goes to the Enviropower Limited facility in Sheffield.

Name of facility	Address of incinerator facility listed	Total tonnes of residual waste sent by councils in Wales	Proportion of national total sent there

Viridor Waste Management Ltd	Cardiff Energy Recovery Facility, Trident Park, Glass Avenue, Ocean Way, Cardiff	264388.279	51.2%
Enviropower Limited	Rother Valley Way, Holbrook, Sheffield, South Yorkshire	147593.287	28.6%
Parc Adfer Operations Limited	Parc Adfer Energy Recovery Facility, Deeside Industrial Park, Deeside, Flintshire,	46811.38	9.1%
Ferrybridge MFE limited	Ferrybridge Multifuel facility, Ferrybridge Power Station, Ferrybridge, West Yorkshire,	19025.38	3.7%
Derwen Plant Limited	Neath Abbey Wharf, Neath, Neath Port Talbot	12610.03	2.4%
Outside UK-EU	Facility Outside The Uk But Within Europe	6875.82	1.3%
Outside UK-nonEU	Facility Outside The Uk And Not Within Europe	4735.41	0.9%
Viridor Waste Management Ltd	Severn Road Resource Recovery Centre, Severn Road, Chittening, Avon,	2468.01	0.5%
Tarmac Limited	Tunstead Quarry, Wormhill, Buxton, Derbyshire	2165.87	0.4%
MES Environmental Limited	Dudley Energy From Waste Facility, Waste To Energy Plant, Lister Road, Dudley, West Midland	1764.43	0.3%

Scotland

The 32 council areas in Scotland generated 2.33 million tonnes of household waste in 2022, the latest year of available data.

A total of 400,000 tonnes was sent for incineration with energy recovery

The way Scotland disposes of waste has changed since 2014, but the country still relies more on landfill than Wales and England. Like England, Scotland's recycling rates have remained largely unchanged.

Back in 2014

- **42% was recycled**
- **1% was incinerated with energy recovery**
- **49% was landfilled.**

In 2022

- **43% was recycled**
- **17% was incinerated with energy recovery**
- **25% was landfilled**

See source: Household Waste

All bar two councils have increased the amount of waste they incinerate in Scotland since 2014.

Authorities which incinerate the most waste proportionally in Scotland: top 10

SOURCE: SEPA, Household Waste data tool

Council area	Incineration rate in 2014 (%)	Incineration rate in 2022 (%)	Percentage point difference between 2014 and 2022
Dundee City	52.1	48.1	-4
East Dunbartonshire	4.8	44.3	39.5
City of	2.5	44.2	41.7

Edinburgh			
West Lothian	1.7	41.2	39.5
Glasgow City	0.8	40.5	39.7
Midlothian	0	39.3	39.3
Scottish Borders	1.7	38.6	36.9
Angus	18.6	36.3	17.7
Renfrewshire	21.6	35.8	14.2
North Ayrshire	0.9	35.4	34.5

The table above shows the large rises in incineration in parts of Scotland. East Dunbartonshire, City of Edinburgh, West Lothian, Glasgow and Midlothian are among those to see rises of abot 40 percentage points since 2014.

Unlike in England and Wales, local authorities in Scotland do not report the end destinations of their waste to WasteDataFlow

However FOI requests revealed- East Renfrewshire Council sent nearly 50,000 tonnes of waste to Sittingbourne in Kent and a further 860 tonnes to Stockholm, Sweden.

Incineration contracts (UK WIDE)

In order to get an idea of the value, length and terms of contracts between councils and incineration companies in Great Britain, we sent Freedom of Information requests to all 212 upper-tier (or single tier in Scotland and Wales) councils in the UK.

We received 133 full or partial responses. The length and contract value of incineration contracts in your area can be found in our data tool here..

In some cases joint waste authorities such as the Riverside Waste Authority in London handle the waste for multiple councils. To see which councils are part of joint authority waste management shemes, see this link here.

- 91 of the responses were from England
- 15 from Wales
- 24 from Scotland

In total, 110 authorities supplied us with the value of their contracts

Our key findings were

- The combined value of the 110 existing contracts was £33.6bn. In many cases the contracts are tied up with other waste management arrangements such as landfilling and recycling.
- The median amount a council spends on a contract including incineration is £12.8m
- 27 of the contracts (20%) are PFI contracts, which have been criticised for being overlong and unduly expensive.

We asked councils whether they had a clawback mechanism in place - that is a method by which they received money back from their incineration company for the energy supplied to the National Grid.

- Only 36% of councils stated they had a clawback mechanism in place, which means most do not receive a benefit from their incineration operation.

We also asked councils when their incineration contract was signed and when it is due to end.

- Councils have an average of 11 years left on their contracts
- Around a third of councils have signed an incineration contract in the last five years

Some authorities have decades left to fun on their incineration deals:

Waste authorities with the longest time remaining on their incineration contracts.

Waste authority	Year incinerator contract commenced	Year Contract is due to end without extensions	Total contract length	Number of years remaining from 2024
London Borough of Bexley	2011	2047	36	23
Buckinghamshire County Council	2016	2046	30	22
Angus Council	2017	2045	28	21
Somerset Council	2020	2045	25	21
City of Edinburgh	2016	2044	28	20

Which companies are burning the waste?

Viridor has the most active incineration contracts with councils fom the 133 responses we received, at 25.

The combined total of all of those contracts is close to £6.5bn. If you were to combine all of the contract values from our 133 responses, Viridor's share would be around 20% of the overall contract value.

Company name	Number of active partnerships with councils and waste authorities	Total combined contract value (£m)	Per cent of total contract value
Viridor	25	6491	19.35%
Veolia	18	6278	18.71%
Suez	9	4583	13.66%
Renewi	3	2891	8.62%
Enfinium	3	1500	4.47%
Allerton Waste Recovery Park SPV	1	1400	4.17%
Thalia	3	1218	3.63%
FCC	6	895	2.67%
Kent Enviropower Limited (KEL), Allington Waste Company Limited (AWL) Countrystyle Recycling Ltd (CRL)	1	792	2.36%
FCC/Veolia	1	769	2.29%

Interviews and quotes

Professor Ian Williams

Professor Ian Williams is professor of applied environmental science, associate dean and head of centre for environmental science at the University of Southampton

He said: “We have this insane situation where in England, we've already got more than 45% incineration in most regions of the country, which means we can't possibly theoretically meet our recycling target the next year and we're planning to build more incinerators which will take us further and further away from our own targets.

“It makes no sense whatsoever to have national targets and entire sectors working on reducing single use plastics, reducing packaging, and so on, which means that your waste arisings will go down, but then building more incinerators on the premise that they're going to go up, but they're clearly not.”

Dr Dominic Hogg

Dr Hogg is an environment campaigner and founder of the environmental consultancy company Eunomia. More information is available via: https://www.dominichogg.com/

- ***Dr Hogg on whether incineration was a ‘disaster’ for generating energy in the UK***

“I think the reality is, it looks like a disaster because we've looked at it too much as though it's a power generating facility. The reality is this is a way of disposing of waste. And we should treat it as such. And we should consider emissions in the round and compare it with things like landfill for the stuff that we really cannot do anything better with. But we should stop considering these things as power stations, because they're not good examples of power stations, their principal objective is to get rid and to reduce the volume of waste.”

- ***Dr Hogg on the cost to the UK government***

“We're switching from landfill to incineration, but we used to get tax revenue from the waste that was landfilled. We're not getting any tax revenue from waste that’s incinerated. So we’ve lost about half a billion pounds in terms of the landfill tax.”

- ***Dr Hogg on why incineration has become the dominant form of waste disposal***

“It's the dominant way of dealing with the stuff we're not recycling…. as the landfill tax has gone up, so the competitiveness of incineration has improved. So more and more has got built. And we've ended up now with the majority of the stuff that you in your home will be throwing away that’s going to incineration.

“We have no tax on incineration. And that's like, effectively subsidising incineration because we're ignoring the environmental damages that it's doing. Whereas we're taking that into account in the impact of landfill.”

Rights of reply

Defra

A Defra spokesperson said:

“We are committed to cutting waste and moving to a circular economy so that we re-use, reduce and recycle more resources and help meet our emissions targets.

“We are considering the role waste incineration will play as we decarbonise and grow the economy.”

Background notes (supplied by Defra - not for quoting directly):

- Energy from waste (EfW) has played an essential role in moving England away from landfill.
- Regulations prevent the incineration or landfilling of separately collected paper, metal, glass, or plastic waste unless it has gone through some form of treatment process first and, following that treatment, landfill or incineration is the best environmental outcome. This is reflected in environmental permit conditions that prevent acceptance of these separately collected recyclable materials at waste incinerators.
- There are exceptional circumstances in which specific local authorities may need longer to introduce weekly food waste collections, due to long-term waste disposal contracts that run beyond 31 March 2026. This could present a barrier to introducing weekly food waste collections and, in these cases, the local authority will be given bespoke transitional arrangements, setting out the date by when they need to bring in these collections.
- We are planning to publish an assessment of our residual waste treatment capacity needs against expected future waste arisings, which will help provide clarity to developers on our further infrastructure needs.
- We are working closely with the Department for Energy Security and Net Zero on policy to support the decarbonisation of Energy from Waste facilities, including the intention

to extend the UK Emissions Trading Scheme to waste incineration and Energy from Waste and on support for waste carbon capture and storage projects.

PFI contracts

- The Sinfin plant in Derbyshire is a PPP (Public Private Partnership) contract, not a PFI. Therefore, Defra has no involvement or knowledge on the contractual arrangements and cannot comment on this case.
- Defra provides grants to part-fund 21 PFI waste projects, including 10 EfW plants. Defra works closely with these LAs to ensure the grant funding provides taxpayers value for money.

Regulation

- Incinerators are one of the most tightly regulated industrial processes and achieve very high levels of permit compliance. Emission limits are set primarily on the basis of legislation and well below the level above which harm to the environment or human health could occur.
- The Environment Agency carries out regular audits and inspections of plants to verify compliance, as well as working with industry to promote best practice and continuous improvement. Non-compliance is addressed through a number of tools, including increased subsistence fees for minor non-compliances and taking enforcement action for more serious permit breaches.

EA background on emissions limit values

- Municipal waste incinerators, also known as energy from waste (EfW) plants, have daily and half-hourly emissions limit values (ELVs) for at least five continuously monitored pollutants. For a typical two-line plant, this means there are more than 160,000 effective compliance checks per year for these pollutants alone, making EfW plants one of the most tightly regulated processes in England.
- In practice, EfW plants achieve an extremely high level of compliance with these checks. However, even the best-run plant may still experience a small number of ELV breaches each year, for example due to minor technical problems or the composition of the municipal waste they receive. The Environment Agency (EA) nevertheless expects operators to comply with their ELVs at all times.
- It is important to understand that an exceedance of an ELV will not automatically result in a significant impact on the environment. This is because ELVs for individual pollutants are set predominantly:
  - on the basis of legislation (which reflects achievable emission levels associated with the use of best available techniques); or
  - for a small number of plants, at a lower level than required by the legislation where the local environment is particularly sensitive (e.g. due to an air quality management area).
- In both cases, ELVs are always set at a conservative level (verified by air quality modelling and human health risk assessments), well below which harm to the environment or human health could occur.
- Operators must notify the EA of any permit breaches and follow this up with an investigation into the root cause of the exceedance and propose and implement measures to prevent recurrence, which the EA assesses. The EA also scores operators for each breach they have, which can lead to them paying higher charges. The EA also carries out regular

audits and inspections of plants and can take more serious action if a major breach or repeated non-compliance were to occur, or if improvements to operations are required.

Environmental Services Association (ESA)

The ESA is the trade body representing the waste and environmental services industry in the UK. *It's statement makes reference to an "independent report" produced by consulting engineers Fichtner in 2021. Page five of that report shows it was commissioned by the ESA itself in response to an earlier Zero Waste Scotland report: The climate change impacts of burning municipal waste in Scotland.*

Statement:

Carbon emissions from Energy from Waste

"The vital role of energy-from-waste (EfW) facilities is to treat waste left over after recycling. In 2023, the United Kingdom treated circa 16 million tonnes of waste across an EfW fleet of around 60 facilities.**[1]**

"Historically, this "residual waste" left over after recycling was sent for disposal in landfill, however, recovering energy from it using EfW facilities is now the predominant means of treating residual waste in accordance with the waste hierarchy – the long-standing policy framework which guides decisions about how to most sustainably manage waste materials.

"Disposing of household-like residual waste in landfill, which is a mixture of biogenic and fossil-based materials, releases methane - a powerful greenhouse gas (GHG). An independent report produced by consulting engineers Fichtner**[2]**, in 2021, estimated that the net GHG emissions of sending one tonne of residual waste to landfill is 432.7 kgCO2e.

"By comparison, Fichtner estimated that the net GHG emissions of sending one tonne of residual waste to conventional EfW is 230.9 kgCO2e. It is therefore estimated that EfW saves approximately 200kg CO2e for every tonne of waste treated compared with landfill.

"The growth in overall carbon emissions from EfW corresponds with the growth in the number of facilities over the past decade, which have moved millions of tonnes of residual waste out of landfill. It is simply incorrect to compare the carbon intensity of energy produced as a by-product of waste treatment with other forms of energy generation without accounting for the avoided emissions associated with landfill – since the primary role of EfW is to treat residual waste. Clearly, other forms of energy generation do not also fulfil this vital function.

"Much of the climate and environmental impact of society's waste is designed-in at source, which is why our industry continues to campaign for more sustainable product and packaging design choices that avoid waste and support re-use and recycling. The emissions associated with residual waste treatment are challenging to avoid and require systemic change, but our sector has a credible decarbonisation pathway to achieve net-zero

emissions by 2040 with the right policy landscape. In particular, decarbonising residual waste by recycling more plastics, and deploying carbon capture and storage to EfW facilities wherever possible, will both play an important role in our pursuit of net-zero emissions and a more circular economy."

Stagnant recycling rates

"Since the early 2000s, recycling rates in England have risen from below ten per cent to more than forty per cent today. This shift was largely a result of the Landfill Tax, which underpinned investment by our industry in new recycling markets and infrastructure.

"Official figures (presented in the table below**[3]**) show that many of the significant gains in recycling performance over the past twenty years coincided with the development of energy-from-waste infrastructure. Recycling rates have remained largely stagnant since 2012/13 while further EfW development has removed millions of tonnes of residual waste from landfill.

"The development of EfW over the past decade has been complementary to efforts to recycle more and is not an impediment to further recycling. Stagnant recycling rates are only indicative of a failure to develop recycling policies which, under the prevailing market conditions, have found their equilibrium. EfW facilities simply deal with the waste left over. If we want to increase recycling we must encourage and incentivise more sustainable design choices; investment in recycling services and behaviour change and, importantly, corresponding market demand for recycled materials.

"The Government's Resources and Waste Strategy (RWS) aims to achieve a national target of 65% municipal recycling by 2035 by introducing Extended Producer Responsibility for packaging; deposit return schemes and simplifying household recycling. Additionally, the Plastics Packaging Tax was introduced to stimulate demand for recycled plastic. However, the RWS reforms still haven't come to fruition after years of delay and the plastics packaging tax, at its current rate, is struggling to compete with virgin plastic. The ESA and its members urge the new government to follow-through on these long-promised reforms and we would like to see an escalator to the plastic packaging tax in Labour's Autumn Budget."

Contractual arrangements with local authorities

"New energy recovery facilities require a significant investment and a typical-size facility can cost anywhere in the region of between £250-350 million to build.

"Local authorities have a statutory duty for safely and reliably managing waste in their region. In the majority of cases, the need case for new regional or local energy recovery infrastructure is first established by a local authority (or partnership of authorities), based on current and anticipated future needs over the lifetime of any new asset, and in the context of external drivers affecting waste volume and composition. Future investment in local recycling services, national policy drivers, and associated recycling performance levels are a component of these considerations.

“Local authorities may choose to finance, build and/or operate their own new infrastructure to meet this need and their statutory obligations, but in many cases, the private sector is invited to bid competitively for the opportunity to finance, design, build and operate new plants on the basis of the anticipated required capacity.

“As such, contracts between operators and local authorities represent a way of delivering this vital public infrastructure at best value (achieved through competition) while sharing risks between both parties and accessing the expertise of the private sector.

“The notion that EfW locks local authorities into contracts which incentivise them to suppress recycling is simply misplaced, as evidenced by the fact that the majority of the top ten performing councils for recycling also make use of EfW to treat the left-over waste. EfW is complementary to efforts to recycle and every household in the UK also has access to kerbside recycling services provided by their local authority. Recycling sorting and collection activity takes place upstream of treating waste through EfW.”

Regulatory performance

“Energy-from-Waste (EfW) facilities are among the most heavily monitored and regulated facilities in Europe. Emissions limits for each facility are set and monitored by the Environment Agency as part of the permitting process.

“Emissions are constantly monitored and Emissions Limit Values (ELVs) are often set at half-hourly limits. Any temporary emissions limit breaches are reported to the Environment Agency, alongside the cause and remedial action taken. These reports are published and the process is transparent.

“A temporary permit breach for emissions can be caused by a range of factors including equipment failure or human error, but they are most commonly caused by items present in the waste that shouldn’t be there. In particular, the growth in recreational abuse of nitrous oxide in recent years has posed a specific challenge for EfW operators because large canisters are often thrown away incorrectly with gas remaining inside them. These can explode in EfW facilities, creating a temporary spike in emissions that can be detected through continuous monitoring and which breach half-hourly emissions limits.

“As just one recent example of the explosive potential of dangerous items being present in waste, the **BBC reported this week of an incident** in which collection crews narrowly avoided serious injury when a gas canister exploded in a collection vehicle.

“To illustrate the impact on regulatory performance of these incidents occurring in EfW, one operator reported to the ESA that six out of seven permit breaches at a single facility in a year were caused by nitrous oxide gas bottles alone. Furthermore, research by the ESA found that, between January and October 2023, there were over 880 recorded instances of a nitrous oxide gas canister being present in processed waste which triggered a short-term carbon-monoxide (CO) spike.

“Other than during planned maintenance, EfW plants typically operate on a 24/7 basis and each process hundreds of thousands of tonnes of waste every year – coping with anything and everything that people put in their general rubbish bins. In this context, the average number of permit breaches per plant remains very low and is demonstrative of the safety and reliability of EfW technology. Over the past five years, the mean average annual number of permit breaches per plant has ranged from 2-5 incidents – although calculating the average this way tends to skew the results since a small number of much older plants, built almost 40 years ago, can account for around 70 per cent of all permit breaches.

“Additionally, the most recent published monitoring data for 2022**[4]** shows that all recorded permit breaches for conventional EfW facilities fell within the most minor regulatory risk categories – which the Environment Agency defines as posing minor or no risk of harm to human health, quality of life or the environment.”

ENDS

Notes to editors

You can find further information about EfW operations and associated policy drivers in the ESA’s:

- **EfW FAQ document**
- **UK Recycling and Waste Treatment market overview - 2024**
- **Net-Zero Strategy**
- **ETS consultation response**

Visit the ESA’s **media library** for our full archive of publications

For further details please visit **www.esauk.org**

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[1] Tolvik Consulting – UK Energy-from-Waste statistics 2023

[2] Fichtner – **Response to Zero Waste Scotland Climate Change Report**

[3] Gov.uk, **Management of all local authority collected waste and recycling rates, England, 2000/01–2022/23**

[4] **ENDS Report**

Councils and waste authorities

Southampton Council

Southampton was among the top ten councils to have the highest proportion of sent for incineration in 22-23:

A spokesperson from Southampton City Council said:

"The collection and disposal of household waste is delivered across Hampshire by an integrated waste management system. The system's strategic direction is coordinated by Project Integra, a partnership of Hampshire County Council, its 11 districts, and unitary authorities Southampton City Council and Portsmouth City Council.

"Energy recovery is preferred over landfill, in line with the waste hierarchy, significant cost and infrastructure based challenges persist in achieving expanded recycling and managing harder-to-recycle materials. The council supports proposals for unified household recycling in England but faces delays in implementing measures like Simpler Recycling, pEPR, and DRS due to legislative uncertainty. Some legislation permits only incineration of certain hazardous wastes (e.g. POPs / Persistent Organic Pollutants). Hampshire, Southampton and Portsmouth do not have a PFI contract, and there has never been any fixed contractual tonnages to be met for incineration which would limit recycling. By law, emissions data for Hampshire's energy recovery facilities (ERFs) is publicly available on Veolia's website."

Thurrock Council

Thurrock was among the top ten councils to have the highest proportion of sent for incineration in 22-23:

Cllr Victoria Holloway, Thurrock Council Cabinet Member for Place and the Environment, said: "Thurrock Council is working hard to increase recycling rates and has recently launched a weekly household food waste recycling collection which now collects hundreds of tonnes of food waste that is recycled into biofuel and nutrient rich crop fertiliser. We also carry out fortnightly kerbside recycling collections and work with residents, community groups and schools to promote the importance of recycling as much waste as possible.

“We know that reducing waste, and recycling more, are preferable to incineration or landfill. We hope the changes we’ve made recently will help us significantly reduce the amount of waste sent to either, and we will continue to build on these changes to encourage more recycling, as well as promoting ways for residents to reduce waste, or find other uses for unwanted items.”

Slough Council

Slough was among the top ten councils to have the highest proportion of sent for incineration in 22-23:

A spokesperson said: “We don’t believe the length of contracts in place for incineration hamper efforts to increase recycling. There are a number of factors at play which affect the recycling rates. Most importantly there has to be buy in from residents.

“A number of factors were considered when it was decided where to dispose of our waste. Slough is fortunate to have an Energy from Waste Facility located within its boundaries. Logistically it makes sense to utilise this facility as it is in such close proximity to help to minimise costs. The waste incinerator is used to create a fuel which generates electricity which is supplied back to the grid. In addition to these considerations, one final thing relates to the disposal price agreed. The current gate price is more favourable compared to other disposal outlets when factoring in disposal costs and the costs to haul the waste outside the borough.

“A number of strategies are in place to improve recycling rates in the borough. In June 2023 we implemented alternative weekly collections in an effort to divert good quality recyclables away from residual bins and into our recycling containers. Anecdotally we are beginning to see evidence that this practice is helping. In addition to this we are currently embarking on a food waste trial with the intention of rolling this out borough-wide. Currently 5,000 properties have been enrolled in this scheme and results are looking favourable.”

Lewisham Council

Lewisham incinerated a greater proportion of waste than any other waste authority in 22-23.

A Lewisham Council spokesperson said:

“Lewisham Council has a clear aim to reduce waste as part of our commitment to climate action and the environment. While we are all still creating waste, the Council has decided to incinerate it locally. The energy generated is used for social homes nearby and has the potential to serve further neighbouring development in the future.
“Although not without environmental impact, incineration is a better approach than sending waste to landfill, as emissions from landfilling contribute more to climate change than CO2 released from incineration. SELCHP is in Lewisham, so the refuse crews do not travel as far, costing the council less in fuel and keeping emission as low as possible. However, the council is committed to following scientific advice should the assessment of impacts change.”

Additional notes:

- SELCHP energy is recovered from the waste, supplying enough electricity for 48,000 homes and heat and hot water for currently 2,800 homes. Waste that is diverted from landfill, helps the residents of the London boroughs meet government and European Directive targets.
- Lewisham Council was one of the first local authorities to declare a Climate Emergency. You can find more about what we're working on in our Climate Emergency Action Plan: [Lewisham Council - Our Climate Emergency declaration]
- Year on year we are improving our recycling. The most recent data presented to DEFRA (and on their website) was 2022/23, and showed Lewisham recycled 23% of waste generated in Lewisham. This means 77% would have gone to incineration, not the 80% stated. For the 2023/24 year, (which has been submitted and being reviewed by DEFRA), shows our recycling rate to be 26.5% and therefore an even lower incineration figure, of 73.5%.

- We have a target of achieving a 65% recycling rate for municipal waste by 2030. Over half of our housing stock is flats, which means that shared recycling bins can be harder to access and more easily contaminated. We're looking at our provisions for these residents, and how to communicate recycling more effectively.
- Lewisham Council extended its waste incineration contract with South East London Combined Heat & Power (SELCHP), from December 31, 2023, to June 30, 2027. A full tender process will be undertaken for a new disposal contract in 2026. Based on our Council’s air quality monitoring observations*, we have no concerns that SELCHP will adversely impact air quality in Lewisham to the extent that we would fail to meet the DEFRA annual mean objective for NO_2 (40 ug/m3). Additionally, SELCHP is regulated by the Environment Agency through a Permit process which includes a number of conditions relating to air emissions.

- Nitrogen dioxide (NO_2) is the main pollutant released by incineration affecting air quality. There is a new monitoring site nearby to the incinerator, and this is regularly measured. There was a 12% decline in NO_2 levels from 2022 to 2023. Another older monitoring site also showed a 31% decline in levels from 2018 to 2023. These levels are also 40% below DEFRA's annual aims.

Tower Hamlets

Tower Hamlets was among the top ten councils to have the highest proportion of sent for incineration in 22-23:

A Tower Hamlets Council spokesperson said:

“Our contract for handling non-recyclable waste for disposal via energy from waste (EfW) avoids waste going to landfill. Instead, non-recyclable waste from our borough produces energy for the national grid. The reason our EfW is high is due to our low recycling rate – we know our recycling rate in Tower Hamlets needs to improve and this is a hugely important and urgent focus for our council.

“As a council we are faced with a number of challenges that make it unique and difficult to compare to the rest of the country. We have the fastest growing population and are the most densely populated place in England. Development is happening at a rapid pace. 9,000 new homes were built between 2019 and 2022, but recycling facilities are not keeping pace. Also, 88% of our housing stock is flats and maisonettes. This is 32% higher than the London average and 64% higher than in England, meaning more of our residents have to share their recycling bins compared to the majority elsewhere who are responsible for their own bin.

“The sheer numbers of people, development not keeping pace with recycling demands, ageing housing stock, and shared facilities make recycling much more difficult. Add to that the thousands of visitors and workers that come to our borough every day and you can see it’s challenging.

“These points are for context and not to make excuses. We have an ambitious plan to deliver a clean and green future for Tower Hamlets. We are committed to delivering improvements over the next five years, with initial investment in service re-design, service delivery and community engagement.

“We are investing £2.1m to improve recycling facilities across 2,160 blocks of flats. We are working on pilot projects to improve recycling services for flats above shops, engaging with community groups and on estates, and are working with schools to encourage more of them to separate their food waste for recycling.

Notes to editors:

- Our contractor, Cory, plans to develop a major carbon capture and storage (CCS) project following the Government’s commitment to support CCS for the waste sector: https://www.corygroup.co.uk/future-growth/carbon-capture-storage-project/
- Energy from waste (EfW) in the waste hierarchy is a recognised form of recovery for waste.
- Tower Hamlets has the fastest growing population nationally. The local population has grown by 22.1% from 254,000 in 2011 to 310,300 in 2021.
- Tower Hamlets is also the most densely populated borough in England with 15,695 residents per square km.

- Tower Hamlets has seen the largest increase in total number of households of any local authority area across England and Wales. Between 2011 and 2021 an additional 19,200 households have been formed representing a 19% increase since 2011.
- Between 2019 and 2022, 9,000 properties have been completed, representing a 7% increase. Resources (service) and infrastructure for recycling at blocks of flats has not kept pace with this rate of property growth and increase in household waste arisings. This has a direct effect on the amount of recycling that is collected and the quality of the materials.
- There are 122,880 flats/maisonettes in Tower Hamlets, this represents 88% of the dwelling stock. Across London 56% of homes are flats/maisonettes compared to just 24% for England (VOA,2021). The high number of flatted properties and communal bin collections poses challenges in achieving high recycling rates, reducing contamination in the dry recycling and introducing waste restrictions or reduced rubbish collection frequencies.
- Food and garden waste collections make up a significant contribution to recycling performance in other local authority areas. However, due to the high rate of flats/maisonettes in Tower Hamlets without gardens, significantly less of our residents have food and garden waste collections compared to other areas. We are currently working to drive up participation numbers in kerbside properties that do have food and garden waste collections available. Government delays to funding and support for food waste collections have meant that we have been unable to plan for delivering boroughwide food waste collections until April 2027. We are currently trialling food waste collections from flats and will deliver boroughwide food waste collections in 2027, which will positively impact our recycling rate.

- The Mayor approved the Tower Hamlets Reduction and Recycling Plan 2023-2025, at a Cabinet meeting in September 2023.

Ends –

Birmingham City Council

Birmingham was among the top ten councils to have the highest proportion of sent for incineration in 22-23:

A spokesperson said: “Birmingham City Council takes its statutory duty to manage waste in a safe and reliable way very seriously. We work closely with our partners to ensure we abide by the heavily regulated laws governing the operation of Energy-from-waste facilities.

“We have a waste strategy in place which gives us the scope to segregate and recycle more waste at the kerbside, benefit from emerging technologies designed to deal with unrecyclable waste and encourage residents to increase their recycling and reduce waste contamination.

“We know we need to increase our recycling rates in the city so we are running small pilots across the city to increase the recycling of paper and card, with the introduction of a second

recycling bin to replace the current pod. This will increase the storage capacity for paper and card in households."

A spokesperson for the City of London Corporation, said:

"The City of London Corporation is committed to reducing emissions, being the first government body to introduce the Clean Air Act in 1953.

"Our ambitious Climate Action Strategy, commits us to achieving net zero carbon emissions in our own operations by 2027, and our full value chain by 2040 - as well as supporting the entire Square Mile to reach net zero by 2040.

"None of our waste goes to landfill. Instead, non-recyclable waste collected from the Square Mile travels by river, along the Thames, to Cory's riverside facility in Belvedere to be converted into electricity for the national grid.

"Unlike other local authorities, the City of London has a comparatively small resident population of around 8,600 - many of whom live in apartments. Our household recycling rate for 2022/23 was 29.8% which is comparable to other London Boroughs, whose figures also include residential garden waste.

"The Square Mile actually has some of the lowest amounts of residual waste produced per person in the UK. In 2022, the estimated amount of residual waste (excluding major mineral waste) per person in England was 558.8 kilograms - in the City of London, this was 344.3kg per person for the year 2023/24.

"The City Corporation has taken a number of bold and practical steps to improve air quality in the Square Mile and has also been hailed as an 'A-List climate action leader' by the Carbon Disclosure Project.

"We maintain a network of 11,000 acres of internationally important open space across London and southeast England, including over 180 smaller green sites within the Square Mile.

"Together, these habitats absorb carbon dioxide through a process known as carbon sequestration or removal, capturing over 16,000 tonnes of carbon every year; equivalent to 70% of the City Corporation's annual carbon footprint within its own operations.

ENDS

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Background - not for quoting

The City Corporation's contract with Cory's riverside facility in Belvedere has three years remaining and is not a Private Finance Initiative contract.

When considering the wider scope of the ENV18 statistics produced by DEFRA (in addition to a bigger tourist and business population), we also have a number of wholesale markets that contribute to this number which impacts our overall percentage split.

The City of London Corporation has a strong track record in sustainable waste management, being the first London Authority to sort and recycle waste from our street. For more information visit: https://www.cityoflondon.gov.uk/services/waste-and-recycling/waste-strategy-and-future-plans

All residents in the Square Mile have access to a mixed recycling service, and over 60% have access to food waste recycling with dedicated drop off locations for electronic equipment and textiles. We also run a number of free events throughout the year to help city residents reduce, reuse and recycle more.

The City Corporation is also developing a new Circular Economy Framework which will help transition the City of London to a Circular City by 2040, in line with our targets in the Climate Action Strategy. We aim to publish the Circular Economy Framework by Spring 2025.