Incineration Overcapacity Technical Annex

Data, methodology and assumptions underpinning UKWIN's overcapacity modelling

Overview

This paper sets out the basis for UKWIN's comparison of potential incinerator feedstock and incineration capacity in England, which takes account of the UK Government's Environmental Target for "halving the waste that ends up at landfill or incineration by 2042"[i] and the Government's interim target for reducing municipal residual waste by 29% by 2027.[iii] Both targets are relative to a 2019 base year.

When looking at incineration capacity it is important to consider the level of residual waste up to 2042, when the proposed halving of residual waste will have taken place, as it would be counterproductive to allow new incineration capacity to be built now when this capacity would undermine or make more difficult achievement of the target to halve residual waste.

UKWIN's modelling anticipates falls in the quantity of the sort of waste that could potentially be used as incinerator feedstock as well as the rise in alternative uses for this feedstock. This modelling is combined with information about those incinerators in England that are operational, under construction, or at various stages of planning and permitting. This allows an estimate to be made of current and future incineration capacity against current and future potential feedstock.

The term 'incineration' used in this analysis broadly reflects what is also known as 'Energy from Waste' (EfW). It relates to combustion or thermal treatment of mixed waste (including refuse-derived fuel) and includes the so-called 'advanced thermal treatment' technologies such as gasification and pyrolysis to treat mixed waste. It does not include co-incineration of waste, e.g. to produce heat for cement or lime kilns, or dedicated biomass plants.

The term 'incineration' also does not include other forms of energy from waste such as anaerobic digestion (AD) or landfill with gas capture. Furthermore, this analysis excludes incineration capacity dedicated to specialist waste streams such as clinical or hazardous.

Estimates of the quantity of potential incinerator feedstock available as reduction targets are met are based on the following process:

1. Estimating future household and business waste per capita based on targets
2. Using population forecasts to convert per capita figures into waste tonnages
3. Estimating how much of the anticipated feedstock is available for use as a fuel
4. Estimating how much of this fuel would be available for use as incinerator feedstock

Resultant figures are then compared with incineration capacity to identify the anticipated level of incineration overcapacity for any given year.

Note: When outputs from one calculation table are used as inputs for another calculation, this is shown through the colour used in the cell.

Table of Contents

About UKWIN

The United Kingdom Without Incineration Network (UKWIN) was founded in March 2007 to promote sustainable waste management. The Network comprises hundreds of campaigners and campaign groups opposing waste incinerator proposals, and is coordinated by the report authors Josh and Shlomo Dowen.

UKWIN works at a national level to make expertise available to those wishing to participate in environmental decisions relating to waste management, including providing support with accessing environmental information and pursuing justice in environmental matters.

UKWIN advocates for economic, policy and legislative drivers to support sustainability in general, and more specifically to support the move away from incineration and towards a sustainable low-carbon circular economy.

For more about UKWIN see our website at: https://ukwin.org.uk/

Estimating future household and business waste per capita based on targets

A legally binding commitment to halve the amount of England's residual waste going to incineration or landfill by 2042 came into force on 30th January 2023 under the Environmental Targets (Residual Waste) (England) Regulations 2023.[ii] This is accompanied by interim targets set out in the UK Government's Environmental Improvement Plan (EIP) 2023.

As the Government's residual waste reduction targets are expressed in kg per capita (i.e. per person), the process of estimating future arisings involves establishing per capita figures and combining these with population forecasts to estimate future waste arisings.

Calculating per capita household and business waste figures for key years

Based on Government targets, the assessment assumes **469 kg** of residual household and business waste in 2019, falling to **333 kg** in 2027 and **234.5 kg** in 2042.

The UK Government's Environmental Improvement Plan 2023 (EIP) states that: "The residual waste target is underpinned by the following interim targets, by 31 January 2028: …Reduce municipal residual waste produced per person by **29%**".[iii]

The EIP also states: "Interim target 3: By 31 January 2028, the total mass of municipal residual waste in a year [i.e. for 2027] does not exceed **333 kg** per capita".

The Government's EIP definition of 'municipal waste' for the purpose of informing their residual waste reduction targets is a broad one that includes discarded material from "households plus waste similar in composition to household waste, such as commercial waste".

UKWIN refers to this 'municipal waste' stream as 'household and business waste' to avoid confusion with the narrower category of Local Authority Collected Municipal Waste.

The EIP makes it clear that the 29% fall in total municipal residual waste per person by 2027 compared to 2019 levels would reduce total municipal residual waste to 333kg per person.

Defra's position is therefore that there was around **469 kg** of municipal residual waste per person in 2019, as 469 kg reduced by 29% is 333kg.

This can be confirmed using the following formula:

[(Starting Value - Final Value) ÷ Starting Value] × 100

[(469 - 333) ÷ 469] × 100 = [136 ÷ 469] × 100 = 28.99786 (rounded to **29%**)

To arrive at the 2042 per capita figure it is assumed that household and business waste will halve by 2042 based on a 2019 baseline in line with the statutory target to halve all residual waste (other than major mineral waste) by 2042, i.e. 469 kg ÷ 2 = **245.5 kg**

Using figures for key years to calculate waste per capita for intervening years

It is assumed for the purpose of the assessment that there would be a linear fall in waste arisings between 2027 and 2042 to meet the 2042 target.

A number of measures to help meet the 2027 and 2042 targets to reduce residual waste are set out in the Environmental Improvement Plan 2023. The UK Government has stated: "The [2042] target will be met by using a range of government policy levers. These levers could include regulation that puts in place rules and standards that producers must follow which will encourage all of industry to improve their products recyclability, repairability and reusability" adding that: "A legally binding long-term target gives a clear signal to industry of the direction of future government policy. This will increase investor confidence and encourage industry to invest in infrastructure and research that will improve the circularity of the economy".[iv]

The UK Government stated in their June 2023 'Developing the UK Emissions Trading Scheme: Main Response' that: "In the Call for Evidence, we proposed exploring expansion of the UK ETS to waste incineration and EfW by the mid-to-late 2020s. This was on the basis that this would align with wider reforms to resources and waste policies later this decade and would help to achieve the UK Government's target to halve residual waste arisings (excluding major mineral wastes) on a kilogramme per capita basis by 2042 from 2019 levels".[v]

Whilst the exact timing of the fall between 2019 and 2027 is not relevant to this analysis, as many of the measures intended to help meet the 2027 target set out in the EIP 2023 have yet to be introduced, it is likely that the changes would come in the form of dramatic falls in waste available for use as incinerator feedstock in the coming years when universal separate food waste collections are introduced, when consistent recycling collections (now known as 'Simpler Recycling') are rolled out, and when initial measures are taken (e.g. to divert plastics from incineration) to minimise price exposure to the inclusion of incineration in the Emissions Trading Scheme.

Using population forecasts to convert per capita figures into waste tonnages

Per capita figures are converted into tonnes per annum (tpa) using forecast population figures from the Office of National Statistics (ONS). According to the ONS: "These statistics are widely used in planning, for example, fiscal projections, health, education and pensions".[vi]

The starting point for this approach is the 2020-based interim national population projections. This assumes the mid-year population in England will rise from 56,343,072 in 2019 to 58,527,723 in 2027, and to 61,549,624 in 2042. As the 2020 projections are for national population only, the regional cluster analysis uses the sub-national population proportions set out in the ONS' 2018-based sub-national population projections for England.[vii]

For example, the 2018-based sub-national projections estimate that in 2027 the Western Cluster regions (North West, West Midlands, South West) would represent 33.72% of England's population rising to 34.01% by 2042 and so the population of the Cluster is assumed to be 33.72% and 34.01% of the 2020-based forecast for England for those years.

Population figures used for 2019 and 2027-2042

Year	North Eastern Cluster	Western Cluster	South Eastern Cluster	England (Total)
2019	13,017,117	18,921,273	24,404,682	56,343,072
2027	13,373,890	19,580,343	25,106,770	58,061,002
2028	13,411,199	19,650,735	25,167,694	58,229,629
2029	13,446,011	19,718,159	25,225,226	58,389,396
2030	13,478,826	19,782,258	25,279,468	58,540,552
2031	13,509,735	19,843,312	25,330,504	58,683,551
2032	13,537,868	19,901,130	25,380,284	58,819,282
2033	13,563,377	19,955,845	25,429,053	58,948,275
2034	13,586,910	20,008,415	25,475,912	59,071,237
2035	13,609,360	20,059,207	25,520,647	59,189,214
2036	13,630,734	20,108,865	25,564,661	59,304,260
2037	13,651,192	20,158,085	25,609,243	59,418,521
2038	13,670,762	20,206,927	25,655,149	59,532,838
2039	13,690,644	20,255,894	25,701,247	59,647,785
2040	13,711,169	20,305,208	25,747,367	59,763,744
2041	13,732,189	20,354,799	25,793,454	59,880,442
2042	13,753,419	20,404,375	25,839,325	59,997,119

The 2019 figures are based on the 2018-based projection and are provided for context.

Estimating how much of anticipated waste would be available for use as a fuel

In 2021/22, only 8.1% of England's Local Authority Collected Waste was landfilled, with 47.5% incinerated and 41.5% recycled.[viii] This means that in order to increase recycling rates to meet recycling targets (such as the target to recycle 65% by 2035[ix]) the amount being incinerated will have to fall.

The amount of waste that goes to landfill in England has fallen significantly over the past decade, in large part as an effort to avoid paying the landfill tax.

Much of the waste currently sent to landfill is material that is either not combustible or that is otherwise unsuitable for incineration, e.g. due to its size or nature. Much of this material is exempt from the standard rate of landfill tax because it is considered 'inactive' (inert).

The Government has assessed that the relatively low adverse environmental impacts of landfilling these materials mean there is no need for punitive financial incentives to divert these materials from landfill, and so it does not make sense to expect that this inactive (and in many cases non-combustible) material would end up being used as incinerator feedstock.

Waste is often categorised based on waste codes from the European Waste Catalogue (EWC). Waste sent for incineration usually comprises waste from the following waste codes:

- **19 12 10** ('Combustible waste – Refuse Derived Fuel');
- **19 12 12** ('Other wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 19 12 11 (hazardous)'); and
- **20 03 01** ('Mixed municipal waste').

One of the most misleading waste codes is 19 12 12, which is generally classed as part of the municipal waste stream. The fact that incinerators burn a large quantity of 19 12 12 might lead one to the false conclusion that all 19 12 12 waste is suitable for use as incinerator feedstock, but this is not the case.

Because 19 12 12 is produced as the result of a sorting process, the fact that some 19 12 12 ends up in landfill is indicative of the fact that some of this waste is not actually suitable for incineration. As set out in a Technical Note produced by Beyond Waste: "...the principle that not all 19 12 12 is suited to incineration is accepted by the sector..."[x] An example of this is Tolvik's forecast of UK residual waste which acknowledges the principle that a significant portion of 19 12 12 is not combustible.[xi]

The Beyond Waste Technical Note explains how: "The processing of mixed skip waste generates residues of low combustibility after removal of wood and cardboard in sorting. These are normally referred to as trommel fines. There is a specific provision under the HMRC landfill tax regime to allow the disposal of these residues to landfill under the inactive waste classification if they meet a loss on ignition test. That is to say they have to prove they are not combustible to qualify. This by definition means they would be unsuitable for incineration. The landfill tax applies two rates, standard rate for active waste which currently stands at £102.10/tonne and inactive which currently stands at £3.25/tonne".

As such, it is clear that it would not be appropriate to assume that all residual waste would be suitable for incineration.

The fact that much of what is currently used as incinerator feedstock is a key focus for reduction, reuse and recycling has been confirmed by the UK Government. For example, as part of the May 2023 debate on Waste Incineration the Government told Parliament that: "We want to see less waste being sent to incinerators, which is why we set a statutory target to halve the 2019 level of residual waste by 2042".[xii]

A large proportion of what is burnt at incinerators falls within the Government's 2027 municipal residual waste reduction target for household and business waste, and so it makes sense to assume that incinerator feedstock would fall in line with that target.

To account for the non-combustible or otherwise unsuitable element of the remaining waste UKWIN assumes waste feedstock that could potentially be used as a fuel in England will be equivalent to 90% of residual household and business waste arising in England. As noted above, not all of this 'waste fuel' would be available for use as incinerator feedstock.

Estimating how much of the waste fuel would be available as incinerator feedstock

Incineration is not the only residual waste treatment option that can process combustible household and business waste. This assessment assumes that, across the whole of England, 1 million tonnes of household and business waste will be treated at facilities that fall outside the incineration capacity considered in this report, thus reducing the level of waste assumed to be potentially available for use as incinerator feedstock.

Tolvik's May 2023 report on 2022 EfW Statistics shows the upwards trend of residual waste (in the form of solid recovered fuel, also known as 'SRF') being accepted at UK cement and lime kilns, alongside the variation of existing biomass permits to allow these facilities to burn refuse derived fuel ('RDF'), which in 2022 rose by 109,000 tonnes to 493,000 tonnes compared with 284,000 tonnes in 2021.[xiii]

If cement/lime kiln use of SRF continued to increase at a rate of just around 100 kilotonnes (kt) per annum until 2027 then the amount of residual waste that is co-incinerated would double to around 1 million tonnes per annum.

It would be reasonable to expect that this upwards trend in the use of residual waste at cement and lime kilns will continue as these sectors seek to decarbonise by moving away from the conventional use of fossil fuels.

Waste production and supply company N+P stated in 2022 that: "...it was often assumed that alternative fuels could only be used in newer kilns, would require major modifications to production processes, and would lead to process instability. In fact, alternative fuels can be adopted even by older kilns with many examples in operation today". [xiv]

As the production of 1 tonne of SRF requires more than 1 tonne of 'raw' waste (e.g. due to dewatering as waste dries), the figure of 493kt of SRF being co-incinerated in 2022 and the 1 million tonne figure reflecting a continuation of this trend to 2027 understate the impact of such increases on the level of waste available for conventional incineration.

There are also other technologies that might divert waste away from incineration and that would therefore support the conclusion that the 1 million tonne assumption is an underestimate. For example, the UKWIN Government has provided financial support for three projects that would convert mixed waste into aviation fuel at Teesside, Immingham and Ellesmere Port. The combined feedstock requirements for these plants are expected to exceed 2 million tonnes of waste fuel per annum.[xv]

While the assessment assumes that waste will be unavailable for incineration due to alternative uses of the waste fuel, it should be noted that the conclusions of the assessment – that there would be incineration overcapacity when the 2027 targets are reached – would remain true even if no waste fuel was diverted away from incineration.

As such, the issue of alternative uses for incinerator feedstock is relevant to the consideration of the extent of anticipated incineration overcapacity rather than whether or not such overcapacity would occur nationally or within the identified regional clusters.

Incineration capacity methodology

UKWIN used the following sources to identify incineration facilities, their headline capacities, and their operational status:

- Tolvik's 2022 UK Energy from Waste Statistics – 2023 report, published in May 2023[xiii]
- BEIS' REPD database (July 2023)[xvi]
- Environmental Permit documents[xvii]
- Planning applications and consents[xvii]
- Press reports and statements made on operator/applicant websites

For incineration facilities where permit variation applications to increase permitted capacity have been submitted to the Environment Agency it is assumed that the variation will be granted as the Environment Agency has never refused such a request.

The assessment is focussed on the capacity of existing incineration plants (i.e. plants that are currently operational or currently under construction) or plants that are in active development that have secured planning permission. Whilst there are also incineration plants with planning permission that are not under active development and incineration plants that are under active development that have yet to obtain planning permission all of these are excluded from the assessment.

After permitted/headline capacity is ascertained, it is assumed that 90% of this capacity will be available. It is this 90% figure which is used throughout the assessment. This is in line with historic availability rates and is considered conservative as it does not account for changes in operation or changes in feedstock composition which could increase capacity utilisation rates, e.g. by reducing downtime thereby increasing the number of hours of operation and the quantity of feedstock that can be processed. For more about the impact of changes in waste composition on incineration capacity see the section below.

The assessment found that there would be incineration overcapacity both nationally and within each of the regional clusters based on existing capacity, and that this overcapacity would be exacerbated if incinerators that are currently in development end up being built.

A list of all these incinerators and their respective capacities is set out at the end of this Annex, reflecting the situation as it was in mid-September 2023.

Incinerator longevity

While UKWIN would like to see a future where all incinerators are progressively and strategically decommissioned (closed down), the assessment is made on the basis that existing incinerators will continue to operate.

As we know from the Eastcroft (Nottingham) and Edmonton (North London) incinerators, incinerators can operate for more than 50 years. More generally, we know that once built there is an economic incentive to keep plants going to make profit and recoup investment / initial construction costs, even if this means periodic refurbishment.

According to Tolvik's May 2023 report on 2022 EfW Statistics, "...as at December 2022 the capacity-weighted average age of the 60 UK EfWs which accepted waste in 2022 was 11.1 years".[xiii]

This means that the UK EfW fleet is relatively young, and indeed a number of plants are currently under construction, with Edmonton being replaced with a new larger facility.

UKWIN's assessment is based on the assumption that Edmonton is being replaced and that both facilities will not be operating at the same time.

Oldest incinerators currently operating in England

Plant	Regional Cluster	Operational start year	90% of headline capacity (ktpa)	50 years of operation
Eastcroft (Nottingham)	North Eastern	1973	180	2023
Edmonton (London)	South Eastern	1974	Not applicable	2024
SELCHP (London)	South Eastern	1993	397	2043
Tyseley (Birmingham)	Western	1996	189	2046
Stoke (Hanford)	Western	1997	210	2047

If incineration plants are decommissioned after 50 years of operation without being replaced then the only one that would close by 2042 would be Eastcroft, which began operations in 1973 and so would close in 2023. However, Eastcroft has been refurbished and is being relied upon for the local district heating scheme, so it is unlikely that it will be closed down any time soon.

Similarly, the South East London Combined Heat and Power (SELCHP) plant is also connected to a district heating scheme and is therefore more likely to be maintained and refurbished than decommissioned after 50 years of operation.

When these factors are taken into account, the evidence suggests that incineration closures are unlikely to have a significant impact on incineration capacity in the foreseeable future.

The impact of changes in waste composition on incineration capacity

The quantity of waste feedstock an incinerator can burn is not based on the tonnes of waste permitted to be processed but rather on the calorific value (CV) of energy that the turbine and engine are designed to manage. As such, changes in feedstock composition can impact on the effective capacity of an incinerator (as measured in tonnes per annum or 'tpa').

The UK Government intends to reduce the amount of plastics and food waste going to incineration through a range of measures such as deposit return schemes, extended producer responsibility, the consistency framework (now known as 'Simpler Recycling'), the plastics tax, inclusion of incineration in the UK ETS, and the mandatory separate collection of food waste.

These changes are expected to alter the composition of the waste feedstock used for incinerators, with an anticipated overall lowering of the CV of waste feedstock. A lower CV would result in an increase in the effective capacity of incineration facilities. For example, feedstock changes in Wales meant that the maximum capacity of the Cardiff incinerator was increased from 350,000 tpa to 425,000 tpa because "lower average calorific value of waste is being generated – meaning more waste is needed to maintain the energy output".[xviii]

The expectation that England will follow a similar trend, with more waste needed to feed a given incinerator, means that for projecting future incineration capacity reliance on historic rates of incineration would inevitably underestimate future levels of incineration capacity.

As headline figures for many incinerators are based on historic feedstock assumptions, it is possible that many will end up burning more than their headline capacity figures. This is especially true for plants designed to process a high volume of plastics (which have a high CV) and/or low volumes of food waste (which has a low CV).

The impact on capacity of changes in feedstock composition will differ for each incinerator. However, we can get a sense of the scale of impact based on feedstock composition data published by the Riverside incinerator operator.[xix]

The Riverside operator's feedstock composition analysis includes data on the respective contributions of dense plastic, plastic film, putrescibles (e.g. food waste) and other waste types by weight and CV. This can be used to determine how much reducing one element of the waste stream would lower the CV, and therefore the increase in other waste categories (paper, wood, etc.) that would be necessary to deliver the same input CV/energy output.

For example:

- Assuming that plastic film and dense plastics are completely removed from the feedstock and that all other categories increase proportionally, it would take around 31% more waste by weight to deliver the same calorific value.
- Assuming 90% of plastic film and dense plastics are removed from the feedstock, and that 50% of putrescible waste is also removed, it would take around 21% more waste by weight to deliver the same calorific value.

As such, reductions in the quantities of plastic in the feedstock can significantly increase the effective capacity of existing waste incinerators even when other changes in feedstock composition arising from increased food waste collection are taken into account.

Waste required to compensate for the removal of plastic film and dense plastic, based on the Riverside incinerator feedstock profile

	Original % by weight	Original % by CV	% of this to assume for future composition	Future % by weight	Future % by CV
Paper and card	27.83%	27.80%	156%	43%	43%
Plastic film	8.51%	18.67%	0%	0%	0%
Dense plastic	7.77%	17.28%	0%	0%	0%
Textiles	3.43%	5.25%	156%	5%	8%
Misc. Combustible	9.55%	12.26%	156%	15%	19%
Misc. Non-Combustible	5.39%	0%	156%	8%	0%
Glass	4.52%	0%	156%	7%	0%
Putrescibles	26.44%	16.35%	156%	41%	26%
Ferrous Metal	1.58%	0%	156%	2%	0%
Non-ferrous Metal	1%	0%	156%	2%	0%
Hazardous	1.21%	0%	156%	2%	0%
Fines	2.77%	2.39%	156%	4%	4%
	100%	100%		**130.6%**	100%

The figure of 130.6% suggests the need for a 30.6% increase in waste by weight to provide the same calorific value.

Similar findings have also been recorded in other studies such as a Reloop report on waste management published in June 2022.[xx] The modelling carried out for Reloop showed the impact of removing between 100 and 150 kg of plastics, metals, glass and fibre from a tonne of residual municipal waste.

Figure 12 of that Reloop report depicts how, at the lower end of the modelled range, the removal of between 100 and 150 kg of plastics, metals, glass and fibre from a tonne of residual municipal waste would result in reducing the net calorific value of the waste:

- from 10 GJ/tonne to 8 GJ/tonne, which is equivalent to a reduction of 20%
- from 12 GJ/tonne to 9.6 MJ/tonne, which is equivalent to a reduction of 20%

At the upper end of the modelled range this would reduce the calorific value of the waste from 12 GJ/tonne to 8 GJ/tonne, which is equivalent to a 32% decrease.

This research from Reloop supports the case that changes in waste management could increase the amount of waste that incinerators can burn by around 20-30% compared to present levels, highlighting how relying on historic utilisation rates of incinerators could result in underestimating how much waste incinerators could need to operate in the future, especially if more operators manage to operate at the availability of the leading operators.

Incineration harms recycling

A summary of the case for how incineration harms recycling is set out in the main briefing. This section of the Technical Annex sets out the evidence base cited in that briefing alongside providing further supporting evidence.

Evidence of conflict between incineration and recycling cited in the main briefing:

The data used for the chart showing the correlation between high rates of incineration and low rates of recycling across England was taken from Defra's 'Local authority collected waste generation annual results 2021/22 (England and regions) and local authority data annual results 2021/22' spreadsheet, which is available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1144270/LA_and_Regional_Spreadsheet_202122.xlsx

Evidence to support the statements that "most of what is incinerated is material that is readily recyclable (including paper, plastic, food, etc.), meaning a significant proportion of what is currently incinerated could and should have been recycled or composted" and that "Of total residual waste from household sources in England in 2017, an estimated 53% could be categorised as readily recyclable, 27% as potentially recyclable, 12% as potentially substitutable and 8% as difficult to either recycle or substitute" can be found in Defra's 'Resources and Waste Strategy Monitoring Progress' 2020 document, available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/907029/resources-and-waste-strategy-monitoring-progress.pdf

The reference to how "Similar studies focussed on commercial and industrial waste arrive at similar conclusions about the high recyclability of what is currently treated as residual waste" relates to WRAP Cymru's 2020 'Composition analysis of Commercial and Industrial waste in Wales' available at: https://wrapcymru.org.uk/resources/report/composition-analysis-commercial-and-industrial-waste-wales (which found that "The majority of the [residual C&I] waste analysed...could have potentially been recycled.") and the 'North West of England Commercial and Industrial Waste Survey 2009' produced for the Environment Agency (which found that: "up to 97.5% of the C&I waste landfilled in the region could be recycled if the correct facilities and services were available") available at: https://webarchive.nationalarchives.gov.uk/ukgwa/20140329075720/http://cdn.environment-agency.gov.uk/genw0410bsjm-e-e.pdf

The Climate Change Committee's (CCC's) 2021 Report to Parliament, which warned that: "If EfW usage is left to grow unchecked, EfW emissions will quickly exceed those of the CCC pathway while undermining recycling and re-use efforts", is available at: https://www.theccc.org.uk/publication/2021-progress-report-to-parliament/ (page 181).

Defra's acknowledgement of the need to minimise the amount of waste going to incineration can be found on pages 28-30 of the Government's May 2022 'Consultation on environmental targets', which is available at: https://consult.defra.gov.uk/natural-environment-policy/consultation-on-environmental-targets/supporting_documents/Environment%20Targets%20Public%20Consultation.pdf

Further reading about how incineration harms recycling:

Further evidence from a range of waste composition studies which found a high level of recyclability in the residual waste stream can be found via:
https://ukwin.org.uk/facts/#recyclability

Further analysis showing how for councils in England with above-average rates of incineration there is a clear correlation between higher rates of incineration and lower rates of recycling is set out alongside other arguments at: https://ukwin.org.uk/oppose-incineration/#recycling

Examples of the view being expressed that incinerator feedstock would not necessarily otherwise be sent untreated to landfill (e.g. because it could be recycled) are set out in UKWIN's 2021 Good Practice guidance for Assessing the GHG Impacts of Waste Incineration.

This Guide includes relevant quotes from Zero Waste Scotland, Professor Sir Ian Boyd, 2012-2019 Chief Scientific Adviser to Defra, the Welsh Government, the Secretary of State for BEIS, Green Alliance, Friends of the Earth, the Centre for Energy and the Environment at the University of Exeter, and the London Assembly's Environment Committee. See: https://ukwin.org.uk/files/pdf/UKWIN-2021-Good-Practice-Guidance-for-Assessing-the-GHG-Impacts-of-Waste%20Incineration.pdf (pages 66-69).

In their February 2018 report on 'Energy from Waste' the London Assembly's Environment Committee explained how: "Investing in more EfW can negatively affect long term recycling rates. This investment needs to be paid for by an assured income stream, usually through contracts with local authorities to pay the EfW operator to take waste. Contracts are often lengthy – the majority are over 20 years. The terms of contracts, such as minimum annual payments, or a low fee per tonne of waste, can undermine the financial viability for the local authority of reducing waste, or sending it to other destinations such as recycling".

The full report is available at: https://www.london.gov.uk/sites/default/files/waste-energy_from_waste_feb15.pdf

Many councils are signed up to long-term waste contracts that involve incineration, and many of these councils have told the Government that their low recycling rates are due to their incineration-based waste contracts that undermine their incentive or ability to invest in improvements to recycling services.

These contracts usually ensure the council takes on the primary risk of there not being enough waste to burn, meaning councils are in effect penalised for not sending enough waste for incineration. Incinerators cost around £200m+ to build and that money cannot then be spent on recycling.

Contractual mechanisms such as 'minimum tonnage guarantees', 'put-or-pay' clauses and 'banding mechanisms' undermine the economic incentive to reduce, re-use and recycle even where funds are available.

UKWIN's 6-page summary from July 2019 which provides examples of incineration harming recycling, and which is available at: http://ukwin.org.uk/files/pdf/UKWIN-Examples-of-incineration-harming-recycling-July-2019.pdf

The blogpost entitled 'UKWIN welcomes EFRACOM's incinerator caution', is available at: https://ukwin.org.uk/2014/10/22/ukwin-welcomes-efracoms-incinerator-caution/

UKWIN's 26-page written evidence from May 2014 submitted as part of the Environment, Food and Rural Affairs Committee (EFRACOM) Inquiry on Waste Management in England, is available at:
http://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/environment-food-and-rural-affairs-committee/waste-management/written/9294.pdf

More information about the correlation between high rates of incineration and low rates of recycling can be found at the following sources:

- Supplementary written evidence submitted by Professor Nicky Gregson, Durham University, available at:
  https://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/housing-communities-and-local-government-committee/implications-of-the-waste-strategy-for-local-authorities/written/103388.pdf

- Oral evidence from Professor Nicky Gregson of Durham University on the 'Implications of Waste Strategy for Local Authorities' (EFRACOM, 20 May 2019) is available at:
  http://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/housing-communities-and-local-government-committee/implications-of-the-waste-strategy-for-local-authorities/oral/102483.pdf

For another academic perspective, see 'Is incineration repressing recycling?' (Masashi Yamamoto, Thomas C. Kinnaman), published in the Journal of Environmental Economics and Management (Volume 111, 2022) is available at:
https://www.sciencedirect.com/science/article/pii/S0095069621001364

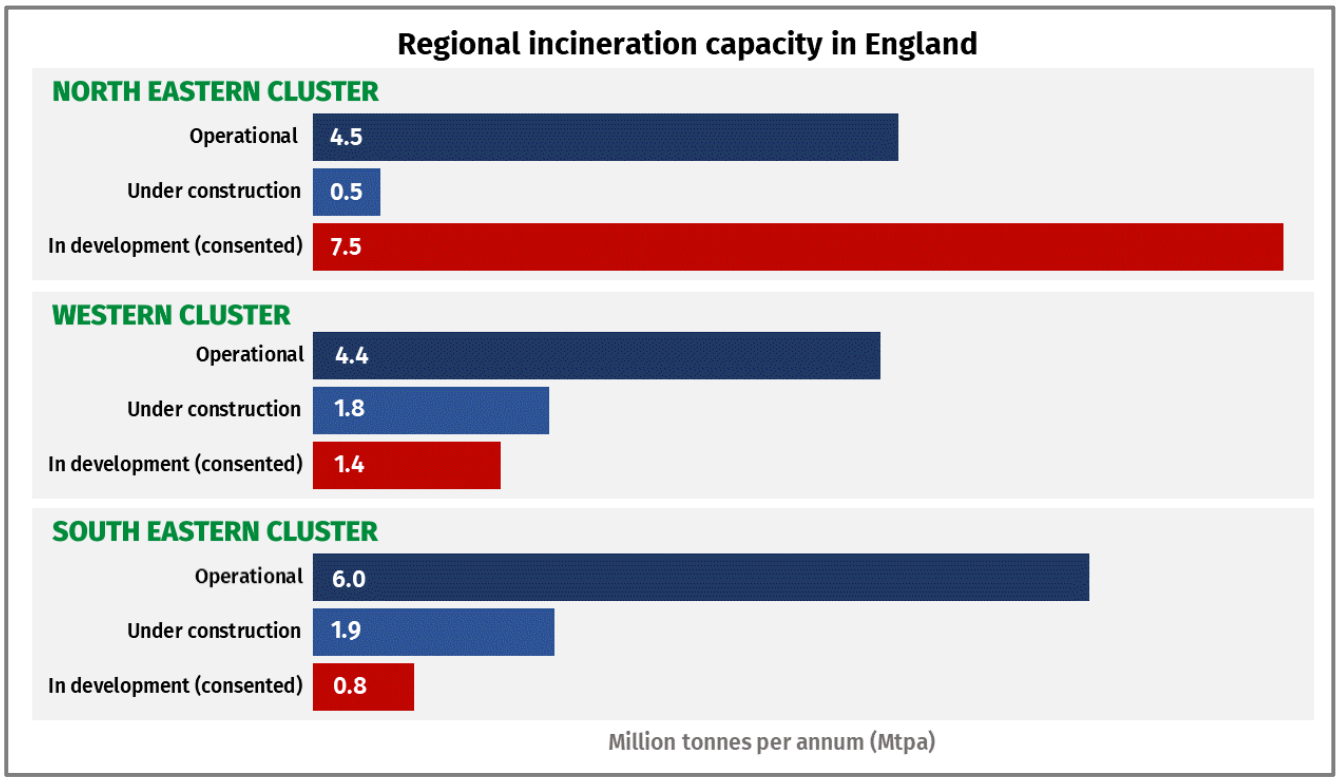
In February 2022 UKWIN provided evidence about how incineration harms recycling to the Scottish Incineration Review. See: https://ukwin.org.uk/files/pdf/UKWIN-Submission-to-Scottish-Incineration-Review-February-2022.pdf (especially UKWIN's answer to Q8 on pages 17-27).

The Scottish Incineration Review was subsequently published in May 2022, warning about the risk of incinerator lock-in. See: https://www.gov.scot/publications/stop-sort-burn-bury-independent-review-role-incineration-waste-hierarchy-scotland/documents/

Cross-boundary movements of waste

Whilst it is recognised that waste is transported into and out of the regional clusters, for the purpose of this analysis it is generally assumed that the quantity of residual waste managed within a regional cluster is equivalent to the quantity of residual waste forecast to arise within that cluster. This means that, for example, the analysis does not factor in the potential for residual waste to be converted to RDF or SRF and exported to Continental European incinerators.

Summaries of regional incineration capacity in England



Summary and calculations for incineration capacity in England and Regions based on 90% of headline / permitted capacity

	North Eastern	Western	South Eastern	England (Total)
Operational in September 2023	4,500	4,365	5,973	14,838
Under construction in September 2023	521	1,815	1,859	4,195
Existing (sum of operational and under construction)	**5,021**	**6,180**	**7,832**	**19,033**
In active development with planning consent	7,462	1,442	781	9,685
Existing and in development with consent	**12,483**	**7,622**	**8,612**	**28,718**
In active development without planning consent	1,071	576	698	2,345

Waste availability calculations

Waste available for incineration per capita within England

Year	England Population	Municipal Residual Waste Per Capita	Equiv. Pro-portion used	Waste Fuel Per Capita	Waste Fuel in England (Tonnes)	Unavailable Due to Other Uses (Tonnes)	Waste Available for Incineration in England (Tonnes)	Waste Available for Incineration Per Capita (kg)
2019	56,343,072	469.0	90%	422.1	23,782,411	-390,000	**23,392,411**	**415.2**
2027	58,061,002	333.0	90%	299.7	17,400,882	-1,000,000	**16,400,882**	**282.5**
2028	58,229,629	326.4	90%	293.8	17,107,283	-1,000,000	**16,107,283**	**276.6**
2029	58,389,396	319.9	90%	287.9	16,809,139	-1,000,000	**15,809,139**	**270.8**
2030	58,540,552	313.3	90%	282.0	16,506,679	-1,000,000	**15,506,679**	**264.9**
2031	58,683,551	306.7	90%	276.1	16,200,181	-1,000,000	**15,200,181**	**259.0**
2032	58,819,282	300.2	90%	270.2	15,890,029	-1,000,000	**14,890,029**	**253.1**
2033	58,948,275	293.6	90%	264.2	15,576,492	-1,000,000	**14,576,492**	**247.3**
2034	59,071,237	287.0	90%	258.3	15,259,873	-1,000,000	**14,259,873**	**241.4**
2035	59,189,214	280.5	90%	252.4	14,940,541	-1,000,000	**13,940,541**	**235.5**
2036	59,304,260	273.9	90%	246.5	14,619,093	-1,000,000	**13,619,093**	**229.6**
2037	59,418,521	267.3	90%	240.6	14,296,096	-1,000,000	**13,296,096**	**223.8**
2038	59,532,838	260.8	90%	234.7	13,971,762	-1,000,000	**12,971,762**	**217.9**
2039	59,647,785	254.2	90%	228.8	13,646,220	-1,000,000	**12,646,220**	**212.0**
2040	59,763,744	247.6	90%	222.9	13,319,546	-1,000,000	**12,319,546**	**206.1**
2041	59,880,442	241.1	90%	217.0	12,991,661	-1,000,000	**11,991,661**	**200.3**
2042	59,997,119	234.5	90%	211.1	12,662,392	-1,000,000	**11,662,392**	**194.4**

The 2019 figure is based on the 2018-based projection and is provided for context.
Waste per capita is shown rounded, but higher precision figures are used for calculations.

Waste available for incineration per capita within North Eastern Cluster (East Midlands, North East, Yorkshire & the Humber)

Year	Waste Available for Incineration Per Capita (kg)	Population in Cluster	Waste Available for Incineration in Cluster (Tonnes)
2027	282.5	13,373,890	**3,777,813**
2028	276.6	13,411,199	**3,709,761**
2029	270.8	13,446,011	**3,640,556**
2030	264.9	13,478,826	**3,570,377**
2031	259.0	13,509,735	**3,499,284**
2032	253.1	13,537,868	**3,427,095**
2033	247.3	13,563,377	**3,353,897**
2034	241.4	13,586,910	**3,279,898**
2035	235.5	13,609,360	**3,205,345**
2036	229.6	13,630,734	**3,130,268**
2037	223.8	13,651,192	**3,054,730**
2038	217.9	13,670,762	**2,978,757**
2039	212.0	13,690,644	**2,902,621**
2040	206.1	13,711,169	**2,826,385**
2041	200.3	13,732,189	**2,750,009**
2042	194.4	13,753,419	**2,673,424**

Waste per capita is shown rounded, but higher precision figures are used for calculations.

Waste available for incineration per capita within Western Cluster (North West, South West and West Midlands)

Year	Waste Available for Incineration Per Capita (kg)	Population in Cluster	Waste available for incineration in cluster (Tonnes)
2027	282.5	19,580,343	**5,530,991**
2028	276.6	19,650,735	**5,435,720**
2029	270.8	19,718,159	**5,338,763**
2030	264.9	19,782,258	**5,240,079**
2031	259.0	19,843,312	**5,139,804**
2032	253.1	19,901,130	**5,037,947**
2033	247.3	19,955,845	**4,934,601**
2034	241.4	20,008,415	**4,830,057**
2035	235.5	20,059,207	**4,724,445**
2036	229.6	20,108,865	**4,617,957**
2037	223.8	20,158,085	**4,510,779**
2038	217.9	20,206,927	**4,402,939**
2039	212.0	20,255,894	**4,294,552**
2040	206.1	20,305,208	**4,185,664**
2041	200.3	20,354,799	**4,076,253**
2042	194.4	20,404,375	**3,966,254**

Waste per capita is shown rounded, but higher precision figures are used for calculations.

Waste available for incineration per capita within South Eastern Cluster (East, London and South East)

Year	Waste Available for Incineration Per Capita (kg)	Population in Cluster	Waste available for incineration in cluster (Tonnes)
2027	282.5	25,106,770	**7,092,078**
2028	276.6	25,167,694	**6,961,802**
2029	270.8	25,225,226	**6,829,821**
2030	264.9	25,279,468	**6,696,223**
2031	259.0	25,330,504	**6,561,093**
2032	253.1	25,380,284	**6,424,988**
2033	247.3	25,429,053	**6,287,994**
2034	241.4	25,475,912	**6,149,918**
2035	235.5	25,520,647	**6,010,751**
2036	229.6	25,564,661	**5,870,868**
2037	223.8	25,609,243	**5,730,586**
2038	217.9	25,655,149	**5,590,066**
2039	212.0	25,701,247	**5,449,048**
2040	206.1	25,747,367	**5,307,497**
2041	200.3	25,793,454	**5,165,398**
2042	194.4	25,839,325	**5,022,713**

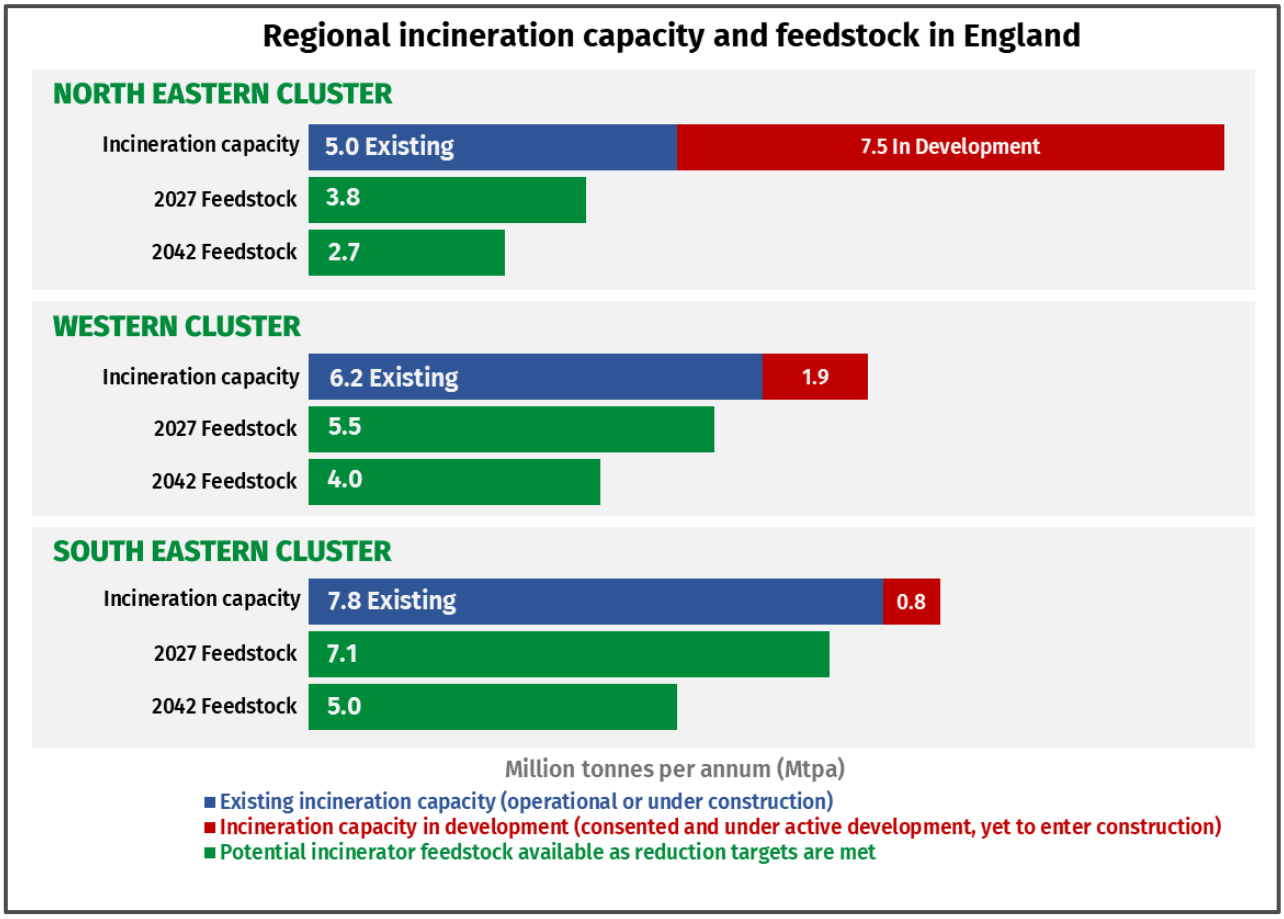
Waste per capita is shown rounded, but higher precision figures are used for calculations.

National balance between potential incinerator feedstock and capacity calculations

Balance between potential incinerator feedstock and capacity in England

Year	Waste available for incineration in cluster (Kilotonnes)	Existing Capacity (90% of headline)	Overcapacity based on existing capacity	Consented Capacity currently in development (90% of headline)	Overcapacity based on existing and in development capacity
2027	16,401	19,033	**2,632**	28,718	**12,317**
2028	16,107	19,033	**2,926**	28,718	**12,611**
2029	15,809	19,033	**3,224**	28,718	**12,909**
2030	15,507	19,033	**3,526**	28,718	**13,211**
2031	15,200	19,033	**3,833**	28,718	**13,518**
2032	14,890	19,033	**4,143**	28,718	**13,828**
2033	14,576	19,033	**4,457**	28,718	**14,141**
2034	14,260	19,033	**4,773**	28,718	**14,458**
2035	13,941	19,033	**5,092**	28,718	**14,777**
2036	13,619	19,033	**5,414**	28,718	**15,099**
2037	13,296	19,033	**5,737**	28,718	**15,422**
2038	12,972	19,033	**6,061**	28,718	**15,746**
2039	12,646	19,033	**6,387**	28,718	**16,072**
2040	12,320	19,033	**6,713**	28,718	**16,398**
2041	11,992	19,033	**7,041**	28,718	**16,726**
2042	11,662	19,033	**7,371**	28,718	**17,056**

Regional balance between potential incinerator feedstock and capacity calculations



Balance between potential incinerator feedstock and capacity in North Eastern Cluster

Year	Waste available for incineration in cluster (Kilotonnes)	Existing Capacity (90% of headline)	Overcapacity based on existing capacity	Consented Capacity currently in development (90% of headline)	Overcapacity based on existing and in development capacity
2027	3,778	5,021	1,243	12,483	8,706
2028	3,710	5,021	1,311	12,483	8,774
2029	3,641	5,021	1,380	12,483	8,843
2030	3,570	5,021	1,451	12,483	8,913
2031	3,499	5,021	1,522	12,483	8,984
2032	3,427	5,021	1,594	12,483	9,056
2033	3,354	5,021	1,667	12,483	9,129
2034	3,280	5,021	1,741	12,483	9,203
2035	3,205	5,021	1,816	12,483	9,278
2036	3,130	5,021	1,891	12,483	9,353
2037	3,055	5,021	1,966	12,483	9,429
2038	2,979	5,021	2,042	12,483	9,505
2039	2,903	5,021	2,118	12,483	9,581
2040	2,826	5,021	2,195	12,483	9,657
2041	2,750	5,021	2,271	12,483	9,733
2042	2,673	5,021	2,347	12,483	9,810

Balance between potential incinerator feedstock and capacity in Western Cluster

Year	Waste available for incineration in cluster (Kilotonnes)	Existing Capacity (90% of headline)	Overcapacity based on existing capacity	Consented Capacity currently in development (90% of headline)	Overcapacity based on existing and in development capacity
2027	5,531	6,180	649	7,622	2,091
2028	5,436	6,180	745	7,622	2,186
2029	5,339	6,180	842	7,622	2,283
2030	5,240	6,180	940	7,622	2,382
2031	5,140	6,180	1,040	7,622	2,482
2032	5,038	6,180	1,142	7,622	2,584
2033	4,935	6,180	1,246	7,622	2,687
2034	4,830	6,180	1,350	7,622	2,792
2035	4,724	6,180	1,456	7,622	2,898
2036	4,618	6,180	1,562	7,622	3,004
2037	4,511	6,180	1,670	7,622	3,111
2038	4,403	6,180	1,777	7,622	3,219
2039	4,295	6,180	1,886	7,622	3,328
2040	4,186	6,180	1,995	7,622	3,436
2041	4,076	6,180	2,104	7,622	3,546
2042	3,966	6,180	2,214	7,622	3,656

Balance between potential incinerator feedstock and capacity in South Eastern Cluster

Year	Waste available for incineration in cluster (Kilotonnes)	Existing Capacity (90% of headline)	Overcapacity based on existing capacity	Consented Capacity currently in development (90% of headline)	Overcapacity based on existing and in development capacity
2027	7,092	7,832	740	8,612	1,520
2028	6,962	7,832	870	8,612	1,651
2029	6,830	7,832	1,002	8,612	1,783
2030	6,696	7,832	1,136	8,612	1,916
2031	6,561	7,832	1,271	8,612	2,051
2032	6,425	7,832	1,407	8,612	2,187
2033	6,288	7,832	1,544	8,612	2,324
2034	6,150	7,832	1,682	8,612	2,463
2035	6,011	7,832	1,821	8,612	2,602
2036	5,871	7,832	1,961	8,612	2,742
2037	5,731	7,832	2,101	8,612	2,882
2038	5,590	7,832	2,242	8,612	3,022
2039	5,449	7,832	2,383	8,612	3,163
2040	5,307	7,832	2,524	8,612	3,305
2041	5,165	7,832	2,666	8,612	3,447
2042	5,023	7,832	2,809	8,612	3,590

Incinerator list: East Midlands, North East, Yorkshire & the Humber

Summary and calculations for incineration capacity in the North Eastern Cluster

	Headline capacity (Ktpa)	90% of headline capacity
Operational in September 2023	5,000	4,500
Under construction in September 2023	579	521
Existing (sum of operational and under construction)	5,579	**5,021**
In active development with planning consent	8,292	7,462
Existing and in development with consent	13,870	**12,483**
In active development w/out planning consent	1,190	1,071

Operational incinerators in the North Eastern Cluster

Plant	Location, Region	Headline Capacity (ktpa)
1. Tees Valley Lines 1-5 (Billingham)	Teesside, North East	756
2. Ferrybridge Multifuel 1 (FM1)	West Yorkshire, Yorks. & Humber	725
3. Ferrybridge Multifuel 2 (FM2)	West Yorkshire, Yorks. & Humber	725
4. Wilton 11	Teesside, North East	500
5. Newhurst Quarry	Leicestershire, East Midlands	455
6. Allerton	North Yorkshire, Yorks. & Humber	320
7. Energy Works (Hull)	Hull, Yorks. & Humber	315
8. Sheffield	South Yorkshire, Yorks. & Humber	245
9. Eastcroft (Nottingham)	Nottingham, East Midlands	200
10. Lincolnshire (North Hykeham)	Lincolnshire, East Midlands	190
11. Leeds (Cross Green)	West Yorkshire, Yorks. & Humber	190
12. Kirklees (Huddersfield)	West Yorkshire, Yorks. & Humber	150
13. Boston Energy Production Facility	Boston, East Midlands	86
14. Hull Energy Production Facility (Aviva)	Hull, Yorks. & Humber	86
15. Newlincs	North Lincolnshire, Yorks. & Humber	56
TOTAL		**5,000**

Incinerators under construction in the North Eastern Cluster

Plant	Location, Region	Headline Capacity (ktpa)
1. Leeds (Skelton Grange)	West Yorkshire, Yorks. & Humber	410
2. Drakelow	Derbyshire, East Midlands	169
TOTAL		**579**

Incinerators in active development with planning consent in the North Eastern Cluster

Plant	Location, Region	Headline Capacity (ktpa)
1. Boston BAEF (NSIP)	Boston, East Midlands	1,200
2. South Humber Bank (Stallingborough)	North East Lincolnshire, Yrks. & Hum.	781
3. North Beck (Immingham)	North East Lincolnshire, Yrks. & Hum.	700
4. Graythorp (Hartlepool)	Hartlepool, North East	650
5. East Midlands Energy Re-Generation (EMERGE) Centre	Nottinghamshire, East Midlands	525
6. Tees Valley (Grangetown)	Redcar and Cleveland, North East	512
7. Redcar	Redcar and Cleveland, North East	450
8. Kirk Sandall (Doncaster)	Doncaster, Yorks. & Humber	427
9. Billingham Reach	Teesside, North East	375
10. Port Clarence	Teesside, North East	350
11. Southmoor (Knottingley)	North Yorkshire, Yorks. & Humber	350
12. Ferndale Park (Hull)	East Riding of Yorkshire, Yrks. & Hum.	320
13. Corby Energy Recovery Centre (Shelton Road)	Northamptonshire, East Midlands	260
14. Teesside	Stockton on Tees, North East	240
15. Alpha Grimsby	North East Lincolnshire, Yrks & Hum.	226
16. Billingham Haverton Hill extension (Suez)	Teesside, North East	200
17. Haverton Hill (New Road, Billingham) (EQTec)	Teesside, North East	170
18. Corby Brookfield	Northamptonshire, East Midlands	154
19. Eastcroft (Nottingham) (3rd Line)	Nottingham, East Midlands	140
20. Kingspan (Selby)	North Yorkshire, Yorks. & Humber	132
21. Knapton	North Yorkshire, Yorks. & Humber	130
TOTAL		**8,292**

Incinerators in active development but not consented in the North Eastern Cluster

Plant	Location, Region	Headline Capacity (ktpa)
1. North Lincolnshire (NSIP)	North Lincolnshire, Yorks. & Humber	760
2. Swadlincote	Derbyshire, East Midlands	230
3. Bilsthorpe	Nottinghamshire, East Midlands	200
TOTAL		**1,190**

Notes regarding the North Eastern Cluster:

- This does not include the 260,000 tonnes per annum of RDF incineration capacity at land near the former Houghton Main Colliery, Barnsley which has been granted planning permission and which is currently applying for an Environmental Permit. This is because the change in status post-dated the mid-September cutoff date.
- This also does not include the 148,000 tonnes per annum of incineration capacity at Keighley, near Bradford which has been granted planning permission and an Environmental Permit as this project appears to have stalled and is therefore not considered to be in active development.

Incinerator list: North West, South West, West Midlands

Summary and calculations for incineration capacity in the Western Cluster

	Headline capacity (Ktpa)	90% of headline capacity
Operational in September 2023	4,850	4,365
Under construction in September 2023	2,017	1,815
Existing (sum of operational and under construction)	6,867	**6,180**
In active development with planning consent	1,602	1,442
Existing and in development with consent	8,469	7,622
In active development w/out planning consent	640	576

Operational incinerators in the Western Cluster

Plant	Location, Region	Headline Capacity (ktpa)
1. Runcorn	Cheshire, North West	1,100
2. Severnside (Avonmouth)	South Gloucestershire, South West	500
3. Tyseley (Birmingham)	West Midlands Met Districts, West Midlands	441
4. Avonmouth (Bristol)	Bristol, South West	377
5. Four Ashes	Staffordshire, West Midlands	340
6. Coventry	West Midlands Met Districts, West Midlands	315
7. Devonport (Plymouth)	Devon, South West	265
8. St Dennis (Cornwall)	Cornwall, South West	240
9. Hartlebury (EnviRecover)	Worcestershire, West Midlands	230
10. Stoke (Hanford)	Stoke on Trent, West Midlands	210
11. Javelin Park	Gloucestershire, South West	190
12. Baddesley	Warwickshire, West Midlands	130
13. Bolton	Greater Manchester, North West	127
14. Wolverhampton	West Midlands Met Districts, West Midlands	118
15. Dudley	West Midlands Met Districts, West Midlands	105
16. Battlefield (Shrewsbury)	Shropshire, West Midlands	102
17. Marsh Barton (Exeter)	Devon, South West	60
TOTAL		**4,850**

Incinerators under construction in the Western Cluster

Plant	Location, Region	Headline Capacity (ktpa)
1. Lostock	Cheshire, North West	728
2. Ince Marshes (Protos)	Cheshire, North West	500
3. Kelvin (West Bromwich)	Sandwell, West Midlands	400
4. Hooton Bio Power	Merseyside, North West	266
5. Bridgwater	Somerset, South West	123
TOTAL		**2,017**

Incinerators in active development with planning consent in the Western Cluster

Plant	Location, Region	Headline Capacity (ktpa)
1. WandE (Walsall)	Walsall, West Midlands	478
2. Preston (Longridge Road)	Lancashire, North West	395
3. Kingmoor (Carlisle)	Cumbria, North West	274
4. Northacre (Westbury)	Wiltshire, South West	243
5. Hill Barton (Exeter)	Devon, South West	87
6. Kidderminster	Worcestershire, West Midlands	75
7. Parley	Dorset, South West	50
TOTAL		**1,602**

Incinerators in active development but not consented in the Western Cluster

Plant	Location, Region	Headline Capacity (ktpa)
1. Canford	Dorset, South West	260
2. Portland Port	Dorset, South West	200
3. Thornton-Cleveleys	Lancashire, North West	120
4. Southport	Merseyside, North West	60
TOTAL		**640**

Note regarding the Western Cluster:

- This does not include the 300,000 tonnes per annum of incineration capacity at Greengate, St Helens which has been granted both planning permission and an Environmental Permit. Waste trade press reports from September 2022 suggest that this project has stalled, and it is therefore not considered to currently be in active development.

Incinerator list: East of England, London, South East

Summary and calculations for incineration capacity in the South Eastern Cluster

	Headline capacity (Ktpa)	90% of headline capacity (Ktpa)
Operational in September 2023	6,637	5,973
Under construction in September 2023	2,065	1,859
Existing (sum of operational and under construction)	8,702	**7,832**
In active development with planning consent	867	781
Existing and in development with consent	9,569	**8,612**
In active development w/out planning consent	775	698

Operational incinerators in the South Eastern Cluster

Plant	Location, Region	Headline Capacity (ktpa)
1. Cory Riverside 1	South East London, London	850
2. Kemsley K3	Kent, South East	657
3. Rookery Pit	Bedfordshire, Eastern	585
4. Edmonton (current)	North London, London	560
5. Allington	Kent, South East	560
6. SELCHP	South East London, London	464
7. Lakeside (Slough)	Berkshire, South East	450
8. Beddington	South London, London	383
9. Greatmoor	Buckinghamshire, South East	345
10. Ardley	Oxfordshire, South East	326
11. Great Blakenham	Suffolk, Eastern	295
12. Newhaven	East Sussex, South East	242
13. Integra South East (Portsmouth)	Hampshire, South East	220
14. Integra South West (Marchwood)	Hampshire, South East	220
15. Milton Keynes	Milton Keynes, South East	140
16. Peterborough (Fourth Drove)	Cambridgeshire, Eastern	110
17. Integra North (Chineham)	Hampshire, South East	110
18. Enviropower Lancing	West Sussex, South East	75
19. Shepperton	Surrey, South East	45
TOTAL		**6,637**

Incinerators under construction in the South Eastern Cluster

Plant	Location, Region	Headline Capacity (ktpa)
1. Cory Riverside 2	South East London, London	806
2. Rivenhall	Essex, Eastern	595
3. Slough Multifuel	Berkshire, South East	480
4. Edmonton (additional)	North London, London	140
5. Isle of Wight	Isle of Wight, South East	44
TOTAL		**2,065**

Incinerators in active development with planning consent in the South Eastern Cluster

Plant	Location, Region	Headline Capacity (ktpa)
1. Tilbury Docks - Phase 2	Essex, Eastern	350
2. Horsham	West Sussex, South East	230
3. Reading	West Berkshire, South East	150
4. Hoddesdon (Ratty's Lane)	Hertfordshire, Eastern	113
5. Beccles	Suffolk, Eastern	24
TOTAL		**867**

Incinerators in active development but not consented in the South Eastern Cluster

Plant	Location, Region	Headline Capacity (ktpa)
1. Medworth (NSIP)	Cambridgeshire, Eastern	625
2. Archers Fields	Essex, South East	150
TOTAL		**775**

Note regarding the South Eastern Cluster:

- This does not include the 650,000 tonnes per annum of incineration capacity at Storeys Bar Road, Fengate, Peterborough which has been granted planning permission. While it was announced in 2020 that relevant planning conditions had been discharged, we are not aware of this project having subsequently progressed, and it is therefore not considered to currently be in active development.

References

[i] Press release: Delivering on the Environment Act: new targets announced and ambitious plans for nature recovery (Defra, March 2022), available at https://www.gov.uk/government/news/delivering-on-the-environment-act-new-targets-announced-and-ambitious-plans-for-nature-recovery

[ii] The Environmental Targets (Residual Waste) (England) Regulations 2023 (UK Parliament, 2023), available at https://www.legislation.gov.uk/uksi/2023/92/contents/made

[iii] Environmental Improvement Plan 2023 (Defra, January 2023), available at https://www.gov.uk/government/publications/environmental-improvement-plan

[iv] Resource efficiency and waste reduction targets - Impact Assessment (Defra, April 2022), available at https://consult.defra.gov.uk/natural-environment-policy/consultation-on-environmental-targets/

[v] Developing the UK Emissions Trading Scheme Main Response (A joint response of the UK Government, the Scottish Government, the Welsh Government and the Department of Agriculture, Environment and Rural Affairs for Northern Ireland, June 2023), available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1166812/uk-emissions-trading-scheme-consultation-government-response.pdf

[vi] National population projections: 2020-based interim (ONS, 2022), available at https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/bulletins/nationalpopulationprojections/2020basedinterim

[vii] Subnational population projections for England: 2018-based (ONS, 2020), available at https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/bulletins/subnationalpopulationprojectionsforengland/2018based

[viii] Local Authority Collected Waste Statistics - Local Authority data (Defra, March 2023), available at https://www.gov.uk/government/statistical-data-sets/env18-local-authority-collected-waste-annual-results-tables-202122

[ix] Waste Management Plan for England (Defra, January 2021), available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/955897/waste-management-plan-for-england-2021.pdf

[x] Technical Note produced to assist the Examining Authority of the DCO into the Medworth EfW proposal (Beyond Waste, September 2023), available at https://ukwin.org.uk/files/pdf/Beyond-Waste-Technical-Note-on-191212-for-Medworth-DCO-September-2023.pdf

[xi] UK Residual Waste: 2030 Market Review (Tolvik, November 2017), available at https://www.tolvik.com/published-reports/view/uk-residual-waste-2030-market-review/

[xii] Hansard – Oral answer to question on Waste Incineration (Parliamentary Under-Secretary of State for Environment, Food and Rural Affairs, 25 May 2023), available at https://hansard.parliament.uk/commons/2023-05-25/debates/1C350831-5CE0-4E86-8C77-FE477F841C08/WasteIncineration#contribution-E3BCE3A4-E5DF-4404-8F91-E0180B3E1D90

[xiii] UK Energy from Waste Statistics - 2022 (Tolvik, May 2023), available at https://www.tolvik.com/published-reports/view/uk-energy-from-waste-statistics-2022/

[xiv] Why alternative fuel use in the cement industry is working so well (N+P, November 2022), available at https://www.npgroup.com/blog/alternative-fuel-used-in-cement-industry-working-well

[xv] UKWIN'S D4 comments on REP3-040 (UKWIN, May 2023), available at https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010110/EN010110-001597-submissions%20received%20by%20Deadline%203%201.pdf

[xvi] BEIS' 'Renewable Energy Planning Database: quarterly extract' (DESNZ, July 2023), available at https://www.gov.uk/government/publications/renewable-energy-planning-database-monthly-extract

[xvii] For Environmental Permit documents and information about planning applications and consents see the entries on UKWIN's 'Map and Table of existing and potential UK incinerators', available at https://ukwin.org.uk/incinerators/

[xviii] 'Wales' giant waste incinerator is set to expand - and people are furious' (13th March 2017), available at https://www.walesonline.co.uk/news/wales-news/hundreds-people-say-should-no-12729274

[xix] 'Cory Riverside Energy case study' (Cory, July 2017), available at https://www.ice.org.uk/engineering-resources/case-studies/cory-riverside-energy-a-carbon-case/

[xx] The case for sorting recyclables prior to landfill and incineration (Reloop, June 2022), available at https://www.reloopplatform.org/wp-content/uploads/2022/06/D-HOGG-_Reloop_FINAL_June2022-1.pdf