



Department
for Environment
Food & Rural Affairs

Resources and Waste Strategy

Monitoring Progress

Third edition

November 2022

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Contents

Foreword.....	5
Introduction	6
Purpose of this document.....	6
Notes on indicators.....	7
Feedback.....	8
Waste Prevention Programme.....	9
Textiles	10
Indicator data sources and information.....	13
Resource Productivity	14
RP1. Material footprint.....	15
RP2. Resource productivity	16
Indicator data sources and information.....	17
Waste Production	18
WP1. Waste generation.....	19
WP2. Avoidable residual waste and WP3. Avoidable residual plastic waste.....	23
WP4. Food and drink waste.....	26
Indicator data sources and information.....	29
Recycling	32
WT1. Final treatment of waste.....	33
RC1. Waste from Households recycling	34
RC2. Municipal waste recycling.....	36
RC3. Commercial and industrial waste recycled (not currently tracked).....	38
RC4. Construction and demolition waste recovery	39
RC5. Packaging waste recycling	41
Indicator data sources and information.....	43

Waste Disposal.....	46
WD1. Waste landfilled or incinerated.....	47
WD2. Biodegradable waste landfilled.....	48
WD3. Food waste landfilled (not currently tracked).....	49
WD4. Waste trade.....	50
Indicator data sources and information.....	52
Greenhouse Gas Emissions.....	54
GG1. Territorial greenhouse gas emissions from waste management.....	55
GG2. Carbon footprint.....	57
GG3. Carbon footprint of a basket of consumer goods (not currently tracked).....	60
Indicator data sources and information.....	61
Waste Crime.....	62
WC1. Illegal waste sites.....	63
WC2. Waste fly tipped.....	65
WC3. Littering.....	68
Indicator data sources and information.....	71
Glossary.....	73

Foreword

This is the third edition of Monitoring Progress, a framework of indicators for tracking progress towards objectives set out in the Resources and Waste Strategy. Monitoring Progress is aimed at a wide audience, including policymakers, analysts and specialists in the Defra Network, the Environment Agency, WRAP, the waste sector, academia, researchers, consultancies and other organizations.

Introduction

In December 2018, we published “Our Waste, Our Resources: A Strategy for England” (the Resources and Waste Strategy, RWS).¹ This presents government’s long-term approach to preserve our stock of natural capital, minimise waste, promote resource efficiency and move towards a circular economy. In addition, it sets out how we will reduce damage to the natural environment by managing waste safely and tackling waste crime.

Section 8.2 of the RWS introduced a suite of indicators to monitor how we are advancing in the areas of resource productivity and recycling, greenhouse gas emissions, waste production, landfilling, and waste crime. These are statistical measures used to consolidate real-world outcomes into meaningful information and are an important tool to measure progress towards the policies and commitments outlined in the RWS.

Purpose of this document

The first Monitoring Progress document² was published in August 2020 with a focus on defining this set of indicators, presenting historic trends to set a baseline for future updates and showing hypothetical pathways towards government objectives.

Monitoring Progress will evolve over time and this third edition builds on the first two by further refining the indicators and updating them with the latest available data. Following feedback from stakeholders, indicators have been reorganised in this edition to better reflect the waste hierarchy, with waste prevention at the top and final disposal (now separated from recycling) at the bottom. It is expected that the suite of indicators tracked will continue to evolve in future releases.

Sources and details for each indicator are provided at the end of each chapter. Relevant targets, commitments and strategic ambitions are highlighted here, and where appropriate within graphs and accompanying text. Indicators that form part of the government’s 25 Year Environment Plan outcome indicator framework³ are highlighted in the text.

Monitoring Progress is intended to be used alongside the Evaluation Plan,⁴ which builds on data generated during monitoring by more comprehensively assessing policies against several dimensions in addition to intended outcomes. These may include costs and benefits of a policy, unintended consequences and the effectiveness of its implementation.

For further details, see the introduction to the first edition of Monitoring Progress.

¹ HM Government (2018) [Our Waste, Our Resources: A Strategy for England](#)

² Defra (2020) [Resources and Waste Strategy: Monitoring Progress](#)

³ Defra (2020) [Outcome indicator framework for the 25 Year Environment Plan](#)

⁴ Defra (2020) [Resources and Waste Strategy: Evaluation Plan](#)

Notes on indicators

This document continues to track all indicators included in the RWS, except for those for which no data are currently available. We will keep the set of indicators under review and expect it to develop further in future releases.

Indicators have been reordered relative to the previous edition. In order to reflect the waste hierarchy, this document leads with the Waste Prevention Programme indicators, followed by statistics on resource consumption, waste production, recycling, and waste disposal. Indicators that form an important part of the RWS but which fall outside this hierarchy (on greenhouse gas emissions and waste crime) are now placed at the end.

Indicators with new data

Due to the release cycle of statistical notices, not all indicators have received an update since the previous edition of Monitoring Progress. Where this is the case, the data are presented as in the previous edition with a note that no new data are available.

The following indicators have been updated with new data:

- RP1. Material footprint
- RP2. Resource productivity
- RC1. Waste from Households recycling
- RC2. Municipal Waste recycling
- RC4. Construction and demolition waste recovery
- RC5. Packaging waste recycling
- WD1. Waste landfilled or incinerated
- WD2. Biodegradable waste landfilled
- WD4. Waste trade
- GG1. Territorial greenhouse gas emissions from waste management
- GG2. Carbon footprint
- WC2. Waste fly tipped
- WC3. Littering

Indicators under development

Some indicators set out in the RWS remain under development. Where possible, a proxy indicator has been presented in the interim. These indicators are under development:

- The indicator suite for the Waste Prevention Programme has not yet been finalised; it is expected that the final indicators will include data for a range of economic sectors. This document presents data on water use by the textiles industry.
- **WP2 and WP3. Avoidable waste & avoidable plastic waste**
This document presents a possible methodology for this indicator, introduced in the first edition, categorising material types within the residual waste stream by the ease with which they could have been prevented from becoming residual waste.

- **RC2. Municipal waste recycled**
The municipal waste indicator is under development. Local authority collected waste is presented here as a proxy, which excludes privately collected waste.
- **RC3. Commercial and industrial waste recycled**
We are currently developing a formal methodology to estimate the recycling rate for commercial and industrial waste. Waste production figures presented in WP1 give an indication of total arisings from commercial and industrial activity.
- **WD1. Percentage of municipal waste landfilled**
This indicator requires an estimate of total municipal waste arisings, which is under development. The total amount of waste sent to landfill is presented as a proxy.
- **WD2. Biodegradable waste landfilled**
A formal methodology for reporting against this indicator has yet to be agreed. Biodegradable municipal waste landfilled is presented as a proxy, but it is unclear how representative this is of total biodegradable waste landfilled.
- **WD3. Food waste landfilled**
A formal methodology for reporting against this indicator has yet to be agreed. Biodegradable municipal waste landfilled is presented in WD2; food waste is thought to form a large proportion of this.
- **GG3. Carbon footprint of a basket of consumer goods**
Work on this indicator continues. No data are presented in this document.

Geographical scope

The RWS is a strategy for England, so it is desirable to track indicators covering England only. However, data for some indicators are available only at United Kingdom level, including:

- WP4. Food and drink waste
- RC5. Packaging waste recycled

The geographical scope is indicated for each dataset presented.

Definitions

Understanding the need for clear definitions of the quantities tracked in these indicators, we have included a glossary at the end of this document. More detailed technical definitions and data sources are provided at the end of each chapter.

Feedback

This document continues to evolve. Some indicators are experimental or remain under development, while others may continue to develop as interests change or new sources of data become available. To facilitate this, we welcome feedback on the content and format of this document to RRW.Strategy@defra.gov.uk.

Waste Prevention Programme

The government recently consulted on the Waste Prevention Programme for England (WPP),⁵ which sets out priorities for action to manage resources and reduce waste by increasing reuse, repair and remanufacture of products, among other things.

Once the WPP is finalised following this consultation, we hope to track indicators relevant to the Waste Prevention Programme in future versions of this document, broken down by sector. Since these indicators have yet to be developed, we have included data on the use of natural resources and improved fibres by the textiles industry and hope to expand this chapter in future.

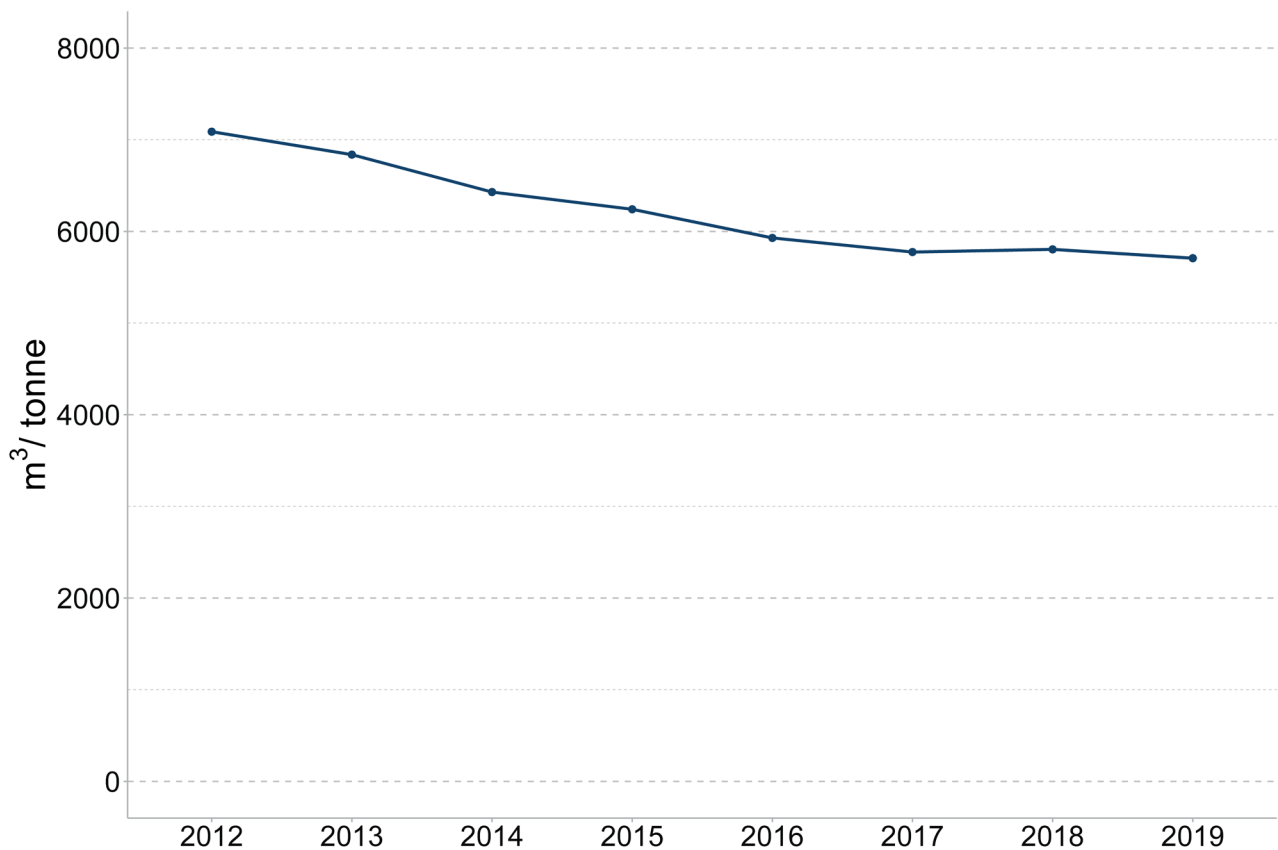
⁵ Defra (2021) [Consultation on the Waste Prevention Programme for England: Towards a Resource-Efficient Economy](#)

Textiles

Textiles production is a significant contributor to water use globally and, in many cases, to pollution of the environment. The total amount of annual textile waste in the United Kingdom is estimated at 1.8 million tonnes.

Launched in 2012, the Sustainable Clothing Action Plan (SCAP) 2020 was a voluntary agreement established by the Waste and Resources Action Programme (WRAP) whose members made up almost half (48%) of United Kingdom retail textiles sales by volume in 2018. As part of the SCAP agreement, signatories committed to reducing the water, waste and carbon footprint of the textiles they sold. Using information reported by signatories in conjunction with lifecycle analysis data, WRAP have monitored changes in the water footprint of SCAP signatories between 2012 and 2019. In this context, the water footprint is defined as the net total volume of water withdrawals over the life cycle of the product and is calculated based on the Global Water Footprint Standard. These results have been published in reporting documents of the SCAP agreement.

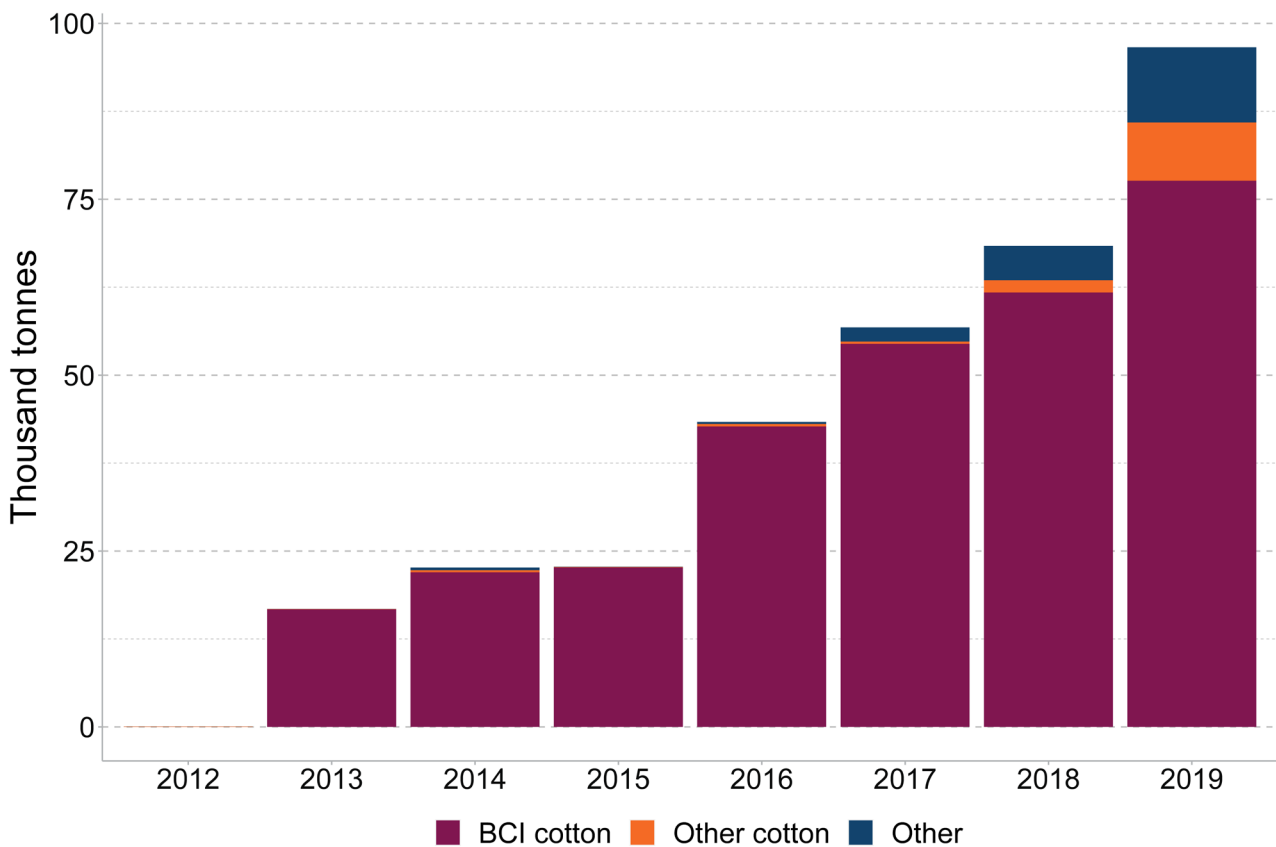
Figure 6.1 Water footprint per tonne of garments sold by United Kingdom SCAP signatories, 2012 to 2019, cubic metres per tonne



Between 2012 and 2019, the quantity of water required to produce a given tonne of garments sold by SCAP signatories fell by almost a fifth (19%), from 7,100 m³ per tonne in 2012 to 5,700 m³ per tonne in 2019.

This decline has been driven by two main factors. The first of these is the use of improved fibres such as organic and other lower impact cottons (e.g. the Better Cotton Initiative) as well as recycled materials, which tend to require less water use relative to conventional cotton. The second main factor is changes in the location of cotton cultivation, which has led to lower water requirements per tonne of cotton produced.

Figure 6.2 Use of improved fibres by United Kingdom SCAP signatories, 2012 to 2019, thousand tonnes



The use of improved cotton and non-cotton fibres by SCAP signatories has grown between 2012 and 2019. Improved fibres include a range of textiles with higher levels of environmental performance, including cotton following Better Cotton Initiative (BCI) standards, organic cotton, Cotton Made in Africa (CMiA), Responsible Environment Enhanced Livelihoods (REEL) cotton and recovered cotton, as well as recycled polyester, lyocell and recycled nylon. Their increased use has contributed to the improved water footprint of SCAP signatories.

Indicator data sources and information

Textiles

Source: WRAP (2021) [SCAP 2012-2019 progress report](#)

Relevant goal in the 25YEP: Goal 8 – minimise waste

Classification: Not a government statistic

Definitions and details of calculations: Data for the SCAP report was collected by individual SCAP members and submitted to WRAP for analysis. Full methodology details are provided in the technical report available at source.

Resource Productivity

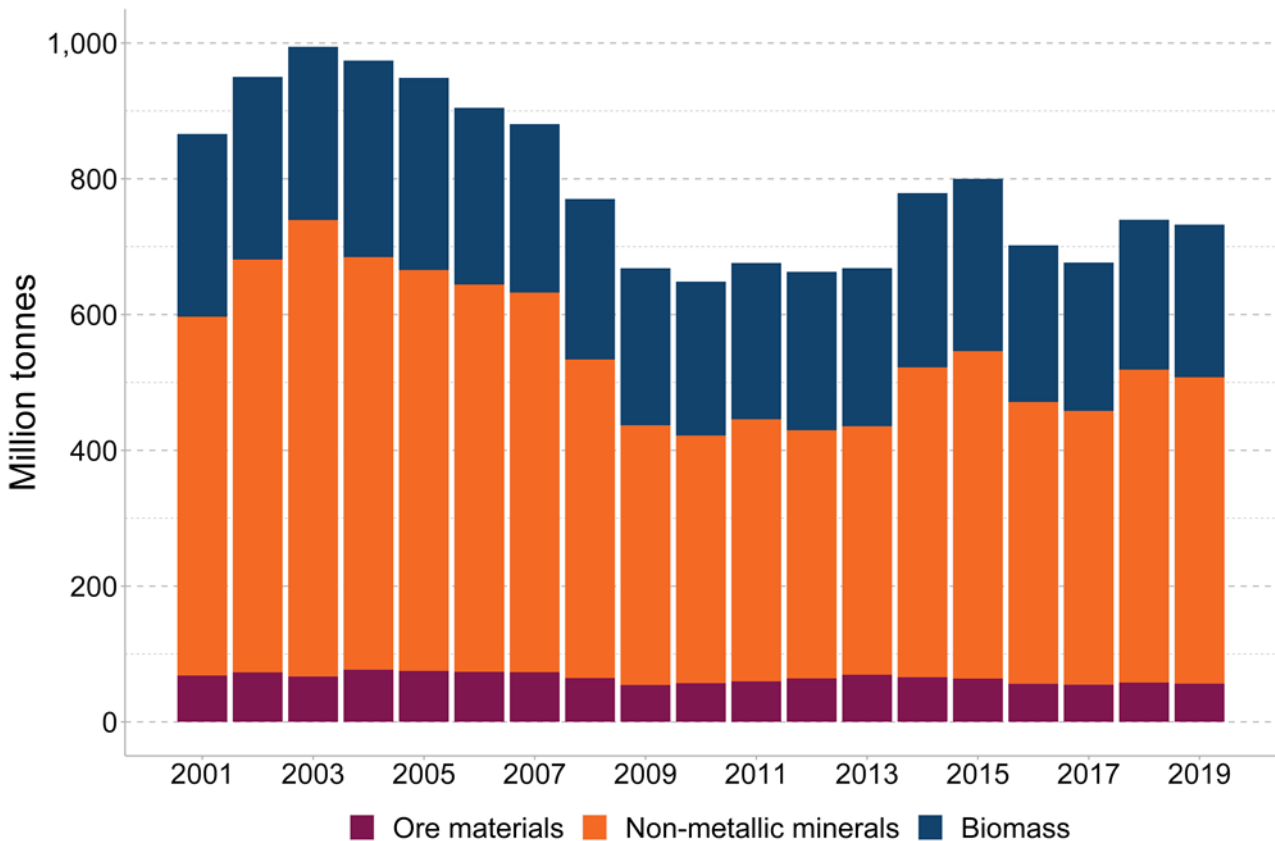
A circular economy means minimising the amount of natural resources entering the economy (especially non-renewable resources) as well as the amount of waste leaving it. A successful circular economy can achieve economic growth with minimal input of natural resources. This can be achieved by reducing consumption or by reusing and recycling materials into new products, both of which can also be expected to result in less waste.

This chapter explores the amount of material England consumes and how efficiently those materials are used.

RP1. Material footprint

This is indicator J2a in the 25 Year Environment Plan outcome indicator framework.

Figure 2.1 Raw material consumption by material type (excluding fossil fuels), England, 2001 to 2019, tonnes



The material footprint, or raw material consumption, is the amount of primary raw materials extracted globally due to final demand for goods and services by England's residents. The measure takes account of the full upstream material extraction associated with the production of imports, while excluding that associated with exports.

For the purposes of the RWS, the material footprint excludes fossil fuels as these are not used directly to produce goods and services for consumption. Fossil fuel use has fallen by 42% since 2001.

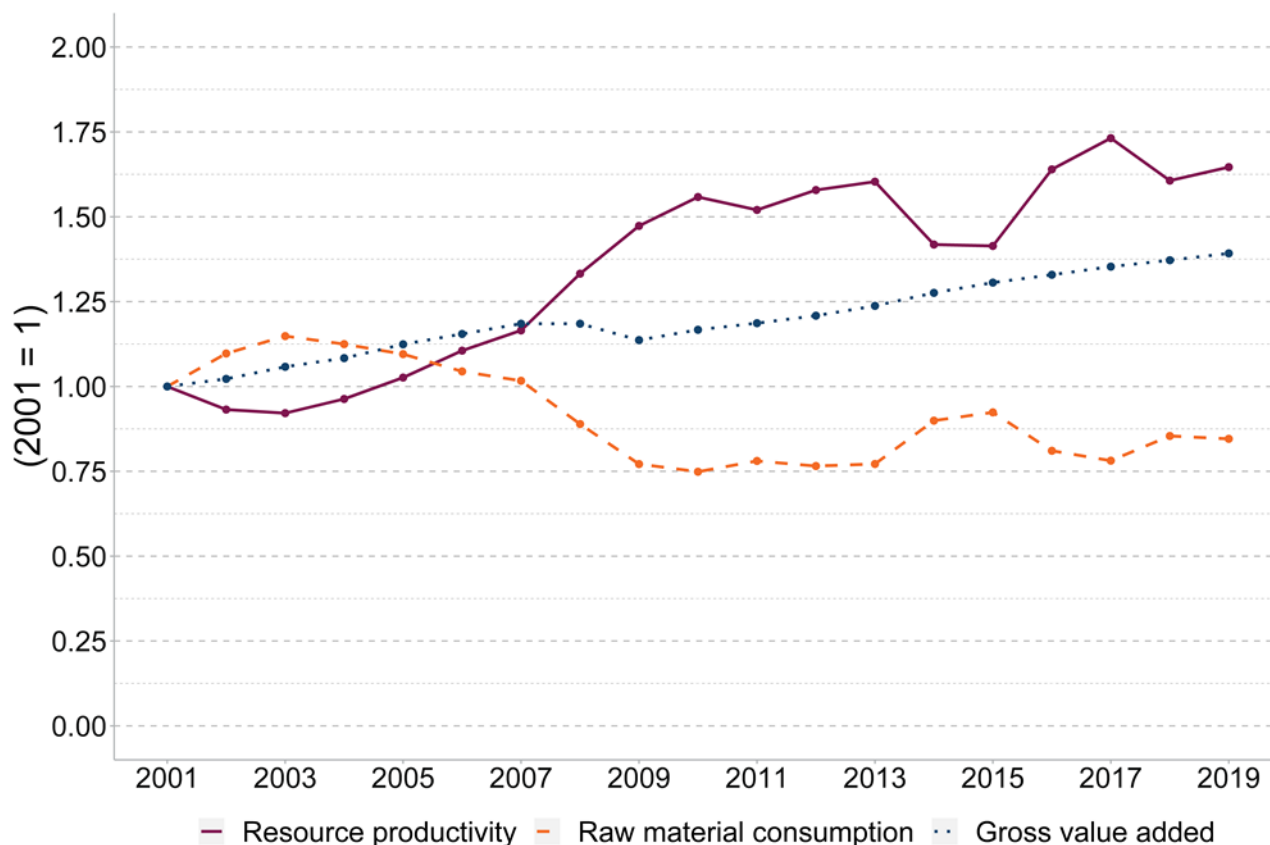
In 2019, England's material footprint was an estimated 902 million tonnes (Mt), or 732 Mt when excluding fossil fuels. In that year, non-metallic mineral materials made up 451 Mt of the footprint, biomass materials 225 Mt, and ore materials 56 Mt.

After peaking in 2003, the footprint (excluding fossil fuels) fell to its lowest level across the available series in 2010, before rising again to 2015; the pattern since then has been inconsistent. When excluding fossil fuels, the total footprint was around a fifth (26%) lower in 2019 than in 2003. It was at a similar level in 2019 to the year prior (2018).

RP2. Resource productivity

This is indicator J2b in the 25 Year Environment Plan outcome indicator framework.

Figure 2.2 Resource productivity, England, 2001 to 2019, gross value added (chained volume measure, 2019 £) per tonne raw material consumption (excluding fossil fuels)



Resource productivity is a measure of economic output (measured by gross value added, GVA) per unit of raw material consumption. The economy is able to grow by consuming more resources or by using resources more efficiently; increasing resource productivity implies more efficient use of raw materials.

Between 2001 and 2019, England's gross value added largely trended upwards and increased by 39% overall, while across the same period, raw material consumption (excluding fossil fuels) fell by 15%.

Resource productivity, measured as a ratio of these two values, therefore increased by an estimated 65% between 2001 and 2019, largely rising year-on-year between 2003 and 2010, before falling to 2015 as growth in raw material consumption outpaced that in GVA. Resource productivity peaked in 2017, fell in 2018, and rose slightly in 2019.

Resource decoupling can be said to occur when the economy grows without a corresponding increase in resource consumption. As GVA has increased while the material footprint has decreased, this suggests that absolute decoupling between economic output and raw material consumption has taken place between 2001 and 2019.

Indicator data sources and information

Sources:

- Defra (2022) [England's material footprint](#)
- Office for National Statistics (2022) [Regional gross value added](#)

Relevant goal in the 25YEP: Goal 5 – using resources from nature more sustainably and efficiently

Relevant target/ambition/commitment:

- Strategic ambition: Double resource productivity by 2050 (RWS, 2018)
- UN Sustainable Development Goals 8 and 12

Classification: Official statistic

Definitions and details of calculations: The estimates of raw material consumption presented here are based on an approach developed on behalf of Defra by the University of Leeds. The approach takes estimates of domestic extraction by country and world region and reallocates them to final demand using an environmentally extended multiregional input-output (MRIO) model which builds on Supply and use and input-output tables produced by the United Kingdom's Office for National Statistics. Further details of the methodology is available in the associated [methodology document](#) and [statistics notice](#). These values are sensitive to changes in the sectoral and geographical resolution of the model used to produce them, changes in which have led to backwards revisions.

Waste Production

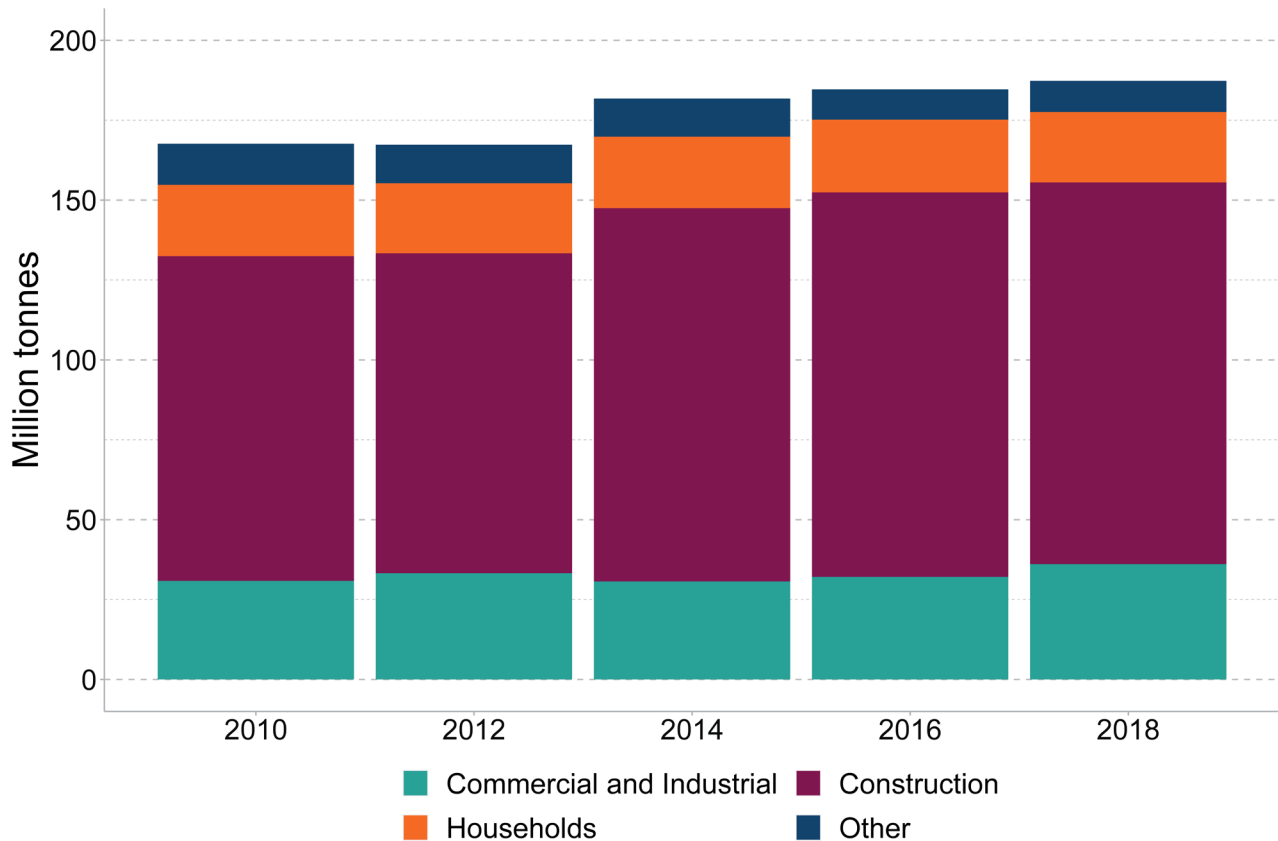
Waste is harmful and costly in its own right: processing of waste is expensive and pollutes the environment (e.g. via greenhouse gas emissions or plastic waste entering ecosystems). Waste also results in indirect harm — disposing of materials that could be used by somebody else or recycled into new products results in increased material consumption, placing strain on our natural resources and causing further environmental damage.

This chapter considers the total amount of waste generated in England by different economic activities, the amount of avoidable waste (and avoidable plastic waste) being thrown away instead of reused or recycled, and the amount of food that is produced or imported and thrown away uneaten.

WP1. Waste generation

These data have not been updated since the previous edition of Monitoring Progress.

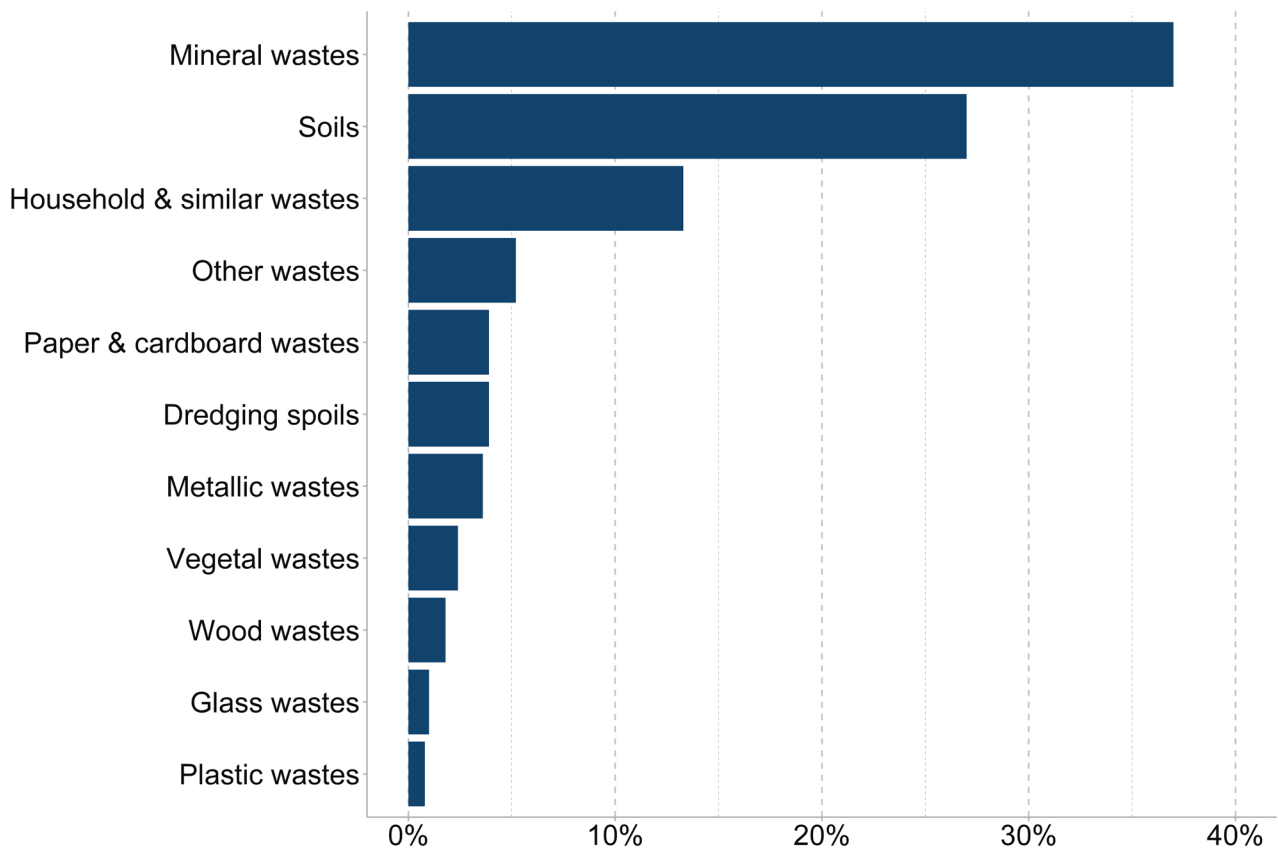
Figure 3.1 Total waste generation split by source, England, 2010 to 2018, million tonnes



187.3 million tonnes of waste were generated in England in 2018, 11.7% more than in 2010 (167.6 million tonnes) and 1.4% more than in 2016.

In 2018, construction, demolition and excavation (CD&E; including dredging) activities were responsible for generating approximately three fifths (64%) of total waste. In the same year, commercial & industrial activities accounted for almost a fifth (19%) of total waste generation, while households and other activities (agriculture, forestry, fishing, mining and quarrying) composed the remainder.

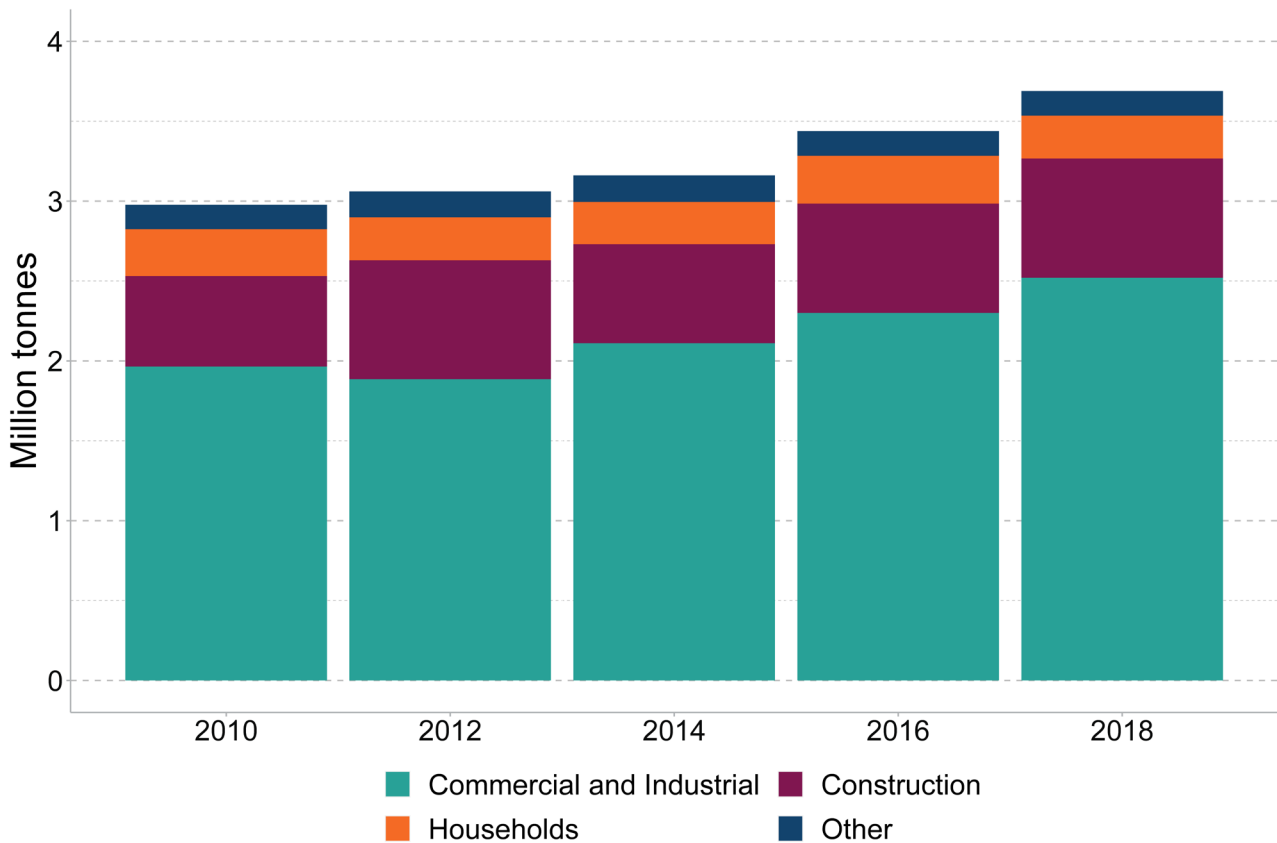
Figure 3.2 Total waste generation split by material type, England, 2018, % of total



Mineral wastes made up the largest proportion of waste generated in England in 2018 at 37% (69.2 million tonnes), followed by soils (27%, 50.6 million tonnes).

Care should be taken in interpreting these categories of materials as individual material categories (e.g. “Plastic wastes”) do not include tonnages in mixed waste streams (such as “Household and similar wastes”).

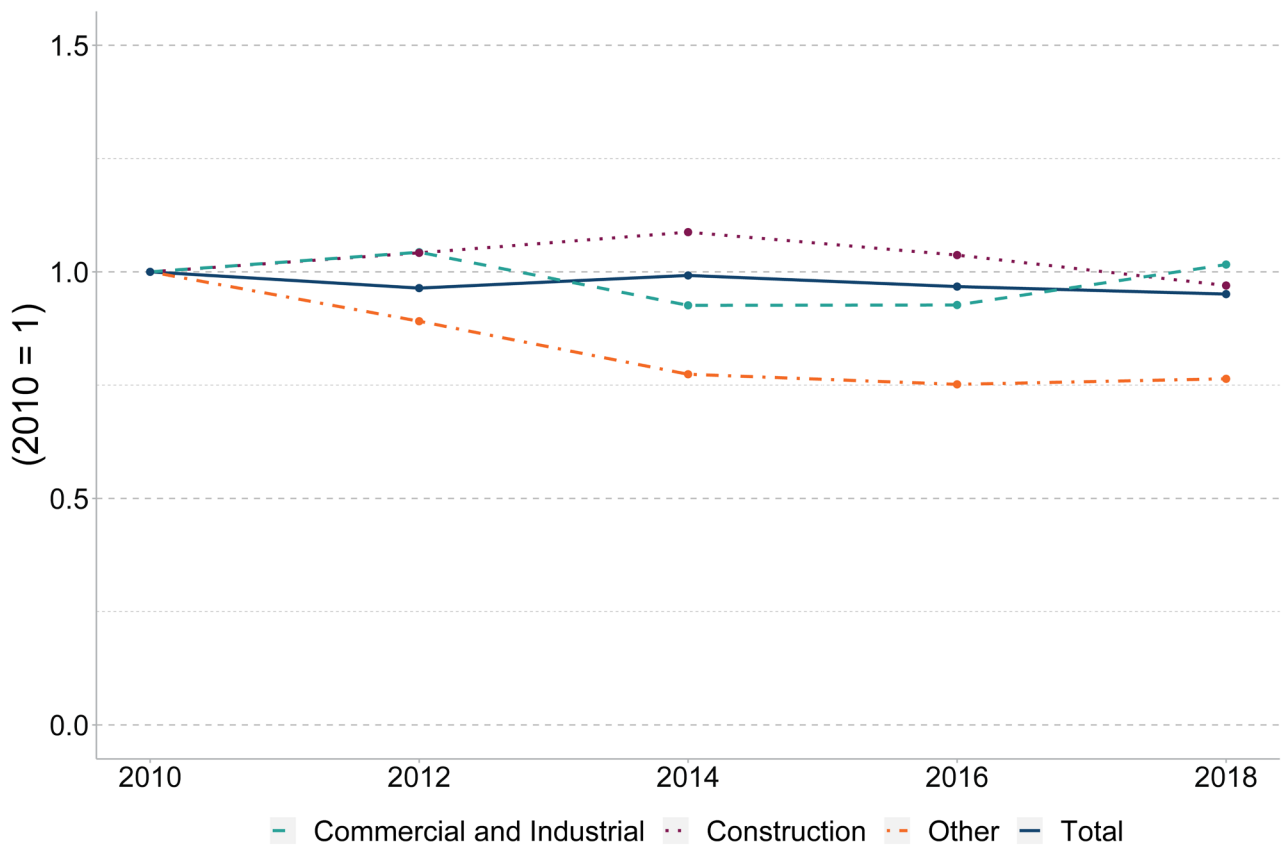
Figure 3.3 Hazardous waste generation split by source, England, 2010 to 2018, million tonnes



Waste is generally considered hazardous if it is harmful to humans or the environment. Examples include asbestos, batteries, and chemicals such as solvents, pesticides, and inedible oils.

3.7 million tonnes of hazardous waste were generated in 2018, an increase of 24% from 3 million tonnes in 2010. Commercial and industrial activities are consistently the largest source of hazardous waste.

Figure 3.4 Waste intensity, waste produced (tonnes) per unit gross value added (chained volume measure, 2018 £), England, 2010 to 2018



Combining economic and waste production data helps us assess the waste intensity of economic output at a national and sectoral level. A declining waste intensity is desirable as it means less waste is being produced for each unit of economic value we generate. Across all sources in England (including households), waste intensity has fallen by 5% between 2010 and 2018, indicating that slightly less total waste was generated per pound of national gross value added (GVA) in 2018 than in 2010.

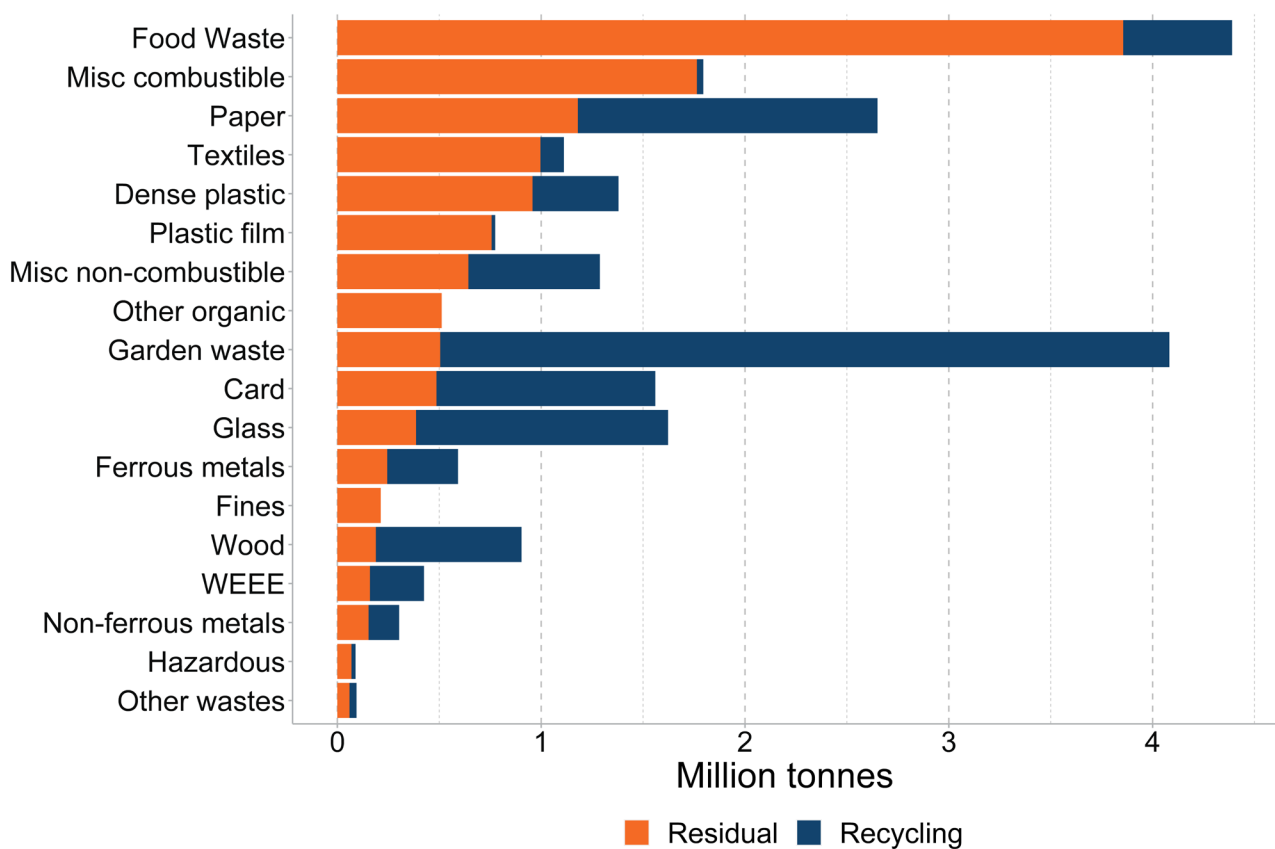
The waste intensity of the construction sector is now below 2010 levels for the first time since this measure has been calculated. The waste intensity of the commercial and industrial sector, however, has risen to slightly above 2010 levels. The waste intensity of other sectors of the economy fell by about 25% between 2010 and 2014 and has remained at this level since then.

WP2. Avoidable residual waste and WP3. Avoidable residual plastic waste

This indicator is under development. The data below are based on a National Waste Composition study undertaken by WRAP, which sampled the compositional breakdown of materials within residual and recycling waste from household and household-like sources (household waste recycling centres, bulky waste collections and street sweepings).

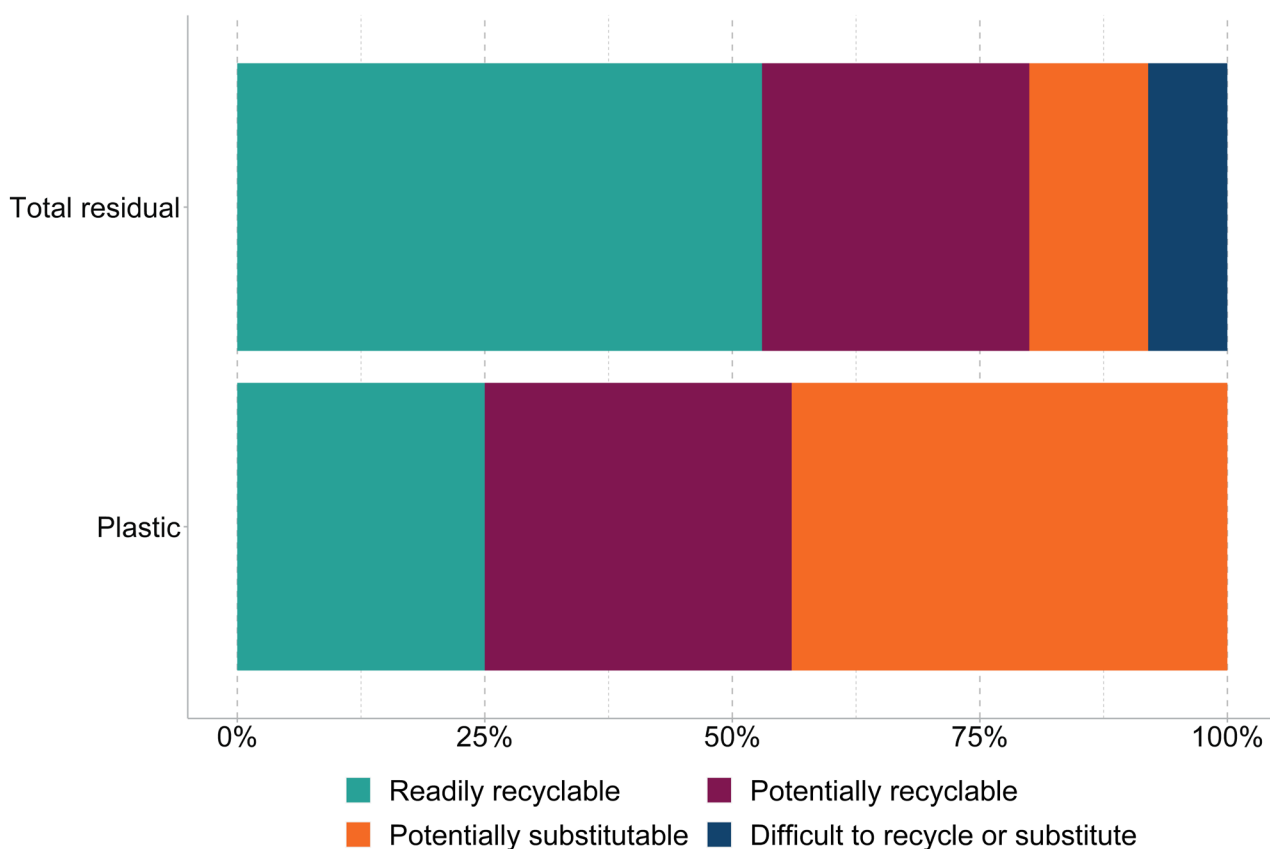
These data have not been updated since the previous edition of Monitoring Progress.

Figure 3.5 Composition of Waste from Households, split by material type, England, 2017



Food waste represents the largest material category in England's waste stream, and is generally sent for disposal, also forming the largest component of England's residual waste. While garden waste represents the second largest material category, most of this is recycled and only a small amount is treated as residual waste. Other large categories of residual waste include miscellaneous combustibles, paper, and textiles.

Figure 3.6 Avoidable residual waste from household sources, England, 2017, proportion of total residual waste



In the Resources and Waste Strategy, we committed to eliminating all avoidable waste by 2050 and all avoidable plastic waste through the lifetime of the strategy (by the end of 2042).

The Clean Growth Strategy defines the aim of zero avoidable waste as eliminating all waste where it is “technologically, environmentally and economically practicable (TEEP) to do so, [while] working to support innovation in new materials, products and processes that extend the range of materials covered by this categorisation”. In the Resources and Waste Strategy, we also talk about plastic waste being “avoidable” when the plastic “could have been reused or recycled; when a reusable or recyclable alternative could have been used instead; or when it could have been composted or biodegraded in the open environment” (RWS, page 7).

It is important to note that quantifying avoidable waste is challenging and subject to varying definitions, interpretations and potential methodologies.

Here, we draw on the waste composition data from WRAP, presented above, to estimate national tonnages of materials in the residual waste stream. Since these data are based on a sample, the numbers presented are subject to some statistical error.

We have categorised using a tiered system, assigning each material type to one of the following four categories:

1. **Readily recyclable** with current technologies. These items are recyclable or compostable either kerbside or at HWRCs and should not enter the residual waste stream.
2. **Potentially recyclable** with technologies in development. Recycling of this material either already happens at small scales or is possible with technological or methodological changes, but is not yet widespread due to technical or practical challenges.
3. **Potentially substitutable** to a material which could be recycled. These materials are difficult to recycle but could potentially be substituted for a more easily recycled material.
4. **Difficult to recycle or substitute**. These materials are unlikely to be recycled or substituted without substantial cost and it is difficult to avoid them becoming residual waste.

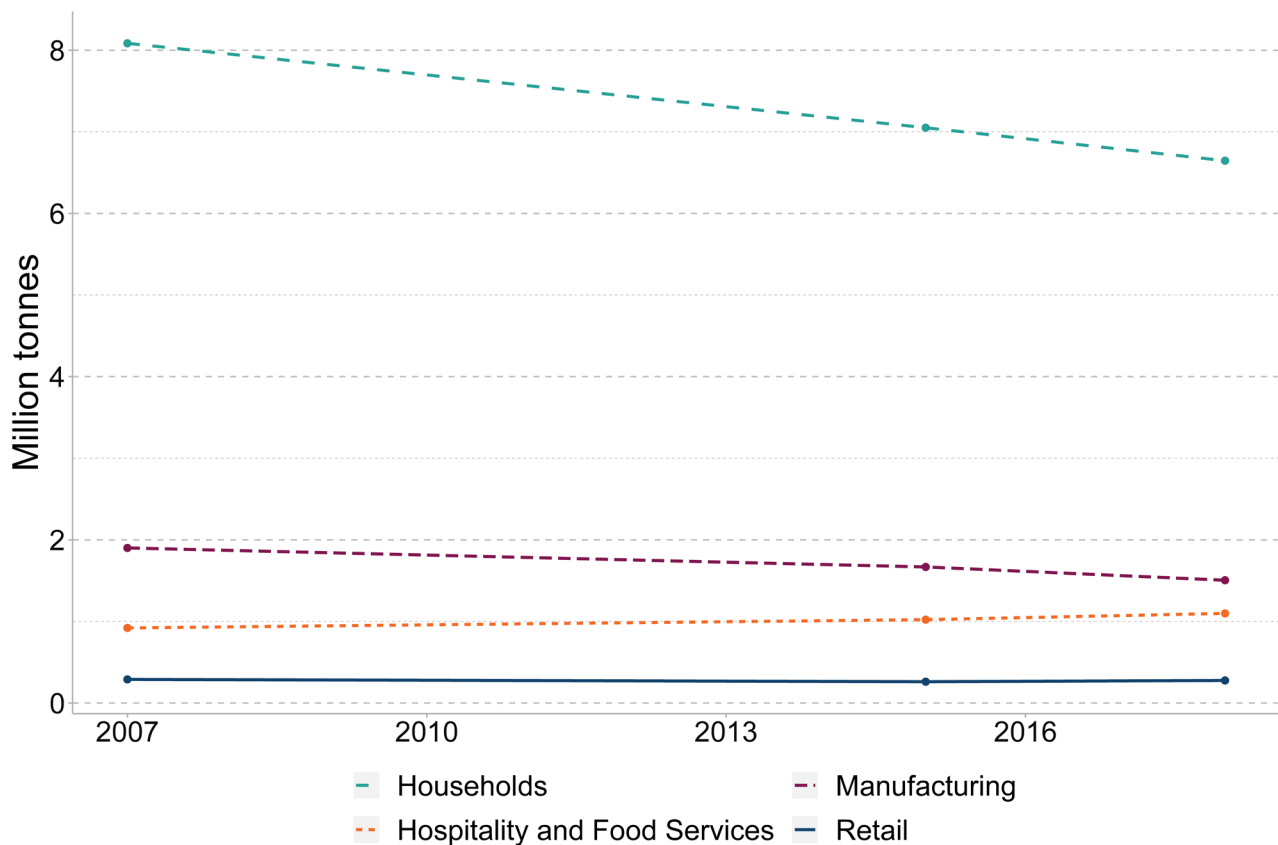
In 2017, an estimated 53% of residual waste consisted of readily recyclable materials, with only 8% being completely unavoidable. This represents a significant opportunity to further decrease the amount of residual waste produced in England.

Of residual plastic waste, 25% consisted of readily recyclable plastics and a further 31% could be potentially recyclable with technologies in development.

WP4. Food and drink waste

These data have not been updated since the previous edition of Monitoring Progress.

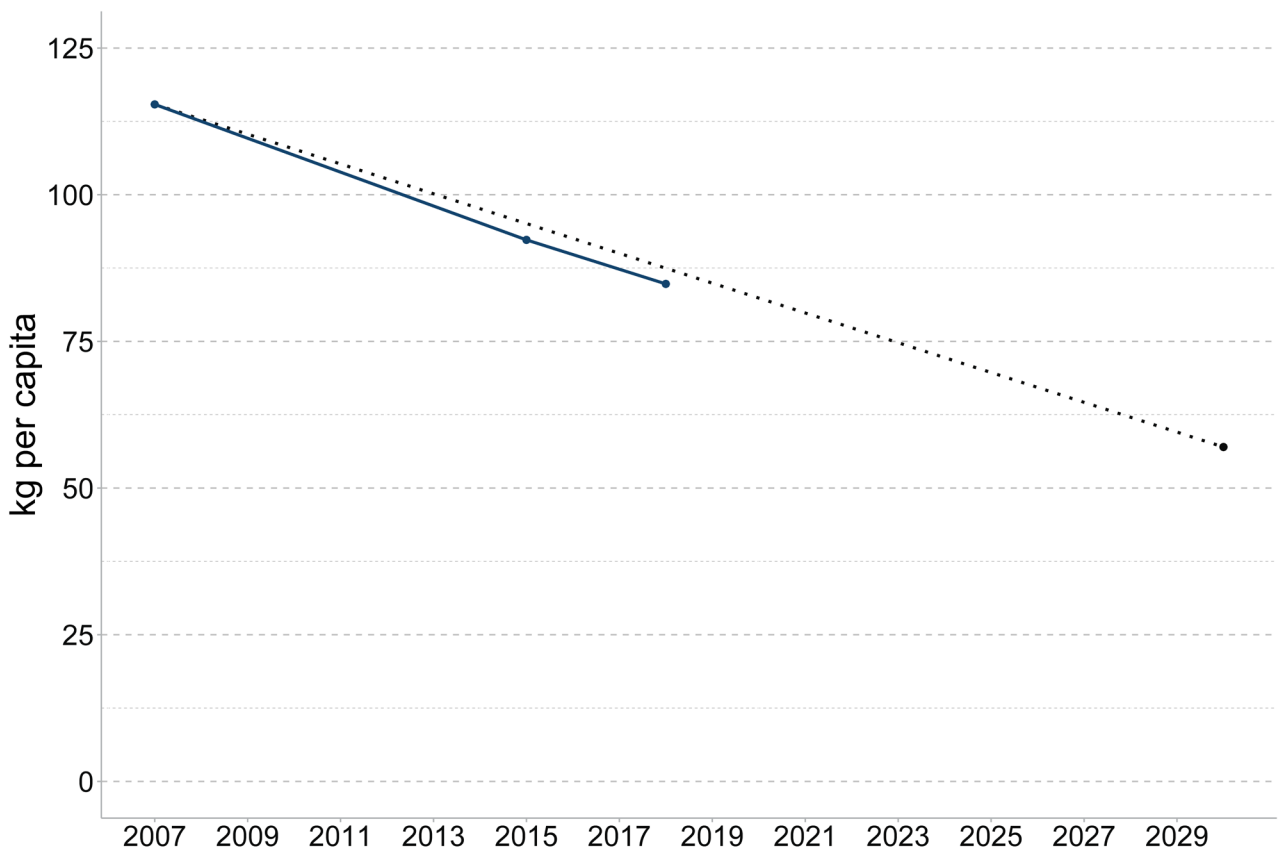
Figure 3.7 Food and drink waste (including inedible parts), United Kingdom, 2007 to 2018, million tonnes



Approximately 9.5 million tonnes of food waste (including inedible parts) were generated in the United Kingdom in 2018, 15% less than in the Sustainable Development Goal 12.3 baseline year (11.2 million tonnes; the baseline year varies across sources of food waste depending on when robust data first became available but is represented graphically here as 2007 as this is when large-scale interventions began in the United Kingdom to reduce food waste).

Of total food waste produced in 2018, approximately 70%, by weight, was made up of household food waste and 30% supply chain waste. Between 2007 and 2018, food waste created by households fell by roughly a fifth, from 8.1 to 6.6 million tonnes. In 2018, 3% of total United Kingdom food waste (0.3 million tonnes) arose from the retail sector, while 16% of food waste (1.5 million tonnes) arose from the manufacturing sector (for which there was a 21% reduction in arisings against baseline). On the other hand, approximately 12% (1.1 million tonnes) of food waste in the United Kingdom in 2018 came from the hospitality and food services sector, a 19% increase in annual arisings in relation to the baseline year.

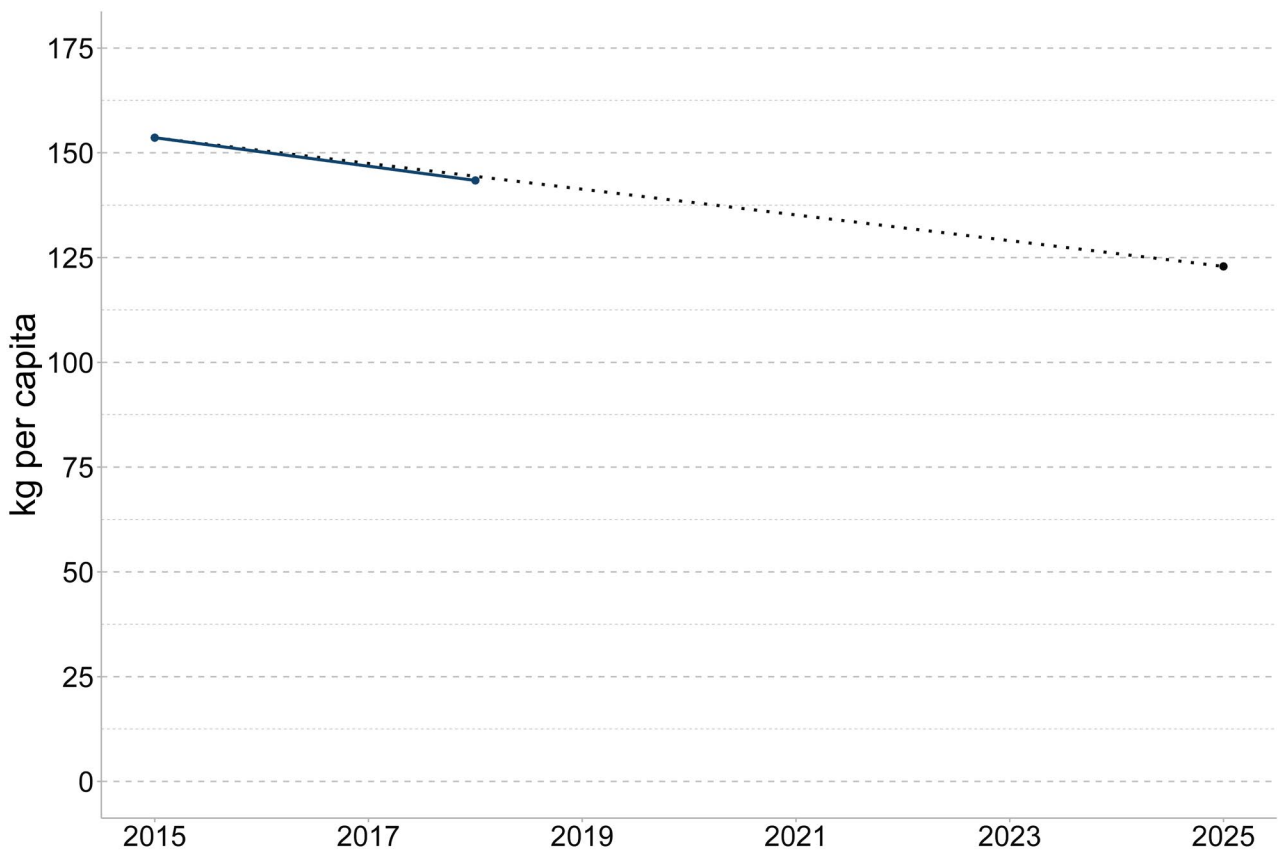
Figure 3.8 Food and drink waste produced at the retail and consumer level (excluding inedible parts), United Kingdom, 2007 to 2018, kg per capita



Per capita food waste generated at the retail and consumer level in the United Kingdom, excluding inedible parts, fell by approximately 26% between the SDG 12.3 baseline year and 2018, declining from 115 kg to 85 kg per capita.

A linear pathway for attaining the UN Sustainable Development Goal (SDG) 12.3 to halve per capita food waste at the retail and consumer level by 2030 (excluding inedible parts) is represented. Progress in reducing food waste based on this measure has so far slightly exceeded the average annual improvement needed to achieve this goal by 2030.

Figure 3.9 Total food and drink waste produced (including inedible parts), United Kingdom, 2015 to 2018, kg per capita



Per capita food waste generated in the United Kingdom, including inedible parts, fell by approximately 7% between 2015 and 2018, from 154 kg to 143 kg. In the same period, it is estimated that there has been a 7% per capita reduction in annual GHG emissions associated with food and drink consumed in the United Kingdom.

The Courtauld 2025 ambition to reduce per capita food waste (including inedible parts) by a fifth (from 2015 levels) by 2025 is represented. The average annual reduction in per capita food waste arisings so far is approximately at the rate needed to stay on track to achieve this ambition.

Indicator data sources and information

WP1

Source: Defra (2021) [UK statistics on waste](#)

Relevant goal in the 25YEP: Goal 8 – minimise waste

Classification: Official statistic

Definitions and details of calculations: Estimates of total waste generated (including both hazardous and non-hazardous waste) presented here have been calculated for the purpose of reporting against the EC Waste Statistics Regulation return. In line with the Regulation requirements, total waste generation is split by material and NACE economic activity responsible for generating it. Total waste production encompasses waste from: i) Commercial and Industrial sources; ii) Household sources; iii) Construction, Demolition and Excavation sources; and iv) sources categorised as “other” (agriculture, forestry, fishing, mining, and quarrying). Sectoral split based on NACE (statistical classification of economic activities in the European Community) codes.

WP2 and WP3

The methodology for this indicator has not been finalised. This document presents a possible approach.

Source: WRAP (2020) [Quantifying the composition of municipal waste](#)

Relevant goal in the 25YEP: Goal 8 – minimise waste

Relevant target/ambition/commitment: Strategic ambition to work towards eliminating avoidable waste of all kinds by 2050

Classification: Not a government statistic

Definitions and details of calculations:

Estimates are based on WRAP’s National Household Waste composition study, a compilation of survey data collected from over 100 local authorities for the year 2017, collated and grossed up to England level to approximate the composition of residual and recycling waste from households and household-like sources (HWRCs, bulky waste collection and street cleaning). Waste is disaggregated based on material type in the study. Each material type has been categorised according to their degree of “avoidability”. Avoidable residual waste here refers to residual waste generated by household sources which could have avoided entering the residual waste stream because it:

1. Is readily recyclable with current technologies – items which should not be in the residual stream whatsoever because they are recyclable or compostable at the kerbside or HWRC;

2. Is potentially recyclable with technologies in development – recycling of this material either: a) happens already but not at scale due to collection or technical challenges; or b) could be possible with technological/methodological changes that are already on the market and can be readily envisaged; or
3. Could be substituted for a material which is recyclable – where it is hard to envisage a recycling route for these, but the material could be substituted for something else which could be recycled.

The mapping of materials to tiers is:

- **Readily recyclable:** Food waste; garden waste; paper (except non-recyclable paper); card (except other card); packaging glass; ferrous metals; non-ferrous metals (except aluminium foil); plastic bottles; dense plastic pots, tubs and trays; large waste from electrical and electronic equipment (WEEE); household batteries; wood; miscellaneous non-combustible (except other miscellaneous non-combustible)
- **Potentially recyclable:** Other organic; other card; non-packaging glass; aluminium foil; plastic film (except non-packaging plastic film); textiles (except carpet & underlay); small WEEE; miscellaneous combustible (except other miscellaneous combustible)
- **Potentially substitutable:** Non-recyclable paper; dense plastic non-bottles (except pots, tubs and trays); non-packaging plastic film; carpet & underlay
- **Difficult to recycle or substitute:** Hazardous (except household batteries); other miscellaneous combustible; other miscellaneous non-combustible; fines; other wastes

Indicator calculated as avoidable residual waste, by category, divided by total residual waste, expressed as a percentage.

WP4

Source: WRAP (2021) [Food surplus and waste in the UK – key facts](#)

Relevant goal in the 25YEP: Goal 8 – minimise waste

Relevant targets/ambitions/commitments:

- Courtauld Agreement 2025: 20% per capita reduction in post-farm gate food waste by 2025 in relation to a 2015 baseline, applying to all food waste (food and inedible parts)
- United Nations Sustainable Development Goal Target 12.3 aims to “by 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including postharvest losses” in relation to a 2007 baseline year (excluding inedible parts) and on a per capita basis

Classification: Not a government statistic

Definitions and details of calculations: Estimates of food waste in the United Kingdom are produced by WRAP, with the methodology for calculation differing according to contributory waste stream. Post-farm-gate food waste encompasses household food and drink waste, comprising: a) waste collected by local authorities; b) waste disposed of to the sewer; and c) waste composted at home, in addition to food waste from the supply chain, comprising: a) retail; b) manufacturing; and c) hospitality and food service. Further details of methodology available at data source.

Recycling

If waste cannot be avoided altogether, recycling is preferable to disposal. This includes dry recycling — turning paper, plastic, metals and glass into new products of a similar type — as well as composting and anaerobic digestion of organic wastes to produce compost or fertilizer, and recovery of construction and demolition waste. In all of these cases, products that would otherwise go to waste substitute for virgin materials, reducing our raw material consumption and keeping waste out of landfill.

This chapter includes data on the recycling rate for waste from households and waste collected by local authorities, the recovery rate for construction and demolition waste, and recycling of packaging materials.

WT1. Final treatment of waste

These data have not been updated since the previous edition of Monitoring Progress.

Table 4.1 All waste at final treatment, percentage (of tonnage) by method, England, 2010 to 2018

Year	Landfill	Incineration with R1 energy recovery	Incineration (excluding R1)	Land treatment and release into water bodies	Backfilling	Recycling and other recovery
2010	25.6%	0.4%	3.2%	13.9%	6.2%	50.7%
2012	25.1%	0.8%	3.5%	13.8%	7.3%	49.6%
2014	23.2%	0.7%	4.1%	12.4%	10.7%	48.8%
2016	24.9%	3.5%	3.0%	10.0%	7.4%	51.4%
2018	24.1%	4.0%	3.8%	9.2%	6.0%	52.8%

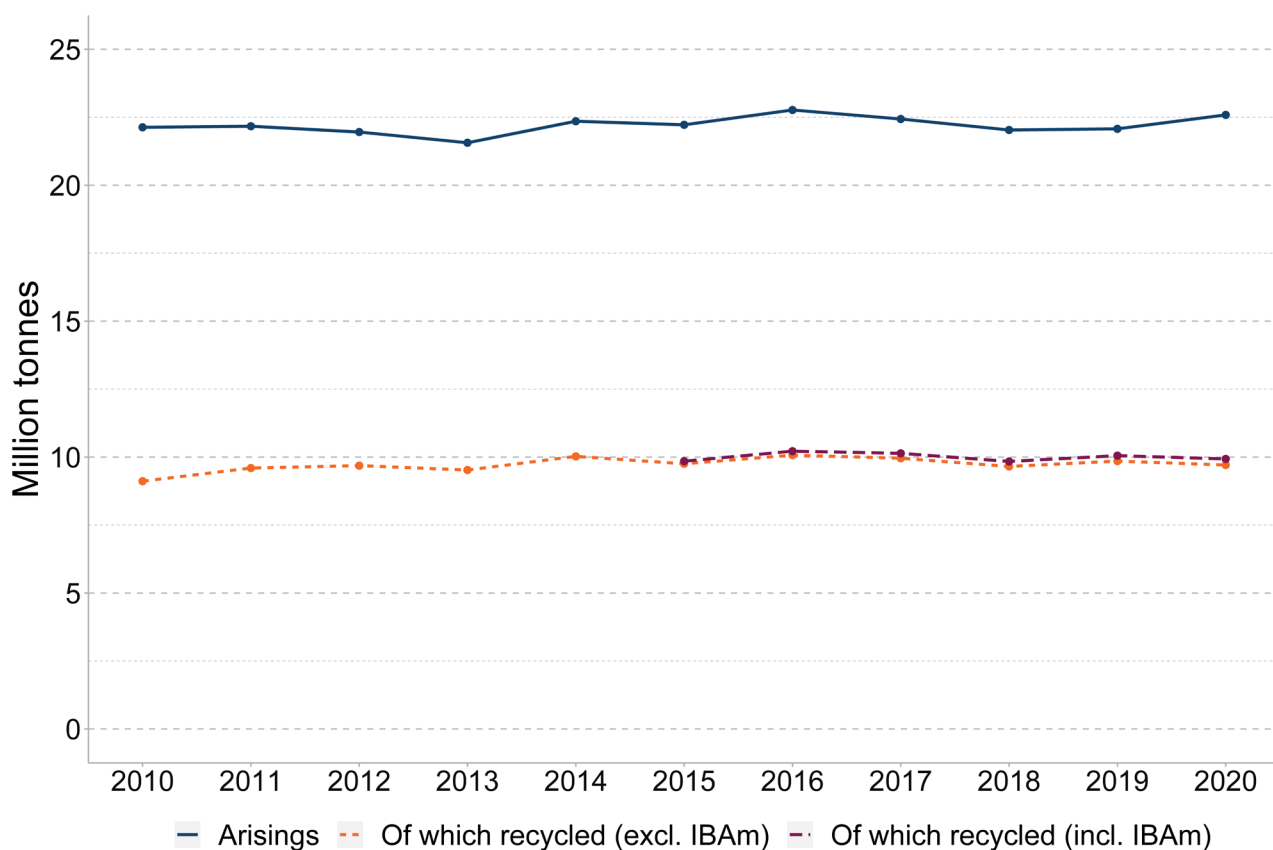
52.8% of waste was recycled or otherwise recovered in 2018, the highest figure since the start of this indicator in 2010. Meanwhile, the proportion of waste sent to landfill fell to 24.1%, although remains higher than the 23.2% recorded in 2014.

The proportion of waste treated on land and released into water bodies has fallen every year, from 13.9% in 2010 to just 9.2% in 2018.

RC1. Waste from Households recycling

Pending the development of the Municipal Waste indicator (RC2), this is interim indicator J3 in the 25 Year Environment Plan outcome indicator framework.

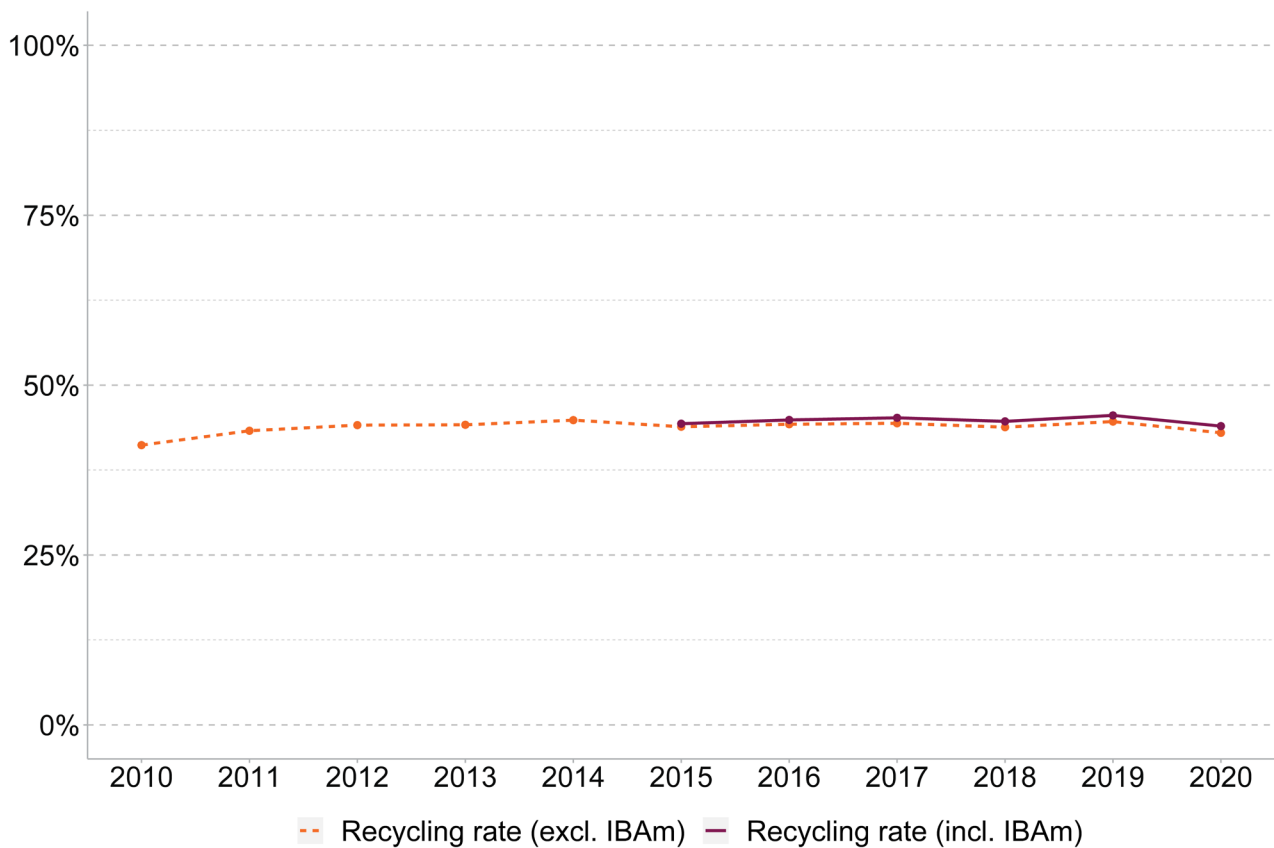
Figure 4.1 Waste from Households recycled, composted or prepared for reuse, England, 2010 to 2020, tonnes



Waste from Households is the agreed harmonised United Kingdom measure used to report household recycling.

Considered annually, 22.6 million tonnes of Waste from Households were collected in 2020, of which 9.7 million tonnes was recycled, composted or prepared for reuse. While the total amount of Waste from Households collected has increased by 2% since 2010, the mass of waste recycled, composted or prepared for reuse has risen by 7% over the same period.

Figure 4.2 Waste from Households recycled, composted or prepared for reuse, England, 2010 to 2020, percentage of total arisings



The percentage of Waste from Households in England recycled, composted or prepared for reuse (excluding incinerator bottom ash (IBA) metal) increased from 41.2% in 2010 to 43.9% in 2015 and has remained broadly flat since, falling slightly to 43.0% in 2020.

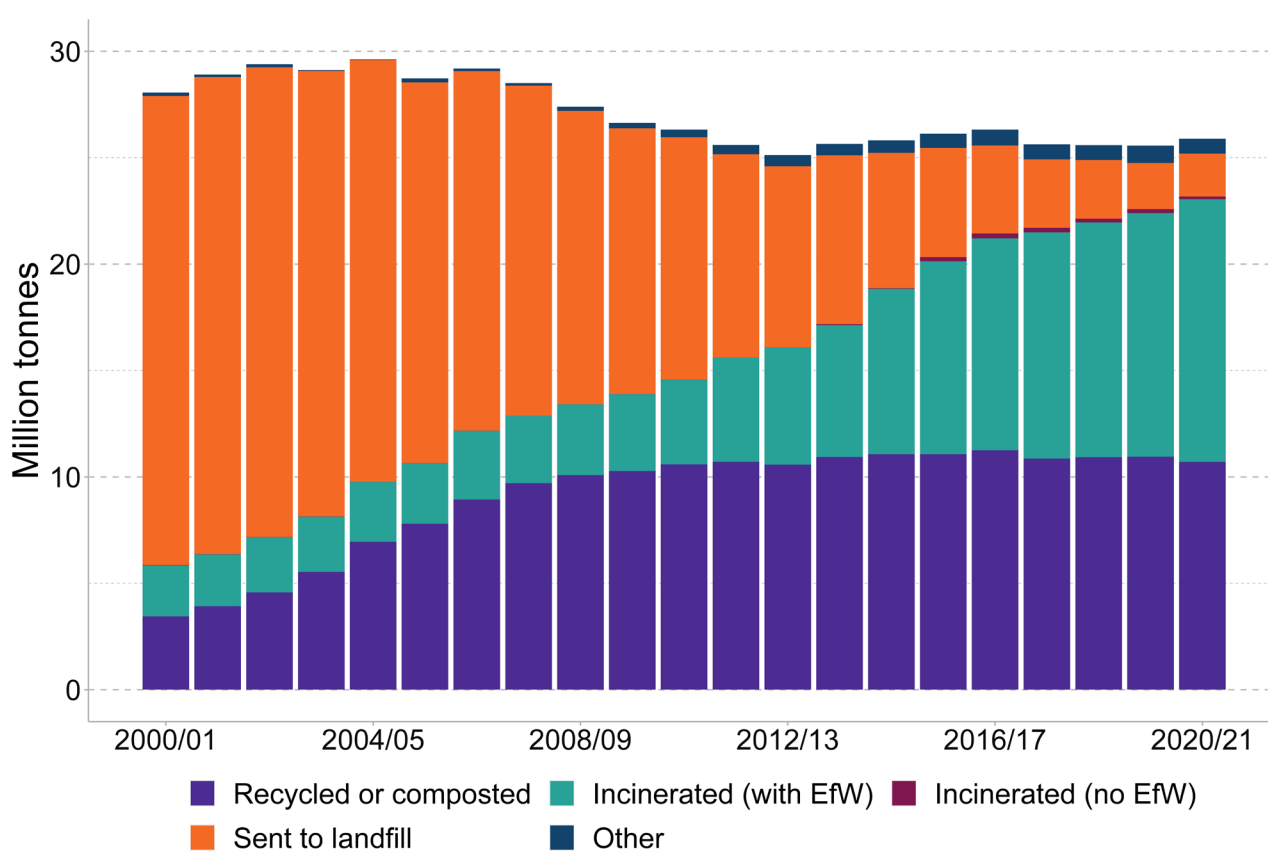
Including IBA metal, the Waste from Households recycling rate has fallen slightly from 44.3% in 2015 to 44.0% in 2020.

RC2. Municipal waste recycling

This indicator is under development. We have presented Local Authority Collected Waste recycled here as a proxy until the metric for municipal waste recycled is developed. This measure is slightly narrower than municipal waste but broader than Waste from Households, as it incorporates non-household Local Authority Collected Waste, including from Commercial & Industrial sources.

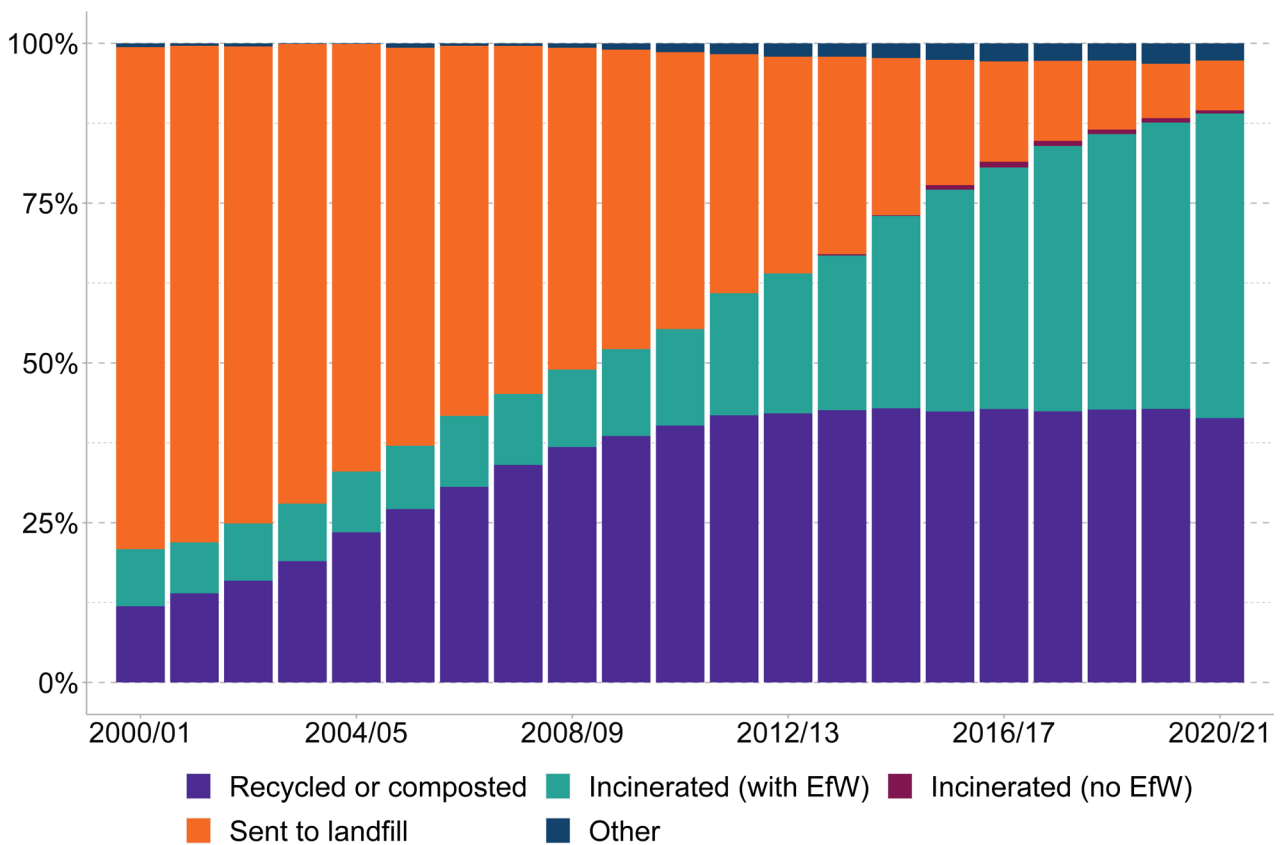
Once completed, this will be indicator J3 in the 25 Year Environment Plan outcome indicator framework.

Figure 4.3 Local Authority Collected Waste recycled or composted, England, 2000/01 to 2020/21, million tonnes



3.1 times as much Local Authority Collected Waste was sent for recycling or composting in 2020/21 as in 2000/01, rising from 3.4 million tonnes to 10.7 million tonnes despite arisings falling by 7.7% over the same period. However, as with Waste from Households, Local Authority Collected Waste recycled has been largely flat for several years.

Figure 4.4 Local Authority Collected Waste recycled or composted, England, 2000/01 to 2020/21, percentage of total arisings



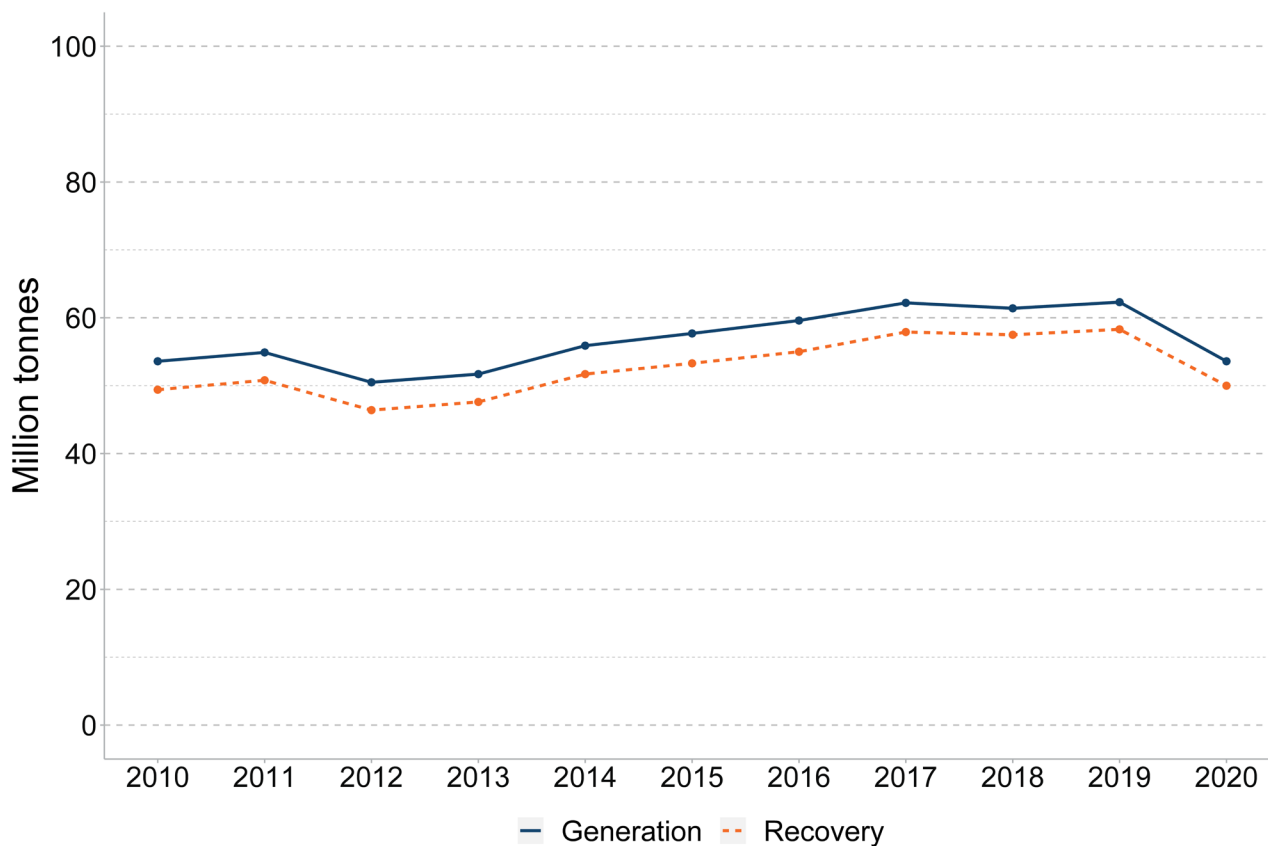
The proportion of Local Authority Collected Waste sent for recycling or composting, relative to overall arisings, has remained roughly constant since 2011/12, standing at 41.4% in 2020/21.

RC3. Commercial and industrial waste recycled (not currently tracked)

This indicator was set out in the Resources and Waste Strategy. We are currently developing a formal methodology to estimate the recycling rate for commercial and industrial waste. Waste production figures presented in WP1 give an indication of total arisings from commercial and industrial activity.

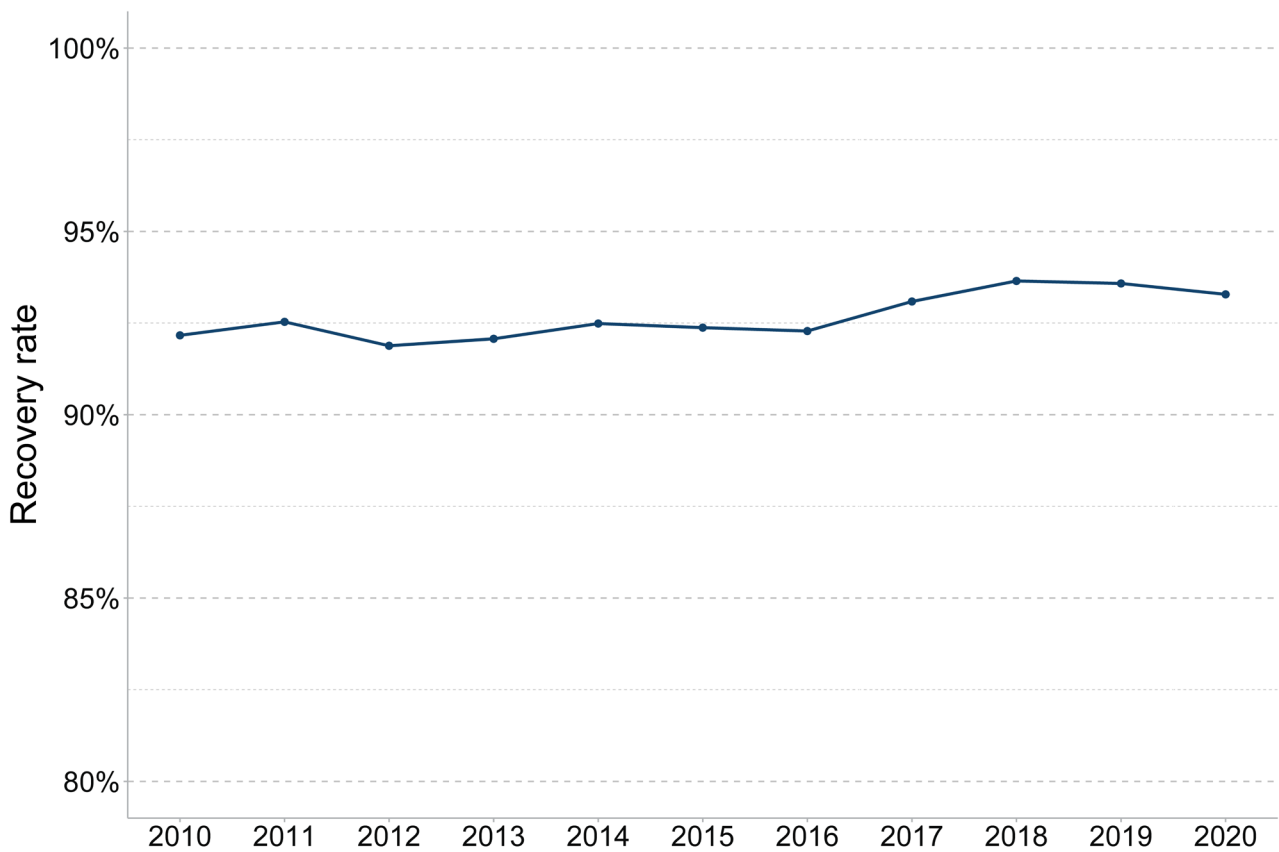
RC4. Construction and demolition waste recovery

Figure 4.5 Non-hazardous construction and demolition waste recovered and placed on market, England, 2010 to 2020, tonnes



Estimates of the recovery rate for non-hazardous construction and demolition waste have been calculated. This rate has remained consistently high over time and the amount of waste recovered closely tracks that placed on the market.

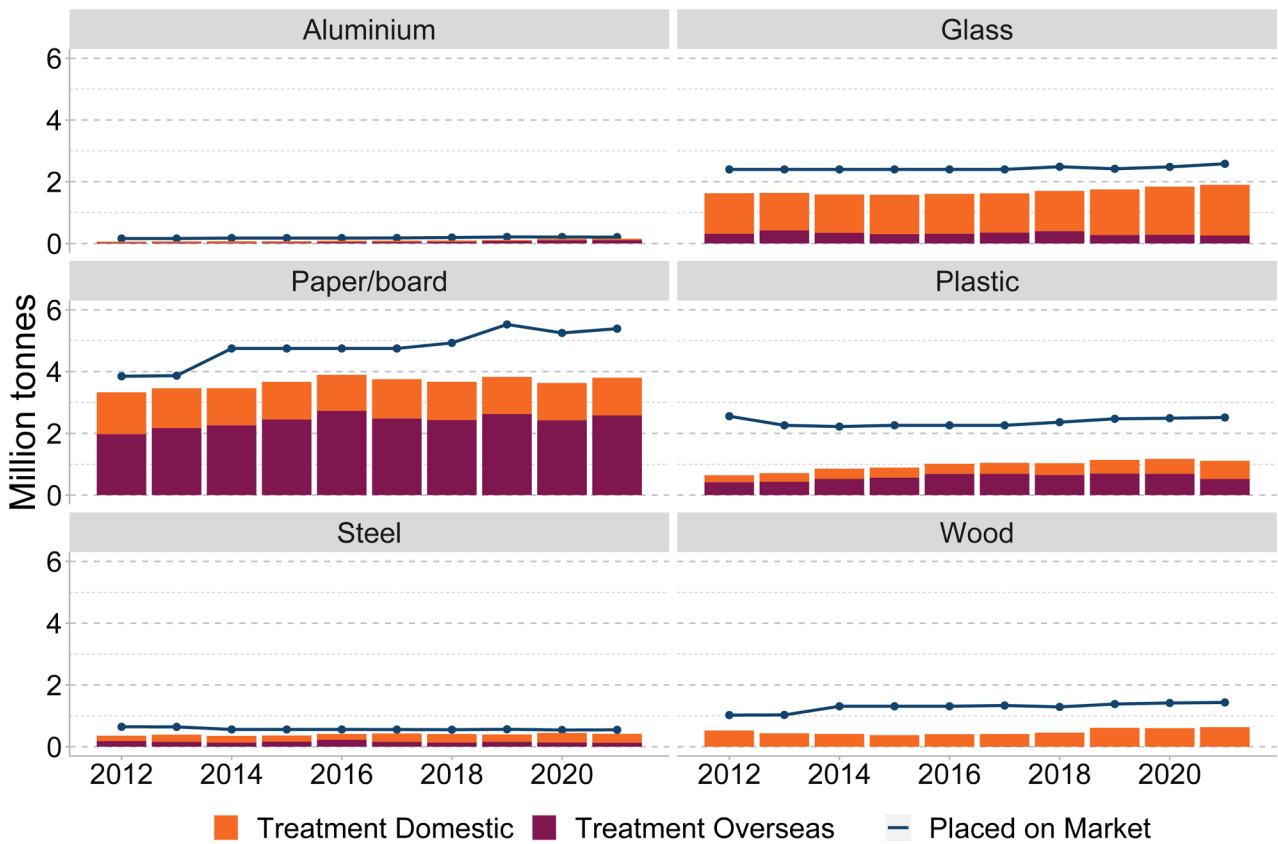
Figure 4.6 Non-hazardous construction and demolition waste recovered, England, 2010 to 2020, percentage of total placed on market



The proportion of construction and demolition waste that is recovered rose from 92.2% in 2010 to 93.2% in 2020.

RC5. Packaging waste recycling

Figure 4.7 Packaging waste recycled, United Kingdom, 2012 to 2021, tonnes



The majority of packaging waste is recycled. Paper and cardboard collectively constitute the most common packaging material, and most of this is recycled, but there has been significant growth in the amount of paper/board packaging placed on the market without a corresponding increase in the amount treated.

Most of this treatment takes place overseas, whereas most treatment of glass occurs within the United Kingdom.

Table 4.2 Packaging waste recycled, United Kingdom, 2012 to 2021, percentage of total

Year	Aluminium	Steel	Paper and cardboard	Glass	Plastic	Wood	Total recycling
2012	38%	56%	86%	68%	25%	51%	61%
2013	43%	61%	89%	68%	32%	42%	65%
2014	41%	64%	73%	67%	38%	31%	59%
2015	43%	65%	77%	66%	39%	29%	61%
2016	51%	74%	82%	67%	45%	31%	65%
2017	52%	77%	79%	68%	46%	31%	64%
2018	39%	75%	74%	69%	44%	35%	62%
2019	54%	70%	69%	72%	46%	44%	62%
2020	72%	82%	69%	74%	47%	42%	63%
2021	75%	76%	71%	74%	44%	44%	63%

The total recycling rate for packaging material has changed little between 2012 and 2021, rising just two percentage points from 61% to 63%.

However, the recycling rate for most material categories has risen significantly over this period, with aluminium, steel, glass and plastic all seeing substantially increased recycling rates. This is counteracted by reduced levels of recycling for paper and cardboard (which represents the most common material category for packaging) and wood.

Indicator data sources and information

WT1

Source: Defra (2021) [UK statistics on waste](#)

Relevant goal in the 25YEP: Goal 8 – minimise waste

Classification: Official statistic

Definitions and details of calculations: Final treatment methods presented here have been calculated for the purpose of reporting against the EC Waste Statistics Regulation return. Further details of methodology available at data source.

RC1

Source: Defra (2022) [ENV18 - Local authority collected waste](#)

Relevant goal in the 25YEP: Goal 8 – minimise waste

Classification: National Statistic

Definitions and details of calculations: Waste from Households recycled refers to waste generated by households sent for recycling, composting or reuse in England. This measure is calculated in accordance with Waste Framework Directive (2008/98/EC) and includes waste from regular household collection, civic amenity sites, bulky waste and other household waste, while excluding street cleaning/sweeping, gully emptying, separately collected healthcare waste and soil, rubble, plasterboard and asbestos wastes. Incinerator bottom ash is included in figures from 2015. Further details on definition and calculation available at data source.

RC2

The municipal waste indicator is under development. Local Authority Collected Waste has been used as a proxy.

Source: Defra (2022) [ENV18 - Local authority collected waste](#)

Relevant goal in the 25YEP: Goal 8 – minimise waste

Relevant target/ambition/commitment: The government's target ambition is to recycle 65% of municipal waste by 2035 (by weight).

Classification: Official statistic

Definitions and details of calculations: Municipal waste includes household waste, commercial and industrial waste collected by local authorities, and commercial and industrial waste that is similar in nature and composition to household waste but not

collected by local authorities. Using local authority collected waste as a proxy therefore omits this latter component of municipal waste. LACW consists of all waste from households, street sweepings, municipal parks and gardens waste, beach cleansing waste and waste resulting from the clearance of fly-tipped materials plus commercial or industrial waste which is collected by local authorities. It is a broader measure than Waste from Households, but a narrower measure than municipal waste. LACW recycled or composted refers to the waste collected by local authorities which is then sent for recycling or composting. Data reported for financial years. Further details on definition and calculation available at data source.

RC4

Source: Defra (2022) [UK statistics on waste](#)

Relevant goal in the 25YEP: Goal 8 – minimise waste

Classification: Official statistic

Definitions and details of calculations: Estimates of recovery rates from non-hazardous construction and demolition (C&D) waste are calculated for reporting against the EC Waste Framework Directive. Recovered refers to waste either being recycled or reused in some form while including backfilling.

RC5

Source: Defra (2022) [UK statistics on waste](#)

Relevant goal in the 25YEP: Goal 8 – minimise waste

Relevant targets/ambitions/commitments:

The resources and waste strategy includes a commitment to recycle 65% of packaging waste by 2025 and 70% by 2030, and the following material-specific targets:

- Paper and cardboard: 75% (2025) and 85% (2030)
- Ferrous metals: 70% (2025) and 80% (2030)
- Aluminium: 50% (2025) and 60% (2030)
- Glass: 70% (2025) and 75% (2030)
- Plastic: 50% (2025) and 55% (2030)
- Wood: 25% (2025) and 30% (2030)

Classification: Official statistic

Definitions and details of calculations: Packaging waste recycled refers to tonnes of United Kingdom packaging waste accepted for recycling, both domestically and overseas. Estimates of recycling rates for packaging materials have been calculated for reporting against targets set by the EC Directive 94/62/EC. Estimates are calculated based on

Packaging Recovery Notes and Packaging Export Recovery Notes sold by accredited reprocessors and exporters. A de minimis threshold exists for producers obligated to obtain these notes of a turnover of £2 million and the handling of at least 50 tonnes of packaging each year. Further details of methodology available at data source.

Waste Disposal

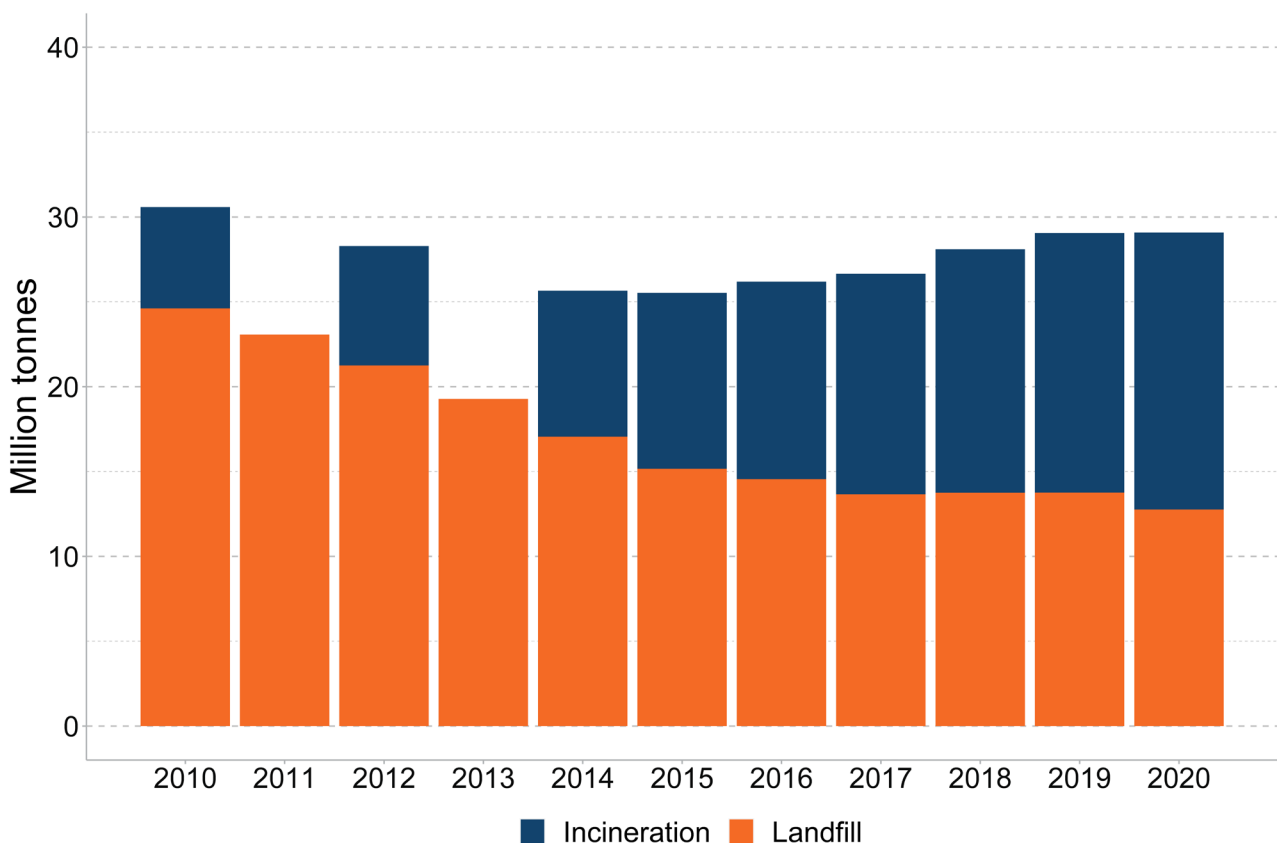
Recovering energy from and disposing of waste are the last resort for waste that is not recycled. This includes landfill and incineration, which are associated with higher carbon emissions than most other waste management methods and permanently remove the waste from the economy. This necessitates more material extraction if the products are to be replaced (though incineration can be used to produce energy in an energy-from-waste (EfW) plant and metals can be extracted from incinerator bottom ash). A circular economy would minimise the amount of waste sent for final disposal by extending the life of products and recycling them to substitute for virgin materials.

This chapter includes statistics on the amount of waste landfilled or incinerated in England, the amount of especially harmful biodegradable waste sent to landfill, and the amount of residual waste sent abroad for disposal.

WD1. Waste landfilled or incinerated

Pending development of an indicator representing residual waste arisings by type and sector, this is interim indicator J4 in the 25 Year Environment Plan outcome indicator framework.

Figure 5.1 Waste landfilled or incinerated (excluding mineral wastes), England, 2010 to 2020, tonnes



Note: Prior to 2014, data on waste incinerated were collected only in even-numbered years.

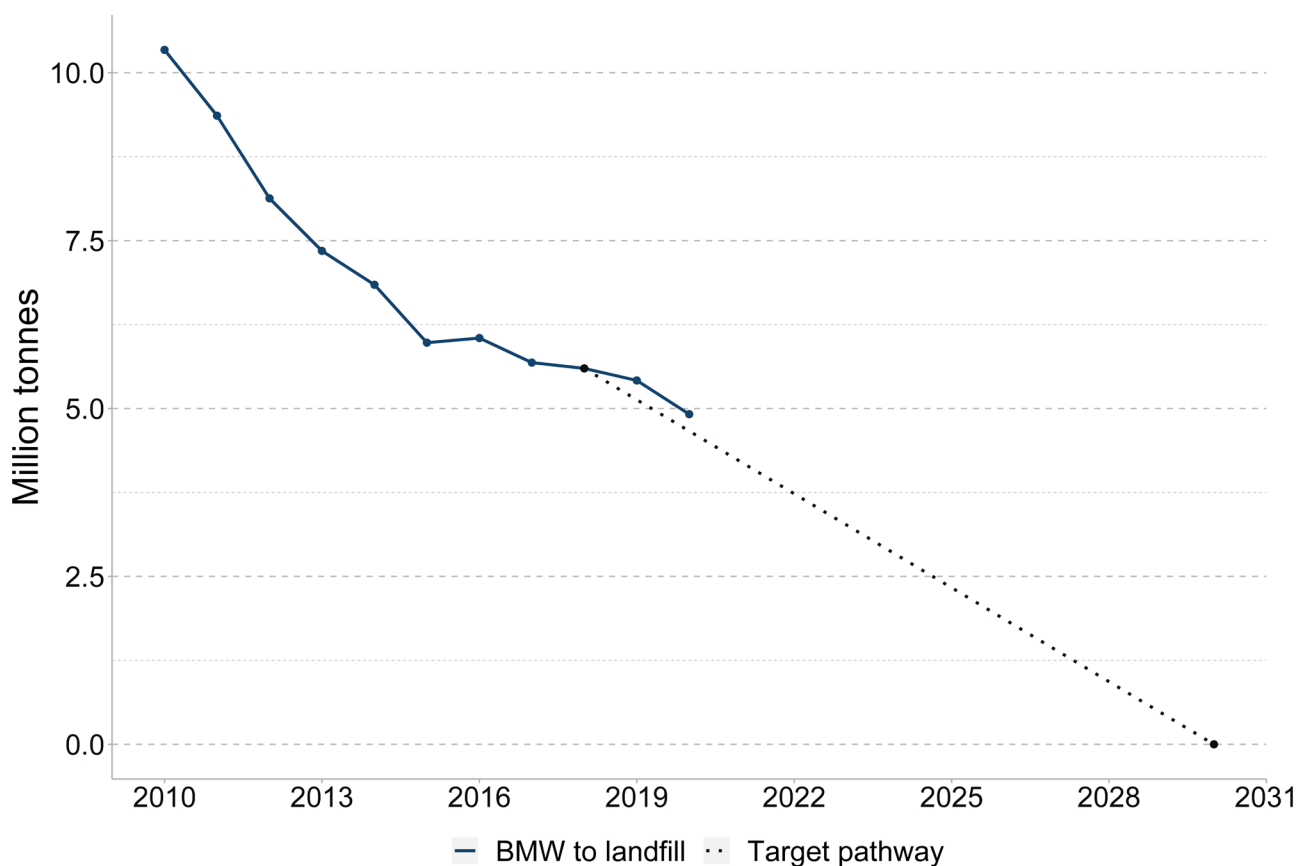
The amount of waste sent to landfill has fallen from 26 million tonnes in 2010 to 13 million tonnes in 2020, driven mostly by increased levels of incineration (with or without energy recovery), which rose from 6 million tonnes in 2010 to 16 million tonnes in 2020.

The amount of waste disposed of by landfill or incineration (with or without energy recovery) has risen slightly in recent years, from a total of 26 million tonnes in 2015 to 29 million tonnes in 2020, but remains lower than the 30 million tonnes disposed of in 2010.

WD2. Biodegradable waste landfilled

This indicator was set out in the Resources and Waste Strategy but a formal methodology for reporting against it has yet to be agreed. Biodegradable municipal waste landfilled is presented here as a proxy, but it is unclear how representative this is of total biodegradable waste landfilled.

Figure 5.2 Biodegradable municipal waste landfilled, England, 2010 to 2020, million tonnes



Among other materials, biodegradable waste includes food waste, green waste (such as from gardens), cardboard, and paper.

In 2020, 4.9 million tonnes of Biodegradable Municipal Waste (BMW) were sent to landfill in England, 52.5% less than in 2010. The 2020 figure is just 16.9% of the 1995 baseline of BMW generation.

In the Resources and Waste Strategy, we set out a commitment to explore policies to work towards eliminating biodegradable waste to landfill by 2030. The pathway represents the average improvement needed year-on-year (from 2018 levels) for England to meet this ambition (which necessarily entails sending zero biodegradable municipal waste to landfill). While tonnages to landfill have reduced each year since 2010 (except in 2016 when there was a small increase), achieving this ambition will require this reduction to accelerate.

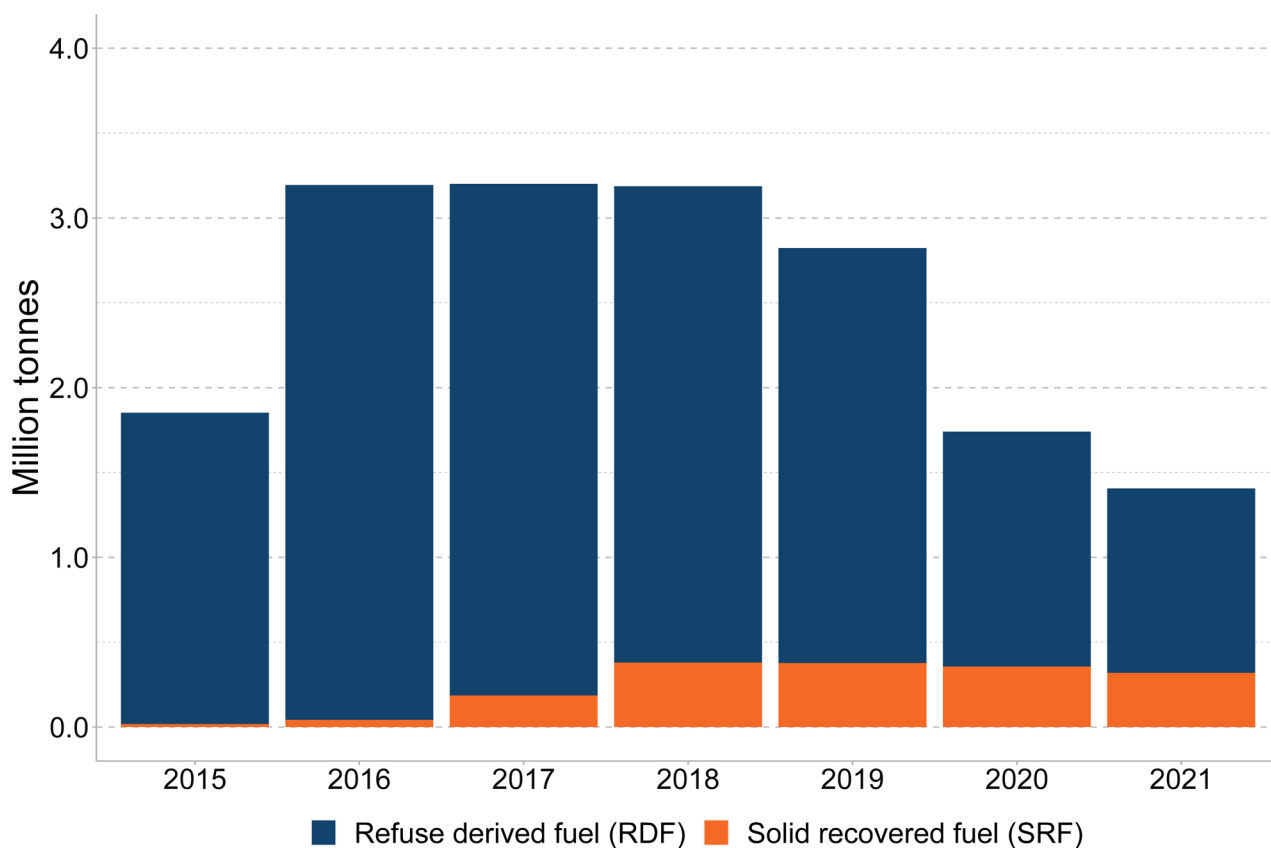
WD3. Food waste landfilled (not currently tracked)

This indicator was set out in the Resources and Waste Strategy but a formal methodology for reporting against it has yet to be agreed. Biodegradable municipal waste landfilled is presented in WD2; food waste is thought to form a large proportion of this.

WD4. Waste trade

The Environment Agency collects data on permits granted for international waste shipments into or out of England, with this dataset initially covering refuse derived fuel (RDF) and being added to over time. RDF consists of residual waste that is subject to a contract with an end-user for use as a fuel in an energy from waste facility. This is typically waste from the mechanical treatment of waste such as sorting, crushing, compacting, pelletising, etc. Solid recovered fuel (SRF) is waste-derived fuel distinguished from RDF in that it is produced to reach a specific quality standard.

Figure 5.3 Exports of Refuse Derived Fuel and Solid Recovered Fuel, England, 2010 to 2020, tonnes



The total amounts of RDF and SRF exported from England were very stable between 2016 and 2018, although SRF rose significantly as a proportion of exports over this period. Total exports have fallen in every year since. Although the total amount of SRF exported has remained roughly constant since 2018, the decline in the total means it continues to make up an increasing proportion of exports.

Table 5.1 Exports of Refuse Derived Fuel and Solid Recovered Fuel by destination, England, 2021, thousand tonnes

Destination	Refuse derived fuel (RDF)	Solid recovered fuel (SRF)	Total
Sweden	451	31	482
The Netherlands	408	0	408
Germany	103	0	103
Norway	91	2	94
Bulgaria	0	87	87
Denmark	34	30	65
Latvia	0	58	58
Cyprus	0	48	48
Greece	0	33	33
Portugal	0	24	24
Spain	0	5	5
Belgium	0	1	1
France	0	0	0
Total	1087	320	1406

Sweden was the largest importer of refuse derived fuel originating in England in 2020, importing 451 thousand tonnes of RDF and 31 thousand tonnes of SRF, followed by the Netherlands and Germany. Bulgaria was the largest importer of SRF, at 87 thousand tonnes.

Indicator data sources and information

WD1

The Resources and Waste Strategy specifies that this indicator should be presented as a proportion of total municipal waste. While the municipal waste indicator remains under development, the total tonnage is presented as a proxy.

Source: Environment Agency (2022) [2020 Waste Data Interrogator](#)

Relevant goal in the 25YEP: Goal 8 – minimise waste

Classification: None

Definitions and details of calculations: Residual waste here adopts a treatment-based definition and refers to waste landfilled or incinerated (with and without energy recovery) in England. Data on residual waste are collected by the Environment Agency and made available through the Waste Data Interrogator and associated incineration datasets. From these datasets, European Waste Catalogue codes catalogued as “major mineral wastes” (which are according to Eurostat and the European Waste Classification for Statistical Purposes (EWC-Stat, version 4), mineral construction and demolition waste (EWCStat 12.1), other mineral waste (EWC-Stat 12.2, 12.3 and 12.5), soils (EWC-Stat 12.6) and dredging spoils (EWC-Stat 12.7), are removed.

WD2

A formal methodology for reporting against this indicator has yet to be agreed. Biodegradable municipal waste to landfill is presented here as a proxy.

Source: Defra (2022) [UK statistics on waste](#)

Relevant goal in the 25YEP: Goal 8 – minimise waste

Relevant target/ambition/commitment: The Resources and Waste strategy included a strategic ambition to send zero biodegradable waste to landfill by 2030. This is a broader category than biodegradable municipal waste, but achieving this ambition necessarily entails sending zero biodegradable municipal waste to landfill, as this is a category of biodegradable waste.

Classification: Official statistic

Definitions and details of calculations: For the purposes of reporting to the Landfill Directive, the United Kingdom’s governments have agreed a set of European Waste Catalogue (EWC) classification codes to represent municipal waste. Biodegradable municipal waste sent to landfill refers to the fraction of this municipal waste which will decompose within a landfill. Amongst other materials it includes food waste, green waste, cardboard and paper. Estimates for biodegradable municipal waste to landfill have been

calculated in accordance with the Landfill Directive (1999/31/EC). Further details of methodology available at data source. The 1995 baseline was modelled and agreed in 2010.

WD4

Source: Environment Agency (2022) [International Waste Shipments exported from England](#)

Relevant goal in the 25YEP: Goal 8 – minimise waste

Classification: None

Definitions and details of calculations: The Environment Agency holds records of international shipments permitted under the Transfrontier Shipment of Waste Regulations 2007. Shipments into or out of the United Kingdom qualify as International Waste Shipments. They are registered to the country where the producer or receiver is registered, regardless of the exit or entrance point from/to the United Kingdom. The Environment Agency holds details of producers and receivers registered in England. This dataset initially covers Refuse Derived Fuel, with other waste types being added over time. Refuse-derived fuel (RDF) is waste typically from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising, etc). RDF consists largely of combustible components of both municipal and commercial industrial waste, such as plastics and biodegradable waste. Permit holders give indicative figures for how much waste they wish to have approved for import/export. They are not forecasts or projections.

Greenhouse Gas Emissions

Waste management results in greenhouse gas emissions. The decomposition of biodegradable waste in landfills is a significant source of methane, a potent greenhouse gas, and other processes such as recycling and incineration also emit greenhouse gases. Greenhouse gas emissions are themselves a particularly harmful form of waste released into our atmosphere, so the Resources and Waste Strategy is also concerned with reducing our consumption-based carbon emissions. Carbon reductions align with the government's Net Zero Strategy, and footprint accounting builds on this by tracking global emissions associated with England's consumption.

This chapter includes data on territorial greenhouse gas emissions from waste management in England and on the global carbon footprint associated with English consumption.

GG1. Territorial greenhouse gas emissions from waste management

Table 6.1 Territorial greenhouse gas (GHG) emissions from the waste management sector, England, 1990 to 2020, million tonnes carbon dioxide equivalent

Year	Landfill	Waste-water handling	Composting	Incineration (without EfW)	Anaerobic digestion	Total
1990	56.0	2.7	0.0	1.4	0.0	60.1
1995	58.6	2.7	0.2	1.0	0.0	62.5
2000	52.5	2.7	0.3	0.6	0.0	56.2
2005	40.3	2.1	0.5	0.5	0.0	43.4
2010	22.0	2.3	0.9	0.3	0.0	25.5
2015	13.1	2.3	1.3	0.3	0.1	17.1
2016	12.5	2.2	1.4	0.3	0.2	16.5
2017	12.7	2.4	1.4	0.3	0.2	17.0
2018	12.8	2.3	1.4	0.3	0.2	16.9
2019	12.7	2.3	1.4	0.3	0.2	16.9
2020	11.7	2.3	1.4	0.3	0.2	15.8

Note: These figures have been revised to use the global warming potentials from the Intergovernmental Panel on Climate Change (IPCC)'s Fifth Assessment Report (AR5), instead of AR4 as used previously.

In 2020, the waste management sector in England generated an estimated 15.8 million tonnes CO₂e (MtCO₂e) of greenhouse gas emissions, 73.7% less than the equivalent figure in 1990 (60.1 MtCO₂e) and slightly lower than 2019. The waste management sector accounted for 4.7% of England's overall territorial emissions, down from 8.5% in 1990.

Emissions from landfill in England were significantly lower in 2020 than in 1990. This reflects a shift away from a reliance on landfill as a form of waste management in England as well as changes in the composition of landfilled waste and increased capture of gases from landfill sites.

These figures exclude recycling and incineration with energy from waste (EfW), as these processes are not considered waste management for the purposes of the National Atmospheric Emissions Inventory. The greenhouse gas emissions from EfW were around 6.2 MtCO_{2e} in 2019.⁶

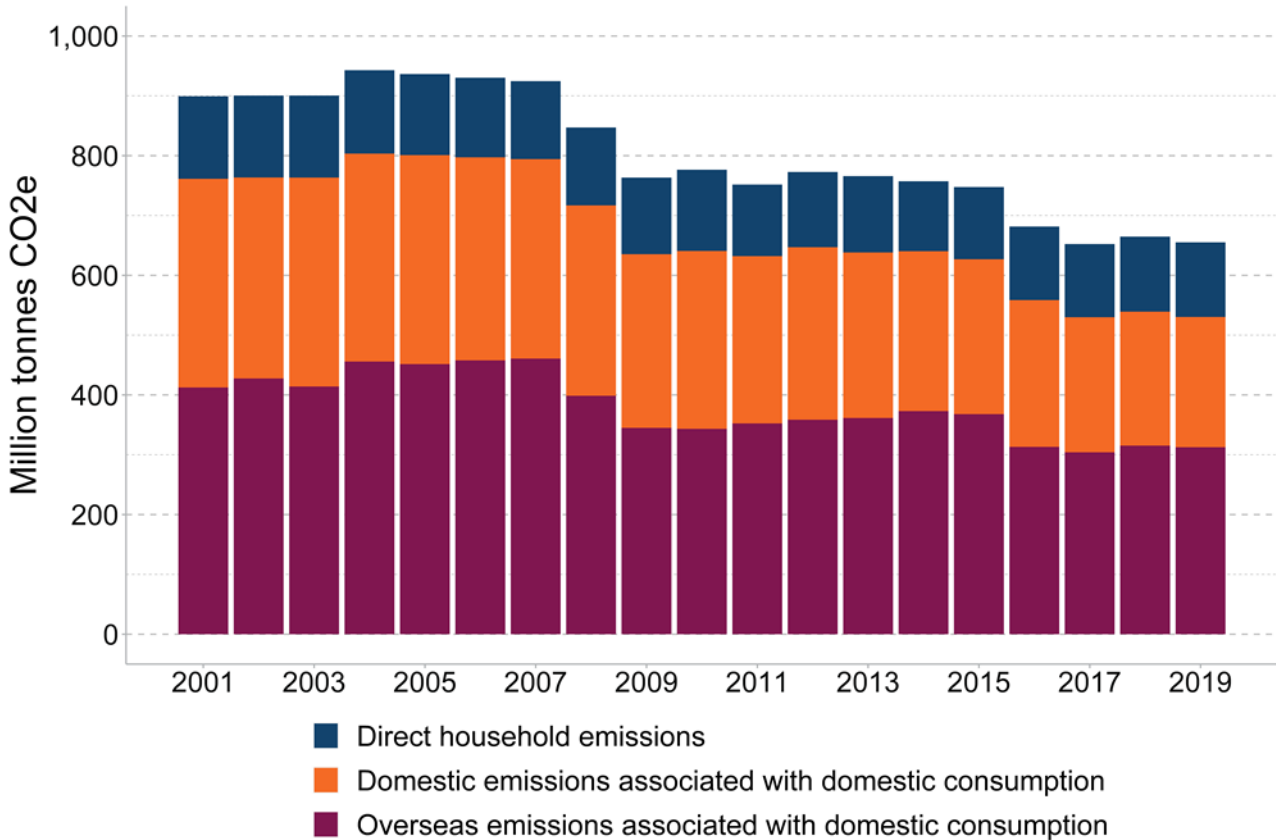
In isolation, all waste management processes are emitters of greenhouse gases, but processes such as recycling can contribute to offsetting emissions that might otherwise have arisen. When assessing emissions from waste management, it is important to consider any greenhouse gas savings that may arise through the process of treatment, such as associated with substituting virgin with recycled material, generating energy via incinerating waste, or reducing nitrate fertiliser via anaerobic digestion. The figures provided in the table above do not account for these savings. Work is ongoing on updated estimates of the CO_{2e} savings from waste management, with the hope that these will be published in a future release of this document.

6 Climate Change Committee (2020) [The Sixth Carbon Budget: Waste](#)

GG2. Carbon footprint

This is indicator J1 in the 25 Year Environment Plan outcome indicator framework.

Fig 6.1 Carbon footprint on a consumption basis, England, 2001 to 2019, million tonnes CO₂ equivalent (MtCO₂e)



The carbon footprint is the allocation of global greenhouse gas emissions to final demand for goods and services by England's residents. The measure takes account of the emissions arising along the supply chain for imported products and excludes domestic emissions associated with exports.

England's carbon footprint was an estimated 655 million tonnes CO₂ equivalent (MtCO₂e) in 2019, 27% less than in 2001 (899 MtCO₂e). In 2019, 48% of the footprint was made up of emissions arising overseas driven by domestic consumption, 33% of domestic emissions associated with domestic consumption and 19% direct emissions by households.

Table 6.2 Carbon footprint split by product group, England, 2019

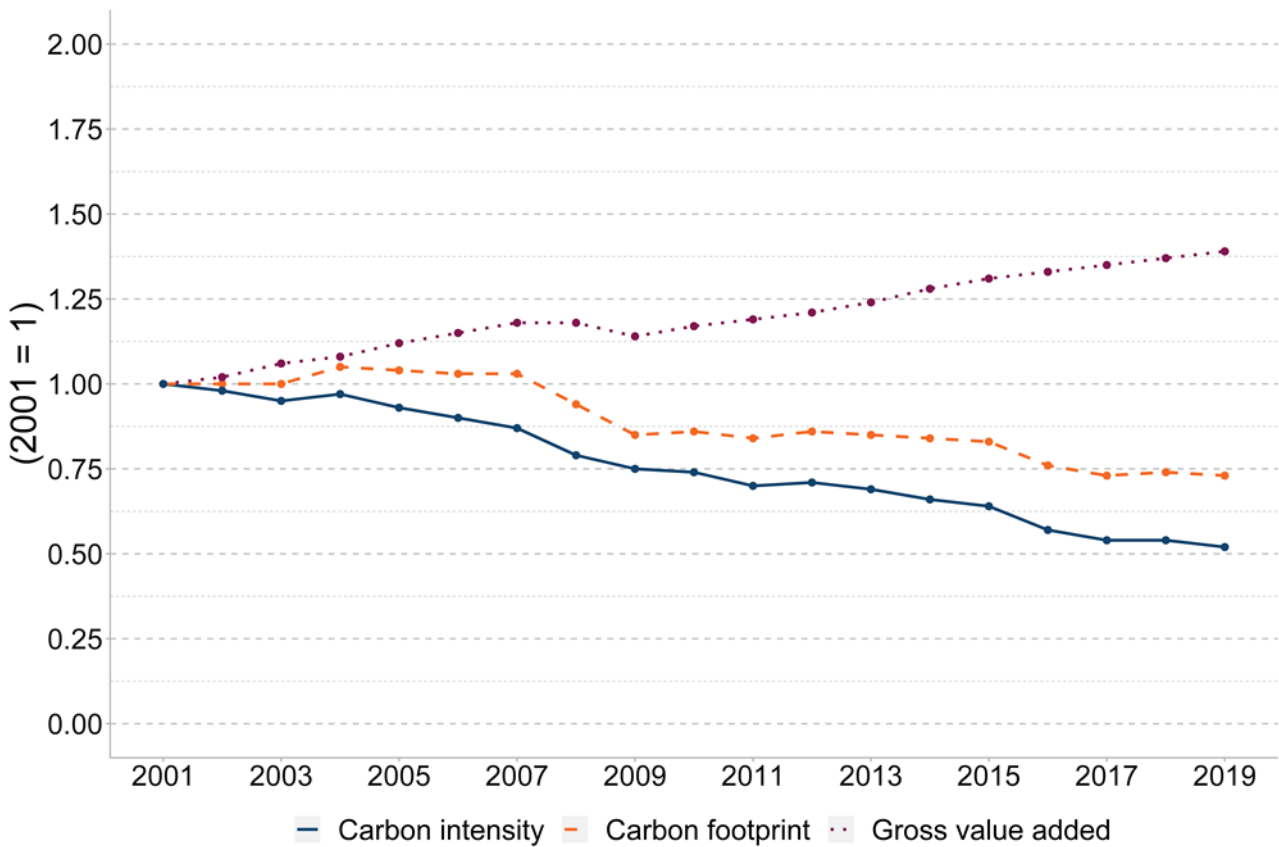
Category	Million tonnes	Percentage
Transportation	176	27%
Housing & power	145	22%
Gross fixed capital formation	81	12%
Food & beverages	64	10%
Government	54	8%
Other	42	6%
Recreation & communication	36	5%
Hotels & restaurants	31	5%
Furnishing, appliances	15	2%
Clothing & footwear	10	2%

Note: “Other” encompasses alcohol & tobacco, health, education and miscellaneous goods and services.

In 2019, transportation made up the largest share of England’s carbon footprint (27%), followed by housing & power (22%) and gross fixed capital formation (12%).

77% of England’s carbon footprint was associated with final consumption expenditure of households. Transportation made up the largest share of the carbon footprint associated with household consumption in England (35%), while housing & power and food & beverages made up 29% and 13%, respectively. Emissions associated with these uses composed 76% of the carbon footprint associated with household consumption in 2018.

Fig 6.2 Intensity of greenhouse gas emissions on a consumption basis, England, 2001 to 2019, kilogrammes CO₂ equivalent (kgCO₂e) per £ gross value added (chained volume measure, 2019 pounds)



Carbon intensity is the carbon footprint per unit of economic productivity (gross value added, GVA). A lower carbon intensity shows that the economy is becoming more carbon-efficient as it grows.

Between 2001 and 2019, England’s GVA largely trended upwards, increasing by 39% overall as the economy grew, while across the same period, the carbon footprint fell by 27%. Measured as a ratio of these two indicators, England’s carbon intensity fell by an estimated 48% between 2001 and 2019, indicating that GVA is absolutely decoupled from the carbon footprint and that economic growth is possible without a negative impact on the climate.

GG3. Carbon footprint of a basket of consumer goods (not currently tracked)

This indicator was set out in the Resources and Waste Strategy but remains under development. We hope to include data on this indicator in a future release.

Indicator data sources and information

GG1

Source: Department for Business, Energy and Industrial Strategy (2022) [Greenhouse Gas Inventories for England, Scotland, Wales & Northern Ireland: 1990-2020](#)

Relevant goal in the 25YEP: Goal 7 – mitigating and adapting to climate change

Relevant target/ambition/commitment: Legislative target within the Climate Change Act (2008), since updated with the aim of achieving net zero emissions by 2050 on a territorial basis.

Classification: National Statistic

Definitions and details of calculations: The waste management sector is a category used in international reporting and for which data are collected within the National Atmospheric Emissions Inventory. Greenhouse gases covered within the inventory are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O) and hydroflourocarbons (HFC), perflurocarbons (PFC), nitrogen trifluoride (NF₃) and sulphur hexafluoride (SF₆). Emissions from waste incineration with energy capture (the majority of incineration-related emissions today) is excluded in these figures, not because it is unimportant but because it is covered elsewhere within the emissions inventory under energy-related emissions.

GG2

Source: Defra (2022) [UK's carbon footprint](#)

Relevant goal in the 25YEP: Goal 7 – mitigating and adapting to climate change

Relevant target/ambition/commitment: Legislative targets within the Climate Change Act (2008) since updated with the aim of achieving net zero emissions by 2050 on a territorial basis, covering domestic emissions within the footprint.

Classification: Official statistic

Definitions and details of calculations: The carbon footprint refers to emissions of greenhouse gases attributable to final demand in England, irrespective of where these are released globally. From this release, the carbon footprint now includes the following seven Greenhouse Gases: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O) and hydroflourocarbons (HFC), perflurocarbons (PFC), nitrogen trifluoride (NF₃) and sulphur hexafluoride (SF₆).

Waste Crime

The term waste crime encompasses illegal waste sites, illegal waste exports, illegal waste dumping (including fly-tipping) and the misdescription of waste among other illegal waste-related activities. Waste crime causes a disamenity to the public's enjoyment of the environment, reduces the availability of resources in our economy and imposes financial costs. The total cost of waste crime in 2018/19 to the legitimate waste industry and taxpayer in England was an estimated £924 million,⁷ including £236 million from illegal waste sites and £392 million from fly-tipping.

This chapter provides statistics on some of the main types of waste crime: the number of illegal waste sites identified by the Environment Agency, the number of incidents of fly-tipping on public land and the types of waste involved. Statistics on the perceptions and cost of litter are also presented.

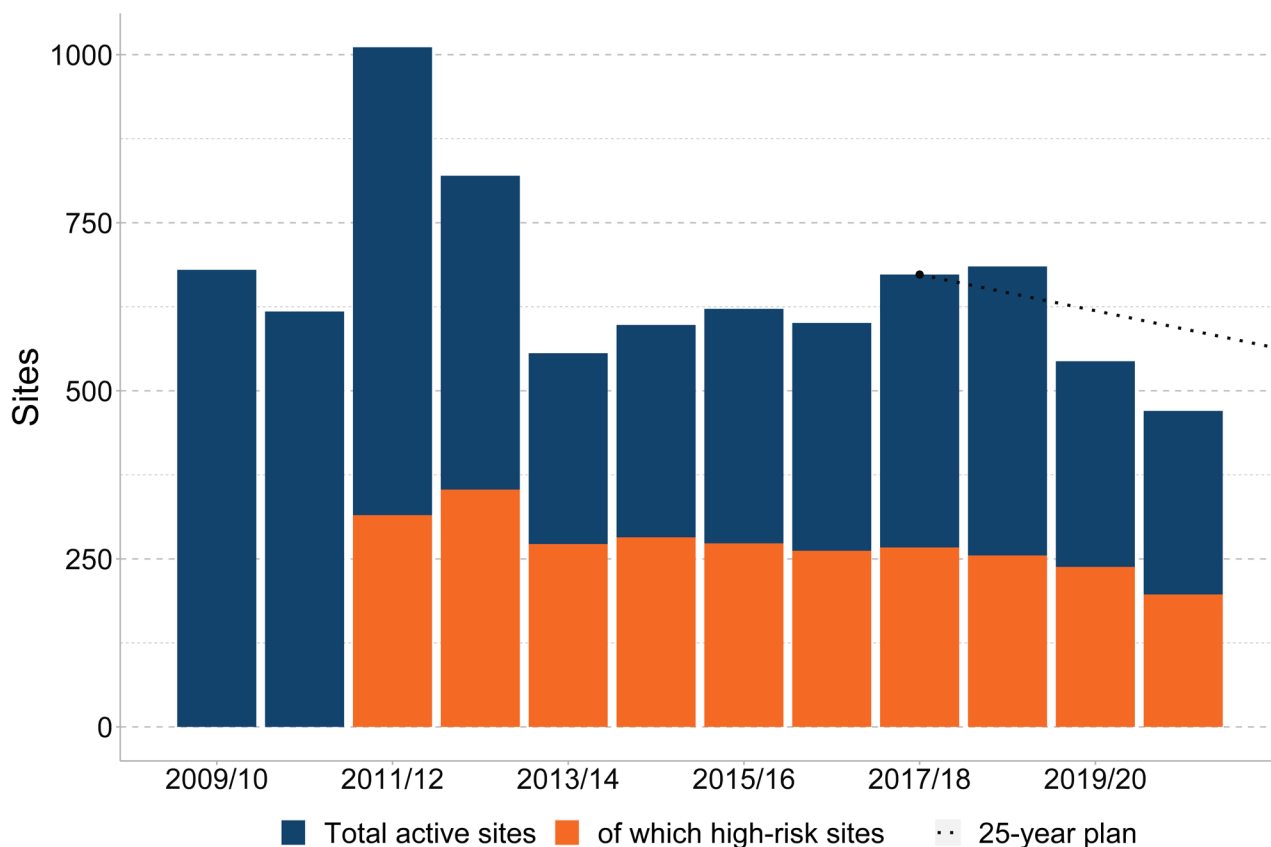
⁷ Eunomia (2021) [Counting the Cost of UK Waste Crime](#)

WC1. Illegal waste sites

These data have not been updated since the previous edition of Monitoring Progress.

This is indicator J6a in the 25 Year Environment Plan outcome indicator framework.

Figure 5.1 Active illegal waste sites and high risk active illegal waste sites, England, 2009/10 to 2020/21, number of sites

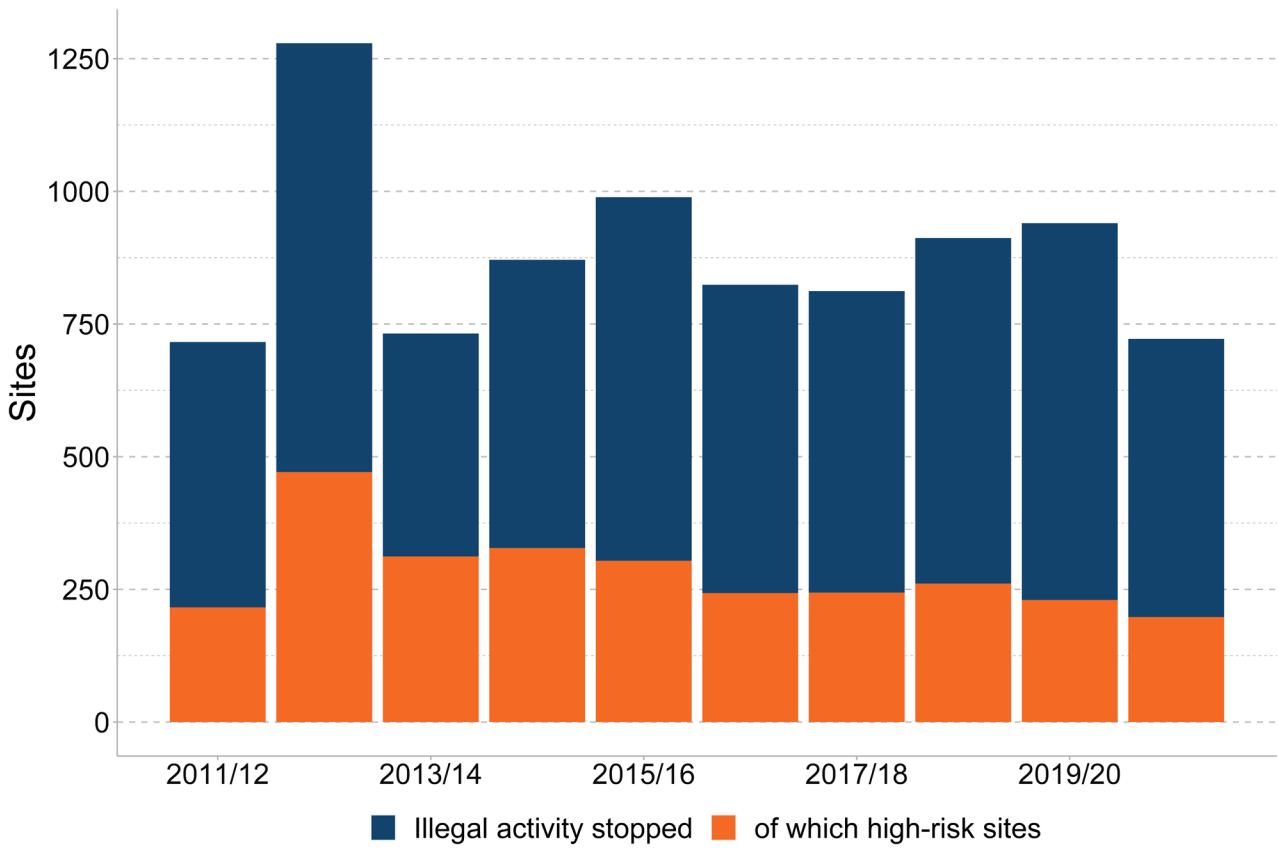


From 2013/14 to 2018/19, the total number of active illegal waste sites identified in England increased gradually from 556 to 685. In 2020/21, the number of active illegal waste sites fell to 470, the lowest figure yet recorded. Some of the reduction for 2020/21 may be due to reduced enforcement activity during the COVID-19 pandemic, which may have led to fewer sites being identified. However, the number of illegal waste sites recorded in 2019/20 was also lower than in any previous year, suggesting that this trend predates the pandemic.

The number of active illegal waste sites categorised as high-risk (monitored since 2011/12) has fallen by 44% from a peak of 353 sites in 2012/13 to 197 in 2020/21 (also the lowest figure yet recorded).

The 25-year Environment Plan (2018) includes a commitment to seek to eliminate illegal waste sites through the lifetime of the plan. Assuming a linear decay of the number of illegal waste sites from 2017/18 levels over 25 years (shown as a dotted line on the graph above), England is currently on track to achieve this ambition.

Figure 5.2 Illegal waste activity stopped, England, 2009/10 to 2020/21, number of sites

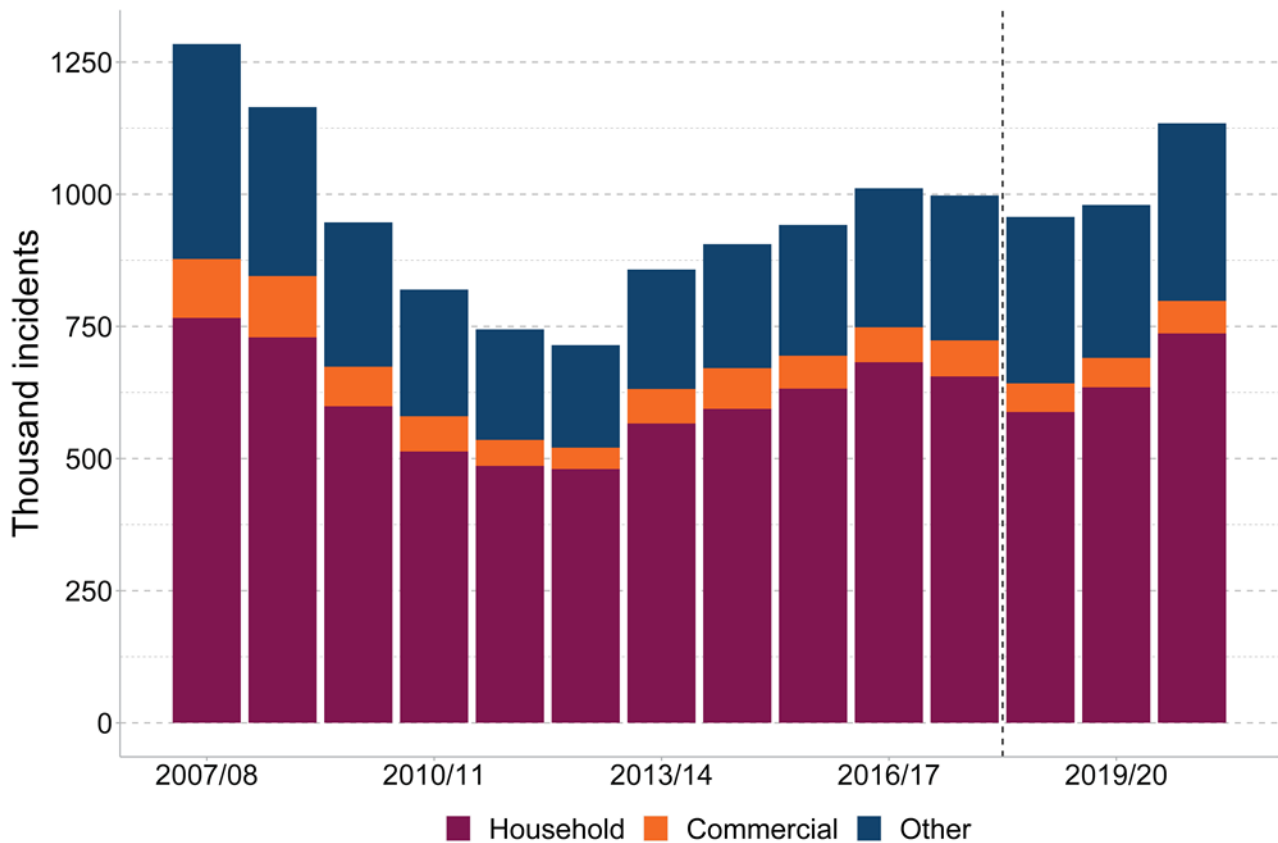


Most illegal waste sites identified by the Environment Agency have their illegal activity stopped, either by bringing the site into line with regulations or by otherwise putting a stop to its operation. In 2020/21, illegal waste activity was stopped at 722 sites, with 198 of these classified as high-risk sites.

WC2. Waste fly tipped

This is indicator J6b in the 25 Year Environment Plan outcome indicator framework.

Figure 5.3 Waste fly tipped, England, 2007/08 to 2020/21, thousand incidents



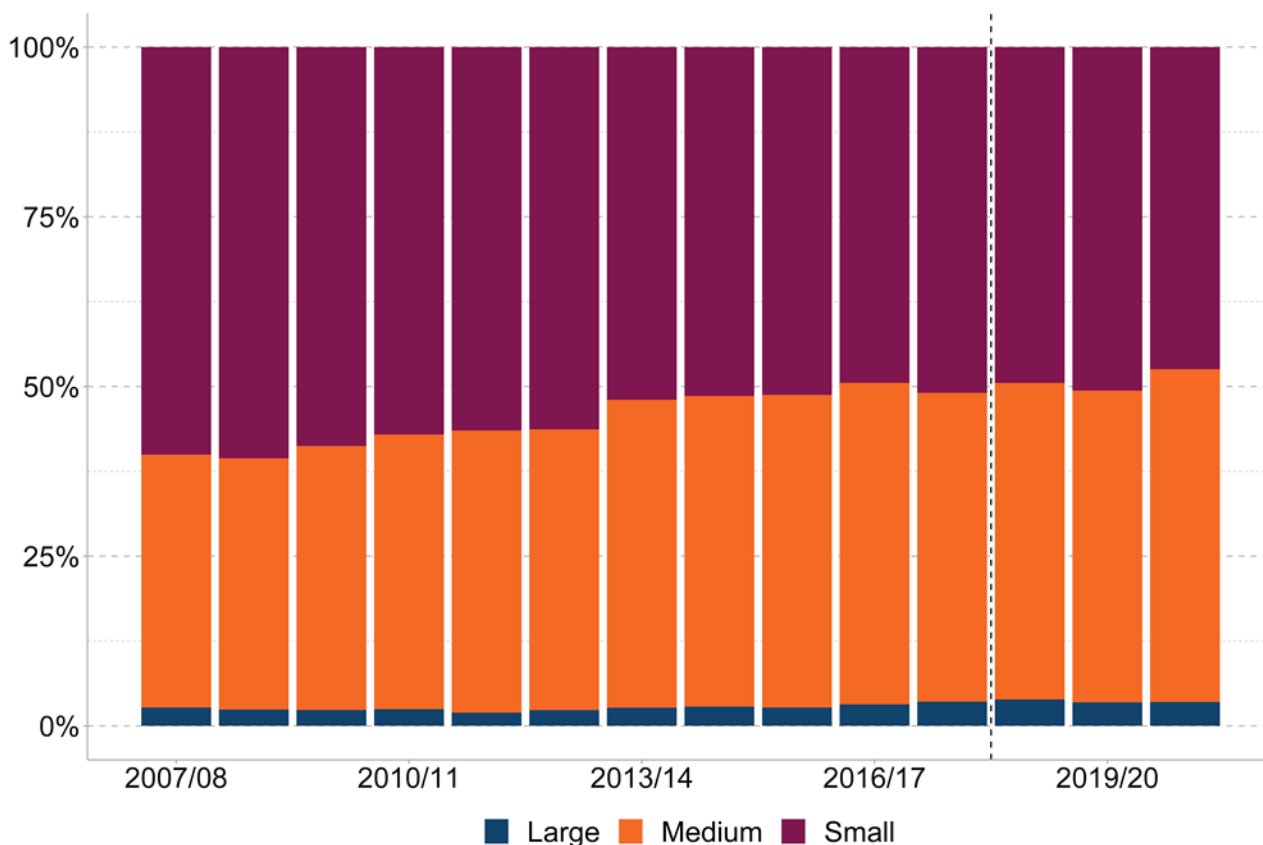
Note: National totals for fly-tipping incidents from 2019/20 onwards are not comparable to earlier years due to methodological changes. These changes have been retroactively applied to 2018/19.

Approximately 1.13 million incidents were reported in 2020/21, a 16% increase from 2019/20. This increase coincides with COVID-19 lockdowns. Figures from 2018/19 onwards are not directly comparable to earlier years. The majority of incidents (65% in 2020/21) continue to involve household waste, with commercial waste incidents making up only a small proportion of the total (5% in 2020/21).

These figures cover incidents identified and cleared by local authorities only. Incidents involving the Environment Agency or cleared by private landowners are not included. Details of the 151 incidents of illegal dumping dealt with by the Environment Agency in 2020/21 are published separately.⁸

⁸ Environment Agency (2021) [Regulating for People, the Environment and Growth](#)

Figure 5.4 Fly tipping incident sizes, England, 2007/08 to 2020/21, proportion of incidents

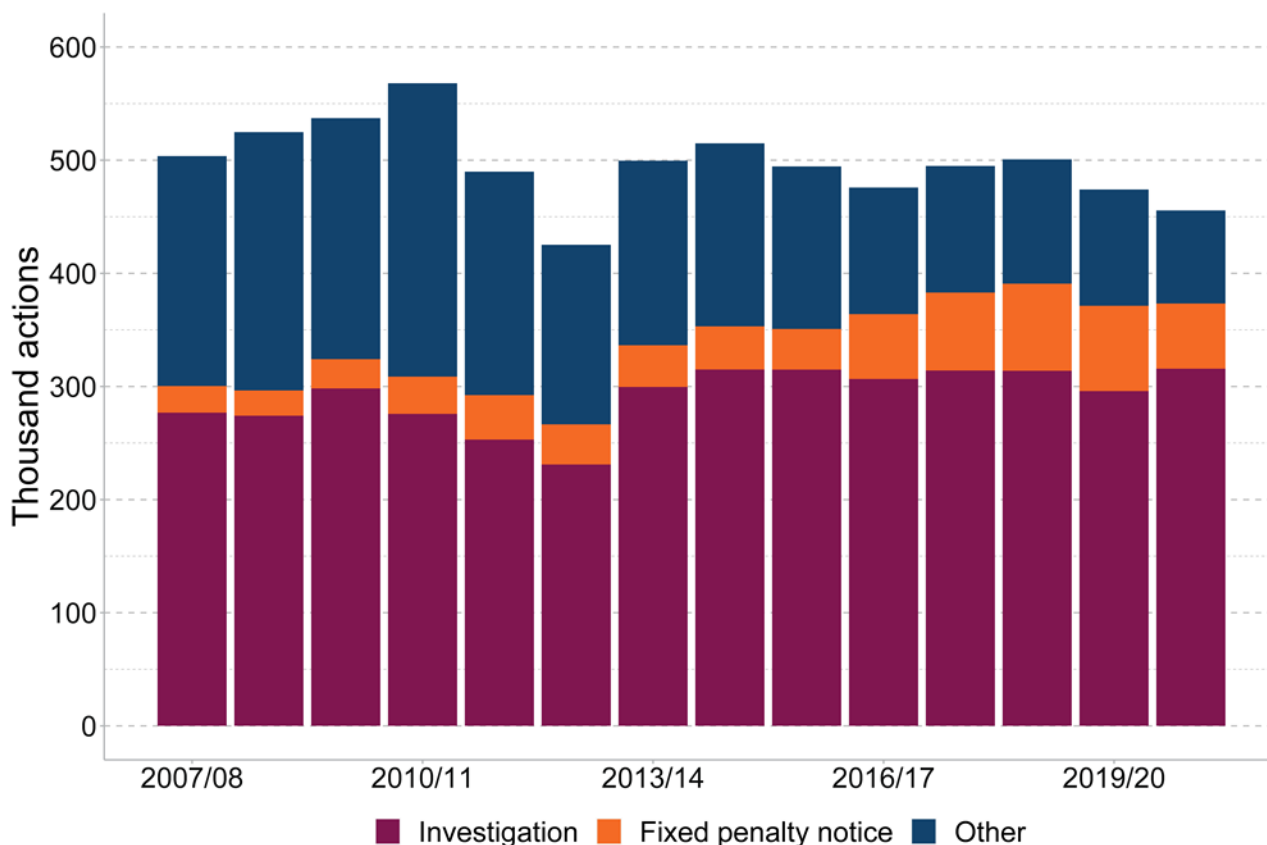


Note: “Small” incidents are here defined as single black bags, single items, and incidents that fit in a typical car boot; “medium” as van loads (small vans or Transit vans); and “large” as incidents requiring a tipper lorry to clear or consisting of multiple loads. National totals for fly-tipping incidents from 2019/20 onwards are not comparable to earlier years due to methodological changes. These changes have been retroactively applied to 2018/19.

Fly-tipping incidents vary in size. Large incidents (classified as “tipper lorry load” or “significant/multiple loads”) made up only 3.5% of incidents recorded in 2020/21. (The proportion was 2.7% in 2007/08, but these figures are not directly comparable.)

Meanwhile, the proportion of medium incidents (classified as “small van load” or “Transit van load”) rose from 37% to 46% between 2007/08 and 2017/18, with a corresponding reduction in the proportion of small incidents (“single black bag”, “single item”, or “car boot or less”) from 60% to 51%. This suggests that the typical fly-tipping incident has become larger over time.

Figure 5.5 Fly tipping enforcement, England, 2007/08 to 2020/21, thousand actions



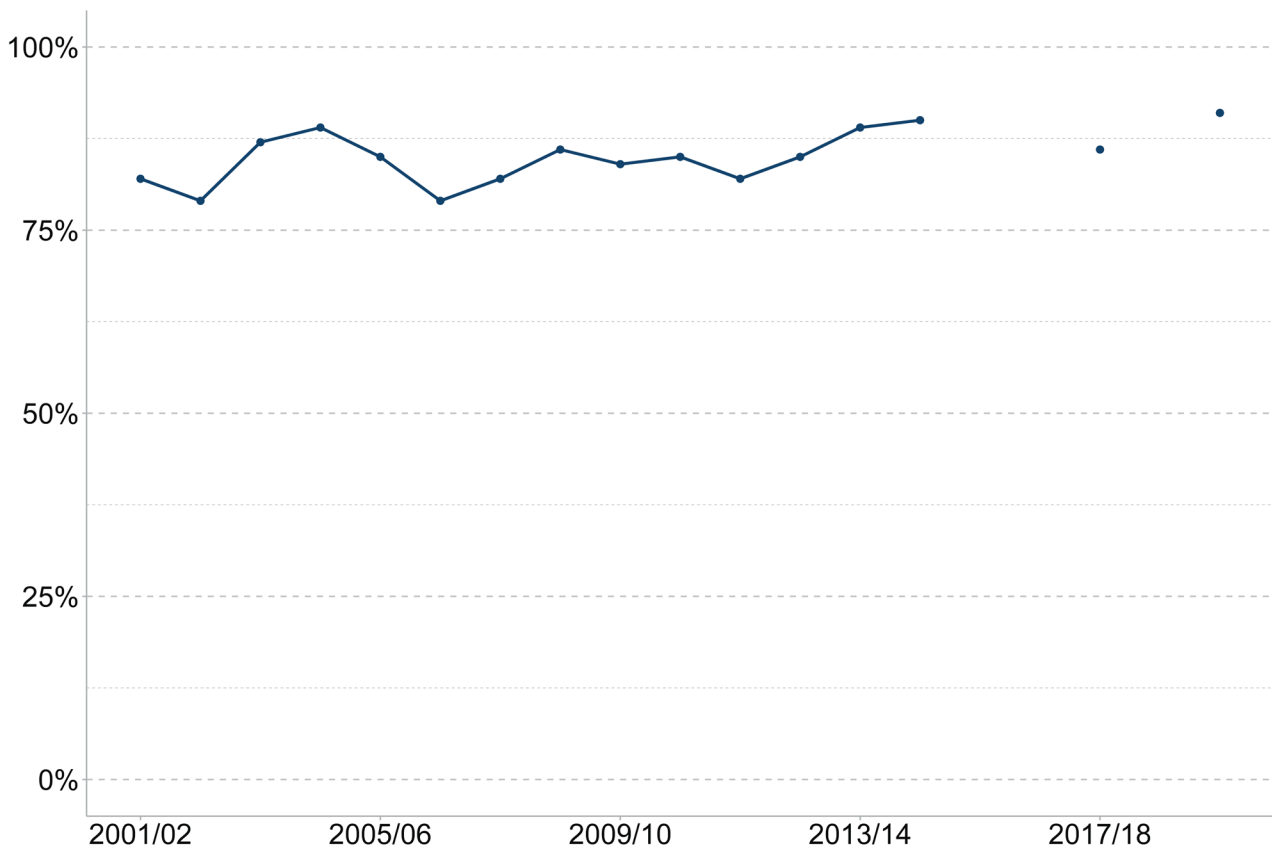
Enforcement actions taken against fly-tipping include investigations, fixed penalty notices, warning letters, statutory notices, prosecutions, injunctions, cautions, and vehicle seizures.

There was an increase in the levels of enforcement activity between 2007/08 and 2010/11, but this has since fallen off and remained roughly flat for several years. In 2020/21 a total of 456 thousand enforcement actions were taken across England.

In May 2016, local authorities in England were given the power to issue fixed penalty notices for fly-tipping. Prior to this date, local authorities issued fly-tippers with fixed penalty notices in relation to littering, duty of care, or anti-social behaviour. Since this date, the use of fixed penalty notices has increased from around 36 thousand in 2015/16 to 58 thousand in 2020/21.

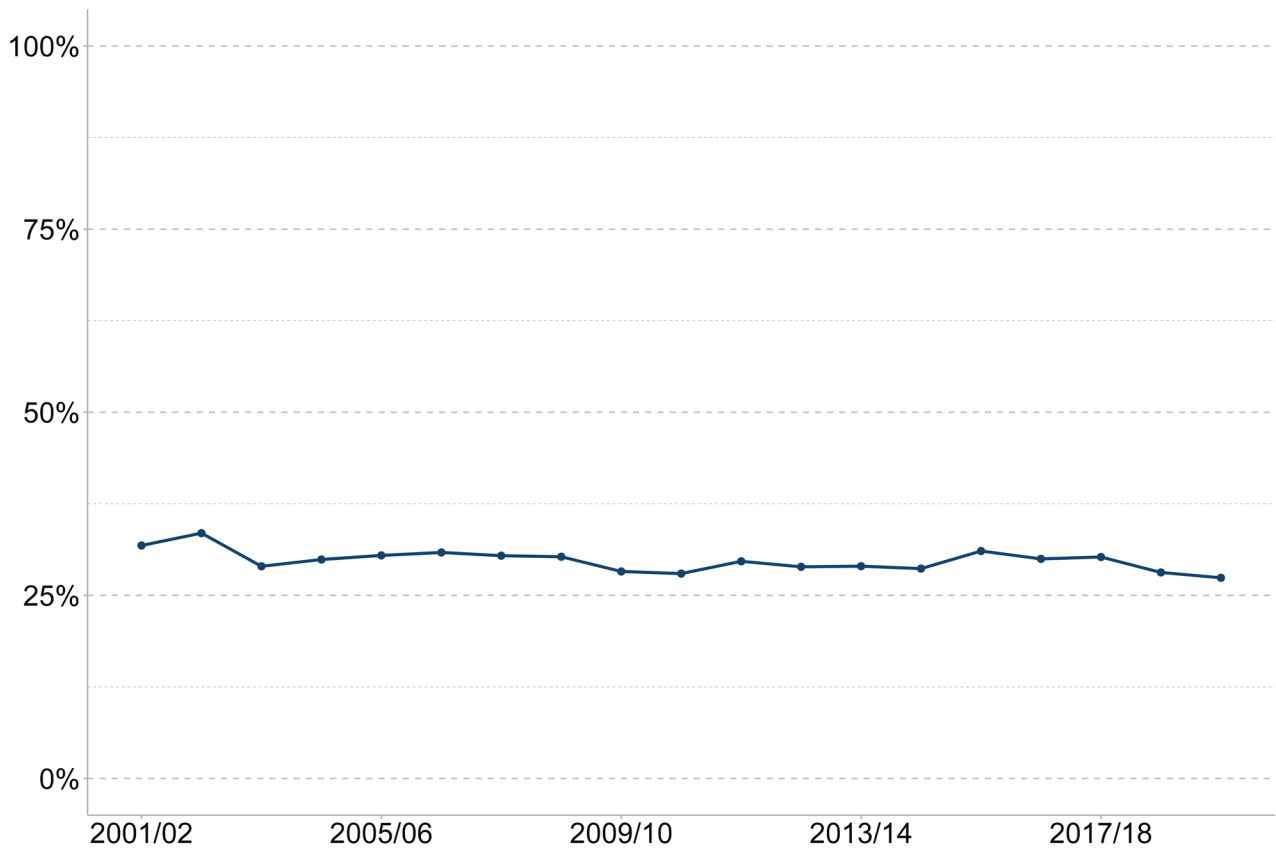
WC3. Littering

Figure 5.6 Percentage of places at or above an acceptable standard for litter, England, 2001/02 to 2019/20



In 2019/20, 91% of sites in England were surveyed to be at or above an acceptable standard for litter (i.e. where either no litter was present, or the area was predominantly free with some minor instances of littering). The percentage of sites meeting this standard has risen by 5 percentage points compared to the previous survey covering 2017/18, although there has been significant variation since 2001/02. While there is no clear long-term trend, the figure for 2019/20 is the highest yet recorded.

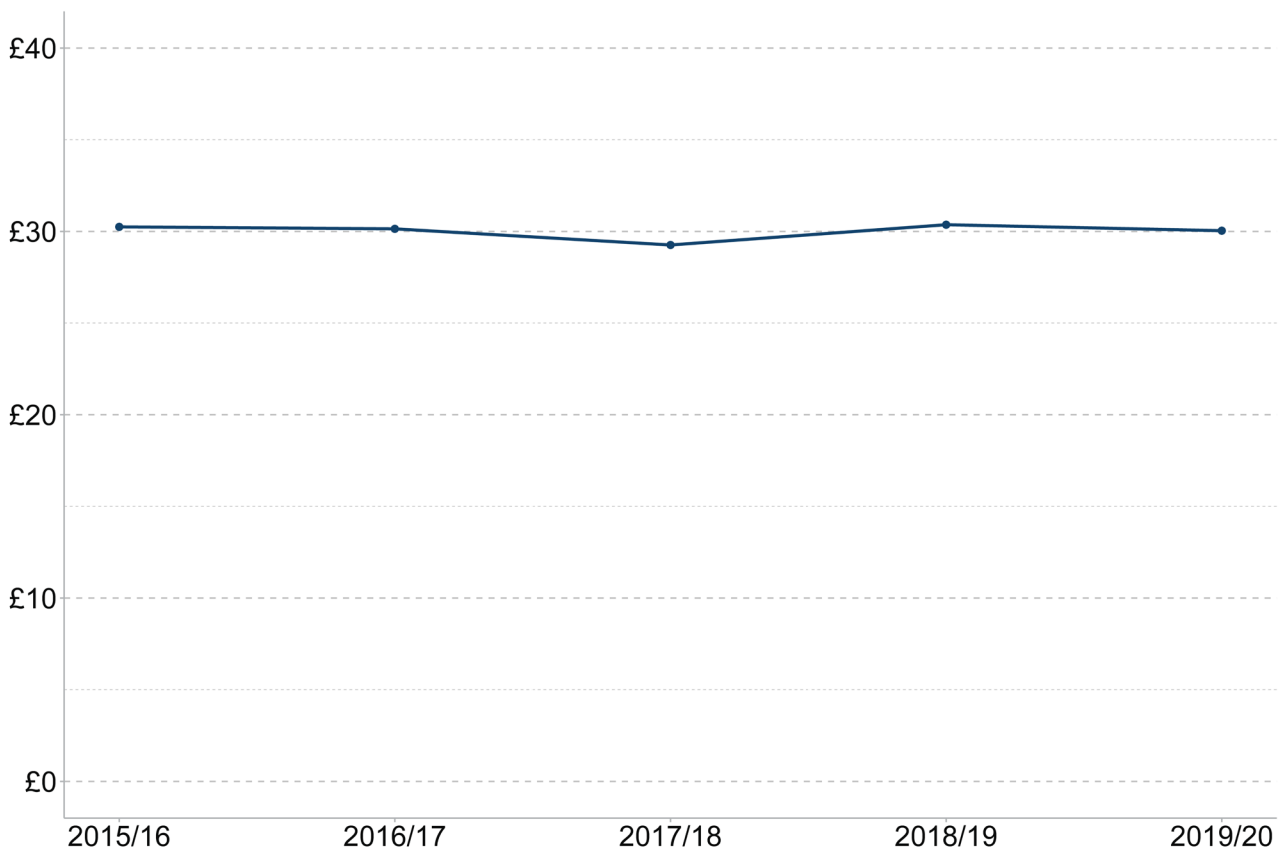
Figure 5.7 Percentage of people perceiving litter as a problem, England, 2001/02 to 2019/20



These data have not been updated since the previous edition of Monitoring Progress.

In 2019/20, 27.4% of people in England said there was a very or fairly big problem with litter or rubbish lying around in their area. This has decreased by 4.4 percentage points since 2001/02. The figure for 2019/20 is the lowest percentage so far recorded.

Figure 5.8 Costs to local authorities of street cleaning per household, England, 2015/16 to 2019/20



These data have not been updated since the previous edition of Monitoring Progress.

In 2019/20, it cost local authorities £696 million, or £30.04 per household, to keep England's streets clean. The cost per household has remained roughly constant since 2015/16 (the first year on record), when the cost per household was £30.24. This figure does not include spending by other authorities whose role involves clearing litter, such as National Highways.

Indicator data sources and information

WC1

Source: Environment Agency (2021) [Data on regulated businesses in England](#)

Relevant goal in the 25YEP: Goal 8 – minimise waste

Relevant target/ambition/commitment: The 25-year environment plan includes a commitment to seek to eliminate illegal waste sites by 2043, focusing on those of highest risk.

Classification: None

Definitions and details of calculations: Illegal waste sites refer to sites which operate without a permit, are organised and involve multiple loads of waste being treated, stored or disposed. High risk sites are waste sites deemed especially risky or hazardous by the Environment Agency. Data are a snapshot taken at the end of each financial year (April) for the financial year prior. Further details of methodology available at data source.

WC2

Source: Department for Environment, Food and Rural Affairs (2021) [ENV24 - Fly tipping incidents and actions taken in England](#)

Relevant goal in the 25YEP: Goal 8 – minimise waste

Relevant target/ambition/commitment: Seek to eliminate waste crime by 2042 (25YEP)

Classification: Official statistic

Definitions and details of calculations: Waste fly tipping refers to the illegal deposition of waste on land contrary to Section 33(1) (a) of the Environmental Protection Act. The types of waste fly-tipped can range from “black bag” waste to large deposits of materials such as industrial waste, tyres, construction material and liquid waste. Data based on returns made to the fly-tipping module in the Waste Data Flow database by local authorities from April-March of the prior year. Further details of methodology available at data source.

WC3

Sources:

- Department for Environment, Food and Rural Affairs (2019) [Litter and littering in England: data dashboard](#)
- Keep Britain Tidy (2021) [Local Environmental Quality Survey of England](#)

- Office for National Statistics (2020) [Crime in England and Wales: Other related tables \(Year Ending March\)](#)
- Ministry of Housing, Communities and Local Government (2021) [Revenue outturn cultural, environmental, regulatory and planning services \(RO5\)](#)
- Office for National Statistics (2021) [Families and households in the UK](#)

Relevant goal in the 25YEP: Goal 8 – minimise waste

Classification:

- Litter and littering in England: data dashboard: None
- Local Environmental Quality Survey of England: Not a government statistic
- Crime in England and Wales: National Statistic
- Revenue outturn cultural environmental, regulatory and planning services: National Statistic
- Families and households in the UK: National Statistic

Definitions and details of calculations:

Defra have adopted a dashboard of indicators to measure litter. This is on the basis that no one indicator satisfactorily captures all dimensions of the issue of litter. Further details available at each data source.

The percentage of places at or above an acceptable standard for litter is based on the Local Environment Quality Survey of England periodically carried out by Keep Britain Tidy. An acceptable standard is defined as a grade of B or above, where B corresponds to “predominantly free of [litter] with some minor instances of the issue”.

The proportion of people perceiving litter as a problem is based on the annual Crime in England and Wales publication by the Office for National Statistics. This combines data from police records with the Telephone Crime Survey for England and Wales. This indicator is based on the proportion of people in this survey who say there is a “very” or “fairly” big problem in their area with “rubbish or litter lying around”.

The cost of street cleaning per household is calculated by dividing the total revenue outturn reported by local authorities in England in the category “street cleansing (not chargeable to Highways)” by the number of households in England as estimated by the Office for National Statistics.

Glossary

Avoidable waste: Waste that it is technologically, environmentally and economically practicable (TEEP) to prevent from becoming residual waste, but that nevertheless entered the residual waste stream ([RWS](#)).

Biodegradable municipal waste (BMW): The fraction of municipal waste that will degrade within a landfill site. Amongst other materials it will include food waste, green waste, cardboard and paper ([UK statistics on waste](#)).

Carbon footprint: A consumption-based measure of the global emissions attributable to final domestic demand for goods and services in England, including emissions for imports at every stage of the supply chain, wherever in the world they may occur, but excluding emissions generated in the production of products exported from England ([ONS](#)).

Final domestic demand: Consumption expenditure on goods and services by resident households, government and charities in a given period, in addition to gross fixed capital formation and changes in inventories and valuables ([OECD](#)).

Fly tipping: Fly-tipping is a wide-ranging crime, including “the illegal disposal of household, industrial, commercial or other ‘controlled’ waste without a waste management licence” ([House of Commons, 2019](#)). We define this as the illegal deposition of waste on land contrary to Section 33(1) (a) of the Environmental Protection Act.

Greenhouse gas: An atmospheric gas that absorbs and emits infrared solar radiation, contributing to climate change. Greenhouse gases covered within the United Kingdom’s greenhouse gas inventory are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFC), perfluorocarbons (PFC), nitrogen trifluoride (NF₃) and sulphur hexafluoride (SF₆) ([ONS](#)).

Gross domestic product (GDP): “Combines into a single figure...[the monetary value of] the [market] output...carried out by all the firms, non-profit institutions, government bodies and households in a given territory during a given period, provided that the production takes place within the country’s economic territory” ([OECD](#)). GDP is a headline measure of the System of National Accounts and the most widely used metric for measuring national economic development at present. Gross domestic product (GDP) is equivalent to GVA plus value-added tax (VAT) plus other taxes on products, less subsidies on products.

Gross value added (GVA): Measures the increase in the value of the economy due to the production of goods and services. GVA is calculated as the difference between the value of goods and services sold and intermediate expenses incurred to produce these ([ONS](#)).

Hazardous waste: Waste is generally considered hazardous if it (or a material or substance it contains) is harmful to humans or the environment. Examples include asbestos, certain chemicals, batteries, solvents, pesticides, inedible oils and ozone-depleting substances ([HM Government](#)).

Illegal waste site: Waste sites that operate without a permit, are organised and involve multiple loads of waste being treated, stored or disposed. Permit breaches and fly-tipping are not illegal waste sites, but exempt sites operating outside their conditions and permitted sites operating outside of their permitted boundary are illegal waste sites ([Environment Agency](#)).

Intensity indicators: Intensity indicators compare trends in economic activity with trends in specific environmental flows. These can be expressed as intensity or productivity ratios, with productivity ratios (such as resource productivity) calculated as a ratio of economic activity in relation to environmental flow, and intensity indicators (such as carbon intensity) the inverse of this ratio ([SEEA](#)). Intensity indicators can be grouped into two broad types:

1. Environmental intensity indicators - ratios of environmental variables such as emissions of pollutants or other residuals to economic variables.
2. Resource intensity indicators - ratios expressing resource use variables to economic variables.

Local Authority Collected Waste (LACW): All Waste from Households, street sweepings, municipal parks and gardens waste, beach cleansing waste, and waste resulting from the clearance of fly-tipped materials plus some commercial and/or industrial waste collected by local authorities ([Defra](#)).

Municipal waste: A measure combining both household waste and that from other sources which is similar in nature and composition to household waste, including “household-like” waste generated by businesses and collected by private contractors ([Defra](#)). There is not yet an agreed methodology for reporting against this measure, although the United Kingdom’s governments have agreed a set of European Waste Catalogue (EWC) codes corresponding to biodegradable municipal waste ([UK statistics on waste](#)).

Raw material consumption (RMC, material footprint): The allocation of global primary used raw material extraction to final domestic demand for goods and services by a country’s residents ([UN](#)). A key benefit of this indicator is that it accounts for the full upstream material extraction associated with imports, measuring this on an equal basis to domestic extraction. The material footprint includes biomass materials harvested from, or cultivated within, ecosystems, including crops, wood and wild fish catch. The footprint also encompasses mineral resources (both metallic ores e.g. iron and non-ferrous metals, as well as non-metallic minerals such as limestone, clay or sand), in addition to fossil fuels such as oil and gas. It does not include other types of resources such as water.

Refuse derived fuel (RDF): Material that is produced from waste, has undergone some sort of treatment process, and is intended for use as a fuel ([Environment Agency](#)). This is typically fuel produced by shredding and dehydrating municipal solid waste and consists largely of combustible components such as plastics and biodegradable waste ([Defra](#)).

Residual waste: Waste intended for disposal by landfill or incineration (with or without energy recovery), such as that collected from households in black bags or wheelie bins, as distinct from waste bound for recycling, reuse or recovery ([Defra](#)).

Solid recovered fuel (SRF): A waste-derived fuel distinguished from RDF in that it is produced to reach a specific quality standard ([Defra](#)).

Territorial emissions: Emissions of greenhouse gases that originate within the country's borders. This includes emissions released in England by foreign visitors and foreign-registered companies but excludes emissions released by British citizens or United Kingdom-registered businesses abroad. This is the standard measure used to quantify greenhouse gas emissions under the Climate Change Act and the Net Zero target ([ONS](#)).

Waste from Households (WfH): The agreed harmonised United Kingdom measure used to report household recycling. This includes waste from regular household collections, civic amenity sites, bulky waste collections and other household waste but excludes street sweepings, waste from gully emptying, separately collected healthcare waste and waste such as soil, rubble, plasterboard and asbestos ([UK statistics on waste](#)).

Waste treatment: Waste treatment methods are categorised as follows ([UK statistics on waste](#)):

- **Recovery:** “any operation the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function”
- **Recycling:** (a subset of recovery) – “any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material (e.g. composting, anaerobic digestion etc.) but excludes the use as fuels and the use for backfilling operations”
- **Energy recovery:** facilities where the main purpose is generation of energy and formal R1 accreditation has been awarded. Facilities without R1 accreditation are reported as incineration (disposal) even if they produce some energy.
- **Backfilling:** “a recovery operation where waste is used in excavated areas (such as underground mines, gravel pits) for the purpose of slope reclamation or safety or for engineering purposes in landscaping and where the waste is substituting other non-waste materials which would have had to be used for the purpose”
- **Disposal:** (including landfill and incineration) – “any operation which is not recovery even where the operation has as a secondary consequence the reclamation of substances or energy”

Water footprint: The net total volume of water withdrawals over the life cycle of a product, usually calculated based on the Global Water Footprint Standard ([Water Footprint Network](#)).