Department
for Environment
Food & Rural Affairs

# Resources and Waste Strategy

## Monitoring Progress

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## Contents


**1 Introduction ..... 1**

1.1 Purpose of this document ..... 1

1.2 Timing ..... 2

1.3 Quality assurance ..... 2

1.4 Updating Monitoring Progress ..... 3

**2 Monitoring ..... 4**

2.1 Headline indicators ..... 4

2.2 Summary of data sources ..... 7

2.3 Proxy Indicators ..... 10

2.4 Strategic ambitions, targets and commitments ..... 12

2.5 Moving beyond weight-based metrics ..... 14

**3 Data trends ..... 16**

3.1 Resource productivity ..... 16

3.2 Greenhouse gas emissions ..... 21

3.3 Waste production ..... 26

3.4 Recycling ..... 47

3.5 Landfilling ..... 65

3.6 Waste crime ..... 72

**Appendix A – Data sources ..... 78**

**Appendix B – Indicator metadata ..... 82**

Resource productivity ..... 82

Greenhouse gas emissions ..... 84

Waste production ..... 88

Recycling ..... 100

Landfilling ..... 109

Waste crime ..... 114

## Foreword

This is the first 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.

# 1 Introduction

In December 2018, we published *Our Waste, Our Resources: A Strategy for England* (the Resources and Waste Strategy) (RWS).[1] It 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. By indicators, we mean statistical measures used to consolidate real-world outcomes into meaningful information. These indicators will be an important tool to measure progress towards the policies and commitments outlined in the RWS.

## 1.1 Purpose of this document

Following on from the publication of the RWS, *Monitoring Progress* has been released alongside *The Monitoring and Evaluation Plan*.

The purpose of *Monitoring Progress* (MP) is to monitor government's key strategic objectives related to resource use, waste production and waste management as outlined in the Resources and Waste Strategy, in addition to relevant objectives set out within the 25 Year Environment Plan[2], the Clean Growth Strategy[3], the Industrial Strategy[4], and the Litter Strategy[5]. Ultimately, *Monitoring Progress* will allow us to track outcomes and change in the area of resources and waste, compare this to ambition and communicate progress.

The *Monitoring and Evaluation Plan* (EP) establishes how policies implemented as part of the RWS will be evaluated. Evaluation builds on data generated during monitoring, but goes further, by more comprehensively assessing policies against several dimensions in addition to intended outcomes. These may include costs and benefits of a policy, whether any unintended consequences arose and effectiveness of implementation.

The first publication of the EP sets out evaluation principles, quality assurance mechanisms and a range of methods for assessing the attribution of policies to outcomes. In addition, individual chapters detail methodologies for evaluating key areas where change is anticipated as a result of our policies.

[1] HM Government (2018) Our Waste, Our Resources: A Strategy for England
[2] HM Government (2018) A Green Future: Our 25 Year Plan to Improve the Environment
[3] HM Government (2017) The Clean Growth Strategy: Leading the Way to a Low Carbon Future
[4] HM Government (2017) Industrial Strategy: Building a Britain Fit for the Future
[5] HM Government (2017) Litter Strategy for England

Together, the documents advance the monitoring and evaluation programme of the RWS. Through time, they will help give a systematic, regular and comprehensive picture of the impacts and outcomes driven by the strategy, in addition to progress towards related commitments, targets and ambitions. This will support accountability, learning, timely decision-making and ultimately, improvement.

As the policies established under the RWS are currently in the process of being introduced, this first release of MP intends to:

1. Present historic trends for indicators we intend to formally track. This will give a baseline against which to assess the impacts of RWS policies when they come into effect;

2. Show hypothetical pathways to achieve objectives where government has made a clear future commitment. This will help give a rough guide to the level of improvement needed year-on-year to meet these;

3. Provide an easily accessible reference for calculation methodologies behind each indicator, including links to sources and other metadata; and

4. Give an update for headline indicators that remain under development and explain how we intend their monitoring to develop.

## 1.2 Timing

Following this first release, we aim to provide annual updates of Monitoring Progress going forward to summarise the latest trends in the data. In addition to these, we will look to produce less frequent but more comprehensive progress reviews, when required, to give a more focused assessment of performance towards our goals.

## 1.3 Quality assurance

Although this document is not in itself an official statistics publication, where possible we follow the UK's Code of Practice for Statistics[6] in its production and in the compilation of the indicators within it. The code is built around 3 main pillars which have been applied in a proportionate way to demonstrate voluntary compliance with many parts of the code, in line with the *Guide for Voluntary Application of the Code*:

1. **Quality** – *To ensure that we use data and methods that produce assured statistics*. Where statistics presented in this report are National or official statistics, these have undergone a quality assessment and assurance process. Details on the methodologies used in constructing the underlying statistics are set out in the

[6] UK Statistics Authority (2018) Code of Practice for Statistics

original source publications, which are referenced. Where we have developed new indicators for the purpose of this document, methods are detailed.

2. **Value** – *To publish statistics that support society's need for information, addressing the questions that external users wish to have answered*. MP meets a government commitment to produce an annual assessment of progress towards objectives in the RWS. The indicators presented within this report have been identified by a cross-disciplinary team, with views from a range of external stakeholders incorporated in determining which were selected for monitoring.

3. **Trustworthiness** – *To build and maintain confidence in the people and the organisations that publish information, including that derived from National and official statistics*. In support of this aim and wherever possible, this document draws on formally published National or official statistics produced either by Defra or by the Department's Arms' Length Bodies. In addition, it promotes transparency through providing links to data used and details of methodologies throughout.

## 1.4 Updating Monitoring Progress

During the lifetime of the strategy, *Monitoring Progress* will remain under review to ensure that it continues to report progress in the right areas, uses the most appropriate indicators based on the data available, and ensures that as new data comes along, it is incorporated where it can add value.

In this first release of MP, we have not included an explicit assessment of how indicators are progressing relative to previous years. For future releases, we will be considering how we might include a summary 'scorecard' of our indicators to give a concise update of performance in relation to previous years and future objectives. We may also look to incorporate projections of the impacts of our policies to identify, in advance, whether we are on track to meet commitments.

Over time we will try to make data available for indicators where proxies are currently relied on. Significant existing and emerging data gaps will be reviewed so that, where appropriate, these are filled as quickly as possible via, for example, new surveys or research.

As new data becomes available, such as following the introduction of a waste tracking system, it will be incorporated where relevant. In addition, new indicators and metrics will be considered for inclusion in MP to reflect changes in areas of focus and approaches to measurement. This may include expanding the types and levels of indicators we track to more closely monitor the impacts of our policies and the various economic and attitudinal precursors to outcomes.

# 2 Monitoring

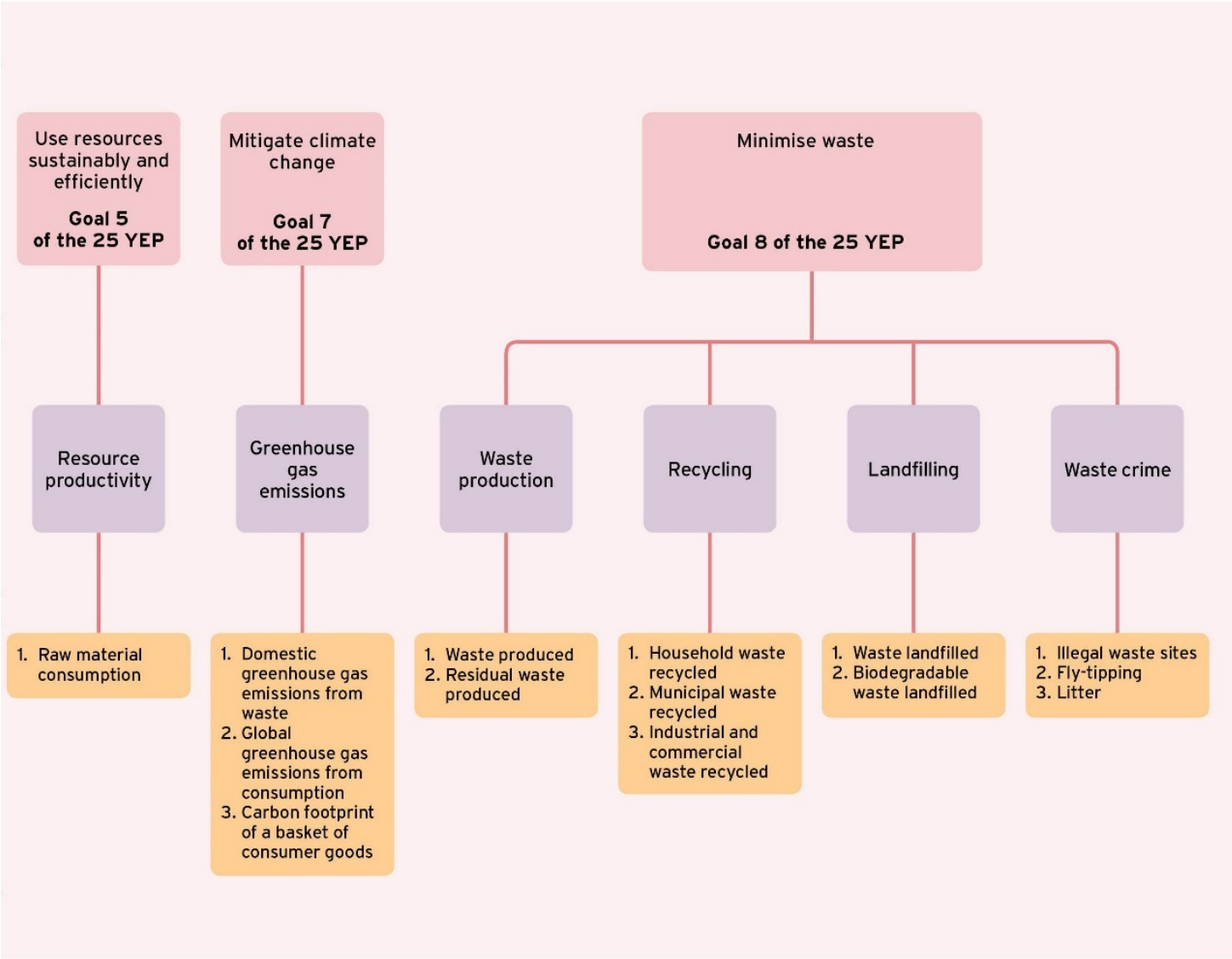
In the RWS, we committed to monitoring progress towards government's objectives linked to resource use, waste production and waste management, as outlined in the strategy and related government publications. Monitoring is important to ensure accountability, support timely decision-making, and provide the building blocks for evaluation and learning.

## 2.1 Headline indicators

Section 8.2 of the RWS set out a suite of macro level headline indicators across six priority areas (see figure 1). Tracking these indicators will help us compare outcomes and impacts against commitments and targets established in the area of resources and waste. They also align with several goals of the 25 Year Environment Plan[7]: use resources from nature more sustainably and efficiently; mitigate and adapt to climate change; and minimise waste. Some of the indicators presented here therefore appear in the 25 Year Environment Plan's *Outcome Indicator Framework*, which collates a broad set of metrics for monitoring the state of our natural assets and the pressures on them.[8]

[7] HM Government (2018) A Green Future: Our 25 Year Plan to Improve the Environment
[8] HM Government (2020) Outcome Indicator Framework for the 25 Year Environment Plan: 2020 Update

Figure 1. Indicator Framework for Monitoring the Resources and Waste Strategy



Where relevant, we present different measures under each indicator, which can include one in raw form, one relative to population or economic performance, and another as a percentage rate of an overall total (see Table 2.1). This can help us explore each area from a variety of perspectives and enable comparability.

By tracking raw material consumption, resource productivity and consumption-based greenhouse gas emissions, this represents the beginning of our shift away from monitoring waste alone to monitoring the wider system of resources and waste.

**Table 2.1. 25 YEP goals, RWS priority areas, headline indicators and measures**

| 25 YEP Goal | RWS Priority Area | Headline Indicator | | Measure |
|---|---|---|---|---|
| **GOAL 5 Use resources sustainably and efficiently** | Resource productivity | RP1 | Material footprint (Raw Material Consumption) | a) Tonnes |
| | | | | b) Tonnes per capita |
| | | | | c) £ Gross Value Added[9]/Raw Material Consumption |
| **GOAL 7 Mitigate climate change** | Greenhouse gas (GHG) emissions | GG1 | Domestic greenhouse gas emissions from waste management | a) Tonnes $CO_2e$ |
| | | GG2 | Carbon footprint (consumption-based greenhouse gas emissions) | a) Tonnes $CO_2e$ |
| | | | | b) Tonnes $CO_2e$ per capita |
| | | | | c) Tonne $CO_2e$/£ Gross Value Added |
| | | GG3 | Carbon footprint of a basket of consumer goods | a) Index |
| **GOAL 8 Minimise waste** | Waste production | WP1 | Total waste and hazardous waste | a) Tonnes |
| | | | | b) Tonnes per capita |
| | | | | c) Tonnes/£ Gross Value Added |
| | | WP2 | Avoidable residual waste from household sources | a) % of total residual waste from households |
| | | | | b) Tonnes |
| | | | | c) kg per capita |
| | | WP3 | Avoidable residual plastic waste from household sources | a) % of total residual plastic waste from households |
| | | | | b) Tonnes |
| | | | | c) kg per capita |
| | | WP4 | Food and drink waste | a) Tonnes |
| | | | | b) kg per capita |
| | | WP5 | Residual waste | a) Tonnes |
| | | | | b) kg per capita |

[9] Gross Domestic Product (GDP) provides a measure of the total economic activity in the country. Gross Value Added is a key component of GDP and measures the contribution to the economy of each individual producer, industry or sector.

| 25 YEP Goal | RWS Priority Area | Headline Indicator | | Measure |
|---|---|---|---|---|
| | | | | c) % of waste arisings |
| | Recycling | RC1 | Waste from households recycled | a) Tonnes |
| | | | | b) kg per capita |
| | | | | c) % of total waste from households |
| | | | | d) Net tonnes $CO_2e$ |
| | | RC2 | Municipal waste recycled | a) Tonnes |
| | | | | b) kg per capita |
| | | | | c) % of total municipal waste |
| | | RC3 | Commercial and Industrial (C&I) waste recycled | a) Tonnes |
| | | | | b) kg per capita |
| | | | | c) % of total C&I waste |
| | | RC4 | Construction and Demolition (C&D) waste recovered | a) Tonnes |
| | | | | b) kg per capita |
| | | | | c) % of total C&D waste |
| | | RC5 | Packaging waste recycled | a) Tonnes |
| | | | | b) kg per capita |
| | | | | c) % of total packaging, and by material type |
| | Landfilling | LF1 | Municipal waste landfilled | a) Tonnes |
| | | | | b) kg per capita |
| | | | | c) % of total municipal waste |
| | | LF2 | Biodegradable waste landfilled | a) Tonnes |
| | | | | b) kg per capita |
| | | | | c) % of waste landfilled |
| | | LF3 | Food waste landfilled | a) Tonnes |
| | | | | b) kg per capita |
| | | | | c) % of total food waste |
| | Waste crime | WC1 | Illegal waste sites and high-risk waste sites | a) Number in operation |
| | | WC2 | Waste fly-tipped | a) Number of fly tipping incidents |
| | | WC3 | Litter dashboard | a) % of places at or above an acceptable standard for litter |
| | | | | b) % of people perceiving litter as a problem in their area |
| | | | | c) Costs to local authorities of street cleansing |

## 2.2 Summary of data sources

In this section, we give a summary of the data sources used to calculate the indicators and measures listed in section 2.1. Further details of these sources are provided in Appendix

A. Where indicator methodologies are under development, proxies will be drawn on temporarily and these indicative measures are outlined in Section 2.3. As other indicators are selected for monitoring, our list of data sources will be updated accordingly.

Table 2.2 summarizes the sources for data we currently draw on, alongside the most recent year for which data are available at the time of publishing this document.

**Table 2.2. Sources of data for headline indicators**

| Headline Indicator | | Sources of data | Data Availability |
|---|---|---|---|
| **RP1** | **Material footprint (Raw Material Consumption)**<br>• Tonnes<br>• Tonnes per capita<br>• £ Gross Value Added/Raw Material Consumption | • Material footprint data from the University of Leeds published by Defra[10]<br>• Economic data from the Office for National Statistics[11] | 2017<br>2018 |
| **GG1** | **Domestic greenhouse gas emissions from waste management**<br>• Tonnes $CO_2e$ | • Devolved Administration Greenhouse Gas Inventory Data published by the Department for Business, Energy and Industrial Strategy[12] | 2017 |
| **GG2** | **Carbon footprint (consumption-based greenhouse gas emissions)**<br>• Tonnes $CO_2e$<br>• Tonnes $CO_2e$ per capita<br>• Tonne $CO_2e$ per £ Gross Value Added | • Carbon footprint data from the University of Leeds published by Defra[13]<br>• Economic data from the Office for National Statistics | 2017 |
| **GG3** | **Carbon footprint of a basket of consumer goods**<br>• Index | • This indicator is currently under development by Defra | Not yet published |
| **WP1** | **Total waste production**<br>• Tonnes<br>• Tonnes per capita<br>• Tonnes per £ Gross Value Added | • England total waste production figures published in Defra's UK Statistics on Waste publication[14]<br>• Economic data from the Office for National Statistics | 2016/18 |
| **WP2** | **Avoidable residual waste from household sources**<br>• % of total residual household waste<br>• Tonnes<br>• kg per capita | • Commissioned studies into the composition of residual waste published by WRAP[15] | 2017 |
| **WP3** | **Avoidable residual plastic waste from household sources**<br>• % of total residual plastic household waste | • Commissioned studies into the composition of residual waste published by WRAP | 2017 |

[10]Owen, A., Giesekam, J., Barrett, J. (2020) Material footprint and resource efficiency in the UK
[11]Office for National Statistics (2018) Nominal and real regional gross value added (balanced) by industry, Table 1b. Office for National Statistics (2019) Regional gross domestic product all NUTS level regions
[12] Department for Business, Energy and Industrial Strategy (2019) Greenhouse Gas Inventories for England, Scotland, Wales & Northern Ireland: 1990-2017
[13] Owen, A., Giesekam, J., Barrett, J. (2020) Material footprint and resource efficiency in the UK
[14] Department for Environment, Food and Rural Affairs (2020) ENV23 - UK statistics on waste
[15] WRAP (2020) Quantifying the composition of municipal waste

| Headline Indicator | | Sources of data | Data Availability |
|---|---|---|---|
| | • Tonnes<br>• kg per capita | | |
| **WP4** | **Food and drink waste produced**<br>• Tonnes<br>• kg per capita | • Food waste estimates produced by WRAP[16] | 2018 |
| **WP5** | **Residual waste**<br>• Tonnes<br>• kg per capita<br>• % of waste arisings (excluding major mineral wastes) | • Administrative data published by the Environment Agency[17] | 2018 |
| **RC1** | **Waste from households recycled**<br>• Tonnes<br>• kg per capita<br>• % of total household waste<br>• Net waste treatment emissions | • England Local Authority Collected Waste data published by Defra[18] | 2018 |
| **RC2** | **Municipal waste recycled**<br>• Tonnes<br>• kg per capita<br>• **%** of total municipal waste | • This indicator is currently under development by Defra | Not yet published |
| **RC3** | **Commercial & industrial (C&I) waste recycled**<br>• Tonnes<br>• kg per capita<br>• % of total C&I waste | • This indicator is currently under development by Defra | Not yet published |
| **RC4** | **Construction & demolition (C&D) waste recovered**<br>• Tonnes<br>• kg per capita<br>• **%** of total C&D waste | • UK Statistics on Waste | 2016 |
| **RC5** | **Packaging waste recycled**<br>• Tonnes<br>• kg per capita<br>• % of total packaging placed on market, by material type | • National Packaging Waste Database[19] | 2017 |
| **LF1** | **Municipal waste landfilled**<br>• Tonnes<br>• kg per capita<br>• % of total municipal waste | • UK Statistics on Waste | 2018 |
| **LF2** | **Biodegradable waste landfilled**<br>• Tonnes<br>• kg per capita<br>• % of waste landfilled | • This Indicator is currently under development by Defra | Not yet published |
| **LF3** | **Food waste landfilled**<br>• Tonnes<br>• kg per capita<br>• % of total food waste | • This indicator is currently under development by Defra | Not yet published |

[16] WRAP (2020) Food surplus and waste in the UK – key facts
[17] Environment Agency (2020) Waste Data Interrogator 2018
[18] Department for Environment, Food and Rural Affairs (2019) ENV18 - Local authority collected waste: annual results tables
[19] Environment Agency (2020) National Packaging Waste Database

| Headline Indicator | | Sources of data | Data Availability |
|---|---|---|---|
| **WC1** | **Illegal waste sites**<br>• Number of sites in England<br>• Number of high-risk sites in England | • Environment Agency data on regulated businesses in England[20] | 2018/19 |
| **WC2** | **Waste fly-tipped**<br>• Number of incidents | • Fly-tipping statistics for England published by Defra[21] | 2018/19 |
| **WC3** | **Litter dashboard**<br>• % of places at or above an acceptable standard for litter<br>• % of people perceiving litter as a problem<br>• Costs to local authorities of street cleansing | • Local Environmental Quality Survey published by Keep Britain Tidy[22]<br>• Crime Survey for England and Wales published by the Office for National Statistics[23]<br>• Defra Litter Dashboard[24] | 2017/18<br>2018/19<br>2017/18 |

## 2.3 Proxy Indicators

It will take time to develop the full suite of indicators set out in section 2.1. Therefore, in the early years of the Strategy, proxy indicators will be drawn on where data are not currently available in order to provide an indication of whether we are moving in the right direction.

### 2.3.1 Proxies for indicators under development

Table 2.3 lists the indicators which remain under development. We give a progress update for publishing these and outline the proxy measures that are used to give an indication of related trends in the interim.

**Table 2.3. Proxies for headline indicators under development**

| Headline Indicator | | Progress update | Indicative measures |
|---|---|---|---|
| **GG3** | **Carbon footprint of a basket of consumer goods** | Indicator methodology being considered | GG2a Consumption-based greenhouse gas emissions |
| **WP2/ WP3** | **Avoidable waste/avoidable plastic waste** | A formal methodology for reporting against this area has not yet been agreed though an possible method has been presented in this release | WP2 and WP3 provide an assessment categorising residual (plastic) waste from households by their potential 'avoidability'. This provides a subset of total avoidable waste and total avoidable plastic waste. |
| **RC2** | **Municipal waste recycled** | We are currently developing a formal methodology for producing a best estimate of municipal waste recycled | To give an indication of change in a related measure, we have included data Defra publishes on Local Authority Collected |

[20] Environment Agency (2019) Data on regulated businesses in England
[21] Department for Environment, Food and Rural Affairs (2019) ENV24 - Fly tipping incidents and actions taken in England
[22] Keep Britain Tidy (2019) Litter in England, the Local Environmental Quality Survey of England 2017/18
[23] Office for National Statistics (2019) Crime in England and Wales: Other related tables (Year Ending March)
[24] Department for Environment, Food and Rural Affairs (2019) Litter and littering in England: data dashboard

| Headline Indicator | Progress update | Indicative measures |
|---|---|---|
| | | Waste (LACW), which is similar in scope but doesn't include privately collected "household-like" municipal waste |
| **RC3 Commercial and industrial waste recycled** | We are currently developing a formal methodology for producing a best estimate of recycling of commercial and industrial waste based on the best available data | The "UK Statistics on Waste" estimates of waste production from commercial and industrial (C&I) activities presented in WP1 gives an indication of total arisings |
| **LF1c Percentage rate of municipal waste landfilled** | We are currently developing a methodology for producing a best estimate of municipal waste arisings required to calculate the percentage of total municipal waste landfilled | LF1a Municipal Waste Landfilled provides an indication of the municipal waste landfilled |
| **LF2 Biodegradable waste landfilled** | A formal methodology for reporting against this area has not yet been agreed | LF3 Biodegradable Municipal Waste. Biodegradable municipal waste can offer a proxy as a large proportion of biodegradable waste that is landfilled is thought to come from municipal sources |
| **LF3 Food waste landfilled** | A formal methodology for reporting against this area has not yet been agreed | LF3 Biodegradable Municipal Waste. As a large proportion of biodegradable municipal waste is thought to be food, this can provide a proxy for food waste landfilled |

### 2.3.2 UK proxies for England-level indicators

The RWS is a strategy for England and we are therefore looking to track outcomes at the level of England. For several indicators, however, data are currently only available at the UK level:

1. WP4 – Food and drink waste
2. RC5 – Packaging waste recycled

There are no immediate plans to collect data at the England level for either of these indicators as the regulations and commitments driving their reporting do not require a sub-UK focus at present. If this changes in the future, or alternative means of measuring the indicator enable England-level estimates to be produced, we will look to incorporate these.

## 2.4 Strategic ambitions, targets and commitments

In the RWS, we outlined a range of strategic ambitions, targets and commitments to drive improvements in resource use, waste production and waste management. Our strategic ambitions include:

- At least double resource productivity by 2050
- Zero avoidable plastic waste by the end of 2042
- Zero avoidable waste by 2050
- Work towards eliminating food and biodegradable waste to landfill by 2030

Our strategic ambitions add to several pre-existing targets related to waste management, in addition to ambitions set out in the 25 Year Environment Plan, the Clean Growth Strategy, the Industrial Strategy and the Litter Strategy.

We are committed to working towards the UN Sustainable Development Goal 12.3 target of halving per capita food waste (excluding inedible parts) generated at the consumer and retail level between 2007 and 2030, as well as the Courtauld 2025 Agreement's aim of reducing per capita food waste (including inedible parts) by 2025 alongside associated emissions.

Finally, as we implement and deliver the Strategy, we will explore whether more stretching targets, over and above those proposed by the EU in the Circular Economy Package (2019) can be introduced. Targets associated with the CEP are:

- Recycle 55% of municipal waste by 2025, 60% by 2030 and 65% by 2035
- Reduce landfill to a maximum of 10% of municipal waste by 2035
- Recycle 65% of packaging waste by 2025 and 70% by 2030
- Specific packaging material recycling rates to be achieved by 2025 and 2030:
    - 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)

Table 2.4 outlines which indicators will be used to report progress against key ambitions, targets and commitments.

## Table 2.4. Indicators used for reporting against strategic ambitions, targets and commitments

| Strategic Ambition/ Target/ Commitment | Drivers[25] | Indicator |
|---|---|---|
| ***Strategic Ambition:*** Double resource productivity by 2050 | 25YEP, IS, RWS | Unit Gross Value Added or Gross Domestic Product per unit of Raw Material Consumption (RP1c) |
| ***Strategic Ambition:*** Zero avoidable waste by 2050 | 25YEP, IS, CGS, RWS | Avoidable residual waste from households (WP2) provides a partial estimate. A formal methodology for reporting against this commitment has not yet been agreed |
| ***Strategic Ambition****:* Zero avoidable plastic waste by the end of 2042 | 25YEP | Avoidable residual plastic waste from households (WP3) provides a partial estimate. A formal methodology for reporting against this commitment has not yet been agreed |
| ***Commitment:*** 50% reduction in per capita food and drink waste (excluding inedible parts) at the retail and consumer level by 2030 | RWS, CEP, SDG | Per capita food and drink waste produced at the retail and consumer level (excluding inedible parts) (WP4b (i)) |
| ***Commitment:*** 20% reduction in per capita food and drink waste 2015-2025 (including inedible parts) | 25YEP, CGS, RWS, CEP, Courtauld | Per capita total food and drink waste produced (including inedible parts) (WP4b (ii)) |
| ***Target:*** 50% of household waste recycled by 2020 (by weight) | WFD | % of household waste recycled (RC1c) |
| ***Commitment:*** 55% of municipal waste recycled by 2025, 60% by 2030 and 65% by 2035 (by weight) | CEP | % of municipal waste recycled (RC2c). A formal methodology for reporting against this ambition has not yet been agreed |
| ***Target:*** Recycle and reuse 70% of non-hazardous construction & demolition waste by 2020 (by weight) | WFD | % of non-hazardous construction & demolition waste recovered (RC4c) |
| ***Commitment:*** 65% of packaging materials recycled by 2025 and 70% by 2030 (by weight) | CEP | % of packaging materials recycled (RC5c) |
| ***Commitment:*** Recycling targets for specific packaging materials to be achieved by 2025 and 2030 | CEP | % packaging recycled, by material type (RC5c) |
| ***Commitment:*** No more than 10% of municipal waste sent to landfill by 2035 (by weight) | CEP | % of municipal waste landfilled (LF1c). A formal methodology for reporting against this ambition has not yet been agreed |
| **Strategic Ambition*:*** Zero biodegradable waste to landfill by 2030 | RWS | Biodegradable waste landfilled (LF2). A formal methodology for reporting against this commitment has not yet been agreed |
| ***Strategic Ambition:*** Zero food waste to landfill by 2030 | CGS | Food and drink waste landfilled (LF3). A formal methodology for reporting against this commitment has not yet been agreed |

[25] 25YEP = 25 Year Environment Plan, IS = Industrial Strategy, CGS = Clean Growth Strategy, RWS = Resources and Waste Strategy, CEP = Circular Economy Package, SDG = Sustainable Development Goal, WFD = Waste Framework Directive

| Strategic Ambition/ Target/ Commitment | Drivers[25] | Indicator |
|---|---|---|
| ***Commitment:*** Seek to eliminate illegal waste sites, focussing on those of highest risk, through the lifetime of the plan | 25YEP | Illegal waste sites and high-risk illegal waste sites (WC1a) |

## 2.5 Moving beyond weight-based metrics

To date, weight-based metrics have provided a useful basis for measuring resource use and waste in a common currency. Weight-based metrics alone can, however, lead us in directions which aren't supportive of the strategy's ultimate objective to preserve and restore natural capital. This is because, for instance, light-weight materials such as plastic have only a modest impact on a weight-based recycling rate despite having a large environmental footprint, while some heavier materials such as aggregates have a small environmental footprint but a large impact on weight-based recycling targets.

Given this, we committed in the RWS to also report on alternative metrics to weight, including in terms of greenhouse gas emissions, natural capital impacts and social value. There exists strong support for such alternatives. In our 2019 consultation on improving consistency in household and business recycling collections in England, 70% of respondents agreed that alternatives to weight-based metrics should be developed.[26]

### 2.5.1 Carbon metrics

In addition to emissions from the waste management sector collated by the Department for Business, Energy and Industrial Strategy, in this release we have included an estimate of England's 'Carbon Footprint' or consumption-side emissions which has not been previously published.

We have also worked with WRAP over the last year to develop an updated carbon metric to help us measure the impact household waste recycling and management has on avoided or produced greenhouse gas emissions. WRAP will release this metric as a spreadsheet to enable local authorities and others to measure their treatment of waste in carbon terms.

More work will be undertaken in subsequent editions, depending on data availability, to extend carbon metrics to the treatment of additional waste streams.

### 2.5.2 Natural capital metrics

In the 25 Year Environment Plan, we committed to improving the environment within a generation. Natural capital appraisal and accounting provides a concise way to track

[26] Defra (2019) Consultation on consistency in household and business recycling collections in England: Part 2: analysis of organisational responses

whether we actually do so. It aims to convert a quantified analysis of environmental assets and changes within them into contributions to human activity and wellbeing.

Natural capital refers to the renewable and non-renewable elements of nature that directly provide benefits to people or indirectly underpin their wellbeing. The ‘capital framing’ holds that by, at least, maintaining the value of capital assets, we can leave future generations with the capacity to be as well off as we are now. The 25 Year Environment Plan applies a further requirement to the portfolio we hand down – that our natural assets, specifically, are nurtured and improved.

The 25 Year Environment Plan and associated documents have laid out a conceptual framework for assessing change in England’s natural capital, covering the condition of capital assets, the services or benefits these provide and pressures acting upon them. We will build upon this model while drawing on guidance provided by the Natural Capital Committee as we look to apply natural capital measurement approaches to resource use and waste production going forward. This will require measuring how our resource use and waste production impact the natural world in biophysical terms, and how this, in turn, affects the value humans derive from natural assets.

### 2.5.3 Social impact metrics

A further area on which more work is required is to develop indicators of social impact, such as for job creation or economic value. For example, reuse may have the potential to generate social value by creating volunteering and job opportunities in testing, repairing and reconditioning goods.

We are discussing the best way to quantify this multi-dimensional issue with academic partners and others at present. New sources of data will be required, and we hope to incorporate these in future releases.

# 3 Data trends

- *The various datasets presented in section 3 are not all for the same time period due to differences in data availability.*
- *As figures and percentages have been rounded, there may be slight discrepancies between contributory values and totals presented.*

## 3.1 Resource productivity

Material resources are at the heart of our economy and we consume them in large quantities. They are essential for meeting our basic human needs, supporting economic activity and creating social value. But the extraction, production and disposal of material resources also exerts a significant pressure on the environment. For example, these processes can drive biodiversity loss, water stress and greenhouse gas emissions.

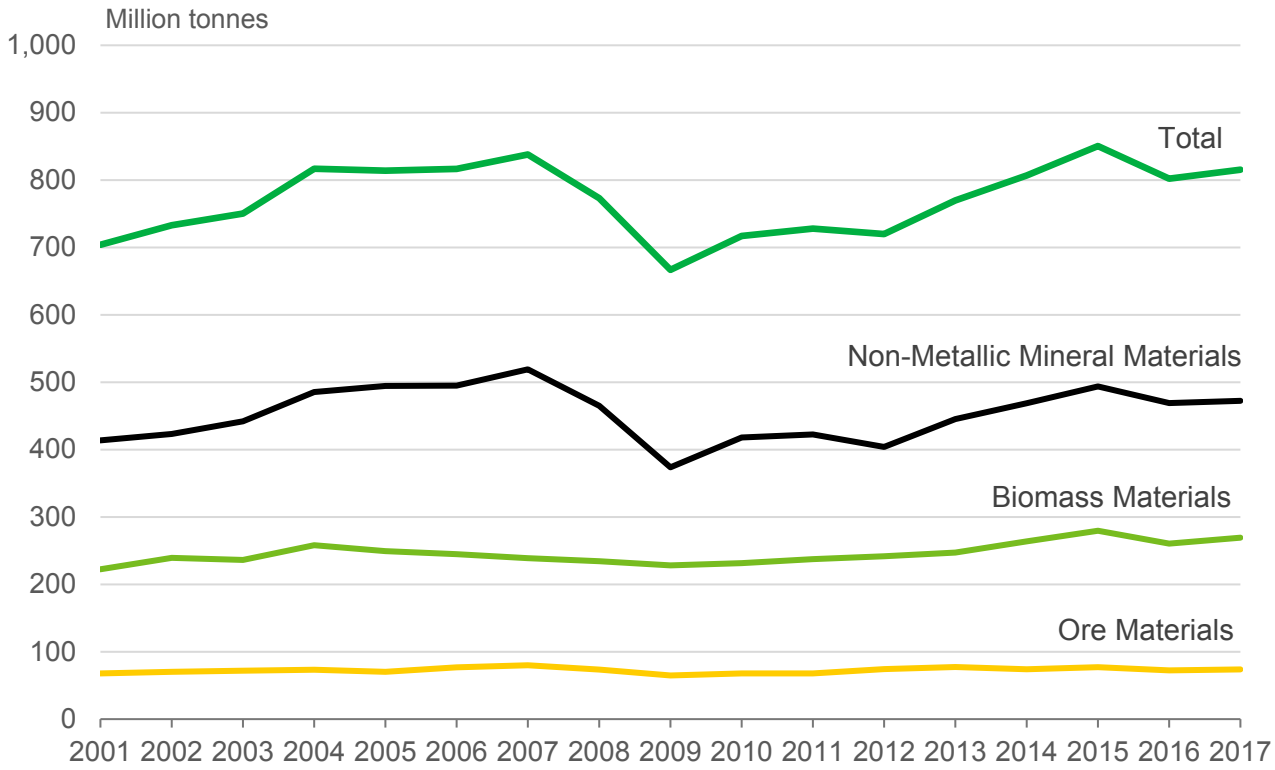
‘Raw Material Consumption’ (RMC) (alternatively ‘material footprint’) measures the full amount of raw material required to meet final demand for goods and services consumed in England, wherever in the world they are extracted. The measure takes a consumption-based accounting approach, which is a method for allocating resource use to the point of consumption rather than the location of extraction or production.

‘Resource productivity’ is a measure of the economic value we generate per unit of raw materials consumed. It tells us how efficiently we are using raw materials while decoupling economic growth from their use. We have presented resource productivity as the annual economic output of England’s economy (in Gross Value Added and Gross Domestic Product) in relation to its annual material footprint.

The desired direction for raw material consumption is down, while we have a strategic ambition in place to at least double resource productivity by 2050.

## RP1. Material footprint (Raw Material Consumption)

**Chart 1. Raw Material Consumption (excluding fossil fuels), England, 2001 to 2017 inclusive, million tonnes (RP1a)**



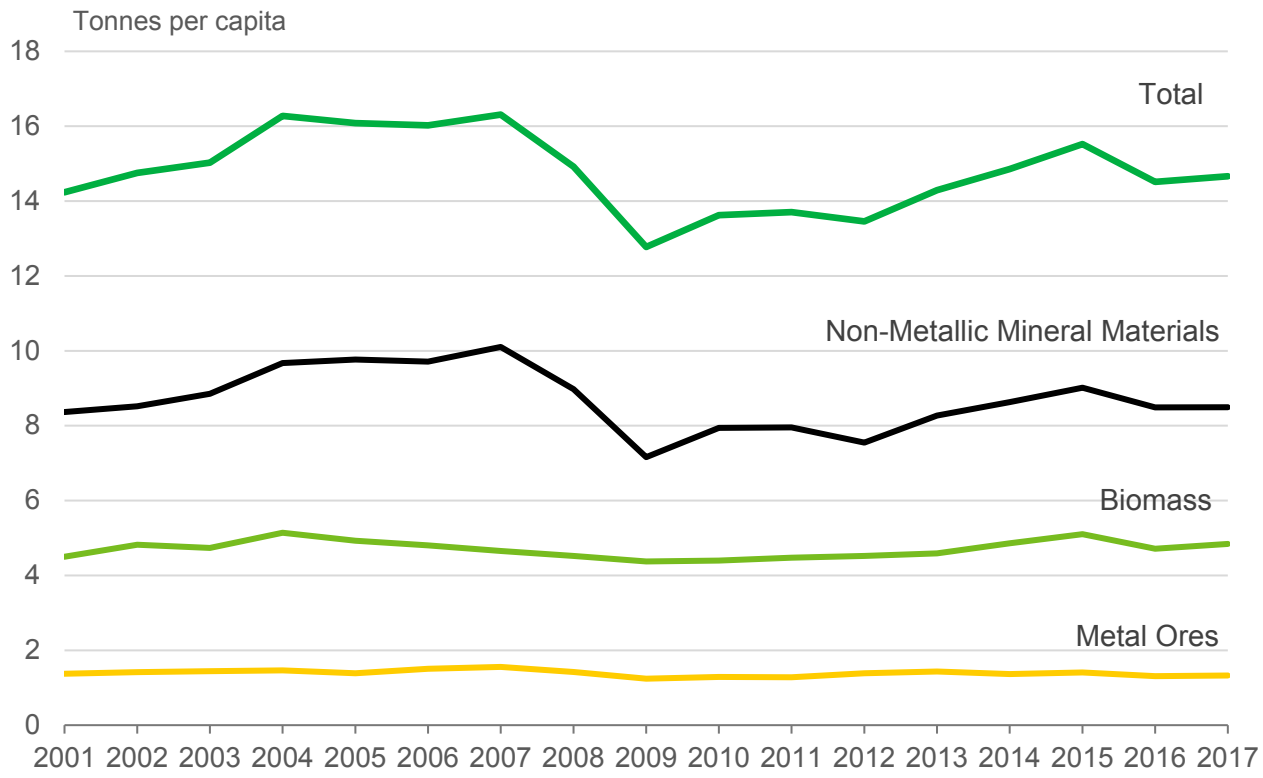

*Source(s):* Owen, A., Giesekam, J., Barrett, J. (2020) Material footprint and resource efficiency in the UK

In 2017, England's material footprint or Raw Material Consumption (RMC) was an estimated 815.4 million tonnes when excluding fossil fuels, 15.8% greater than in 2001 (704.0 million tonnes).

RMC rose steadily between 2001 and 2007, before declining sharply during the recession brought about by the 2008 financial crisis. This decline was driven largely by a reduction in the consumption of non-metallic mineral materials, generally used in construction activities. Since then, RMC has returned to around pre-recession levels. Between 2001 and 2017, consumption of biomass materials such as crops increased by roughly a fifth (21.0%, from 222.4 to 269.2 million tonnes), ore materials such as iron, by approximately a tenth (8.8%, from 67.9 to 73.9 million tonnes), and non-metallic mineral materials such as gravel, by 14.2% (from 413.7 to 472.4 million tonnes).

England is increasingly reliant on imported materials. In 2017, about a quarter of England's material footprint (excluding fossil fuels) was made up of materials extracted within the UK (23.6%, down from 37.1% in 2001). Further information provided at source and in Appendix B.

**Chart 2. Raw Material Consumption (excluding fossil fuels), England, 2001 to 2017 inclusive, tonnes per capita (RP1b)**




*Source(s):* Owen, A., Giesekam, J., Barrett, J. (2020) Material footprint and resource efficiency in the UK

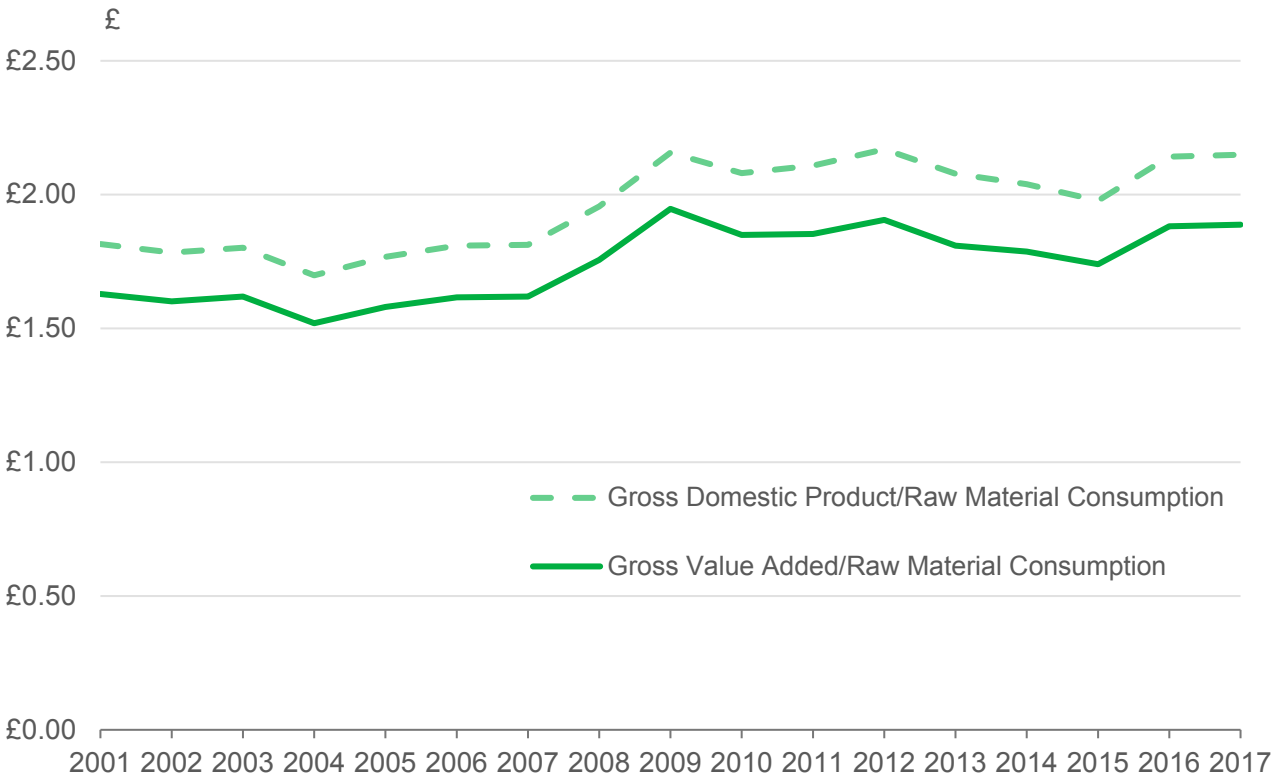
Office for National Statistics (2019) Estimates of the population for the UK, England and Wales, Scotland and Northern Ireland

England's material footprint on a per capita basis when excluding fossil fuels, was 14.7 tonnes in 2017, just 3% higher than in 2001 (14.2 tonnes).

Increases on a per capita basis are less than those for absolute tonnages due to population growth of 12.5% across this period. Per capita RMC rose steadily between 2001 and 2007, before declining sharply during the recession. It rose again to 2015 and fell back in 2016 and 2017, to 14.7 tonnes per capita.

Within the overall total, there have been increases in per capita consumption of both biomass and non-metallic mineral materials between 2001 and 2017 (7.6% and 1.5% respectively), whilst for metal ores, there has been a slight decrease on a per capita basis (3.2%). Further information available in Appendix B.

**Chart 3. Unit Gross Value Added per unit Raw Material Consumption (excluding fossil fuels), England, 2001 to 2017 Inclusive (chained volume measure, 2016 pounds) (RP1c)**




*Source(s):* Owen, A., Giesekam, J., Barrett, J. (2020) Material footprint and resource efficiency in the UK

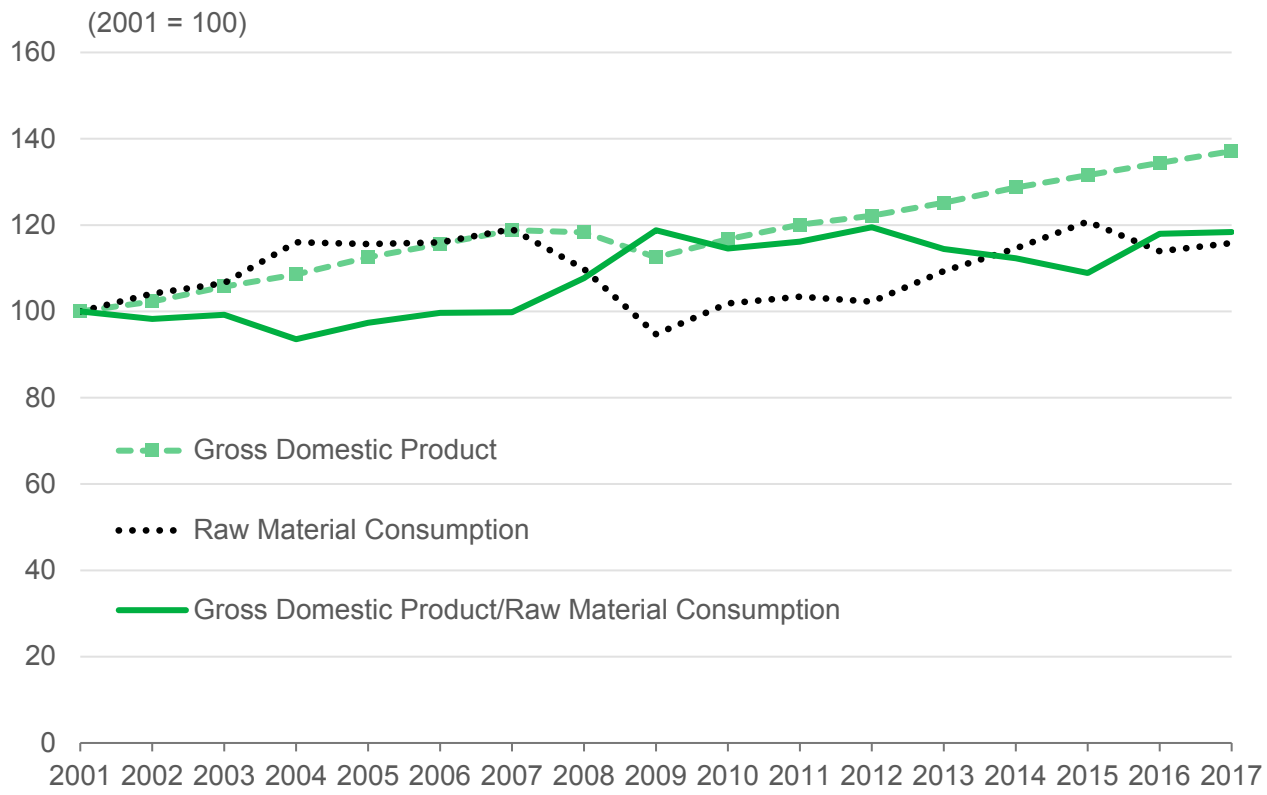
Office for National Statistics (2018) Regional gross value added (balanced) by industry: all NUTS level regions, Accessed November 2019

Office for National Statistics (2019) Regional Gross Domestic Product all NUTS level regions, Table 10.

In 2017, England generated roughly 15.9% more economic value (measured in gross value added (GVA)) for each unit of raw materials (excluding fossil fuels) required to meet final demand for goods and services, than in 2001.

Resource productivity based on this measure increased from £1.63 GVA per kg of RMC in 2001, to £1.89 in 2017. In that period, resource productivity peaked at £1.95 in 2009 as a result of a sharp drop in raw material consumption relative to economic activity during the recession. It has since fallen against this peak, but remains above pre-recession levels. When using an alternative measure of economic value, gross domestic product (GDP), the increase in resource productivity across this period was a similar level (18.4%). Further information available in Appendix B.

**Chart 4. Index values of Gross Domestic Product, Raw Material Consumption and unit Gross Domestic Product per unit Raw Material Consumption, England, 2001 to 2017 Inclusive**




*Source(s):* Owen, A., Giesekam, J., Barrett, J. (2020) Material footprint and resource efficiency in the UK

Office for National Statistics (2019) Regional Gross Domestic Product all NUTS level regions, Table 10.

Gross domestic product (GDP) in England generally increased between 2001 and 2017, by 37.1% overall and on average, 2.0% each year. Raw material consumption (RMC) also increased across this period, but at a lesser rate than GDP (by 15.8% overall and on average, 1.1% each year). The increase in resource productivity across this period represent a relative decoupling of economic activity from resource use i.e. although RMC has increased, it has done so at a lesser rate than GDP.

## 3.2 Greenhouse gas emissions

Monitoring greenhouse gas emissions from waste management is important to help us gauge progress towards developing a domestic low carbon economy and ensure we stay on track to meet the 4th and 5th carbon budgets. Waste sector emissions have been on a downward trajectory since 1990.

Monitoring our 'carbon footprint' on the other hand, provides us with the fullest picture of greenhouse gas emissions associated with demand for goods and services in England, wherever these arise across the globe. Our carbon footprint has been trending downwards since 2007.

Indicators of the emissions intensity of England's 'carbon footprint' help us understand the level of greenhouse gas emissions associated with our consumption in relation to the economic output of England's economy. In 2017, we produced less consumption-based emissions relative to the size of our economy than in 2001.

The desired direction for greenhouse gas emissions is down, while that for economic productivity relative to our emissions is up.

Please note, additional indicators of GHG emissions associated with waste management can be found on page 52 of this document.

## GG1. Domestic greenhouse gas emissions from waste management

**Table 3.1. Domestic greenhouse gas (GHG) emissions from the waste management sector, England, 1990 to 2018, million tonnes carbon dioxide equivalent ($MtCO_2e$) (GG1a)**

*Million tonnes $CO_2e$*

| | Landfill | Waste-water handling | Waste incineration | Composting | Anaerobic digestion | Total waste management |
|---|---|---|---|---|---|---|
| 1990 | 50.028 | 4.089 | 1.344 | 0.000 | 0.000 | 55.461 |
| 1995 | 52.358 | 4.089 | 0.981 | 0.164 | 0.000 | 57.592 |
| 2000 | 46.876 | 4.252 | 0.561 | 0.328 | 0.000 | 52.018 |
| 2005 | 35.964 | 3.454 | 0.480 | 0.506 | 0.004 | 40.408 |
| 2010 | 19.641 | 3.293 | 0.332 | 0.875 | 0.017 | 24.159 |
| 2011 | 17.693 | 3.338 | 0.312 | 0.985 | 0.028 | 22.356 |
| 2012 | 16.715 | 3.342 | 0.301 | 1.007 | 0.049 | 21.413 |
| 2013 | 14.516 | 3.314 | 0.296 | 1.104 | 0.065 | 19.293 |
| 2014 | 12.597 | 3.398 | 0.294 | 1.249 | 0.091 | 17.630 |
| 2015 | 11.728 | 3.484 | 0.276 | 1.255 | 0.117 | 16.861 |
| 2016 | 11.133 | 3.444 | 0.286 | 1.347 | 0.147 | 16.357 |
| 2017 | 11.360 | 3.526 | 0.269 | 1.411 | 0.159 | 16.725 |
| 2018 | 11.621 | 3.522 | 0.257 | 1.384 | 0.162 | 16.946 |

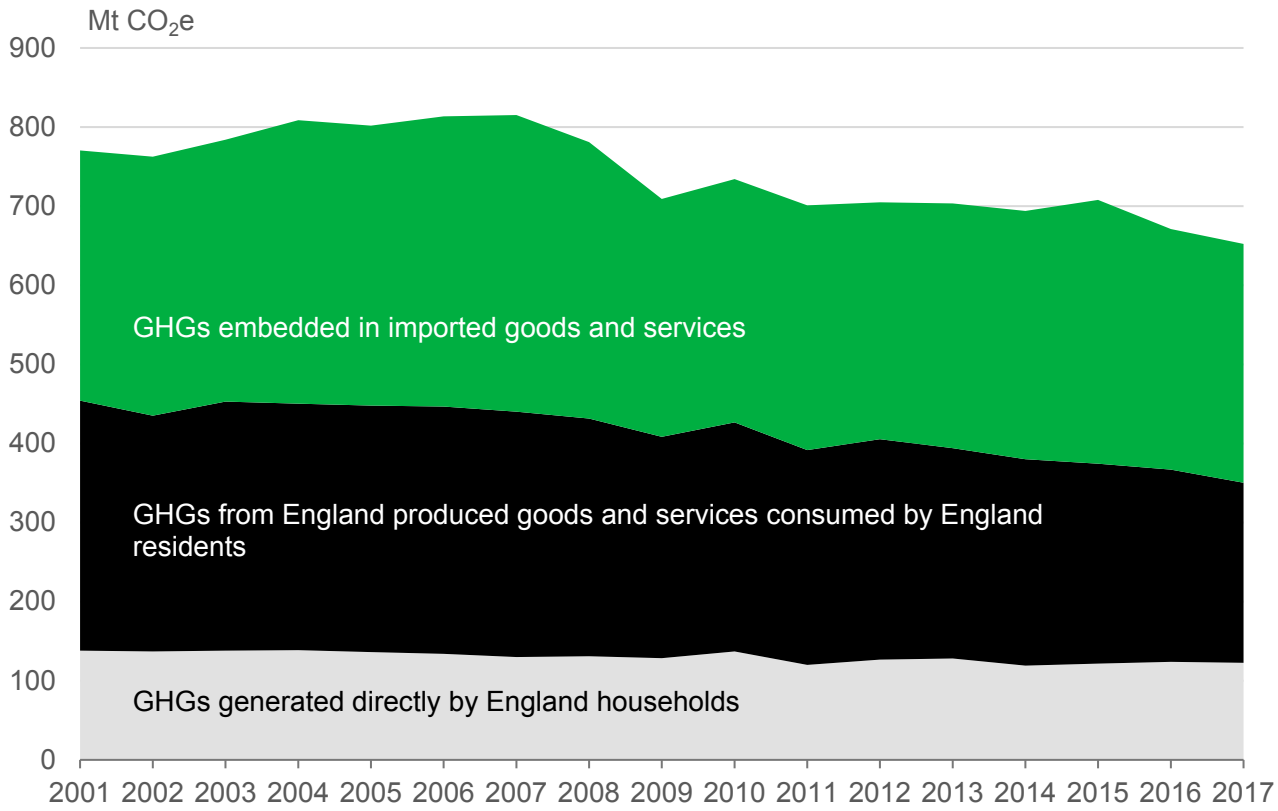
*Source(s):* Department for Business, Energy and Industrial Strategy (2020) Greenhouse Gas Inventories for England, Scotland, Wales & Northern Ireland: 1990-2018

**GHG emissions from England's waste management sector[27] were 16.9 million tonnes CO2e ($MtCO_2e$) in 2018, 69.4% lower than in 1990 (55.5 MtCO2e).** The significant level of decarbonisation in England's waste management sector, as in the UK, was driven by factors including improvements in landfilling standards, changes in the composition of landfilled waste and increased amounts of methane from landfill diverted for energy (BEIS, 2019). In 2018, the waste management sector accounted for 5.0% of England's overall territorial emissions. Further information available at source and in Appendix B.

[27] Emissions from waste incineration with energy capture 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. Carbon footprint (consumption based greenhouse gas emissions)

**Chart 5. Carbon footprint on a consumption basis, England, 2001 to 2017 inclusive, million tonnes $CO_2$ equivalent ($MtCO_2e$) (GG2a)**




*Source(s):* Owen, A., Giesekam, J., Barrett, J. (2020) Material footprint and resource efficiency in the UK

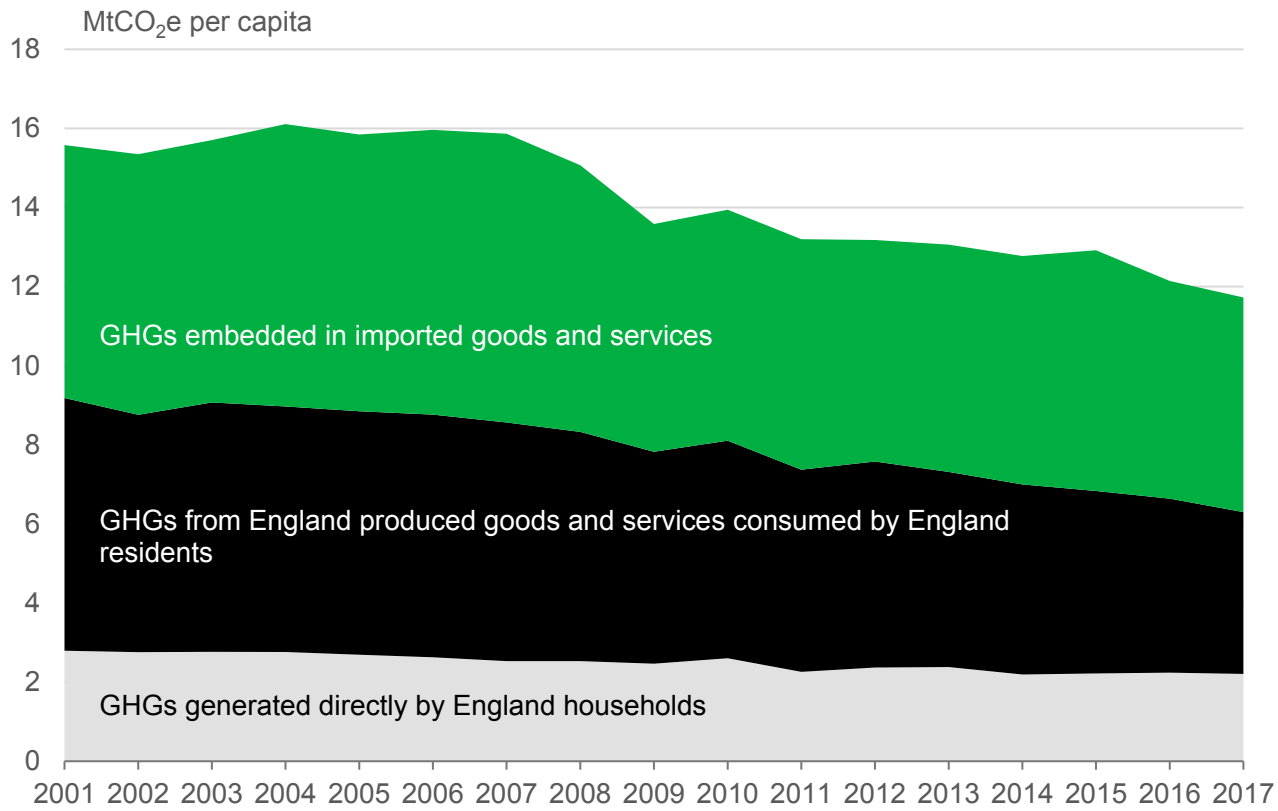
See also: HM Government (2019) UK's carbon footprint

England's carbon footprint was an estimated 652.3 million tonnes $CO_2$ equivalent ($MtCO_2e$) in 2017, 15.3% less than in 2001 (770.5 $MtCO_2e$).

Greenhouse gases (GHGs) emitted directly by households (which make up roughly a fifth of the footprint), were 11.1% lower in 2017 than in 2001, as a result of reductions in emissions associated with household-related heating. The rise in the total carbon footprint seen prior to the 2007-08 financial crisis was driven by an expansion in emissions associated with imported goods and services, however since the crisis, England's total carbon footprint have been on a downward trajectory. Though the greatest contribution to this trend has come from reductions in GHGs associated with goods and services produced in England and consumed here, emissions embedded in imports have also fallen (26.6% and 19.5%, respectively, from a 2007 peak).

GHGs emitted overseas in the production of goods and services consumed in England made up just less than half (46.3%) of the total footprint in 2017. Further information available at source and in Appendix B.

**Chart 6. Carbon footprint on a consumption basis, England, 2001 to 2017 inclusive, tonnes $CO_2$ equivalent per capita (GG2b)**



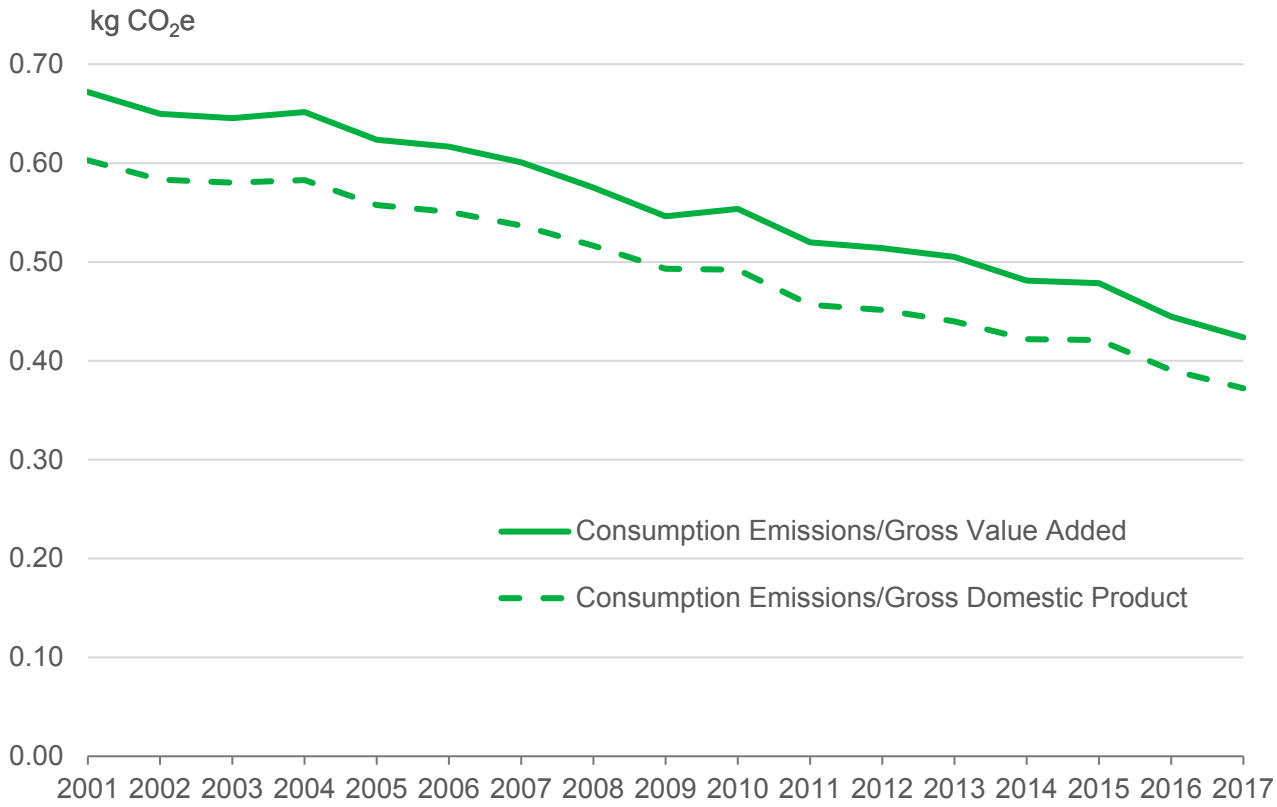

*Source(s):* Owen, A., Giesekam, J., Barrett, J. (2020) Material footprint and resource efficiency in the UK

Office for National Statistics (2019) Estimates of the population for the UK, England and Wales, Scotland and Northern Ireland

The average annual carbon footprint of each person in England fell by roughly a quarter (24.7%) between 2001 and 2017, from 15.6 to 11.7 tonnes $CO_2e$.

This reduction occurred primarily after 2007. On a per capita basis, greenhouse gases (GHGs) emitted directly by households in England fell by approximately a fifth (21.0%) in this period. Per capita emissions associated with goods and services produced in England and consumed by England residents fell by almost two-fifths (36.0%) in the same period, while per capita emissions embedded in imported goods and services decreased by 15.1% overall. Reductions on a per capita basis are greater than those for absolute tonnages due to the growth in England's population in this period. Further information available at source and in Appendix B.

**Chart 7. Intensity of greenhouse gas emissions on a consumption basis, England, 2001 to 2017 inclusive, kg $CO_2$ equivalent per unit Gross Value Added (chained volume measure, 2016 pounds)**




*Source(s):* Owen, A., Giesekam, J., Barrett, J. (2020) Material footprint and resource efficiency in the UK

Office for National Statistics (2018) Regional gross value added (balanced) by industry: all NUTS level regions, Accessed November 2019

Office for National Statistics (2019) Regional Gross Domestic Product all NUTS level regions, Table 10.

The intensity of England's greenhouse gas emissions on a consumption basis (including direct emissions) fell by 36.9% between 2001 and 2017, from 0.67 kg $CO_2e$ per pound of gross value added to 0.42 kg $CO_2e$.

When using gross domestic product (GDP) as an alternative measure of economic value, the reduction in emissions intensity between 2001 and 2017 was a similar 38.3%. Further information available at source and in Appendix B.

## 3.3 Waste production

As the goods we consume are made using renewable and non-renewable natural resources, when discarded as waste without being reused or recycled in some way, this represents a missed opportunity for the circular economy and drives the additional use of raw materials.

The indicators of waste production tell us how much of the stock of natural capital we use then becomes waste across different sources and types, as well as the amount of waste which isn't then recycled or reincorporated back into the economy.

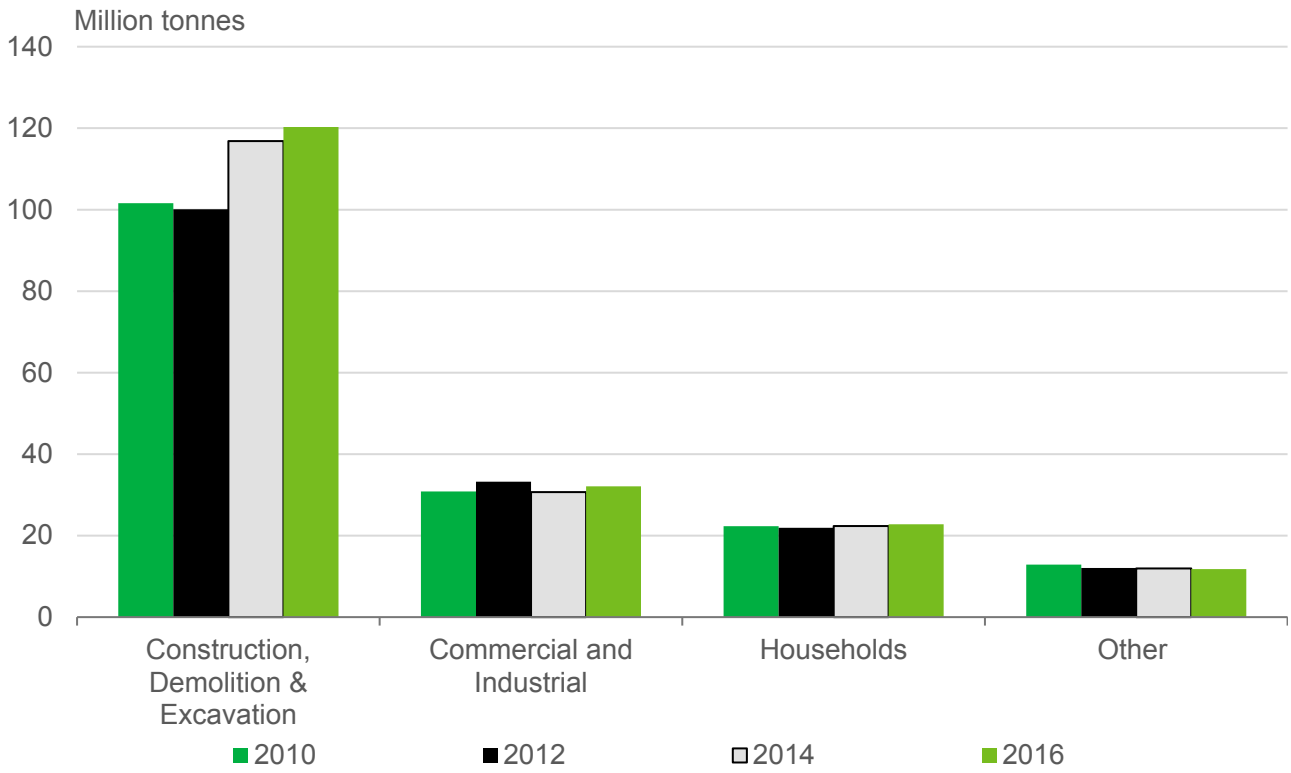
Total waste production has increased in the period for which data are presented, though this is not the case for all waste streams e.g. 'Waste from Households', nor all waste types e.g. food. Total food and drink waste has been on a downwards trend since monitoring began in 2007, roughly in line with our commitments in this area.

The large amount of avoidable residual waste and avoidable residual plastic waste generated by household sources each year suggests there remains substantial opportunity for increased recycling.

The desired direction for all indicators of waste production is down.

## WP1. Total waste production

**Chart 8. Total waste production, England, 2010 to 2016 inclusive, million tonnes (WP1a (i))**




*Source(s):* Department for Environment, Food and Rural Affairs (2020) ENV23 - UK statistics on waste, Table 5.1.

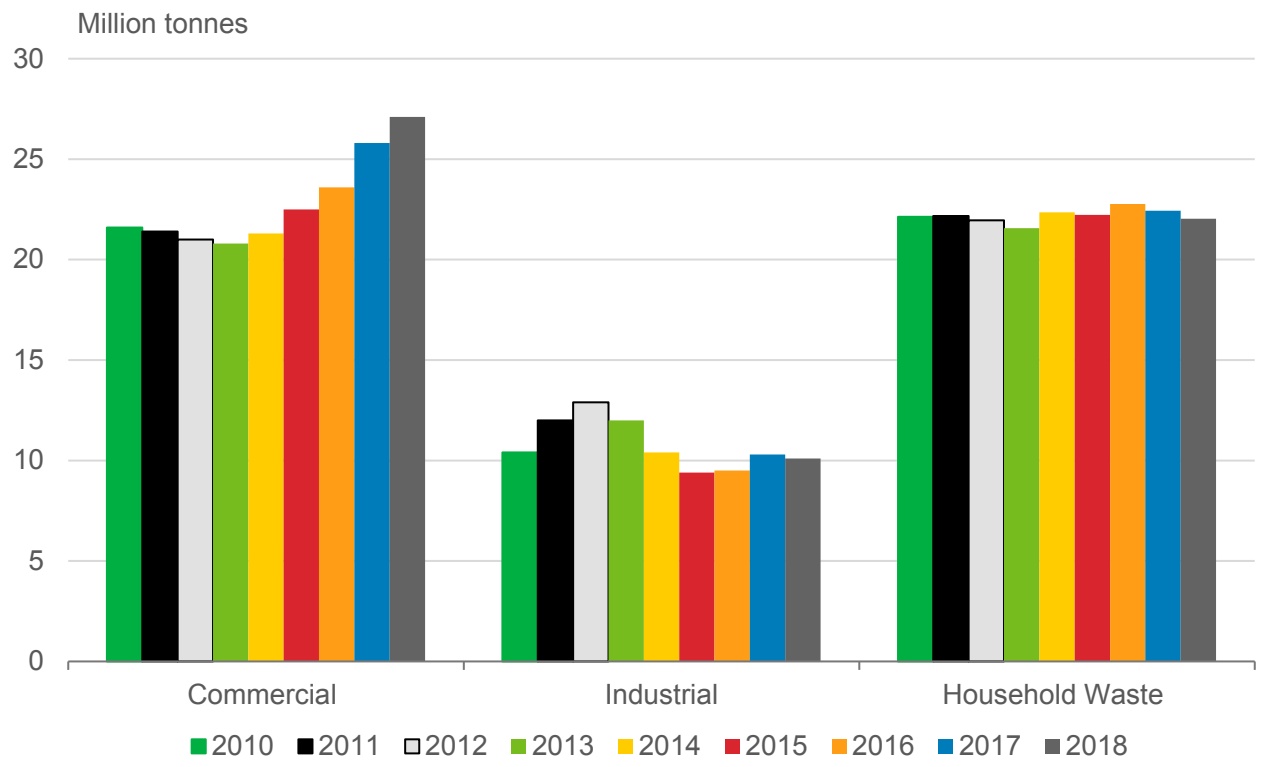
England produced 187.0 million tonnes of total waste in 2016, over a tenth (11.5%) more than in 2010 (167.7 million tonnes).

Estimates of total waste production (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 weight terms, approximately two-thirds of all waste in England comes from construction, demolition and excavation sources.[28] Between 2010 and 2016, waste from these sources increased by 18.4%, from 101.6 to 120.3 million tonnes. Also between 2010 and 2016, waste from 'other'[29] sources fell slightly, from 12.9 to 11.8 million tonnes. Further information available at source and in Appendix B.

[28] This is waste primarily received from construction sites. Some examples of construction, demolition and excavation waste include, but are not limited to, concrete, rebar, wood, panelling, linoleum and carpet. Dredging wastes are included here

[29] Agriculture, forestry, fishing, mining and quarrying

**Chart 9. Waste production: commercial, industrial and 'Waste from Households', England, 2010 to 2018 inclusive, million tonnes (WP1a (ii))**




*Source(s):* Department for Environment, Food and Rural Affairs (2020) ENV23 - UK statistics on waste, Tables 1.1. & 4.1.

Commercial, industrial and household sources together generated an estimated 59.2 million tonnes of waste in England in 2018.

The commercial and industrial[30] (C&I) sectors in England produced 37.2 million tonnes of waste in 2018, 16.3% more than in 2010 (32.0 million tonnes). Over two thirds of C&I waste is generated by the commercial sector specifically. Commercial sector arisings increased by a quarter (25.5%) between 2010 and 2018 (from 21.6 to 27.1 million tonnes), while industrial waste arisings initially increased between 2010 and 2012, before falling to 10.1 million tonnes in 2018 (a similar level to 2010). 'Waste from Households' arisings remained roughly constant between 2010 and 2018 at around 22 million tonnes. Further information available at source and in Appendix B.

[30] This is waste from mainly manufacturing and service industries

**Table 3.2. Hazardous waste production by sector, England, 2010 to 2016 inclusive, million tonnes (WP1a (iii))**

*Million tonnes*

| Sector | 2010 | 2012 | 2014 | 2016 |
|---|---|---|---|---|
| Construction, Demolition & Excavation | 0.566 | 0.744 | 0.620 | 0.684 |
| Commercial & Industrial | 1.965 | 1.886 | 2.111 | 2.300 |
| Households | 0.293 | 0.269 | 0.264 | 0.299 |
| Other[31] | 0.153 | 0.163 | 0.166 | 0.154 |
| **Total** | **2.977** | **3.061** | **3.161** | **3.438** |

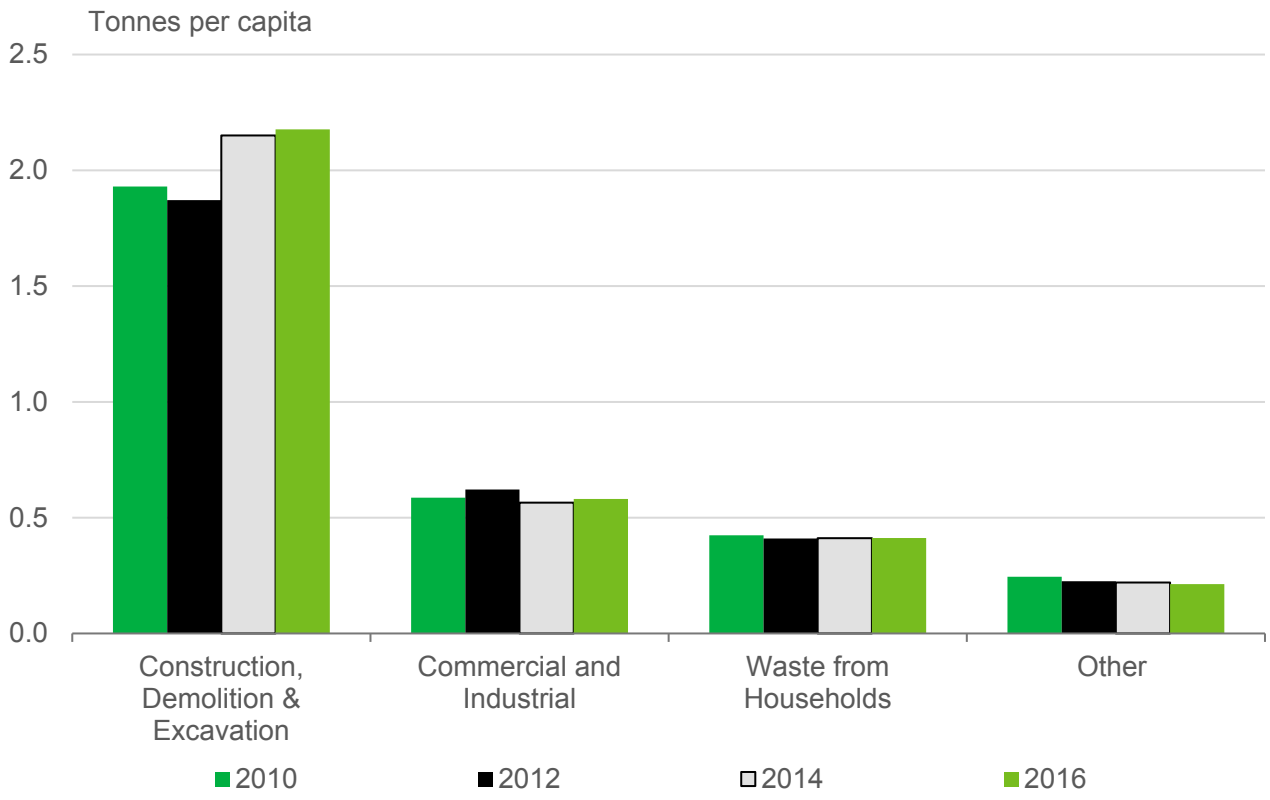
*Source(s):* Department for Environment, Food and Rural Affairs (2020) ENV23 - UK statistics on waste, Table 5.1.

England generated 15.5% more hazardous waste in 2016 than in 2010, having increased from an estimated 3.0 million tonnes to 3.4 million tonnes.

An upward trend in arisings was reflected in all sectors, thought was most pronounced for construction, demolition and excavation (which saw a 20.8% increase), followed closely by the commercial & industrial sector, for which, hazardous waste generation increased by 17.1% between 2010 and 2016. Household and 'other' sources of hazardous waste increased only slightly between 2010 and 2016, by 2.1% and 0.9% respectively. Further information available at source and in Appendix B.

[31] Agriculture, forestry, fishing, mining and quarrying

**Chart 10. Total waste production, England, 2010 to 2016 inclusive, tonnes per capita (WP1b (i))**




*Source(s):* Department for Environment, Food and Rural Affairs (2020) ENV23 - UK statistics on waste, Table 5.1.

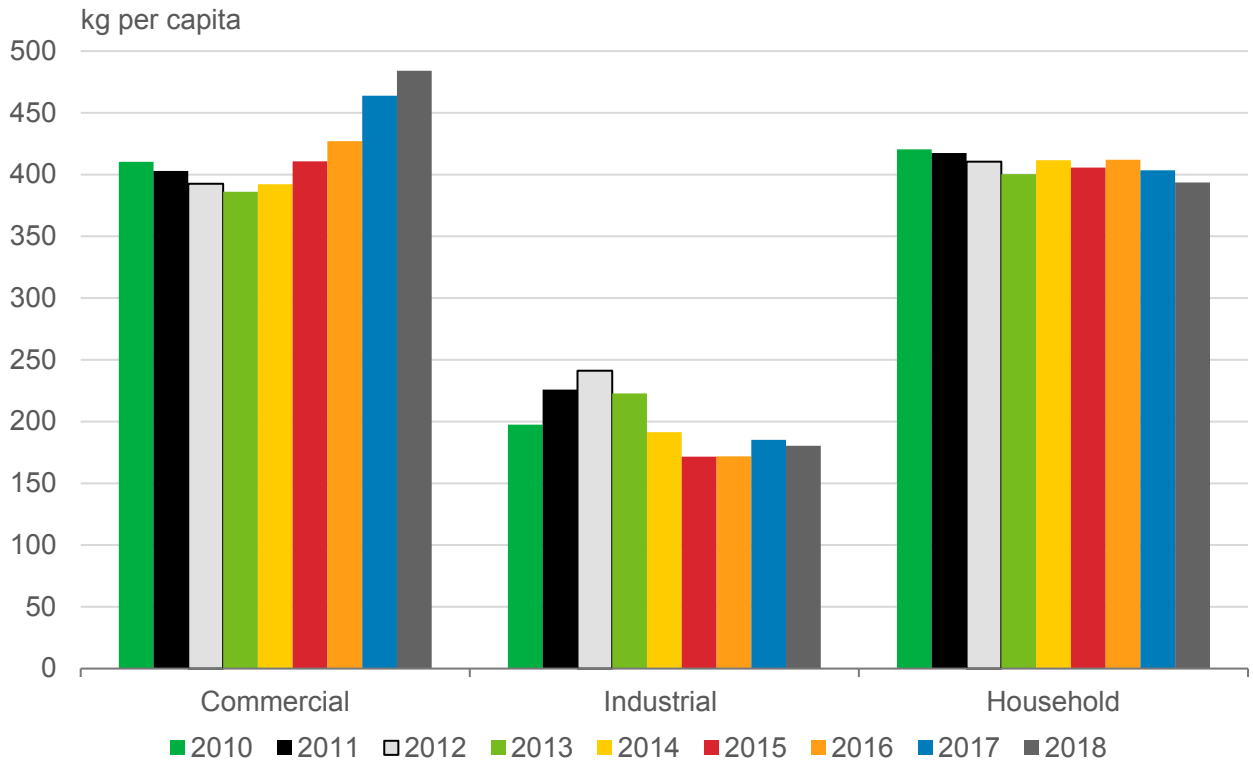
Office for National Statistics (2019) Estimates of the population for the UK, England and Wales, Scotland and Northern Ireland

3.4 tonnes of waste was generated on average per person in England in 2016, 6.3% more than in 2010 (3.2 tonnes).

Per capita waste generated by construction, demolition and excavation sources increased by 12.8% between 2010 and 2016, from 1.9 to 2.2 tonnes, while waste from 'other'[32] sources fell by 13.0% in the same period, from 245.1 kg to 213.3 kg per capita. Further information available at source and in Appendix B.

[32] Agriculture, forestry, fishing, mining and quarrying

**Chart 11. Waste produced: commercial, industrial, and 'Waste from Households', England, 2010 to 2018 Inclusive, kg per Capita (WP1b (ii))**



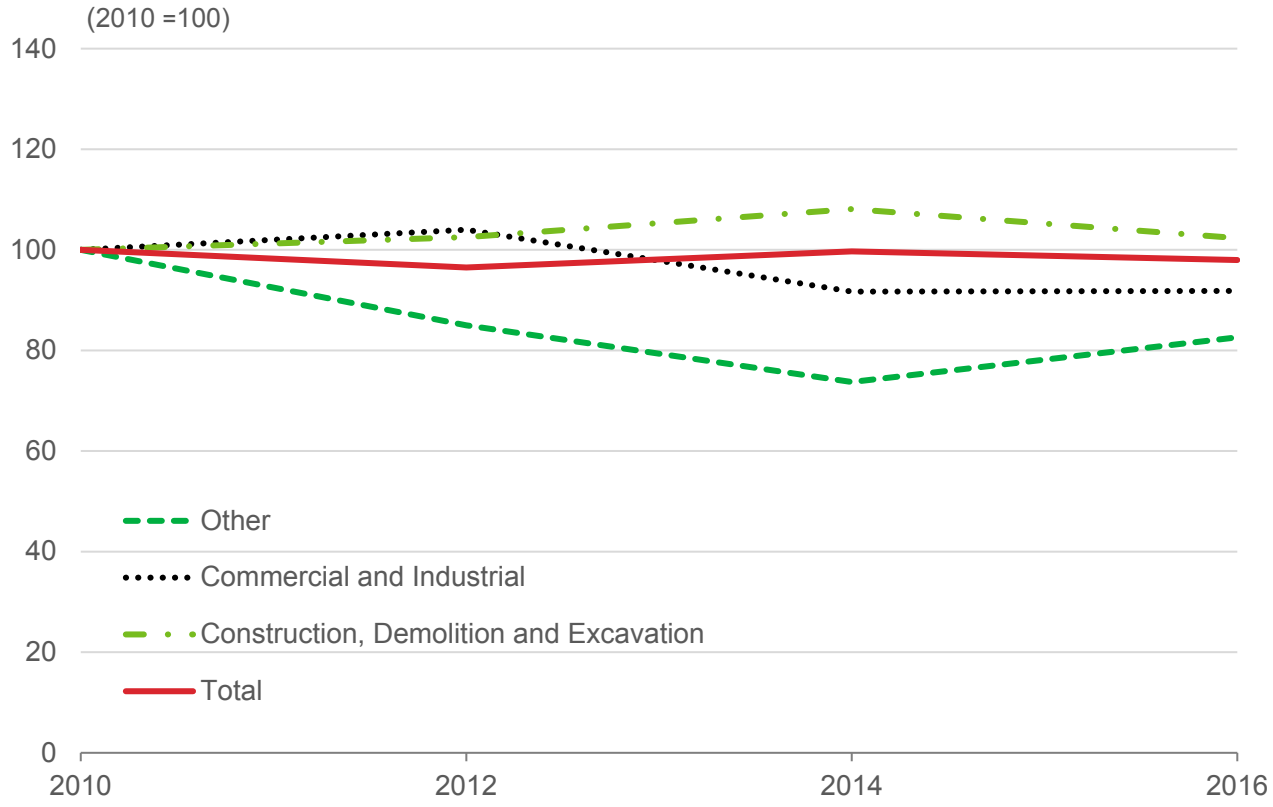

*Source(s):* Department for Environment, Food and Rural Affairs (2020) ENV23 - UK statistics on waste, Tables 1.1. & 4.1.

Office for National Statistics (2019) Population Estimates for UK, England and Wales, Scotland and Northern Ireland

Placing chart 9 onto a per capita basis, an estimated 1.1 tonnes of waste was generated by household, commercial and industrial sources in England in 2018, up slightly on levels in 2010 (1.0 tonnes).

In this period, per capita waste generated by commercial sources increased by almost a fifth (18.0%). Waste from industrial sources on a per capita basis fell by 8.7% between 2010 and 2018, while per capita 'Waste from Households' fell by 6.4% in the same period. Further information available at source and in Appendix B.

**Chart 12. Index values of waste Intensity of economic value by sector, England, 2010 to 2016 (chained volume measure, 2016 pounds) (WP1c)**




*Source(s):* Department for Environment, Food and Rural Affairs (2020) ENV23 - UK statistics on waste, Table 5.1.

Office for National Statistics (2018) Regional gross value added (balanced) by industry: all NUTS level regions, Accessed November 2019

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), slightly less total waste was generated per £1,000 of national Gross Value Added (GVA) in 2016 than in 2010 (2.0% less).

The waste intensity of the construction sector increased from 1.3 tonnes of waste per £1,000 GVA in 2010 to 1.4 tonnes in 2014, before falling back in 2016. Waste intensity was lowest for the commercial and industrial sectors, for which waste intensity fell by 8.2% between 2010 and 2016, from 25 kg per £1,000 sectoral GVA to 23 kg. The waste intensity of 'other' sources experienced the sharpest fall between 2010 and 2016, dropping by more than a quarter between 2010 and 2014, before then rising to 2016. Further information available at source and in Appendix B.

## WP2. Avoidable residual waste from household sources

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"* (page 7).

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

One approach to quantifying avoidable waste is to try to assess the amount of waste which could have been avoided becoming residual given current recycling technologies and opportunities for material substitution. Residual waste here refers to waste that has not been prevented, reused or recycled. It is usually collected from households or businesses in a black bag or wheelie bin to ultimately end up at an energy recovery plant or landfill.

Residual waste is problematic, as its treatment is often the most polluting waste-management option. It also prevents the value of materials and products being retained in the economy. It is important to note that such an approach represents a subset of avoidable waste, as it does not include other forms of waste e.g. that sent for recycling which could have been prevented or avoided further up the waste hierarchy. We may look to expand this method as data becomes available.

Here, we draw on waste composition data from recent National Waste Composition studies undertaken by WRAP, which indicate proportions of materials within residual and recycling waste from household and household-like sources (household waste recycling centres, bulky collection and street sweepings). These proportions have been used to estimate national volumes of the same materials within the residual stream. It is important to note that by drawing on sample-based compositional data, final proportions and values presented here are subject to sampling error.

Using the compositional studies outlined, we have categorised waste using a tiered definition of avoidability and summed the quantity of residual waste from household and household-like sources falling into each category. This modulated approach allows for final values within each category to be combined, so that different interpretations of avoidability can be formulated as desired. The categories used are:

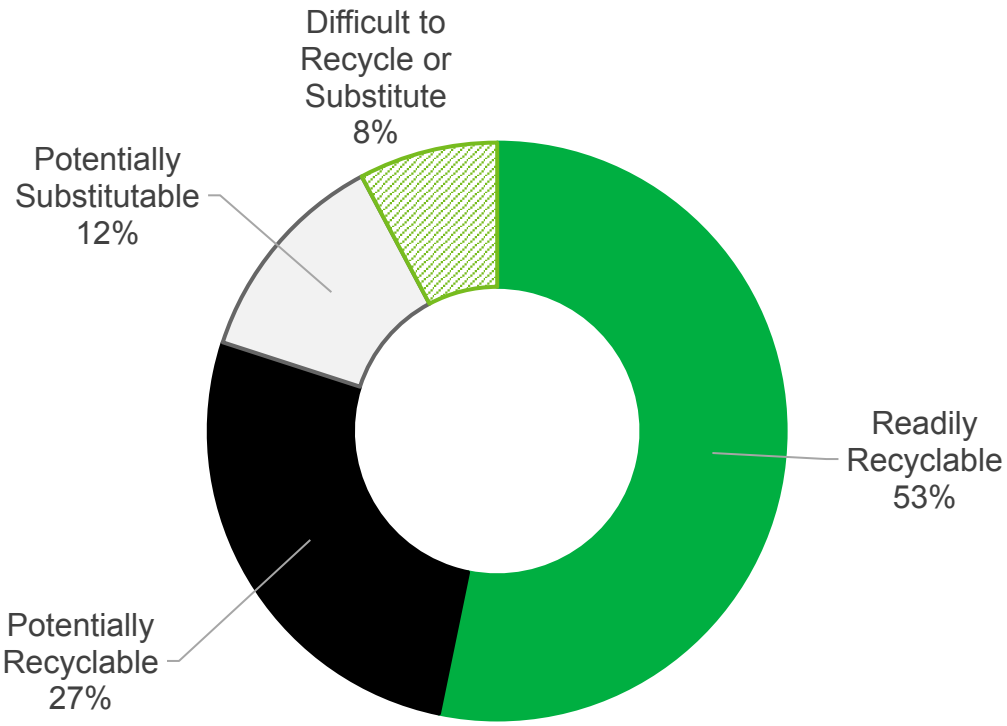
1. **Readily recyclable with current technologies** – items which shouldn't be in the residual waste stream whatsoever because they are recyclable or compostable at the kerbside or household waste recycling centres (HWRCs);[33]
2. **Potentially recyclable with technologies in development** – recycling 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;
3. **Potentially substitutable to a material which could be recycled** – it is hard to envisage a recycling route for these materials, but they could be substituted for something else which could be recycled;
4. **Difficult to recycle or substitute** – the material is difficult to avoid becoming residual and no feasible alternative can be envisaged without entailing substantial cost.

Where a material type falls into two categories e.g. readily recyclable or potentially recyclable, we've chosen to place it into the category closer to being readily recyclable. Please see Appendix B for how we have categorised material types for the purpose of this assessment.

The message from this assessment is that a substantial quantity of material appears to be going into the residual waste stream, where it could have at least been recycled or dealt with higher up the waste hierarchy. This is something we will continue to monitor into the future in line with our commitment to reduce avoidable waste.

[33] This doesn't necessarily mean that all local authorities will recycle these despite being recycled in some places, just that they are potentially recyclable with current technologies in use in some local authorities

**Chart 13. Avoidable residual waste from household sources, England, 2017, proportion of total residual waste, by category (WP2a)**

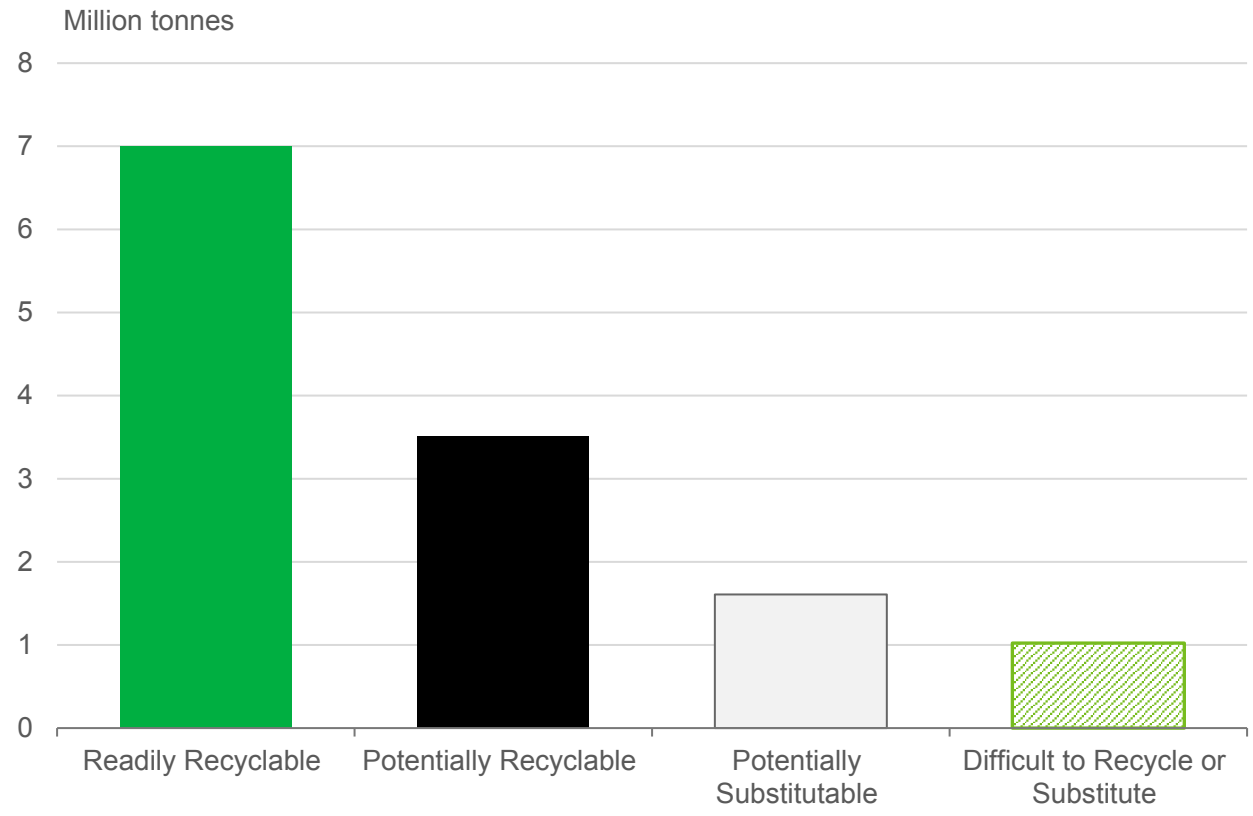



*Source(s):* WRAP (2020) Quantifying the composition of municipal waste

Chart 13 uses the compositional data described on page 33 and 34 to estimate the proportions of residual waste from household sources[34] falling into each category of 'avoidability'. 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. All figures are estimates. Further information available in Appendix B.

[34] Including household kerbside residual collections, household waste recycling centre residual waste, bulky collections and street sweepings

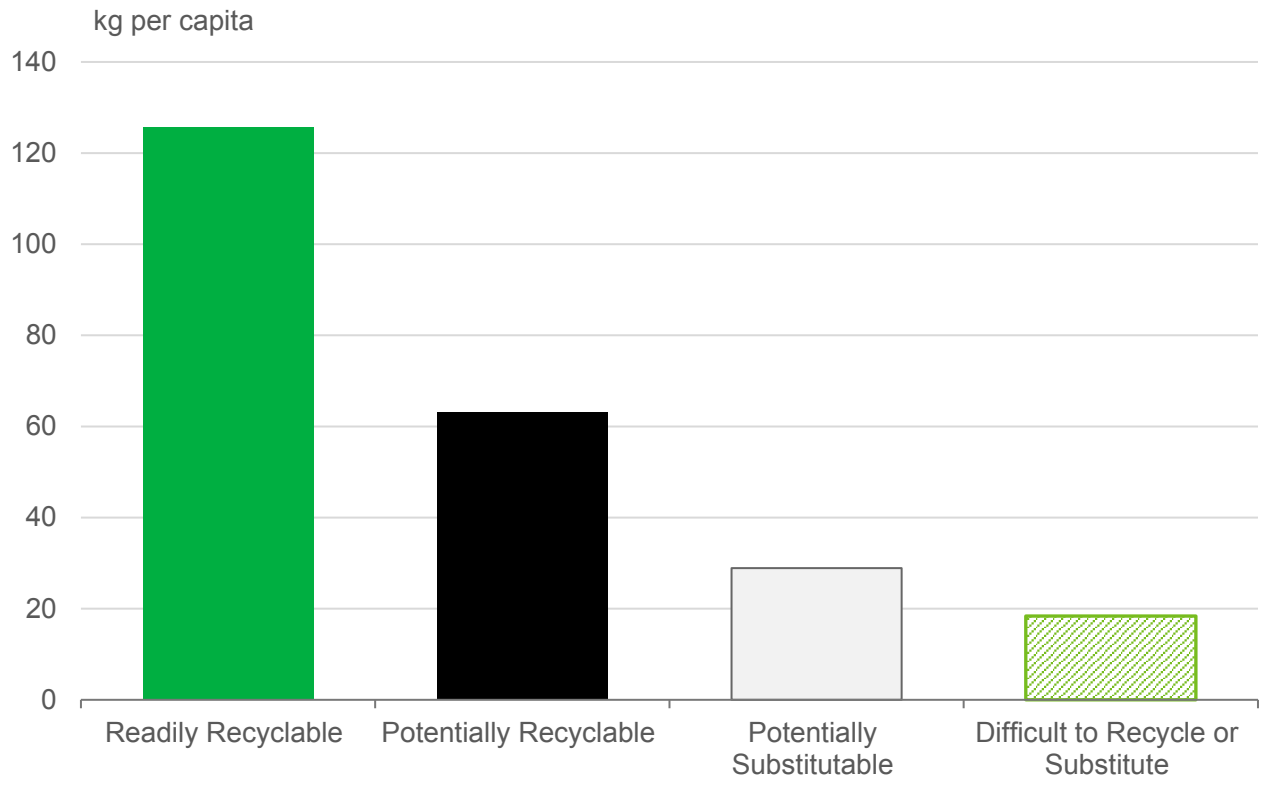
**Chart 14. Avoidable residual waste from household sources, England, 2017, million tonnes (WP2b)**




*Source(s):* WRAP (2020) Quantifying the composition of municipal waste

Of approximately 13.1 million tonnes of residual waste generated by household sources in England in 2017, around 7 million tonnes could be categorised as readily recyclable, 3.5 million tonnes as potentially recyclable, 1.6 million tonnes as potentially substitutable, and 1.0 million tonnes as difficult to recycle or substitute. All figures are estimates. Further information available in Appendix B.

**Chart 15. Avoidable residual waste from household sources, England, 2017, kg per Capita (WP2c)**



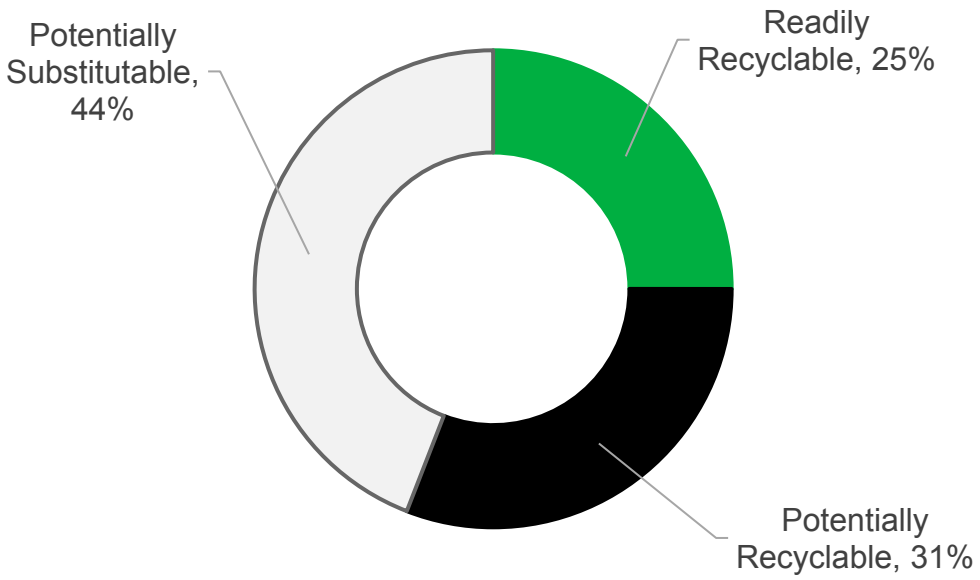

*Source(s):* WRAP (2020) Quantifying the composition of municipal waste

Office for National Statistics (2019) Estimates of the population for the UK, England and Wales, Scotland and Northern Ireland

Chart 15 places the figures in chart 14 onto a per capita basis. In 2017, and of 236 kg of residual household generated on average per person in England, 126 kg could be categorised as readily recyclable, 63 kg as potentially recyclable, 29 kg as potentially substitutable and 18 kg as difficult to recycle or substitute. All figures are estimates. Further information available in Appendix B.

## WP3. Avoidable residual plastic waste from household sources

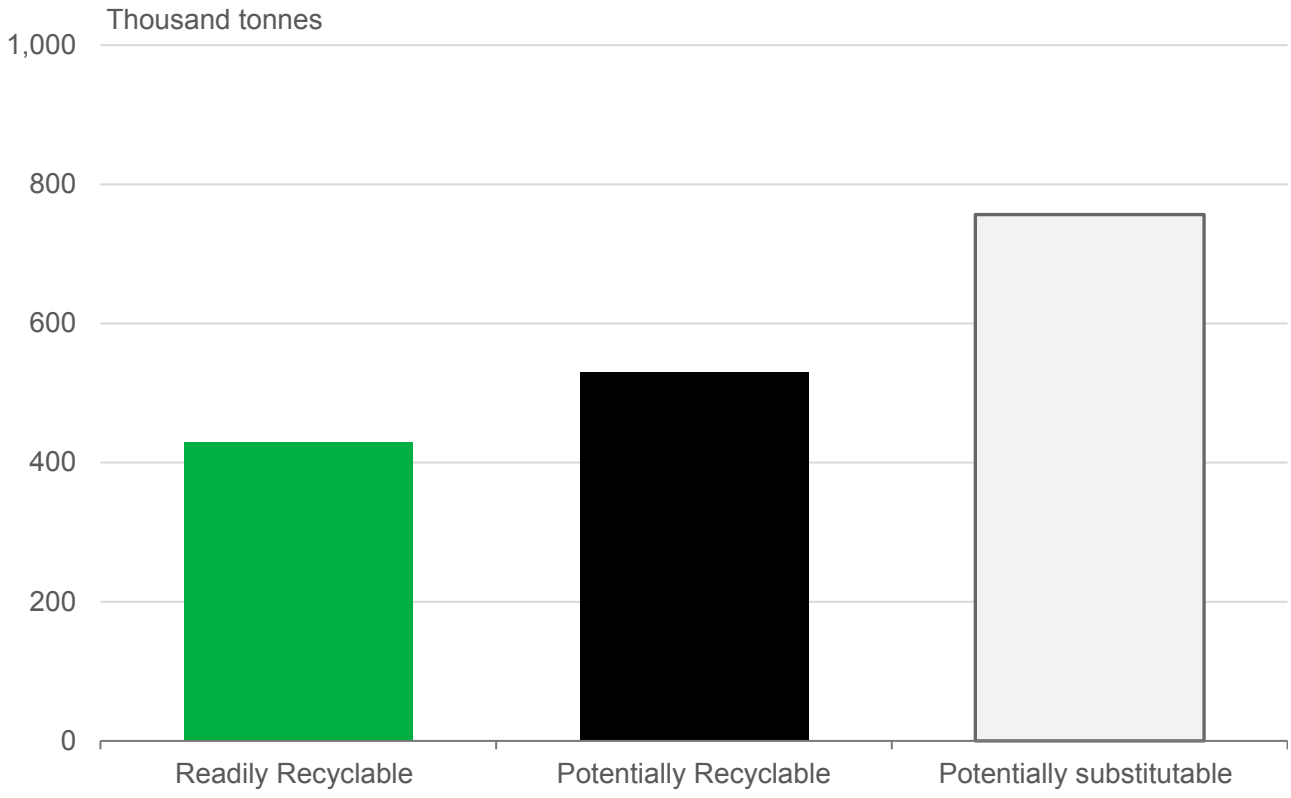
**Chart 16. Avoidable residual plastic waste from household sources, England, 2017, proportion of total waste, by category (WP3a)**




*Source(s):* WRAP (2020) Quantifying the composition of municipal waste

In 2017, approximately 13% of the residual waste from household sources in England was made up of plastic waste (1.7 million tonnes). Of the plastic waste generated by household sources in England in 2017, 25% could be categorised as readily recyclable, 31% as potentially recyclable and 44% as potentially substitutable. Further information available in Appendix B.

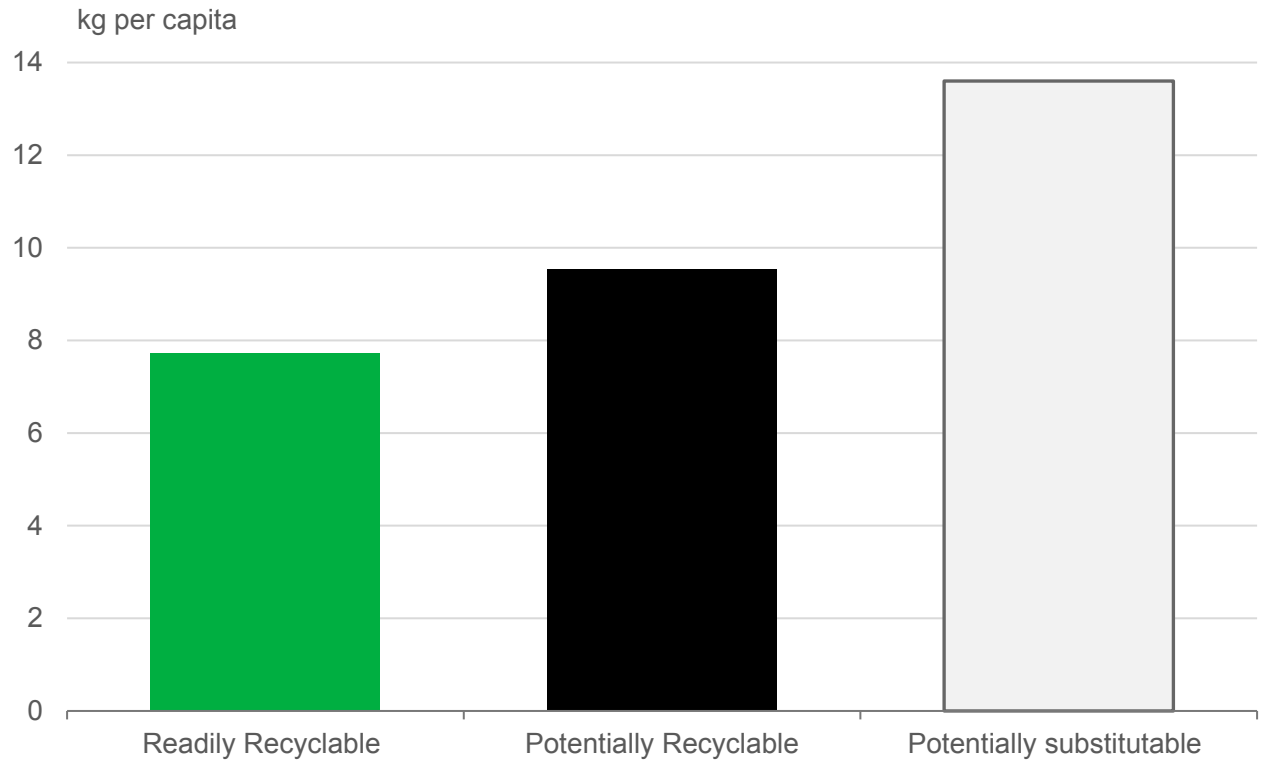
**Chart 17. Avoidable residual plastic waste from household sources, England, 2017, thousand tonnes (WP3b)**




*Source(s):* WRAP (2020) Quantifying the composition of municipal waste

Applying the proportions presented in chart 16 to volumes of residual plastic waste from household sources in England, of 1.7 million tonnes of residual plastic waste, 429 thousand tonnes could be considered as readily recyclable, 530 thousand tonnes as potentially recyclable and 757 thousand tonnes as potentially substitutable. 0 tonnes were categorised as difficult to recycle or substitute. All figures are estimates. Further information available in Appendix B.

**Chart 18. Avoidable residual plastic waste from household sources, England, 2017, kg per capita (WP3c)**




*Source(s):* WRAP (2020) Quantifying the composition of municipal waste

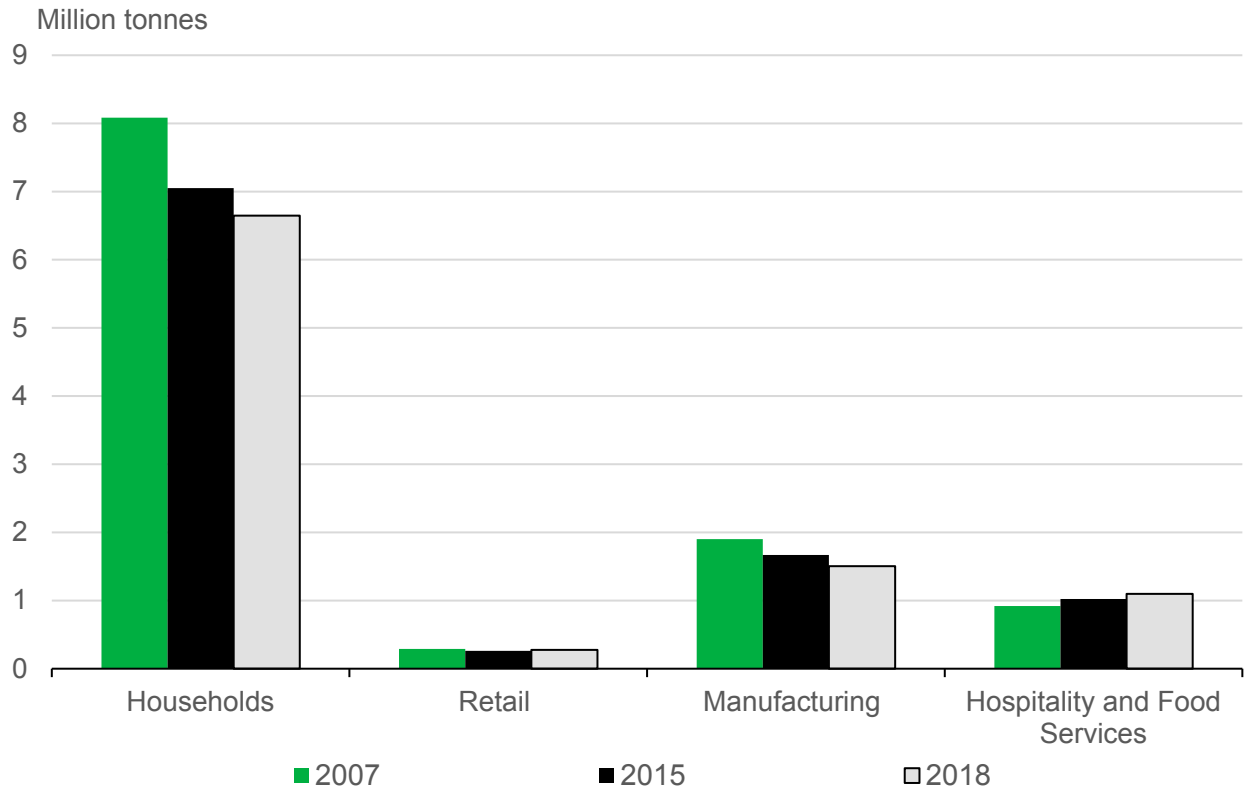
Office for National Statistics (2019) Estimates of the population for the UK, England and Wales, Scotland and Northern Ireland

Chart 18 places the figures in Chart 17 onto a per capita basis. In 2017, and of 31 kg of residual plastic waste from household sources in England per capita, 8 kg could be categorised as readily recyclable, 10 kg as potentially recyclable and 14 kg as potentially substitutable. All figures are estimates. Further information available in Appendix B.

*We recognise the complexities associated with defining and measuring avoidable waste and view this work as an area that will continue to evolve. We welcome any feedback all users have on this approach, including how and why the data are used. This helps us understand the value of statistics to external users. Contact details can be found at the beginning of this document.*

## WP4. Food and drink waste

**Chart 19. Food and drink waste production, UK, 2007 to 2018 Inclusive, million tonnes (WP4a)**

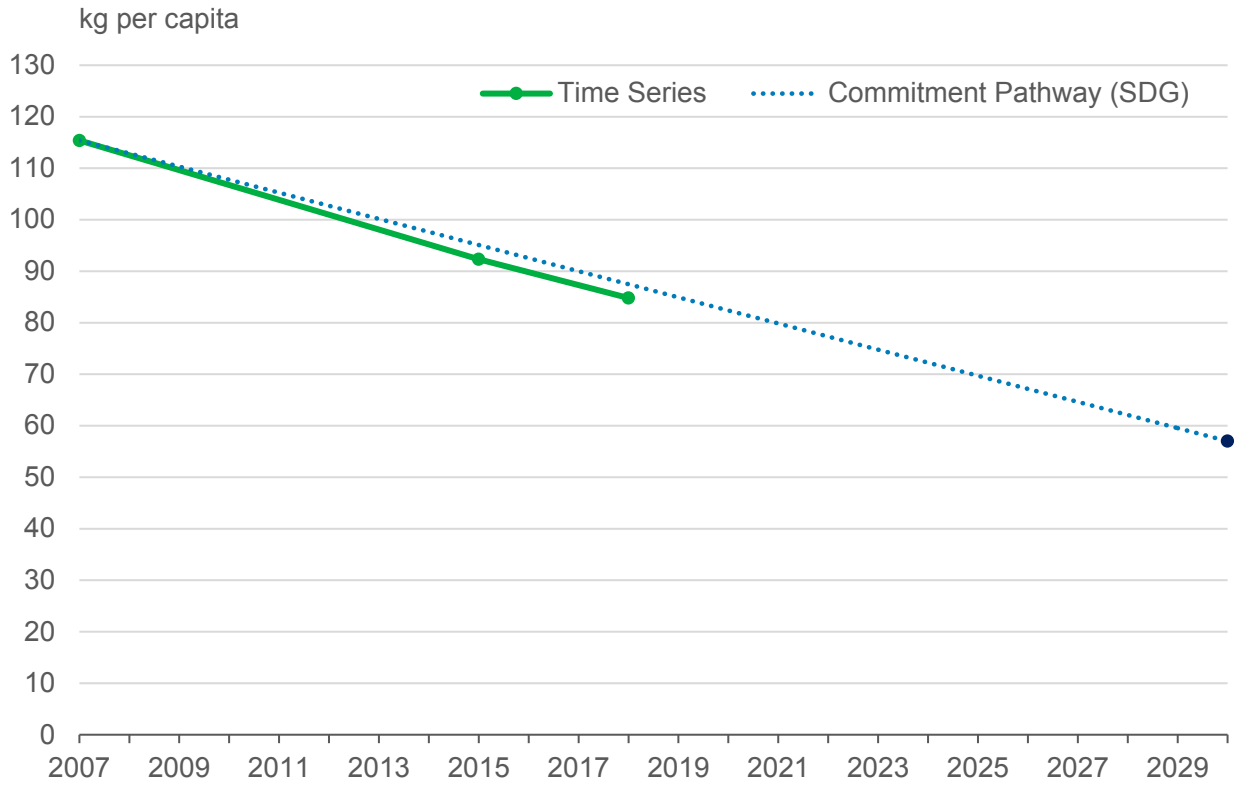



*Source(s):* WRAP (2020) Food surplus and waste in the UK – key facts

There was around 9.5 million tonnes of food waste (including inedible parts) generated in the UK in 2018, which is 15% less than in the Sustainable Development Goal 12.3 baseline year[35] (11.2 million tonnes). 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 UK 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 21% reduction in arisings against baseline). On the other hand, approximately 12% (1.1 million tonnes) of food waste in the UK in 2018 came from the hospitality and food services sector, a 19% increase in annual arisings in relation to the baseline year. Further information available at source and in Appendix B.

[35] Please note that while for graphical purposes, the SDG baseline year is presented here as 2007, the baseline varies across sources of food waste depending on when robust data first became available. A baseline year of 2007 was selected as: a) there is robust data on the largest fraction of UK food waste from that year i.e. household food waste; and b) this is when large-scale interventions began in the UK to reduce food waste. Please see data source for more information

**Chart 20. Food and drink waste produced at the retail and consumer level (excluding inedible parts), UK, 2007 to 2018 inclusive, kg per capita (WP4b (i))**




*Source(s):* WRAP (2020) Food surplus and waste in the UK – key facts

WRAP (2020) UK progress against Courtauld 2025 targets and UN Sustainable Development Goal 12.3

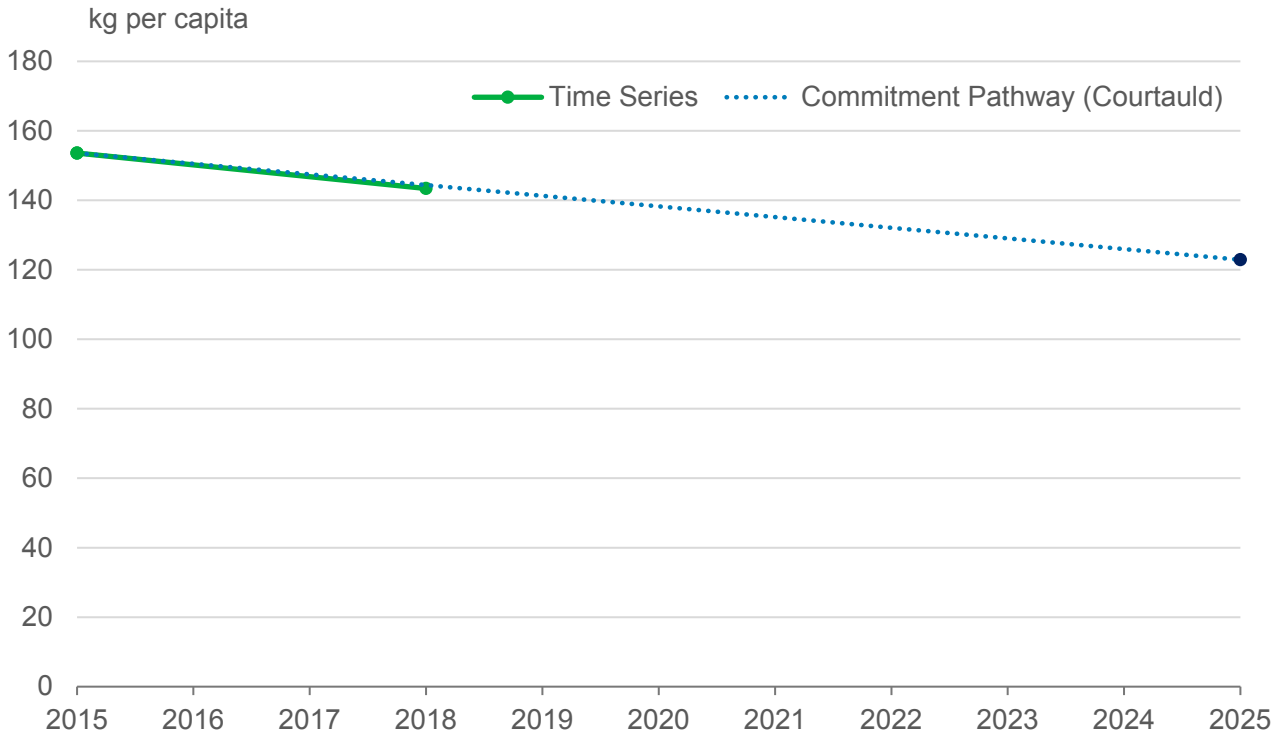
Office for National Statistics (2019) Estimates of the population for the UK, England and Wales, Scotland and Northern Ireland

Per capita food waste generated at the retail and consumer level in the UK excluding inedible parts fell by approximately 26% between the SDG 12.3 baseline year[36] and 2018, declining from 115 kg to 85 kg.

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. Further information available at source and in Appendix B.

[36] Please note that while for graphical purposes, the SDG baseline year is presented here as 2007, the baseline varies across sources of food waste depending on when robust data first became available. A baseline year of 2007 was selected as: a) there is robust data on the largest fraction of UK food waste from that year i.e. household food waste; and b) this is when large-scale interventions began in the UK to reduce food waste. Please see data source for more information

**Chart 21. Total food and drink waste produced (including inedible parts), UK, 2015 to 2018 inclusive, kg per capita (WP4b (ii))**




*Source(s):* WRAP (2020) Food Surplus and Waste in the UK – Key Facts

WRAP (2020) UK progress against Courtauld 2025 targets and UN Sustainable Development Goal 12.3

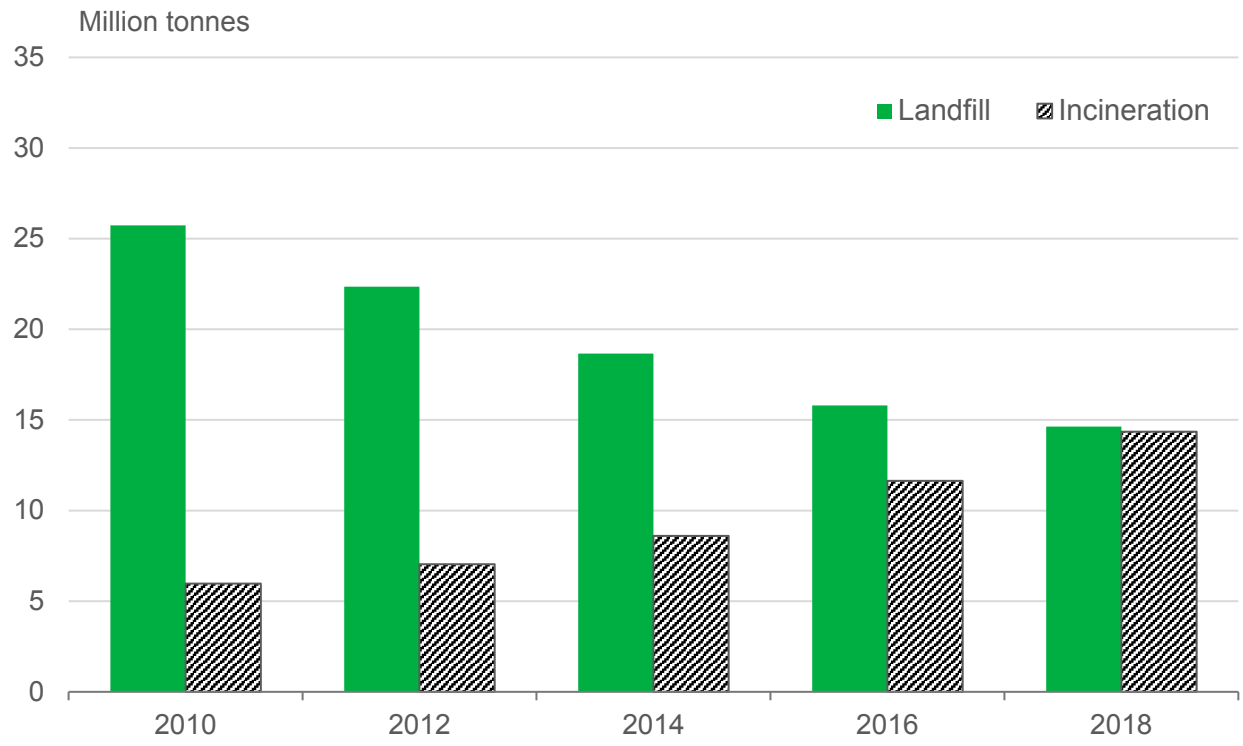
Office for National Statistics (2019) Estimates of the population for the UK, England and Wales, Scotland and Northern Ireland

Per capita food waste generated in the UK including inedible parts fell by approximately 7% between 2015 and 2018, from 154 kg to 143 kg.

The Courtauld 2025 ambition to reduce per capita food waste (including inedible parts) by a fifth by 2025 in relation to 2015 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 commitment. 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 UK. Further information available at source and in Appendix B.

## WP5. Residual waste

**Chart 22. Total waste (excluding major mineral wastes) landfilled or incinerated, England, 2010 to 2018 Inclusive, million tonnes (WP5a)**



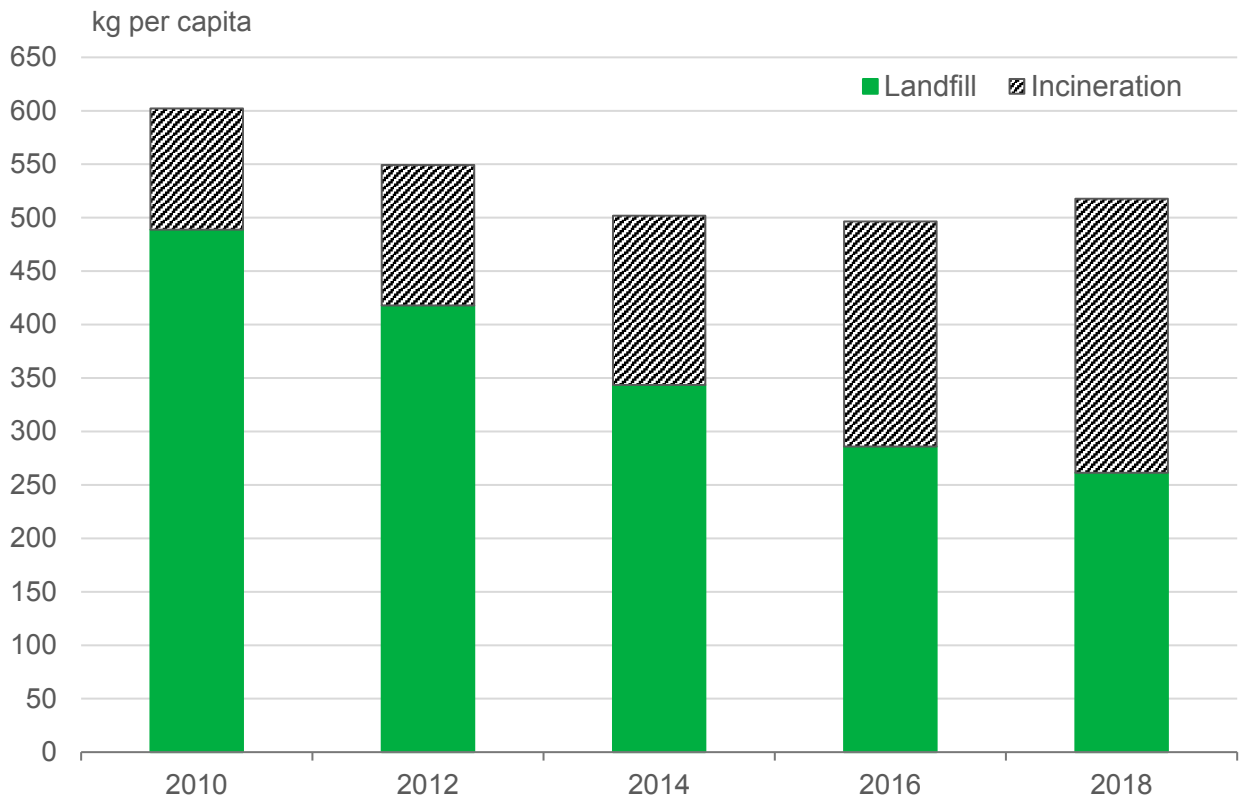

*Source(s):* Environment Agency (2020) Waste Data Interrogator 2018

29.0 million tonnes of waste (excluding major mineral wastes)[37] was landfilled or incinerated[38] in England in 2018, 8.6% less than in 2010 (31.7 million tonnes).

This overall decline was due to less waste being landfilled (falling by almost half over the total period), whereas waste sent to incineration more than doubled in the same time. Further information available at source and in Appendix B.

[37] Major mineral wastes are, according to Eurostat and the European Waste Classification for Statistical Purposes (EWC-Stat, version 4), mineral construction and demolition waste (EWC-Stat 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).
[38] A waste treatment technology involving the combustion of organic materials and substances. Incineration and other high temperature waste systems are described as 'thermal treatment'.

**Chart 23. Total waste (excluding major mineral wastes) landfilled or incinerated, England, 2010 to 2018 inclusive, kg per capita (WP5b)**



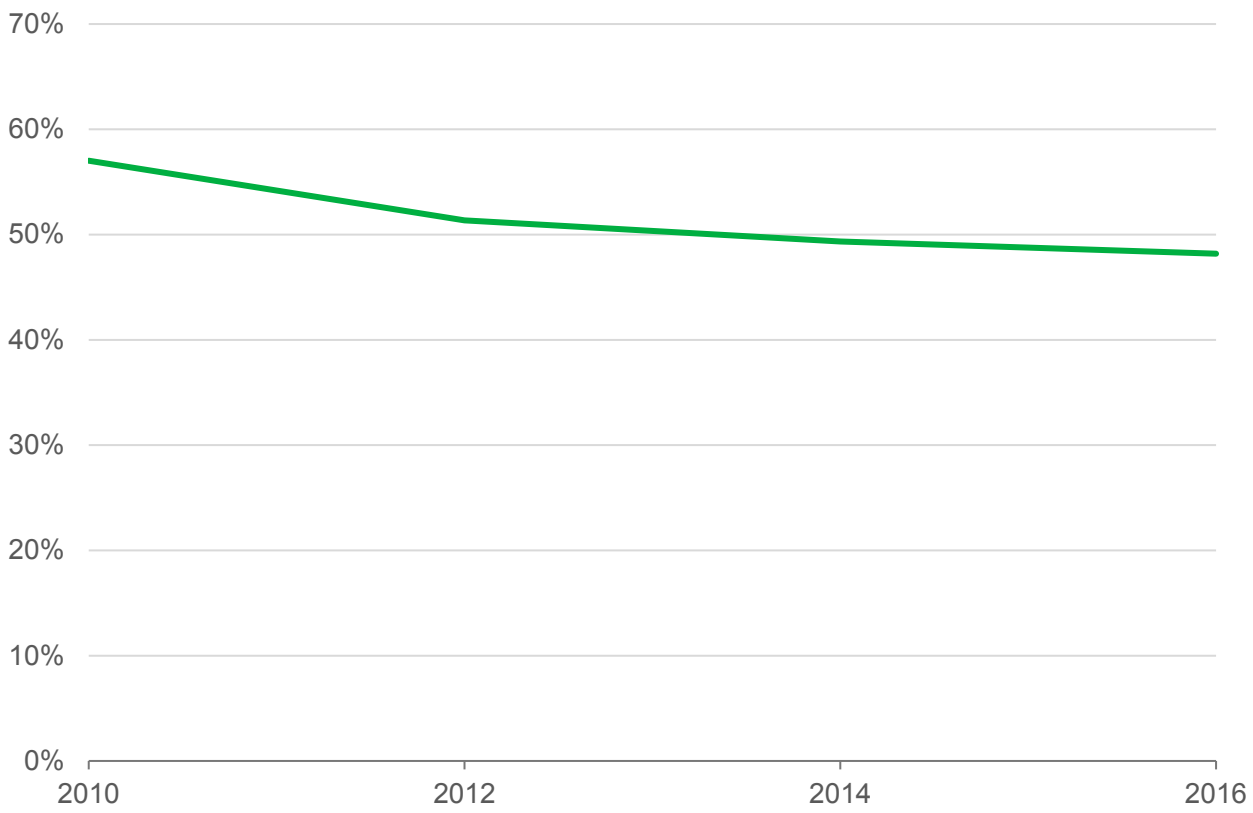

*Source(s):* Environment Agency (2020) Waste Data Interrogator 2018

Office for National Statistics (2019) Estimates of the population for the UK, England and Wales, Scotland and Northern Ireland

Per capita waste (excluding major mineral wastes) landfilled or incinerated in England fell by 14.0% between 2010 and 2018, from 602.2 kg to 517.7 kg.

Waste landfilled in England on a per capita basis fell by 46.5% in this period, from 488.9 kg to 261.4 kg, while waste incinerated on a per capita basis more than double in the same period, rising from 113.4 kg per capita to 256.3 kg. Further information available at source and in Appendix B.

**Chart 24. Total waste (excluding major mineral wastes) landfilled or incinerated, England, 2010 to 2016 Inclusive, percentage of total waste produced (excluding major mineral wastes) (WP5c)**




*Source(s):* Environment Agency (2020) Waste Data Interrogator 2018

Department for Environment, Food and Rural Affairs (2019) ENV23 - UK statistics on waste, Table 5.1

The percentage of waste generated in England (excluding major mineral wastes) sent to landfill or incineration fell by 8.8 percentage points between 2010 and 2016, from 57.0 per cent to 48.2 per cent. Further information available at source and in Appendix B.

## 3.4 Recycling

The indicators of recycling help us understand which quantity of the stock of resources we use, then re-enters the economic system through being recycled.

Recycling is environmentally desirable in relation to other forms of waste treatment further down the waste hierarchy e.g. landfilling, as it has the potential to offset the need to use raw materials. Nevertheless, recycling is still associated with emissions and environmental impacts that would not have arisen had waste been avoided in the first place. The desired direction for all recycling rates is up.

Improvements in 'Waste from Households' and Local Authority Collected Waste recycling rates have slowed in recent years. We aim to further increase recycling rates through ensuring a consistent set of dry recyclable materials is collected from all households and businesses, and by introducing new recycling targets for municipal and packaging waste.

Ensuring a consistent set of dry recyclable materials is collected from all households will help cut confusion over recycling. We are monitoring surveys of resident satisfaction with waste collection services, such as those undertaken three times a year by the Local Government Association,[39] to track that this policy is cutting confusion and increasing resident satisfaction with waste collections.

Recovery levels for non-hazardous construction and demolition waste remain high, having changed little over the period for which we have data.

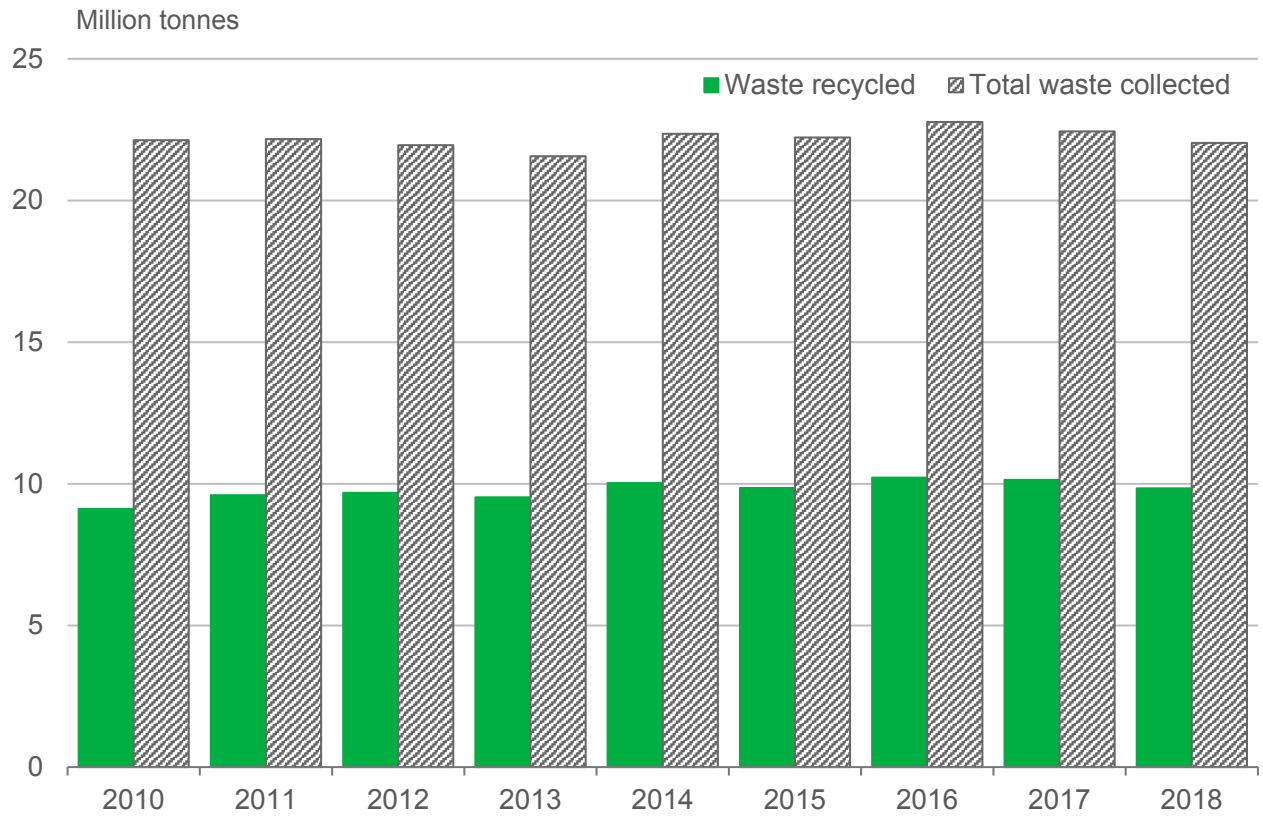
Recycling rates for packaging vary by material, but overall have not increased substantially since 2008. Through the Extended Producer Responsibility and Deposit Return schemes being introduced through the Resources and Waste Strategy, we aim to see packaging recycling rates increase further.

Further information on the treatment of waste by disposal route for England can be found within the UK Statistics on Waste.

[39] Local Government Association (2020) Residents Satisfaction Surveys

## RC1. ‘Waste from Households’ recycled

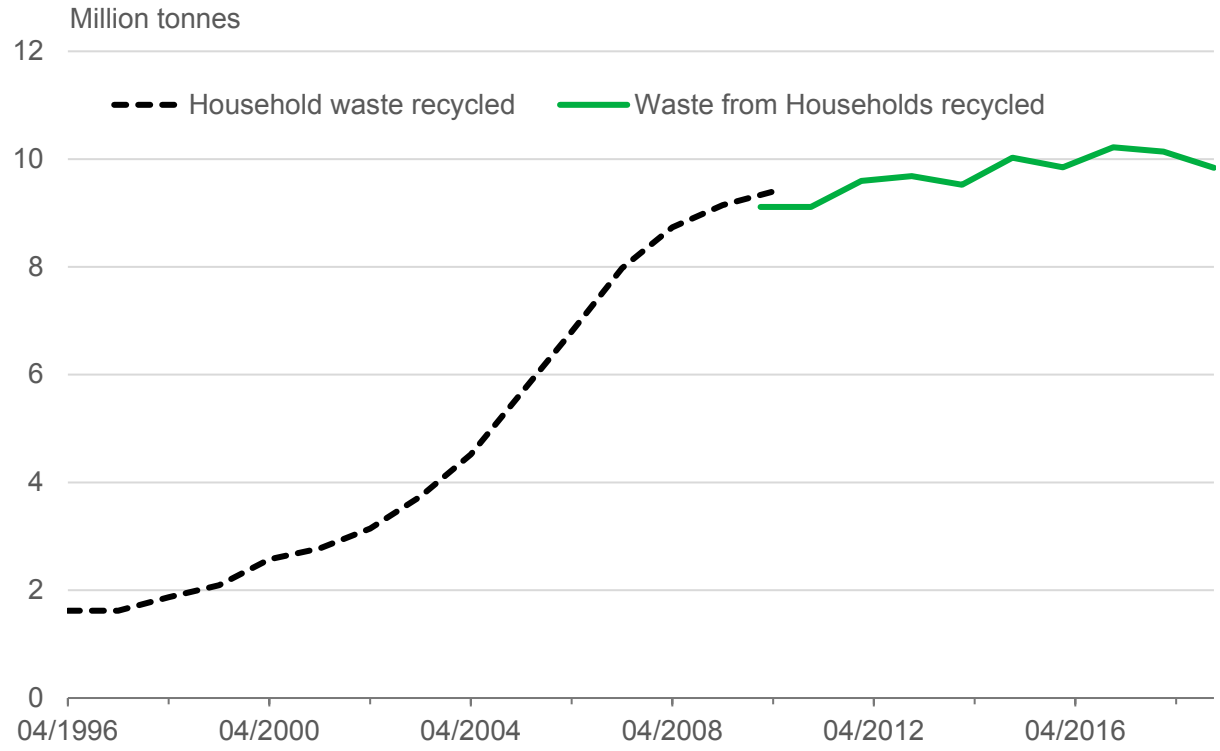
**Chart 25. ‘Waste from Households’ recycled, composted or prepared for reuse, England, 2010 to 2018 inclusive, million tonnes (RC1a)**




*Source(s):* Department for Environment, Food and Rural Affairs (2019) ENV18 - Local authority collected waste: annual results tables

‘Waste from Households’ is the agreed harmonised UK measure used to report household recycling to comply with the Waste Framework Directive (2008/98/EC). In England, 9.8 million tonnes of ‘Waste from Households’ (WfH) was recycled, composted or prepared for reuse in 2018. This is almost a tenth (8.0%) more than in 2010 (9.1 million tonnes), though down slightly on 2016. Between 2010 and 2013, WfH collected remained at a relatively constant level before increasing to 2016, and falling since. Further information available at source and in Appendix B.

**Chart 26. 'Household Waste' and 'Waste from Households' recycled, composted or reused, England, 1996/97 to 2018 Inclusive**



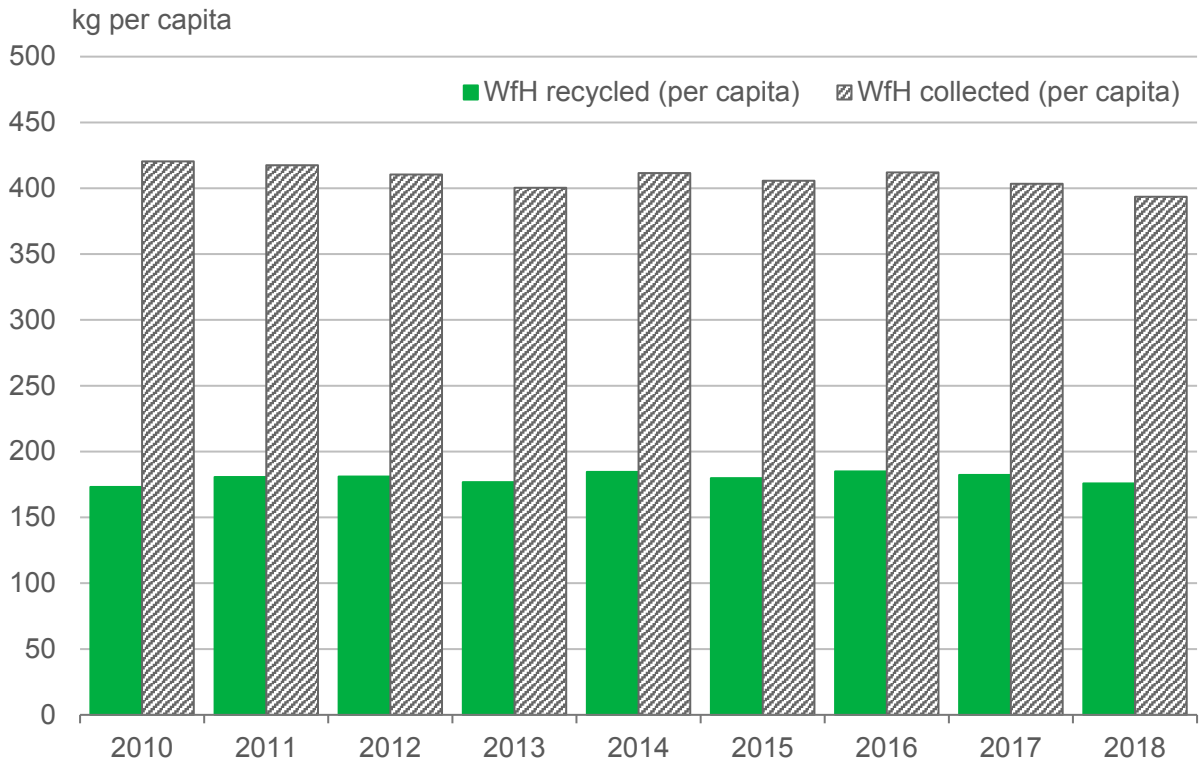

*Source(s):* Department for Environment, Food and Rural Affairs (2019) ENV18 - Local authority collected waste: annual results tables

Department for Environment, Food and Rural Affairs (2019) Household recycling by material and region, England. 1996/97 to 2009/10

The measure "Household waste" (HH) is slightly broader than "Waste from Households" and includes waste from street bins, street sweepings, parks and grounds. As HH waste has been tracked since 1996/97, it provides a longer period across which to examine changes in the quantity of recycling for a similar waste stream to 'Waste from Households'.

'HH waste' recycled was almost six times as high in 2009/10 (9.4 million tonnes) as in 1996/97 (1.6 million tonnes). From 2010, the quantity of "Waste from Households" recycled, composted or reused has continued to increase but at a slower rate, while since 2016, it has fallen.

**Chart 27. 'Waste from Households' recycled, composted or prepared for reuse, England, 2010 to 2018 inclusive, kg per capita (RC1b)**

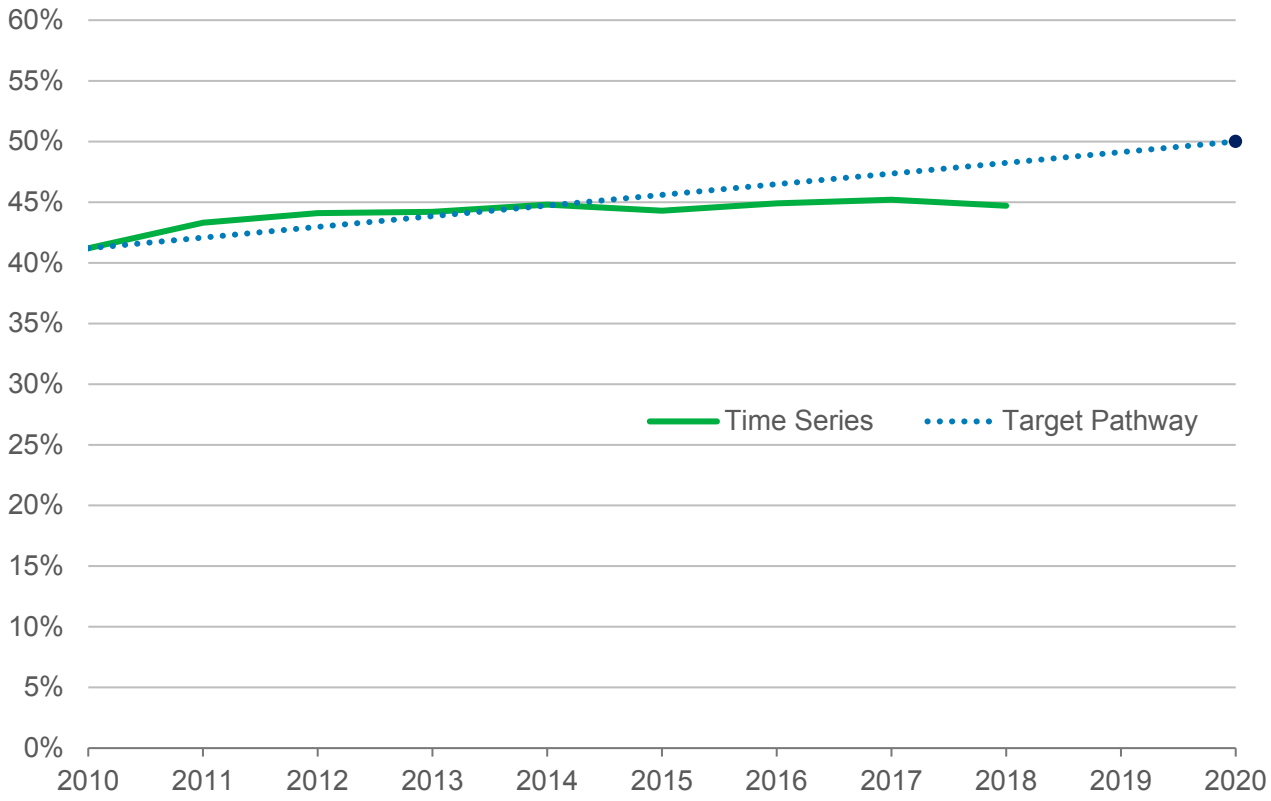



*Source(s):* Department for Environment, Food and Rural Affairs (2019) ENV18 - Local authority collected waste: annual results tables

Office for National Statistics (2019) Estimates of the population for the UK, England and Wales, Scotland and Northern Ireland

'Waste from Households' (WfH) recycled, composted or prepared for reuse in England on a per capita basis, increased marginally between 2010 and 2018, from 173.1 to 175.8 kg. Since 2016, however, when figures peaked at 184.9 kg, per capita WfH recycled has fallen. Further information available at source and in Appendix B.

**Chart 28. 'Waste from Households' recycled, composted or prepared for reuse, England, 2010 to 2018 inclusive, percentage of total 'Waste from Households' (RC1c)**




*Source(s):* Department for Environment, Food and Rural Affairs (2019) ENV18 - Local authority collected waste: annual results tables

The percentage of 'Waste from Households' in England recycled, composted or prepared for reuse, increased from 41.2% in 2010 to 44.8% in 2014 and has remained broadly flat since (44.7% in 2018).

A linear pathway is shown to represent the average annual improvement needed to reach the Waste Framework Directive's target of 50% of 'Waste from Households' being recycled, composted or reused by 2020 from recycling levels in 2010. Since 2015, year-on-year change in the recycling rate has been insufficient to keep up with the average annual increase required to hit this target. Further information available at source and in Appendix B.

**Table 3.3. Net greenhouse gas emissions from the management of 'Waste from Households', by treatment method, England, 2017, million tonnes carbon dioxide equivalent ($MtCO_2e$) (RC1d)**

| | *Million tonnes* |
|---|---|
| **Net emissions (all treatment methods)** | **+0.0572** |
| *Of which* | |
| Landfill | +2.06 |
| Composting | +0.264 |
| Energy from Waste | +0.138 |
| Open loop recycling | +0.0523 |
| | |
| Anaerobic digestion | -0.0367 |
| Closed loop recycling | -2.42 |

*Data source(s):* Wrap (2020) English Carbon Metric, forthcoming

The estimated annual net greenhouse gas (GHG) emissions associated with the treatment of waste from households in England in 2017, was 57.2 thousand tonnes $CO_2e$. This estimate is based on provisional data.

In isolation, all waste management processes are emitters of greenhouse gases and it is important to note that processes such as recycling cannot, in themselves, produced negative emissions. Rather, they can only *contribute* to offsetting emissions that might have otherwise 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 in table 3.3 reflect both the amount of 'Waste from Households' being treated under each waste management process and the net greenhouse gas emissions per tonne of waste treated. Estimates of emissions are on the basis of emissions produced directly by the process, net of any savings as described above. For example, emissions from recycling are calculated as emissions from waste collection, transport and the recycling process, minus emissions avoided through offsetting the need for the use of as much virgin material.

Based on this method, closed-loop recycling of 'Waste from Households' in England saved 2.4 million tonnes $CO_2e$ in 2017 when accounting for avoiding the need for some virgin material, while anaerobic digestion of waste saved 37 thousand tonnes $CO_2e$ through electricity generation and offsetting nitrate fertilisers.

On the other hand, composting generated an estimated 264 thousand tonnes $CO_2e$ in 2017 (net of allowing for nitrate fertilisers saved), energy from waste treatment generated 138 thousand tonnes $CO_2e$ (after allowing for emissions saved from generation of heat

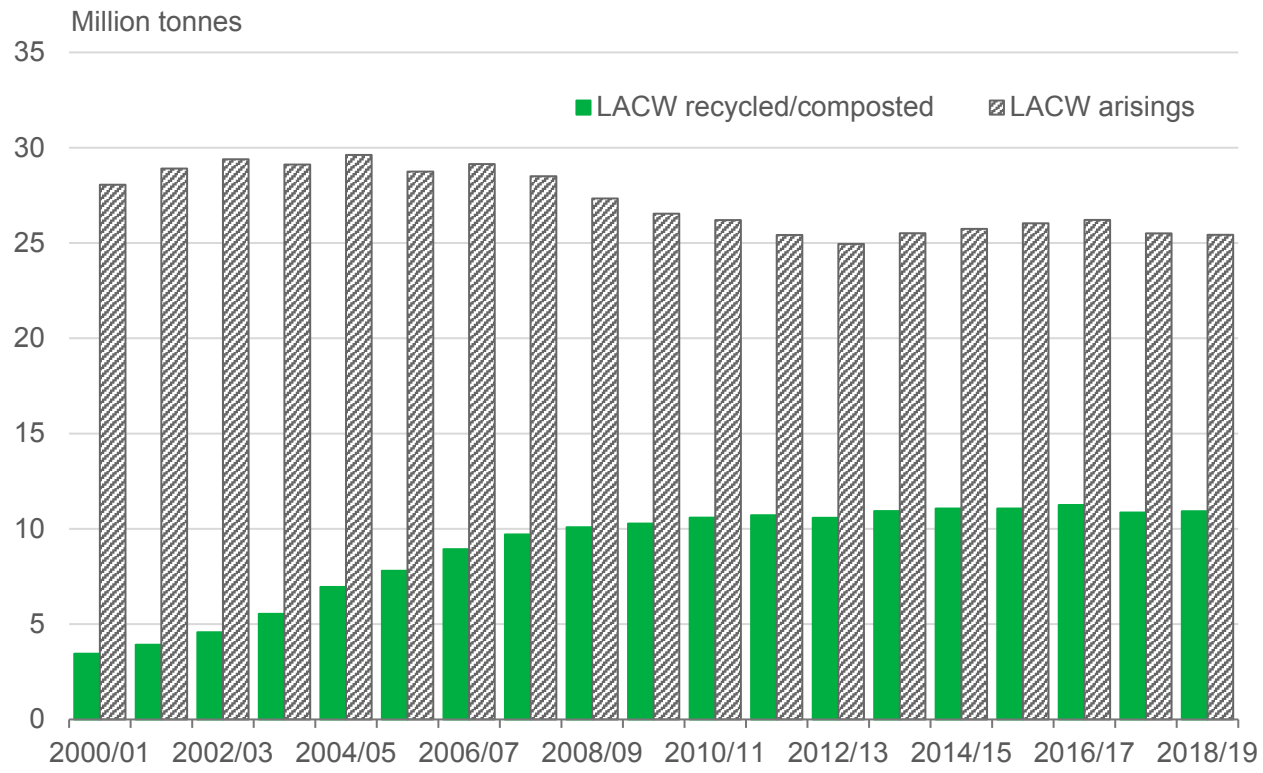
and power), and open loop recycling, 52 thousand tonnes $CO_2e$ (net of emissions saved by avoiding virgin material). Landfill as a treatment generated the greatest quantity of emissions (approximately 2.1 million tonnes $CO_2e$ each year) when accounting for emissions which could have otherwise been avoided through alternative treatment e.g. recycling.

Relative to the level of emissions which could be expected to arise if all waste were treated in a manner producing greatest emissions savings (-9.5 million tonnes $CO_2e$ per annum), versus treated in the manner producing greatest emissions (13.8 million tonnes $CO_2e$ per annum), we are approximately 59% of the way towards the maximum possible emissions savings associated with the management of 'Waste from Households' in England. Further information available at source and in Appendix B.

## RC2. Municipal waste recycled

*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.*

**Chart 29. Local Authority Collected Waste recycled or composted, England, 2000/01 to 2018/19 inclusive, tonnes (RC2a)**

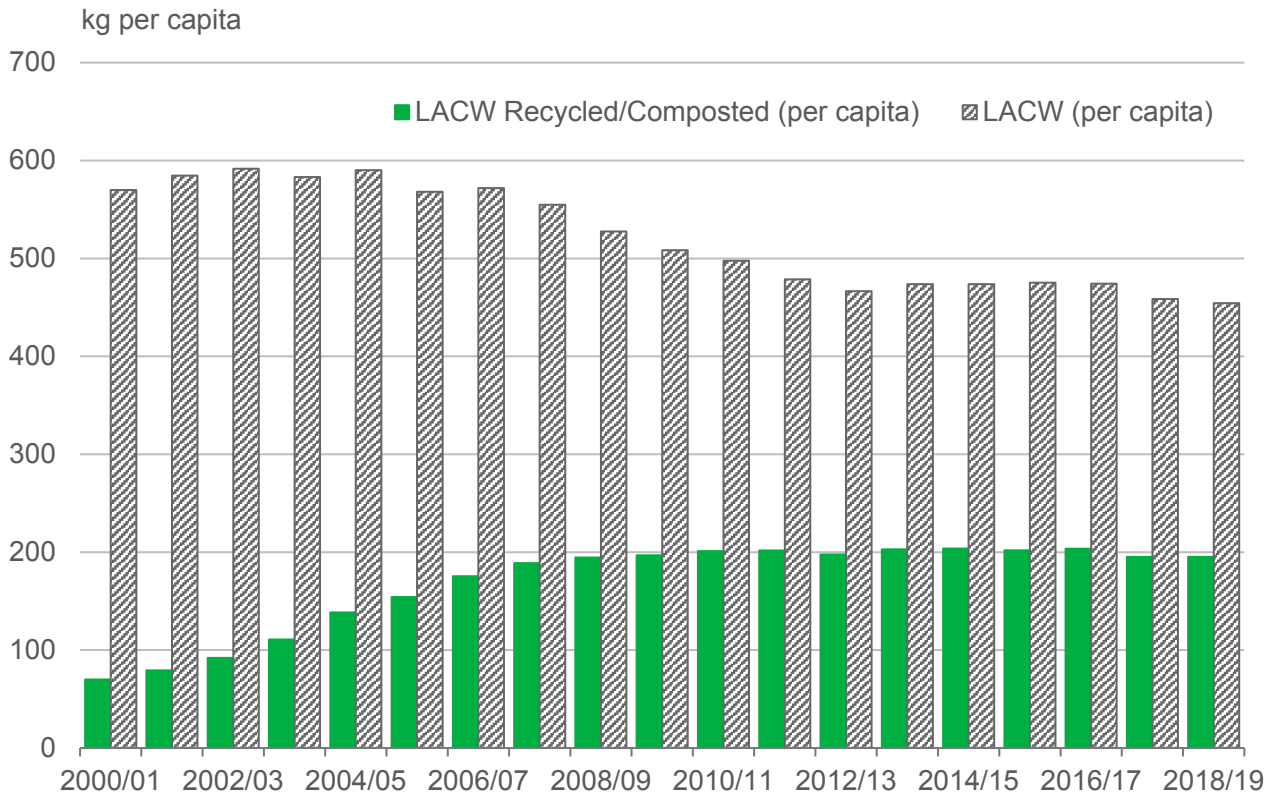



*Source(s):* Department for Environment, Food and Rural Affairs (2019) ENV18 - Local authority collected waste: annual results tables

Almost three times more Local Authority Collected Waste (LACW) in England was sent for recycling or composting in 2018/19 than in 2000/01, rising from 3.4 million tonnes to 10.9 million tonnes.

This has occurred within the context of LACW arisings falling by 9.4% during this period (from 28.0 to 25.4 million tonnes). Since 2016/17, as with 'Waste from Household' recycling, LACW tonnages recycled have dipped slightly, though by a similar amount to the mass of waste collected by local authorities. Further information available at source and in Appendix B.

**Chart 30. Local Authority Collected Waste recycled or composted, England, 2000/01 to 2018/19 inclusive, kg per capita (RC2b)**



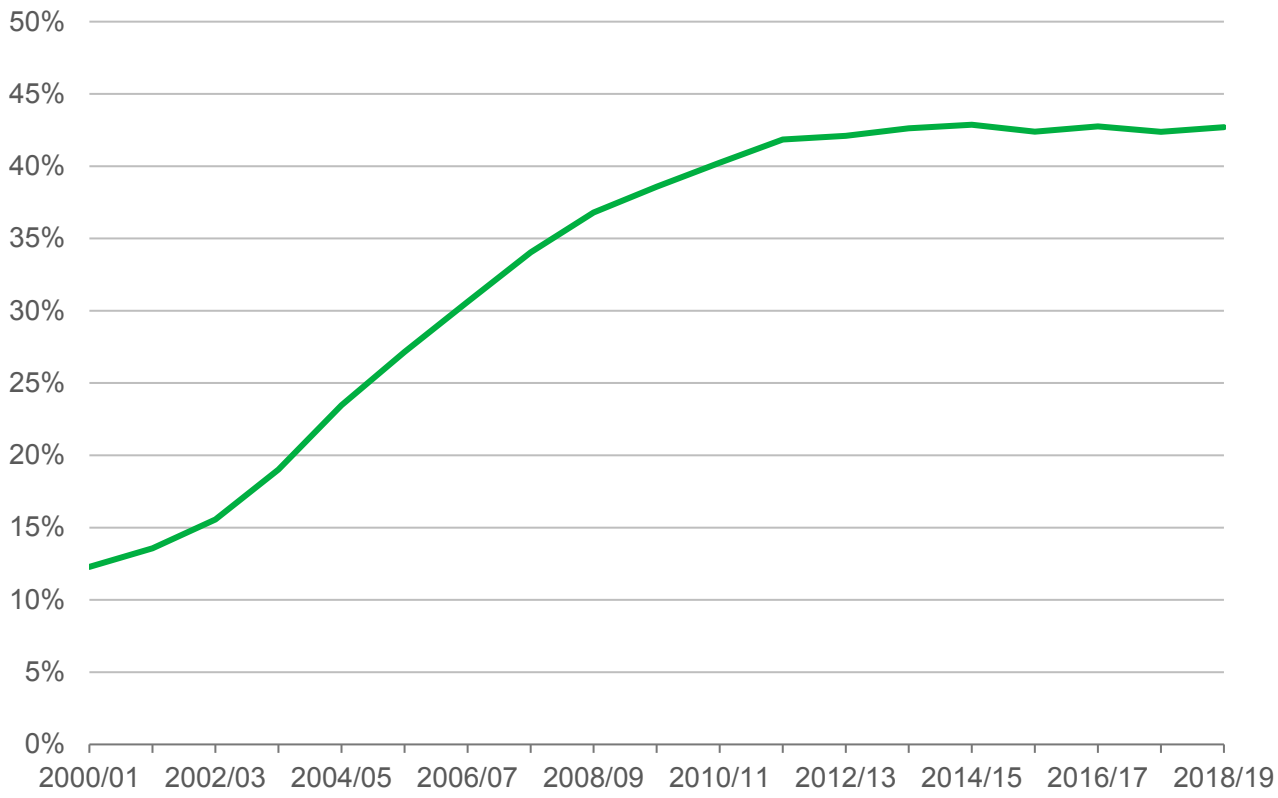

*Source(s):* Department for Environment, Food and Rural Affairs (2019) ENV18 - Local authority collected waste: annual results tables

Office for National Statistics (2019) Estimates of the population for the UK, England and Wales, Scotland and Northern Ireland

Local Authority Collected Waste (LACW) sent for recycling or composting on a per capita basis was over 2.5 times higher in 2018/19 than in 2000/01, having increased from 70.0 kg to 195.2 kg.

There has been a tailing off in the per capita quantity of LACW recycled or composted since 2008/09, and a decline since 2016/17. LACW arisings on a per capita basis fell by a fifth (20.3%) between 2000/1 and 2018/19. Further information available at source and in Appendix B.

**Chart 31. Local Authority Collected Waste recycled or composted, England, 2000/01 to 2018/19 inclusive, percentage of total Local Authority Waste (RC2c)**




*Source(s):* Department for Environment, Food and Rural Affairs (2019) ENV18 - Local authority collected waste: annual results tables

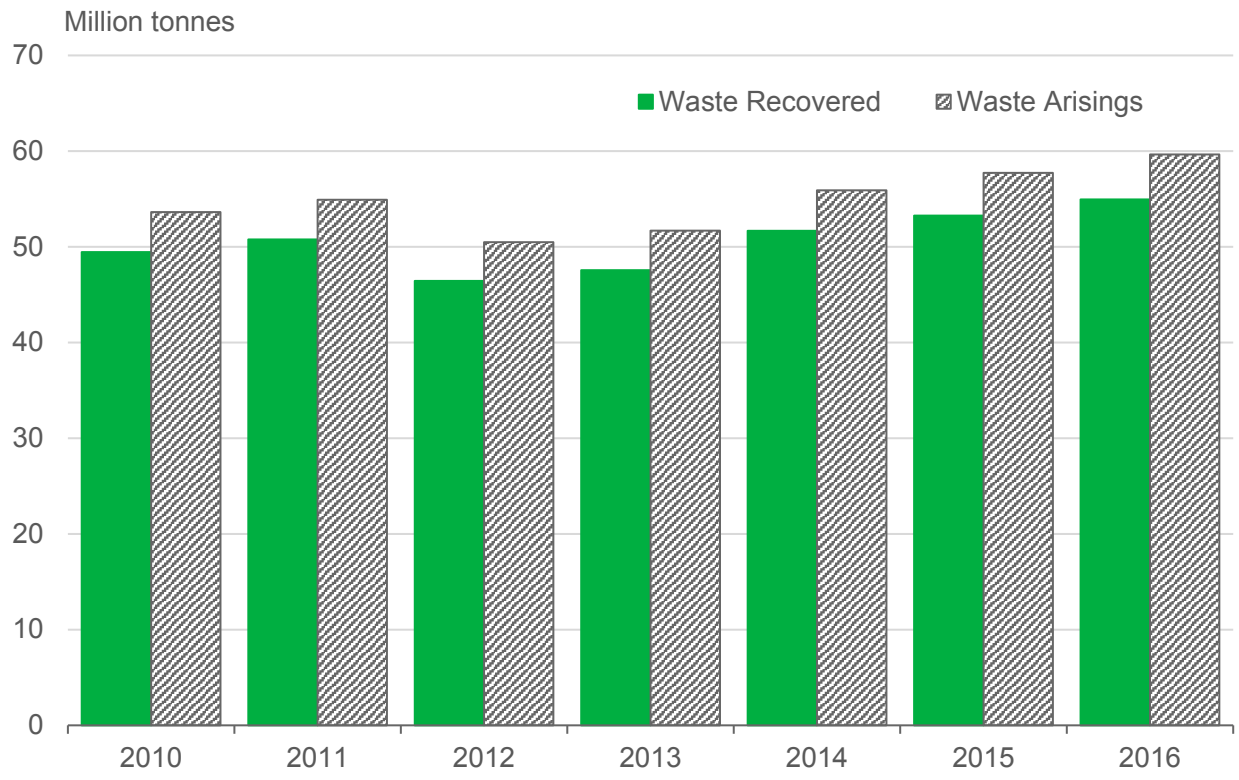
The percentage of Local Authority Collected Waste (LACW) sent for recycling or composting more than trebled between 2000/01 and 2018/19, from 12.0% to 42.7%. Nevertheless, since 2013/14, the recycling rate for LACW has remained stable and has not increased significantly. Further information available at source and in Appendix B.

## RC3. Commercial and industrial waste recycled

*This indicator is currently under development.*

## RC4. Construction and demolition waste recovered

**Chart 32. Non-hazardous construction and demolition waste recovered, England, 2010 to 2016 Inclusive, tonnes (RC4a)**



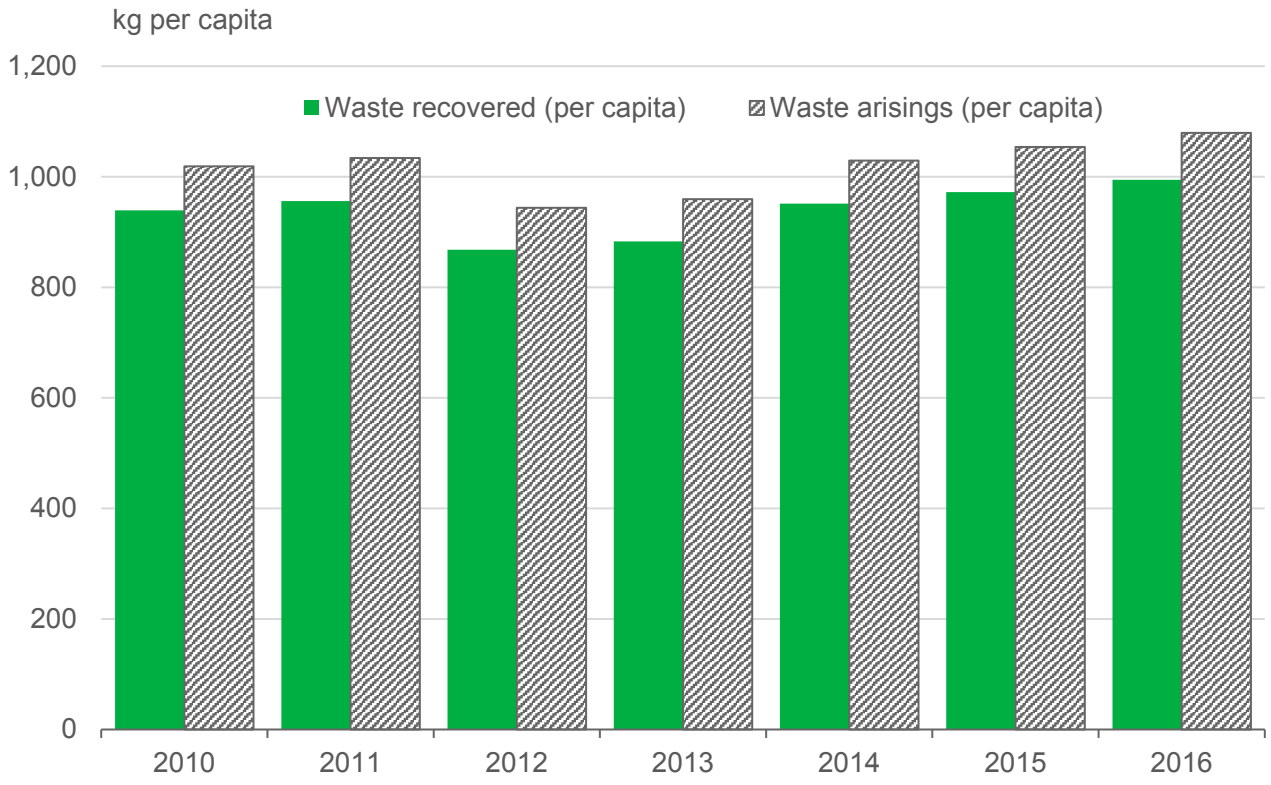

*Source(s):* Department for Environment, Food and Rural Affairs (2020) ENV23 - UK statistics on waste, Table 3.1.

The construction sector has achieved significant improvements in diverting waste from landfill, though it remains one of the highest contributors to waste production in England. Non-hazardous construction and demolition waste recovered[40] increased by about a tenth between 2010 and 2016, rising from 49.4 to 55.0 million tonnes.

Non-hazardous construction and demolition waste generated was estimated to increase by roughly the same percentage in this period, rising from 53.6 million tonnes to 59.6 million tonnes. Estimates of the recovery rate for non-hazardous construction and demolition waste have been calculated for the purposes of reporting against the EC Waste Framework Directive. Further information available at source and in Appendix B.

[40] Recovery refers to waste being either recycled or reused in some form, while also including backfilling

**Chart 33. Non-hazardous construction and demolition waste recovered, England, 2010 to 2016 inclusive, kg per capita (RC4b)**

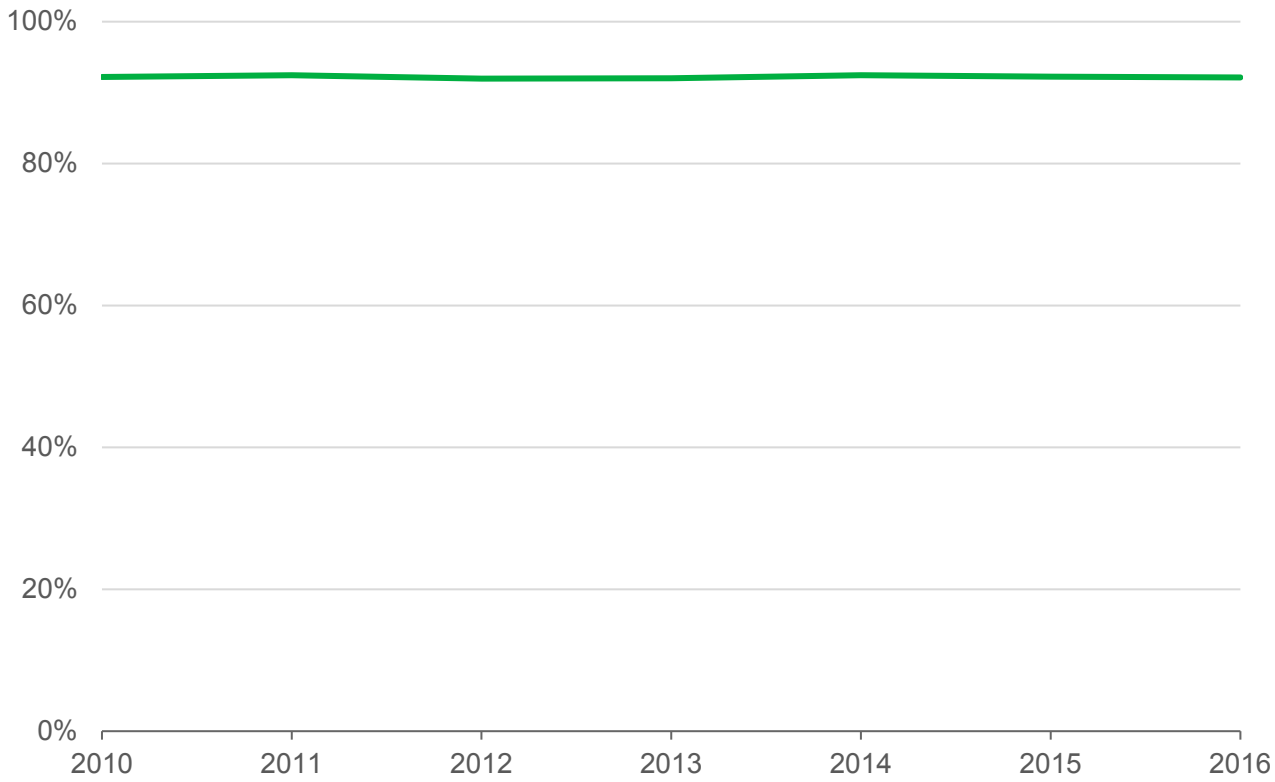



*Source(s):* Department for Environment, Food and Rural Affairs (2020) ENV23 - UK statistics on waste, Table 3.1.

Office for National Statistics (2019) Estimates of the population for the UK, England and Wales, Scotland and Northern Ireland

Per capita non-hazardous construction and demolition waste recovered in England increased by 5.9% between 2010 and 2016, from 939.2 to 994.4 kg in 2016. Also between 2010 and 2016, per capita non-hazardous construction and demolition waste arisings also are estimated to have increased by the same rate, of 5.9% (from 1,018.7 kg to 1,079.3 kg). Further information available at source and in Appendix B.

**Chart 34. Non-hazardous construction and demolition waste recovered, England, 2010 to 2016 inclusive, percentage of total waste (RC4c)**



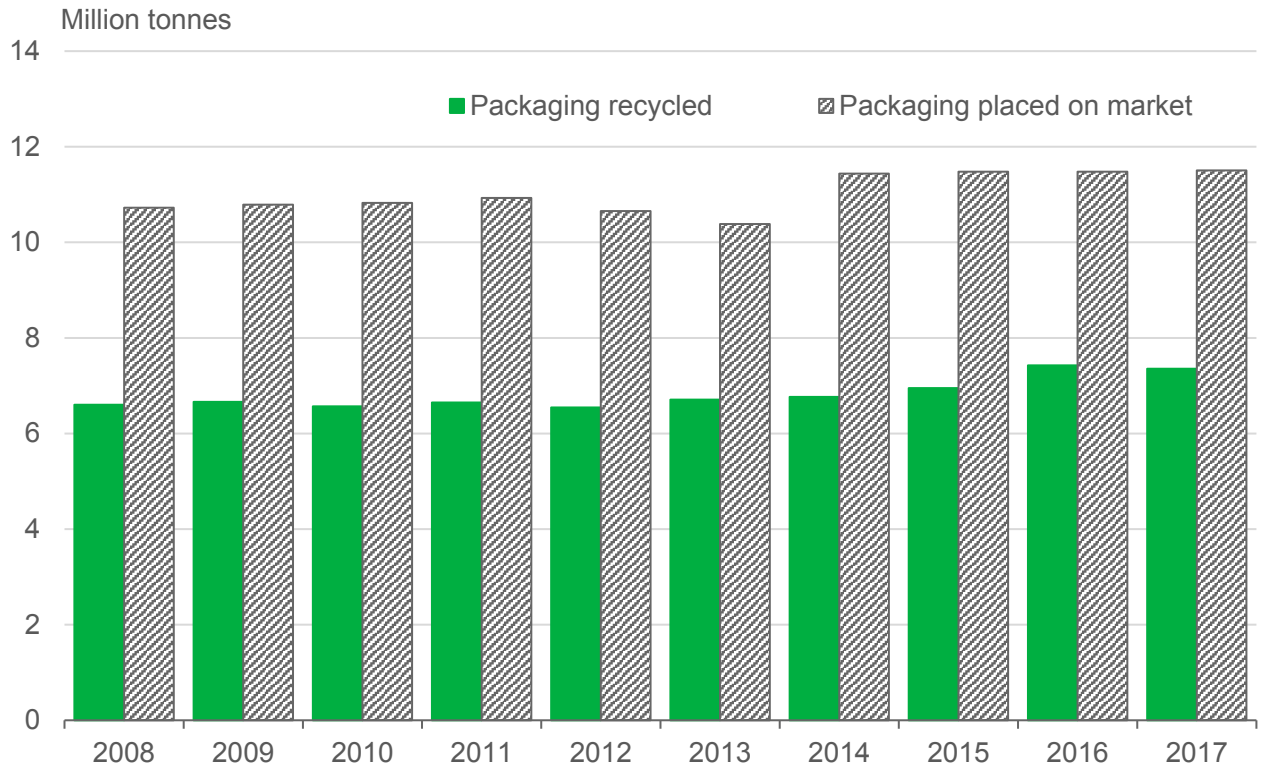

*Source(s):* Department for Environment, Food and Rural Affairs (2020) ENV23 - UK statistics on waste, Table 3.1.

The percentage of non-hazardous construction and demolition waste in England recovered remained constant between 2010 and 2016 at 92%.

Under the EC Waste Framework Directive, there is a target for the UK to recover at least 70% of non-hazardous C&D waste by 2020. England is currently meeting this target comfortably. Further information available at source and in Appendix B.

## RC5. Packaging waste recycled

**Chart 35. Packaging waste recycled, UK, 2008 to 2017 inclusive, million tonnes (RC5a)**



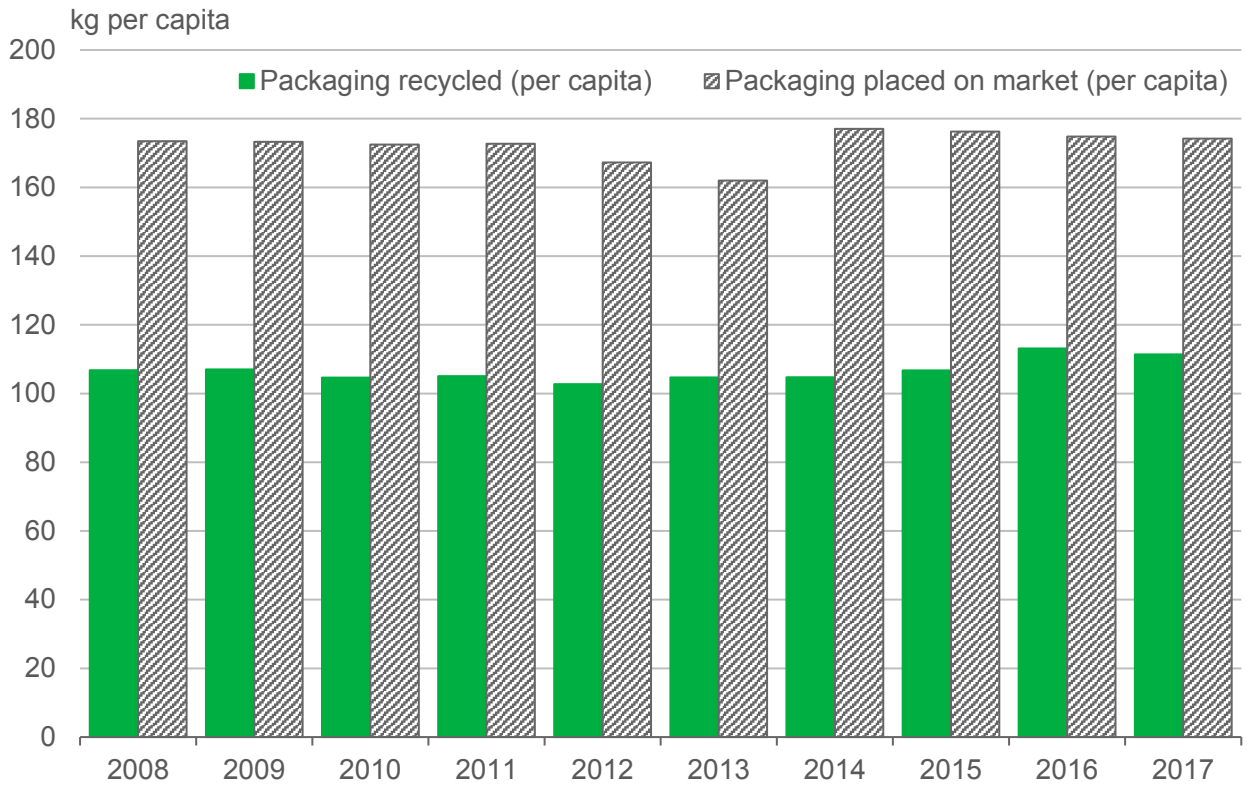

*Source(s):* Department for Environment, Food and Rural Affairs (2020) ENV23 - UK statistics on waste, Table 7.1.

Environment Agency (2020) National Packaging Waste Database, Accessed: 10th March 2020

Packaging placed on the market increased by an estimated 7.3% between 2008 and 2017, from 10.7 to 11.5 million tonnes. UK packaging waste arisings recycled remained flat between 2008 and 2012 at around 6.6 million tonnes, before rising gradually to reach 7.4 million tonnes in 2017.

Estimates for recycling of packaging have been compiled in accordance with the Packaging and Packaging Waste Directive reporting requirements. Packaging waste recycled within the UK fell from 4.0 million tonnes in 2008 to 3.4 million tonnes in 2016, before increasing to 3.6 million tonnes in 2017. At the same time, packaging waste generated in the UK and recycled overseas increased from 2.6 million tonnes in 2008 to 4.0 million tonnes in 2016, before falling back to 3.7 million tonnes in 2017. Further information available at source and in Appendix B.

**Chart 36. Packaging waste recycled, UK, 2008 to 2017 inclusive, kg per capita (RC5b)**



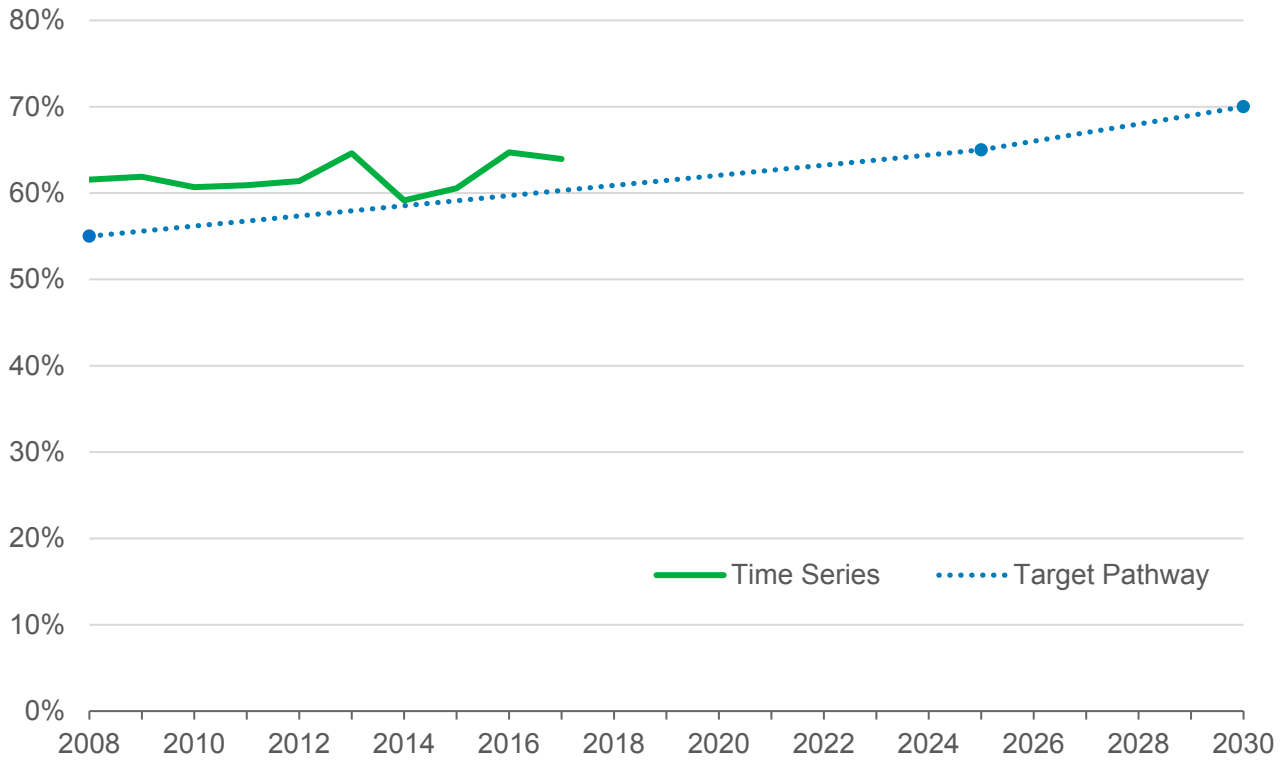

*Source(s):* Department for Environment, Food and Rural Affairs (2020) ENV23 - UK statistics on waste, Table 7.1.

Environment Agency (2020) National Packaging Waste Database, Accessed: 10th March 2020

Office for National Statistics (2019) Estimates of the population for the UK, England and Wales, Scotland and Northern Ireland

Per capita UK packaging waste recycled increased by 4.3% between 2008 and 2017, from 106.8 kg to 111.4 kg. Per capita packaging placed on the market remaining roughly constant between 170 kg and 180 kg from 2008 and 2017 (with exception to a drop in the years 2012 and 2013). Further information available at source and in Appendix B.

**Chart 37. Packaging waste recycled, UK, 2008 to 2017 inclusive, percentage of total packaging waste (RC5c)**



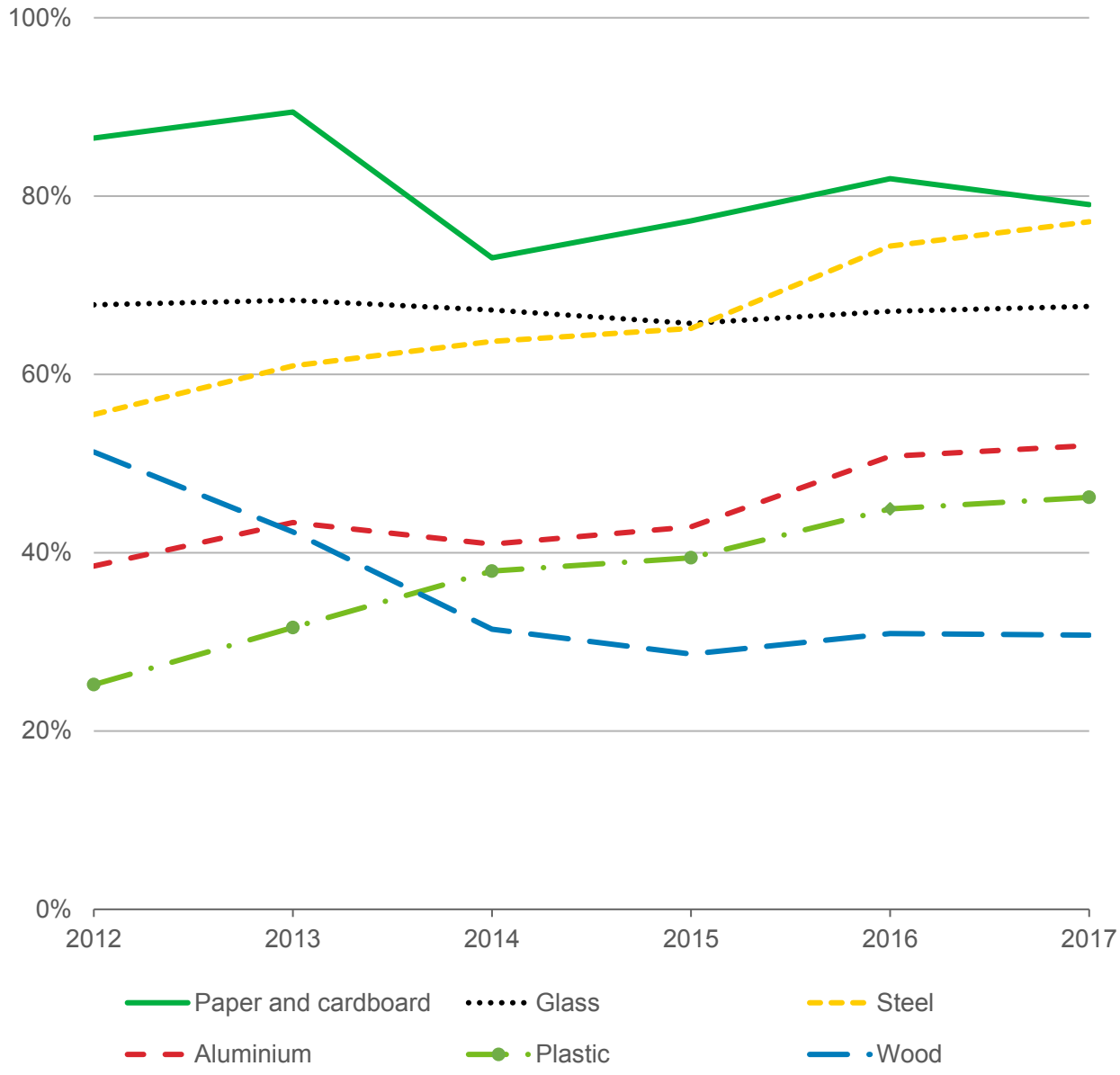

*Source(s):* Department for Environment, Food and Rural Affairs (2020) ENV23 - UK statistics on waste, Table 7.1.

Environment Agency (2020) National Packaging Waste Database, Accessed: 10th March 2020

The percentage of packaging waste placed on the market in the UK that went on to be recycled increased by 2.4 percentage points between 2008 and 2017, from 61.5% to 63.9%. Following a period of stability, the recycling rate rose in 2013, before falling to 2014 and climbing again thereafter.

A linear pathway is presented between the EC Directive 94/62/EC recycling target of 55% in 2008 and the RWS commitment to recycling 65% of packaging waste by 2025 and 70% by 2030. The UK has achieved its targets in this area so far. Further information available at source and in Appendix B.

**Chart 38. Packaging waste recycled, UK, 2012 to 2017 inclusive, percentage of packaging waste, split by material (RC5c)**




*Source(s):* Department for Environment, Food and Rural Affairs (2020) ENV23 - UK statistics on waste, Table 7.1.

This chart shows the percentage of packaging placed on the market that was recycled by material type. The highest material-specific packaging recycling rate in 2017 was for paper and cardboard, standing at 79.0 per cent (a decrease of 7.5 percentage points in relation to 2012). This was followed by 77.3 per cent for steel in 2017 (an increase of 21.8 percentage points on 2012), 67.6 per cent for glass (a similar percentage as in 2012), 52.0 per cent for aluminium (13.5 percentage points greater than in 2012), 46.2 per cent for plastic (21.0 percentage points greater) and 30.8 per cent for wood (a 20.5 percentage point decrease on 2012). Further information available at source and in Appendix B.

## 3.5 Landfilling

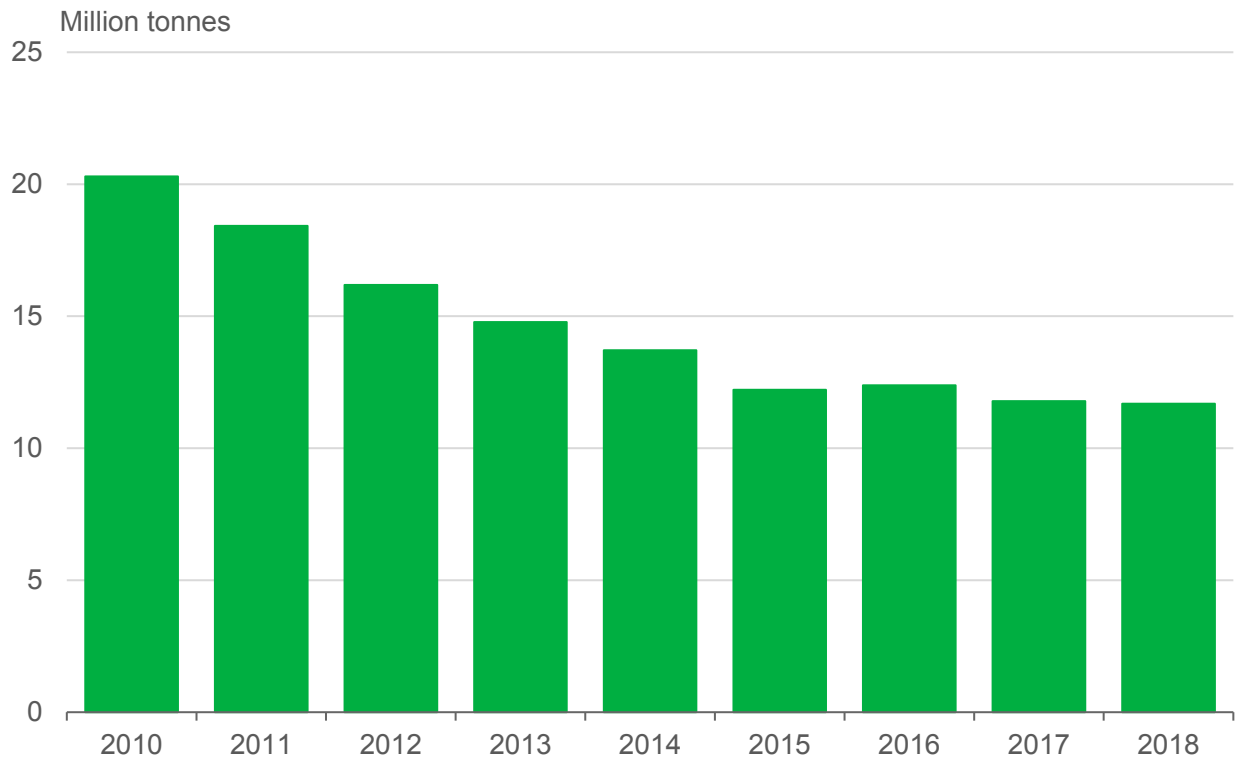
The indicators of landfilling tell us which amount of our waste is dealt with at the lowest rung of the waste hierarchy. Despite significant progress brought about by policy interventions such as the landfill tax (introduced in 1996), England continues to rely on landfill, with 11.7 million tonnes of municipal waste landfilled in 2017 of which 5.6 million tonnes was estimated to be biodegradable.

We committed in the RWS to no more than 10% of municipal waste being sent to landfill by 2035, and set out the strategic ambition to eliminate biodegradable waste and food waste to landfill.

The desired direction for all indicators of landfilling is down.

## LF1. Municipal waste landfilled

**Chart 39. Municipal waste landfilled, England, 2010 to 2018 inclusive, million tonnes (LF1a)**

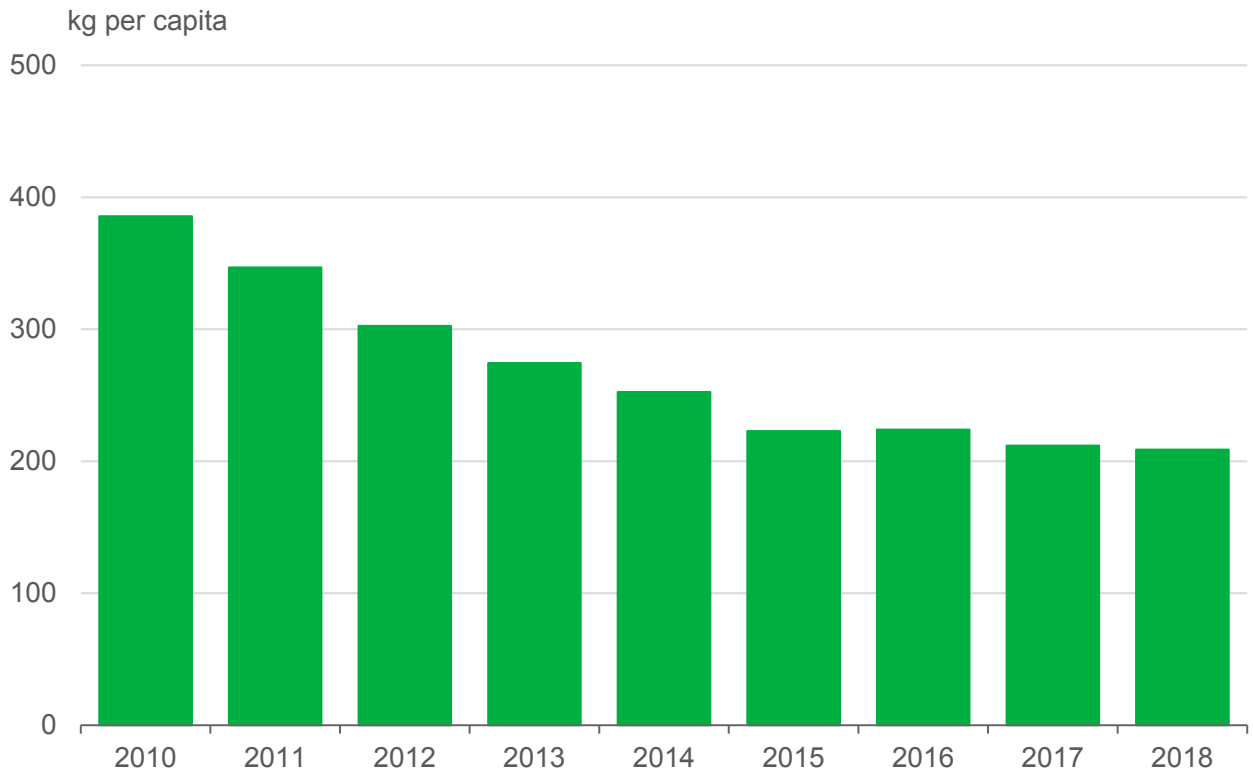



*Source(s):* Department for Environment, Food and Rural Affairs (2020) ENV23 - UK statistics on waste, Table 2.1.

Municipal waste' presented here is defined using a list of European Waste Classification (EWC) codes agreed across the UK for the purposes of reporting against the Landfill Directive's target on biodegradable municipal waste to landfill.

Municipal waste sent to landfill in England nearly halved between 2010 and 2018, from 20.3 to 11.7 million tonnes (a 42.4% reduction). The rate of decrease has slowed since 2015. Further information available at source and in Appendix B.

**Chart 40. Municipal waste landfilled, England, 2010 to 2018 inclusive, kg per capita (LF1b)**




*Source(s):* Department for Environment, Food and Rural Affairs (2020) ENV23 - UK statistics on waste, Table 2.1.

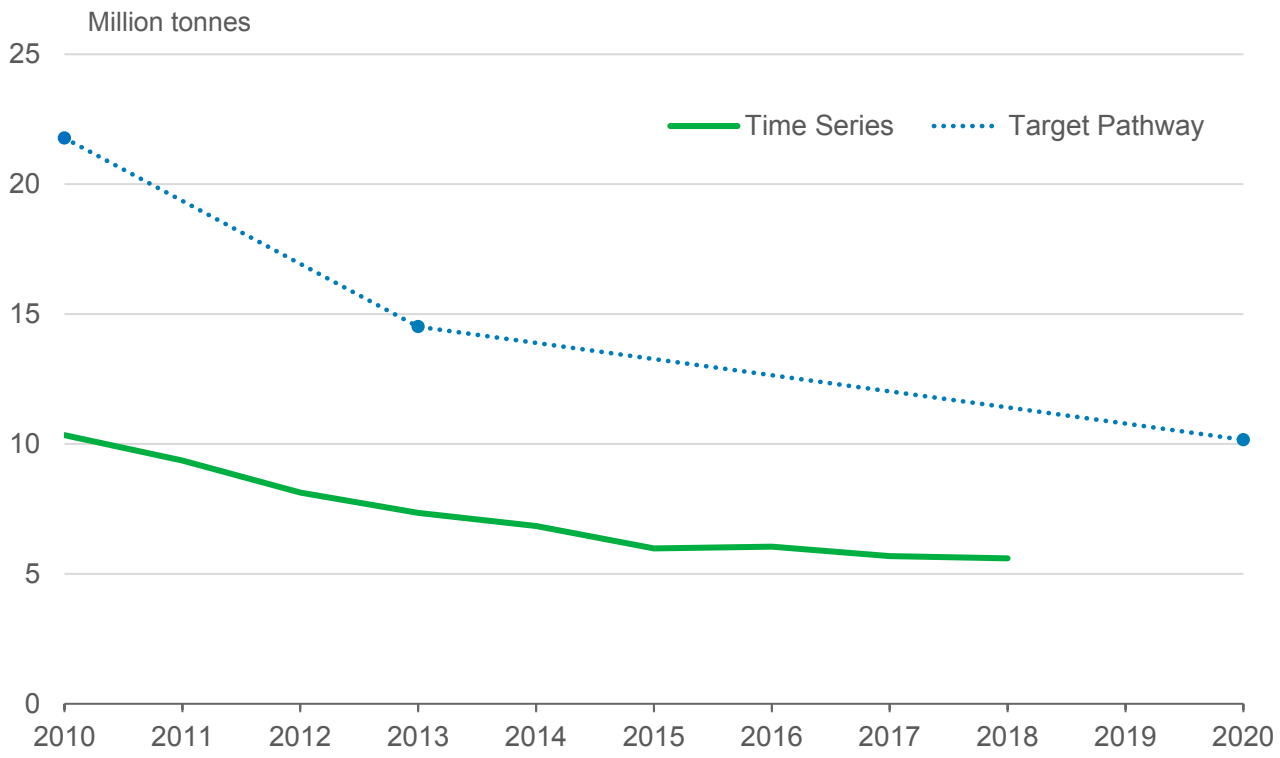
Office for National Statistics (2019) Estimates of the population for the UK, England and Wales, Scotland and Northern Ireland

Per capita municipal waste sent to landfill in England stood at 208.8 kg in 2018, about half (45.8% less) that in 2010 (385.6 kg). Further information available at source and in Appendix B.

## LF2. Biodegradable waste landfilled

*This indicator is under development. We have presented biodegradable municipal waste landfilled as a proxy until a metric for total biodegradable waste landfilled is developed.*

**Chart 41. Biodegradable municipal waste landfilled, England, 2010 to 2018 inclusive, million tonnes (LF2a)**

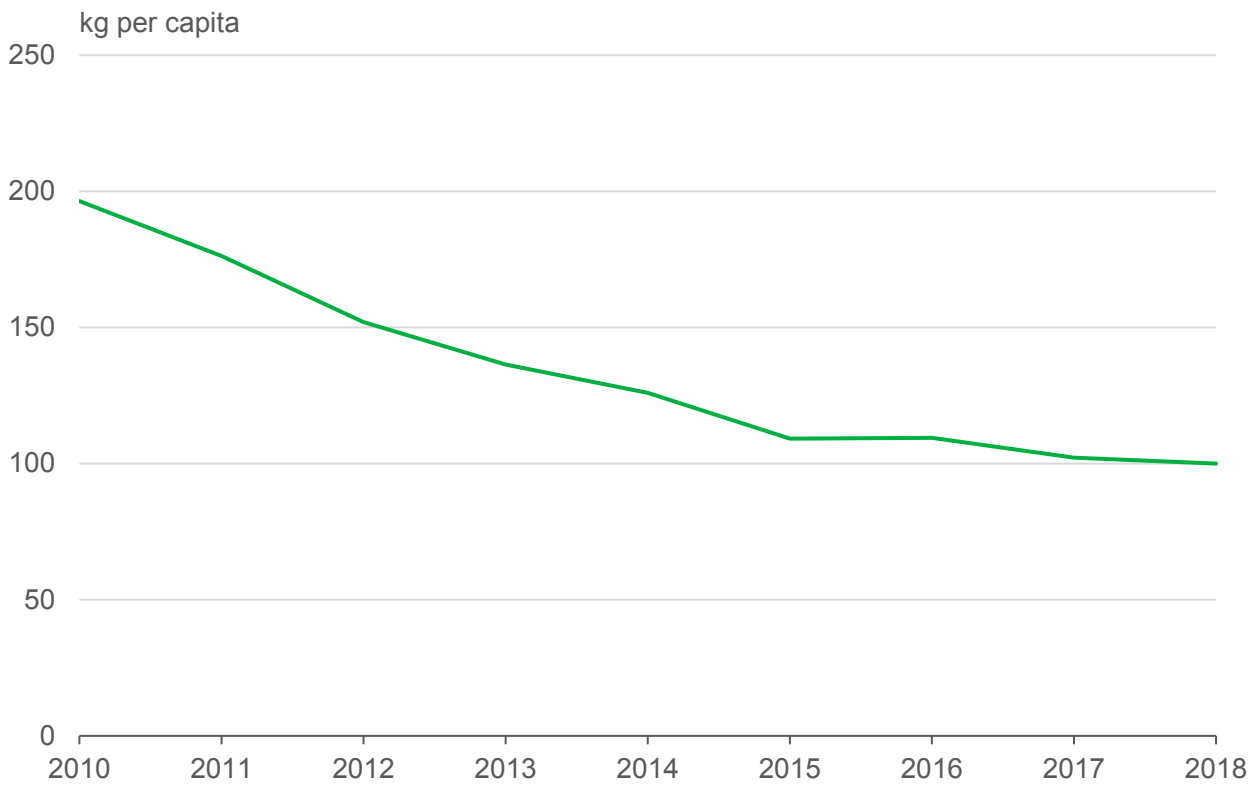



*Source(s):* Department for Environment, Food and Rural Affairs (2020) ENV23 - UK statistics on waste, Table 2.1.

In 2018, 5.6 million tonnes of Biodegradable Municipal Waste (BMW) was sent to landfill in England, 45.9% less than in 2010 or 19% of the 1995 baseline of BMW generation. Tonnages to landfill have reduced each year since 2010, except in 2016 when there was a small increase.

Estimates for biodegradable municipal waste (BMW) to landfill have been calculated in accordance with the Landfill Directive (1999/31/EC). The pathway represents the average improvement needed year-on-year for England to match the Landfill Directive's UK-level target for the amount of biodegradable municipal solid waste sent to landfill to be reduced: to 75% of the amount of BMW generated in 1995 (29.0 million tonnes) by 2010; to 50% of 1995 levels by 2013; and 35% of 1995 levels by 2020. England makes up roughly 80% of BMW sent to landfill in the UK. Further information available at source and in Appendix B.

**Chart 42. Biodegradable municipal waste landfilled, England, 2010 to 2018 inclusive, kg per capita (LF2b)**

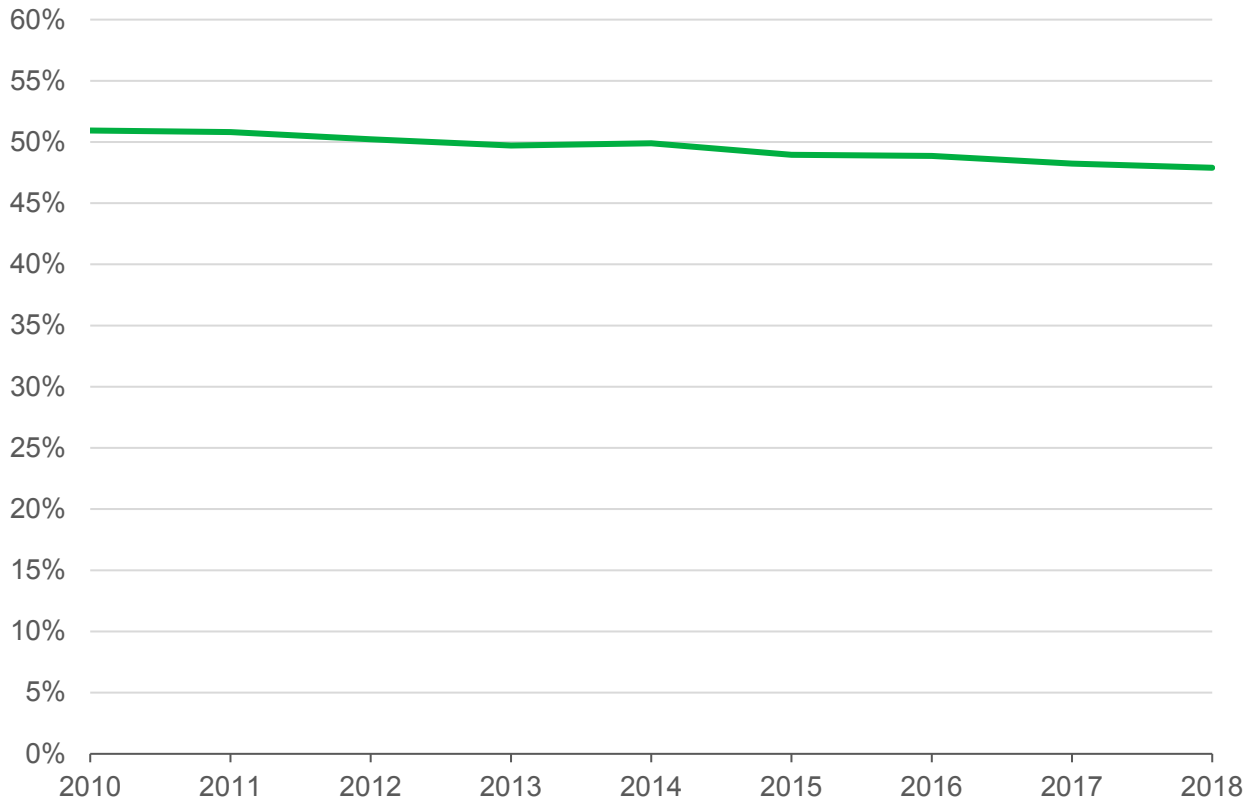



*Source(s):* Department for Environment, Food and Rural Affairs (2020) ENV23 - UK statistics on waste, Table 2.1.

Office for National Statistics (2019) Estimates of the population for the UK, England and Wales, Scotland and Northern Ireland

In 2018, 100.0 kg of biodegradable municipal waste per capita was sent to landfill in England, about half the level in 2010 (196.4 kg). Further information available at source and in Appendix B.

**Chart 43. Biodegradable municipal waste landfilled, England, 2010 to 2018 inclusive, proportion of municipal waste landfilled (LF2c)**




*Source(s):* Department for Environment, Food and Rural Affairs (2020) ENV23 - UK statistics on waste, Table 2.1.

The proportion of municipal waste sent to landfill in England which was biodegradable fell by 3.0 percentage points between 2010 and 2018, from 50.9% to 47.9%. Further information available at source and in Appendix B.

## LF3. Food and drink waste landfilled

*When developed, this indicator will allow us to track progress against our ambition to eliminate food waste to landfill by 2030.*

## 3.6 Waste crime

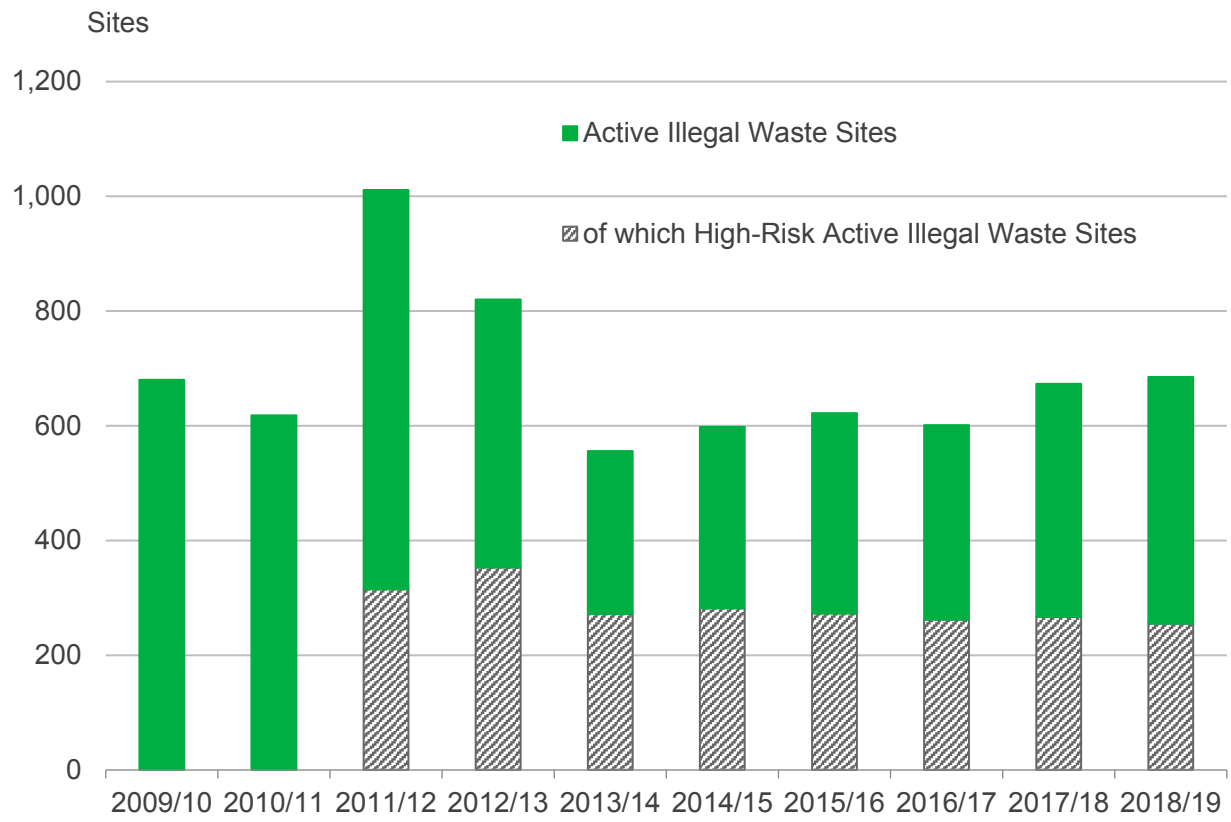
The indicators of waste crime help us assess the extent to which our resources are being used to benefit society while producing least adverse impact.

Waste crime in the form of illegal waste sites, fly-tipping and littering lead to environmental pollution, degrades natural capital and causes a disamenity to the public's enjoyment of the environment. They also impose significant costs on local authorities.

The desired direction for all indicators of waste crime is down with exception to WC3a (i), for which the desired direction is up.

## WC1. Illegal waste sites

**Chart 44. Active illegal waste sites, of which high risk active illegal waste sites, England, 2009/10 to 2018/19 inclusive, number of sites (WC1a)**




*Source(s):* Environment Agency (2019) Data on regulated businesses in England

The total number of active illegal waste sites in England increased sharply from just over 600 in 2010/11 to over a thousand in 2011/12, due to an increase in the number of sites identified by the Environment Agency. Action to stop the illegal activity led to a fall to 556 active illegal sites in 2013/14. Since then, the number has increased more gradually, rising to 685 in 2018/19.

The number of active illegal waste sites categorised as high-risk (monitored since 2011/12), fell by more than a quarter from a peak of 353 sites in 2012/13 to 255 in 2018/19 (the lowest figure yet recorded). Further information available at source and in Appendix B.

## WC2. Waste fly tipped

**Chart 45. Waste fly tipped, England, 2007/08 to 2018/19 inclusive, incidents (WC2a)**

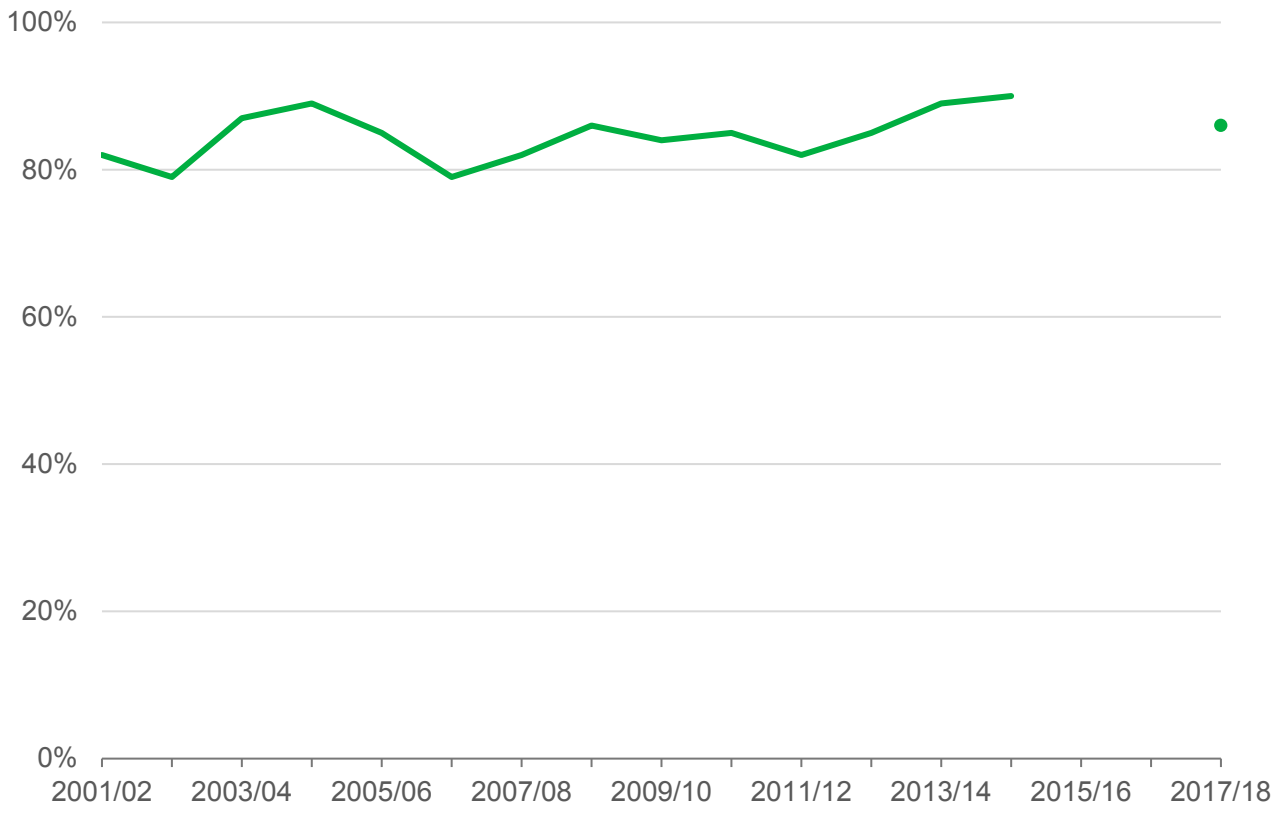

*Source(s):* Department for Environment, Food and Rural Affairs (2019) ENV24 - Fly tipping incidents and actions taken in England

Fly-tipping is a wide ranging offence, defined as 'the illegal disposal of household, industrial, commercial or other 'controlled' waste without a waste management licence'.[41] The number of fly-tipping incidents in England fell from 1.28 million in 2007/08 to 715 thousand incidents in 2012/13 whilst there was an increase in the levels of actions to prevent fly-tipping between 2007/08 and 2010/11. Subsequently, the number of incidents have increased back to over 1 million (1.07 million) incidents in 2018/19. Further information available at source and in Appendix B.

[41] House of Commons (2019) Briefing Paper: Fly-tipping – the Illegal Dumping of Waste

## WC3. Littering

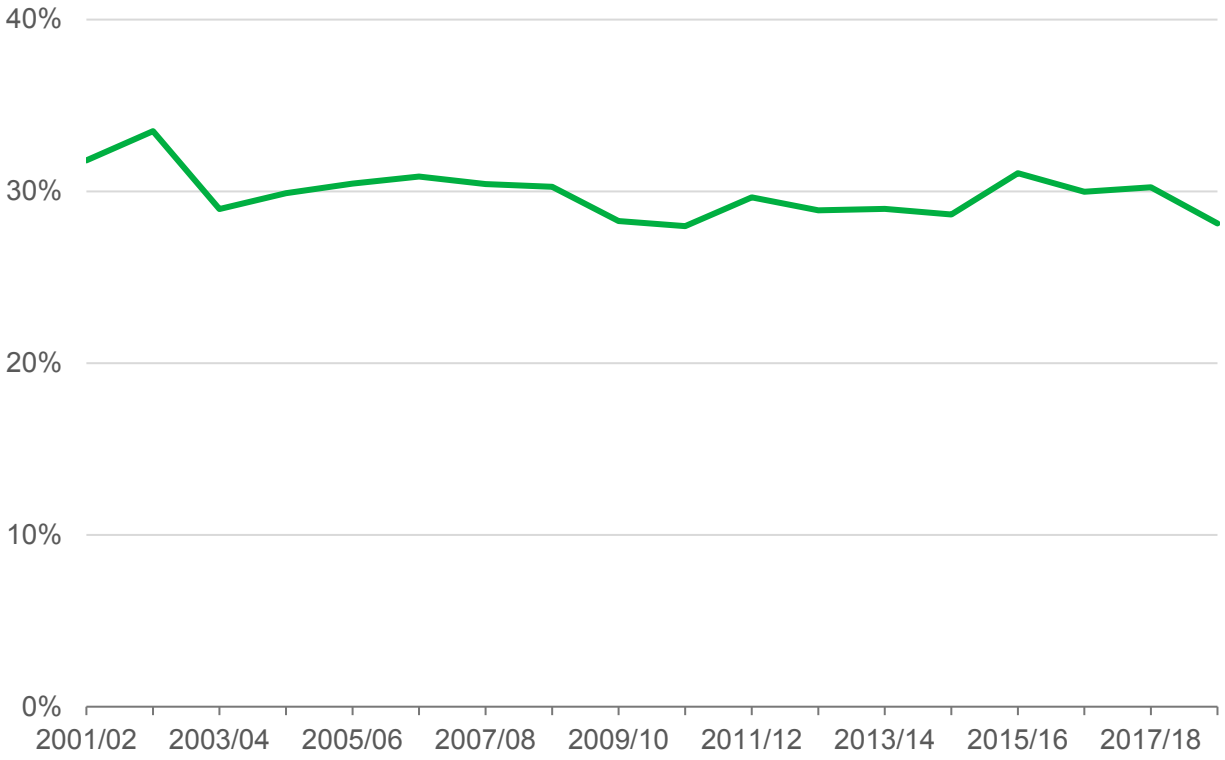
**Chart 46. Percentage of places at or above an acceptable standard for litter, England, 2001/02 to 2017/18 inclusive (WC3a (i))**




*Source(s):* Department for Environment, Food and Rural Affairs (2019) Litter and littering in England: data dashboard

In 2017/18, 86% 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). This is 4 percentage points higher than in 2001/02. Nevertheless, in relation to the level in 2014/15, the percentage of sites meeting this standard has fallen. The survey was not undertaken in 2015/16 and 2016/17 and these years are therefore missing from the time series. Further information available at source and in Appendix B.

**Chart 47. Percentage of people perceiving litter as a problem, England, 2001/02 to 2018/19 inclusive (WC3a (ii))**

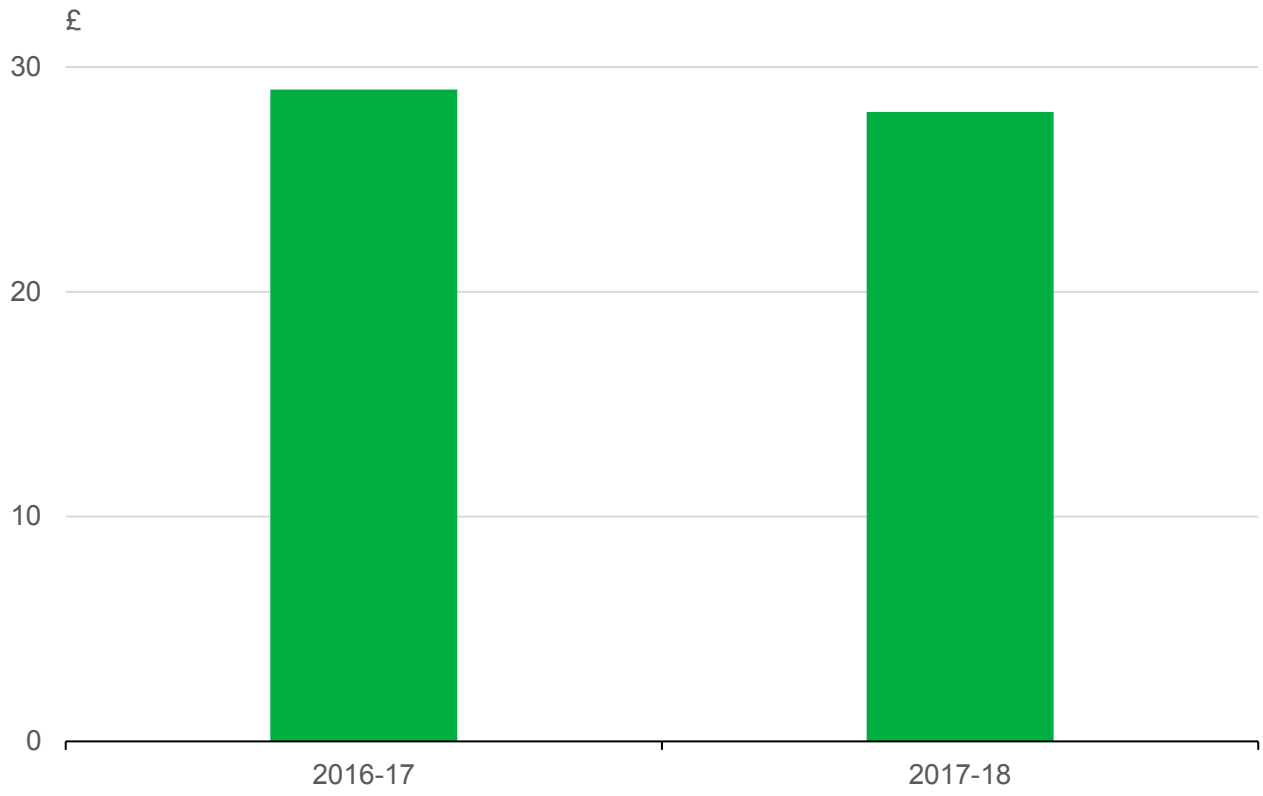



*Source(s):* Department for Environment, Food and Rural Affairs (2019) Litter and littering in England: data dashboard

Office for National Statistics (2019) Crime in England and Wales: Other related tables (Year Ending March)

In 2018/19, 28.1 per cent of people in England said there was a very or fairly big problem with litter or rubbish lying around in their area. This has been a largely consistent picture since 2001/02, with the figure having decreased by 3.7 percentage points between then and 2018/19. It is worth noting that the percentage for 2018/19 was nevertheless the lowest percentage since 2010/11. Further information available at source and in Appendix B.

**Chart 48. Costs to local authorities of street cleaning per household, England, 2016/17 to 2017/18 inclusive (WC3a (iii))**




Source(s): Department for Environment, Food and Rural Affairs (2019) Litter and littering in England: data dashboard

In 2017/18, it cost local authorities £663 million or £28 per household to keep England's streets clean, a similar level to that in the previous financial year (£29). This figure does not include spending by other authorities whose role involves clearing litter, such as Highways England. Further information available at source and in Appendix B.

# Appendix A – Data sources

## WasteDataFlow

WasteDataFlow is a web-based system for local authority collected municipal waste data reporting by UK local authorities to government. It holds weight-based data from 2004 onwards on waste collection and treatment for a range of local authority collected waste and recycling streams.[42]

This system is also used by local authorities to report on fly-tipping. These data include the number and type of incidents of illegally deposited waste, the cost of dealing with them and the actions taken against fly-tipping in England.

WasteDataFlow data are national statistics that are reported annually; see *Local authority collected waste management - annual results*[43] and *Fly-tipping statistics for England.*[44]

## Environment Agency Administrative Data

On the back of its regulatory activities, the Environment Agency (EA) gathers a range of data on England's waste management system. All operators of regulated waste management facilities have to provide the EA with details of the quantities and types of waste they deal with i.e. waste received into site and waste sent on from site to other facilities or processes. This data provides the basis for our residual waste estimates. In addition, data produced by the EA on illegal waste sites are incorporated in the framework.

These data are collected primarily for regulatory purposes but have also been used by local authorities to assist in planning for new waste facilities and by central government for monitoring against targets, input into analytical work, and for statutory reporting.

The EA also manages the National Packaging Waste Database (NPWD).[45] This provides information on packaging and packaging waste recycling rates by material type.

## University of Leeds Data

In recent years, the University of Leeds has produced and published estimates of Raw Material Consumption ('material footprint') and ratios of this to Gross Value Added as a measure of resource efficiency or resource productivity. The University has also published

[42] Waste Data Flow (2020) Waste Data Flow, Accessed: 10th March 2020
[43] Defra (2019) Local authority collected waste management - annual results
[44] Defra (2019) Fly-tipping statistics for England
[45] Environment Agency (2020) National Packaging Waste database, Accessed: 10th March 2020

estimates of material flows in carbon terms – the so-called 'carbon footprint' or carbon emissions on a consumption basis, which includes emissions embedded in imports.

The University has developed environmentally-extended input-output (EEIO) analysis to enable this. EEIO provides a replicable and robust, albeit experimental approach, for evaluating the linkages between economic consumption activities and environmental impacts. The Leeds estimates use a computer model that can assimilate data on emissions and product flows from different countries and years in different classifications and valuations, dealing with data gaps and reconciling inconsistencies. Through this model, England level footprint estimates have been made.

The UK level carbon footprint estimates are produced as (experimental) official statistics and published annually by Defra.[46] The England level figures for carbon footprint and raw material consumption figures are not currently designated as official statistics, much of the method overlaps with the UK carbon footprint estimates. Both metrics form the basis of commitments in the Strategy and will probably be used in reporting against the Sustainable Development Goals (SDGs).

## Department for Business, Energy and Industrial Strategy Data

Data on the total domestic emissions of GHGs from waste management are produced by the Department for Business, Energy and Industrial Strategy as part of international reporting to the United Nations Framework Convention on Climate Change (UNFCCC).

Waste management emissions covered here include those from waste disposed to landfill sites, waste incineration, composting, anaerobic digestion and the treatment of waste water. Emissions from incineration with energy recovery is excluded from this category not because it is unimportant, but because it is accounted for under energy production in the National Atmospheric Emissions Inventory.

## Studies on Waste Composition

Quantifying the composition of mixed waste is fundamental to being able to monitor the Strategy's objectives of eliminating avoidable plastic waste over the lifetime of the 25 Year Environment Plan (by the end of 2042), working towards eliminating food waste to landfill by 2030 and eliminating avoidable waste by 2050. It will also enable us to estimate the carbon content of mixed waste.

In 2018, WRAP commissioned a study on Defra's behalf to quantify, through primary research, the composition of household and commercial municipal waste.[47] Previously, the

[46] Defra (2020) UK's carbon footprint. Accessed 14th March 2020
[47] WRAP (2020) Quantifying the composition of municipal waste

most recent composition data had been from a study carried out in 2010/11. This dataset, when combined with data on the quantities of each waste stream being produced, will enable us for the first time to pinpoint opportunities in these waste streams. We will ensure the dataset is updated periodically and explore options for expanding this to encompass more industrial and construction waste, subject to budget availability.

For composition of household waste, WRAP has recently commissioned a study to bring together household waste composition data which will also be used to monitor progress on food waste. The data, which covers priority materials streams as well as food waste, will be provided to Defra and can be used for monitoring purposes when repeated by WRAP in the future.

## Biodegradability Factors

In 2014, Defra commissioned a study from Resource Futures to establish new estimates for the biodegradability of municipal waste being sent to landfill for different waste categories[48]. These factors, along with the Waste Data Interrogator (WDI), are used to estimate the tonnages of biodegradable municipal waste which are landfilled.

## WRAP Food and Drink Waste Estimates

WRAP have produces estimates of the food and drink waste arisings, by sector, at the UK level periodically since 2007[49]. These estimates are used to measure progress against the aspirations of the Courtauld Commitment 2025 and Sustainable Development Goal 12.3. Signatories to this commitment agree to work toward a collective goal: to cut the amount of resources needed to provide our food and drink by one-fifth over 10 years, from 2015-2025. This will set the UK on a path to meet the UN target of halving per capita global food waste at retail and consumer levels by 2030.

For the first publication of the indicator framework, we intend to use the indicator produced by WRAP as the headline measure for food and drink waste. Defra are also considering methodologies for the annual reporting of food waste, to be used formally to monitor progress against Sustainable Development Goal 12.3.

## ONS Data

The Office for National Statistics published a range of datasets which are drawn on throughout *Monitoring Progress*:

[48] Defra (2014) Analysis of biodegradability of residual waste based on subtraction of diverted materials
[49] WRAP (2020) What is Courtauld, Accessed 12th March 2020

- Population data used to normalise the majority of the indicators will come from the published ONS England and UK population figures.
- Gross Value Added and Gross Domestic Product data used to normalise indicators RP1, GG2 and WP1 derive from published ONS annual estimates.

## National Packaging Waste Database Data

The National Packaging Waste Database[50] is supported by the Environment Agency, the Scottish Environment Protection Agency (SEPA), the Northern Ireland Protection Agency, the Department for Environment, Food and Rural Affairs, the Department for Business, Innovation and Skills and the Advisory Committee on Packaging. It is a repository for data tracking firms obligated under extended producer responsibility regulation linked to packaging, batteries and waste electrical and electronic equipment.

For packaging data specifically, the database tracks Packaging Recovery Notes and Packaging Export Recovery Notes purchased to meet extended producer responsibility obligations.

## The Local Environmental Quality Survey

The Local Environmental Quality Survey (LEQSE) is carried out annually by Keep Britain Tidy on behalf of the Department for Environment, Food and Rural Affairs.[51] It quantitatively tracks levels of litter, detritus, graffiti, fly-posting, leaf and blossom fall, weed growth and staining using a grading system between A and D based on Defra's Code of Practice on Litter and Refuse. Before 2015/16, the survey made an assessment of 7,200 randomly selected sites across five local authorities in nine English regions. Following a pause in the survey being undertaken in 2015/16 and 2016/17, 7,800 places were surveyed across 25 local authorities.

## The National Crime Survey

The Crime Survey conducted by the Office for National Statistics for England and Wales (formerly British Crime Survey) asks people aged 16 and over living in households in England and Wales about their experiences of crime in the last 12 months.[52] These experiences are used to estimate levels of crime in England and Wales. This source is used by us to assess the public's perception of littering, an indicator within our litter dashboard.

[50] Environment Agency (2020) National Packaging Waste Database, Accessed: 10th March 2020
[51] Keep Britain Tidy (2019) Litter in England, the Local Environmental Quality Survey of England 2017/18
[52] Office for National Statistics (2019) Crime in England and Wales: Other related tables (Year Ending March)

# Appendix B – Indicator metadata

## Resource productivity

### RP1. Material footprint (Raw Material Consumption)

| | |
|---|---|
| Headline Indicator | **RP1**. Material footprint (Raw Material Consumption, excluding fossil fuels) |
| Measure Name(s) | **RP1a**. Raw Material Consumption (excluding fossil fuels), England, million tonnes<br><br>**RP1b**. Raw Material Consumption (excluding fossil fuels), England, tonnes per capita<br><br>**RP1c**. Unit Gross Value Added per unit Raw Material Consumption, England (chained volume measure, 2016 prices) |
| Proxy Indicator and Measures (where applicable) | N/A |
| Time Period of Data | 2001 to 2017 inclusive |
| Description of Indicator and Measures Used | Indicator represents a time series of England's Raw Material Consumption (excluding fossil fuels) measured in: 1) million tonnes; 2) tonnes per capita; 3) and as a ratio of Gross Value Added (GVA) or Gross Domestic Product (GDP) measured in pounds to each unit of raw material consumption |
| Desired Direction of Travel | Down |
| Relevant Goal in the 25 YEP | Goal 5 – using resources from nature more sustainably and efficiently |
| Priority Area(s) | Increasing resource productivity |
| Relevant Legislative Targets/Commitments/ Ambitions | Strategic ambition: Double resource productivity by 2050 (RWS, 2018)<br><br>UN Sustainable Development Goals 8 and 12 |
| National/Experimental/ Official Statistics | **RP1a**. Official (Experimental)<br><br>**RP1b.** Population data, a National Statistic<br><br>**RP1c**. Economic data, a National Statistic |

| | |
|---|---|
| Headline Indicator | **RP1**. Material footprint (Raw Material Consumption, excluding fossil fuels) |
| Geographical Scope | England |
| Definitions and Details of Calculation(s) | **RP1a.** Raw Material Consumption (RMC) is defined as the full amount of raw materials required to meet final demand for goods and services by households, government and charities in England in one year. It includes an estimate of the materials extracted within England's borders to meet final demand, in addition to the full upstream material requirements needed to produce imported goods and services. Fossil fuels are excluded in the measure presented here. Estimates of England's fossil fuel, water and energy footprints are also available at data source.<br><br>There are several methodologies available for calculating the material use of a country, the choice of which will affect the final estimate. The values presented here are based on an approach to calculating RMC developed on behalf of Defra by the University of Leeds since 2017. This approach takes estimates of domestic extraction by world region and reallocates them to final demand using an environmentally-extended multi-regional input-output (MRIO) database building on the Supply and use tables produced annually by the UK's Office for National Statistics. Further details of methodology available in the associated methodology document.<br><br>**RP1b.** Population of England defined in accordance with the Office for National Statistics. Further details available at data source. Indicator calculated as the ratio of raw material consumption (in mass unit) over the total population (in number).<br><br>**RP1c.** 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. Gross domestic product (GDP) is equivalent to GVA plus value-added tax (VAT) plus other taxes on products, less subsidies on products. A chained volume measure of GVA and GDP is used to remove inflationary price effects, allowing for inter-temporal comparison in 'real' terms. Indicator defined as unit GVA/GDP (in 2016 pound, chained volume measure) per unit Raw Material Consumption (in mass unit). Ratio expressed in pound GVA/GDP per kg RMC. |

# Greenhouse gas emissions

## GG1. Domestic Greenhouse Gas Emissions from the Waste Management Sector

| | |
|---|---|
| Headline Indicator | **GG1**. Domestic greenhouse gas (GHG) emissions from the waste management sector |
| Measure Name(s) | **GG1a**. Domestic greenhouse gas (GHG) emissions from waste management activities, England, million tonnes $CO_2$ equivalent ($MtCO_2e$) |
| Proxy Indicator and Measures (where applicable) | |
| Time Period of Data | 1990 to 2018 inclusive |
| Description of Indicator and Measures Used | Indicator represents a time series of the GHG emissions associated with the domestic waste management sector in England, measured in million tonnes $CO_2$ equivalents |
| Desired Direction of Travel | Down |
| Relevant Goal in the 25 YEP | Goal 7 – mitigating and adapting to climate change |
| Priority Area(s) | Reducing GHG emissions |
| Relevant Legislative Targets/Commitments/ Ambitions | Legislative target within the Climate Change Act (2008) since updated with the aim of achieving net zero emissions by 2050 on a territorial basis. |
| National/Experimental/ Official Statistics | National |
| Geographical Scope | England |
| Definitions and Details of Calculation(s) | Emissions presented are those associated with the 'waste management sector', a category used in international reporting to the United Nations Framework Convention on Climate Change (UNFCCC). Emissions here include those from waste disposed to landfill sites, waste incineration without energy recovery, composting, anaerobic digestion and the treatment of waste water. Emissions from incineration with energy recovery are excluded in this indicator as they are accounted for under energy-related emissions in the national inventory. Greenhouse gases covered within the inventory are carbon dioxide ($CO_2$), methane ($CH_4$), nitrous oxide ($N_2O$) and fluorinated |

| Headline Indicator | **GG1**. Domestic greenhouse gas (GHG) emissions from the waste management sector |
|---|---|
| | compounds (hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride ($SF_6$) and nitrogen trifluoride ($NF_3$). Further details of methodology available at data source. |

## GG2. Carbon footprint (consumption based greenhouse gas emissions)

| Headline Indicator | **GG2**. Carbon footprint (consumption based greenhouse gas emissions) |
|---|---|
| Measure Name(s) | **GG2a**. Carbon footprint on a consumption basis, England, million tonnes $CO_2$ equivalent ($MtCO_2e$)<br><br>**GG2b**. Carbon footprint on a consumption basis, England, tonnes $CO_2$ equivalent per capita<br><br>**GG2c.** Carbon footprint, tonnes CO2e equivalent per Unit Gross Value Added (chained volume measure, 2016 prices) |
| Proxy Indicator and Measures (where applicable) | N/A |
| Time Period of Data | 2001 to 2017 inclusive |
| Description of Indicator and Measures Used | Indicator represents a time series of GHG emissions associated with consumption by households, government and charities in England, measured in: 1) million tonnes $CO_2e$; 2) tonnes $CO_2e$ per capita; and 3) as a ratio of gross value added (GVA) and gross domestic product (GDP) to each tonne of consumption-based $CO_2e$ emissions |
| Desired Direction of Travel | Down |
| Relevant Goal in the 25 YEP | Goal 7 – mitigating and adapting to climate change |
| Priority Area(s) | Reducing GHG emissions |
| Relevant Legislative Targets/Commitments/ Ambitions | Legislative targets within the Climate Change Act (2008) since updated with the aim of achieving net zero emissions by 2050 on a territorial basis. Net zero covers the domestic emissions within the footprint. |
| National/Experimental/ Official Statistics | **GG2a**. Official (Experimental)<br><br>**GG2b.** Population data, a National Statistic<br><br>**GG2c.** Economic data, a National Statistic |
| Geographical Scope | England |
| Definitions and Details of Calculation(s) | **GG2a**. The 'carbon footprint' refers to carbon dioxide ($CO_2$), methane ($CH_4$) and nitrous oxide ($N_2O$) emissions resulting from the consumption spending of households, government and charities in England on goods and services, |

| Headline Indicator | **GG2**. Carbon footprint (consumption based greenhouse gas emissions) |
|---|---|
| | wherever in the world these arise, and in addition to those emitted directly by households. These estimates are produced using a 15 trade-region global multi-regional input-output model.<br><br>**GG2b.** Population for England defined in accordance with the Office for National Statistics. Further details available at data source. Indicator calculated as the ratio of consumption-based greenhouse gas emissions (in tonnes $CO_2$ equivalents) over the total population (in number).<br><br>**GG2c**. 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. Gross domestic product (GDP) is equivalent to GVA plus value-added tax (VAT) plus other taxes on products, less subsidies on products. A chained volume measure of GVA and GDP is used to remove inflationary price effects, allowing for inter-temporal comparison in 'real' terms. Indicator defined as consumption-side greenhouse gas emissions (in tonnes $CO_2$ equivalent), per unit GVA/GDP (in 2016 pounds, chained volume measure). Ratio expressed in tonne of emissions per pound. |

# Waste production

## WP1. Total waste produced

| Headline Indicator | **WP1.** Total waste produced |
|---|---|
| Measure Name(s) | **WP1a.** i) Total waste production; ii) waste production: commercial, industrial and household sources; and iii) hazardous waste production, England, million tonnes<br><br>**WP1b**. i) Total waste production; and ii) waste production: commercial, industrial, and household sources, England, tonnes/kg per capita<br><br>**WP1c**. Waste intensity of economic activity, England, unit waste production per unit national/sectoral Gross Value Added (chained volume measure in 2016 pounds) |
| Proxy Indicator and Measures (where applicable) | N/A |
| Time Period of Data | 2010 to 2016/18 inclusive |
| Description of Indicator and Measures Used | Indicator represents a time series of total waste production (including hazardous) in England from: i) all sources; ii) commercial, industrial and household sources in England, measured in: 1) million tonnes; 2) tonnes and kg per capita; and 3) as a ratio between the quantity of waste generated in England to national and sectoral Gross Value Added |
| Desired Direction of Travel | Down |
| Relevant Goal in the 25 YEP | Goal 8 - minimise waste |
| Priority Area(s) | Reduce waste production |
| Relevant Legislative Targets/Commitments/ Ambitions | |
| National/Experimental/ Official Statistics | Official |
| Geographical Scope | England |

| Headline Indicator | **WP1.** Total waste produced |
|---|---|
| Definitions and Details of Calculation(s) | **WP1a.** Estimates have been calculated to report 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. Commercial & Industrial (C&I) is defined as NACE codes C, D, E36, 37 & 39 and G-U (including sewage sludge with wet weight to dry weight adjustment). Household sources defined as codes EP-HH. Construction sources defined as code F and includes dredging spoils. 'Other' defined as codes A, B. Data prepared on even years as part of the Waste Statistics Return to Eurostat.<br><br>Commercial, industrial and household waste production presented in WP1a (ii) is a narrower subset of total waste production with slight methodological differences. Commercial and industrial figures in WP1a (ii) deviate slightly from those presented in WP1a (produced for the purposes of the EC Waste Statistics Regulation return) due to the exclusion of sewage sludge. C&I is defined here as C, D, E36, 37 & 39 (excluding sewage sludge) and G-U (excluding G46.7.7). C&I waste generation is difficult to estimate owing to data limitations and gaps. Caution should therefore be exercise when interpreting these figures. Household figures are based on the Waste from Household measure used for reporting household recycling rates against the Waste Framework Directive (2008/98/EC). These differ slightly from figures presented in WP1a as they have not been mapped to the EWC-STAT material categories.<br><br>Hazardous waste production refers to the quantity of waste from all sources classified as being harmful to humans or the environment. Further details available at data source.<br><br>**WP1b**. Population for England defined in accordance with the Office for National Statistics. Further details available at data source. Indicator calculated as the ratio of waste produced (in mass unit), over the total population (in number).<br><br>**WP1c**. 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. A chained volume measure of GVA is used to remove inflationary price effects, allowing for inter-temporal comparison in 'real' terms. Indicator calculated as waste generated (in mass unit) per £1000 Gross Value Added (GVA) (in 2016 pounds, chained volume measure). SIC codes within the Office for National Statistics GVA economic data are mapped to corresponding NACE Economic Activity Classification sections within the UK Statistics on Waste to produce each ratio which is presented as an index. |

## WP2. Avoidable residual waste from household sources

| Headline Indicator | **WP2.** Avoidable residual waste from household sources |
|---|---|
| Measure Name(s) | **WP2a.** Avoidable residual waste from household sources, England, proportion of total residual waste<br><br>**WP2b**. Avoidable residual waste from household sources, England, million tonnes<br><br>**WP2c**. Avoidable residual waste from household sources, England, kg per capita |
| Proxy Indicator and Measures (where applicable) | N/A |
| Time Period of Data | 2017 |
| Description of Indicator and Measures Used | Indicator provides an estimate of residual waste from household sources in England categorised according to different categories of 'avoidability' and measured: 1) as a proportion of total residual waste from household sources; 2) in tonnes: and 3) kg per capita |
| Desired Direction of Travel | Down |
| Relevant Goal in the 25 YEP | Goal 8 - minimise waste |
| Priority Area(s) | Reduce waste production |
| Relevant Legislative Targets/Commitments/ Ambitions | Strategic ambition: To work towards eliminating avoidable waste of all kinds by 2050 (RWS, 2018) |
| National/Experimental/ Official Statistics | |
| Geographical Scope | England |
| Definitions and Details of Calculation(s) | **WP2a**. 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 |

| Headline Indicator | **WP2.** Avoidable residual waste from household sources |
|---|---|
| | 'avoidability'. Avoidable residual waste here refers to residual waste generated by household sources which could have avoided entering the residual waste stream because it:<br><br>1. *Is readily recyclable with current technologies* – items which shouldn't be in the residual stream whatsoever because they are recyclable or compostable at the kerbside or HWRC;<br>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<br>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.<br><br>Indicator calculated as avoidable residual waste, by category, divided by total residual waste, multiplied by 100 and expressed as a percentage. Please note that 'avoidable food waste' within the material list refers to food and drink that is thrown away untouched or opened/started but not finished. 'Unavoidable food waste' refers to the elements of food that is not edible under normal circumstances, such as bones, cores, peelings, and egg shells.<br><br>**WP2b**. Indicator presents the proportions in WP2a on a total annual tonnage basis<br><br>**WP2c.** Population for England defined in accordance with the Office for National Statistics. Further details available at data source. Indicator calculated as the ratio of avoidable residual waste from households (in mass unit) over the total population (in number). |

| Material Category | | | Avoidability Classification | | | |
|---|---|---|---|---|---|---|
| 1st Tier | 2nd Tier | 3rd Tier | Readily recyclable | Potentially recyclable | Potentially substitutable | Difficult to recycle or substitute |
| **Food Waste** | | Avoidable food waste | X | | | |
| | | Unavoidable food waste | X | | | |
| | | Consumable liquids, fats & oils | X | | | |
| **Garden waste** | | | X | | | |
| **Other organic** | | Pet excrement and bedding | | X | | |
| | | Other organic | | X | | |
| **Paper** | *Recyclable paper* | Packaging paper | X | | | |
| | | News, mags, brochures, catalogues & directories | X | | | |
| | | Other recyclable paper | X | | | |
| | *Non-recyclable paper* | Non-recyclable paper | | | X | |
| **Card** | | Thin card | X | | | |
| | | Thick and corrugated card | X | | | |
| | | Cartons | X | | | |
| | | Other card | | X | | |
| **Glass** | | Packaging glass | X | | | |
| | | Non-packaging glass | | X | | |
| **Ferrous metals** | *Ferrous cans, all* | Ferrous drink cans | X | | | |
| | | Ferrous food cans | X | | | |
| | *Ferrous non-cans* | Ferrous aerosols | X | | | |
| | | Other ferrous packaging | X | | | |
| | | Other ferrous non-packaging | X | | | |
| **Non-ferrous metals** | *Non-ferrous cans, all* | Non-ferrous drink cans | X | | | |
| | | Non-ferrous food cans | X | | | |
| | *Non-ferrous non-cans* | Non-ferrous aerosols | X | | | |
| | | Aluminium foil | | X | | |
| | | Other non-ferrous | X | | | |
| **Dense plastic** | *Plastic bottles* | PET bottles | X | | | |
| | | HDPE bottles | X | | | |
| | | Other plastic bottles | X | | | |
| | *Dense plastic non-bottles* | Pots, tubs & trays | X | | | |
| | | Other dense plastic packaging | | | X | |
| | | Other dense plastic non-packaging | | | X | |
| | | Polystyrene | | | X | |
| **Plastic film** | | Carrier bags | | X | | |
| | | Other packaging plastic film | | X | | |
| | | Non-packaging plastic film | | | X | |
| **Textiles** | *Clothing, shoes, bags & belts* | Clothing | | X | | |
| | | Shoes, bags & belts | | X | | |
| | *All non-clothing textiles* | Carpet & underlay | | | X | |
| | | Other non-clothing textiles | | X | | |
| **WEEE** | | Large WEEE | X | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | Small WEEE | | X | | |
| **Hazardous** | | Household batteries | X | | | |
| | | Paints and varnishes | | | | X |
| | | Other household hazardous waste | | | | X |
| **Wood** | | Treated wood | X | | | |
| | | Non-treated wood | X | | | |
| **Miscellaneous combustible** | | Absorbent Hygiene Products | | X | | |
| | | Other sanitary | | X | | |
| | | Furniture | | X | | |
| | | Mattresses | | X | | |
| | | Other miscellaneous combustible | | | | X |
| **Miscellaneous non-combustible** | | Soil | X | | | |
| | | Rubble | X | | | |
| | | Plasterboard | X | | | |
| | | Other miscellaneous non-combustible | | | | X |
| **Fines** | | | | | | X |
| **Other wastes** | | | | | | X |

## WP3. Avoidable residual plastic waste from household sources

| | |
|---|---|
| Headline Indicator | **WP3**. Avoidable residual plastic waste from households |
| Measure Name(s) | **WP3a**. Avoidable residual plastic waste from household sources, England, proportion of total residual plastic waste<br><br>**WP3b**. Avoidable residual plastic waste from household sources, England, million tonnes<br><br>**WP3c**. Avoidable residual plastic waste from household sources, England, kg per capita |
| Proxy Indicator and Measures (where applicable) | N/A |
| Time Period of Data | 2017 |
| Description of Indicator and Measures Used | Indicator represents an estimate of avoidable residual plastic waste from household sources in England and measured as: 1) a proportion of total residual waste from households; 2) in tonnes; and 3) kg per capita |
| Desired Direction of Travel | Down |
| Relevant Goal in the 25 YEP | Goal 8 - minimise waste |
| Priority Area(s) | Reduce waste production |
| Relevant Legislative Targets/Commitments/ Ambitions | Strategic ambition: To eliminate avoidable plastic waste by 2042 (RWS, 2018) |
| National/Experimental/ Official Statistics | |
| Geographical Scope | England |
| Definitions and Details of Calculation(s) | **WP3a.** Avoidable residual plastic waste follows the same methodology as outlined for WP2a but is specific to the portion of residual waste which is plastic. Indicator calculated as avoidable residual plastic waste, by category, divided by total residual plastic waste, multiplied by 100 and expressed as a percentage.<br><br>**WP3b**. Indicator presents the proportions in WP3a on a national tonnage basis |

| Headline Indicator | **WP3**. Avoidable residual plastic waste from households |
|---|---|
| | **WP3c.** Population for England defined in accordance with the Office for National Statistics. Further details available at data source. Indicator calculated as the ratio of avoidable residual plastic waste from households (in mass unit) over the total population (in number). |

## WP4. Food and drink waste

| | |
|---|---|
| Headline Indicator | **WP4**. Food and drink waste produced |
| Measure Name(s) | |
| Proxy Indicator and Measures (where applicable) | **WP4a**. Food and drink waste produced, UK, million tonnes<br><br>**WP4b (i)**. Food and drink waste produced at retail and consumer level (excluding inedible parts), UK, kg per capita<br><br>**WP4b (ii)**. Total food and drink waste produced (including inedible parts), UK, kg per capita |
| Time Period of Data | 2007 to 2018 inclusive |
| Description of Indicator and Measures Used | Indicator represents a time series of post-farm-gate food and drink waste produced in the UK measured in: 1) tonnes; and 2) kg per capita |
| Desired Direction of Travel | Down |
| Relevant Goal in the 25 YEP | Goal 8 - minimise waste |
| Priority Area(s) | Reduce waste production |
| Relevant Legislative Targets/Commitments/ Ambitions | 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)<br><br>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 post-harvest losses” in relation to a 2007 baseline year (excluding inedible parts) and on a per capita basis |
| National/Experimental/ Official Statistics | |
| Geographical Scope | UK |
| Definitions and Details of Calculation(s) | **WP4a**. Estimates of food waste in the UK 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 |

| Headline Indicator | **WP4**. Food and drink waste produced |
| --- | --- |
| | the supply chain, comprising: a) retail; b) manufacturing; and c) hospitality and food service. Further details of methodology available at data source.<br><br>Please note that while for graphical purposes, the SDG baseline year is presented here as 2007, the baseline varies across sources of food waste depending on when robust data first became available. A baseline year of 2007 was selected as: a) there is robust data on the largest fraction of UK food waste from that year i.e. household food waste; and b) this is when large-scale interventions began in the UK to reduce food waste. Please see data source for more information.<br><br>**WP4b**. Population for UK defined in accordance with the Office for National Statistics. Further details available at data source. Indicator calculated as the ratio of total food waste (in mass unit) over the total population (in number). For the purpose of reporting against the UN Sustainable Development Goal (SDG) 12.3, inedible parts of food waste are excluded, as is manufacturing sources. For the purpose of reporting against the 2025 Courtauld Agreement, per capita food waste from all sources is accounted for. |

## WP5. Residual waste

| Headline Indicator | **WP5.** Waste landfilled or incinerated (excluding major mineral wastes) |
|---|---|
| Measure Name(s) | **WP5a.** Waste landfilled or incinerated (excluding major mineral wastes), England, million tonnes<br><br>**WP5b.** Waste landfilled or incinerated (excluding major mineral wastes), England, kg per capita<br><br>**WP5c**. Waste landfilled or incinerated (excluding major mineral wastes), England, percentage of total waste generated (excluding major mineral wastes) |
| Proxy Indicator and Measures (where applicable) | N/A |
| Time Period of Data | 2010 to 2018 inclusive |
| Description of Indicator and Measures Used | Indicator represents a time series of waste landfilled or incinerated in England (excluding major mineral wastes) measured in: 1) tonnes: 2) kg per capita; and 3) as a percentage of total waste generated (excluding major mineral wastes) |
| Desired Direction of Travel | Down |
| Relevant Goal in the 25 YEP | Goal 8 - minimise waste |
| Priority Area(s) | Reduce waste production |
| Relevant Legislative Targets/Commitments/ Ambitions | |
| National/Experimental/ Official Statistics | Neither |
| Geographical Scope | England |
| Definitions and Details of Calculation(s) | **WP5a**. 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 is 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 |

| Headline Indicator | **WP5.** Waste landfilled or incinerated (excluding major mineral wastes) |
|---|---|
| | Eurostat and the European Waste Classification for Statistical Purposes (EWC-Stat, version 4), mineral construction and demolition waste (EWC-Stat 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.<br><br>**WP5b**. Population for England defined in accordance with the Office for National Statistics. Further details available at data source. Indicator calculated as the ratio of residual waste (in mass unit) over the total population (in number).<br><br>**WP5c**. Indicator calculated as waste landfilled or incinerated (excluding major mineral wastes) divided by total waste generated (excluding major mineral wastes), multiplied by 100 and expressed as a percentage. Data shown up to 2016 as at the time of publishing, 2018 arisings data not available. |

# Recycling

## RC1. Waste from Households recycled

| Headline Indicator | **RC1**. Waste from Households recycled, composted or prepared for reuse |
|---|---|
| Measure Name(s) | **RC1a**. Waste from Households recycled, composted or prepared for reuse, England, million tonnes<br><br>**RC1b.** Waste from Households recycled, composted or prepared for reuse, England, kg per capita<br><br>**RC1c**. Waste from Households recycled, composted or prepared for reuse, England, percentage of total waste from households<br><br>**RC1d.** Net GHG emissions from management of Waste from Households, England, million tonnes $CO_2$ equivalent ($MtCO_2e$) |
| Proxy Indicator and Measures (where applicable) | N/A |
| Time Period of Data | **RC1a-c.** 2010 to 2018 inclusive<br><br>**RC1b**. 2017 |
| Description of Indicator and Measures Used | RC1a-c represent a time series of waste generated by households in England sent for recycling, composting or preparation for reuse measured in: 1) million tonnes; 2) kg per capita; and 3) as a percentage of overall waste from households. RC1d represents a snapshot of the estimated net greenhouse gas emissions associated with the management of waste from households in England in 2017, measured in million tonnes $CO_2$ equivalent |
| Desired Direction of Travel | **RC1a-c.** Up<br><br>**Rc1d.** Down |
| Relevant Goal in the 25 YEP | Goal 8 - minimise waste<br><br>Goal 7 – mitigating and adapting to climate change |
| Priority Area(s) | Increasing recycling<br><br>Reducing GHG emissions |
| Relevant Legislative Targets/Commitments/ Ambitions | Target: Recycle or prepare for reuse at least 50% of household waste by 2020 (Waste Framework Directive) |

| Headline Indicator | **RC1**. Waste from Households recycled, composted or prepared for reuse |
|---|---|
| National/Experimental/ Official Statistics | **RC1a-c:** Official<br><br>**RC1d**: No official classification |
| Geographical Scope | England |
| Lag | ~2 years |
| Definitions and Details of Calculation(s) | **RC1a.** '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.<br><br>**RC1b**. Population for England defined in accordance with the Office for National Statistics. Further details available at data source. Indicator calculated as the ratio of waste from households recycled (in mass unit) over the total population (in number).<br><br>**RC1c.** Indicator calculated as Waste from Households recycled, composted or prepared for reuse, divided by total Waste from Households, multiplied by 100 and expressed as a percentage.<br><br>**RC1d.** Greenhouse gas emissions avoided or produced are estimated based on waste composition data from the 2020 National Waste Composition studies produced by WRAP. Treatment routes are based on Waste Data Flow data. Assumptions about the carbon emissions associated with the treatment of material types derive from WRAP's English Carbon Metric (forthcoming). |

## RC2. Municipal waste recycled

| Headline Indicator | **RC2**. Municipal waste recycled |
|---|---|
| Measure Name(s) | |
| Proxy Indicator and Measures (where applicable) | **RC2a**. Local Authority Collected Waste (LACW) recycled or composted, England, million tonnes<br><br>**RC2b**. Local Authority Collected Waste (LACW) recycled or composted, England, kg per capita<br><br>**RC2c**. Local Authority Collected Waste (LACW) recycled or composted, England, percentage of total LACW |
| Time Period of Data | 2000/01 to 2018/19 inclusive |
| Description of Indicator and Measures Used | Proxy indicator represents a time series of local authority collected waste (LACW) recycled or composted in England measured in: 1) tonnes; 2) kg per capita; and 3) as a percentage of total LACW |
| Desired Direction of Travel | Up |
| Relevant Goal in the 25 YEP | Goal 8 - minimise waste |
| Priority Area(s) | Increase recycling |
| Relevant Legislative Targets/Commitments/ Ambitions | Target: Recycle 55% of municipal waste by 2025, 60% by 2030 and 65% by 2035 |
| National/Experimental/ Official Statistics | Proxy - official |
| Geographical Scope | England |
| Definitions and Details of Calculation(s) | **RC2a**. 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 |

| Headline Indicator | **RC2**. Municipal waste recycled |
| --- | --- |
| | 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.<br><br>**RC2b.** Population for UK defined in accordance with the Office for National Statistics. Indicator calculated as the ratio of local authority collected waste recycled and composted (in mass unit) over the total population (in number).<br><br>**RC2c**. Indicator calculated as local authority collected waste recycled or composted divided by total LACW, multiplied by 100 and expressed as a percentage. |

## RC3. Commercial and industrial waste recycled

*Indicator under development*

## RC4. Non-hazardous construction and demolition waste recovered

| Headline Indicator | **RC4.** Non-hazardous construction and demolition waste recovered |
|---|---|
| Measure Name(s) | **RC4a.** Non-hazardous construction and demolition (C&D) waste recovered, England, million tonnes<br><br>**RC4b.** Non-hazardous construction and demolition (C&D) waste recovered, England, kg per capita<br><br>**RC4c.** Non-hazardous construction and demolition (C&D) waste recovered, England, percentage of total C&D waste |
| Proxy Indicator and Measures (where applicable) | N/A |
| Time Period of Data | 2010 to 2016 inclusive |
| Description of Indicator and Measures Used | Indicator represents a time series of non-hazardous construction and demolition waste in England recovered, measured in: 1) tonnes; 2) kg per capita; and 3) as a percentage of total construction and demolition waste arisings |
| Desired Direction of Travel | Down |
| Relevant Goal in the 25 YEP | Goal 8 - minimise waste |
| Priority Area(s) | Increase recycling |
| Relevant Legislative Targets/Commitments/ Ambitions | Target: Recover at least 70% of non-hazardous Construction and Demolition waste by 2020 (EC Waste Framework Directive [2008/08/EC]) |
| National/Experimental/ Official Statistics | Official |
| Geographical Scope | England |
| Definitions and Details of Calculation(s) | **RC4a.** 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.<br><br>**RC4b.** Population for England defined in accordance with the Office for National Statistics. Further details available at data source. Indicator |

| Headline Indicator | **RC4.** Non-hazardous construction and demolition waste recovered |
|---|---|
| | calculated as the ratio of non-hazardous construction and demolition waste (in mass unit) over the total population (in number)<br><br>**RC4c**. Indicator calculated as non-hazardous C&D waste recovered divided by total non-hazardous C&D waste arisings, multiplied by 100 and expressed as a percentage |

## RC5. Packaging waste recycled

| Headline Indicator | **RC5**. Packaging waste recycled |
|---|---|
| Measure Name(s) | UK level packaging waste recycled used |
| Proxy Indicator and Measures (where applicable) | **RC5a**. Packaging waste recycled, UK, million tonnes<br><br>**RC5b**. Packaging waste recycled, UK, kg per capita<br><br>**RC5c.** Packaging waste recycled, UK, percentage of total packaging waste |
| Time Period of Data | 2008 to 2017 inclusive |
| Description of Indicator and Measures Used | Indicator represents a time series of UK packaging waste sent for recycling, measured in: 1) tonnes; 2) kg per capita; and 3) as a percentage of packaging placed on the market |
| Desired Direction of Travel | Up |
| Relevant Goal in the 25 YEP | Goal 8 - minimise waste |
| Priority Area(s) | Increase recycling |
| Relevant Legislative Targets/Commitments/ Ambitions | Commitment: Recycle 65% of packaging waste by 2025 and 70% by 2030 (RWS, 2018)<br><br>Material-specific targets:<br>o Paper and cardboard: 75% (2025) and 85 % (2030)<br>o Ferrous metals: 70% (2025) and 80% (2030)<br>o Aluminium: 50% (2025) and 60% (2030)<br>o Glass: 70% (2025) and 75% (2030)<br>o Plastic: 50% (2025) and 55% (2030)<br>o Wood: 25% (2025) and 30% (2030) |
| National/Experimental/ Official Statistics | Official |
| Geographical Scope | UK |
| Definitions and Details of Calculation(s) | **RC5a.** 'Packaging waste recycled' refers to tonnes of UK 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 |

| Headline Indicator | **RC5**. Packaging waste recycled |
|---|---|
| | of £2 million and the handling of at least 50 tonnes of packaging each year. Further details of methodology available at data source.<br><br>**RC5b.** Population for UK defined in accordance with the Office for National Statistics. Further details available at data source. Indicator calculated as the ratio of packaging waste recycled/recovered (in mass unit) over the total population (in number).<br><br>**RC5c**. Indicator calculated as packaging waste recycled/reprocessed divided by packaging waste placed on the market, multiplied by 100 and expressed as a percentage |

# Landfilling

## LF1. Municipal waste landfilled

| Headline Indicator | **LF1**. Municipal waste landfilled |
|---|---|
| Measure Name(s) | **LF1a**. Municipal waste landfilled, England, million tonnes<br><br>**LF1b.** Municipal waste landfilled, England, kg per capita |
| Proxy Indicator and Measures (where applicable) | N/A |
| Time Period of Data | 2010 to 2018 inclusive |
| Description of Indicator and Measures Used | Indicator represents a time series of municipal waste sent to landfill in England, measured in: 1) tonnes; and 2) kg per capita |
| Desired Direction of Travel | Down |
| Relevant Goal in the 25 YEP | Goal 8 - minimise waste |
| Priority Area(s) | Reduce landfilling |
| Relevant Legislative Targets/Commitments/ Ambitions | Commitment: No more than 10% of municipal waste sent to landfill by 2035 |
| National/Experimental/ Official Statistics | Official |
| Geographical Scope | England |
| Definitions and Details of Calculation(s) | **LF1a.** Indicator estimates the quantity of municipal waste sent to landfill in England. Municipal waste is defined as household waste and waste that is similar in nature and composition to household waste. Further details of methodology available at data source. 'Municipal waste' presented here is defined using a list of EWC (European Waste Classification) codes agreed across the UK for the purposes of reporting against the Landfill Directive's target on biodegradable municipal waste to landfill. Defra are currently reviewing which EWC codes might best reflect municipal waste for reporting going forward and changes will be backdated wherever possible.<br><br>**LF1b.** Population for England defined in accordance with the Office for National Statistics. Further details available at data source. Indicator |

| Headline Indicator | **LF1**. Municipal waste landfilled |
|---|---|
| | calculated as the ratio of municipal waste landfilled (in mass unit) over the total population (in number). |

## LF2. Biodegradable waste landfilled

| | |
|---|---|
| Headline Indicator | **LF2**. Biodegradable waste landfilled |
| Measure Name(s) | |
| Proxy Indicator and Measures (where applicable) | **LF2a**. Biodegradable municipal waste landfilled, England, million tonnes<br><br>**LF2b**. Biodegradable municipal waste landfilled, England, kg per capita<br><br>**LF2c.** Biodegradable municipal waste landfilled, England, proportion of total municipal waste landfilled |
| Time Period of Data | 2010 to 2018 inclusive |
| Description of Indicator and Measures Used | Proxy indicator represents a time series of biodegradable municipal waste (BMW) sent to landfill in England, measured in: 1) tonnes; 2) kg per capita; and 3) as a proportion of municipal waste landfilled |
| Desired Direction of Travel | Down |
| Relevant Goal in the 25 YEP | Goal 8 - minimise waste |
| Priority Area(s) | Reduce landfilling |
| Relevant Legislative Targets/Commitments/ Ambitions | Target: The amount of biodegradable municipal waste sent to landfill in the UK to be reduced to 75% of 1995 levels by 2010, to 50% of 1995 levels by 2013, and 35% of 1995 levels by 2020 (Landfill Directive [199/31/EC] |
| National/Experimental/ Official Statistics | Official |
| Geographical Scope | England |
| Definitions and Details of Calculation(s) | **LF2a.** For the purposes of reporting to the Landfill Directive, the UK countries 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<br><br>**LF2b**. Population for England defined in accordance with the Office for National Statistics. Further details available at data source. Indicator |

| Headline Indicator | **LF2**. Biodegradable waste landfilled |
| --- | --- |
| | calculated as the ratio of biodegradable municipal waste landfilled (in mass unit) over the total population (in number).<br><br>**LF2c**. Indicator calculated as biodegradable municipal waste landfilled divided by municipal waste landfilled, multiplied by 100 and expressed as a percentage |

## LF3. Food and drink waste landfilled

*Indicator under development.*

# Waste crime

## WC1. Illegal waste sites

| | |
|---|---|
| Headline Indicator | **WC1.** Illegal waste sites and high-risk illegal waste sites |
| Measure Name(s) | **WC1a.** Illegal waste sites and high-risk illegal waste sites, England, number of sites |
| Proxy Indicator and Measures (where applicable) | N/A |
| Time Period of Data | 2009/10 to 2018/19 inclusive |
| Description of Indicator and Measures Used | Indicator represents a time series of the total number of illegal waste sites and of these, the number of high-risk illegal waste sites, identified in England |
| Desired Direction of Travel | Down |
| Relevant Goal in the 25 YEP | Goal 8 - minimise waste |
| Priority Area(s) | Reduce waste crime |
| Relevant Legislative Targets/Commitments/ Ambitions | Seek to eliminate waste crime and illegal sites by 2043 focusing on those of highest risk |
| National/Experimental/ Official Statistics | |
| Geographical Scope | England |
| Definitions and Details of Calculation(s) | 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. Waste fly tipped

| Headline Indicator | **WC2.** Waste fly tipped |
|---|---|
| Measure Name(s) | **WC2a.** Waste fly tipped, England, incidents |
| Proxy Indicator and Measures (where applicable) | N/A |
| Time Period of Data | 2007/08 to 2018/19 inclusive |
| Description of Indicator and Measures Used | Indicator represents a time series of the number of incidents of fly-tipping recorded in England |
| Desired Direction of Travel | Down |
| Relevant Goal in the 25 YEP | Goal 8 - minimise waste |
| Priority Area(s) | Reduce waste crime |
| Relevant Legislative Targets/Commitments/ Ambitions | Seek to eliminate waste crime by 2042 (25YEP) |
| National/Experimental/ Official Statistics | Official |
| Geographical Scope | England |
| Definitions and Details of Calculation(s) | 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. Littering

| Headline Indicator | **WC3.** Littering |
|---|---|
| Measure Name(s) | **WC3a (i).** Percentage of places at or above An acceptable standard for litter, England<br><br>**WC3a (ii).** Percentage of people perceiving litter as a problem, England<br><br>**WC3a (iii).** Costs to Local Authorities of street cleaning, England |
| Proxy Indicator and Measures (where applicable) | N/A |
| Time Period of Data | **WC3a (i).** 2001/02 to 2017/18 inclusive<br><br>**WC3a (ii).** 2001/02 to 2018/19 inclusive<br><br>**WC3a (iii).** 2016/17 to 2017/18 inclusive |
| Description of Indicator and Measures Used | Indicators represents a subset of Defra's litter dashboard which together enable us to assess litter from several dimensions. The indicators are: 1) the percentage of places at or above a desired standard for litter; 2) how big of a problem people think litter is; and 3) how much street cleansing costs local authorities. |
| Desired Direction of Travel | Various |
| Relevant Goal in the 25 YEP | Goal 8 - minimise waste |
| Priority Area(s) | Reduce waste crime |
| Relevant Legislative Targets/Commitments/ Ambitions | |
| National/Experimental/ Official Statistics | **WC3a (i).**<br><br>**WC3a (ii).** National<br><br>**WC3a (iii).** Official |
| Geographical Scope | England |

| Headline Indicator | **WC3.** Littering |
| --- | --- |
| Definitions and Details of Calculation(s) | 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 data source alongside links to underlying data sources for each indicator.<br><br>**WC3a (i):** Data missing for 2015/16 and 2016/17 due to the Local Environmental Quality Survey of England not being undertaken in these years.<br><br>**WC3a (ii):** All annual data presented for the year ending March. |