Office for National Statistics

Article

A review of household behaviour in relation to food waste, recycling, energy use and air travel

This analysis looks at what the available statistics tell us about how UK household approaches to food waste, recycling, energy use and travel have changed over time.

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1 . Main points

- Overall energy consumption in the UK fell by 13% between 1990 and 2019.
- The share of renewable energy in overall energy consumption in the UK increased by almost 12 percentage points between 1990 and 2019.
- Households were the highest user of fossil fuels in the UK in 2019; this is compared with the energy, manufacturing and transport sectors.
- Household recycling rates have increased by 5 percentage points from 40 to 45% between 2010 and 2019 in the UK, with the highest rates currently in Wales.
- The biggest contributor to food waste in the UK is households, making up 70% of the overall total; overall food waste produced by the UK fell by around 15% between 2007 and 2018.
- International aviation emissions have risen sharply since the early 1990s, while domestic aviation emissions have remained at a similar level.
- The level of concern about climate change has increased by 11 percentage points from 2012; around three-quarters of people (76%) in the UK said they were concerned about climate change in March 2020.

2 . Overview

A target of net zero for UK greenhouse gas (GHG) emissions by 2050 compared with 1990 levels was adopted in 2019.

In this article, we look at what the available statistics tell us about how UK household approaches to food waste, recycling, energy use and travel have changed over time.

The role of businesses will be explored in a further article on 8 November 2021.

Using Office for National Statistics (ONS) emissions statistics, households have been the largest contributor of emissions since 2015 when compared with the energy, manufacturing and transport sectors. This includes activities such as heating homes and travelling, for commuting, social, domestic or leisure purposes. Households and the energy, manufacturing and transport sectors accounted for 72% of all greenhouse gas emissions in 2019.

We recently launched a UK climate change statistics platform to help to inform policymakers and the public, which includes an explanation of the different measures of GHG emissions available.

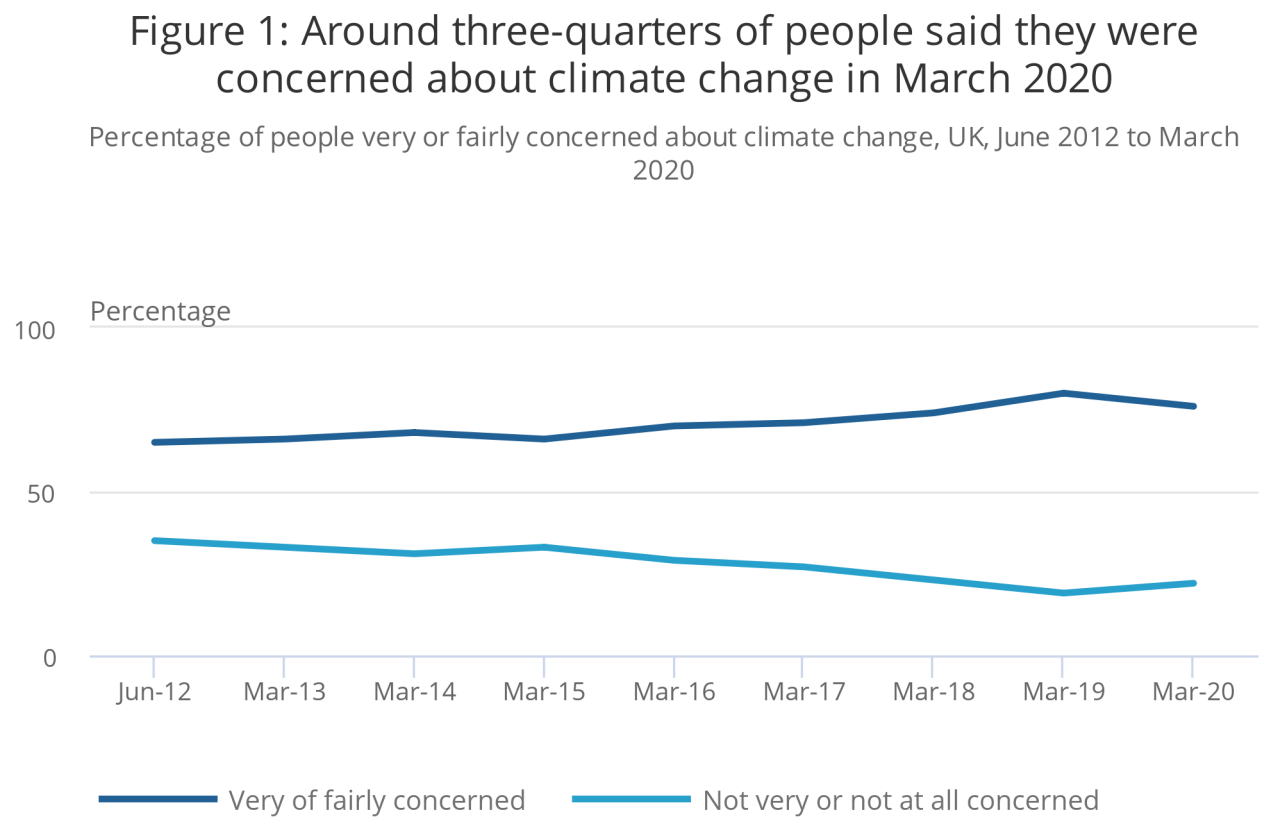
3 . Concern about climate change

The United Nations has been bringing together world governments for climate summits, Conferences of the Parties, or COPs, for almost three decades. This year will be the 26th COP which, with the UK as co-president, takes place in Glasgow.

In recent years, attitudes towards climate change have changed. Department for Business, Energy and Industrial Strategy (BEIS) statistics show that levels of concern about climate change have increased in the UK. In March 2020, 76% expressed concern about climate change, with 22% not concerned, compared with 65% concerned and 35% not concerned in June 2012. Following the start of the coronavirus (COVID-19) pandemic, face-to-face fieldwork was suspended for this survey. For comparison purposes, data collected from before the suspension have been used in this article.

Figure 1: Around three-quarters of people said they were concerned about climate change in March 2020

Percentage of people very or fairly concerned about climate change, UK, June 2012 to March 2020



Source: Department for Business, Energy and Industrial Strategy (BEIS), Public Attitudes Tracker (PAT)

Notes:

1. 2012 figures are taken from June 2012 (Wave 2) as this question was not asked in a comparable format in March 2012 (Wave 1).

2. Figures from 2013 to 2020 taken from March survey waves.

3. The 33rd wave of PAT data was collected between 11 and 17 March 2020 through face-to-face in-home interviews with a representative sample of 1,850 households in the UK.

4. Fieldwork for this wave stopped early due to the outbreak of coronavirus (COVID-19) in the UK, and the associated lockdown measures.

5. Details of the methodology can be found in the BEIS Public Attitudes Tracker (Wave 33) release.

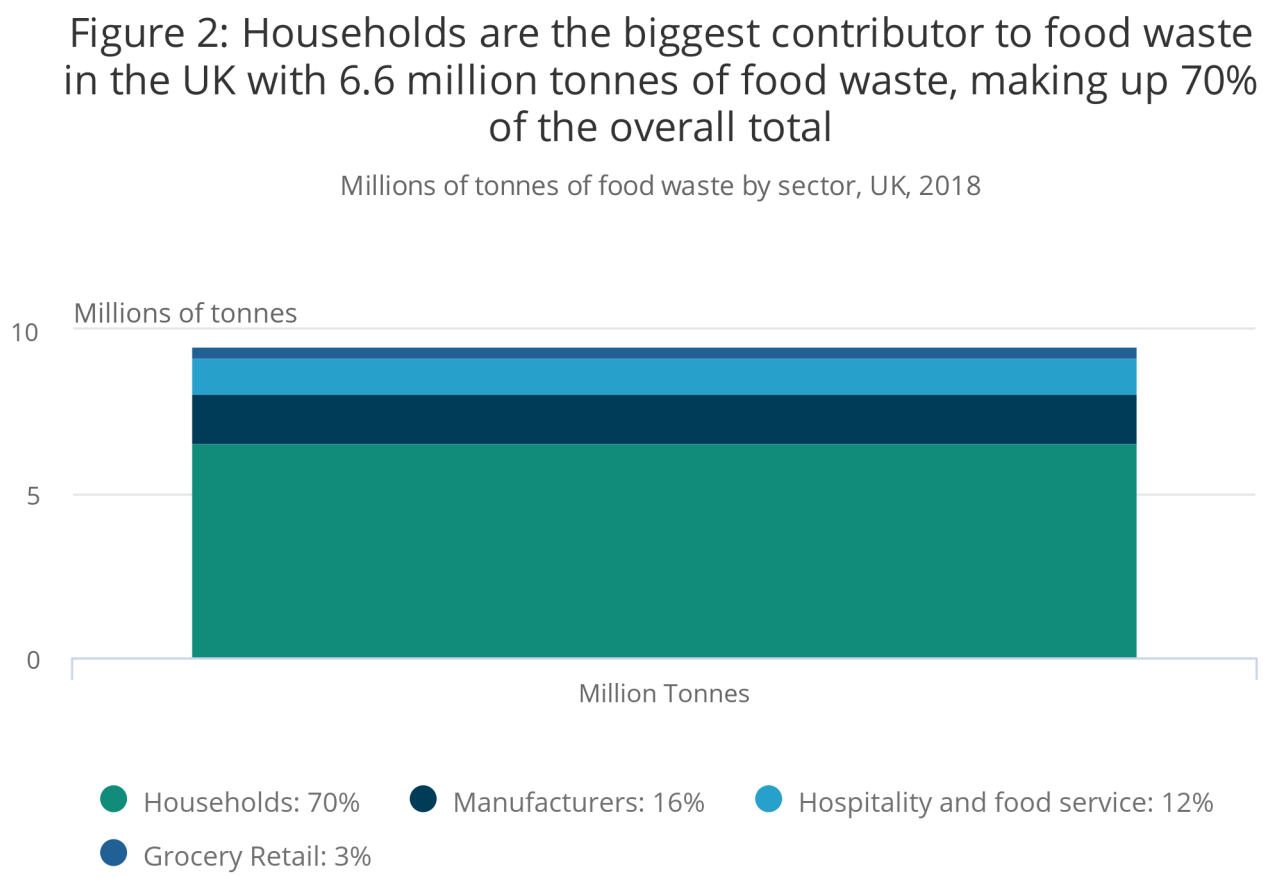
An article looking at public attitudes to climate in Great Britain, using data from the ONS Opinions and Lifestyle Survey, will be published on 5 November 2021.

4 . Changes to household food waste

The UK produced around 9.5 million tonnes of food waste in 2018, or the equivalent of 143 kilogrammes per person, according to the Office for National Statistics (ONS). This is down 15% from 11.2 million tonnes of food waste in 2007, an equivalent of 181 kilogrammes per person. In 2018, the majority of this food waste, 70% of the total, was from within households. Their share is slightly down from 72% in 2007.

Figure 2: Households are the biggest contributor to food waste in the UK with 6.6 million tonnes of food waste, making up 70% of the overall total

Millions of tonnes of food waste by sector, UK, 2018



Source: Office for National Statistics (ONS), Sustainable Development Goals (SDG) data, Waste and Resources Action Programme (WRAP)

Notes:

1. “Food” is any substance (whether processed, semi-processed, or raw) that is intended for human consumption. “Inedible parts” are components associated with a food that, in a particular food supply chain, are not intended to be consumed by humans. It is estimated that 70% of this total was intended to be consumed by people with the other 30% classified as inedible parts. 2. Percentages may not sum to 100% because of rounding.

2. Percentages may not sum to 100% due to rounding.

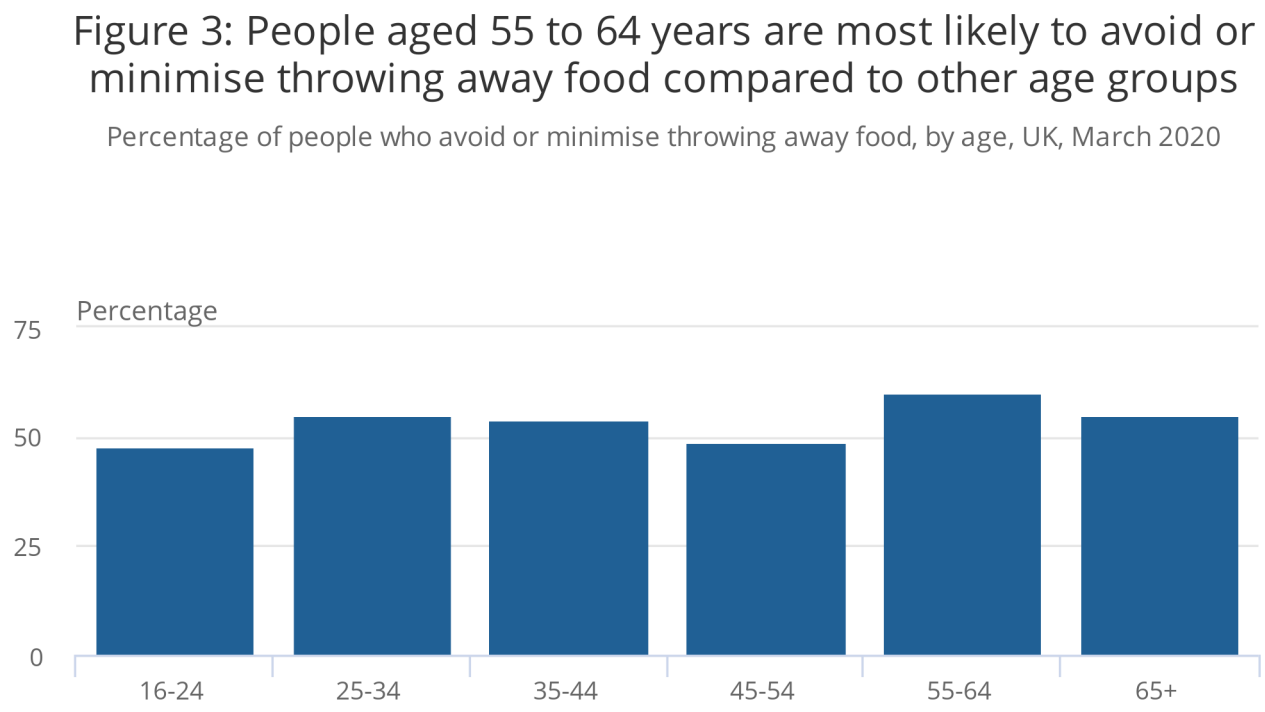
The greenhouse gas emissions associated with the 9.5 million tonnes of food waste in the UK in 2018 have been estimated to be around 36 million tonnes of carbon dioxide equivalent (CO2e), according to the latest report from Waste and Resources Action Programme (WRAP), which collects the UK food waste data. This is equivalent to around 8% of the UK's territorial emissions in 2018 (PDF, 1MB). This calculation is based on territorial emissions of 451.5 tonnes CO2e in 2018, published by BEIS.

Just over half (54%) of the public in the UK reported avoiding or minimising throwing away food in March 2020, according to Business, Energy and Industrial Strategy (BEIS) statistics. Around a quarter (26%) reported doing so to limit the effects of climate change, while two-thirds (66%) reported doing this mainly for other reasons, such as lifestyle choice, cost, convenience, health or ethical reasons.

Six in ten people aged 55 to 64 years (60%) reported avoiding or minimising throwing away food, compared with 48% of people aged 16 to 24 years. However, older people were less likely to avoid or minimise food waste because of climate change, with 15% of people aged 65 years and over and 23% of people aged 55 to 64 years reporting this as their main reason. This compares with 39% of 16- to 24-year-olds.

Figure 3: People aged 55 to 64 years are most likely to avoid or minimise throwing away food compared to other age groups

Percentage of people who avoid or minimise throwing away food, by age, UK, March 2020



Source: Department for Business, Energy and Industrial Strategy (BEIS) – Public Attitudes Tracker (PAT)

Notes:

1. The 33rd wave ofPATdata was collected between 11 and 17 March 2020 through face-to-face in-home interviews with a representative sample of 1850 households in the UK.

2. Fieldwork for this wave stopped early because of the outbreak of coronavirus (COVID-19) in the UK, and the associated lockdown measures.

3. Details of the methodology can be found in the BEIS Public Attitudes Tracker (Wave 33) release.

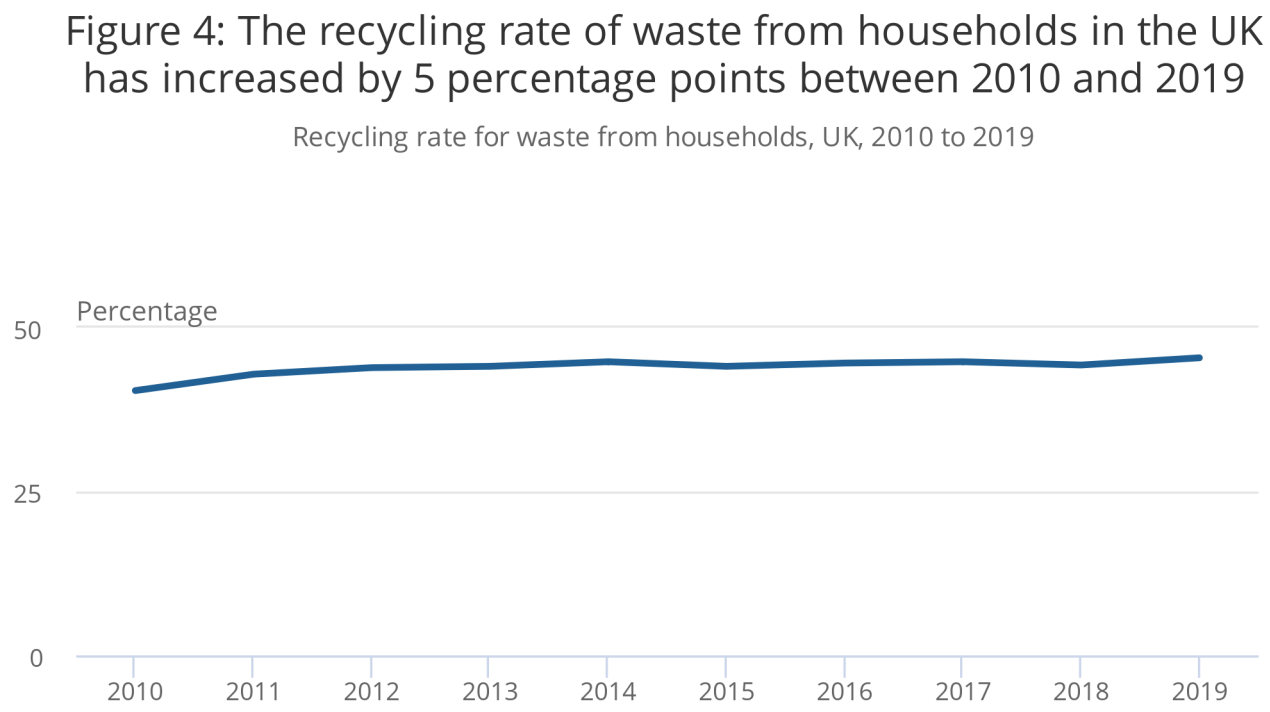
5 . Changes in household recycling

Waste from Households (WfH) is a measure used to report household recycling used by the Department for Environment, Food and Rural Affairs (Defra) and the devolved administrations of the UK government. It calculates the percentage of waste collected from households that is recycled.

The recycling rate for WfH was 45% for the UK in 2019, an increase of 5 percentage points between 2010 and 2019.

Figure 4: The recycling rate of waste from households in the UK has increased by 5 percentage points between 2010 and 2019

Recycling rate for waste from households, UK, 2010 to 2019



Source: Department for Environment, Food and Rural Affairs (Defra), Waste Data Flow

Notes:

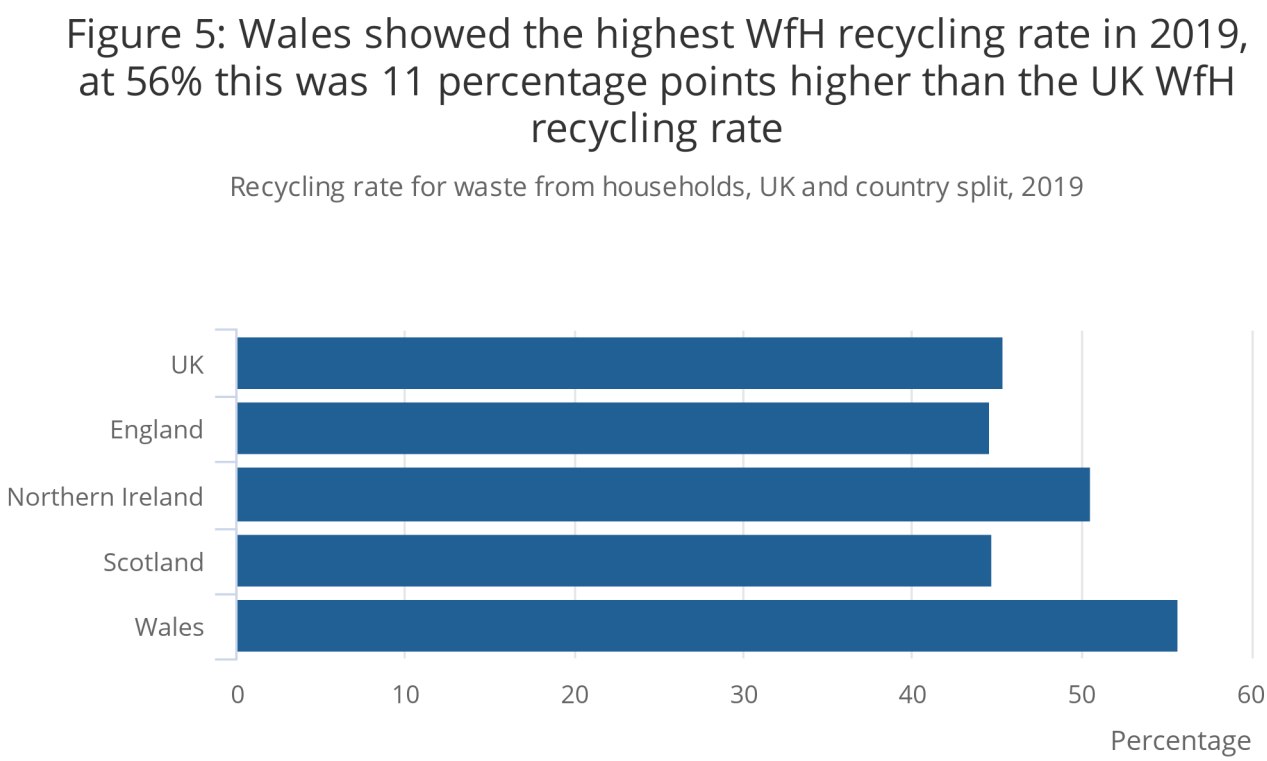
1. UK estimates for “Waste from households” have been calculated in accordance with the Waste Framework Directive.
2. “Waste from households” includes waste from regular household collection, civic amenity sites, bulky waste, and other household waste.
3. “Waste from households” excludes waste from: Street cleaning/sweeping, Gully emptying, separately collected healthcare waste, Soil, Rubble, Plasterboard & Asbestos wastes.
4. Whilst the general approach is consistent across UK nations, aggregation method and the wording of some questions completed by Local Authorities varies.
5. Users should be aware that individual UK nations other than England publish household recycling estimates using alternative measures and as such may differ from the estimates published here.
6. Local Authorities in England may also additionally use an alternative measure to “Waste from Households”.
7. Incineration bottom ash (IBA) metals excluded within the recycling rate calculations.

Within the UK, Wales had the highest WfH recycling rate in 2019 of the four nations. At 56%, this was 11 percentage points higher than the UK overall rate. Northern Ireland's rate (51%) was 6 percentage points higher than the UK overall rate, while England and Scotland, who each has a waste from household recycling rate of 45%, had a similar rate to the overall UK rate.

Northern Ireland has also shown the greatest increase since 2010, 13 percentage points from 38% in 2010 to 51% in 2019. This was followed by Scotland, with a 12-percentage point increase from 33% in 2010 to 45% in 2019. Wales saw a 12-percentage point increase from 44% in 2010 to 56% in 2019, while England increased by 6 percentage points from 40% in 2010 to 46% in 2019.

Figure 5: Wales showed the highest WfH recycling rate in 2019, at 56% this was 11 percentage points higher than the UK WfH recycling rate

Recycling rate for waste from households, UK and country split, 2019



Source: Department for Environment, Food and Rural Affairs (Defra), Waste Data Flow

Notes:

1. UK estimates for “Waste from households” have been calculated in accordance with the Waste Framework Directive.

2. “Waste from households” includes waste from: Regular household collection, Civic amenity sites, Bulky waste, Other household waste.

3. “Waste from households” excludes waste from: Street cleaning/sweeping, Gully emptying, separately collected healthcare waste, Soil, Rubble, Plasterboard & Asbestos wastes.

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6. Local Authorities in England may also use an alternative measure to “Waste from Households”.

7. Incineration bottom ash (IBA) metals excluded within the recycling rate calculations.

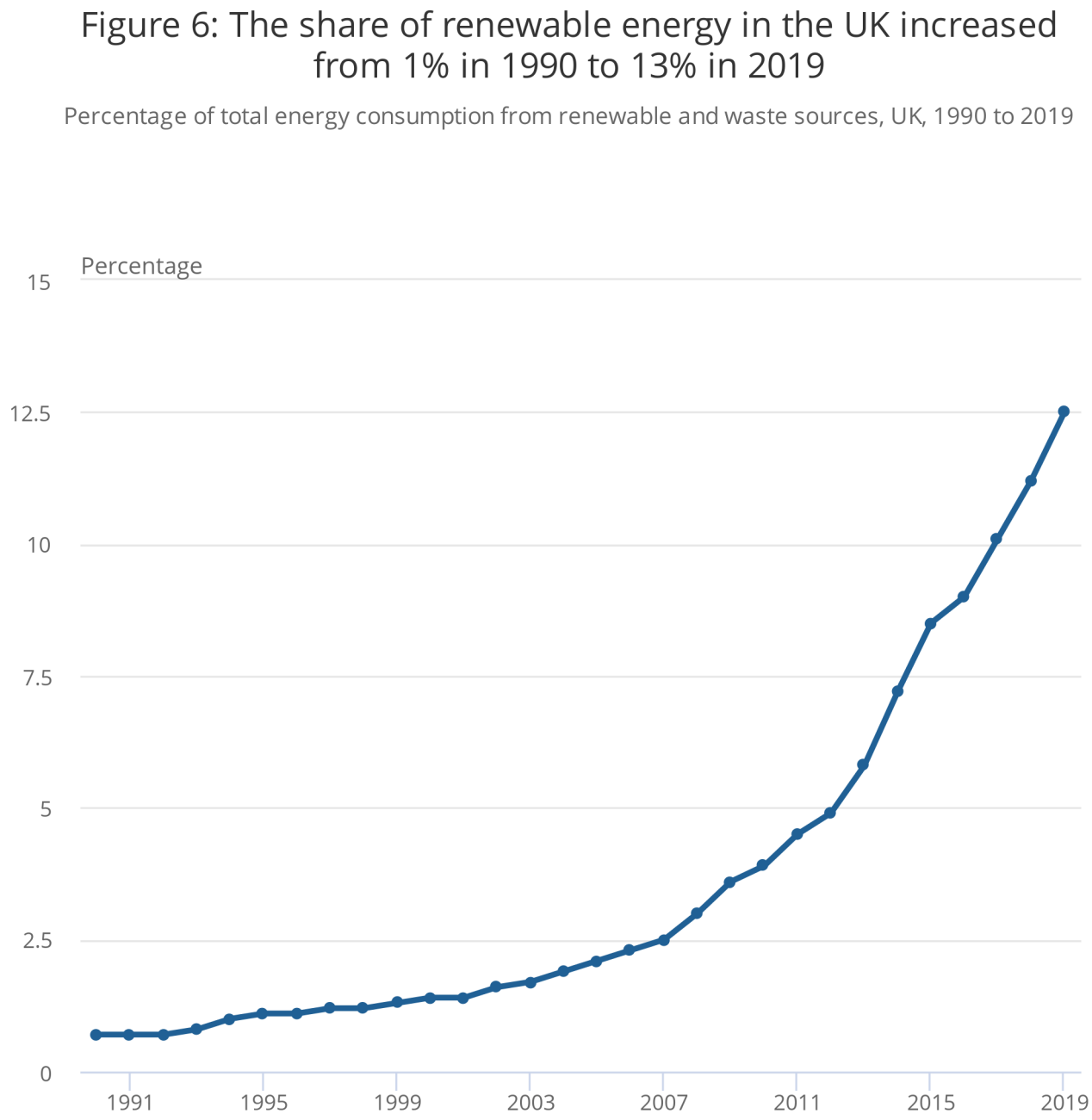
8. Minor revisions were made to historical figures for UK, England, NI and Scotland in February 2019.

6 . Energy use

Overall energy consumption in the UK has fallen 13%, from 224.6 million tonnes of oil equivalent in 1990 to 195.3 million tonnes of oil equivalent (Mtoe) in 2019, according to data from the Office for National Statistics (ONS). In 1990, energy consumption from fossil fuels contributed to 92% of total energy consumption, which had fallen to 80% by 2019. ONS statistics show that the share of renewable energy has increased from 1% in 1990 to 13% in 2019.

Figure 6: The share of renewable energy in the UK increased from 1% in 1990 to 13% in 2019

Percentage of total energy consumption from renewable and waste sources, UK, 1990 to 2019



Source: Office of National Statistics (ONS) – Energy use: renewable and waste sources

Notes:

1. Renewable sources include solar photovoltaic, geothermal and energy from wind, wave and tide, hydroelectricity, wood, charcoal, straw, liquid biofuels, biogas from anaerobic digestion and sewage gas. Landfill gas, poultry litter and municipal solid waste combustion have also been included within this definition.

2. There are two measures of UK renewable energy consumption, an Environmental Accounts figure produced by the Office for National Statistics (ONS) and a Digest of UK Energy Statistics (DUKES) figure produced by the Department for Business, Energy and Industrial Strategy (BEIS)

3. The ONS statistic is calculated on a residency basis, whereas the DUKES figure is calculated on a territory basis. This means the ONS statistic uses data relating to UK residents and UK-registered businesses, regardless of whether they are based in the UK or overseas.

4. The DUKES publication is annually produced by BEIS. The ONS also produce a bridging table to aid with comparisons between the two measures.

Fossil fuel use is an important contributor to greenhouse gas emissions. ONS statistics show that households remained the highest users of fossil fuels in the UK in 2019, using 52 Mtoe. This is compared with the energy, manufacturing, and transport and storage sectors.

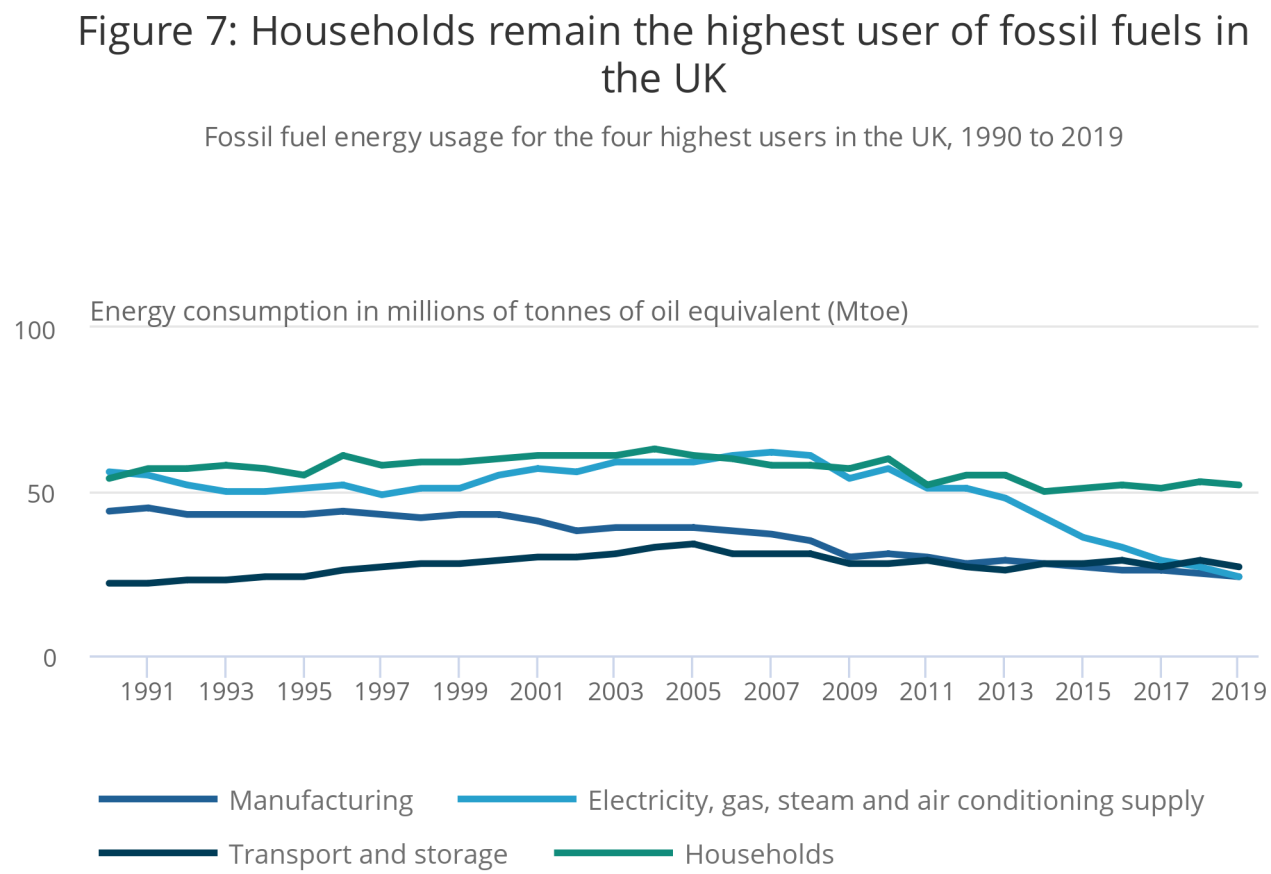
Fossil fuel use in the energy supply sector (electricity, gas, steam and air conditioning supply) has declined from 56 Mtoe in 1990 to 24 Mtoe in 2019. Fossil fuel use by the manufacturing sector has also been falling in recent years. This is largely because of a switch from the use of coal to other, more resourceful fuels such as natural gas.

Fossil fuel usage in the transport and storage sector has increased from 22 Mtoe in 1990 to 27 Mtoe in 2019. At its highest in 2007, fossil fuel use in this sector was at 31 Mtoe and has been steadily in decline since then. However, the same data suggest energy usage from fossil fuels by households has shown little decline overtime.

An article looking at the barriers to switching to all electric vehicles, using data from the ONS Opinions and Lifestyle Survey, was recently published by the ONS.

Figure 7: Households remain the highest user of fossil fuels in the UK

Fossil fuel energy usage for the four highest users in the UK, 1990 to 2019



Source: Office for National Statistics (ONS), Ricardo Energy and Environment

Notes:

1. Industry aggregations are based on the UK Standard Industrial Classification (SIC) 2007. Households include “consumer expenditure” and “activities of households as employers; undifferentiated goods and services – producing activities of households for own use” (for example, employing a cleaner and growing vegetables for your own consumption). The electricity, gas, steam and air conditioning supply sector is referred to as the energy supply sector. The transport and storage sector is referred to as the transport sector.

2. Coal, natural gas and fuels derived from crude oil (for example petrol and diesel) are called fossil fuels because they have been formed over long periods of time from ancient organic matter.

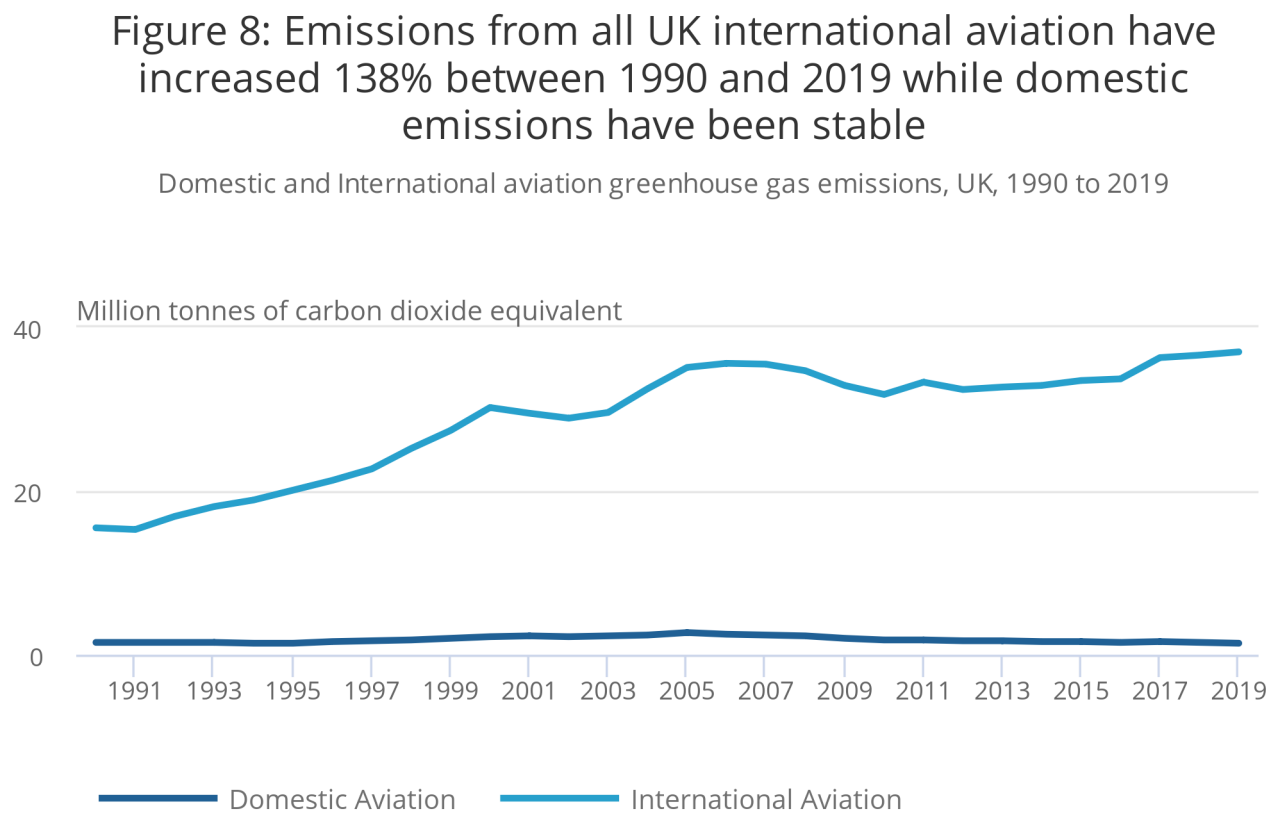
Half (51%) of the UK public report minimising their energy usage in March 2020, according to Business, Energy and Industrial Strategy (BEIS) statistics. Of these people, 34% said they did so mainly to limit effects of climate change, while 11% said this was to limit effects of climate change as well as other reasons. Also, 37% of people thought about the energy efficiency of products and appliances when they made a purchase. Of these, 43% said they did this mainly to limit the effects of climate change while 10% said it was for this as well as other reasons.

7 . Air travel

Statistics from the Department of Transport (DfT) estimated emissions from all UK international aviation have risen by 138%, from 16 million tonnes of carbon dioxide equivalent (MtCO2e) to 37 MtCO2e, between 1990 and 2019. Emissions from all domestic aviation have stayed stable, from 1.5 MtCO2e in 1990 to 1.4 MtCO2e in 2019. These aviation carbon dioxide emissions estimates are based on the BEIS figures on the deliveries of aviation spirit and aviation turbine fuel in the UK.

Figure 8: Emissions from all UK international aviation have increased 138% between 1990 and 2019 while domestic emissions have been stable

Domestic and International aviation greenhouse gas emissions, UK, 1990 to 2019



Source: Department for Transport

Notes:

1. International aviation and international shipping emissions are not included in the national total reported to the United Nations Climate Change, since there is no internationally agreed way of allocating these emissions to individual nation states.

2. Domestic and international shipping are defined by the start/destination of the voyage (that is a journey between UK ports is classed as domestic for reporting purposes).

3. Aviation carbon dioxide emissions estimates are based on the BEIS figures on the deliveries of aviation spirit and aviation turbine fuel in the UK. The fuel used for military aviation is subtracted from these figures. Emissions for military aircraft are allocated to "Military aircraft and shipping", which is included in the "Other" category in tables ENV0201 and ENV0202. The aviation fuels (after subtraction of fuel used for military aviation) are split between domestic aviation and international aviation on the basis of data on domestic and international fights, taking into account the types of aircraft used for each fight. Only international flights departing the UK are included for compatibility with consumption of fuels from UK supplies.

There were 93.1 million visits overseas by UK residents in 2019 according to the Office for National Statistics (ONS). Statistics on overseas visits by UK residents were collected by the International Passenger Survey (IPS). The IPS covers all major airports, seaports and the Channel Tunnel. In 2018, 84% of visits overseas by UK residents were by air, 8% of visits by sea and 7% by the Channel Tunnel. Data collection was suspended on 16 March 2020, for the period April to December 2020 because of the coronavirus (COVID-19) pandemic. For comparison purposes, data collected from before the suspension have been used in this article.

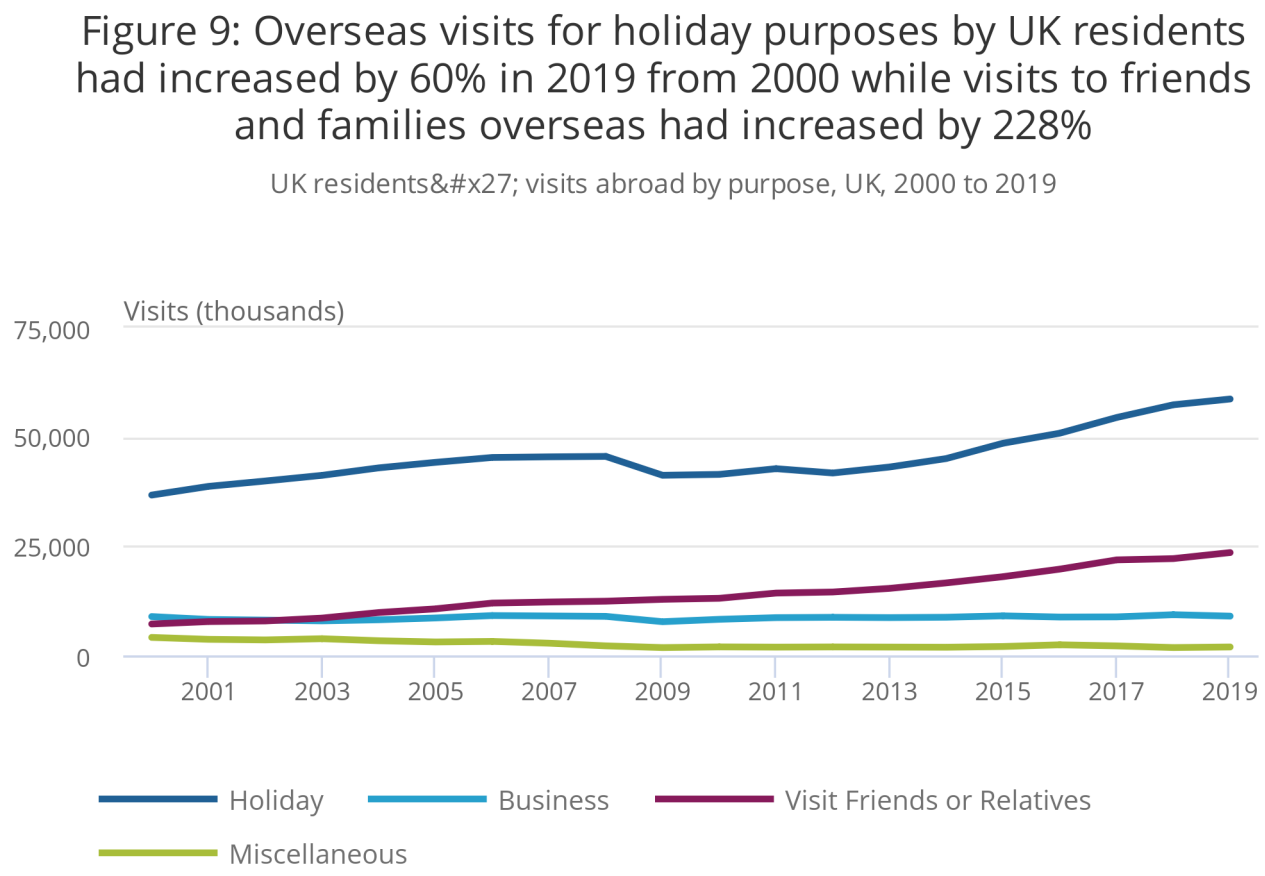
Visits overseas by UK residents have increased steadily over the last 20 years, except for a notable fall seen in 2009. Between 2000 and 2019, visits overseas increased by 64%.

Going on holiday accounted for 63% of all overseas visits by UK residents in 2019. Since 2000, the number of overseas visits for holidays has increased by 60%. Going overseas to visit friends or relatives accounted for a quarter (25%) in 2019, and has seen an increase of 228% since 2000.

Overseas visits for business purposes account for around 1 in 10 visits overseas (10%). Since 2000, the number of business trips has remained stable, with a slight increase of 1% in 2019. Overseas visits for miscellaneous purposes account for 2% of the overall total in 2019 and have decreased by 53% from 2000 to 2019. Visits for miscellaneous purposes include those for study, to attend sporting events, for shopping, health, religious, or for other purposes.

Figure 9: Overseas visits for holiday purposes by UK residents had increased by 60% in 2019 from 2000 while visits to friends and families overseas had increased by 228%

UK residents' visits abroad by purpose, UK, 2000 to 2019



Source: Office for National Statistics – International Travel and Tourism

Notes:

1. Data collection by the International Passenger Survey (IPS) was suspended 16 March 2020. For the period April to December 2020 the figures in this release are based on administrative sources and modelling; estimates prior to April 2020 are based on data collected from the IPS.

2. Visits for miscellaneous purposes include those for study, to attend sporting events, for shopping, health, religious, or for other purposes, together with visits for more than one purpose when none predominates (for example, visits both on business and on holiday). Overseas visitors staying overnight in the UK on their way to other destinations are also included in miscellaneous purposes.

Department for Business, Energy and Industrial Strategy (BEIS) statistics suggest that 18% of the public in the UK avoided or minimised air travel in March 2020. Of these, 42% did so mainly to help limit the effects of climate change while 6% said it was for this as well as other reasons.

8 . Glossary

Climate change

Long-term shift in the planet's weather patterns and rising average global temperatures.

Food waste

"Food" is any substance – whether processed, semi-processed, or raw – that is intended for human consumption. "Inedible parts" are components associated with a food that, in a particular food supply chain, are not intended to be consumed by humans.

Fossil fuels

These materials include coal, oil and gas.

Greenhouse gas

The greenhouse gases included in the atmospheric emissions accounts are those covered by the Kyoto Protocol: carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF6) and nitrogen trifluoride (NF3). These gases contribute directly to global warming and climate change owing to their positive radiative forcing effect. The potential of each greenhouse gas to cause global warming is assessed in relation to a given weight of CO2 so all greenhouse gas emissions are measured as carbon dioxide equivalents (CO2e).

Industry

Businesses are classified into an industry using the current Standard Industrial Classification 2007 by the type of economic activity in which they are engaged.

Net zero

Net zero means that the UK's total greenhouse gas (GHG) emissions would be equal to or less than the emissions the UK removed from the environment. This can be achieved by a combination of emission reduction and emission removal. The new net zero target was announced by the government in June 2019, which requires the UK to bring all greenhouse gas emissions to net zero by 2050.

Territory basis

Estimates of greenhouse gas emissions compiled on a territory basis include emissions within UK borders. UK air emissions statistics on a territory basis are published by the Department for Business, Energy and Industrial Strategy.

Visits

The figures relate to the number of completed visits, not the number of visitors. Anyone entering or leaving more than once in the same period is counted on each visit.

9 . Data sources and quality

More quality and methodology information on the strengths, limitations, appropriate uses, and how the data were created can be found on the original data source publication sites using the following links:

- BEIS Public Attitudes Tracker - Wave 33
- WRAP technical report (PDF, 984KB)
- UK statistics on waste - GOV.UK (www.gov.uk)
- Methodology related to environmental accounts - Office for National Statistics (ons.gov.uk)
- Transport energy and environment statistics information - GOV.UK (www.gov.uk)
- International Passenger Survey QMI - Office for National Statistics (ons.gov.uk)

10 . Related links

COVID-19 restrictions cut household emissions
Article | Released 21 September 2021
With more people staying at home last year, household greenhouse gas emissions dropped by 10%. Could the shift to home working see lower emissions in the longer term?

Over half of younger drivers likely to switch to electric in next decade
Article | Released 25 October 2021
With the sale of vehicles reliant on fossil fuels set to end by 2030, what barriers exist for drivers to make the switch, and is the necessary infrastructure in place?

Low carbon and renewable energy economy, UK: 2019
Bulletin | Released 29 March 2021
Estimates of the size of the UK's green economy from the Low Carbon and Renewable Energy Economy Survey, including turnover, employment, investment and trade.

Road transport and air emissions
Article | Released 16 September 2019
Contribution of road transport to greenhouse gas and air pollutant emissions – analysis of the UK Environmental Accounts data.

Material footprint in the UK: 2018
Article | Released 10 May 2021
The UK's material footprint captures domestic and foreign extraction of materials needed to produce products used in the UK. This article presents updated estimates.

Greenhouse gas emissions intensity, UK
Bulletin | Released 21 September 2021
Measuring the contribution of the environment to the economy, the impact of economic activity on the environment, and society's response to environmental issues.

How has lockdown changed our relationship with nature?
Article | Released 26 April 2021
More than a year on from the first national lockdown in spring 2020, we look at how people's perception of nature changed during the pandemic and whether this is likely to continue as restrictions ease.