Office for National Statistics

Statistical bulletin

UK Environmental Accounts: 2025

Measuring the contribution of the environment to the economy, the impact of economic activity on the environment, and responses to environmental issues

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Next release:
To be announced

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1 . Main points

- UK greenhouse gas emissions on a residence basis in 2023 were 479 million tonnes of carbon dioxide equivalent (MtCO2e) - the lowest since 1990, the earliest year available; this is 4.3% below the 2022 level and 43.0% below 1990's level.
- Consumer expenditure remains the largest single contributor to this measure of UK emissions in 2023, accounting for 25.4% of total emissions, followed by the energy industry with 15.5%.
- Among industries, energy saw the largest decrease of emissions by industry since 2022, by 14.6% to 74 MtCO2e in 2023.
- For every £ million of UK economic activity, the UK emitted 160 tonnes of CO2e in 2023, 71.4% down from 560 tonnes in 1990.
- The environmental goods and services sector (EGSS) contributed an estimated £60.2 billion in 2022, 2.7% of total UK gross value added (GVA) in that year.
- Full-time equivalent employment in the UK's EGSS was an estimated 479,800 in 2022, up 6.1% from 2021, with waste accounting for the largest activity by employment.

For the full list of all datasets published as part of the UK Environmental Accounts see "View all data used in this statistical bulletin" at the top of this page.

The latest available year for the range of measures in this release varies because of availability of source data. Greenhouse gas emissions and energy use are available to 2023, while environmental goods and services sector estimates are available to 2022.

2 . Greenhouse gas emissions

Information about different emissions measures can be found in our Measuring UK greenhouse gas emissions article. This bulletin covers residence-based emissions, which focuses on emissions by UK residents and UK-registered businesses, whether they happen in the UK or overseas.

Total UK greenhouse gas (GHG) emissions on this basis in 2023 were 479 million tonnes of CO2 equivalent (MtCO2e). This is below the previous record low estimate in 2020, which was affected by coronavirus (COVID-19) pandemic restrictions, and the lowest emissions estimate since 1990, when this data series began.

UK emissions have fallen 43.0% on this basis since 1990, with the 66.0% fall in energy industry emissions being one of the main factors.

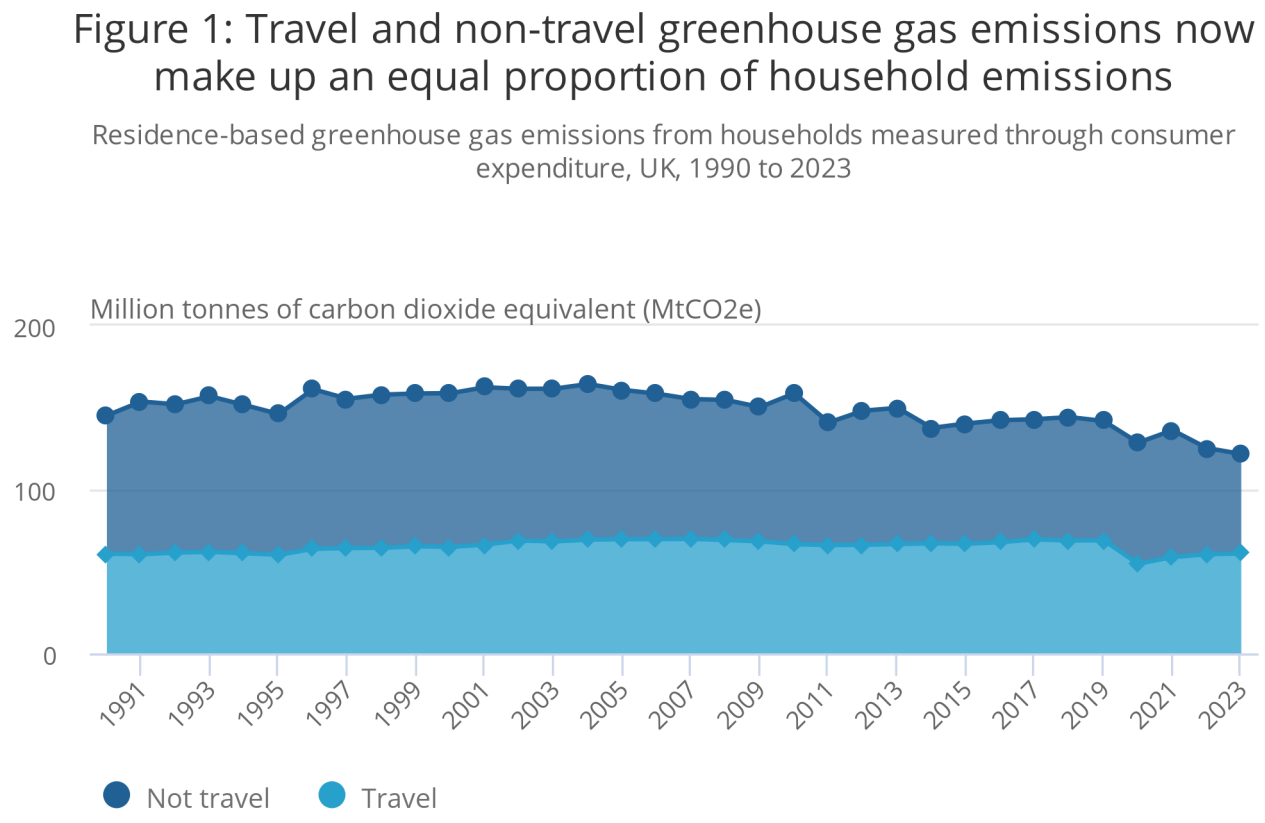
Household emissions

Emissions from households, measured through the consumer expenditure industry code (Standard Industrial Classification: SIC 2007), have been the largest source of GHG emissions in the UK in every year since 2015, averaging 21.7% of total annual emissions since 1990.

These emissions mainly comprise domestic travel and heating of homes (referred to as "non-travel"), but not emissions from electricity use. "Non-travel" had been the larger of the two emissions groups. However, since 2022, these have converged and are now at similar levels.

Figure 1: Travel and non-travel greenhouse gas emissions now make up an equal proportion of household emissions

Residence-based greenhouse gas emissions from households measured through consumer expenditure, UK, 1990 to 2023



Source: UK Environmental Accounts from Ricardo Energy and Environment and the Office for National Statistics

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).

2. Non-travel related emissions are from the consumption of fuels and other products by individuals in the UK, as opposed to the production of these by industry. Travel-related emissions consist almost entirely of road transport emissions. Travel and non travel add up to total household emissions, known as consumer expenditure.

3. The Air Emission Accounts these data come from only include direct residence-based emissions, defined as "scope 1" under the greenhouse gas protocol guidance.

Industry emissions

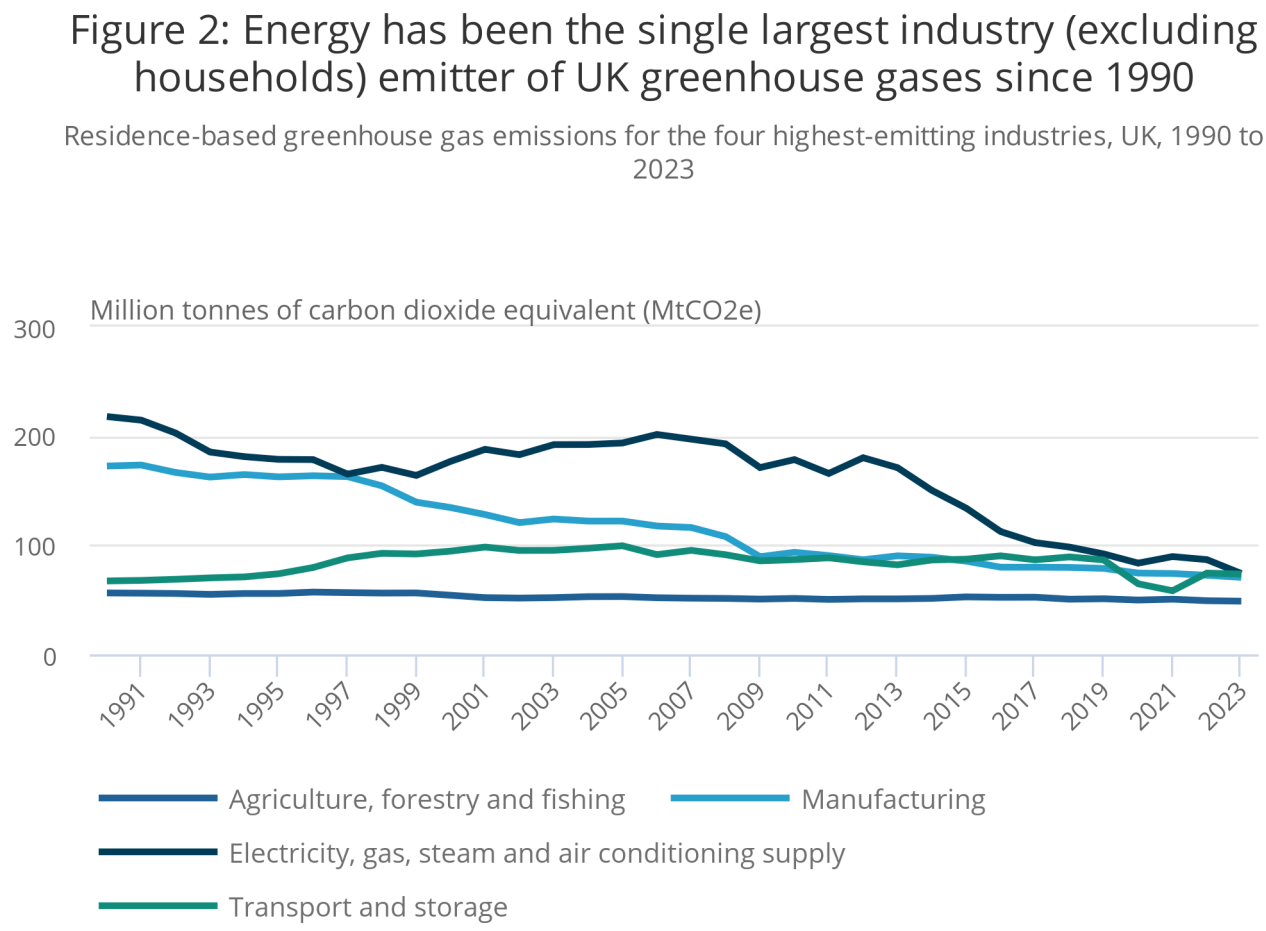
After households, the highest-emitting industry in 2023 was the energy industry, with an estimated 74 MtCO2e, closely followed by transport (73 MtCO2e) and manufacturing (71 MtCO2e), then agriculture (49 MtCO2e).

Electricity production from natural gas accounted for almost half (45.9%) of the emissions produced by the energy industry.

However, energy industry emissions fell 14.6% from 2022 levels, the largest decrease across all industries in 2023. Mining and quarrying experienced the second-largest decrease in emissions of 6.1% since 2022.

Figure 2: Energy has been the single largest industry (excluding households) emitter of UK greenhouse gases since 1990

Residence-based greenhouse gas emissions for the four highest-emitting industries, UK, 1990 to 2023



Source: UK Environmental Accounts from Ricardo Energy and Environment and the Office for National Statistics

Notes:

1. Industry aggregations are based on the UK Standard Industrial Classification (SIC) 2007. The electricity, gas, steam and air-conditioning supply industry is referred to as the energy supply sector or industry. The transport and storage industry is referred to as the transport sector or industry.

2. These data are taken from the air emissions accounts, which only include direct residence-based emissions. These are defined as "Scope 1", under the greenhouse gas protocol guidance.

Emissions from the agriculture industry have remained relatively flat since 1990, while other high-emitting industries have seen greater fluctuations.

This can partly be explained by agricultural emissions of methane, a highly potent greenhouse gas. The agriculture industry emits the most methane of any industry, and accounts for around 52.4% of total UK methane emissions in 2023. While the industry's methane emissions have fallen 17.1% since 1990, the water industry - the largest methane emitter in 1990 - has reduced methane emissions by 74.2% since that year.

We analysed employment in high-emissions industries as part of our green jobs measurement work.

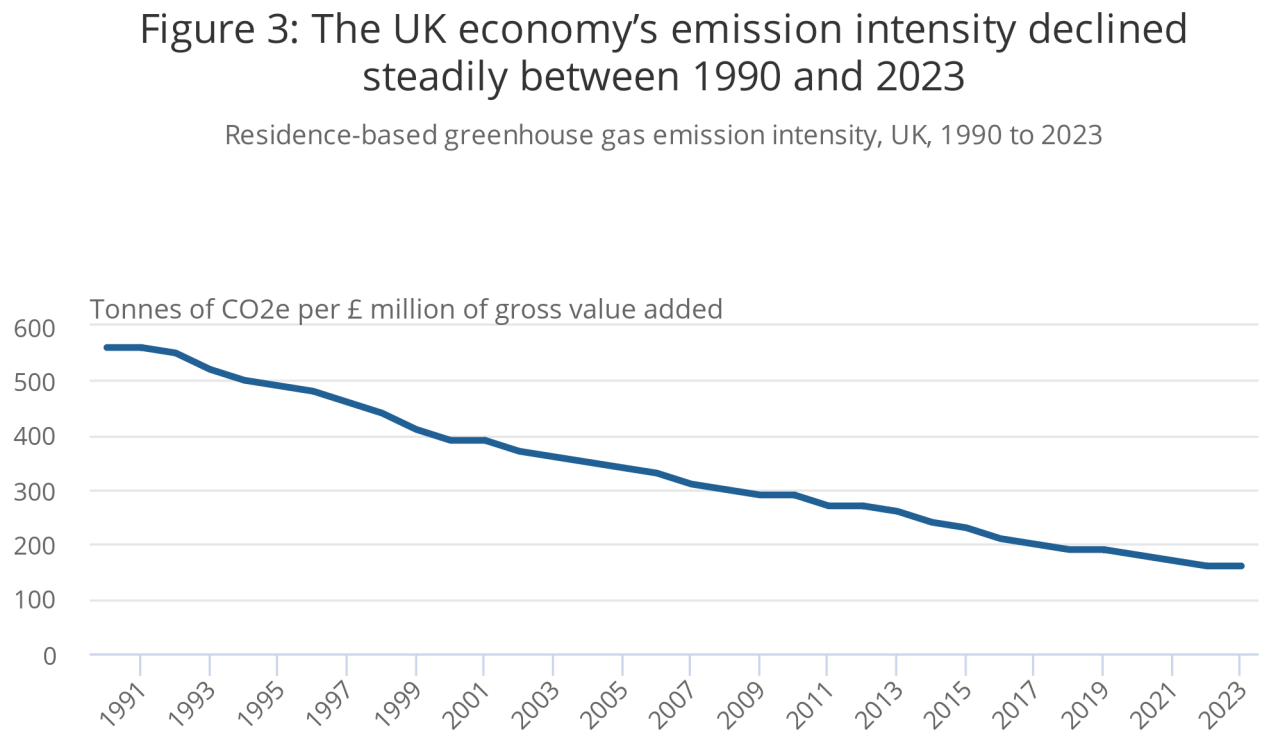
3 . Decoupling emissions from economic growth

In principle, a reduction in overall UK greenhouse gas (GHG) emission intensity - emissions per unit of economic output - would indicate that the UK is moving towards a lower carbon economy.

Since 1990, the UK economy's emission intensity has fallen 71.4%, from 560 tonnes of carbon dioxide equivalent (CO2e) per £ million of gross value added (GVA) in 1990 to 160 tonnes in 2023.

Figure 3: The UK economy’s emission intensity declined steadily between 1990 and 2023

Residence-based greenhouse gas emission intensity, UK, 1990 to 2023



Source: UK Environmental Accounts from Ricardo Energy and Environment and the Office for National Statistics

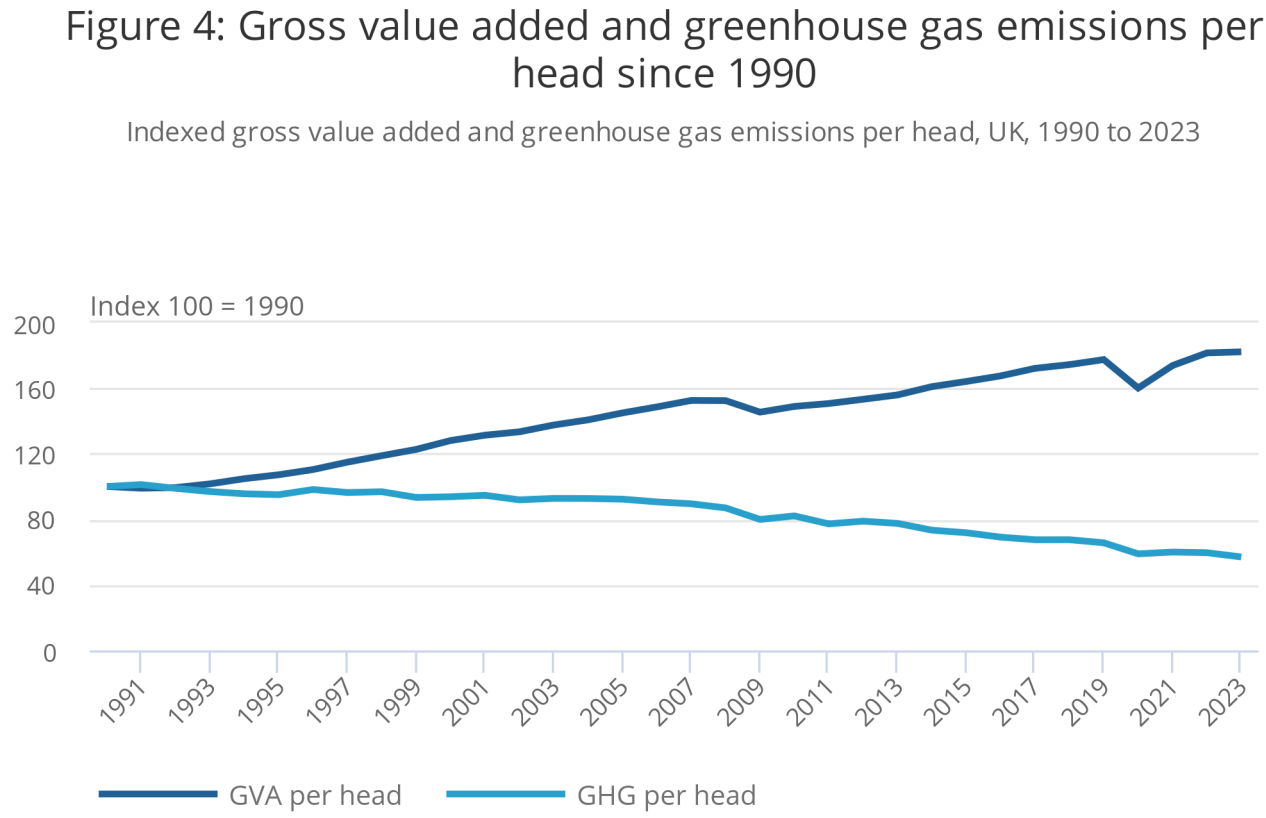
Notes:

1. Greenhouse gas emissions intensity (the level of direct emissions per unit of gross value added) is calculated by dividing the level of carbon dioxide emissions by gross value added (GVA) in constant prices. This is the difference between output and intermediate consumption for any given industry. This means the difference between the value of goods and services produced (output) and the cost of raw materials and other inputs which are used up in production (intermediate consumption). Data are in constant prices, with 2022 defined as the base year. All emissions intensity figures exclude consumer expenditure.

Since 1990, GHG emissions per head have steadily decreased, while GVA per head has generally increased. This suggests some decoupling of GVA from residence-based emissions since 1990. However, it is important to note that residence-based emissions do not cover consumption emissions, such as those from supply chains. Statistics for this measure are published by the Department for Environment, Food and Rural Affairs.

Figure 4: Gross value added and greenhouse gas emissions per head since 1990

Indexed gross value added and greenhouse gas emissions per head, UK, 1990 to 2023



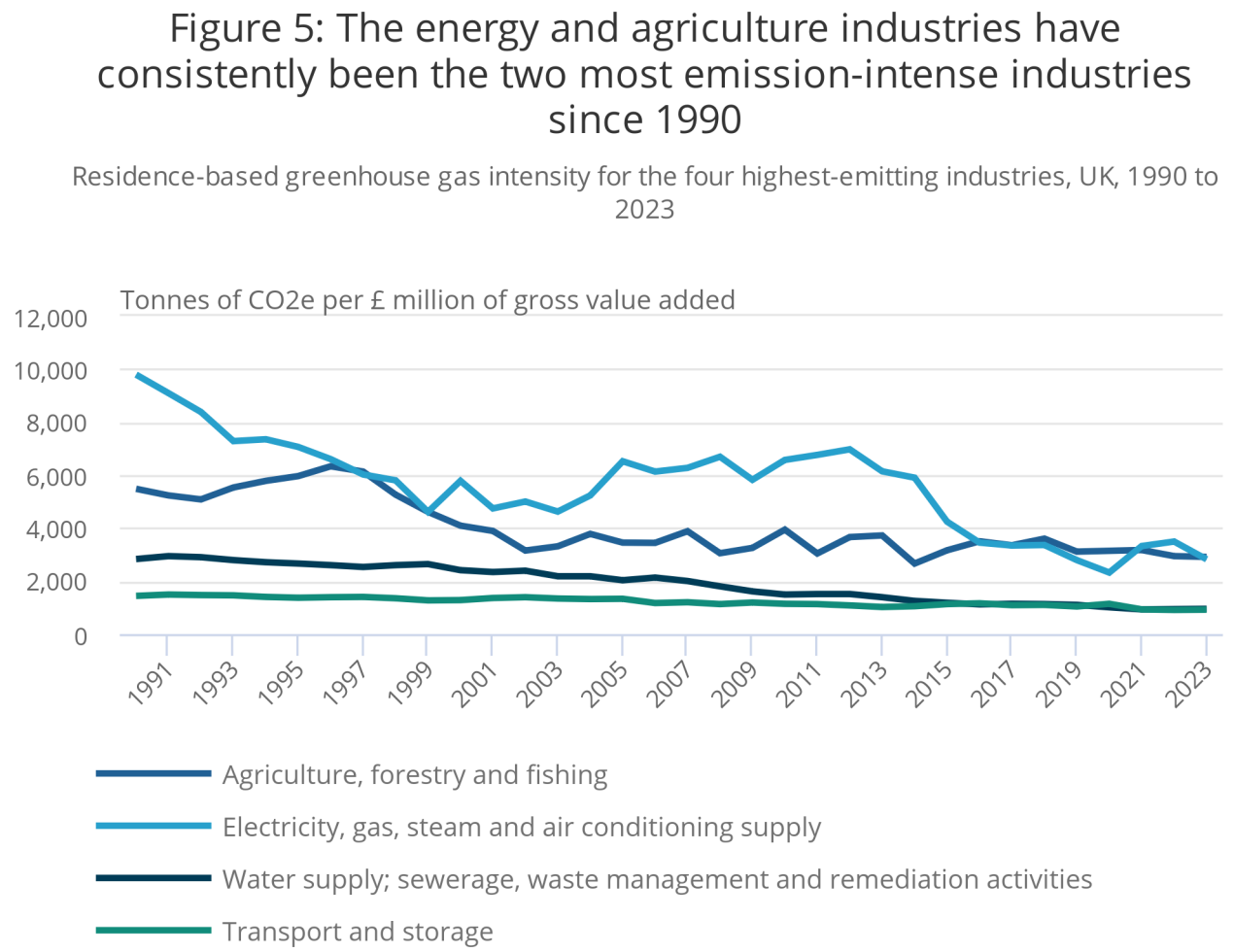
Source: UK Environmental Accounts from Ricardo Energy and Environment and the Office for National Statistics

Emission-intense industries

In 2023, water supply replaced mining and quarrying in the four most emissions-intense industries. This is predominately because of revisions in the estimates of GVA from mining since the previous iteration of the environmental accounts, rather than a substantial change in emissions for either industry. You can read more about the rebasing of gross domestic product (GDP), which also affects GVA, in our article Blue Book 2024: advanced aggregate estimates.

Figure 5: The energy and agriculture industries have consistently been the two most emission-intense industries since 1990

Residence-based greenhouse gas intensity for the four highest-emitting industries, UK, 1990 to 2023



Source: UK Environmental Accounts from Ricardo Energy and Environment and the Office for National Statistics

Notes:

1. Greenhouse gas emissions intensity is calculated by dividing the level of greenhouse gas emissions by gross value added (GVA). GVA is the difference between output and intermediate consumption for any given industry. This means the difference between the value of goods and services produced (output) and the cost of raw materials and other inputs that are used up in production (intermediate consumption). GVA are chained volume measures, in constant prices with 2022 as the base year.

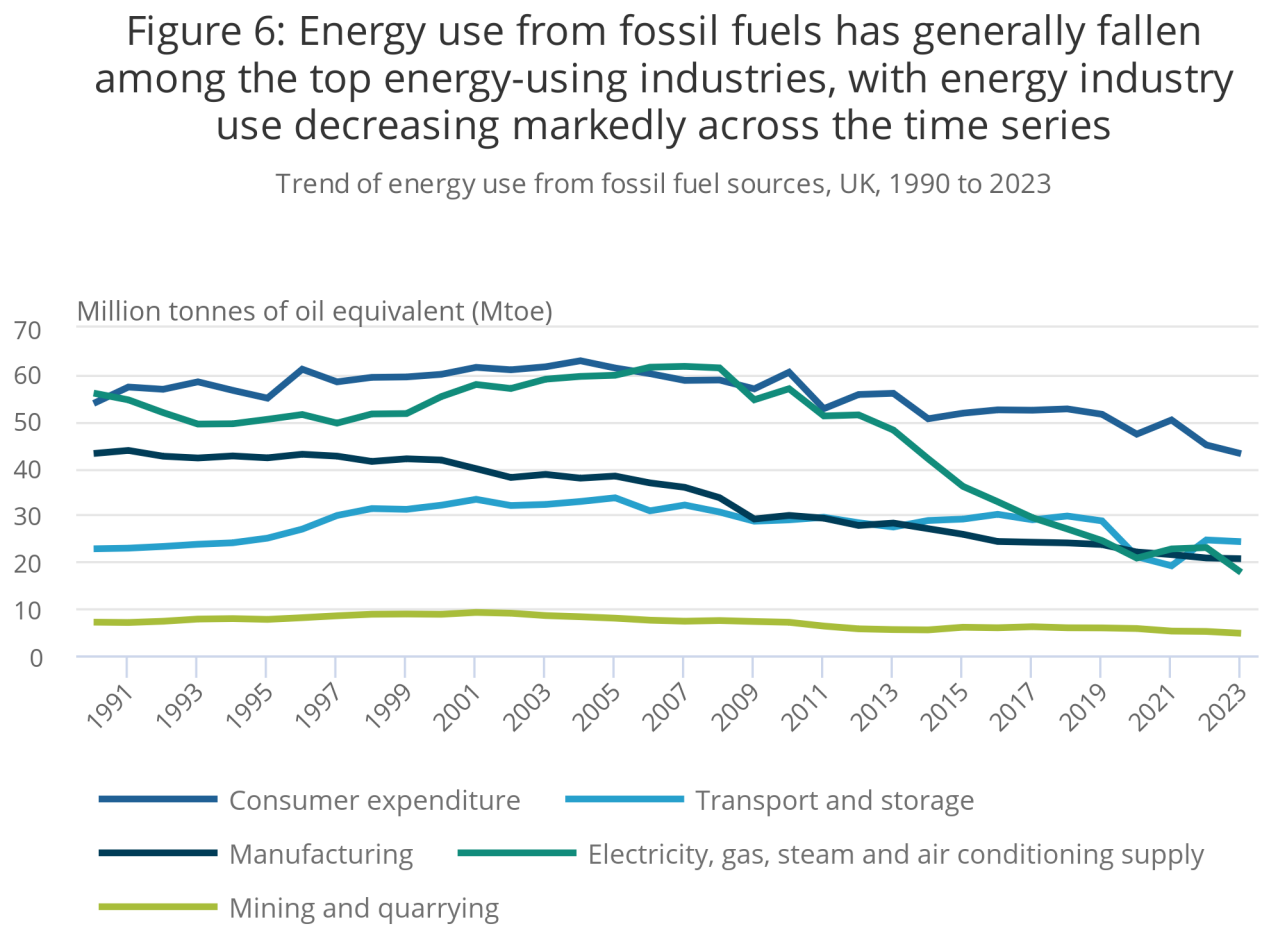
2. All emissions intensity figures are calculated excluding consumer expenditure, often referred to as "households".

4 . Energy use

Most greenhouse gas (GHG) emissions are related to energy use. The UK used a total of almost 165 million tonnes of oil equivalent (Mtoe) of energy in 2023, 79.4% from fossil fuels.

Figure 6: Energy use from fossil fuels has generally fallen among the top energy-using industries, with energy industry use decreasing markedly across the time series

Trend of energy use from fossil fuel sources, UK, 1990 to 2023



Source: UK Environmental Accounts from Ricardo Energy and Environment and the Office for National Statistics

Notes:

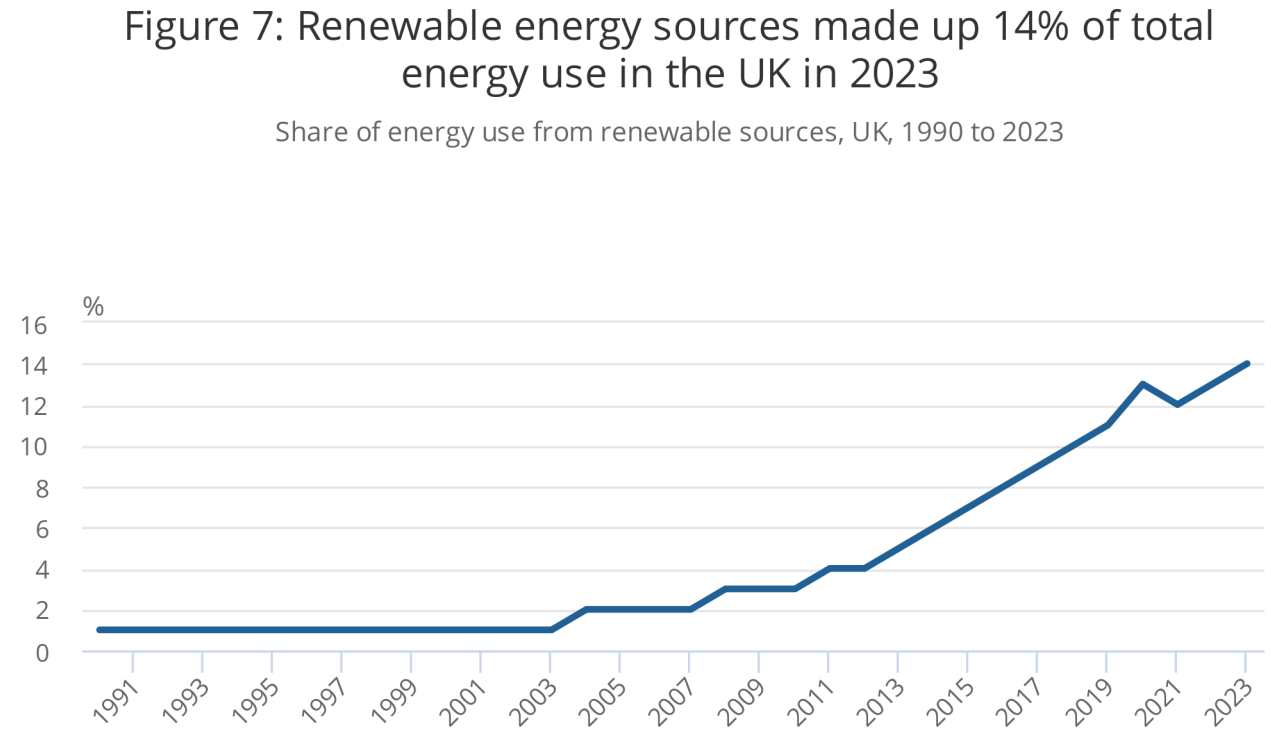
1. Industry aggregations are based on the UK Standard Industrial Classification (SIC) 2007. The electricity, gas, steam and air-conditioning supply industry is referred to as the energy supply sector or industry. The transport and storage industry is referred to as the transport sector or industry.

2. Direct use of energy refers to the energy content of fuel for energy at the point of use, allocated to the original purchasers and consumers of fuels. Reallocated energy consumption is where losses incurred during transformation and distribution are allocated to the final consumer of the energy rather than the electricity generation industry.

Although fossil fuels are the predominant fuel source for energy use, the share of renewables has increased steadily. In 2023, the total proportion of energy use that came from renewable sources was 14.0%, up from 0.8% in 1990.

Figure 7: Renewable energy sources made up 14% of total energy use in the UK in 2023

Share of energy use from renewable sources, UK, 1990 to 2023



Source: UK Environmental Accounts from Ricardo Energy and Environment and the Office for National Statistics

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.

5 . The environmental economy

Our UK environmental goods and services sector (EGSS) statistics measure 17 economic activities producing goods and services for environmental protection and resource management purposes. These statistics are classified as official statistics in development.

The framework follows the United Nations System of Environmental-Economic Accounting (SEEA). For more details, see our EGSS Quality and Methodology Information report.

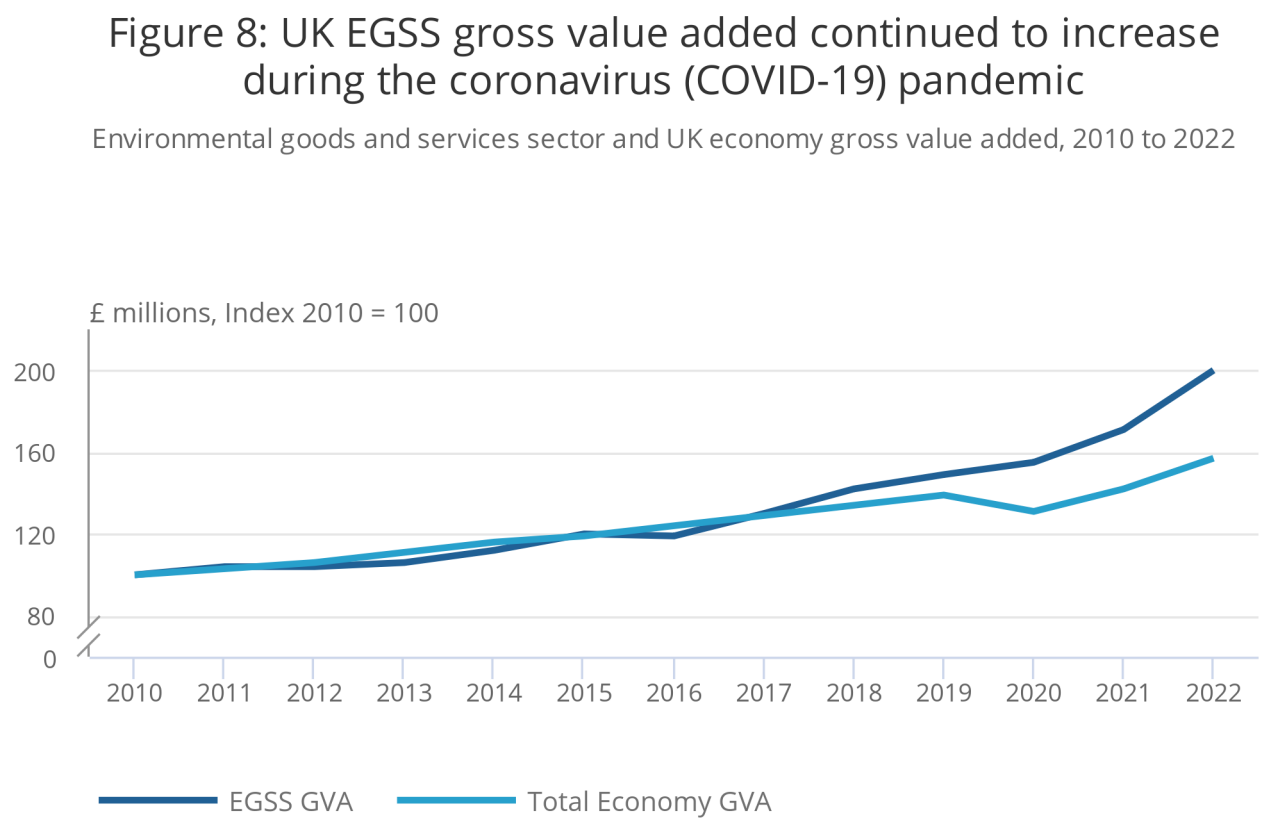
Gross value added

Gross value added (GVA) from the UK's EGSS totalled £60.2 billion (current prices) in 2022, accounting for around 2.7% of total UK current price GVA for that year.

While GVA decreased overall during the coronavirus (COVID-19) pandemic, UK EGSS GVA increased both as a whole and consistently across most activities. This trend is consistent with [environmental economy estimates covering 2020 from other European countries.]

Figure 8: UK EGSS gross value added continued to increase during the coronavirus (COVID-19) pandemic

Environmental goods and services sector and UK economy gross value added, 2010 to 2022



Source: The Office for National Statistics

Notes:

1. The total economy GVA current price index has been calculated based on estimates from the annual national accounts (series YBEX).

Production of renewable energy was the largest contributor to EGSS GVA, and this activity has also seen the largest increase in GVA since 2010, the start of the data time series.

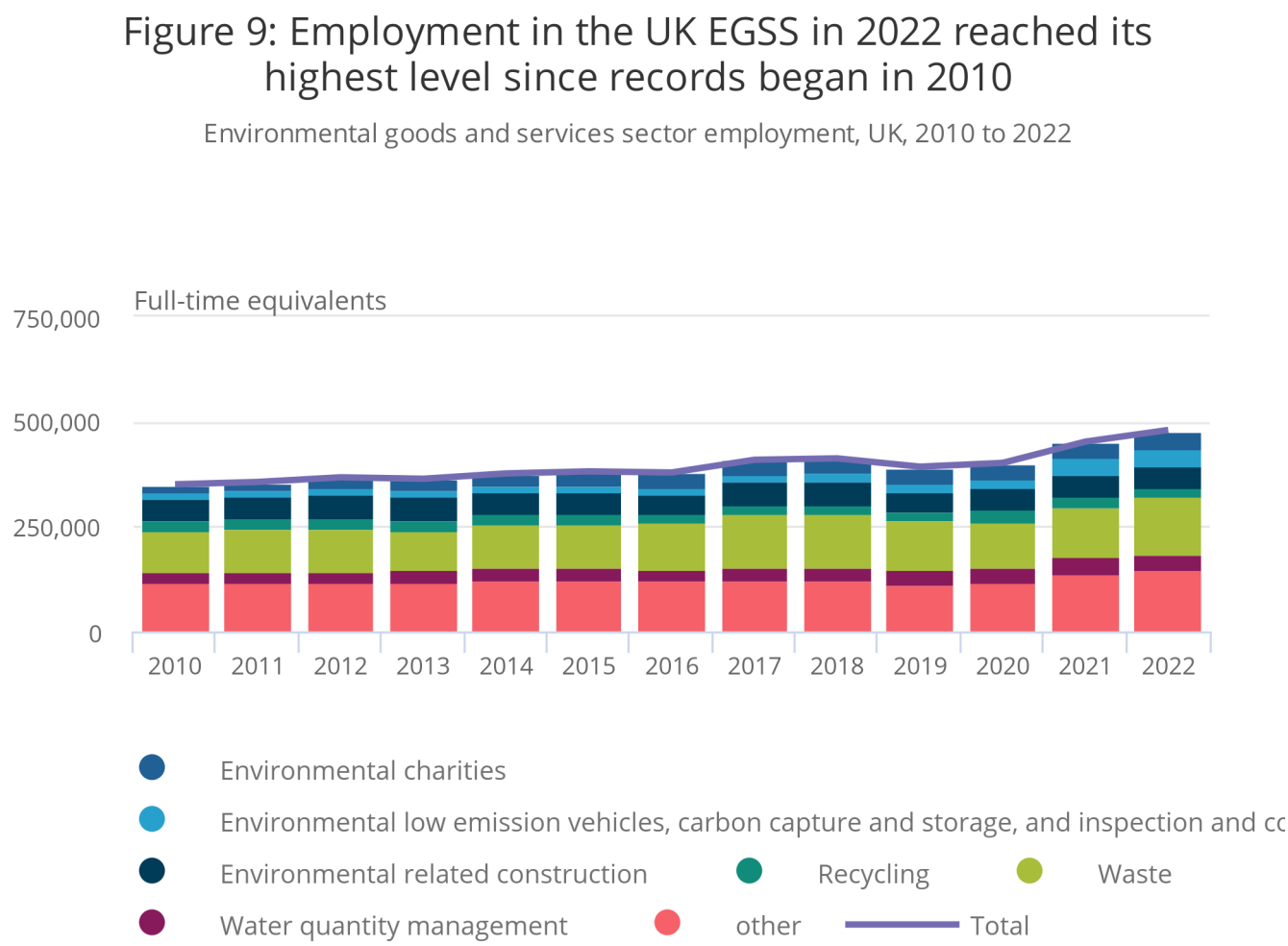
Employment

The UK EGSS had an estimated 479,800 full-time equivalent (FTE) employees in 2022, up 6.1% from 452,100 FTE in 2021. Waste accounted for the largest share by activity, 28.9%, with 138,900 FTE.

The EGSS activities with the largest increases in FTE employees in 2022 were environmental consultancy and engineering (89.4%) to 17,800 FTE, and insulation activities (31.6%) to 10,000 FTE. Recycling was the only activity with a substantial decrease in employment in 2022, down 25.2% (5,900 FTE).

Figure 9: Employment in the UK EGSS in 2022 reached its highest level since records began in 2010

Environmental goods and services sector employment, UK, 2010 to 2022



Source: UK Environmental Accounts from the Office for National Statistics

6 . Data on the Environmental Accounts

For the full list of all datasets published as part of the environment accounts "View all data used in this statistical bulletin" at the top of the page.

Atmospheric emissions: greenhouse gases by industry and gas
Dataset | Released 5 June 2025
The emissions of carbon dioxide, methane, nitrous oxide, hydro-fluorocarbons, perfluorocarbons, sulphur hexafluoride, nitrogen trifluoride and total greenhouse gas emissions, by industry (SIC 2007 group - around 130 categories), UK, 1990 to 2023.

Energy use: total
Dataset | Released 5 June 2025
The UK's direct use of energy from fossil fuels and other sources (nuclear, net imports, renewables, biofuels and waste and reallocated use of energy by industry (SIC 2007 section - 21 categories), 1990 to 2023.

Energy use: fossil fuels by fuel type and industry
Dataset | Released 5 June 2025
The UK's fuel use by industry (SIC 2007 group - around 130 categories) and type (coal, natural gas, petrol, diesel oil for road vehicles (DERV), fuel oil, gas oil, aviation fuel and other); UK-level fuel use of nuclear, hydro, wind, solar, geothermal aquifers and net imports, 1990 to 2023. This table excludes biofuels and waste.

Environmental goods and services sector estimates
Dataset | Released 5 June 2025
First estimates of the UK environmental goods and services sector (EGSS) for 2022 and revised estimates for 2010 to 2021. Included are estimates of output, gross value added, employment and exports.

Environmental protection expenditure: accounts
Dataset | Released 5 June 2025
Estimates for the UK's environmental protection expenditure, output and use by general government, businesses, and households, 2010 (or 2006 where available) to 2022.

Environmental protection expenditure: general government
Dataset | Released 5 June 2025
Estimates for the UK's environmental protection expenditure by general government according to activity, 1995 to 2023.

7 . Glossary

Environmental goods and services sector (EGSS)

The UK environmental goods and services sector accounts follow the UN System of Environmental-Economic Accounting (SEEA) Central Framework and measure areas of the economy engaged in producing goods and services for environmental protection purposes. This includes areas of the economy engaged in conserving and maintaining natural resources as well as climate change.

Greenhouse gases

The greenhouse gases (GHG) included in the atmospheric emissions accounts are those covered by the Paris Agreement, which has superseded 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, because of their positive radiative forcing effect. The potential of each GHG 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).

Residence basis

Estimates compiled on a residence basis include data relating to UK residents and UK-registered businesses, regardless of whether they are in the UK or overseas. Data relating to foreign visitors and foreign businesses in the UK are excluded. This is the same basis on which GDP and GVA are estimated, enabling them to be directly compared with emissions.

Territory basis

Estimates of GHG emissions are also compiled on a territory basis and include emissions within UK borders. UK air emissions statistics on a territory basis are published by the Department for Energy Security and Net Zero.

8 . Data sources and quality

The UK Environmental Accounts are "satellite" or extended accounts, complementing the main UK National Accounts, and are compiled in accordance with the System of Environmental Economic Accounting (SEEA), which closely follows the UN System of National Accounts (SNA).

Air emissions and energy use

The air and energy accounts in the UK Environmental Accounts are compiled by Ricardo Energy and Environment on behalf of the Office for National Statistics (ONS).

The main source of information for this reporting is the UK's National Atmospheric Emissions Inventory (NAEI). These data sources provide air emissions data, calculated from activity data and emission factors, for all relevant sources in the UK as a starting point for generating the air emissions accounts. The residence principle is then applied to these datasets, thereby apportioning the emissions to an industrial classification based on the Standard Industrial Classification: SIC 2007.

The United Nations Intergovernmental Panel on Climate Change (IPCC) summarises the latest scientific knowledge on climate change, greenhouse gasses and their impact on the environment in their Assessment Reports. The Fifth Assessment Report (AR5) sets out the reporting standards for global warming potential (GWP). GWP is an emission metric used to quantify the contributions of different greenhouse gases to climate change. Our estimates are reported with a GWP of AR5.

More strengths, limitations, appropriate uses, and how the data are created is available in our Environmental accounts on air emissions Quality and Methodology Information (QMI).

Environmental goods and services sector

These data are from a wide range of sources; major sources include supply and use tables, the Low Carbon and Renewable Energy Economy Survey, the Annual Business Survey, and the Business Register and Employment Survey. These sources are used in different ways to compile estimates of output, gross value added (GVA), employment and exports for 17 activities.

Further information is available in our Environmental accounts on the environmental goods and services sector (EGSS) Quality and Methodology Information (QMI) and our methodology annex.

Environmental protection expenditure

The environmental protection expenditure (EPE) accounts are produced as part of the environmental accounts and provide estimates for the UK's environmental protection expenditure, output and use by general government, businesses, and households.

The main data sources for the EPE accounts are supply and use tables, the Annual Business Survey, the EPE survey, and the European System of Accounts, Table 11 (general government annual expenditure). Estimates of the EPE accounts cover general government, households and businesses. Estimates from the EPE survey are also published by the ONS.

Further information is available in our Environmental protection expenditure (EPE) survey QMI and our Environmental protection expenditure (EPE) accounts QMI.

Quality

As noted previously, more information on strengths, limitations, appropriate uses, and how these data were created is available in the QMI for the various datasets linked in this bulletin.

Data are subject to revisions, so data in this bulletin may differ from previous publications; more information is available on ONS revisions policies. For example, EGSS estimates use supply and use data, which have incorporated Blue Book 2023 methodology improvements, resulting in revisions back to 2010. Details of the sources used to compile the supply and use tables can be found in our Supply and use tables data sources catalogue.

Strengths and limitations

Air emissions and energy accounts

There are several different official measures of greenhouse gas (GHG) emissions, including GHG emissions on a territory basis. Tables are released alongside these estimates, "bridging tables", which explain the differences between the reporting used for the Office for National Statistics (ONS) air accounts and for the United Nations Economic Commission for Europe (UNECE) and United Nations Framework Convention on Climate Change (UNFCCC). Further explanation of the different measures can be found in our explainer article on Measuring UK greenhouse gas emissions.

Environmental goods and services sector

Methodology varies for each of the 17 activities considered, and so the robustness of estimates also varies. The scope of the accounts increases complexity. It is unlikely that every activity that could qualify as part of the environmental goods and services sector (EGSS) is captured. More information can be found in our Environmental accounts on the environmental goods and services sector QMI and methodology annex that accompanies the dataset.

Environmental protection expenditure

It is important to note that a low level of environmental protection expenditure (EPE) does not necessarily mean that a country's government or industries are not effectively protecting the environment. If governments or industries have more focus on reducing and cleaning pollution as part of their production process, their expenditure is likely to be less than for those that do not change their production processes and instead focus on cleaning the pollution produced by them.

Accredited official statistics

These accredited official statistics were independently reviewed by the Office for Statistics Regulation in April 2012. They comply with the standards of trustworthiness, quality and value in the Code of Practice for Statistics and should be labelled "accredited official statistics".

9 . Related links

UK environmental taxes: 2024
Bulletin | Released 7 May 2025
The value and composition of UK environmental taxes between 1997 and 2024, by type of tax and economic activity, with other European country comparisons.

Material footprint in the UK
Dataset | Released 8 May 2025
Data on the UK's domestic extraction, imports and exports and flow of materials (biomass, minerals and fossil fuels), 1990 to 2022.

Measuring UK greenhouse gas emissions
Methodology | Last revised 17 October 2024
Summary of the three measures of UK greenhouse gas (GHG) emissions: territorial, residence and footprint.

UK greenhouse gas emissions statistics
Article | Last updated 28 March 2024
Official statistics on UK greenhouse gas emissions and related publications. Territorial-based emissions published by the Department for Energy Security and Net Zero.

UK and England's carbon footprint to 2022
Article | Last updated 14 May 2025
Annual greenhouse gas and carbon dioxide emissions relating to UK and England consumption. Consumption-based emissions published by the Department for Environment, Food and Rural Affairs.

Air quality and emissions statistics
Article | Last updated 12 February 2025
This series brings together all documents relating to air quality and emissions statistics.

10 . Cite this statistical bulletin

Office for National Statistics (ONS), released 5 June 2025, ONS website, statistical bulletin, UK Environmental Accounts: 2025