

Statistical bulletin

UK Environmental Accounts: 2022

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



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1 . Main points

- UK greenhouse gas (GHG) emissions on a [residence basis](#) fell by 13% between 2019 and 2020, to just over 478 million tonnes of carbon dioxide equivalent (Mt Co2e)
- Coronavirus (COVID-19) restrictions implemented in the UK in the first quarter of 2020 are likely to be the main driver of the decline in GHG emissions.
- Consumer expenditure is still the largest contributor to UK emissions; it was responsible for 26% of all greenhouse emissions in the UK in 2020.
- Energy from renewable sources accounted for 14% of total UK energy use in 2020.
- Estimates in this bulletin are on a residence basis and all sectors and industries mentioned relate to those defined under the [UK Standard Industrial Classification \(SIC\) 2007](#).

2 . Greenhouse gas emissions

Total greenhouse gas (GHG) emissions on a [residence basis](#) for the UK in 2020 were over 478 million tonnes of carbon dioxide equivalent (Mt Co2e). This is a 13% decline from 2019 and is the biggest single year drop since these statistics began in 1990.

The estimates in this bulletin are on a [residence basis](#). All sectors and industries mentioned relate to those defined under the UK Standard Industrial Classification (SIC) 2007.

The four sectors contributing the most GHG to UK emissions remain the same as in previous years: consumer expenditure, energy, manufacturing and transport. These sectors contribute over 71% of total UK GHG emissions.

Transport recorded the biggest fall in GHG emissions, of just under 37% from 2019 to 2020. In previous years the levels in this sector had stayed relatively stable. The transport emissions reduction is much greater than in any other sector, and much greater than the overall 13% reduction.

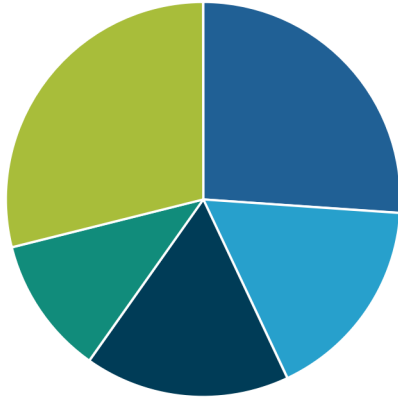
Households, who are accountable for emissions related to consumer expenditure, are the largest contributor to UK emissions when compared with industry sectors. In 2020, emissions fell less for households than for some other sectors. Emissions related to consumer expenditure fell 11% to 125 Mt Co2e in 2020. This is one of the largest annual reductions in this sector since 1990. Consumer expenditure emissions are primarily from the heating of homes and travelling (including commuting, social, domestic or leisure travelling).

Figure 1: Households remain the highest contributors to overall UK greenhouse gas emissions in 2020

Greenhouse gas emissions share for the three highest-emitting industries, and households in 2020

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Greenhouse gas emissions share for the three highest-emitting industries, and households in 2020



Source: Office for National Statistics – UK Environmental Accounts

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. Greenhouse gas emissions include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF₆) and nitrogen trifluoride (NF₃).

3 . Emissions intenisty

In 2020, greenhouse gas (GHG) emissions intensity for the UK dropped to 0.19 thousand tonnes of carbon dioxide equivalent (Co₂e) per £ million of gross value added (GVA), a drop of 4% from 2019. The transport sector showed the largest fall, with a drop of 24% between 2019 and 2020. Usually, a reduction in overall UK greenhouse gas emissions intensity would indicate that the UK is moving towards a lower carbon economy. However, for 2020, the restrictions relating to the coronavirus (COVID-19) pandemic will have affected the economic output of most industries and activity more broadly.

4 . Energy use

Most greenhouse gas emissions are directly related to energy use, particularly energy use from fossil fuels. The UK used a total of almost 170 million tonnes of oil equivalent (Mtoe) of energy in 2020, with the majority of this (78%) coming from fossil fuels.

Households and the energy, manufacturing, and transport sectors are the biggest users of energy from fossil fuels. In 2020, these sectors accounted for 82% of all fossil fuel energy use in the UK. These are the same four sectors that accounted for the most GHG emissions in 2020.

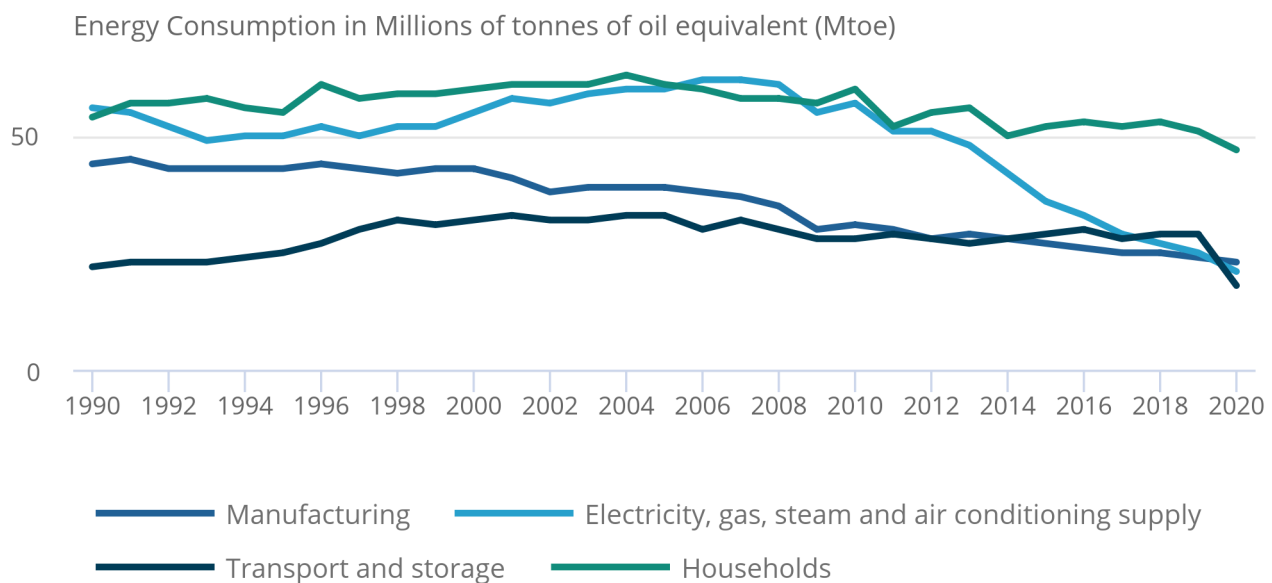
Energy use from fossil fuels has been falling for the energy and manufacturing sectors, largely because of a switch from the use of coal to other fuels such as natural gas, which generate lower emissions. More recently, an increasing amount of energy use is from renewable sources. In 2020, energy from renewable sources accounted for 14% of all energy use in the UK, compared with 0.7% in 1990.

Figure 2: The same four sectors that contribute the most air emissions also use the most energy from fossil fuels

Fossil fuel energy use for the four highest users in the UK, 1990 to 2020

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Source: Ricardo Energy and Environment, Office for National Statistics

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5 . Environmental accounts data

[Atmospheric emissions: greenhouse gases by industry and gas](#)

Dataset | Released 9 June 2022

Data on the emissions of carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulphur hexafluoride, nitrogen trifluoride and total greenhouse gas emissions, UK, 1990 to 2020.

[Energy use: total](#)

Dataset | Released 9 June 2022

Data on the UK's direct use of energy (allocated to the original purchasers and consumers of fuels) from fossil fuels and other sources (nuclear, net imports, renewables, biofuels and waste) and reallocated use of energy (losses incurred during transformation and distribution are allocated to the final consumer of the energy rather than the electricity generation industry), by industry (SIC 2007 section - 21 categories), 1990 to 2020.

[Energy use: carbon-based fuels by fuel type and industry](#)

Dataset | Released 9 June 2022

Data on the UK's fuel use by industry (SIC07 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 2020. This table excludes biofuels and waste.

6 . Glossary

Greenhouse gases

The greenhouse gases (GHG) 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, 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 residency 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.

Territory basis

Estimates of GHG emissions are 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 Business, Energy and Industrial Strategy.

Environmental goods and services sector

The [environmental goods and services sector accounts](#), which follow the [UN System of Environmental-Economic Accounting \(SEEA\)](#), measure areas of the economy engaged in producing goods and services for environmental protection purposes. It also includes areas of the economy engaged in conserving and maintaining natural resources.

Environmental protection expenditure

The [environmental protection expenditure accounts](#), which follow SEEA guidance, estimate how much is spent on activities that have the prevention, reduction and elimination of pollution and any other degradation of the environment as their main purpose.

Environmental taxes

[Environmental taxes](#) are based on a physical unit that has a proven negative impact on the environment. For example, this could be a litre of petrol, or a proxy measurement such as a passenger flight. The tax also needs to be defined as a tax (and not another type of payment) in the [European System of National and Regional Accounts \(ESA 2010\)](#). The data are based on SEEA guidance.

7 . Measuring the data

The UK Environmental Accounts are "satellite accounts" to the main UK National Accounts and they 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 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 [Standard Industrial Classification: SIC 2007](#).

More quality and methodology information on strengths, limitations, appropriate uses, and how the data were created is available in our [Environmental accounts air emissions QMI](#).

Taxes

Most taxes in the UK are collected by HM Revenue and Customs (HMRC). HMRC provide monthly data to the Office for National Statistics (ONS), detailing each individual tax collected and the amount of revenue associated with that tax. The ONS then uses supply and use data (and several other minor sources) to apportion tax revenue to different industries.

Further information is available in our [Quality and Methodology Information report](#).

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. 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 [Quality and Methodology Information report](#) and our [methodology annex](#).

Environmental protection expenditure

The main data sources for the [environmental protection expenditure \(EPE\) 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 the [EPE survey QMI](#) and the [EPE accounts QMI](#).

Quality

Other methodology documents relating to the compilation of the environmental accounts can be found on the [environmental accounts](#) pages of the ONS website.

8 . 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 [Net zero and the different official measures of the UK's greenhouse gas emissions article](#).

Environmental taxes

Levels of revenues from environmental taxes do not necessarily indicate the relative importance or the success of environmental policy. High environmental tax revenues can result either from high rates of taxes or from high levels of environmental problems (for example, pollution), leading to a large tax base. The broad measure of revenues can also fail to capture the effect of the differential rates that encourage a shift away from higher-impact behaviour (such as the use of leaded petrol).

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 environmental goods and services sector (EGSS) is captured. More information can be found in our [Quality and methodology information report](#) and [methods 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.

9 . Related links

[Low carbon and renewable energy economy, UK: 2020](#)

Bulletin | Released 17 February 2022

Estimates of the size of the UK's green economy from the Low Carbon and Renewable Energy Economy Survey, including turnover and employment.

[The challenges of defining a "green job"](#)

Methodology | Released 7 April 2021

This article reviews the options available to define "green jobs" and explores the challenges in doing so. The ONS contributions to defining and measuring "green jobs" are explained, together with alternatives from the relevant literature.

[UK natural capital accounts: 2021](#)

Bulletin | Released 12 November 2021

Estimates of the financial and societal value of natural resources to people in the UK.

[UK environmental goods and services sector \(EGSS\): 2019](#)

Bulletin | Released 21 March 2022

First estimates of the UK environmental goods and services sector (EGSS) for 2019 and revised estimates for 2010 to 2018. Included are estimates of output, gross value added, employment and exports.

[Environmental protection expenditure, UK: 2020](#)

Bulletin | Released 8 June 2022

Data on the UK government's revenue from environmental taxes (including energy, transport and pollution or resource taxes), 1997 to 2021 (where available).

[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.