Office for National Statistics

Statistical bulletin

UK Environmental Accounts: 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.

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1 . Main points

- Travel restrictions implemented by the government in 2020 resulted in declines in major environmental taxes income.
- Fuel Duty fell by almost a fifth between 2019 and 2020, to £22.6 billion.
- Revenue from Air Passenger Duty also declined between 2019 and 2020 to £0.9 billion, a fall of 76%.
- Greenhouse gas (GHG) emissions in the UK fell by 3% between 2018 and 2019, to just over 550 million tonnes of CO2 equivalent (residence basis).
- Households and the energy, manufacturing and transport sectors accounted for 72% of all greenhouse gas emissions in 2019.
- Energy from renewable sources accounted for 12.5% of total UK energy use in 2019.
- Environmental protection expenditure by government was £14.4 billion in 2019, 1.6% of all government expenditure.
- There were equivalent to over 400,000 full-time employees in the environmental goods and service sector in 2018.
- 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 . Environmental taxes

Travel restrictions implemented by the government in 2020 resulted in declines in environmental taxes income

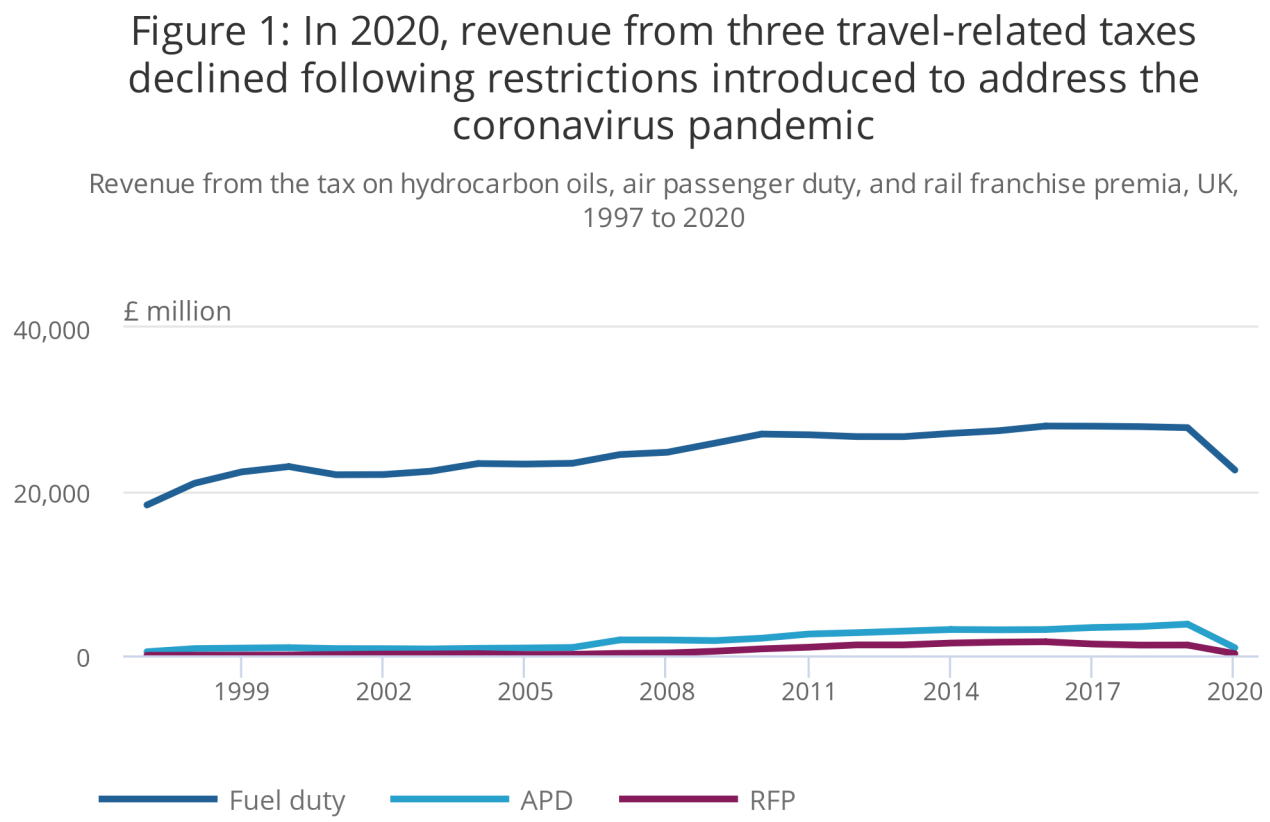
Environmental taxes are those that have a tax base of something with a direct negative impact on the environment. For example, any tax on motor vehicles qualifies.

In 2020, each country of the UK introduced its own set of restrictions to manage the spread of coronavirus (COVID-19). The travel restrictions that were introduced had a noticeable impact on some environmental tax revenues. Tax on hydrocarbon oils, also known as Fuel Duty, saw a fall in revenue of almost a fifth (19%) from the previous year, to £22.6 billion. It was still the largest environmental tax in terms of revenue, accounting for over half (52%) of all revenue from environmental taxes in 2020.

While smaller in value, revenue from environmental taxes relating to rail and air travel also fell between 2019 and 2020. Rail franchise premia were paused for much of 2020, and in September 2020 the government decided to implement emergency agreements; revenue declined by 83% to £0.2 billion. The ban on travel caused Air Passenger Duty tax revenue to decline by around three-quarters (76%), from £3.8 billion in 2019 to £0.9 billion in 2020. These declines are reflected in overall revenue from environmental taxes, which fell 17% between 2019 and 2020.

Figure 1: In 2020, revenue from three travel-related taxes declined following restrictions introduced to address the coronavirus pandemic

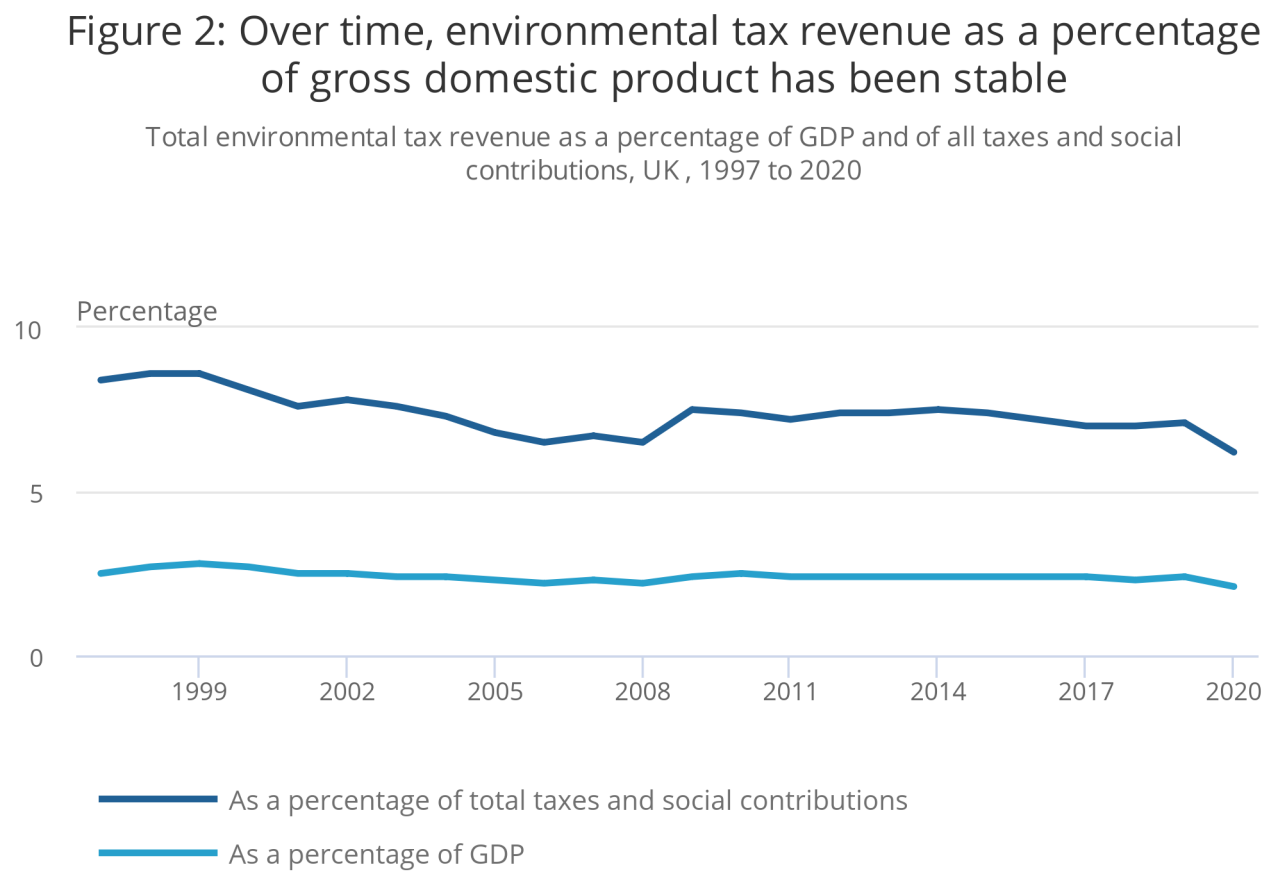
Revenue from the tax on hydrocarbon oils, air passenger duty, and rail franchise premia, UK, 1997 to 2020



Source: Office for National Statistics – UK Environmental Accounts

Figure 2: Over time, environmental tax revenue as a percentage of gross domestic product has been stable

Total environmental tax revenue as a percentage of GDP and of all taxes and social contributions, UK , 1997 to 2020



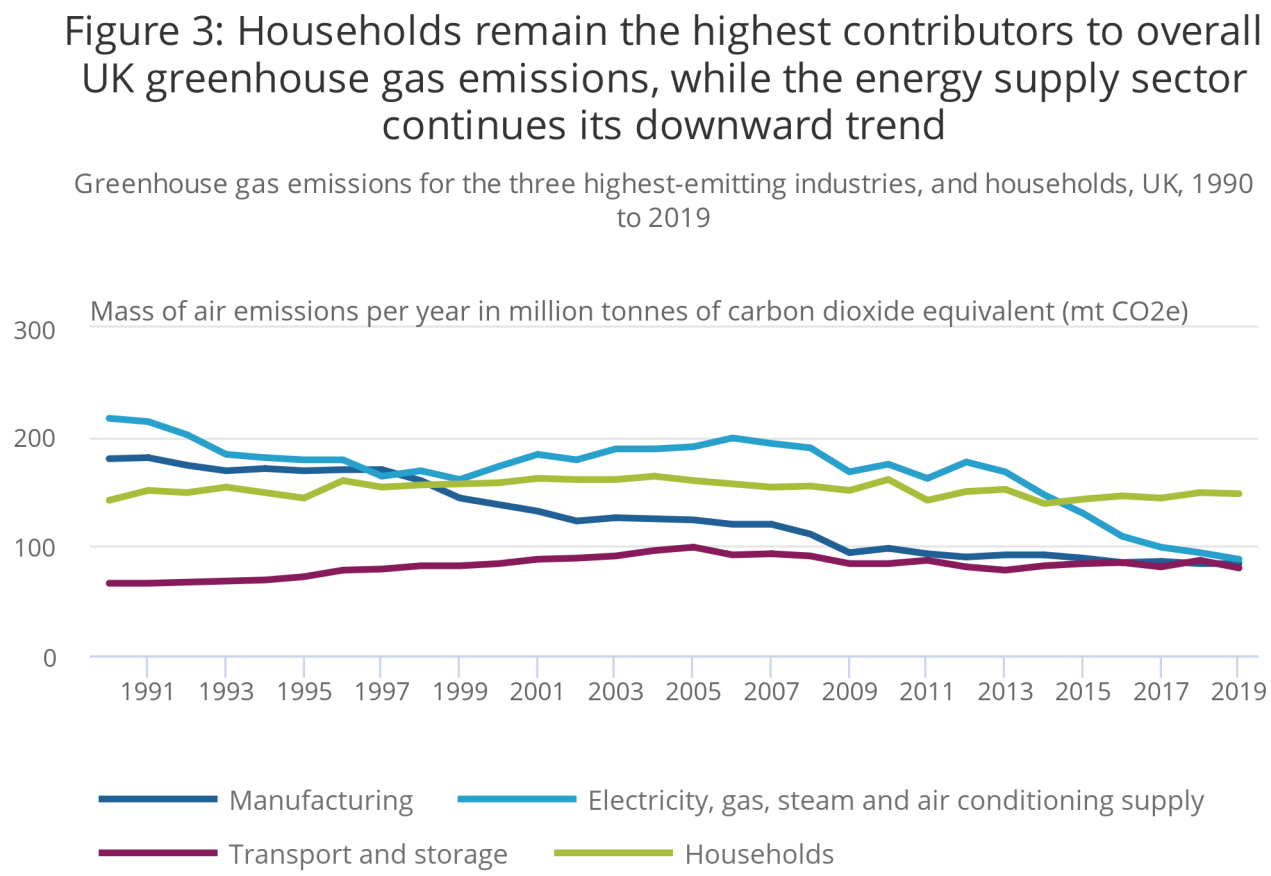
Source: Office for National Statistics – UK Environmental Accounts

3 . Greenhouse gas emissions

The data for greenhouse gas emissions (GHG) In the UK is provided up to the year 2019, before the coronavirus (COVID-19) pandemic. The total GHG emissions for 2019 were over 550 million tonnes of carbon dioxide equivalent (Mt Co2e) (residence basis). This is a decrease of approximately 3% on the previous year's emissions, continuing the general downward trend of greenhouse gas emissions in the UK since 1990. Households and the energy, manufacturing and transport sectors were the top four contributors to UK greenhouse gas emissions in 2019. These accounted for over 72% of the total emissions for the UK.

Figure 3: Households remain the highest contributors to overall UK greenhouse gas emissions, while the energy supply sector continues its downward trend

Greenhouse gas emissions for the three highest-emitting industries, and households, UK, 1990 to 2019



Source: Ricardo Energy and Environment, 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). 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), hydro-fluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF6) and nitrogen trifluoride (NF3).

3. 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 in carbon dioxide equivalents (CO2e).

4 . Energy use

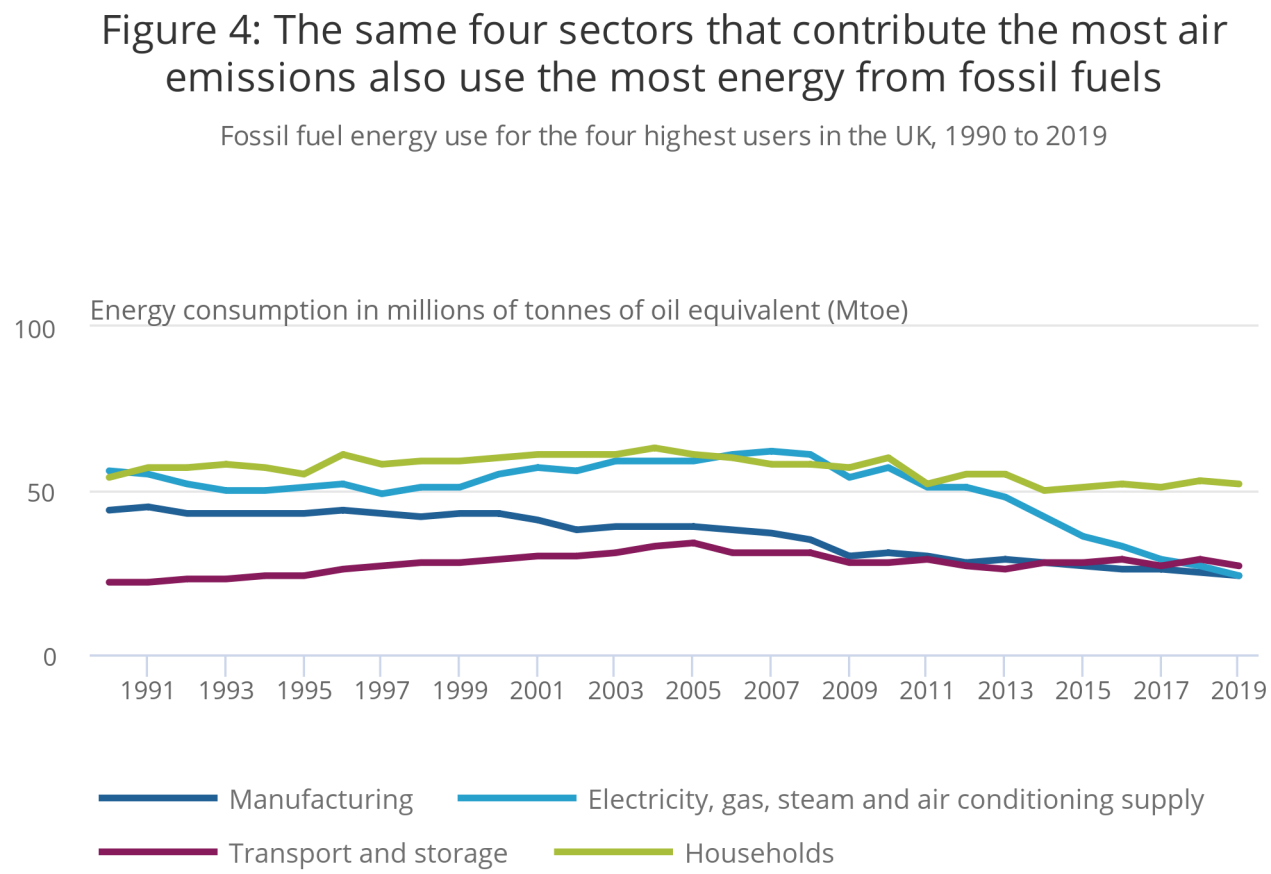
Greenhouse gas emissions are directly related to energy use, particularly energy use from fossil fuels. The UK used a total of 195 million tonnes of oil equivalent (Mtoe) of energy in 2019, with the majority of this (88%) coming from fossil fuels.

Households and the energy, manufacturing and transport sectors are the biggest users of energy from fossil fuels (Figure 4). In 2019, these sectors accounted for 82% of all fossil fuel energy use in the UK. These are the same four sectors that created the most air emissions in 2019.

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, more efficient, fuels such as natural gas. More recently, an increasing amount of energy use is from renewable sources. In 2019 energy from renewable sources accounted for 12.5% of all energy use in the UK, compared with 0.6% in 1990.

Figure 4: 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 2019



Source: Ricardo Energy and Environment, 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). 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.

5 . Environmental protection expenditure

General government expenditure on environmental protection was £14.4 billion in 2019, which is similar to the previous year. It accounted for 1.6% of all government expenditure. Solid waste management, which includes activities such as waste collection and treatment, was the largest component of government spending on environmental protection expenditure (EPE), at 81% of the total in 2019.

Total EPE, which includes expenditure by general government, industry, non-profit institutions and households was £28.9 billion in 2018 (latest date figures are available). This has grown by 36% since 2010, although figures are in current prices and no adjustments have been made for inflation. Much of this growth is from industry.

6 . Environmental goods and services sector

The environmental goods and services sector (EGSS) contributed £84.5 billion of output to the UK economy in 2018. This was an increase of over a third (36%) since 2010, although figures are not adjusted for inflation. EGSS as a share of gross domestic product (GDP) was the same in 2018 as in 2010, at around 4%. Employment (in full-time equivalents) has grown to 403,100, a rise of 15% since 2010.

The environmental goods and services sector is dominated by six activities: environmental-related construction, recycling, production of renewable energy, waste, wastewater, and water quality management. These activities accounted for 80% of output in 2018 and 70% of total employment.

7 . Environmental accounts data

Environmental taxes
Dataset | Released 3 June 2021
Data on the UK government's revenue from environmental taxes (including energy, transport and pollution or resource taxes), 1997 to 2020 (where available).

Atmospheric emissions: greenhouse gases by industry and gas
Dataset | Released 3 June 2021
Data on the emissions of carbon dioxide, methane, nitrous oxide, hydro-fluorocarbons, perfluorocarbons, sulphur hexafluoride, nitrogen trifluoride and total greenhouse gas emissions, UK, 1990 to 2019.

Energy use: total
Dataset | Released 3 June 2021
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 2019.

Energy use: carbon-based fuels by fuel type and industry
Dataset | Released 3 June 2021
Data on 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, geohermal aquifers and net imports, 1990 to 2019. This table excludes biofuels and waste.

8 . Glossary

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).

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 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.

Environmental goods and services sector

The environmental goods and services sector framework, which follows the UN System of Environmental-Economic Accounting (SEEA), measures areas of the economy engaged in producing goods and services for environmental protection purposes, as well as those 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 of 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.

9 . 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 the 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 the 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, employment, and exports for 17 activities.

Further information is available in the Quality and Methodology Information report and the methodology annex.

Environmental protection expenditure

Data are collected for general government using the ONS data on general government annual expenditure, with additional data from the ONS Blue Book compendium (Table 6). For total environmental protection expenditure (EPE), data for industry are from the EPE survey, which is also from the ONS. Some other data are also used to a lesser extent, such as from supply and use tables.

Further information is available in the Quality and Methodology Information report.

Quality

Other methodology documents relating to the compilation of the environmental accounts can be found on the environmental accounts pages of the website.

10 . 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 UNFCCC. Further explanation of the different measures can be found in the article Net zero and the different official measures of the UK's greenhouse gas emissions.

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, and it is unlikely that every activity that could qualify as part of EGSS is captured. More information can be found in the 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 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.

11 . Related links

UK natural capital accounts: 2020
Bulletin | Released 19 November 2020
Estimates of the financial and societal value of natural resources to people in the UK.

The challenges of defining a "green job"
Article | Released 7 April 2021
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.

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.

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 – further analysis of the UK Environmental Accounts data.