



Annex 2: 2019 UK Greenhouse Gas Emissions, final figures by Standard Industrial Classification

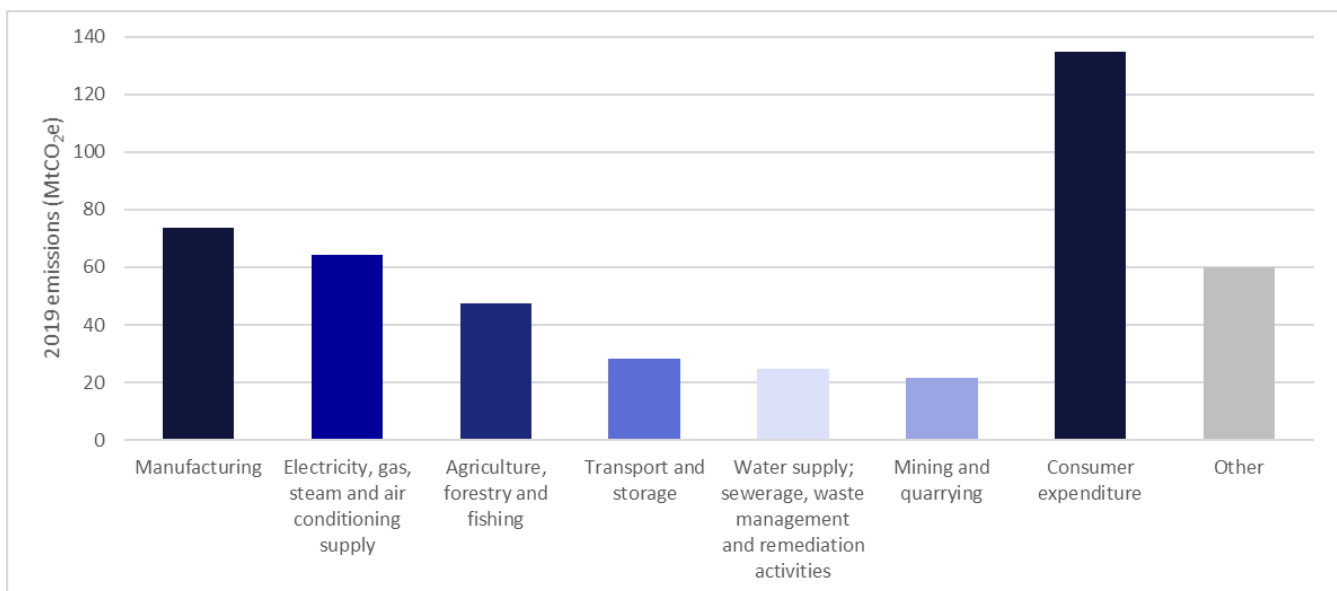
24 June 2021

National Statistics

This publication is an extension of the UK territorial greenhouse gas emission estimates by source for 1990-2019 published in February 2021. It provides the latest estimates of 1990-2019 greenhouse gas emissions in the UK by Standard Industrial Classification, which are presented in carbon dioxide equivalent units throughout this statistical release (these are noted as MtCO_{2e} and ktCO_{2e} for million and thousand tonnes of carbon dioxide equivalent respectively).

The Standard Industrial Classification (SIC) is used to classify business and activities to the relevant industries, and includes a hierarchy of SIC codes to represent subsections of various industries. Using this system allows this publication to report greenhouse gas emissions against their relevant industry rather than their whole-economy sector, as is seen in the [estimates by National Communication sector](#) that were published in February 2021. Emissions from a particular industry can vary over time due to a number of factors, including expansions and contractions in that industry as well as changes in practices. The total emissions presented here are consistent with the data published in February by source sector.

Figure 1: Territorial greenhouse gas emissions by Standard Industrial Classification section, UK 2019



- Figure 1 shows the largest SIC sections in terms of overall greenhouse gas emissions in 2019. Manufacturing was the largest at an estimated 73.7 MtCO_{2e} (16% of the 2019 UK total). Sections smaller than 5% of the total have been combined and captured in 'Other', totalling a combined 60.1 MtCO_{2e}: 13% of total UK emissions.
- The remaining 30% of emissions (134.9 MtCO_{2e}) are captured by 'Consumer Expenditure', a non-SIC sector which captures emissions associated with households and personal travel, as opposed to business activity.

1990-2019 greenhouse gas emissions by SIC section

The overall reductions in territorial greenhouse gas emissions in the UK from 1990 to 2019 was 44% (354.4 MtCO_{2e}), with the largest contributor being a 70% (152.4 MtCO_{2e}) fall in emissions from the electricity, gas, steam and air conditioning supply section, due largely to a switch from the use of coal in electricity production to other more efficient fuels such as natural gas and more recently renewable sources.

In 2019, 16% of the UK's territorial greenhouse gas emissions were from the manufacturing industry, with emissions of 73.7 MtCO_{2e}. This was the highest of any of the industry sections presented in these statistics. The electricity, gas, steam and air conditioning supply section had emissions of 64.3 MtCO_{2e} (14% of the UK total) and the agriculture, forestry and fishing section 47.3 MtCO_{2e} (10%).

Emissions from the manufacturing section fell by 104.7 MtCO_{2e} (59%) between 1990 and 2019. The most significant reduction in manufacturing was a 40.9 MtCO_{2e} (88%) fall in the manufacture of petrochemicals, followed by a fall of 13.6 MtCO_{2e} (56%) in emissions from the manufacture of basic iron & steel.

There was a 63% (42 MtCO_{2e}) fall in emissions from the water supply; sewerage, waste management and remediation activities industry section between 1990 and 2019. This was due to a combination of factors, including improvements in the standards of landfilling, changes to the types of waste going to landfill (such as reducing the amount of biodegradable waste), and an increase in the amount of landfill gas being used for energy. In 2019 it was responsible for about 5% of UK emissions (24.6 MtCO_{2e}).

A number of industries have seen increases in greenhouse gas emissions since 1990. This includes emissions from the wholesale and retail trade (including the repair of motor vehicles and motorcycles), which increased by 34% between 1990 and 2019 to 15.5 MtCO_{2e}. This was largely due to an increase in emissions from the retail sector, driven by increased emissions from goods vehicles and from the use of refrigeration and air conditioning systems which use HFCs. There was also a 39% increase in emissions from the construction industry, to 13.2 MtCO_{2e} in 2019.

Households were responsible for greenhouse gas emissions of 134.9 MtCO_{2e} in 2019, 30% of the UK total. This is shown as "consumer expenditure" in the tables. Just under half of these emissions were from private travel, largely road transport, with the rest almost entirely resulting from the combustion of fuels in homes, in particular from gas boilers used for heating (in 2019, 96% of non-travel consumer expenditure emissions were due to domestic combustion). The level of greenhouse gas emissions from households has only fallen by 4% since 1990, with emissions from travel having increased by 7%. Non-travel emissions tend to fluctuate from year to year depending on the temperature, as households consume more or less energy depending on the weather.

When emissions are considered on a National Communication sector basis, the largest sector in recent years is transport, which was responsible for 27% of UK emissions in 2019 (122.2 MtCO_{2e}). Around half (52%) of these transport emissions in 2019 were from households,

predominantly from the private use of cars. The largest industry section was transport and storage (section H), which was responsible for 22% of UK transport emissions in 2019, with the remaining 26% of transport emissions split across other industry sections.

Accompanying tables

The following tables are available in Excel and ODS format on the department's [statistics website](#).

Table 8.1	Estimated territorial greenhouse gas emissions by industry section and group, UK 1990-2019 (ktCO ₂ e)
Table 8.2	Estimated territorial emissions of carbon dioxide (CO ₂) by industry section and group, UK 1990-2019 (ktCO ₂ e)
Table 8.3	Estimated territorial emissions of methane (CH ₄) by industry section and group, UK 1990-2019 (ktCO ₂ e)
Table 8.4	Estimated territorial emissions of nitrous oxide (N ₂ O) by industry section and group, UK 1990-2019 (ktCO ₂ e)
Table 8.5	Estimated territorial emissions of hydrofluorocarbons (HFCs) by industry section and group, UK 1990-2019 (ktCO ₂ e)
Table 8.6	Estimated territorial emissions of perfluorocarbons (PFCs) by industry section and group, UK 1990-2019 (ktCO ₂ e)
Table 8.7	Estimated territorial emissions of sulphur hexafluoride (SF ₆) by industry section and group, UK 1990-2019 (ktCO ₂ e)
Table 8.8	Estimated territorial emissions of nitrogen trifluoride (NF ₃) by industry section and group, UK 1990-2019 (ktCO ₂ e)
Table 8.9	Estimated territorial greenhouse gas emissions by industry section, group and National Communication sector, UK 1990-2019 (ktCO ₂ e)

Technical information

These estimates have been produced by Ricardo Energy and Environment based on the territorial greenhouse gas emission estimates in the National Atmospheric Emissions Inventory (NAEI), which is maintained by Ricardo Energy and Environment on behalf of the Department for Business, Energy and Industrial Strategy (BEIS). They are consistent with the estimates of emissions by Standard Industrial Classification (SIC) groups published by the Office for National Statistics (ONS) in the UK's Environmental Accounts, other than that the ONS estimates are presented on a "residency" basis whereas these statistics are on a "territorial" basis.

The greenhouse gas emission estimates in the NAEI are primarily calculated from a combination of activity data and emission factors. The methodology is outlined and explained in full in the final 2019 UK greenhouse gas emissions estimates statistical release that this annex accompanies.

These emissions have then been allocated to industrial classification based on Standard Industrial Classification SIC 2007. A mapping procedure is required to make a link between the source categories in the NAEI and the SIC 2007 groups. The definitions are such that many of the NAEI sources can be mapped directly to a SIC 2007 group through many-to-one relationships, where one or more NAEI sources are judged as being equivalent to or contained

within a single SIC 2007 group. In some other cases NAEI sources can be linked to several SIC 2007 codes through one-to-many relationships, and here the “activity” and consequent emissions from that source have to be split to each of the relevant SIC 2007 codes either directly according to their proportionate level of activity, or indirectly.

Further details can be found in the ONS Environmental Accounts quality and methodology information here:

<https://www.ons.gov.uk/economy/environmentalaccounts/methodologies/environmentalaccountsonairemissionsqmi>

These estimates are on a "territorial" basis, meaning they show emissions within the UK's borders. Similar estimates are also published on a "residency" basis by the Office for National Statistics, as part of the UK Environmental Accounts. These are known as the air emissions accounts. Emissions on a residency basis include emissions that UK residents and UK-registered businesses are directly responsible for, whether in the UK or overseas, but exclude emissions from foreign visitors and businesses in the UK. The methodology used to allocate the territorial emissions to SIC (in this publication) and residence emissions are the same, although the scope will be different.

An explanation of the different measures of greenhouse gas emissions in the UK can be found in the ONS article '[Net Zero and the different official measures of the UK's greenhouse gas emissions](#)'.

Bridging tables are available from ONS that clearly explain the differences between the reporting used for the ONS Environmental Accounts, used to fulfil the UK's UN System of Environmental-Economic Accounting (SEEA) reporting requirements for Eurostat, and the territorial estimates published by BEIS and used to fulfil the UK's international UNFCCC reporting requirements:

<https://www.ons.gov.uk/economy/environmentalaccounts/datasets/ukenvironmentalaccountsatmosphericemissionsbridgingtables>

Estimates of emissions have an inherent uncertainty due to uncertainty in the underlying data used for the inventory and due to uncertainty in the applicability, completeness and application of that data. Estimates of the uncertainty in the emissions estimates by gas and by sector are shown in tables 4.1 and 4.2 in the main set of Excel tables in the final 2019 UK greenhouse gas emissions statistics. In addition, there are further uncertainties in these estimates by SIC group due to the allocation of the emissions estimates to industry groups, which in some cases has needed to be modelled using other datasets. Further details are published by ONS in its methodology information:

<https://www.ons.gov.uk/economy/environmentalaccounts/methodologies/environmentalaccountsonairemissionsqmi#methods-used-to-produce-the-air-emissions-data>

Further information

Future updates to these statistics

In February 2022 final 1990-2020 UK greenhouse gas emissions estimates will be published by source sector.

In March 2022 the 1990-2020 UK emissions estimates will be updated to include estimates by end user and by fuel type, and provisional 2021 emissions estimates will be published.

In June 2022 the 1990-2020 UK emissions estimates will be updated to include estimates by Standard Industrial Classification (SIC). BEIS will also publish estimates of carbon dioxide emissions by local authority for 2020.

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This publication is available from: <https://www.gov.uk/government/collections/final-uk-greenhouse-gas-emissions-national-statistics>

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