



Department for
Energy Security
& Net Zero



Background quality report

UK territorial greenhouse gas emissions
statistics

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1. Introduction

1.1 Background

This report provides a summary of quality issues relating to statistics on UK territorial greenhouse gas (GHG) emissions published by the Department for Energy Security and Net Zero (DESNZ). The estimates present emissions on a “territorial” basis, so cover emissions which occur within the UK’s borders, including offshore areas over which the UK has jurisdiction. They are based on the UK’s greenhouse gas inventory, which is compiled by a consortium led by Ricardo, on behalf of DESNZ.

The UK GHG Inventory contains the UK’s official reported greenhouse gas estimates. It is the key tool for understanding the origin and magnitude of emissions in the UK. It contains emissions of seven greenhouse gases, reported in eight Territorial Emissions Statistics (TES) sectors in our statistics. Emissions are reported in line with Intergovernmental Panel on Climate Change (IPCC) reporting requirements and are used to measure the UK’s progress towards international and domestic emissions reduction targets.

1.2 Publications, methodology and documentation

Final UK greenhouse gas emissions

A National Statistics publication reporting on [UK territorial GHG emissions](#) by source from the latest GHG Inventory is published annually in February. Final emissions statistics for the same period with energy supply emissions presented on an end user basis are published the following month and statistics showing emissions by Standard Industrial Classification (SIC) category are published a few months later in June.

The source data and methods used to derive UK GHG emissions estimates have been developed to be consistent with methods defined within international guidance provided to all countries via the IPCC. The inventory reports UK emissions dating back to 1990 in a methodologically comparable time series.

The basic approach to estimating most emissions in our inventory is to multiply some activity data by an emission factor. Examples of activity data include the quantity of a given fuel combusted at a power station, or the number of cows in the UK. An emission factor is the emissions per unit of activity, reflecting on the carbon content of the fuel for example. For some sources the calculation of emissions is more complicated and therefore a model is used to estimate emissions, for example modelling carbon emissions and removals from forests.

The source data and methods used to derive UK GHG emission estimates have been developed to be consistent with methods defined within international guidance provided to all countries via the IPCC. The inventory reports UK emissions dating back to 1990 in a methodologically comparable time series.

The publication comprises a statistical release, a one-page infographic, data tables and detailed datasets. A detailed summary of the methodology used to compile the inventory is available in the National Inventory Report (NIR)¹.

Provisional UK greenhouse gas emissions

A National Statistics publication reporting on provisional [territorial GHG emissions](#) is published annually approximately 3 months after the end of the reporting year. Provisional estimates are calculated based on the latest energy statistics to give an early indication of emissions estimates for the most recent year, almost a year ahead of the publication of final inventory data. This publication also includes estimates of emissions in each quarter of the year and temperature adjusted emissions, to consider the impact that external temperatures have on emissions, e.g. through the amount of fuel used for heating.

Provisional annual and quarterly estimates for carbon dioxide are calculated based on the most recent inventory data, combined with provisional inland energy consumption statistics published by DESNZ in [Energy Trends](#). Data from Energy Trends are used to estimate the change in fuel use compared to the final year in the inventory to approximate the change in emissions. To produce quarterly emissions estimates from annual data the proportion of fuel used in each quarter is used. Because there is limited data available at that time for non-CO₂ gases, provisional estimates of non-CO₂ gases are based on a simple approach which assumes that emissions of non-CO₂ gases will change from the previous year's total in line with the percentage difference between the estimates for non-CO₂ emissions in those two years in the most recent DESNZ [Energy and emissions projections](#). More information on the methodology is given in the statistical release and in a separate methodology note on the publication page.

UK local authority and regional greenhouse gas emissions

The annual [local authority and regional greenhouse gas emissions](#) National Statistics publication provides the latest estimates of greenhouse gas emissions for local authority areas and National Parks areas, using nationally available datasets going back to 2005.

This publication combines data from the UK's GHG Inventory with data from several other sources, including local energy consumption statistics, to produce a nationally consistent set of greenhouse gas emissions estimates at local authority level.

The statistics show emissions allocated on an "end user" basis where emissions are distributed to sectors and locations according to the point of energy consumption (or point of emission if not energy related). For example, emissions from electricity generation are assigned to areas based on where the electricity is used. Except for the energy industry, emissions from the production of goods are assigned to where the production takes place. Therefore, emissions from the production of goods which are exported will be included, and emissions from the production of goods which are imported are excluded. Emissions from waste management have been spatially distributed using an approach analogous to the fuel end-user basis, distributing UK total emissions from waste management proportionally to the waste arising in each local authority, rather than to the location of waste management facilities. For example, emissions from landfills are distributed based on estimates of biogenic waste arising in each local authority.

¹. UK National Inventory Report 1990 to 2021 and Annexes:
https://naei.beis.gov.uk/reports/reports?report_id=1108

Data from the final UK greenhouse gas inventory are spatially disaggregated to local authority level using a complex, sector specific methodology which is detailed in an accompanying technical report and summary.

The statistics are largely consistent with the UK national GHG Inventory and with the Devolved Administration (DA) GHG inventories, but there are some minor methodological differences which are explained in the publication. If you are looking for emissions figures at UK or DA level, you should use the [UK](#) or [DA](#) inventories rather than this publication.

The publication comprises a statistical release, a one-page infographic, along with data tables, a dataset and detailed methodology reports.

Sub-national road transport fuel consumption and residual fuel consumption data

These National Statistics cover fuel consumption rather than emissions, but the estimates are derived from data collected to produce the UK GHG Inventory.

The sub-national '[residual fuels](#)' dataset is a modelled dataset covering non-gas, non-electricity, and non-road transport fuels from 2005 to the most recent year, at a devolved administration, regional and local authority level. A methodology summary is published as part of the publication. Estimates for 2003 and 2004 are also available but these are not on a consistent basis with later publications.

The sub-national [road transport](#) dataset is a modelled dataset covering road transport fuel consumption in the UK, disaggregated to devolved administration, English regional and local authority levels. A methodology summary is published as part of the publication.

DESNZ separately publishes sub-national [gas](#) and [electricity](#) consumption estimates. These are not based on the GHG Inventory, though are used in the production of the local authority greenhouse gas emissions statistics.

1.3 Production and dissemination

The UK national emissions estimates are prepared via a central database of activity data and emission factors, from which the UK emissions are extracted and reported in a variety of formats. For the annual publications, data are provided by Ricardo according to pre-determined timescales. For the provisional publication, data from Energy Trends are provided to the UK GHG Inventory team on a restricted basis ahead of its publication.

The quality assurance process undertaken by Ricardo is detailed in Chapter 1.6 of the National Inventory Report¹ (NIR). Data are also quality assured by DESNZ, with any issues raised with Ricardo for resolution. Provisional and summary calculations are produced by DESNZ, with QA measures built into the process. The statistical release is reviewed by the Head of Energy Statistics and Head of Profession for final quality assurance and comments.

Pre-release access to the statistical release, briefing and data tables is granted 24 hours ahead in accordance with DESNZ' [statement of compliance with pre-release access](#).

2. Relevance

2.1 Content

The UK GHG inventory dataset contains emissions of the seven greenhouse gases that the UK is required to report internationally (carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulphur hexafluoride and nitrogen trifluoride) on a by source basis, meaning emissions are attributed to the sector that emits them directly. Emissions are reported in line with [IPCC reporting requirements](#). This means they cover anthropogenic emissions and removals (i.e. those resulting from human activities) within the UK's territory, including offshore areas over which the UK has jurisdiction.

In the final UK GHG emission statistics, emissions are broken down by source, fuel type, by end user and by Standard Industrial Classification (SIC). An end user breakdown allows a more complete picture of emissions within a given sector, by allocating emissions associated with energy supply to end use sectors, and the SIC breakdown provides an understanding of emissions from different industries and allows for comparisons with a range of other statistics. A time series is presented starting in 1990, with carbon dioxide emissions estimates for most sources available from 1970.

In the provisional UK GHG statistics, sectoral breakdowns are given on a carbon dioxide only basis. For the non-CO₂ GHGs, an estimate is presented based on high level trends only.

The local authority greenhouse gas statistics are compiled on an end user basis, which means that emissions related to energy supply are allocated to the sector in which the energy is used. A full dataset containing emissions within the bounds of each local authority is published, along with a second dataset containing a breakdown of emissions thought to be within the scope of influence of local authorities. Sectoral breakdowns are also provided and estimates include emissions of carbon dioxide, methane and nitrous oxide, but we are not currently able to produce estimates for fluorinated gases at a local authority level. A time series is presented starting in 2005.

The residual fuel consumption and road transport statistics datasets provide residual fuel consumption and road transport fuel consumption in the UK at a local authority and regional level. Residual fuels are defined as non-gas, non-electric and non-road transport energy consumption, and cover consumption of coal, petroleum, manufactured solid fuels, bioenergy and wastes. A time series is presented in these datasets starting in 2005.

2.2 Completeness

In the final inventory, estimates are reported for all pollutants, all relevant source categories, and all years and for the entire territorial areas of Parties covered by the reporting requirements set forth in the provisions of the United Nations Framework Convention on Climate Change (UNFCCC). A detailed assessment of completeness of the UK Greenhouse Gas Inventory can be found in the National Inventory Report¹.

The UK greenhouse gas inventory additionally reports on indirect greenhouse gases which do not form part of the required basket of greenhouse gases. In the UK, these gases are nitrogen

oxides, carbon monoxide, non-methane organic volatile compounds, and sulphur dioxide. More information about indirect greenhouse gases can be found in the National Inventory Report¹.

Emissions from international aviation and shipping are not included in the UK's emissions total in accordance with UNFCCC guidelines, but emissions from refuelling at UK-based international aviation and shipping bunkers are reported in the inventory as a memo item. Further information can be found in the [Final UK GHG statistical release](#).

The local authority emissions statistics cover carbon dioxide, methane and nitrous oxide only, with no estimates made at local authority level for the fluorinated gases. It is also not possible to allocate some UK emissions to local authorities, for example for some electricity consumption where there is a lack of accurate address information. Further information can be found in the [local authority and regional greenhouse gas emissions](#) statistics.

The UK GHG Inventory does not measure emissions on a “consumption” basis, but emissions estimates are available on this basis in the [UK's carbon footprint](#) published by the Department for Environment, Food and Rural Affairs (Defra). These statistics cover emissions associated with the consumption of goods and services by households in the UK. They include estimates of emissions associated with each stage of the supply chain for those goods and services, regardless of where they occur, while excluding emissions occurring in the UK that are associated with the consumption of goods and services by households outside the UK.

2.3 Geographical coverage

The statistics cover greenhouse gas emissions and removals taking place within the UK territory, including offshore areas over which the UK has jurisdiction. In addition, emissions from the UK's Crown Dependencies (Jersey, Guernsey and the Isle of Man) and those Overseas Territories that are party to the UK ratification of the UNFCCC (Bermuda, Cayman Islands, Falkland Islands and Gibraltar) are presented in some tables in the final UK GHG statistics.

The sub-national emissions and fuel consumption statistics cover the UK, broken down by devolved administration, English region, and local authority. The sub-national emissions statistics also cover National Park areas.

2.4 User needs

The UK's territorial GHG emission estimates are used by central government departments, devolved governments and local authorities to understand emissions in the areas they are responsible for, to develop policies to reduce emissions and to set targets and serve a variety of users including policymakers, academics, companies, and the public.

The UK final emissions statistics allow users to understand the UK's GHG emissions and measure the UK's progress against international and domestic targets, including commitments under the Kyoto Protocol, Paris Agreement and the UK Climate Change Act 2008 such as the UK's 2050 Net Zero target. More detail on progress against targets can be found in the [final emissions statistics release and accompanying data tables](#).

The Greenhouse Gas Inventory is reported to The United Nations Framework Convention on Climate Change, the UK government and devolved administrations.

Provisional annual estimates provide users with an early indication of emissions estimates and are published nearly a year ahead of the publication of the final inventory statistics.

Local authority greenhouse gas emissions statistics are produced to allow local authorities to monitor their emissions. Local authorities are not mandated to have greenhouse gas emissions reductions targets, but some local authorities do have such targets. These statistics allow local authorities to track their GHG emissions trends over time, and measure progress against any targets they have. Sub-national road transport and residual fuel data are also used by local authorities to understand and monitor local energy use as part of their energy strategies.

Users of emissions statistics include ministers, policy makers and analysts within DESNZ, policy makers within central government, Devolved Administrations and local authorities, energy and climate change consultancy companies, non-profit organisations/charities, international statistics organisations, academia, media and the public.

3. Accuracy and reliability

3.1 Methodology

All our greenhouse gas emissions statistics are designated as National Statistics, meaning they are produced in line with the [Code of Practice for Statistics](#) published by the UK Statistics Authority. DESNZ publishes [standards for producing official statistics](#) describing the standards we follow to produce national and official statistics.

The methodology used to compile the UK national inventory is detailed in the National Inventory Report¹.

The methodology for the provisional emissions statistics is summarised in the statistical releases, and in a separate methodology note published alongside them.

The local authority greenhouse gas emissions methodology is reported in a detailed technical report alongside the statistics.

3.2 Uncertainty and bias

The inventory is compiled to be as accurate as possible, meaning that steps are taken to ensure emissions are neither systematically overestimated nor underestimated, as far as can be judged and with uncertainties reduced as far as practicable.

Detailed notes regarding the uncertainty analysis undertaken for the final inventory can be found in the National Inventory Report¹ and in the data tables accompanying the final GHG statistics.

Provisional estimates are compared to the final inventory figures and an analysis of this is detailed in the final inventory statistical release. Differences between the provisional and final estimates arise primarily due to revisions to other statistics on which these estimates were based, the availability of data for non-energy related emissions sources in the final estimates

and methodological changes arising from developments to the inventory. Overall, the year-on-year percentage change indicated by the provisional figures has usually been within a percentage point of the change shown by the final figures.

Uncertainties are calculated for local authority greenhouse gas emissions, based on uncertainty in national emissions, uncertainty in the spatial distribution, and the proportion that each sector contributes to local authority emissions. A summary of the uncertainty analysis, by subsector, is presented in the detailed technical report accompanying the publication.

Factors affecting uncertainty in the sub-national road transport and residual fuel consumption datasets are detailed in their technical reports.

4. Timeliness and punctuality

4.1 Timeliness

The final UK greenhouse gas statistics are published with a 13-month lag. This is because of the time taken to compile and publish the UK GHG Inventory. Emissions by end user, by Standard Industrial Classification (SIC) category, and local authority greenhouse gas emissions are based on inventory data and are published later in the year, due to the time taken to compile them.

The table below details the publication timetable of each release, with examples.

| Statistical release | Timeliness | Example |
|--|--|--|
| Final UK emissions | Published around 13 months after the end of the year covered. End user breakdown published two months later and supplementary data tables showing UK greenhouse gas emissions by Standard Industrial Classification (SIC) category going back to 1990 are published in June. | Final statistics for 1990-2022 published in February 2024 |
| Provisional UK emissions | Published ~3 months after the reported year | Provisional estimate of 2023 emissions published in March 2024 |
| Local authority greenhouse gas emissions | Published ~18 months after the end of the year reported | Emissions to 2022 published in June 2024 |
| Sub-national road transport consumption data | Published ~18 months after the end of the year reported | Data to 2022 published in June 2024 |

| | | |
|--|---|--|
| Sub-national residual fuel consumption | Published ~21 months after of the year reported | Data to 2022 published in September 2024 |
|--|---|--|

4.2 Punctuality

All releases are published in accordance with a pre-announced release timetable. In accordance with the Code of Practice for Statistics, releases are published at 9.30am.

5. Accessibility and clarity

5.1 Accessibility

All statistical releases and accompanying documents and data tables are published on the relevant area of the gov.uk website. Data tables are provided in Excel format and Open Document Spreadsheet format, although users may request other formats if they wish.

We want as many people as possible to be able to use those documents by following DESNZ' [accessible documents policy](#), and all documents are produced in line with public sector accessibility regulations. For example, when we produce a document, we make sure to:

- tag headings and other parts of the document properly, so screen readers can understand the page structure
- include alternative text alongside non-decorative images, so people who cannot see them understand what they are there for
- ensure any tables used follow simple structures
- write in plain English.

Users of assistive technology can request a version of the publications or data tables in a more accessible format by contacting DESNZ at alt.formats@energysecurity.gov.uk.

5.2 Clarity

Each statistical release comprises a written statistical release containing a summary of the data, along with a one-page infographic presenting the headline findings, contextual information, and information about drivers of change in the data. For more expert users, data tables are provided, and for the final UK emissions statistics and local authority emissions statistics datasets are published to enable users to conduct their own analysis.

Some methodological information is summarised in the releases, but more technical methodological documents are provided for users who need this. A statistical summary using data visualisation is also published alongside the Final and Provisional UK statistics

publications and the local authority emissions statistics. These provide a one-page summary infographic highlighting the key trends in the latest data.

6. Coherence and comparability

6.1 Consistency across time

Final inventory data are reported in a methodologically comparable time series dating back to 1990. Estimates for any different inventory years, pollutants and source categories are made in such a way that differences in the results between years and source categories reflect real differences in emissions. Annual emissions, as far as possible, are calculated using the same method and data sources for all years, so the resultant trends should reflect real fluctuations in emissions and not changes resulting from methodological differences.

In all statistics publications, updates are made each year to the complete time series to take account of new methods and data (emission factors and activity data). This means that estimates for a specific year are not consistent between one inventory and the next but ensures that each year's inventory consists of a methodologically consistent time series.

The input data for the end user estimates are compiled as part of the national inventory as reported to the UNFCCC.

6.2 Consistency with related datasets

All the National Statistics are broadly consistent with the UK's GHG Inventory, with differences shown in the local authority publication.

The UK Digest of Energy Statistics (DUKES) is a key data source for the inventory; however, inventory data are not always fully consistent with DUKES due to the use of different methodologies (due to the need to comply with international guidelines) or supplementary data sources.

The local authority greenhouse gas dataset is derived from the national inventory, but there are some differences between the datasets, and these are outlined in the local authority emissions statistical release and in the accompanying Excel files.

There are differences between the sub-national road transport statistics and DUKES because the sub-national statistics are based on fuel consumption, while DUKES is based on fuel sales. There are also differences between the sub-national residual fuel consumption statistics and DUKES, due to differences in methodology.

The UK GHG emissions statistics published by DESNZ are based on territorial emissions. However, emissions estimates are also published on a [UK residency basis](#) by the Office for National Statistics (ONS) and on a [consumption emissions basis](#) by the Department for Environment, Food and Rural Affairs (Defra). A breakdown of UK territorial emissions is published by Standard Industrial Classification (SIC) category to enable comparisons with the residency-based estimates.

6.3 Differences in geographical coverages

The standard geographical coverage in the UK GHG emissions statistics is the UK, but the UK GHG Inventory also includes estimates of emissions in the UK's Crown Dependencies (Jersey, Guernsey and the Isle of Man), and those Overseas Territories that are included in its reporting to the UNFCCC (Bermuda, Cayman Islands, Falkland Islands and Gibraltar), and these are presented in some tables in the statistics. Different geographical coverages are used for reporting against specific GHG emissions reductions targets. Geographical coverages are clearly stated in each statistical release and accompanying data set.

6.4 Alternative measures to reporting greenhouse gas emissions

The UK, for specific reasons, uses three different approaches to report greenhouse gas emissions and the UK Government publishes figures based on each approach. These approaches are:

- [“Territorial” emissions](#) based on the UK greenhouse gas inventory, published by the Department for Energy Security and Net Zero (DESNZ)
- [“Residency-based” emissions](#) as measured by the UK Environmental Accounts, published by the Office for National Statistics (ONS)
- [“Consumption-based” emissions](#), known as the UK's carbon footprint, published by the Department for Environment, Food and Rural Affairs (Defra).

These are each prepared in accordance with an established annual timetable and are published as Official Statistics. A comparison between the estimates for each approach is shown in the DESNZ final greenhouse gas emissions statistics release and the Office for National Statistics (ONS) has published [an article](#) that compares these different measures of the UK's greenhouse gas emissions in more detail. At present there is no internationally agreed basis for reporting consumption emissions. Only emissions published on a territorial basis are required for reporting internationally to the UNFCCC.

UK greenhouse gas inventory

DESNZ National Statistics for UK GHG emissions come from the UK's greenhouse gas inventory. This measures emissions on a "territorial" basis, which effectively means that the figures represent emissions occurring within the UK's territorial boundaries.

The UK has measured and reported its emissions of GHGs since 1988. These processes were revised and improved to support the UK's obligations under the UNFCCC, which entered into force in March 1994. It was within the framework of the UNFCCC that the Kyoto Protocol was negotiated in 1997. Most developed nations (including the UK as part of the EU) took on specific targets for limiting or reducing their GHG emissions. In ratifying the Kyoto Protocol, the UK committed itself to maintaining an inventory of GHG emissions, taking action to reduce them, and reporting regularly to the UNFCCC. Since 1990, both national and international reporting has been based on this inventory. Final reporting of emissions under the Kyoto Protocol was completed in 2022, and from 2024 the UK will report a GHG inventory as part of its reporting under the Paris Agreement.

UK Environmental Accounts

Since 1998 ONS has also reported on UK greenhouse gas emissions as part of the Environmental Accounts. These are satellite accounts to the main UK National Accounts, and provide information on air pollution, energy consumption, oil and gas reserves, forestry, trade in basic materials, environmental taxation and spending on environmental protection by government, and commercial and domestic industries. The UK Environmental Accounts are based on a range of statistical information, covering natural resource use, financial expenditure on environmental protection, and revenues raised from environmental taxes. They use similar concepts and classifications of industries to those employed in the UK National Accounts and are governed by the recommended United Nations framework and standards for developing such accounts. They are used to inform sustainable development policy, to model impacts of fiscal or monetary measures and to evaluate the environmental performance of different industrial sectors.

ONS relies on the outputs of data from the UK greenhouse gas inventory. However, with respect to the reporting of greenhouse gas emissions, there are a number of differences between the residency-based estimates in the Environmental Accounts and the territorial data compiled for UNFCCC purposes.

A significant difference in methodology exists in the reporting arrangements for emissions from international aviation and shipping. For UNFCCC purposes, in accordance with international guidelines, these are excluded from national totals on the grounds that there is currently no international agreement on the way to allocate them to national inventories. These emissions are estimated but are reported as “memorandum” items, based on fuel use from UK international aviation and shipping bunkers. By contrast, the Environmental Accounts include international emissions relating to UK operators in national totals using the best available data. In the case of aviation, ONS utilises flight kilometre data which provide relatively accurate information on which to calculate aviation emissions, whilst for shipping they have to rely on the consumption of bunker fuels.

Also, the ONS approach focuses attention on responsibility for emissions rather than the physical location of an emission. The statistics presented in the Environmental Accounts are measured on what is therefore referred to as a UK “residency” basis, as opposed to a “territorial” basis. This means that the Environmental Accounts includes emissions which UK residents and UK-registered businesses are directly responsible for in other countries (e.g., on holiday), and discount emissions caused by foreign visitors and businesses in the UK. This therefore includes emissions related to activity by UK residents’ transport and travel overseas, and excludes emissions generated by non-residents’ transport and travel in the UK. The principle is that this is the same basis on which the UK National Accounts are produced, so environmental impacts can be directly compared with economic indicators such as Gross Output and Gross Domestic Product.

This means that the Environmental Accounts include international emissions relating to UK airlines in national totals using the best available data. For example, they include all emissions by British Airways (a British registered company) anywhere, but not from Ryanair (a Rep. of Ireland registered company) flights into, and out of, the UK.

ONS prepares a [“bridging table”](#) to accompany the Environmental Accounts (EA) greenhouse gas emissions data. The purpose of this table is to clearly demonstrate the differences between the two time-series, by way of a breakdown which compares how each measure is compiled. The table shows in detail both the EA and UNFCCC GHG emissions time series from the base year of 1990 and works down through the differences between the EA and the UNFCCC measures through a series of subtractions and additions. Apart from the addition of

international aviation and shipping, there is also a “Cross–Boundary adjustment”, which captures both the additional emissions in respect of UK residents as well as those to be deducted in respect of overseas visitors and businesses in the UK, and a further element relating to the treatment of biomass. There are then further adjustments which relate to the Crown Dependencies and Overseas Territories, and to land use, land-use change and forestry (LULUCF).

The Environmental Accounts break down emissions using the Standard Industrial Classification (SIC), which is based on the economic sector of the person or company responsible for the activity, rather than the activity itself. This is particularly relevant to transport emissions, which are attributed to the owner of the transport.

ONS publishes the Environmental Accounts as National Statistics in June each year. Emissions are reported 18 months in arrears, i.e. emissions for calendar year t are reported in June of year $t+2$.

Consumption-based emissions

Neither of the two methods described above take account of the emissions “embedded” within the manufactured goods and services which the UK imports and exports. This method therefore captures what is sometimes referred to as the UK’s “carbon footprint”. The calculation of emissions on a consumption basis, reporting on emissions embedded in goods and services across international borders, is considerably more challenging.

The UK Government has undertaken research into embedded emissions and the Department of Environment, Food and Rural Affairs (Defra) provide the lead in this area. They publish annual statistics on the UK’s Carbon Footprint that investigates the impact the UK consumption has on greenhouse gas emissions. These are usually published in the spring each year just over two years after the end of the year they relate to, i.e. emissions for calendar year t are reported in the spring of year $t+3$.

7. Trade-offs

There is a trade-off between timeliness and accuracy in publishing annual greenhouse gas emissions statistics. Final inventory data are published approximately 13 months after the end of the reporting year as the methodology used is complex and time consuming. In order to bridge the gap before the publication of final inventory data, provisional emissions estimates are published 3 months after the end of the reporting year. The provisional estimates are based on the final inventory combined with UK energy consumption data for the intervening year and are therefore not compiled with the same level of detail as the final inventory.

8. Assessment of user needs and perceptions

8.1 Users

Users of emission statistics can be categorised as being from the following groups:

- Ministers, policy makers and analysts within DESNZ
- Policy makers within central government, Devolved Administrations and local authorities
- Energy and climate change consultancy companies
- Non-profit organisations/charities
- International statistics organisations
- Academia
- Media
- The public.

8.2 Use of Statistics

The UK final greenhouse gas emissions statistics provide the latest final inventory statistics estimates of territorial emissions and allow users to measure the UK's progress against international and domestic targets. More detail on progress against targets can be found in the final inventory statistical release and accompanying data tables.

The Greenhouse Gas Inventory is reported to The United Nations Framework Convention on Climate Change, the UK government, and devolved administrations.

Based on discussions with a variety of users we have identified the following uses of these statistics:

- Informing the general public on levels of UK greenhouse gas emissions, and trends over time in UK greenhouse gas emissions.
- Providing information on progress against various UK emissions reductions targets (both domestic and international).
- Providing information on devolved administration and sub-national emissions that can be used to monitor progress against Devolved Administration or local authority targets.
- Informing policy making on emissions reductions measures.
- Informing media reporting of UK greenhouse gas emissions and trends.
- Providing a historical baseline for UK emissions projections.
- Providing detailed emissions data on gases, sectors and sub-sectors that may be of interest to users (particularly academics) with a focus on a particular area of emissions.

8.3 User engagement

DESNZ recognises that users will have different needs. Users are encouraged to provide comments and feedback on how the greenhouse gas statistics are used and how well they

meet user needs. Comments and any issues relating to the greenhouse gas statistical releases are welcomed and should be sent to: GreenhouseGas.Statistics@energysecurity.gov.uk.

Further information about DESNZ' user engagement policies can be found in the [statistical public engagement and data standards](#) published on gov.uk. The statement sets out the department's commitments on public engagement and data standards as outlined by the Code of Practice for Statistics.

9. Performance, cost and respondent burden

The data used to produce the GHG emissions statistics largely comes from the UK GHG Inventory and from other Official Statistics. The UK is required by the UN to produce an annual GHG Inventory, so using the data to produce Official Statistics does not add an additional respondent burden. The work of producing the statistics themselves is done by a team of 12 individuals within DESNZ and our contractors Ricardo.

10. Confidentiality, transparency, and security

The transparency of emissions reporting is fundamental to the effective use, review and continuous improvement of the inventory. To this end, clear documentation is available, and reporting is at a level of disaggregation that sufficiently allows individuals or groups other than the designated emissions expert or the compiler of the inventory to understand how the inventory was compiled and assure it meets good practice requirements.

Much of the data used to compile the inventory are publicly available. Where organisations have provided information on the condition that the data remains confidential, these sources are reported in combination. Where detailed data are required, for example due to a freedom of information request, any elements of confidential data in the dataset are identified and suppressed.

For the local authority greenhouse gas emissions, some data from large gas consumers are suppressed in order to comply with non-disclosure agreements. Estimates of emissions from the excluded sites are calculated using other data, and this process is detailed in the technical report.

This publication is available from: <https://www.gov.uk/government/publications/uk-greenhouse-gas-emissions-explanatory-notes>

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