



## **Guide to UK official statistics on climate change**

RSS Climate Change and Net Zero Task Force

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## Introduction

Decision-making of any kind should be informed by statistical and other evidence. Evidence is formed from data (or, in some cases, by noting a lack of data). The Royal Statistical Society’s [Data Manifesto](#) highlights areas the UK government should focus upon to improve data for policymaking. The manifesto opens by calling for evidence to be taken seriously in policy formulation and evaluation, and for official statistics to be at the heart of policy debate.

Official statistics are not just for government. They have a wide role in helping to meet the needs for data and evidence of local and regional governments, businesses, research, and education. Official statistics also serve to “[empower](#), enabling citizens to call governments to account and providing a window on society”.

Climate change is a major area of concern to many statistics users within and outside of government. It is notable that the Secretary-General of the United Nations has long had tackling “the climate crisis that is ravaging and savaging our world” among his [priorities](#), invariably quoting statistics in his [speeches](#).

This note aims to provide information about UK statistics on climate change. It is an unofficial guide, produced by the RSS’s [Climate Change and Net Zero Task Force](#). We are also grateful for the advice and material kindly provided by colleagues in the Department for Energy Security and Net Zero (DESNZ), the Office for National Statistics (ONS), and the Met Office.

### 1. What are climate change statistics?

Climate change is the large-scale, long-term shift in the Earth’s weather patterns and temperatures. Statistics of climate change can be indicators of climate change or of the effects of climate change (for example, the changes in summer maximum temperature). Statistics are also available on causes (or drivers) of climate change (for example, how the

concentration of carbon dioxide has changed in the Earth's atmosphere). Other statistics relate to climate change mitigation (for example, greenhouse gas emissions) or to climate change adaptation.

Because the Earth's weather fluctuates rapidly – over hours, days, and years – climate statistics of drivers and indicators are typically calculated over a period of 30 years or more.

## 2. UK official statistics on climate change

For an overview of climate change – evidence that the climate is changing, causes and impacts – in official UK documents, start by accessing the annual [State of the UK Climate reports](#), published on the Met Office website. Highlights from the most recent report include:

“2023 was the second warmest year on record for the UK in the series from 1884, with only 2022 warmer. Six years in the most recent decade (2014-2023) have been within the top-ten warmest in the series.”

“Observations show that extremes of temperature in the UK have been affected much more than average temperature. The number of ‘hot’ days (28°C) has more than doubled and ‘very hot’ days (30°C) more than trebled for the most recent decade (2014-2023) compared to 1961-1990.”

“Five of the ten wettest years for the UK in the series from 1836 have occurred in the 21st Century.”

Another official source is this [climate change explainer](#) on the UK Government website, although at the time of writing this guide in January 2025, the statistics in the explainer had not been updated beyond 2022.

To generate a list of all available UK official statistics on climate change, with links to published data and analysis, access the official statistics release calendar [here](#). There are some 985 entries (as at January 2025), ordered to show the latest releases first. The list can be reduced by browsing for publications or topics of particular interest, like “historical energy pricing” or “greenhouse gas emissions”, and then restricting the search to those. However, the search function is cumbersome, and it is not easy to narrow a search down.

To illustrate the range of statistics available, the following statistical releases were published in November 2024:

29-Oct-24	<a href="#">DESNZ Public Attitudes Tracker: Summer 2024</a>
06-Nov-24	<a href="#">Greenhouse gas emissions (residence basis), Q2 2024</a>
08-Nov-24	<a href="#">UK Natural Capital Accounts</a>
13-Nov-24	<a href="#">UK inclusive wealth and income accounts: 2005 to 2022</a>
13-Nov-24	<a href="#">Public and business attitudes to the environment and climate change, Great Britain; 2023 and 2024</a>
14-Nov-24	<a href="#">Measuring progress, well-being and beyond GDP in the UK: November 2024 (including climate change statistics)</a>
15-Nov-24	<a href="#">Public opinions and social trends, Great Britain: October 2024</a>
25-Nov-24	<a href="#">Low Carbon and Renewable Energy Economy (LCREE) Survey indirect estimates, UK: 2015-2020</a>

In all cases bar one, these releases were still the latest available in January 2025. Links to earlier releases should be found in each release. The 15 November publication is a monthly release and for this (as generally) when later releases are published, the links above should include a link to the newer statistics.

An alternative way of accessing statistics is via government departments and agencies with relevant responsibilities:

- (1) The Department for Energy Security and Net Zero (DESNZ) is the lead UK department on the goal of net zero emission. All the statistics from DESNZ are [here](#) (320 entries at time of writing). The comments above on the difficulties of searching for specific topics or publications also apply here.
- (2) Official statistics on UK greenhouse gas emissions and related publications are brought together on this [page](#), published by DESNZ (previously the Department for Business, Energy & Industrial Strategy, BEIS). This page includes local authority and regional statistics.
- (3) The official sources for climate change-related statistics and emission measures are, as well as DESNZ, the Office for National Statistics, the Department for Environment, Food & Rural Affairs (Defra) and the devolved governments in Northern Ireland, Scotland and Wales. These can all be accessed through the official statistics release calendar [here](#).
- (4) The Office for Statistics Regulation (OSR) produced this [explainer](#) on climate change and net zero statistics for the UK general election in 2024.

### 3. Met Office statistics on climate change

In legislative terms, the Met Office is not included as a producer of official statistics. However, as the UK's national meteorological service it is an official body (with a gov.uk website address) and is responsible for public weather services and for running a vast observations network that generates the data essential to the creation of accurate climate statistics.

The [Met Office Hadley Centre](#) (MOHC) is one of the UK's foremost climate change research centres. MOHC data supports many other government outputs and publications, and regularly published its own datasets and reports, including:

- (1) As noted in section 2 above, an annual [State of the UK Climate report](#), published every July.
- (2) Several multi-century climate time series, including the [Central England Temperature record](#) (HadCET) and the [UK regional precipitation series](#) (HadUKP) that begins in 1766.
- (3) [Global historical surface temperature anomalies](#) from 1850 to the present day, relative to a 1961-1990 reference period, known as HadCRUT5.
- (4) A further catalogue of over 20 additional [datasets](#) are available from the Met Office.

Links to further data sets and climate summaries are available [here](#).

The latest official climate projection statistics (known as UKCP18) are available from the interactive [UK Climate Projection portal](#) or via this [link](#). This includes data summaries at local authority level that can be explored via an [interactive map](#).

The Met Office contributes global historical reconstruction and future projection data via the [Coupled Model Intercomparison Project \(CMIP\)](#) along with numerous other climate institutes from around the world. Climate projection data is freely available via several portals via the CMIP website.

#### **4. The definition and role of “official statistics”**

UK official statistics are formally defined as those produced and published by the Office for National Statistics and by the devolved administrations, other government departments and specified official UK organisations. The precise specification of these organisations is laid down in legislation. Further details are available on the UK Statistics Authority [website](#).

There is more to official statistics than just who produces them. This relates to their quality and to why they are produced. Some official statistics are [Accredited Official Statistics](#) – signalling that the Office for Statistics Regulation (OSR) has independently reviewed them and confirmed that they comply with the standards of trustworthiness, quality and value in the [Code of Practice for Statistics](#). For a complete list of all accredited official statistics, see the [List of Accredited Official Statistics](#) maintained by OSR. The statistics are grouped into domains, one of which covers transport, environment, and climate change.

The most important thing about official statistics is that they are produced and published for the public good, in line with the [UN Principles of Official Statistics](#), which set out a vision for official statistics:

*Official statistics provide an indispensable element in the information system of a democratic society, serving the government, the economy and the public with data about the economic, demographic, social and environmental situation. To this end, official statistics that meet the test of practical utility are to be compiled and made available on an impartial basis by official statistical agencies to honour citizens' entitlement to public information. (Principle 1)*

The phrase *official statistics for the public good* was used purposefully in the UK official statistics legislation, with the intention of preventing any future interpretation that official statistics are primarily for government: the public good is understood as both informing the public about social, economic, and environmental matters and assisting in the development, delivery, and evaluation of public policy by governments.

The RSS has concluded that there is an innate tendency for producers of official statistics to prioritise government users over other users. It is now campaigning for more [public statistics](#), which starts from identifying the areas where statistics are needed to help answer society's big questions. The idea of public statistics is that, having identified these questions, official statisticians would draw on other relevant and trustworthy sources of data and statistics and publish analyses to help answer the questions.

#### **5. Other statistics and data to help fill gaps and to get a more comprehensive picture of climate change**

Climate change is one area where a 'public statistics' approach seems urgently needed. Official data are not the only data used in assessing climate change in key, authoritative, international reports, notably those of the [Intergovernmental Panel on Climate Change \(IPCC\)](#). The fullest picture of climate change draws on a wide range of scientific, statistical, and administrative data. But that does not appear to be happening yet in UK official statistical reports.



It is our (the RSS's Climate Change and Net Zero Task Force) experience that UK government departments have been quite open about making 'open data' available, including where these do not result in official statistical publications. For example, the Department for Environment, Food & Rural Affairs (Defra) has provided access to many open environmental data sets [here](#). The portal to all open data published by central government, local authorities and public bodies is [here](#). However, having released datasets, UK officials then leave civil society and businesses to find and to analyse them and other relevant datasets.

The Centre for Environmental Data Analysis (CEDA), principally funded by the UKRI Natural Environment Research Council (NERC) runs the UK's national data centre for atmospheric and earth observation research, hosting Petabytes of data. [CEDA's data archive](#) is a useful source. The CEDA Archive is part of [NERC's Environmental Data Service \(EDS\)](#) - a network of data centres covering all aspects of environmental science.

The [Integrated Data Service](#) (IDS) is a UK cross-government service providing researchers access to a range of secure, de-identified data, including some relevant to climate change. (De-identified data prevents the identity of individual persons or businesses being revealed). You must be an "[accredited researcher](#)" to access the full IDS data catalogue. To become a provider of data and add greater value to the service, email [IDS Customer Support](#).

Whether one set of statistics is better than another depends on their relative quality: not only methodological rigour, detail, and accuracy but also their timeliness and usefulness in answering questions about the extent and impact of climate change and what to do about it.

## 6. The scope for getting more official statistics on climate change

There are known gaps in the statistics, such as Gavin Schmidt's call for "[more nimble data-collection systems](#)" to help understand recent heat anomalies such as the sudden heat spikes in the summer of 2023.

Also, some aspects of climate change are better covered than others – for example, there appears to be a dearth of statistics available on adaptation, perhaps partly at least because there are differing views on what should be the principal measures of climate change adaptation. Also, adaptation is inherently specific to a local context and so measures of it cannot necessarily be easily aggregated up, in the same way as greenhouse gas emissions can be summarised, for example.

That said, it is worth noting that Defra do publish some adaptation statistics, and ONS has asked climate risks and adaptation questions in its surveys to households and to businesses (and we gather that ONS is planning a publication that will dive more deeply into this). Published outputs should be retrievable via the official statistics release calendar [here](#).

The designated route for raising new user requirements for official statistics is the [User Engagement Hub](#), from where these will be passed to the designated provider or to a theme group. (The theme group for Environment, climate and nature is led by ONS and is, we understand, currently more about meeting government needs – such as more coherence, sharing best practice and identifying data gaps – than addressing external needs, although there will be indirect benefits for external users). Theme-based user engagement is underpinned by the Government Statistical Service (GSS) [user engagement strategy](#), which is aiming to ensure that "official statistics meet society's needs".

If you have specific questions about the content (or what is not included) of specific official statistics outputs, there is invariably a contact email address given in the release.

A new development, strongly supported by the RSS, is the UK Statistics Assembly. Formed in response to a recommendation in the [Independent Review of the UK Statistics Authority](#), the Assembly is a unique opportunity for a diverse range of voices and views, including from central, local and devolved governments, business and industry, academia, civil society and charities to come together to discuss and advise the UK official statistics system on statistical priorities, user needs and gaps for the country. The Assembly met for the first time (on-line and in-person) in January 2025. Further details of the event are [here](#).

## 7. The official UK climate change statistics portal

Launched in 2021, ahead of the COP26 summit, the portal operated briefly as a “one-stop shop for official statistics on climate change and related topics”. However, it is now archived [here](#) – it ceased to be updated in September 2023. We understand the portal was only ever in pilot form, but the potential usefulness of such a one-stop shop in the future can still be guided by assessing the archived product. Also, the archive now serves as a record of UK official statistics on climate change that were available around the time that the UK hosted [COP26](#).

## 8. Statistics giving a global view of climate change

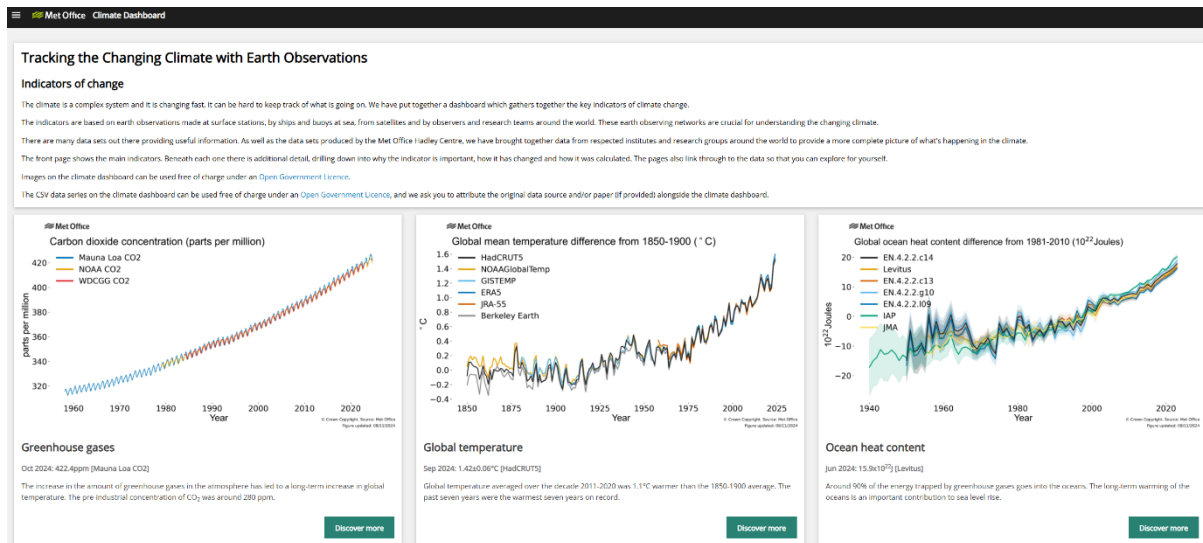
Global statistics on climate change are published by international organisations including the [World Meteorological Organisation](#) (WMO) and the [UN Environment Programme](#) (UNEP). The WMO publishes several annual reports, including the [State of the Global Climate](#) and the [Greenhouse Gas Bulletin](#).

The United Nations body for assessing the science related to climate change, The Intergovernmental Panel on Climate Change (IPCC), prepares comprehensive assessment reports every 6-10 years, that summarise the latest scientific assessments on climate change, its implications and potential future risks, and put forward adaptation and mitigation options. [The latest IPCC report is Assessment Report 6 \(AR6\)](#). The IPCC also makes data available via a [portal](#) and an [interactive atlas](#).

The [World Environment Situation Room](#) (WESR) is a new UNEP data, information and knowledge platform providing users access to validated content to support environmental decision-making. UNEP also maintains the largest real-time [air quality databank](#) (but note that air quality interacts with climate change but is not the same as it). Some international organisations are linked to official webpages given in section 2 above.

[Copernicus](#) is the European Union's Earth Observation Programme. It includes a “Climate Change Service” that aims to support society by providing authoritative information about the past, present and future climate in Europe and the rest of the world. Copernicus publishes an annual global climate summary. The [latest](#) (as at January 2025) reports that “*The year 2024 was the warmest on record globally, with an average global temperature of 1.6°C above the pre-industrial average. It was the first calendar year with a global average temperature exceeding 1.5°C above pre-industrial level*”.

The UK Met Office produces a live [dashboard](#) of several common indicators of global climate change, an extract from which is shown here:



This dashboard includes a section tracking [progress against the Paris Agreement long-term temperature goal](#).

International Climate Finance (ICF) is UK Official Development Assistance funding to support developing countries to reduce poverty and respond to the causes and impacts of climate change. [ICF results](#) is an annual publication that reports what ICF investments have achieved against a set of Key Performance Indicators, using data collected and aggregated from ICF programmes. ICF results are not accredited or official statistics, because of the range of data sources used and their variable quality, but the UK producers of ICF results have committed to following the Code of Practice for Statistics. Further details of methodology and evaluation are [here](#).

## 9. Statistics that show how the UK is progressing on its climate change targets

The [Climate Change Committee](#) (CCC) is an independent, statutory body established under the [Climate Change Act 2008](#). Their purpose is to advise the UK and devolved governments on emissions targets and to report to Parliament on progress made in reducing greenhouse gas emissions and preparing for and adapting to the impacts of climate change.

The CCC make annual reports to Parliament including the UK [progress towards Net Zero](#) and progress in [adaptation measures](#).

The Climate Change Act 2008 also sets out a legally binding target to reduce greenhouse gas emissions by at least 100% below the 1990 baseline by 2050, and introduced “carbon budgets” setting the trajectory to ensure the 2050 target in the Act is met. These budgets represent legally-binding limits on the total amount of greenhouse gases that can be emitted in the UK for a given five-year period. To measure compliance against each carbon budget, section 18 of the Climate Change Act requires that the Government lays before Parliament a final statement for each budgetary period by 31 May in the second year after the budget finishes. The [final statement for the third carbon budget](#) (2018-2022) was published in this way in May 2024.



DESNZ also publish an [Annual statement of emissions](#), including the net UK carbon account and which is compared against the carbon budgets to determine whether they are being met.

## Summary

There is a richness of official climate change statistics available both at UK level and internationally, however there are still some gaps. This is a complex area with often a wealth of detail that might be off-putting to some potential users. Browsing the links included in this guide, including the official statistics release calendar, for published and for planned future releases, should give a flavour of the relevant statistics. Alternatively, it may be worth searching with a particular angle in mind, such as tracking greenhouse gas emissions over time. The official statistics are complemented by statistics published by other organisations, some of which incorporate official data in their products.

There are challenges in focussing in on specific concerns. Statistics may be required at sub-national and local levels, and to be differentiated by sectors of the economy (such as agriculture, transport, energy production, manufacturing, etc) and to be linked across the various policy area, especially mitigation or adaptation.

The importance of having – and using – relevant, reliable, authoritative data and statistics to help understand and to tackle climate change cannot be stated strongly enough. For example, The Economist magazine (4 January 2025) emphasised that “The keys to faster adaptation [to climate change] are information, incentives and effective government. Better information allows more rational decision-making”. We continue to believe that statistics can also help debate with anti-green and climate-sceptic agendas, and in discussing the scaling back of environmental action.

We hope that this guide provides some insight into the available statistics and how to find them. Please send any comments, corrections, or suggested additions to the [Policy Team](#) at the RSS.

The guide was compiled by Paul Allin and Amanda Penistone (lead authors) with other members of the Royal Statistical Society’s Climate Change and Net Zero Task Force.

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