UK Government

UK greenhouse gas emissions statistics: 2026 planned methodology changes

Department for Energy Security and Net Zero (2026)

Contents

Introduction

This note outlines the planned method changes to greenhouse gas emissions statistics due for publication in the Final UK greenhouse gas emissions statistics for 1990-2024 on 5 February 2026.

The estimates presented in this note are provisional and are subject to revision until the statistical release on 5 February 2026. Importantly, this note only covers method changes. It does not account for revisions to the data sources used to estimate emitting activities, such as to energy data in the Digest of UK Energy Statistics (DUKES), except where stated otherwise.

Throughout this note, emissions estimates are expressed in million tonnes of carbon dioxide equivalents (MtCO2e), with emissions from each gas weighted based on its global warming potential[1]. The geographic coverage of the emissions estimates in this note are UK only (excluding UK Crown Dependencies and Overseas Territories), except where stated otherwise.

Background

Final UK greenhouse gas emissions statistics are derived from the UK Greenhouse Gas Inventory, the time series of greenhouse gas emissions occurring within the borders that the UK is required to report under the United Nations Framework Convention on Climate Change (UNFCCC).

Each year, there are improvements to the way that emissions are estimated. Changes are applied back through the time series to ensure that the trend in emissions from 1990 to the present is based on a consistent method.

The impacts of each method change on the 1990 and 2023 emissions estimates are given in Table 1. The combined impact of them on each Territorial Emissions Statistics (TES) sector is shown in Table 2. Impacts are also reported as a percentage of the UK total.

[1] The global warming potentials (GWPs) used are from table 8.A.1 (without climate-carbon feedback) of Working Group 1 of the IPCC Fifth Assessment Report: Climate Change 2013.

Impact of method changes

In total, the method changes are estimated to decrease total UK emissions in 1990 by around 17 MtCO2e (-2%) and increase total UK emissions in 2023 by around 1 MtCO2e (0.2%).

Table 1: Provisional impact of method changes on UK totals[2, 3, 4]

	Change in emissions (MtCO2e)		Impact on UK total (%)	
Change	**1990**	**2023**	**1990**	**2023**
Solid waste	-14.87	-1.37	-1.83%	-0.36%
Domestic wastewater	1.85	3.29	0.23%	0.85%
Shipping	-4.81	-1.53	-0.59%	-0.40%
Industrial wastewater	0.26	0.48	0.03%	0.12%
Biogas[5]	~0.00	0.82	~0.00%	0.21%
Iron and steel	0.00	-0.59	0.00%	-0.15%
Gas oil[6]	~0.00	-0.25	~0.00%	-0.07%
Peat	0.08	~0.00	0.01%	~0.00%
Fluoropolymer production	0.00	0.02	0.00%	~0.00%
Domestic combustion	~0.00	-0.01	~0.00%	~0.00%
Agriculture changes	0.51	0.56	0.06%	0.15%
Land use, land use change and forestry (LULUCF) changes	-0.36	-0.78	-0.04%	-0.20%
Total[7]	**-17.33**	**0.65**	**-2.14%**	**0.17%**

[2] ~0.00 indicates a non-zero value that is less than 0.005 MtCO2e or 0.005% in magnitude; 0.00 indicates no change.
[3] A positive number indicates an increase on the previous estimate; a negative number indicates a decrease.
[4] All estimates are rounded to 2 decimal places.
[5] Estimates include updates to data sources such as DUKES.
[6] Estimates include updates to data sources such as DUKES.
[7] Total may not sum due to rounding.

Table 2: Provisional impact of method changes on UK totals by sector[8, 9, 10]

	Change in emissions (MtCO2e)		Impact on UK total (%)	
TES sector	**1990**	**2023**	**1990**	**2023**
Electricity supply	~0.00	0.62	~0.00%	0.16%
Fuel supply	~0.00	0.81	~0.00%	0.21%
Domestic transport	-4.81	-1.41	-0.59%	-0.37%
Buildings and product uses	-0.36	0.08	-0.04%	0.02%
Industry	0.33	-1.37	0.04%	-0.36%
Agriculture	0.62	0.30	0.08%	0.08%
Waste	-12.76	2.40	-1.57%	0.62%
LULUCF	-0.36	-0.78	-0.04%	-0.20%
Total[11]	**-17.33**	**0.65**	**-2.14%**	**0.17%**

[8] ~0.00 indicates a non-zero value that is less than 0.005 MtCO2e or 0.005% in magnitude; 0.00 indicates no change.
[9] A positive number indicates an increase on the previous estimate; a negative number indicates a decrease.
[10] All estimates are rounded to 2 decimal places.
[11] Total may not sum due to rounding.

Summary of method changes

Details of the method changes are given below. Further information on the updated methods will be available in the UK National Inventory Document (NID) when it is submitted to the UNFCCC in April 2026[12].

Solid waste

There has been an update to the landfill model to use gross domestic product (GDP) data to approximate solid waste disposal volumes where actual activity data is unavailable. Importantly, historic data on solid waste disposal at landfill sites is uncertain and unavailable before 1997. Previously, solid waste disposal volumes from 1990 to 1996 were extrapolated from 1997 data using household and employment statistics. However, an external review of this method highlighted that it is inconsistent with the Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories[13]. To improve consistency with IPCC guidelines, the landfill model has been updated to use GDP data as a proxy for solid waste disposal volumes.

This change is exclusive to the waste sector and leads to a large decrease in landfill emissions estimates over the early portion of the historic time series.

Domestic wastewater

There have been several changes to the domestic wastewater model to improve consistency with IPCC guidelines and capture UK-specific wastewater treatment practices. An external review of the model highlighted several inconsistencies with IPCC guidelines and recent improvements in the scientific understanding of wastewater treatment emissions. Therefore, the model has been updated to use the parameters and emissions factors from the 2019 Refinement to the 2006 IPCC Guidelines[14]. In addition, new UK-specific assumptions and academic literature are used to estimate processes that are not covered by IPCC guidelines.

This change is exclusive to the waste sector and increases emissions estimates across the historic time series, mainly from higher nitrous oxide (N2O) emissions.

[12] The UK NID covering 1990-2024 emissions estimates will be submitted to the UNFCCC by 15 April 2026. Previous submissions can be found here: https://unfccc.int/reports.
[13] Guidance from the IPCC Task Force on National Greenhouse Gas Inventories can be found here: https://www.ipcc-nggip.iges.or.jp/.
[14] The 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories can be found here: https://www.ipcc.ch/report/2019-refinement-to-the-2006-ipcc-guidelines-for-national-greenhouse-gas-inventories/.

Shipping

There has been an update to the model for estimating domestic shipping emissions. Ship movement estimates are now normalised against DUKES data on fuel sales. Previously, domestic shipping emissions were based on ship movements only. This meant that the emissions estimates were inconsistent with DUKES. Now, estimates derived from ship movements are adjusted so that they match the total amount of fuel use implied by sales data in DUKES. The normalisation process is also applied to modelled emissions estimates for inland waterways and port machinery, but not naval shipping that are based on fuel purchases by the Ministry of Defence (MoD).

In addition, the modelling and coverage of activities has been enhanced through incorporation of global Automatic Identification System (AIS) data from 2019. Previously, the model used UK AIS data from 2014. Overall, these changes decrease UK domestic shipping emissions estimates across the historic time series.

The model improvements also impact emissions estimates for Crown Dependencies and Overseas Territories. In particular, the incorporation of global AIS data allows for improved coverage of activities in Overseas Territories. Overall, the changes increase emissions estimates for domestic shipping in Crown Dependencies and Overseas Territories across the historic time series (an increase of around 1 MtCO2e in 1990 and 0.5 MtCO2e in 2023)[15].

The model has also been updated to remove double counting of at berth emissions. Previously, at berth emissions were reported against totals for both domestic and international shipping. However, IPCC guidelines require at berth emissions to be reported against domestic shipping. Now, all at berth emissions are included within the domestic shipping emissions estimates only. This reduces UK-based international shipping emissions estimates across the time series (a decrease of around 2 MtCO2e in 1990 and 1 MtCO2e in 2023)[16].

Industrial wastewater

Estimates of emissions from the discharge of industrial wastewater have been added to the totals for the first time. Previously, they were excluded from totals due to a lack of guidance in the 2006 IPCC Guidelines. However, guidance was introduced in the 2019 Refinement to the IPCC 2006 Guidelines. Inclusion of this emissions source is now

[15] Revisions to emissions estimates for Crown Dependencies and Overseas Territories are excluded from the estimated impacts on UK totals shown in Table 1 and Table 2.

[16] International shipping emissions are excluded from the UK total in line with IPCC guidelines. However, they are included in the Carbon Budget 6 and reported to the UNFCCC as a memorandum item each year. Therefore, revisions to international shipping emissions estimates are excluded from the estimated impacts on UK totals shown in Table 1 and Table 2.

justified through its addition to the common reporting table (CRT) format used to comply with Paris Agreement reporting commitments.

This change is exclusive to the waste sector and results in a small increase in N2O and methane (CH4) emissions across the historic time series.

Biogas

Emissions from biogas and natural gas use from the gas distribution network have been separated for the first time. Previously, biogas in the distribution network was treated as a component of natural gas and wasn't distinguishable. However, an external review of the method highlighted the previous approach was not transparent to users. Therefore, DUKES data on biogas injection into the gas distribution network is used to produce separate estimates of fossil fuel and biofuel use emissions.

The impact of this change on UK emissions totals is minimal. Importantly however, almost all biogas and natural gas blending occurs in the gas distribution network. This means that consumers with a more direct supply of gas, such as large-scale consumers or upstream oil and gas sites, will use natural gas only. To account for these differences, the apportionment of gas use across the industry, fuel supply, electricity supply, domestic transport, buildings and product uses, and agriculture sectors has been revised.

Iron and steel

There has been an update to the method for estimating emissions from the iron and steel industry to apply a 5-year average to fuel data for 2022, 2023, and 2024. Previously, annual fuel data was used to estimate emissions from iron and steel production. However, coke oven closures in recent years mean that the existing method produces emissions estimates that are challenging to justify. Since the closures, the UK iron and steel industry has relied on imported coke. This means that use of UK coke oven coke data to track emissions from iron and steel production is no longer valid. Similarly, alignment to operator Emissions Trading Scheme (ETS) data has deteriorated. To account for these discrepancies, a 5-year average is applied to the fuel data for 2022, 2023, and 2024.

This change improves the alignment to ETS data and is exclusive to the industry sector. It decreases emissions estimates for 2022 and 2023.

Gas oil

Gas oil use emissions estimates have been revised to improve their time series consistency. DUKES is regularly updated with revisions back to 2009. Emissions estimates incorporate these revisions to maintain consistency with DUKES. However,

these revisions also introduce time series inconsistencies between 2008 and 2009. In addition, there are further time series inconsistencies in the DUKES data from before 1997 that is not available electronically. To address these inconsistencies, several adjustments to the sector breakdown of gas oil use emissions have been made:

- For domestic, commercial, and agricultural use – 1998 to 2008 activity data is interpolated from the 1997 and 2009 DUKES data
- For the non-ferrous metal, chemical, paper and pulp, and minerals industries use – 1990 to 1997 activity data is extrapolated from the DUKES data from 1998 onwards
- For the food and drink, construction, and iron and steel industries well as unclassified use – 1990 to 2008 activity data is extrapolated from the DUKES data from 2009 onwards
- For forest machinery use, activity data is taken from forestry statistics in place of DUKES data.

Importantly, overall gas oil use emissions estimates remain consistent with the gas oil use totals reported in DUKES. Therefore, time series consistency improvements impact the apportionment of emissions estimates between the industry, agriculture, and buildings and product uses sectors only.

Peat

Peat fuel use emissions estimates have been updated to be more reflective of UK use cases. In response to recommendations from a review of the model for peat emissions, a higher calorific value for peat has been adopted in place of the default value in IPCC guidelines. At the same time, the carbon content in fuel peat extracted from Northern Ireland has been increased to align with UK Centre for Ecology & Hydrology (UKCEH) estimates.

This change is exclusive to the buildings and product uses sector and results in a small increase in emissions across the historic time series.

Fluoropolymer production

Hydrofluorocarbon (HFC) emissions from fluoropolymer production have been estimated and included in the totals for the first time. These estimates are derived from Pollution Inventory[17] and additional site-level data from the Environment Agency.

[17] Data from the Pollution Inventory can be found here: https://www.gov.uk/government/collections/pollution-inventory-reporting.

This change is exclusive to the industry sector and leads to a small increase in HFC emissions estimates, namely HFC-23, HFC-32, and HFC-125.

Domestic combustion

Domestic wood combustion emissions estimates have been updated to use new DUKES data on changes in domestic wood use attributable to heating degree days (HDD) and stock impacts. Previously, changes in wood use attributable to HDD were estimated using adjusted and unadjusted domestic gas use data from DUKES. This has been replaced with a direct breakdown of impacts on domestic wood use.

This change is exclusive to the buildings and product uses sector and results in a small decrease in emissions in 2023.

Agriculture changes

There have been several method changes to emissions estimates for the agriculture sector. These include:

- An update to the model for estimating emissions from dairy cattle livestock to use the latest slaughter-weight data to derive cattle weight. This change increases enteric CH4 emissions and causes a small increase in N2O emissions from dairy cattle.
- An update to the model for estimating emissions from slurry management to use country-specific data for low emissions slurry spreading equipment (LESSE) uptake for cattle and pig slurry in England. Meanwhile, data for Great Britain is used to estimate LESSE uptake in Wales, Scotland, and Northern Ireland. This change has a negligible impact on emissions estimates.
- An update to the model for estimating emissions from grassland to include new assumptions to reflect improvements to grass yield and nitrogen uptake from plant breeding. This change results in a negligible increase in N2O emissions from grass residue decomposition and a decrease in N2O emissions from the leaching of applied fertiliser, manures, and excreta.
- The introduction of a method to estimate ammonia emissions from the decomposition of plant residues on the soil surface. Importantly, ammonia is an air pollutant rather than a greenhouse gas. However, it is an indirect source of N2O emissions. This change results in a small increase in N2O emissions from deposition of ammonia from grassland.
- An update to the model for estimating emissions from sheep to use assumptions on the grass energy content that are more reflective of survey evidence. This results in an increase in grass intake to meet energy requirements that increases enteric CH4 emissions. The crude protein content of the grass was also adjusted in line with

changed grassland assumptions, resulting in a steady reduction in the nitrogen content of grass over the time series. This change leads to a small increase in N2O emissions from sheep early in the time series, but a decrease in recent years.

LULUCF changes

There have been several method changes to UK emissions estimates for the LULUCF sector. These include:

- Updates to the forest carbon accounting model to better reflect the tree species and growth rates for afforestation from 2011, include deadwood from natural competition among young trees, improve the estimation of carbon transfer from branches on dead trees into the soil, and improve consistency with wood production estimates. In addition, new activity data for forest planting and wood production have been incorporated into the model. These changes lead to a reduction in net forestry and harvested wood products emissions across the time series.
- An update to the modelling of net emissions from peatland to incorporate evidence from Department for Environment, Food & Rural Affairs (Defra) funded field studies on the conditions of historic domestic peat extraction areas, Defra rewetting data for 2021 to 2024, and the Peatland ACTION programme for Scotland. These changes lead to a small reduction in net emissions across the time series.
- A small update to the modelling of net emissions from cropland and biomass carbon stock change to incorporate data from the 2024 Agricultural Census for England. This change leads to a small increase in net emissions across the time series

There have also been several method changes to LULUCF emissions estimates for the Crown Dependencies and Overseas Territories. These include:

- An update to the forest carbon accounting model to incorporate newly available forest planting for the Isle of Man. Data from the Isle of Man Government is used in place of modelled data from historic areas. This changes lead to a decrease in net removals from forest land in the Isle of Man.
- Incorporation of a new upland peatland map for the Isle of Man to estimate emissions from upland organic soils for the first time. This change leads to an increase in net emissions from grassland in the Isle of Man.
- An update to modelling across the LULUCF sector to replace emissions factors from the 2006 IPCC Guidelines with ones from the 2019 Refinement where appropriate. The new factors impact net emissions and removals estimates for all Crown Dependencies and Overseas Territories except the Falkland Islands. Most of the change occurs in forest carbon stock changes, with some minor changes to soil carbon stock change across other LULUCF subsectors.

Overall, the changes increase LULUCF sector emissions in Crown Dependencies and Overseas Territories across the time series (an increase of around 0.01 MtCO2e in 1990 and 0.05 MtCO2e in 2023)[18].

[18] Revisions to emissions estimates for Crown Dependencies and Overseas Territories are excluded from the estimated impacts on UK totals shown in Table 1 and Table 2.

This publication is available from: https://www.gov.uk/government/publications/planned-methodology-changes-for-uk-greenhouse-gas-emissions.

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