Department for
Business, Energy
& Industrial Strategy

2018 UK GREENHOUSE GAS EMISSIONS, PROVISIONAL FIGURES

Statistical Release: National Statistics

28 March 2019

Any enquiries regarding this publication should be sent to us at:
ClimateChange.Statistics@beis.gov.uk

The responsible statistician for this publication is Amanda Penistone.
Contact telephone: 0300 068 8090.

Contents

Executive Summary

This publication provides the latest estimates of 1990-2018 UK greenhouse gas emissions which are presented in carbon dioxide equivalent units throughout this statistical release.

Key findings

The provisional estimates suggest that in 2018, total UK greenhouse gas emissions were 43.5 per cent lower than in 1990 and 2.5 per cent lower than 2017.

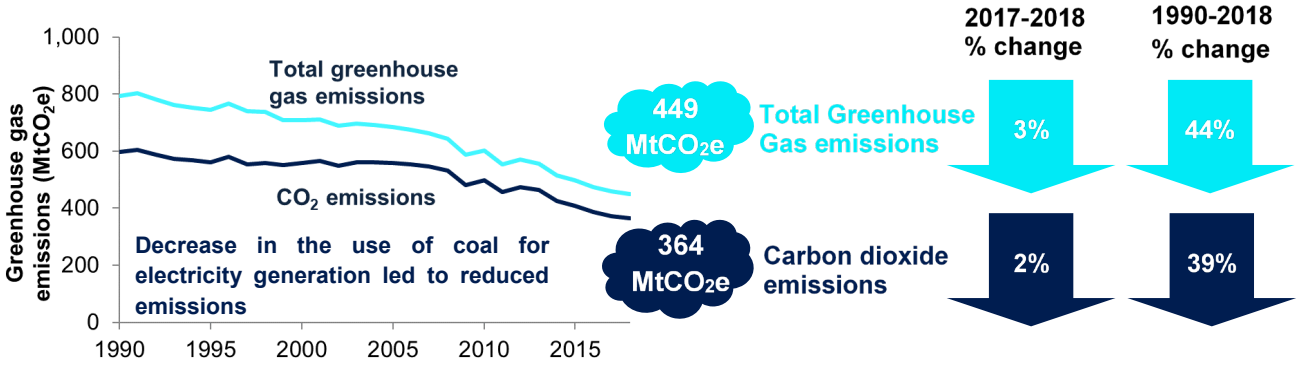
The provisional emissions figures rely on provisional estimates of carbon dioxide emissions based on UK energy statistics. In 2018, UK net emissions of carbon dioxide were provisionally estimated to be 364.1 million tonnes (Mt), 2.4 per cent lower than the 2017 figure of 373.2 Mt. Carbon dioxide (CO_2) is the main greenhouse gas, accounting for 81 per cent of total UK greenhouse gas emissions.

The decrease in carbon dioxide emissions was driven by the continuing downward trend in emissions from power stations, with a 9.9 per cent decrease between 2017 and 2018. This is mainly as a result of changes in the fuel mix used for electricity generation, away from coal and towards renewables.

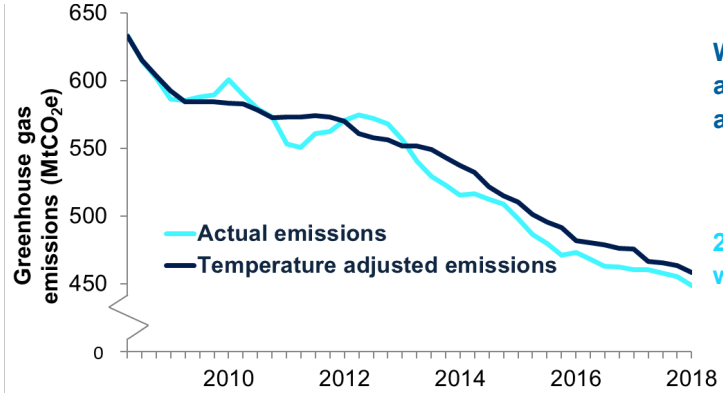
The sectoral breakdowns for provisional emissions are based on the source of the emissions. Emissions related to electricity generation are therefore attributed to power stations, the source of these emissions, rather than the households, public sector, businesses, etc. where the electricity is used.

Figure 1: Summary of key findings

2018 UK greenhouse gas emissions are provisionally estimated to be lower than in 2017



Adjusting emissions for external temperature does not change the long term trend



While actual emissions fell by 3% temperature adjusted emissions fell by 4% between 2017 and 2018

2018 annual average temperature warmer than long term average by 0.7°C

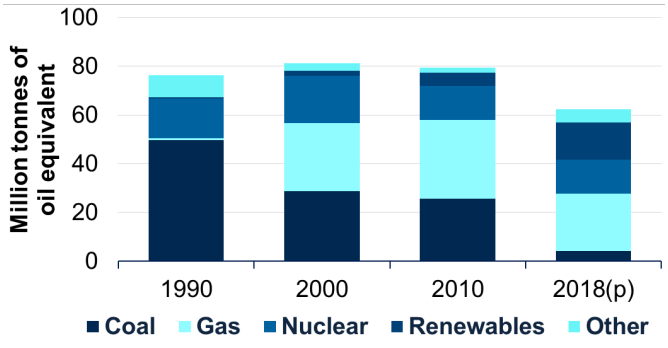
Temperature adjusted emissions estimates remove the estimated effect of external temperatures
Emissions are calculated for each quarter, with the preceding four quarters summed to create a rolling annual total

The energy supply sector experienced the largest reduction in CO_2 emissions from 2017-2018

	2017-2018 % change	1990-2018 % change
Energy supply (including power sector)	7%	59%
Business	0%	41%
Transport	3%	3%
Residential	3%	16%
Public	4%	39%

For the sectors not included here, provisional CO_2 estimates for 2018 cannot be made as they cannot be derived from the energy statistics. Final 2018 estimates for all sectors will be published in February 2020, which will include total emissions by sector.

The reduction in power sector emissions has been driven by a shift away from using coal for electricity generation towards gas and renewables



Introduction

This publication provides provisional annual and quarterly estimates of UK greenhouse gas emissions by source sector for 2018. It also provides an estimate of temperature adjusted emissions, which give an idea of overall trends in emissions without fluctuations due to changes in external temperature.

Data for 1990-2017 are consistent with the annual emissions presented in the National Statistics publication 2017 Final UK Greenhouse Gas Emissions statistics. Data for 2018 emissions are provisional and are calculated based on UK energy statistics.

The provisional estimates of carbon dioxide (CO_2) emissions are based on provisional inland energy consumption statistics, which are being published at the same time by BEIS in the quarterly Energy Trends publication. Estimates of non-CO_2 gases are based on a simple approach which assumes that emissions of non-CO_2 gases in 2018 will change from the 2017 total in line with the percentage difference between the estimates for the 2017 and 2018 of non-CO_2 emissions in the 2018 Energy and Emissions Projections published by BEIS, and that these emissions will be spread evenly over the year.

Quarterly emissions estimates are presented as a moving annual total up to a particular quarter. For example when quarterly emissions are presented as up to quarter 4, 2018, this represents an annual total comprising the latest quarter (quarter 4 2018) and the preceding 3 quarters (quarters 1, 2 and 3 of 2018). Presenting the data in this way has some advantages over presenting data for single quarters, since seasonal fluctuations are smoothed out and long term trends highlighted. Data on emissions in individual quarters are available in the data tables published alongside this publication.

There are uncertainties associated with all estimates of greenhouse gas emissions. Although for any given year considerable uncertainties may surround the emissions estimates for a pollutant, it is important to note that trends over time are likely to be much more reliable. It is also important to note that the provisional 2018 estimates are subject to a greater range of uncertainty than the final figures for earlier years. For more information on uncertainties see the annex published alongside the 2017 Final UK Greenhouse Gas Emissions statistics.

For the purposes of reporting, greenhouse gas emissions are allocated into sectors as follows:

- Energy supply
- Business
- Transport
- Public
- Residential
- Agriculture
- Industrial process
- Land use, land use change and forestry (LULUCF)
- Waste management

These high-level sectors are made up of a number of more detailed sectors, which follow the definitions set out by the Intergovernmental Panel on Climate Change (IPCC)[1] and which are used in international reporting tables which are submitted to the United Nations Framework Convention on Climate Change (UNFCCC)[2] every year. It is important to note that these figures are based on provisional energy data and are subject to change. The sectoral breakdown is given mainly for information, and is included in the publication for completeness, but sectoral estimates are more uncertain than the overall total.

The provisional estimates are not used for any formal reporting of how the UK is performing against its emissions reduction targets, as this requires final estimates based on the UK's greenhouse gas inventory. However, these statistics give policy makers and other users an initial steer as to the trend in emissions between 2017 and 2018, which helps them to form an initial assessment of the extent to which the UK is on track to meet targets. For information on UK emissions targets and progress towards them, see the 2017 Final UK Greenhouse Gas Emissions statistics.

More information about the underlying methodology for the provisional emissions statistics can be found in the accompanying methodology summary.

Note that all 2018 greenhouse gas emissions and energy statistics figures in this statistics release are provisional and subject to change. The annual provisional emissions estimates will be subject to revision when the final estimates are published in February 2020; however, they provide an early indication of emissions for the most recent full calendar year. We recommend that users look at this trend rather than any absolute figures.

[1] https://www.ipcc-nggip.iges.or.jp/

[2] https://unfccc.int/

2018 annual provisional emissions results

In 2018, an estimated 33 per cent of carbon dioxide (CO_2) emissions were from the transport sector, 27 per cent from energy supply, 18 per cent from business and 18 per cent from the residential sector.

Between 2017 and 2018, provisional estimates indicate that carbon dioxide emissions decreased by 2.4 per cent (9.1 million tonnes (Mt)).

Table 1: UK annual greenhouse gas emissions, 1990-2018, headline results

$MtCO_2e$

	1990	1995	2000	2005	2010	2015	2017	2018 (p)
Energy supply	242.1	210.3	204.0	219.1	197.3	137.6	106.0	98.3
from power stations	*203.0*	*163.0*	*158.7*	*173.1*	*157.3*	104.1	72.4	65.2
other Energy supply	*39.1*	*47.3*	*45.3*	*46.0*	*40.0*	33.4	33.5	33.1
Business	111.9	108.9	108.7	96.9	78.2	69.5	66.1	65.9
Transport	125.4	126.8	131.0	134.3	123.4	122.2	124.6	121.4
Public	13.4	13.2	12.1	11.1	9.4	7.9	7.8	8.1
Residential	78.3	79.6	85.6	82.5	84.5	64.5	64.1	65.9
Agriculture	6.5	6.5	5.5	6.1	5.4	5.5	5.6	5.6
Industrial process	19.4	17.7	16.9	16.3	10.6	12.1	10.2	10.0
Waste management	1.3	1.0	0.5	0.4	0.3	0.2	0.3	0.3
LULUCF	-2.0	-3.9	-6.0	-8.9	-10.7	-11.2	-11.3	-11.3
Total CO_2	**596.3**	**560.1**	**558.3**	**557.9**	**498.3**	**408.3**	**373.2**	**364.1**
Other greenhouse gases	198.0	185.4	149.2	125.8	102.5	89.6	87.0	84.4
Total greenhouse gases	**794.4**	**745.6**	**707.5**	**683.7**	**600.9**	**498.0**	**460.2**	**448.5**

Source: Table 1, Provisional UK greenhouse gas emissions national statistics 1990-2018 Excel data tables

Notes:

1. (p) 2018 estimates are provisional.
2. Provisional 2018 CO_2 emissions for the agriculture, waste and LULUCF sectors are assumed to be the same as 2017 estimates as unlike other CO_2 estimates these cannot be estimated from energy statistics.
3. The entire time series is revised each year to take account of methodological improvements in the UK emissions inventory.
4. Emissions are presented as carbon dioxide equivalent in line with international reporting and carbon trading. To convert carbon dioxide into carbon equivalents, divide figures by 44/12.
5. Figures shown do not include any adjustment for the effect of the EU Emissions Trading System (EU ETS), which was introduced in 2005.
6. Totals for CO_2 emissions, energy supply and total greenhouse gases may not sum due to rounding.
7. Estimates of non-CO_2 gases are based on a simple approach which assumes that emissions of non-CO_2 gases in 2018 will change from the 2017 total in line with the percentage difference between the estimates for the 2017 and 2018 of non-CO_2 emissions in the 2018 Energy and Emissions Projections published by BEIS.

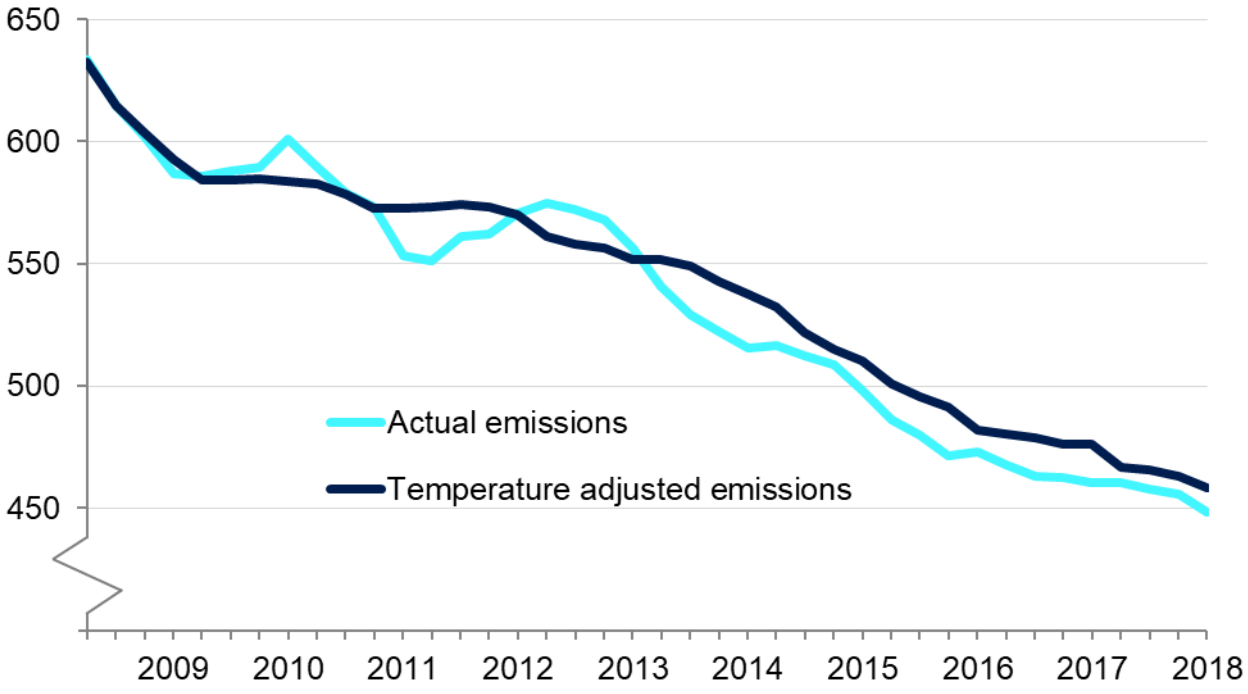
Carbon dioxide emissions in the energy supply sector decreased by 7.2 per cent (7.7 Mt), between 2017 and 2018 driven by a change in the fuel mix for electricity generation. There was also a fall of 2.6 per cent (3.2 Mt) in transport carbon dioxide emissions. Changes in transport emissions are usually as a result of traffic volumes or improvements in fuel efficiency.

These falls in emissions between 2017 and 2018 were partially offset by a 2.8 per cent (1.8 Mt) increase in residential carbon dioxide emissions owing to an increase in the amount of natural gas used for heating. This is likely to be due to a difference in weather conditions between the two years. Adjusting for temperatures suggests there would have been a 1.5 per cent decrease in residential carbon dioxide emissions without the effect of temperature changes.

Since 1990, UK carbon dioxide emissions have decreased by 39 per cent. This decrease has resulted mainly from changes in the mix of fuels being used for electricity generation, with a shift away from coal and growth in the use of renewable energy sources. This was combined with lower electricity demand, owing to greater efficiency resulting from improvements in technology and a decline in the relative importance of energy intensive industries.

Overall inland energy consumption is provisionally estimated to have decreased by 11 per cent since 1990, and if this figure is adjusted to allow for the effect of temperature, there was a 13 per cent decrease over this period.

Figure 2: Actual and temperature adjusted greenhouse gas emissions, UK, Year ending Q1 2009 - Year ending Q4 2018 ($MtCO_2e$)



Source: Tables 3 & 4, Provisional UK greenhouse gas emissions national statistics 1990-2018 Excel data tables

Note: 1. Figures are annual totals including the preceding 4 quarters.

2. From year ending Q1 2018 onwards, figures include provisional data.

As shown in Figure 2 above, temperature adjusting greenhouse gas emissions show a similar overall trend to non-temperature adjusted emissions. On a temperature adjusted basis, greenhouse gas emissions decreased by 23 per cent between 2009 and 2018, similar to the fall in actual emissions over this period (24 per cent).

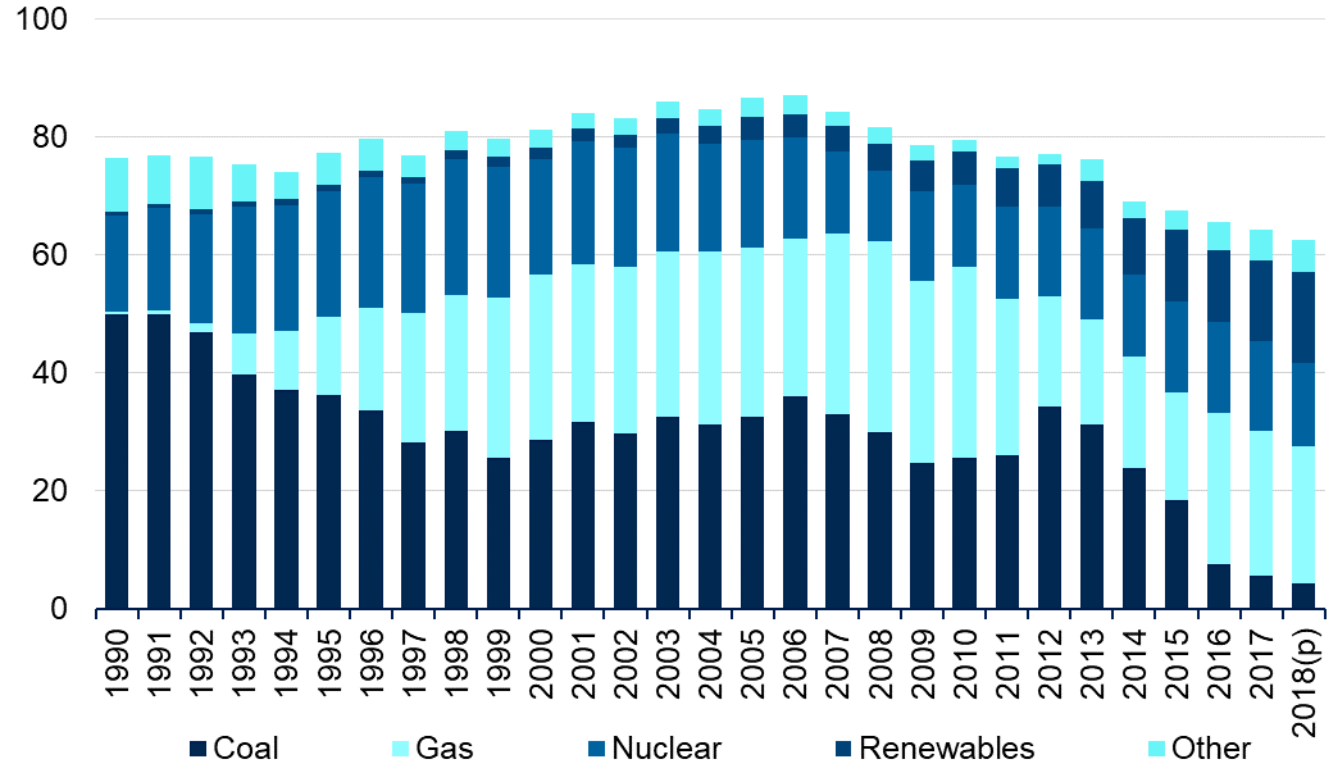
Energy Supply

The energy supply sector was the largest contributor to the decrease in carbon dioxide emissions between 2017 and 2018. Carbon dioxide emissions from this sector were provisionally estimated to be 98.3 Mt in 2018, a decrease of 7.2 per cent (7.7 Mt) compared to 2017.

This fall was mainly as a result of a 9.9 per cent (7.2 Mt) fall in carbon dioxide emissions from power stations. In 2018, carbon dioxide emissions from power stations, at 65.2 Mt, accounted for 18 per cent of all carbon dioxide emissions. Overall emissions from power stations were 68 per cent lower in 2018 than in 1990. This is despite consumption of electricity being provisionally estimated to be around 8 per cent higher in 2018 than in 1990 (although it peaked in 2005 and has decreased since then).

This decrease has mainly resulted from changes in the mix of fuels being used for electricity generation with a switch from coal to natural gas and growth in the use of renewable energy sources, combined with greater efficiency resulting from improvements in technology and a decline in the relative importance of energy intensive industries. In 2018 coal made up only 7 per cent of fuel used for electricity generation, down from 65 per cent in 1990. Nuclear and renewables, which are low carbon energy sources, accounted for 47 per cent of fuel used for electricity generation in 2018, up from 22 per cent in 1990.

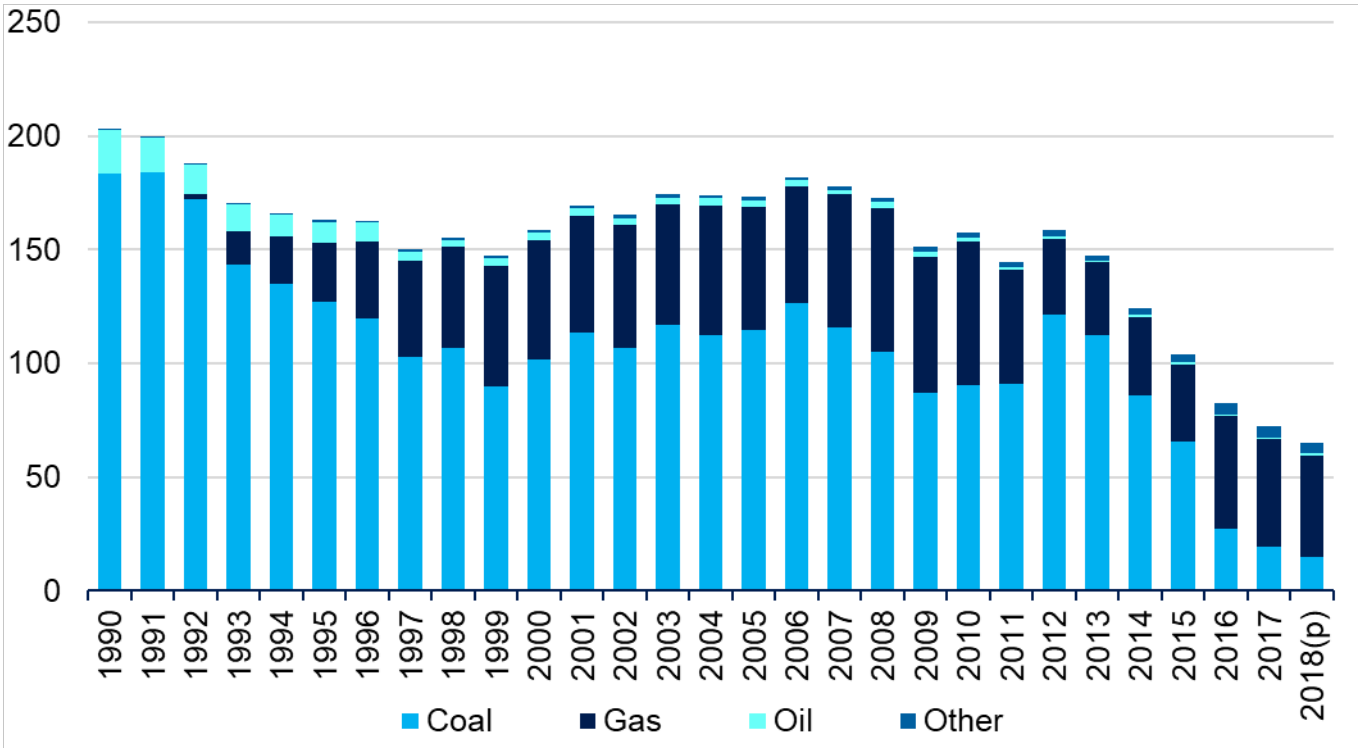
Figure 3: Fuel mix for UK electricity generation, 1990-2018 (Million tonnes of oil equivalent)



Source: Table 5.1.1, Digest of UK Energy Statistics (DUKES) 1970-2017 and Table 5.1 Energy Trends: March 2019 Excel data tables

Note: (p) 2018 estimates are provisional.

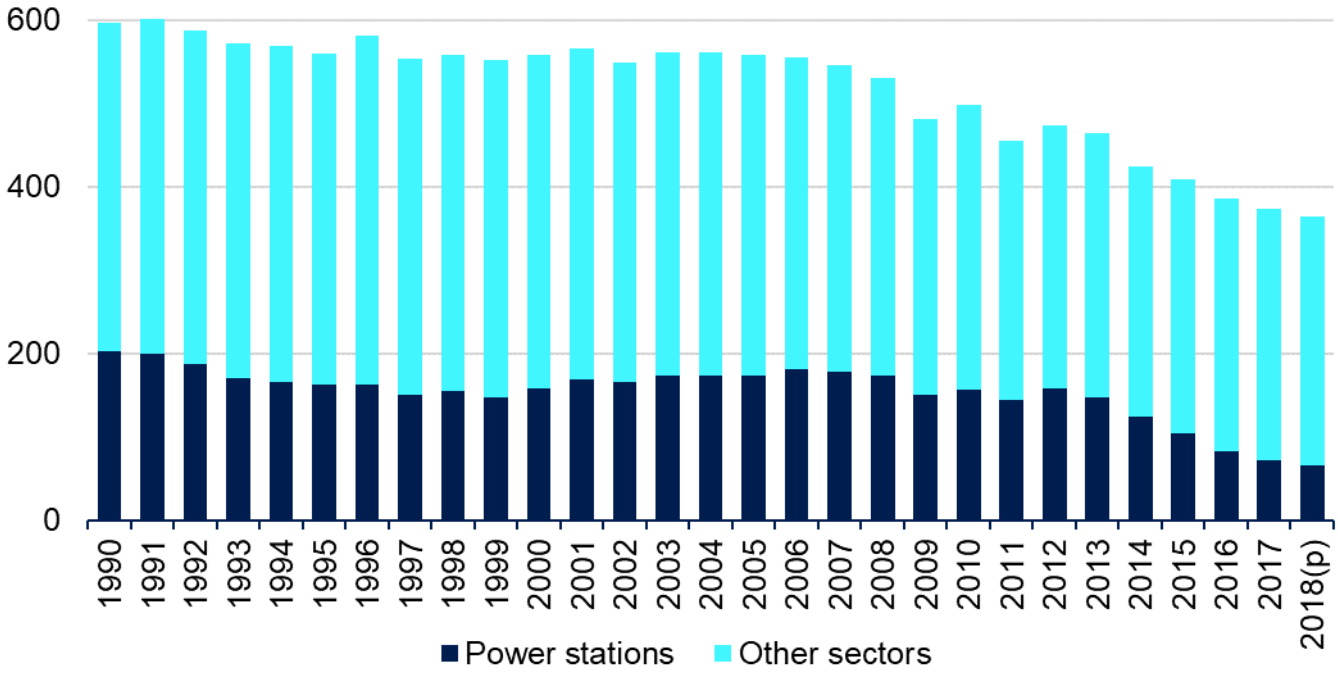
Figure 4: Carbon dioxide emissions from electricity generation, UK, 1990-2018 ($MtCO_2$)



Source: Tables 1 & 2, Provisional UK greenhouse gas emissions national statistics 1990-2018 Excel data tables

Note: (p) 2018 estimates are provisional.

Figure 5: Carbon dioxide emissions from power stations compared to carbon dioxide emissions from other sectors, UK, 1990-2018 ($MtCO_2$)



Source: Table 1, Provisional UK greenhouse gas emissions national statistics 1990-2018 Excel data tables
Note: (p) 2018 estimates are provisional.

Residential and Public sectors

The main source of emissions in these sectors is the use of natural gas for heating (and for cooking in the case of the residential sector). It should be noted that emissions from these sectors do not include the emissions from the generation of the electricity consumed, as these emissions are included in the energy supply sector.

In 2018, the residential sector emitted 65.9 $MtCO_2$, accounting for 18 per cent of all carbon dioxide emissions. Emissions from the public sector were 8.1 $MtCO_2$ accounting for 2 per cent of all carbon dioxide emissions. Between 1990 and 2018 carbon dioxide emissions from the residential sector have fallen by 16 per cent.

Between 2017 and 2018:

- There was a 2.8 per cent (1.8 Mt) increase in residential emissions.
- There was 4.5 per cent (0.3 Mt) increase in emissions from the public sector

These increases can largely be explained by colder weather in Q1 2018 than the previous year. On a temperature adjusted basis between 2017 and 2018:

- There was a 1.5 per cent (1.1 Mt) decrease in residential emissions.
- There was a 1.6 per cent (0.1 Mt) increase in emissions from the public sector

Transport sector

In 2018, carbon dioxide emissions from the transport sector were 121.4 Mt, 2.6 per cent (3.2 Mt) lower than in 2017, and 3.2 per cent lower than in 1990. In 2018 transport accounted for a third (33 per cent) of all carbon dioxide emissions. The large majority of emissions from transport are from road transport.

Driven by continual growth in vehicle kilometres travelled on roads[3], transport carbon dioxide grew to a peak in 2007, 8.5 per cent higher than in 1990. Since then emissions from this sector have fallen back to around 1990 levels, driven mainly by improvements in new car fuel efficiency[4], as well lower traffic growth than in previous years as a result of a dip following the 2008/2009 recession.

It should be noted that these estimates do not include emissions from international aviation and shipping. Domestic aviation and shipping, however, are included.

Business sector

Carbon dioxide emissions from the business sector were estimated to be 65.9 Mt in 2018 and accounted for around 18 per cent of all carbon dioxide emissions. This was similar to the emissions seen in 2017. There has been a 41 per cent decrease in business sector emissions since 1990. Most of this decrease came between 2001 and 2009, with a significant drop in 2009 likely to have been driven by economic factors.

Other sectors

For the *agriculture*, *waste management*, and *land use, land use change and forestry* (LULUCF) provisional CO_2 emissions cannot be derived based on energy statistics, so the carbon dioxide emissions from these sectors are assumed to be the same as they were in 2017[5]. This is also the case for most of the emissions from the *industrial processes* sector.

[3] Transport Statistics Great Britain, Roads and traffic (TSGB07), Table TSGB0702 (TRA0201) Road traffic (vehicle kilometres) by vehicle type in Great Britain, annual from 1949
https://www.gov.uk/government/statistical-data-sets/tsgb07

[4] Transport Statistics Great Britain, Energy and environment (TSGB03), Table TSGB0303 (ENV0103) Average new car fuel consumption: Great Britain from 1997
https://www.gov.uk/government/statistical-data-sets/tsgb03

[5] Final UK greenhouse gas emissions national statistics
https://www.gov.uk/government/collections/final-uk-greenhouse-gas-emissions-national-statistics

Carbon dioxide emissions by fuel type

The combustion of fuels releases both energy and carbon dioxide. The amount of carbon dioxide released by the production of one unit of power depends on the type of fuel that is burned. For example, since coal has a higher carbon content than gas, more carbon dioxide emissions result from burning one tonne of coal to generate a unit of power than from one tonne of gas.

Emissions per unit of electricity supplied from fossil fuels are estimated to have been around 430 tonnes of carbon dioxide per gigawatt hour (GWh) overall in 2018. Within this, emissions from electricity generated from coal (870 tonnes of carbon dioxide per GWh electricity supplied) were almost twice as high as for electricity supplied by gas (340 tonnes of carbon dioxide per GWh). For all sources of electricity (including nuclear, renewables and autogeneration), the average amount of carbon dioxide emitted in 2018 amounted to 180 tonnes per GWh of electricity supplied.

In 2018, total carbon dioxide emissions from the use of fossil fuels, including fuel used for generating electricity, were estimated at 350.5 Mt. This was 2.5 per cent lower than the 2017 figure of 359.4 Mt. The biggest change in emissions was from the use of coal, down 5.1 Mt (20.4 per cent) from 25.2 Mt in 2017 to 20.1 Mt in 2018. This largely resulted from the increasing use of renewables for electricity generation.

Over the period 1990 to 2018, carbon dioxide emissions from fossil fuels decreased by 38 per cent. Over the same period, overall primary consumption of fossil fuels dropped by 22 per cent. This relatively high decrease in emissions can be attributed to an increase in the use of gas accompanied by a decrease in the use of coal.

Carbon dioxide emissions from gas as a proportion of all carbon dioxide emissions from fossil fuels has increased from 26 per cent in 1990 to 52 per cent in 2018, whilst emissions from coal as a proportion of all fossil fuel carbon dioxide emissions has decreased from 39 per cent to 6 per cent over the same period. The proportion of carbon dioxide emissions from oil as a proportion of all carbon dioxide emissions from fossil fuels has increased from 35 per cent in 1990 to 42 per cent in 2018.

Table 2: UK carbon dioxide emissions by fuel type, 1990-2018

$MtCO_2e$

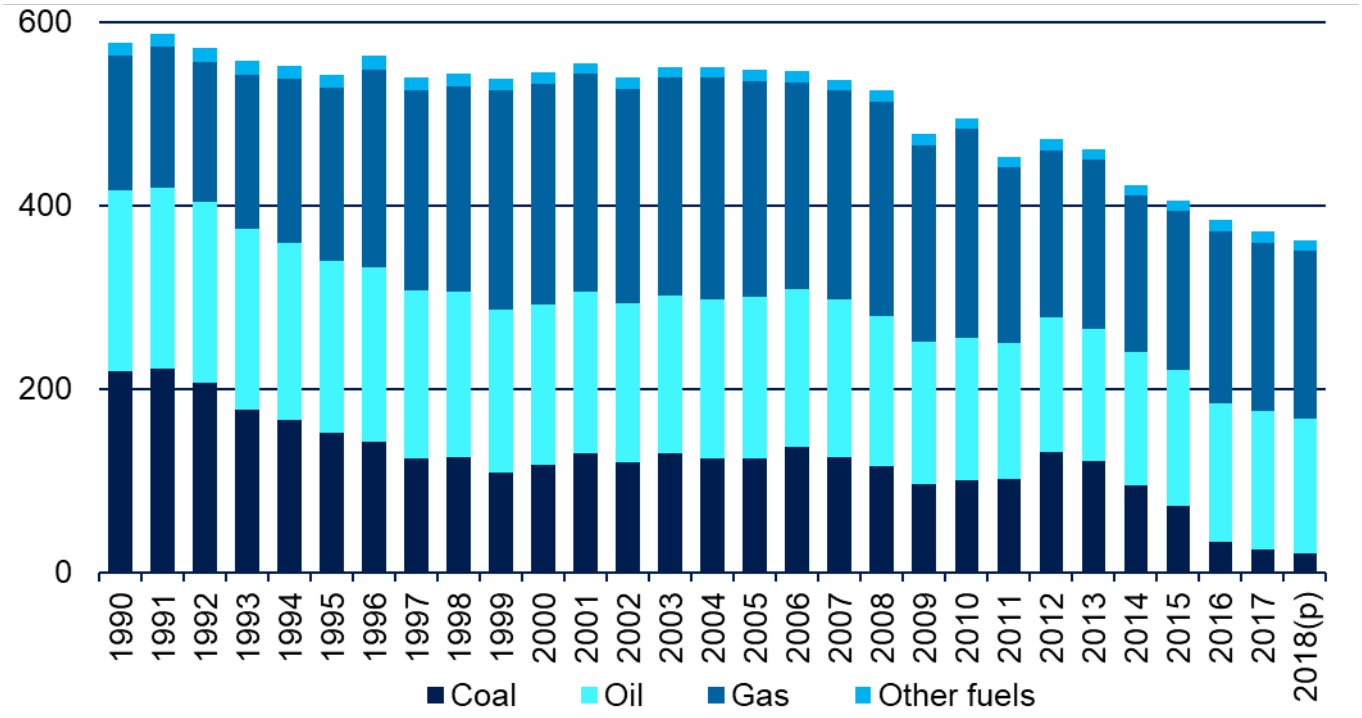
	1990	1995	2000	2005	2010	2015	2017	2018 (p)
Gas	146.1	188.5	241.5	235.3	228.2	173.1	183.4	183.1
Oil	197.9	187.2	174.6	175.7	155.1	148.5	150.8	147.3
Coal	219.2	152.2	117.0	124.9	100.9	72.6	25.2	20.1
Other fuels	14.9	14.4	12.8	11.7	11.2	11.5	12.1	11.9
Non-fuel	18.3	17.8	12.5	10.2	2.9	2.6	1.7	1.7
Total	**596.3**	**560.1**	**558.3**	**557.9**	**498.3**	**408.3**	**373.2**	**364.1**

Source: Table 2, Provisional UK greenhouse gas emissions national statistics 1990-2018 Excel data tables

Note: (p) 2018 estimates are provisional.

A negative number indicates that this sector was a net sink, with the total removals of carbon dioxide by the land use, land use change and forestry sector larger than the emissions from other non-fuel activities.

Figure 6: UK Carbon dioxide emissions by fuel type, 1990-2018 ($MtCO_2$)



Source: Table 2, Provisional UK greenhouse gas emissions national statistics 1990-2018 Excel data tables

Note: (p) 2018 estimates are provisional.

2018 temperature adjusted provisional emissions results by sector

A temperature adjustment has been applied to the quarterly CO_2 emissions, in order to estimate what the overall trend of emissions would have been without the impact of external temperatures. Table 3 compares temperature adjusted and unadjusted CO_2 emissions by sector in 2018.

Table 3: Percentage changes in carbon dioxide emissions by sector between 2017 and 2018 based on the temperature adjusted emissions and actual emissions

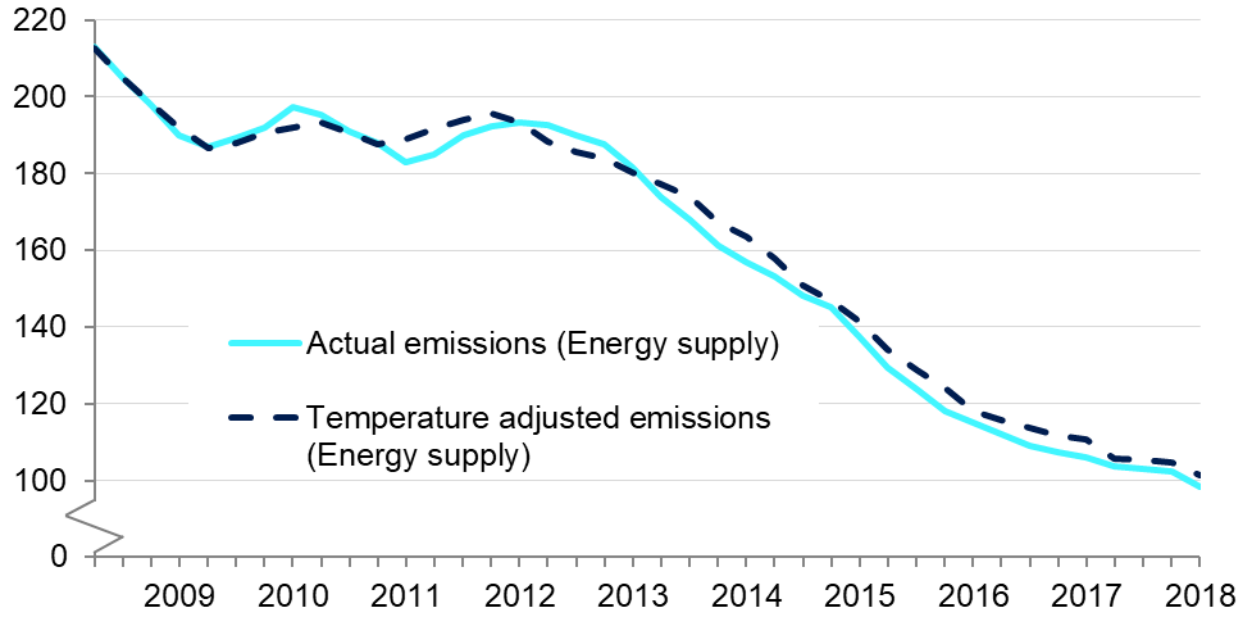
	Temperature adjusted emissions			Actual emissions		
	2017 ($MtCO_2$)	2018 ($MtCO_2$)	**Percentage change**	2017 ($MtCO_2$)	2018 ($MtCO_2$)	**Percentage change**
Energy supply	110.7	101.3	**-8.5%**	106.0	98.3	**-7.2%**
Business	68.5	67.4	**-1.6%**	66.1	65.9	**-0.3%**
Transport	124.6	121.4	**-2.6%**	124.6	121.4	**-2.6%**
Public	8.4	8.5	**1.6%**	7.8	8.1	**4.5%**
Residential	72.0	70.9	**-1.5%**	64.1	65.9	**2.8%**
Other	4.7	4.5	**-3.1%**	4.7	4.5	**-3.1%**
Total CO_2	**388.9**	**374.1**	**-3.8%**	**373.2**	**364.1**	**-2.4%**

Source: Tables 3 & 4, Provisional UK greenhouse gas emissions national statistics 1990-2018 Excel data tables

The sectors most affected by external temperatures are the residential sector and energy supply. When temperatures are lower there is greater use of natural gas and electricity for heating households. Residential emissions fluctuate from year to year owing to year on year variation in weather conditions. As shown in Figure 8, after we adjust the residential emissions figures to remove the effect of year on year variation in temperatures, we see a more consistent downward trend. Between 2009 and 2018 residential emissions fell by 12 per cent, but only fell by 9 per cent on a temperature adjusted basis.

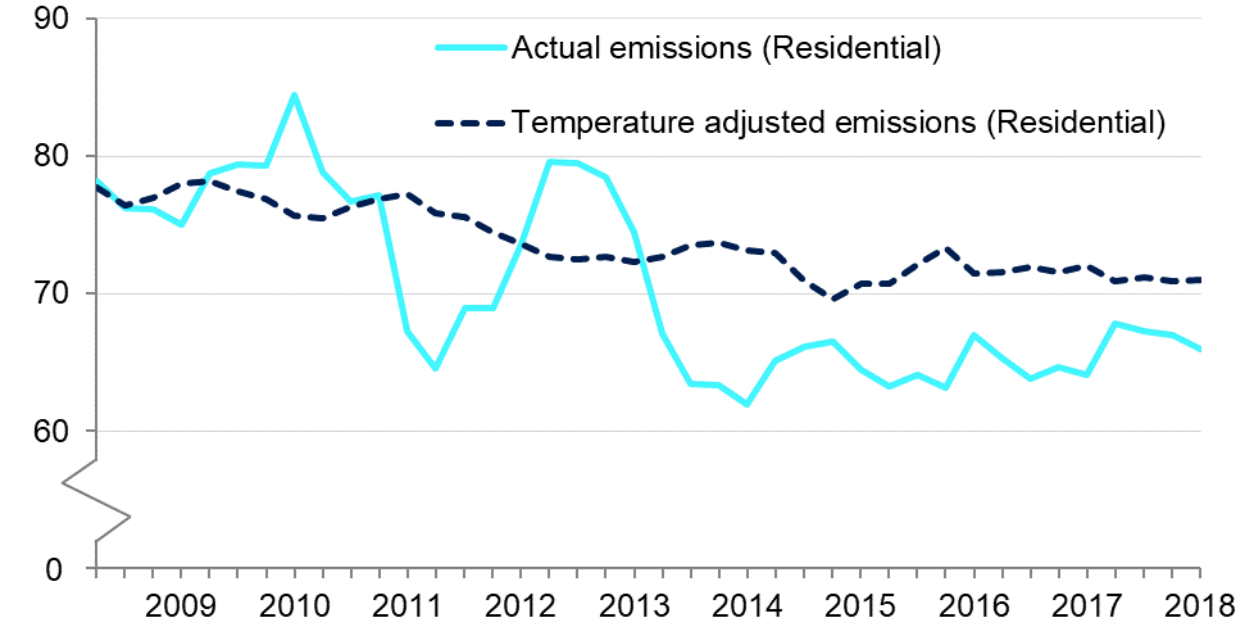
The overall trend in temperature adjusted energy supply emissions is similar to the unadjusted trend, as the majority of electricity generated is used for other purposes rather than heating.

Figure 7: Actual and temperature adjusted energy supply carbon dioxide emissions, UK, Year ending Q1 2009 - Year ending Q4 2018 ($MtCO_2$)



Source: Tables 3 & 4, Provisional UK greenhouse gas emissions national statistics 1990-2018 Excel data tables

Figure 8: Actual and temperature adjusted residential carbon dioxide emissions, UK, Year ending Q1 2009 - Year ending Q4 2018 ($MtCO_2$)



Source: Tables 3 & 4, Provisional UK greenhouse gas emissions national statistics 1990-2018 Excel data tables

Additional Information

Coverage of emissions reporting

The basket of greenhouse gases covered by these statistics is based on that covered by the Kyoto Protocol, and consists of seven gases: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFC), perfluorocarbons (PFC), sulphur hexafluoride (SF_6) and nitrogen trifluoride (NF_3). The last four gases are collectively referred to as fluorinated gases or F gases. In accordance with international reporting and carbon trading protocols, each of these gases is weighted by its global warming potential (GWP)[7], so that total greenhouse gas emissions can be reported on a consistent basis. The GWP for each gas is defined as its warming influence relative to that of carbon dioxide. Greenhouse gas emissions are then presented in *carbon dioxide equivalent* units.

Carbon dioxide is reported in terms of *net* emissions, which means total emissions from burning fuel minus total removals of carbon dioxide from the atmosphere by *carbon sinks*. Carbon sinks are incorporated within the land use, land use change and forestry (LULUCF) sector, which covers afforestation, reforestation, deforestation and forest management. They are defined by the United Nations Framework Convention on Climate Change (UNFCCC) as "any process, activity or mechanism which removes a greenhouse gas, an aerosol or a precursor of a greenhouse gas from the atmosphere".

Unless otherwise stated, any figures included in this release represent emissions from within the UK and exclude its Crown Dependencies (Jersey, Guernsey, and the Isle of Man) and overseas territories. Figures are expressed in millions of tonnes of carbon dioxide equivalent ($MtCO_2e$).

Basis of the provisional emissions estimates

The estimates of carbon dioxide emissions have been produced based on provisional inland energy consumption statistics which are published in BEIS's quarterly Energy Trends publication.

Carbon dioxide accounts for the majority of UK greenhouse gas emissions (81 per cent in 2017). However, in order to give an indication of what the latest provisional carbon dioxide emissions estimates imply for the total, we need to also produce an estimate of emissions of the remaining non-CO_2 gases. Estimates of non-CO_2 gases are based on a simple approach which assumes that emissions of non-CO_2 gases in 2018 will change from the 2017 total in line with the percentage difference between the estimates for the 2017 and 2018 non-CO_2 emissions in the 2018 Energy and Emissions Projections published by BEIS.

[7] Transport Global warming potentials (GWP) of greenhouse gases used in UK emissions statistics: https://www.gov.uk/government/publications/uk-greenhouse-gas-emissions-explanatory-notes

Methodology change for non-CO_2 provisional emissions estimates

In the provisional statistics, estimates of carbon dioxide (CO_2) emissions are produced based on provisional inland energy consumption statistics published in BEIS's quarterly Energy Trends publications, while the smaller non-CO_2 emissions (19 per cent of the total in 2017) have previously been estimated based on an assumption that they will be the same as in the most recent year in the final statistics. However, in the 2018 estimates this approach to estimating non-CO_2 emissions has been changed.

The 2018 non-CO_2 emissions have been estimated by adjusting the 2017 non-CO_2 emissions total in the 1990-2017 greenhouse gas inventory in proportion to the percentage difference between the estimates for the 2017 and 2018 non-CO_2 emissions in the most recent Energy and Emissions Projections published by BEIS.

Using the projections means that the provisional statistics will take into account anticipated changes in emissions. In recent years, non-CO_2 emissions have steadily fallen year on year in the greenhouse gas inventory, meaning that the provisional statistics have overestimated non-CO_2 emissions each year, whereas they were projected to continue to fall. Based on the 1990-2016 inventory, using this new approach would have led to the provisional non-CO_2 emissions total having a difference of 2.0 per cent on average from the final figure over the most recent five years compared to a 3.0 per cent average difference under the previous approach.

Quarterly totals

In order to remove the seasonality in the data so that a trend in emissions over time can be observed, quarterly emissions are reported as annual totals, covering the stated quarter plus the preceding three quarters. When data becomes available for each new quarter, the estimates for the latest quarter are added to the total, while at the same time the estimates for the same quarter from the previous year are removed from the series. This procedure serves to smooth out short-term fluctuations and highlights long term trends, and can be used to show the underlying trend each quarter. Emissions estimates for each individual quarter are reported in the data tables accompanying this publication.

Temperature adjustment

Carbon dioxide emissions are indirectly influenced by external temperatures. During the winter months, emissions are generally higher than in summer months, due to higher demand for fuel for space heating. During a particularly cold winter for example, it is likely that more fuel will be burnt for domestic or commercial use than during an average winter, and therefore emissions will be higher due to the additional fuel consumption.

Temperature adjusted quarterly emissions estimates therefore remove the effect of external temperatures. In a particularly cold winter quarter, for example, this will result in temperature adjusted emissions being lower than actual emissions, reflecting the lower fuel consumption

which would have occurred if temperatures had been at average levels (based on the 30 year period 1981-2010). Temperature adjustment is determined by the average number of heating degree days in each quarter. This information can be found in Energy Trends.

Further details of how quarterly emissions have been estimated and of the methodology underlying the temperature adjusted estimates can be found alongside this statistical release in a separate methodology summary.

Revisions to the quarterly provisional emissions estimates

It should be noted that the quarterly emissions time series may be revised annually to reflect any revisions made to either the underlying energy data or to the UK greenhouse gas inventory. Emissions from 2009-2017 are consistent with final UK greenhouse gas emissions statistics from 1990-2017. Emissions estimates for 2018 are provisional and are based on UK energy statistics. More information on the timing of revisions to the underlying data can be found in the methodology summary.

Future updates to emissions estimates

On Thursday 27th June BEIS will publish estimates of carbon dioxide emissions by local authority for 2017.

Final estimates of UK greenhouse gas emissions for 2018 will be published as National Statistics on 4th February 2020. These estimates will be based on the UK's Greenhouse Gas Inventory for 2018.

On Thursday 27th March 2020 the 1990-2018 UK emissions estimates will be updated to include estimates by end user and by fuel type, and provisional 2019 emissions estimates will be published.

Further information

Further information on UK greenhouse gas emissions statistics, including Excel tables with additional data on UK emissions, can be found on the Gov.uk website at:

https://www.gov.uk/government/collections/uk-greenhouse-gas-emissions-statistics

The latest UK energy statistics, including revisions to earlier years' data, can be found in the Energy Trends quarterly bulletin produced by BEIS. Any enquiries about the Energy Trends report should be sent to energyefficiency.stats@beis.gov.uk.

National Statistics designation

National Statistics status means that our statistics meet the highest standards of trustworthiness, quality and public value, and it is our responsibility to maintain compliance with these standards.

The continued designation of these statistics as National Statistics was confirmed in September 2018 following a compliance check by the Office for Statistics Regulation. The statistics last underwent a full assessment against the Code of Practice for Statistics in 2014.

Since the latest review by the Office for Statistics Regulation, we have continued to comply with the Code of Practice for Statistics, and have made the following improvements:

- Improved the accuracy of the historic emissions estimates by continuing to make methodological changes to the UK's Greenhouse Gas Inventory.
- Improved the accuracy of the provisional estimates by reviewing and changing the methodology for making provisional estimates of non-CO_2 emissions.

Background notes

1. A full set of data tables can be accessed via the provisional UK greenhouse gas emissions national statistics pages of the Gov.uk website.
2. The background quality report provides a summary of quality issues relating to statistics on UK greenhouse gas (GHG) emissions.
3. The latest UK energy statistics, including revisions to earlier years' data, can be found in the Digest of UK Energy Statistics.
4. Detailed UK temperature data can be found on both the Met Office website and the weather statistics section of the Gov.uk website.
5. When emissions are measured on this basis, UK emissions account for less than 2 per cent of the global total, based on a range of estimates produced by the UN, the IEA, the World Resources Institute and the EIA, amongst others.
6. Some ministers and officials receive pre-release access to these statistics up to 24 hours before release. Details of the arrangements for doing this and a list of the ministers and officials that receive pre-release access to these statistics can be found in the BEIS statement of compliance with the Pre-Release Access to Official Statistics Order 2008.

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

If you need a version of this document in a more accessible format, please email enquiries@beis.gov.uk. Please tell us what format you need. It will help us if you say what assistive technology you use.