



Department for
Business, Energy
& Industrial Strategy

FINAL STATEMENT FOR THE SECOND CARBON BUDGET

Presented to Parliament pursuant to section 18 of the Climate Change Act
2008

May 2019



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Executive Summary

This is the final statement for the second carbon budgetary period covering 2013 to 2017 as required under section 18 of the Climate Change Act 2008¹. This statement sets out the steps taken to calculate the “net UK carbon account”² for the second carbon budget period. The net UK carbon account is what we compare against the second carbon budget (2,782,000,000 tCO₂e) to determine whether it has been met. The net UK carbon account must not exceed the level of the carbon budget at the end of each budgetary period.

This statement shows that, over the second budgetary period, the net UK carbon account was 2,398,125,993 tCO₂e, which is 383,874,007 tCO₂e (14%) below the cap of 2,782,000,000 tCO₂e. On average this means emissions as measured by the net carbon account were 40% lower than 1990 base year emissions over the second carbon budget period.

¹ <http://www.legislation.gov.uk/ukpga/2008/27/section/18>

² The net UK carbon account is calculated by first calculating net UK emissions (i.e. aggregate gross emissions from sources in the UK, adjusted to take into account removals of emissions from the atmosphere by UK carbon sinks). These are adjusted to account for any carbon units which have been brought in from overseas by Government and others, to offset UK emissions, and UK carbon units which have been disposed of to a third party outside the UK. The detailed rules for these calculations are contained in the Carbon Accounting (2013-2017 Budgetary Period) Regulations 2015.

Introduction

The Climate Change Act 2008 introduced a legally binding target to reduce greenhouse gas emissions by at least 80% below the 1990 baseline by 2050, with an interim target to reduce emissions by at least 34% by 2020. The Act also introduced “carbon budgets”, which set the trajectory to ensure the targets in the Act are 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.

The UK has set five carbon budgets in total to date, covering years 2008 to 2032. The UK met its first carbon budget, running from 2008 to 2012, with a surplus of 36,452,037 tCO_{2e}. The second carbon budget period ran from 2013 to 2017 with an emissions cap of 2,782,000,000 tCO_{2e}. The third budget will cover the period 2018–2022 (2,544,000,000 tCO_{2e}), the fourth budget 2023–2027 (1,950,000,000 tCO_{2e}) and the fifth budget 2028–2032 (1,725,000,000 tCO_{2e}).

In order 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. This must provide information on whether the UK has met each carbon budget in a clear and transparent way. The statements must include information on both emissions of greenhouse gases in the UK and removals of greenhouse gas emissions from the atmosphere (e.g. from forestry activities), as well as the use of carbon units – which can be brought into the UK from overseas to offset UK emissions, or sold to a third party outside the UK. This ensures that an amount for “the net UK carbon account” can be calculated for each budgetary period, in accordance with the requirements in the Act.

Calculating the net UK carbon account

Section 27 of the Climate Change Act³ defines the “net UK carbon account”. This is what we compare against carbon budgets to determine whether we are meeting them. The net UK carbon account must not exceed the level of the carbon budget at the end of each budgetary period. The process for determining the net UK carbon account in each year is summarised in Figure 1.

The starting point is UK emissions for the year, using data from the annual statistical release of UK greenhouse gas emissions, published as National Statistics each February⁴. These are then adjusted to take into account removals of carbon dioxide from the atmosphere by sinks associated with land use, land use change and forestry (LULUCF) activity. The new total is referred to as net UK emissions.

Net UK emissions are then further adjusted to account for:

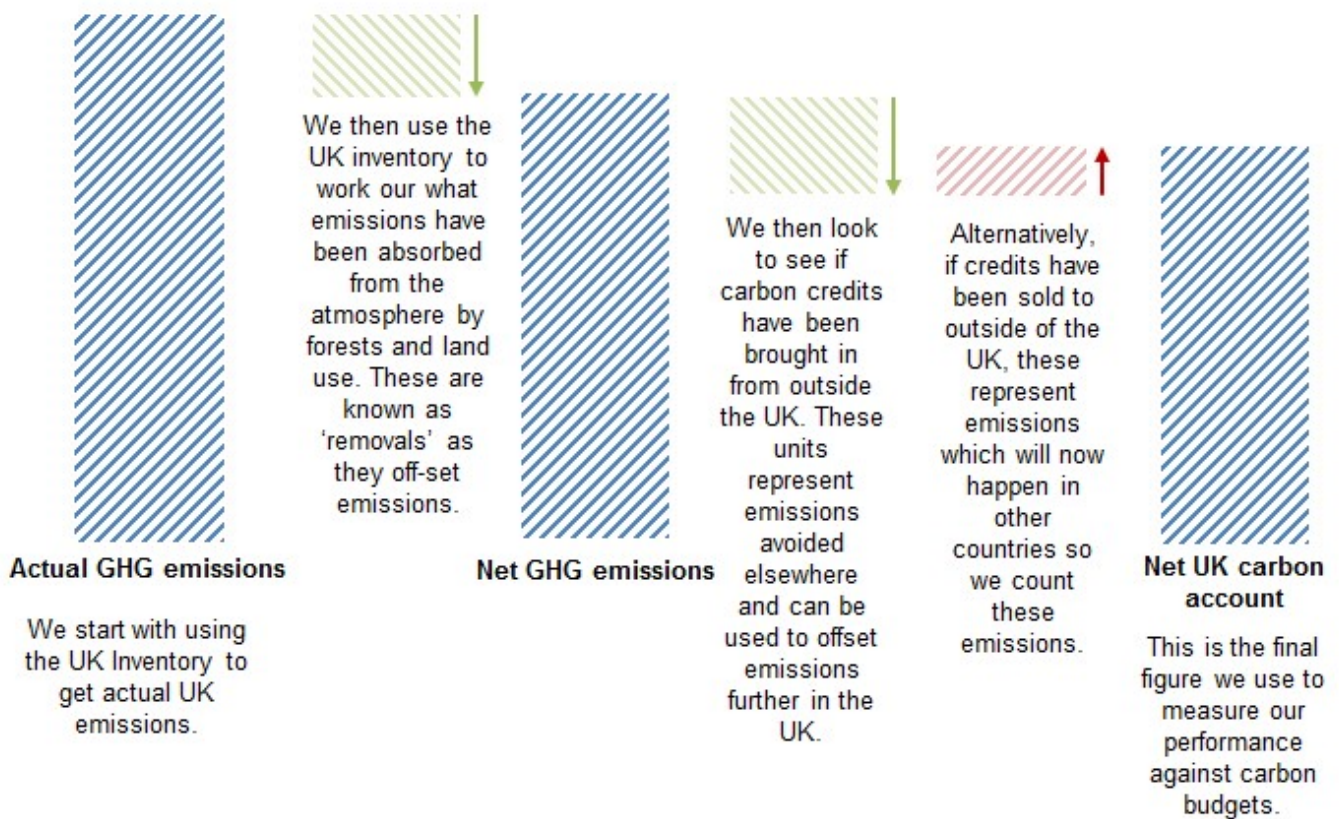
³ <http://www.legislation.gov.uk/ukpga/2008/27/section/27>

⁴ The final 2017 estimates of UK greenhouse gas emissions were published on 5 February 2019. See: <https://www.gov.uk/government/statistics/final-uk-greenhouse-gas-emissions-national-statistics-1990-2017>

- carbon units which have been brought in from overseas by Government and others (e.g. installations covered by the EU Emissions Trading System (EU ETS)) to offset UK emissions (“credits”), thereby reducing the net UK carbon account; and
- UK carbon units which have been sold to a third party outside the UK or otherwise disposed of (“debits”). These increase the net UK carbon account as the recipient can use these units to offset their own emissions and it would lead to double counting if they were also used to offset UK emissions.

The Government publishes an Annual Statement of Emissions each year. It should be noted that the emissions estimates for years 2013 to 2016 reported in this statement differ from emissions reporting in respective annual statements of emissions. This is because of changes in the historical time series of emissions data back to 1990 in the most recent greenhouse gas emissions statistics⁵ (published in February 2019). Annex A provides a summary of the adjusted net carbon accounting for each year within the budgetary period.

Figure 1: The net UK carbon account



⁵ The final 2017 estimates of UK greenhouse gas emissions were published on 5 February 2019. See: <https://www.gov.uk/government/statistics/final-uk-greenhouse-gas-emissions-national-statistics-1990-2017>

Structure of the report

This report contains two sections:

- Part 1 provides UK greenhouse gas emissions statistics for the second budgetary period, covering emissions, removals and net emissions of each of the six greenhouse gases covered by carbon budgets, individually and collectively.
- Part 2 sets out the amount of units which were credited to and debited from the net UK carbon account during the second budgetary period. The calculations in this part of the report are based on the methodologies established by the Carbon Accounting Regulations 2009 and 2015⁶.

⁶ SI 2015 No. 775: <http://www.legislation.gov.uk/ukSI/2015/775/introduction/made>

Part 1 – UK Greenhouse Gas Emissions

The information contained in this part of the statement is derived from the final UK greenhouse gas emissions statistics for 2017, which were published on 5 February 2019. Emissions coverage under the Climate Change Act 2008 comprises UK territory only (i.e. England, Wales, Scotland and Northern Ireland)⁷.

Unless otherwise stated, all figures in this section are stated in tonnes of carbon dioxide-equivalent (tCO₂e). This is the usual way of reporting greenhouse gases to account for the different global warming potentials of each gas. The global warming potential (GWP) of a gas is a measure of its impact on global warming relative to carbon dioxide, and is agreed at international level. Carbon dioxide equivalent figures are therefore produced by multiplying the emissions of a greenhouse gas by its GWP. This means the emissions and removals figures for different greenhouse gases in this part of the report are directly comparable.

UK emissions totals

Section 18(2) of the Climate Change Act

Table 1 below sets out in respect of each targeted greenhouse gas, the final adjusted amount for the period of UK emissions, UK removals and net UK emissions of that gas.

The emissions and removals data included in table 1 are taken from the greenhouse gas emissions data published on 5 February 2019, derived from the UK's 1990-2017 National Greenhouse Gas Emissions Inventory. The methodologies used to calculate and compile these data are in line with United Nations Framework Convention on Climate Change (UNFCCC) reporting guidelines on annual inventories. These methods include emissions factors (country specific, plant specific and the default emissions factors used under the international framework), as well as emissions and production data reported by operators and regulators, and modelling⁸.

⁷ Section 89 of the Climate Change Act specifies that this includes UK coastal waters and the UK sector of the continental shelf: <http://www.legislation.gov.uk/ukpga/2008/27/section/89>

⁸ Further details on the methods used in specific sectors are set out in table 13 of the data tables published alongside the final 2017 emissions data, available from: <https://www.gov.uk/government/statistics/final-uk-greenhouse-gas-emissions-national-statistics-1990-2017>

Table 1: Net UK greenhouse gas emissions during the second carbon budgetary period (2013 to 2017) by gas, tCO₂e

Greenhouse gas	UK emissions (excluding net emissions/ removals from LULUCF) (A)	Net emissions/ removals from LULUCF (B)	UK net emissions (including net emissions/ removals from LULUCF) (A + B)
Carbon dioxide (CO ₂)	2,111,916,784	-55,721,802	2,056,194,982
Methane (CH ₄)	263,862,379	137,857	264,000,236
Nitrous oxide (N ₂ O)	94,839,919	7,234,345	102,074,264
Hydrofluorocarbons (HFC)	76,584,706	0	76,584,706
Perfluorocarbons (PFC)	1,649,673	0	1,649,673
Sulphur hexafluoride (SF ₆)	2,503,572	0	2,503,572
Total	2,551,357,034	-48,349,601	2,503,007,433

Note: a negative value means that the net effect is the removal of gas from the atmosphere (i.e. a carbon sink), while a positive figure means the net effect is emissions to the atmosphere.

Historic UK greenhouse gas emissions are revised each year as a result of annual improvements to the inventory methodology. The figures presented in table 1 show net UK greenhouse gas emissions as reported at the end of the budgetary period. A full breakdown of the emissions by year are published in table 2 of the final UK greenhouse gas emissions statistics for 2017.

Part 2 – The Net UK Carbon Account

This part sets out the amount of carbon units which are to be credited to and debited from the net UK carbon account during the second budgetary period. The Government must follow the rules set out in the regulations when working out the net UK carbon account and so the calculations in this part of the statement are based on the methodologies established by the Carbon Accounting Regulations 2009 and the Carbon Accounting (2013–2017 Budgetary Period) Regulations 2015.

Total amount of units credited to and debited from the net UK carbon account

Section 18(3) of the Climate Change Act

The net UK carbon account for a given year is calculated by taking net UK emissions for that year, with an adjustment made to reflect the amount of units to be credited to, and debited from, the net UK account for that year. Carbon units that are counted as credits reduce the level of the net UK carbon account, while carbon units that are counted as debits increase the level of the net UK carbon account.

The amounts of units to be counted as credits and debits in respect of the second budgetary period should be calculated based on three elements:

- amount of units in the credit account which have been declared as credits to the net UK carbon account
- effect of the EU ETS (including emissions arising from domestic aviation)
- determining whether the Government disposed of any carbon units

Units in the credit account

The Government set up a “credit account” in the UK Registry in 2009 which is the dedicated route through which carbon units can be credited voluntarily to the net UK carbon account. During the second budgetary period, zero units were credited to the net UK carbon account under this mechanism.

Accounting for the EU Emissions Trading System (EU ETS)

The EU ETS is a cap and trade system that sets a limit on the total amount of greenhouse gases that can be emitted by installations in the system⁹. This cap is reduced over time so that emissions decrease across the EU. If EU ETS participants in the UK collectively exceed the UK cap, the amount of emissions in excess of the cap must be considered as a ‘credit’, as operators must have bought units from other EU ETS participants to cover these emissions. If on the other hand EU ETS participants in the UK collectively reduce their emissions below the UK cap, then the difference between reported emissions from the EU ETS sector and the cap must be considered a ‘debit’, as operators must have sold or retained excess units which are not required to cover emissions in the UK.

⁹ http://ec.europa.eu/clima/policies/ets/index_en.htm.

The EU ETS is currently in its third phase, which runs from 2013 to 2020. In this phase Member States do not receive a fixed cap at the national level as was the case during the first carbon budget¹⁰; the ETS instead operates at installation level¹¹. As the net carbon account calculation relies on a cap for the traded sector, for the second budgetary period a 'notional' cap will be estimated. This notional cap estimates the UK share of a given EU-wide cap, replicating the components of the previous cap as defined in EU regulations.

EU ETS notional cap

In accordance with the 2015 Carbon Accounting Regulations¹², the notional cap is created by adding together the volume of EU allowances freely allocated to stationary UK operators, the volume of allowances in the EU-wide auction pot to be auctioned by the UK to stationary operators, and an estimated share of the New Entrants Reserve (NER).

The volume of EU allowances freely allocated to stationary UK operators, for the purposes of this calculation, is taken from the UK's finalised NIMs (National Implementation Measures). The NIMs are the installation level list of free EU ETS allocations to stationary UK operators¹³.

The volume of allowances in the EU-wide auction pot to be auctioned by the UK to stationary operators each year is captured through the UK's auctioning platform¹⁴.

The NER is an additional amount of free allowances set aside for new installations that are covered by the scope of the ETS Directive, and installations that increase capacity, covering the whole of Phase III (years 2013–20).

Guidance on participation in the EU ETS, including information on these various types of allowances, is published on the European Commission website¹⁵.

At the time the second carbon budget was set, it was estimated that the notional UK share of the EU ETS cap (i.e. traded sector) would be 1,078,000,000 tCO_{2e}. However, the UK share of the EU ETS cap (i.e. allocation over 2013-17) was subsequently set at 782,056,278 tCO_{2e} (including domestic aviation), which is 295,943,722 tCO_{2e} smaller than estimated.

¹⁰ Details of this calculation can be found in the end of budgetary statement found here: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/310648/final_statement_first_carbon_budget_period.pdf

¹¹ Detailed guidance on Phase 3 of the ETS can be found here: <https://www.gov.uk/guidance/participating-in-the-eu-ets>

¹² SI 2015 No. 775: <http://www.legislation.gov.uk/ukSI/2015/775/introduction/made>

¹³ Free allocation data based on NIMs are updated annually and can be found in two locations: <https://www.gov.uk/guidance/participating-in-the-eu-ets>
https://ec.europa.eu/clima/policies/ets/registry_en

¹⁴ ICE futures Europe: <https://www.theice.com/emissions/auctions>

¹⁵ http://ec.europa.eu/clima/policies/ets/cap/index_en.htm

Table 2: The effect of EU ETS installations on the net UK carbon account during the second carbon budgetary period (2013 to 2017) (excluding domestic aviation), tCO₂e

UK notional share of EU ETS cap (i.e. allocation over 2013-17)	(A)	772,999,285
Of which:		
Free allowances allocated to the UK		299,876,802
Auctioned allowances allocated to the UK		434,752,000
Estimated new entrants reserve for the UK		38,370,483
Total amount of units surrendered by operators of UK installations	(B)	879,092,211
Difference between the allocation over 2013-17 and the amount of units surrendered	(A - B)	-106,092,926

Table 2 sets out the number of units surrendered by UK operators, as well as the UK notional share of the EU ETS, thus showing the effect of the EU ETS on the net UK carbon account during the second carbon budgetary period.

As the amount of units surrendered by UK operators was greater than the UK share of EU ETS (i.e. allocation over 2013-17), a corresponding amount of units must be credited to the net UK carbon account. This means 106,092,926 tCO₂e are to be credited to the net UK carbon account during the second carbon budgetary period as a result of the EU ETS installations.

Domestic aviation emissions

Under the Climate Change Act, the net carbon account must contain emissions generated by domestic aviation (flights between UK airports). Historically this has been reported in the “non-traded” sector of the UK’s emissions, but are now included in the EU ETS. As a result, domestic aviation carbon dioxide emissions are included in the “traded sector” of the budgets.

In order to determine whether units should be credited to or debited from the net UK carbon account in each year, the number of allowances surrendered is compared with “the annual allocation”, i.e. the domestic aviation emissions cap¹⁶.

¹⁶ Please refer to page 15 in the Annual Statement of Emissions for 2017 for a full explanation of domestic aviation emissions:
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/789243/Annual_Statement_of_Emissions_2017.pdf

Table 3: The effect of domestic aviation on the net UK carbon account during the second carbon budgetary period (2013 to 2017), tCO₂e

Domestic aviation cap	(A)	9,056,992
Domestic aviation emissions	(B)	7,845,507
Difference between the aviation cap and emissions	(A - B)	1,211,486

Table 3 sets out the emissions from domestic aviation, as well as the domestic aviation cap, thus showing the effect of domestic aviation on the net UK carbon account during the second carbon budgetary period.

As the emissions from domestic aviation were less than the domestic aviation cap, a corresponding amount of units must be debited from the net UK carbon account. This means 1,211,486 tCO₂e are to be debited from the net UK carbon account during the second carbon budgetary period as a result of domestic aviation.

Net UK carbon account for the year

Section 18(4) of the Climate Change Act

As described above, the net UK carbon account is calculated by taking net UK emissions and adjusting these to account for the amount of units to be debited from and credited to the net UK carbon account.

The information in table 4 is taken from preceding tables in this statement and provides a summary of how the net UK carbon account is calculated for the second carbon budgetary period.

Table 4: Summary of how the net UK carbon account is calculated for the second carbon budgetary period (2013 to 2017), tCO₂e

Net UK emissions	A	2,503,007,433
Amount of units to be credited/debited from EU ETS installations	B	-106,092,926
Amount of units to be credited/debited from domestic aviation	C	1,211,486
Net UK carbon account	A + B + C	2,398,125,993

Note: carbon units to be credited to the net UK carbon account have been assigned negative values.

Over the second carbon budgetary period, the net UK carbon account was 2,398,125,993 tCO₂e, which is 383,874,007 tCO₂e below the second carbon budget of 2,782,000,000 tCO₂e.

Annex A – Adjusted Net Carbon Accounting During The Second Carbon Budgetary Period

Table 5: Summary of net UK emissions for each year within the second carbon budgetary period (2013 to 2017), tCO₂e

UK Emissions		2013	2014	2015	2016	2017	CB2
UK emissions (excluding LULUCF)	A	565,551,842	525,146,768	507,683,633	482,859,789	470,115,003	2,551,357,034
LULUCF	B	-9,350,247	-9,570,121	-9,733,956	-9,802,510	-9,892,768	-48,349,601
Net UK emissions	C = A + B	556,201,595	515,576,647	497,949,677	473,057,279	460,222,235	2,503,007,433

Table 6: The effect of the EU ETS on the net UK carbon account for each year within the second carbon budgetary period (2013 to 2017), tCO_{2e}

EU ETS fixed installations		2013	2014	2015	2016	2017	CB2
UK share of EU ETS	D = E + F + G	181,279,426	138,601,625	142,626,154	146,090,051	164,402,030	772,999,285
Of which:							
Free allowances allocated to the UK	E	65,951,011	64,310,971	59,902,465	58,199,691	51,512,664	299,876,802
Auctioned allowances allocated to the UK	F	107,356,000	66,220,000	74,958,000	80,258,000	105,960,000	434,752,000
Estimated new entrants reserve for the UK	G	7,972,415	8,070,654	7,765,689	7,632,360	6,929,366	38,370,483
Total amount of units surrendered by operators of UK installations	H	225,481,380	197,664,784	171,722,483	147,423,466	136,800,098	879,092,211
Difference between the amount of units surrendered and the annual allocations	I = D - H	-44,201,954	-59,063,159	-29,096,329	-1,333,415	27,601,932	-106,092,926

Table 7: Performance against the domestic aviation emissions cap for each year within the second carbon budgetary period (2013 to 2017), tCO₂e

EU ETS	domestic aviation	2013	2014	2015	2016	2017	CB2
Domestic aviation cap	J	1,811,398	1,811,398	1,811,398	1,811,398	1,811,398	9,056,992
Domestic aviation emissions	K	1,690,693	1,560,012	1,574,322	1,490,473	1,530,006	7,845,507
Difference between emissions and the cap	L = J - K	120,706	251,387	237,076	320,925	281,392	1,211,486

Table 8: Summary of how the net UK carbon account for each year within the second carbon budgetary period (2013 to 2017) is calculated, tCO₂e

Carbon accounting		2013	2014	2015	2016	2017	CB2
Net UK emissions (including LULUCF)	C = A + B	556,201,595	515,576,647	497,949,677	473,057,279	460,222,235	2,503,007,433
Amount of units to be credited/debited from EU ETS installations	I = D - H	-44,201,954	-59,063,159	-29,096,329	-1,333,415	27,601,932	-106,092,926
Amount of units to be credited/debited from domestic aviation	L = J - K	120,706	251,387	237,076	320,925	281,392	1,211,486
Net UK carbon account	M = C + I + L	512,120,346	456,764,874	469,090,424	472,044,790	488,105,559	2,398,125,993

Table 9: Summary of how the net UK carbon account compares against the second carbon budget (2013 to 2017), tCO₂e

Comparison to Carbon Budget		CB2
Carbon Budget	N	2,782,000,000
Of which:		
Traded sector	O	1,078,000,000
Non-traded sector	$P = N - O$	1,704,000,000
Net UK Carbon account	$M = C + I + L$	2,398,125,993
Of which:		
Traded sector	$Q = D + J$	782,056,278
Non-traded sector	$R = M - Q$	1,616,069,716
Difference	$S = N - M$	383,874,007
Of which:		
Traded sector	$T = O - Q$	295,943,722
Non-traded sector	$U = P - R$	87,930,284

This publication is available from: www.gov.uk/government/statistics/final-statement-for-the-second-carbon-budget-period

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