



Department
of Energy &
Climate Change

Final Statement for the First Carbon Budget Period

May 2014

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

May 2014



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Executive Summary

This is the final statement for the first carbon budgetary period covering 2008 to 2012 as required under Section 18 of the Climate Change Act 2008.¹ This statement sets out the steps taken to calculate the “net UK carbon account” for the first carbon budget period. The net UK carbon account² is what we compare against the first carbon budget (3,018 MtCO₂e) 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 first budgetary period, **the net UK carbon account was 2,982 MtCO₂e, which is 36 MtCO₂e below the cap of 3,018 MtCO₂e.** On average this means emissions as measured by the net carbon account were 23.6% lower than 1990 base year emissions.

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 sinks¹). These are adjusted to account for any carbon units which have been brought in from overseas by the 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 Regulations 2009 and the Carbon Accounting (Amendment) Regulations 2009.

Introduction

1. 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.
2. The first budgetary period is from 2008 to 2012 (3,018 MtCO_{2e}), and the next two budgets cover the periods 2013-2017(2,782 MtCO_{2e}), and 2018-2022 (2,544 MtCO_{2e}). The levels of these budgets, which took account of the advice of the independent Committee on Climate Change, were announced in April 2009 and subsequently approved by Parliament and entered into force in May 2009. The level of the fourth carbon budget was set in law, following approval by Parliament, at the end of June 2011 as required under the Act. The level was set at 1,950 MtCO_{2e}, in line with the Committee on Climate Change’s recommendation.
3. 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. 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

4. 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 below.
5. 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 in February annually.⁴ These emissions comprise aggregate gross emissions from sources in the UK, including emissions from land use, land use change and forestry (LULUCF), which are

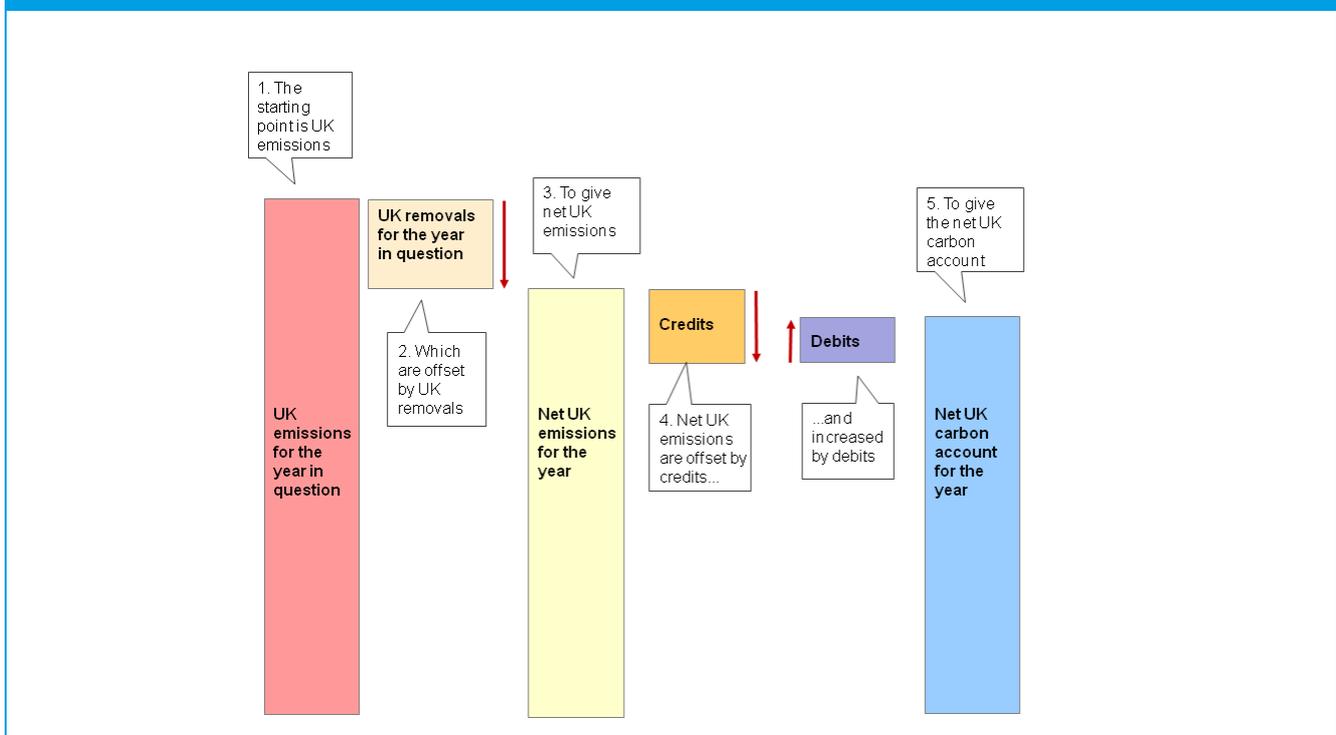
³ <http://www.legislation.gov.uk/ukpga/2008/27/section/27>.

⁴ The final 2012 estimates of UK greenhouse gas emissions were published on 4 February 2014. See: <https://www.gov.uk/government/publications/final-uk-emissions-estimates>.

then adjusted to take into account removals of emissions from the atmosphere by carbon sinks associated with LULUCF activity.

6. This gives net UK emissions, which are adjusted to account for:
 - a. carbon units which have been brought in from overseas by the Government and others to offset UK emissions (“credits”), thereby reducing the net UK carbon account; and
 - b. UK carbon units which have been sold to a third party outside the UK or otherwise disposed of (“debits”), which 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.
7. The Annual Statement of Emissions for 2012 explains the Government’s proposed approach to updating how domestic aviation is accounted⁵. The Government intends to update the Carbon Accounting Regulations to reflect this change in due course.
8. The Government publishes an Annual Statement of Emissions each year. It should be noted that the emissions estimates for years 2008 to 2011 reported in this statement differ from emissions reporting in respective annual statement 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 statistics⁶ (published in February 2014). Annex A details the differences.

Figure 1: Calculating the net UK carbon account



⁵ <https://www.gov.uk/government/publications/annual-statement-of-emissions-for-2012>

⁶ <http://www.gov.uk/government/publications/final-uk-emissions-estimates>

Structure of the report

9. This report contains two sections:

- **Part 1** provides UK greenhouse gas emissions statistics for the first 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 first budgetary period. The calculations in this part of the report are based on the methodologies established by the Carbon Accounting Regulations 2009 and the Carbon Accounting (Amendment) Regulations 2009.⁷

⁷ SI 2009 No. 1257 and SI 2009 No. 3146, respectively, available from: www.opsi.gov.uk/si/si2009/uksi_20091257_en_1 and www.opsi.gov.uk/si/si2009/uksi_20093146_en_1.

Part 1: UK Greenhouse Gas Emissions

10. The information contained in this part of the statement is derived from the UK greenhouse gas emissions statistics for 2012, which were published on 4 February 2014.⁸ Emissions coverage under the Climate Change Act 2008 comprises UK territory only (i.e. England, Wales, Scotland and Northern Ireland).⁹

11. 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.

1.1 UK emissions totals

Section 18(2) of the Climate Change Act

12. Table 1 below sets out in respect of each targeted greenhouse gas:

- the final amount for the period of UK emissions, UK removals and net UK emissions of that gas; and
- the total of the adjusted amounts.

13. The emissions and removals data included in table 1 are taken from the greenhouse gas emissions data published on 4 February 2014, derived from the UK's 1990-2012 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 modelling.¹⁰

⁸ <https://www.gov.uk/government/publications/final-uk-emissions-estimates>

⁹ Section 89 of the Climate Change Act specifies that this includes UK coastal waters and the UK sector of the continental shelf.

¹⁰ Further details on the methods used in specific sectors are set out in table 13 of the data tables published alongside the final 2012 emissions data, available from: <https://www.gov.uk/government/publications/final-uk-emissions-estimates>.

14. In the Government's response to the consultation on carbon units, the net UK carbon account and carbon accounting¹¹ it was stated that any adjustment to annual UK greenhouse gas emissions resulting from improved methodology from annual developments of the inventory would be applied retrospectively to all preceding years at the end of the budgetary period. These adjustments are presented in this statement. Emissions for individual years of the first budgetary period are contained in Annex A.

Table 1: Aggregate 2008 to 2012 UK greenhouse gas emissions, removals and net UK emissions, tCO₂e

	UK emissions excluding net emissions/removals from LULUCF (A)	Net UK emissions/removals from LULUCF (B) ¹²	UK emissions including net emissions/removals from LULUCF (A – B)
Carbon dioxide	2,460,123,819	-39,308,222	2,420,815,597
Methane	267,549,904	240,348	267,790,252
Nitrous oxide	182,033,350	3,506,433	185,539,783
Hydrofluorocarbons	66,793,850	0	66,793,850
Perfluorocarbons	1,102,802	0	1,102,802
Sulphur hexafluoride	2,894,142	0	2,894,142
TOTAL¹³	2,980,497,866	-35,561,440	2,944,936,426

¹¹ http://webarchive.nationalarchives.gov.uk/20110508074721/http://www.decc.gov.uk/en/content/cms/consultations/carbon_account/carbon_account.aspx

¹² A positive amount means the net effect is the removal of emissions from the atmosphere from these carbon sinks, while a negative figure means the net effect is emissions to the atmosphere from the carbon sink.

¹³ Figures may not sum due to rounding.

Part 2: The Net UK Carbon Account

15. This part sets out the amount of units which are to be credited to and debited from the net UK carbon account during the first carbon budget. The calculations in this part of the statement are based on the methodologies established by the Carbon Accounting Regulations 2009 and the Carbon Accounting (Amendment) Regulations 2009.¹⁴

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

Section 18(3) of the Climate Change Act

16. As described above, 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.

17. The amounts of units to be counted as credits and debits in respect of the first budgetary period are calculated based on the methodology set out in the Carbon Accounting Regulations 2009 and Carbon Accounting (Amendment) Regulations 2009. There are three elements to consider:

- The amount of units in the credit account which have been declared as credits to the net UK carbon account over the period 2008 to 2012 (*Regulations 4 and 5*);
- The effect of the EU ETS (*Regulation 6, as amended*); and
- Determining whether the Government disposed of any carbon units during the course of the period 2008 to 2012 (*Regulation 7*).

18. The types of units which may be counted as credits or debits are listed in Regulation 3 of the Carbon Accounting Regulations 2009.

2.1.1 Units in the credit account

19. Regulations 4 and 5 of the Carbon Accounting Regulations 2009 establish the mechanism by which units may be counted as credits towards carbon budgets.

¹⁴ The Carbon Accounting Regulations 2009 (SI 2009 No. 1257) were amended in December 2009 by the Carbon Accounting (Amendment) Regulations 2009 (SI 2009 No. 3146) to correct a minor error regarding the total amount of allowances allocated to UK installations under the EU Emissions Trading System. The original and amended Regulations are available from www.opsi.gov.uk/si/si2009/uksi_20091257_en_1 and www.opsi.gov.uk/si/si2009/uksi_20093146_en_1 respectively. Guidance for stakeholders on the carbon accounting rules is available on the DECC website: http://webarchive.nationalarchives.gov.uk/20121205174605/http://www.decc.gov.uk/assets/decc/Consultations/Carbon%20Accounting/1_20091211101501_e_@@_guidancecarbonaccounting.pdf

20. Regulation 4 requires the Government to open a “credit account” in the UK Registry. The Registry is the system set up in the UK to administer the carbon accounting system under the existing EU and UN frameworks, recording the issuance, transfer, cancellation, retirement and banking of carbon units.
21. The credit account, which was created in the UK Registry in October 2009, is the dedicated route through which carbon units can be credited voluntarily to the net UK carbon account. Regulation 4 establishes a mechanism for returning carbon units which have been transferred into the credit account in error to the account from which they were originally transferred. Any other carbon units can only be removed from the credit account in order to be cancelled – this fulfils the requirement in Section 27(4) of the Act that units counted as credits cannot be used to offset any other emissions.
22. Regulation 5 sets out the process by which carbon units may be counted as credits. In short, any person may transfer carbon units to the credit account but they will only be counted as credits towards the net UK carbon account if a UK Minister makes a declaration to that effect. Where a declaration is not made in respect of a unit in the credit account, the unit may not be counted as a credit.
23. To date no units have been declared as credits towards the net UK carbon account, which means that over the first budgetary period, **0 units are credited to the net UK carbon account under this mechanism.**

2.1.2 Accounting for the EU Emissions Trading System (EU ETS)

24. The EU ETS operates as a cap and trade system, which means that operators of installations subject to the system are given an allocation of emissions allowances each year. The total amount of allowances issued caps the level of emissions allowed by installations across the EU. Each year, operators must surrender (i.e. give back) allowances equal to their emissions for that year. If their emissions are higher than their allocation for that year then they need to procure additional allowances to cover the higher emissions, either from other operators in the UK or EU who have a surplus of allowances, or by investing in projects which reduce emissions outside the EU under the Kyoto Protocol’s Clean Development Mechanism (CDM) or Joint Implementation (JI). If an operator’s emissions are lower than their allocation for that year then they will be left with surplus allowances which they may sell to others or keep for use in future years.
25. Regulation 6, as amended by the Carbon Accounting (Amendment) Regulations 2009, establishes the mechanism to account for credits and debits as a result of the operation of the EU ETS during the first budgetary period (which coincides with the second phase of the EU ETS).
26. During the budgetary period, if operators of EU ETS installations 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 overseas to cover these emissions. If on the other hand operators 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 either sold excess units or retained them for use in future periods.

27. 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”. These are then aggregated over the period.
28. The starting point for calculating the annual allocation is the total amount of allowances to be allocated by the UK in the period 2008-2012, whether for free, by auction/sale or via the new entrant reserve (a total of 1,228,109,497 allowances), less those allowances relating to installations in Gibraltar, which are not covered by the Act (941,956 allowances). This gives 1,227,167,541 allowances as the total UK allocation for the first budgetary period.
29. At the end of Phase II of the EU ETS, the UK is required to cancel all allowances which have not been either issued or auctioned by that point. As a consequence, allowances totalling around 4.5 MtCO_{2e} were cancelled in 2012. As these cancelled allowances have the effect of reducing the overall cap for the whole of Phase II, the calculation of the units to be debited or credited as a result of the EU ETS needs also to be adjusted. The approach chosen to deal with the cancellation is to distribute around 4.5 MtCO_{2e} of cancelled allowances over the five years of Phase II, effectively reducing the cap by approximately 0.9 MtCO_{2e} each year.

Section 18(4) of the Climate Change Act

30. Table 2 sets out the effect of the EU ETS on the net UK carbon account over the first budgetary period.

Table 2: The effect of the EU ETS on the net UK carbon account in the first budgetary period

Total amount of units surrendered by UK operators (A) Comprised of:	1,186,100,706
EU allowances (EUAs)	1,108,744,244
Certified Emission Reductions (CERs)	55,250,969
Emission Reduction Units (ERUs)	22,105,493
UK's EU ETS allocation (B)	1,222,712,243
annual allocation	1,227,167,541
/less cancellation of units from the NER	4,455,298
Difference between allocation and amount of units surrendered (A – B)	-36,611,537

31. As the amount of units surrendered by UK operators was less than the annual allocation for 2012, a corresponding amount of units must be counted as debits. **This means - 36,611,537 units are to be debited to the net UK carbon account in 2012** as a result of the EU ETS. This is made up of 13,156,724 ERUs, 20,795,113 CERs, and 2,659,700 EUAs.

2.1.3 Disposal of units

32. Regulation 7 of the Carbon Accounting Regulations 2009 establishes the mechanism for calculating whether an amount of units is to be debited in each year. Debits arise where the Government disposes of carbon units, for example by selling them to another country or other third party. These units must be debited, and the net UK carbon account increased accordingly, as the recipient can use the units to offset their own emissions and it would lead to double counting if they were also available to offset UK emissions.

33. To ensure we are able to calculate in each year the amount of units which must be debited, Regulation 7 requires that at the end of each year we compare “the UK holding of carbon units” in that year with what “the UK holding of carbon units” was in the previous year.

34. “The UK holding of carbon units” is defined as the amount of units held in the following UK Registry accounts:

- the Party Holding Account in the UK Registry where the UK’s Assigned Amount Units (AAUs) issued under the Kyoto Protocol were initially issued; and
- the UK’s national retirement account, where the UK retires AAUs annually in accordance with Kyoto Protocol obligations.

35. The holding is also deemed to include the total UK allocation under the EU ETS, regardless of where these are held at the time, as these units are simply UK AAUs which have been converted into EU allowances (EUAs), the EU ETS “currency”.

36. If the UK holding of carbon units is less than it was at the end of the previous year, and if it is also below the original allocation of units given to the UK under the Kyoto Protocol (less an amount representing the allocation to the UK’s Crown Dependencies and Overseas Territories, which are not covered by the Act)¹⁵, this means we must have disposed of units in the meantime. The units will be debited from the net UK carbon account to reflect this.

37. At the end of the budgetary period, the UK’s holding of carbon units was greater than the relevant share of the UK assigned amount, which means there is no requirement to debit an amount of carbon units from the net UK carbon account. This calculation is set out in table 3.

¹⁵ The original allocation of units given to the UK under the Kyoto Protocol, less an amount representing the allocation to the UK’s Crown Dependencies and Overseas Territories, is defined as “the relevant share of the UK assigned amount”.

Table 3: Calculation for determining whether an amount of units must be debited in respect of the final budgetary period

UK holding of carbon units on 31 December 2012	3,391,504,667
Comprised of:	
Units in issuance account	2,183,971,133
Units in surrender account	955,137,463
Total UK EU ETS allocation (less allowances that have been issued in previous years and units from the New Entrant Reserve which have been cancelled)	252,396,071
Relevant share of the UK assigned¹⁶	3,391,499,202

38. As the UK holding of carbon units at the end of the first budgetary period is greater than the relevant share of the UK assigned amount, 0 units are to be debited from the net UK carbon account as a result of the disposal of carbon units.

¹⁶ The UK relevant share is lower than previous years as a result of the cancelation of EUAs from the New Entrance Reserve. As EU ETS units are linked to AAUs issued under the KP, the cancellation of EUAs also reduces the overall number of units available to the UK for compliance with the Kyoto Protocol.

2.2 Net UK carbon account for the first budgetary period

Section 18(4) of the Climate Change Act

39. As described above, the net UK carbon account is calculated by taking net UK emissions, which are then adjusted to account for the amount of units to be debited from and credited to the net UK carbon account.

40. The information in table 4 is taken from preceding tables in this report and provides an amount for the net UK carbon account in the first budgetary period.

Table 4: Summary of how the net UK carbon account for the first budgetary period is calculated

2008 to 2012 net UK emissions – see table 1 (page 13) (A)	2,944,936,426
Amount of units to be credited (B)	0
Amount of units to be debited (C)	-36,611,537
2008 to 2012 Net UK carbon account, tCO₂e ((A – B) + C)	2,981,547,963

41. Over the first budgetary period, the net UK carbon account was 2,981,547,963, which is 36,452,037 below the cap of 3,018,000,000.

Annex A: Adjusted UK Greenhouse Gas Emissions, 2008-2011

Table 1: Carbon dioxide (CO₂) emissions, MtCO₂e

	UK CO₂ emissions excluding net emissions/removals from LULUCF	UK CO₂ emissions/removals from LULUCF	UK CO₂ emissions including net emissions/removals from LULUCF
2008	533.367826	-7.658131	525.709695
2009	484.119290	-7.719045	476.400245
2010	501.692543	-7.998761	493.693782
2011	460.760395	-8.210552	452.549843
2012	480.183764	-7.721732	472.462032

Table 2: Methane (CH₄) emissions, MtCO₂e

	UK CH₄ emissions excluding net emissions/removals from LULUCF	UK CH₄ emissions/removals from LULUCF	UK CH₄ emissions including net emissions/removals from LULUCF
2008	57.751747	0.046603	57.798350
2009	55.541582	0.044928	55.586511
2010	52.317206	0.041008	52.358214
2011	51.509556	0.043181	51.552737
2012	50.429813	0.064627	50.494440

Table 3: Nitrous oxide (N₂O) emissions, MtCO₂e

	UK N₂O emissions excluding net emissions/removals from LULUCF	UK N₂O emissions/removals from LULUCF	UK CO₂ emissions including net emissions/removals from LULUCF
2008	38.197805	0.742069	38.939874
2009	36.047200	0.728359	36.775559
2010	36.946339	0.697576	37.643915
2011	35.570853	0.671536	36.242389
2012	35.271154	0.666893	35.938047

Table 4: Hydrofluorocarbon (HFC) emissions, MtCO₂e

	UK HFC emissions excluding net emissions/removals from LULUCF	UK HFC emissions/removals from LULUCF	UK HFC emissions including net emissions/removals from LULUCF
2008	12.672270	0.000	12.672270
2009	13.075101	0.000	13.075101
2010	13.455820	0.000	13.455820
2011	13.713514	0.000	13.713614
2012	13.877145	0.000	13.877145

Table 5: Perfluorocarbon (PFC) emissions, MtCO₂e

	UK PFC emissions excluding net emissions/removals from LULUCF	UK PFC emissions/removals from LULUCF	UK PFC emissions including net emissions/removals from LULUCF
2008	0.203922	0.000	0.203922
2009	0.145030	0.000	0.145030
2010	0.220622	0.000	0.220622
2011	0.325308	0.000	0.325308
2012	0.207919	0.000	0.207919

Table 6: Sulphur hexafluoride (SF₆) emissions, MtCO₂e

	UK SF₆ emissions excluding net emissions/removals from LULUCF	UK SF₆ emissions/removals from LULUCF	UK SF₆ emissions including net emissions/removals from LULUCF
2008	0.584257	0.000	0.584257
2009	0.560924	0.000	0.560924
2010	0.647538	0.000	0.647538
2011	0.559261	0.000	0.559261
2012	0.542161	0.000	0.542161

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