HM Government

UK's Second Biennial Report

The UK's Second Biennial Report under the United Nations Framework Convention on Climate Change

December 2015

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Prepared by the Department of Energy and Climate Change

December 2015

The UK's Second Biennial Report under the UNFCCC

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Background

This report covers the UK's Second Biennial Report under Article 12 of the United Nations Framework Convention on Climate Change (UNFCCC), under Article 7 of the Kyoto Protocol and under decision 2/CP.17 of the Conference of the Parties under the UNFCCC.

In 2010 the Conference of the Parties (COP) decided, under decision 1/CP.16, that Annex I Parties (developed countries) should submit biennial reports, outlining progress in achieving emission reductions and providing financial, technological and capacity building support to Non-Annex I Parties (developing countries).

The decision also established a new process to promote the comparability and comparison of efforts among Annex I Parties, in terms of their economy wide emission reduction and limitation targets. This process is called international assessment and review (IAR) and the UK's Second Biennial Report will be subject to this process.

The guidelines for preparing a Biennial Report were adopted during COP 17, under decision 2/CP.17, in 2011. The UK's Second Biennial Report has been developed in line with these guidelines, in terms of format, content and use of the common tabular format (CTF).

This report also falls under Article 12 of the United Nations Framework Convention and Article 7 of the Kyoto Protocol.

Chapter 1: Information on greenhouse gas emissions and trends

Introduction

This chapter presents information on the UK Greenhouse Gas (GHG) inventory, covering emission estimates for the period 1990-2013, and the National System established to produce and quality assure the UK GHG inventory.

The UK is required to produce an annual GHG inventory, which gives an assessment of all human-driven GHG emissions across the UK, in order to meet its commitments under the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol. A concise summary of the National System is contained within this chapter, a further more detailed summary can be found in the UK's National Inventory Report (NIR), submitted to the UNFCCC in 2015.[1]

The GHG inventory covers the seven direct GHGs under the Kyoto Protocol. These are collectively known as the 'basket' of GHGs and are:

Carbon dioxide (CO_2)
Methane (CH_4)
Nitrous oxide (N_2O)
Hydrofluorocarbons (HFCs)
Perfluorocarbons (PFCs)
Sulphur hexafluoride (SF_6)
Nitrogen trifluoride (NF_3).

The direct GHGs have different impacts on the atmosphere and are therefore assigned a global warming potential (GWP). The GWP is a means of providing a simple measure of the relative effects of the emissions of the various gases when compared with CO_2 which has a GWP of 1. Once the emissions of GHGs are converted into their GWP equivalents, they can be summed and presented as carbon dioxide equivalent emissions, referred to as CO_2e. Annex 1 Table 2(c) contains a list of respective GWPs for each gas.

The Kyoto Protocol was established in 1997 in response to the threat of dangerous climate change. For the Kyoto Protocol the UK's base year for assessing emissions of CO_2, CH_4, and N_2O is 1990. The UK has chosen to use 1995 as the base year for emissions of the fluorinated gases: HFCs, PFCs, SF_6 and NF_3. This is in line with most other EU member states, and in accordance with Article 3.8 of the Kyoto Protocol. This differs from the base year used by the

[1] UK Greenhouse Gas Inventory, 1990–2013, Annual report for submission under the UN Framework Convention on Climate Change, October 2015: http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/8812.php

UK when reporting more generally against the UNFCCC where the base year for all GHGs is 1990. The UK also uses the inventory to track progress against legally binding domestic targets, which are further discussed in Chapter 2.

Under the UNFCCC and the Kyoto Protocol first commitment period[2] the UK's Overseas Territories (OTs) (Gibraltar, Bermuda, Cayman Islands, the Falkland Islands and Montserrat) and Crown Dependencies (CDs) (Guernsey, Jersey and the Isle of Man) are included. Emissions from each OT and CD are calculated individually and added to the UK total.

This chapter shows trends in UK GHG emissions between 1990 and 2013, disaggregating overall emissions by gas and by source and end-user sector. The by-source basis includes emissions from the energy supply industry as a particular sector, whereas the end-user basis reallocates these emissions to the sectors that make use of the energy supplied. The inventory is also spatially disaggregated to provide geographical breakdown to England and the three devolved administrations (Scotland, Wales and Northern Ireland), and to the 406 local authorities[3] that make up the United Kingdom.

Land use, land-use change and forestry (LULUCF) emissions and removals are reported in the UK's GHG inventory in accordance with the rules for reporting this sector under the UNFCCC. The UNFCCC reporting basis includes an estimate of all anthropogenic sources minus sinks from the LULUCF sector. A narrower definition of LULUCF emissions and removals is used to assess progress against the Kyoto target which includes only mandatory activities under Article 3.3 of the Kyoto Protocol, and forest management, which the UK has chosen as an activity under Article 3.4 of the Kyoto Protocol. In the first commitment period of the protocol, the UK elected not to account for cropland or grazing land management or re-vegetation under Article 3.4. For the second commitment period the UK has elected to account for cropland management, grazing land management and wetland drainage and re-wetting. It has not elected to account for re-vegetation.

For calculation of the Kyoto Protocol Base Year, deforestation emissions in 1990 are included in the base year total, as required by Article 3.7 of the Kyoto Protocol and subsequent decisions of the COP.

National Inventory arrangements

This section provides a summary of the National System the UK uses for preparing its GHG inventory. Section 1.2 of the NIR presents the full details of the institutional arrangements the UK has for inventory preparation.

The Department of Energy and Climate Change (DECC) has been appointed as the 'Single National Entity' with responsibility for the overall management and strategic development of priority improvements in the UK's GHG inventory. The latest NIR provides the contact details for the Single National Entity. Ricardo Energy & Environment[4] is the delegated Inventory Agency with responsibility for the planning, preparation and reporting of the UK GHG inventory. Ricardo Energy & Environment is responsible for the quality and delivery of datasets to DECC and reporting on DECC's behalf. DECC has established the National Inventory Steering Committee (NISC), an inter-departmental committee responsible for prioritising improvements and the approval of the national inventory data prior to submission to the European Union (EU) and the UNFCCC each year, as well as guiding the development of the inventory.

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2 Which territories will be ratified to the Kyoto Protocol second commitment period is yet to be confirmed.

3 Local Authority is a designation of local government used in the United Kingdom.

4 Ricardo Energy & Environment, The Gemini Building, Fermi Avenue, Harwell, Didcot, OX11 0QR, Tel: +44 (0)1235753000, email: enquiry-ee@ricardo.com

In addition to compiling the UK's GHG inventory, Ricardo Energy & Environment also compiles the UK's Air Quality Pollutant Inventory, used for reporting emissions to other international agreements, including the Gothenburg Protocol and the United Nations Economic Commission for Europe (UNECE) Convention on Long-Range Transboundary Air Pollution. The majority of the underlying information is held on common databases and this helps ensure consistency between these inventories. Emissions estimates from much of the energy sector, industrial processes sector and waste management sector are also produced under the Ricardo Energy & Environment contract. Emissions from the agricultural sector are provided by Rothamsted Research under contract to Department for Environment, Food and Rural Affairs (Defra), and emissions and removals in the LULUCF sector are produced on behalf of DECC by the Centre for Ecology and Hydrology (CEH).

The GHG inventory is compiled annually according to the Intergovernmental Panel on Climate Change (IPCC) 2006 Guidelines.[5] Methodological improvements take account of new data sources, updated guidance from the IPCC, relevant work by organisations such as CORINAIR (the European inventory system for certain air pollutants) and specific research programmes sponsored by government departments including DECC, Defra and the Department for Transport (DfT) together with the Devolved Administrations. All methodological improvements are applied back to 1990 to ensure a consistent time series.

The UK operates an established national system for GHG emissions estimation, reporting and archiving. There are a wide range of activities that take place as part of this system. These activities include: collecting and processing data from a wide range of sources; selecting appropriate emissions factors and estimation methods according to IPCC guidance; compiling the inventory; managing all aspects of inventory Quality Assurance (QA) and Quality Control (QC) including the quality control of raw and processed data and data management tools; documentation and archiving; prioritisation of methodology and data improvements; and completing uncertainty assessments. The methodologies and data sources used to create the GHG inventory are summarised in Section 1.4 of the NIR.

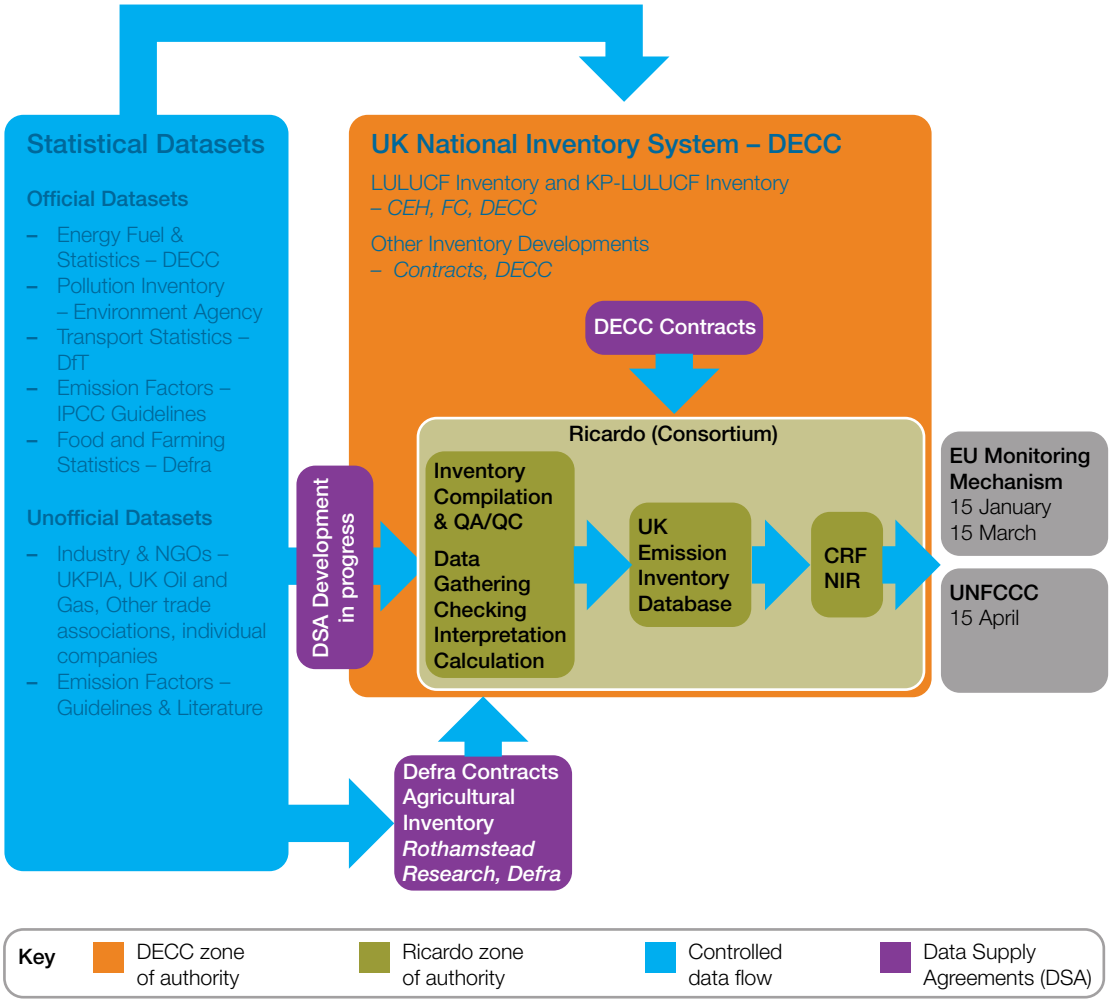
The NIR, including Common Reporting Format (CRF) tables, is reported to the UNFCCC, and to the EU Monitoring Mechanism (EUMM), by the deadlines set. Further details are provided in Section 1.4 of the NIR, and in subsequent chapters and appendices of the NIR. The national system ensures that the UK will be able to engage with the expert review process under Article 8 of the Kyoto Protocol.

Data are collected on an annual basis from national statistics, industry, trade associations and data associated with industrial pollution reporting and emissions trading. Emissions factors are reviewed on an annual basis, and updated if necessary. A consistent time series of emissions and removal estimates is maintained by recalculations to previous years of the time series where necessary if methods or data have been updated. Each sector specific chapter of the NIR provides details of the process for the recalculation of previously submitted inventory data, and the effects of these recalculations. Chapter 10 of the NIR provides a summary which explains and justifies any re-calculations across the inventory. These approaches are fully compliant with the requirements of the Kyoto Protocol and IPCC good practice.

Figure 1 shows the main elements of the UK National Inventory System, including provision of data to the EU under the terms of the EU Monitoring Mechanism.

[5] IPCC 2006 Guidelines: http://www.ipcc-nggip.iges.or.jp/public/index.html.

Figure 1: Main elements for the preparation of the UK greenhouse gas inventory



Source: National Inventory Report[1]

The complexity (or tier) of the methods used to estimate emissions (and removals) of GHGs is prioritised. Higher tier methods of calculation and country specific emissions factors are used for key source categories in the inventory. The UK inventory mainly uses higher tier methods, and makes extensive use of country specific emissions factors.

The GHG inventory is subject to a range of review procedures. These include an annual internal pre-submission review, where the latest GHG inventory is presented and discussed at the NISC. The inventory is also reviewed each year by the UNFCCC during centralised, desk or in-country reviews, and by the compilers of the EU GHG inventory. Any recommendations made as part of these reviews are used to help guide the development of the inventory. Chapter 10 of the NIR provides brief details of improvements to the NIR and the inventory in response to UNFCCC reviews.

DECC has an inventory improvement programme that prioritises improvement needs for the inventory and contracts the improvement work as necessary. Needs are prioritised through consultation with stakeholders via the NISC and subsequent work is contracted through a framework contract with key inventory experts. In doing this the programme aims to ensure completeness of the inventory and reduce its uncertainty. The programme is informed by assessments of uncertainty in the inventory, the identification of key categories, the procedures to ensure quality, and the outcomes of reviews. Section 1.7 of the NIR provides details of the uncertainty analyses; Section 1.5 provides a description of the key categories and the

processes to identify them; and, Section 1.6 provides a description of the QA/QC system, and the inventory improvement programme.

The NIR provides some of the additional reporting required under Article 7, paragraph 2 of the Kyoto Protocol. Other sources of information required under Article 7, paragraph 2 are summarised in Annex 8.

The UK National Registry[6] is operated and maintained by the Environment Agency[7] on behalf of DECC.

The National Registry conforms to the technical standards for data exchange between registry systems as outlined in the Independent Assessment Report (IAR).[8] This also shows the measures that are taken to safeguard data and a description of the database structure. Procedures and security measures are employed to minimise discrepancies and prevent unauthorised changes or errors. Further information can be found in the Standard Independent Assessment Reports (SIAR) along with results of test procedures.

Information on the registry is publicly available on the Environment Agency website[9]. Section 14 of the NIR contains further information on the changes in the National Registry.

Geographical coverage used for national and international reporting

The UK inventory provides data to assess progress with the UK's commitments under the Kyoto Protocol, the UK's contribution to the EU's 2020 target and progress towards domestic targets to reduce GHG emissions.

Geographical coverage for these three purposes differs to some extent, because of the following:

- The UK contribution under the first commitment period of the Kyoto Protocol extends coverage to emissions from the CDs of Jersey, Guernsey and the Isle of Man, and the OTs that have ratified the Convention and Kyoto Protocol (the Cayman Islands, the Falkland Islands, Bermuda, Montserrat and Gibraltar). This is the geographical coverage which is currently reported to the UNFCCC.
- The UK's commitments under the EU's 2020 target only include the UK and Gibraltar, excluding all CDs and other OTs.
- The carbon budgets and targets under the UK Climate Change Act 2008 apply only to the UK excluding CDs and OTs.

Table 1 shows the total GHG emissions estimates associated with the geographical coverages of the United Kingdom, CDs and all OTs including net emissions/removals from LULUCF. Together these total the overall emissions estimates submitted to the UNFCCC. UK emissions trends are described in the next section. The emissions data presented in this chapter, covering the period from 1990 up to and including 2013 come from the UK greenhouse gas emissions statistics, published in February 2015.

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6 https://ets-registry.webgate.ec.europa.eu/euregistry/GB/index.xhtml

7 Environment Agency, PO Box 544, Rotherham, S60 1BY, Tel: +44 (0)1925 542594, email: etregistryhelp@environment-agency.gov.uk

8 http://unfccc.int/kyoto_protocol/registry_systems/independent_assessment_reports/items/4061.php

9 https://www.gov.uk/government/organisations/environment-agency

10 UK National statistics: 2013 Final UK greenhouse gas emissions: https://www.gov.uk/government/publications/final-uk-emissions-estimates

Table 1: UK GHG emissions by geographical coverage, $MtCO_2e$

	1990	1995	2000	2005	2010	2011	2012	2013
United Kingdom	807.5	758.5	720.7	694.7	611.4	564.4	580.3	566.5
Crown Dependencies	2.0	2.1	2.1	1.9	1.9	1.9	1.9	1.9
Overseas Territories (excluding Gibraltar)	1.6	1.6	1.6	1.9	1.9	1.9	1.8	1.8
Gibraltar	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.3
Total	811.2	762.4	724.7	698.7	615.5	568.4	584.3	570.5
Change from 1990	0.0%	-6.0%	-10.7%	-13.9%	-24.1%	-29.9%	-28.0%	-29.7%

Source: 2013 Final UK greenhouse gas emissions statistics[10]

Note: Aviation between UK and Crown Dependencies has been allocated to emissions from Crown Dependencies. Similarly emissions from flights between UK and Overseas Territories have been allocated to Overseas Territories.

Geographical coverage used in this report

This report presents emissions estimates based on UNFCCC coverage. Tables in this section present emissions estimates consistent with this coverage. Figure 2 shows the trend in emissions reported under the Kyoto Protocol; the geographical coverage is on a UNFCCC basis but the total emissions differ slightly. This arises due to differences in reporting of Land Use, Land Use Change and Forestry under the UNFCCC and the Kyoto Protocol. Under the UNFCCC, all emissions and removals from this sector are included, whereas under the Kyoto Protocol, only selected emissions and removals are included. This report does not further discuss these reporting differences, but the executive summary of the UK NIR contains more information.

GHG emissions trends

As shown in table 1, total emissions decreased by around 30% between 1990 and 2013. The full time series can be viewed in Annex 1 Table 1. The fluctuations in emissions between 2009 and 2012 are thought to be due to a number of one-off effects in the series – namely the recession into 2009, which reduced consumption and led to a reduction in emissions; and particularly cold weather in the UK in 2010 and 2012 that resulted in increased emissions from gas for heating.

Figure 2 shows the trend in emissions between 1990 and 2012 for the basket of six GHGs covered by the first commitment period of the Kyoto Protocol (KP), along with the emissions reduction target relating to this first commitment period. These exclude the impact of ETS trading. Annual GHG emissions for 2012 as reported for KP[11] were 583.1 $MtCO_2e$; an estimated 25.2% below the fixed base year[12] emission. This reduction has been driven by a number of factors such as the move away from coal-fired generation towards the use of natural gas and renewable sources, tighter regulation of landfills, increased utilisation of landfill CH_4 in gas flares and engines and abatement technology in adipic acid and nitric acid manufacture.

The second commitment period of the KP started in 2013. Annual GHG emissions in 2013 were an estimated 570.5 $MtCO_2e$; 29.7% below equivalent emissions in 1990. As ratification is not

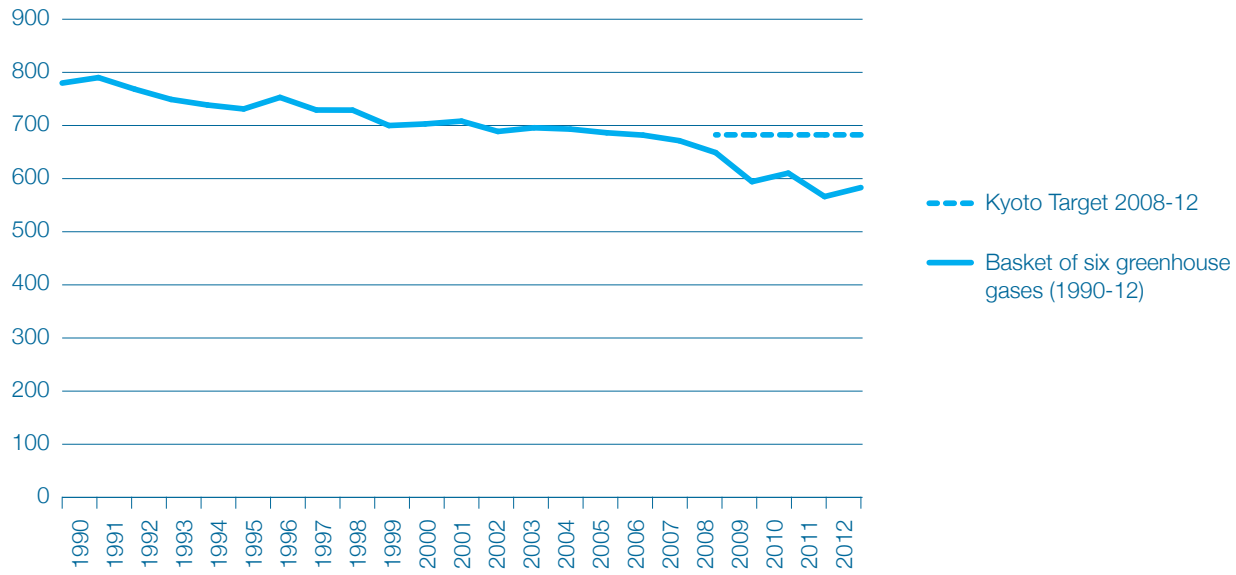
[11] Reported performance against the first commitment period of the Kyoto Protocol is fixed and therefore not affected by more recent revisions to the GHG inventory time series. As a result the 2012 emissions reported here may differ from those stated elsewhere in this report.

[12] The Base Year for emissions of carbon dioxide, methane and nitrous oxide is 1990. The Base Year for emissions of fluorinated gases (F gases) is 1995. The Fixed Base Year is taken from the UK's Initial Report under the Kyoto Protocol. This report was submitted in 2006, based on emissions reported in the 1990-2004 Greenhouse Gas Inventory, and was subject to official review in 2007. For the purposes of calculating achievement of the Kyoto Protocol target emissions occurring in this base year are now fixed, in $MtCO_2e$.

yet complete and exact details of the UK's target for the second commitment period are still being finalised, this report does not include information on the UK's progress against its second commitment period target.

Information on individual gases is contained in sections below and Annex 1 contains tables summarising the UK's GHG emissions. More details can be found in the UK's annual GHG inventory, published in October 2015.[13]

Figure 2: UK emissions of GHGs, 1990–2012, $MtCO_2e$



Source: 2013 Final UK greenhouse gas emissions statistics[10]

Note:
1. The Kyoto Protocol target line is calculated from a fixed base-year figure, as defined in the UK's Initial Report
2. These figures exclude the impact of trading in the EU ETS

GHG emissions inventory by gas

Table 2 shows historical data for CO_2 and the other GHGs. This includes the full UNFCCC coverage of the UK, its CDs and OTs. The base year for UK emissions when reporting against UNFCCC coverage is 1990. Further detailed information and analysis can be found in the UK NIR. Table 3 shows the equivalent emissions as reported against the first commitment period of the Kyoto Protocol. These figures differ on account of the Kyoto Protocol having a fixed base year and different accounting methods for LULUCF. More details on these accounting differences are provided in Chapter 4.

[13] 2015 UK National Inventory Report (NIR): http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/8812.php

Table 2: UK GHG emissions (UNFCCC coverage), $MtCO_2e$

	Base year[1]	1990	1995	2000	2005	2010	2011	2012	2013
Carbon Dioxide	599.3	599.3	563.4	561.0	559.5	502.5	459.3	477.9	469.2
Methane	137.2	137.2	130.2	114.1	92.3	67.3	64.2	61.4	56.4
Nitrous Oxide	57.2	57.2	47.3	36.7	32.2	29.0	27.8	27.8	27.7
Hydrofluorocarbons	14.6	14.6	19.6	10.5	13.2	15.7	16.0	16.2	16.3
Perfluorocarbons	1.7	1.7	0.6	0.6	0.4	0.3	0.4	0.3	0.3
Sulphur Hexafluoride	1.3	1.3	1.3	1.8	1.1	0.7	0.6	0.6	0.6
Nitrogen Trifluoride	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total GHG emissions including LULUCF[1]	811.2	811.2	762.4	724.7	698.7	615.5	568.4	584.3	570.5
Change from base year	na	0.0%	-6.0%	-10.7%	-13.9%	-24.1%	-29.9%	-28.0%	-29.7%

Source: 2013 Final UK greenhouse gas emissions statistics[10]

Note:
1. The Base Year for UNFCCC purposes is 1990

Table 3: UK GHG emissions as reported for the Kyoto Protocol, $MtCO_2e$

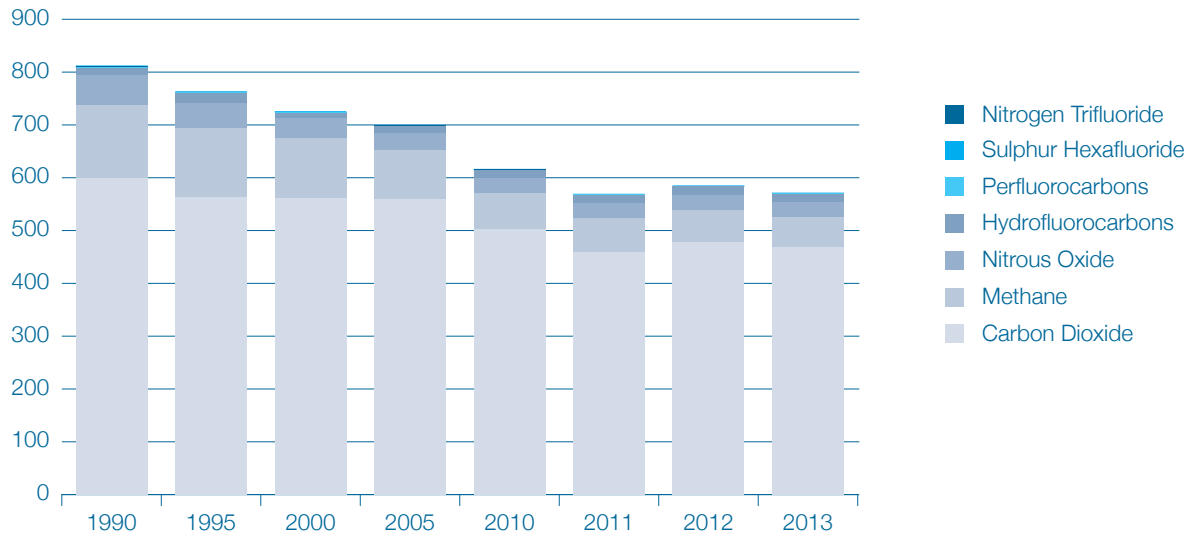
	Base year	1990	1995	2000	2005	2010	2011	2012	2013
Total GHG emissions including only mandatory Article 3.3 LULUCF activities and forest management cap under Article 3.4 LULUCF (Kyoto Protocol Definition)	779.9	782.2	731.1	702.9	686.3	610.3	566.2	583.1	:
Change from Kyoto Protocol fixed base year	na	0.0	-0.1	-0.1	-0.1	-0.2	-0.3	-0.3	:

Source: 2013 Final UK greenhouse gas emissions statistics[10]

Note: Figures exclude the impact of EU ETS trading

The sections that follow summarise the main factors affecting the historical trend by gas. Percentages and data quoted in these sections refer to the full UNFCCC geographical coverage unless otherwise specified. Tables in Annex 1 provide more detailed data available for all years from 1990-2013.

Figure 3: UK GHG emissions by gas, 1990-2013, $MtCO_2e$



Source: 2013 Final UK greenhouse gas emissions statistics[10]

Carbon dioxide

Carbon dioxide was the largest share of UK GHG emissions in 2013, making up 82% of the inventory. Net CO_2 emissions (all anthropogenic sources minus removals by sinks) in 1990 were estimated to be 599 $MtCO_2e$, or an estimated 74% of the UK's total emissions of GHGs. By 2013, CO_2 emissions estimates had been reduced by 22% to 469 $MtCO_2e$.

The main source of CO_2 is from combustion of fossil fuels. Power station emissions have contributed the most to decreases in CO_2 (by an estimated 56 $MtCO_2e$, across the period) primarily due to the move away from coal-fired generation towards the use of natural gas and renewable sources. Industrial combustion emissions have decreased due to lower fuel use, in part due to improvements in energy efficiency and fuel-switching to gas. The LULUCF sector estimates take account of changes in carbon stocks in forests and soils, based on land use and soil survey data, and on annual planting data from the Forestry Commission.

Methane

Methane is the second largest share of the UK's GHG emissions by gas. Estimated emissions of CH_4 in 1990 were 137 $MtCO_2e$, contributing an estimated 17% of the UK's total emissions of GHGs. By 2013 CH_4 emissions estimates had been reduced by 59% to 56 $MtCO_2e$, contributing an estimated 10% of UK GHG emissions in that year.

The major sources of CH_4 include the anaerobic degradation of landfill waste, enteric fermentation and waste management in the agriculture sector, leakage of natural gas from the distribution network, and emissions due to coal mining. The overall trend in CH_4 emissions is a relatively steady decline driven by a large reduction in landfill emissions. Landfill emissions estimates have decreased by 46 $MtCO_2e$ since 1990, due to tighter regulation of landfills and increased utilisation of landfill CH_4 in gas flares and engines.

Nitrous oxide

N_2O emissions contributed 57 $MtCO_2e$ or an estimated 7% of the UK's total GHG emissions in 1990. By 2013 N_2O emissions estimates had been reduced by approximately 52% to 28 $MtCO_2e$, contributing an estimated 5% of UK GHG emissions in that year.

The industrial processes sector was a major source of N_2O emissions in the 1990s. Emissions from this sector have declined significantly following the introduction of abatement technology in adipic acid and nitric acid manufacture and due to plant closures. The largest source of N_2O in 2013 is agricultural soils, accounting for an estimated 70% of total N_2O emissions. Agricultural soil emissions have declined by an estimated 16% since 1990 due to improvements in farm management practices.

Fluorinated gases (hydrofluorocarbons, perfluorocarbons, sulphur hexafluoride and nitrogen trifluoride)

Emissions of the fluorinated or industrial gases are small in absolute terms, but their significance is increased by high GWP values, see CTF Table 2(c). For the purpose of accounting under the Kyoto Protocol, the UK has chosen to use 1995 as the base year for emissions of HFCs, PFCs, SF_6 and NF_3. This is in line with the approach adopted by the majority of EU member states. Comparisons for F gases will therefore be made against both 1990 and 1995 emissions. Emissions estimates of the F gases totalled 17 $MtCO_2e$ in 2013. Since 1995 the overall decrease in their emissions has been an estimated 20%, due mainly to the fall in emissions from F gas manufacture, due to the installation of abatement equipment at two of the three manufacturers and to plant closures. Emissions in 2013 were 2% below 1990 where emissions were 17 $MtCO_2e$. Emissions from certain end-use sectors, such as refrigeration, are continuing to grow.

HFC emissions in 2013 were 12% higher than the level of HFC emissions in 1990 due to greater use in industry replacing other ozone depleting substances, but since 1995 have reduced by 17%. The largest contribution to this sector in 2013 arises from refrigeration and air conditioning equipment. In 2013, these contributed an estimated 81% to the overall emissions of HFCs. Emissions from this category arise due to leakage from refrigeration and air conditioning equipment during its manufacture and lifetime. Emissions from aerosols contribute the next largest percentage (estimated to be 13%) of overall HFCs emissions. In this category, it is assumed that all the fluid is emitted in the year of manufacture. This category contains mainly industrial aerosols and also metered dose inhalers. Emissions from manufacture of HFCs and Hydrochlorofluorocarbons (HCFCs) have decreased by an estimated 99.7% since 1990, due to plant closures and the installation of abatement equipment.

PFCs emissions have declined by an estimated 58% since 1995 and 85% since 1990. The main source of PFCs emissions in 2013 was electronic equipment.

The use of SF_6 has most commonly been in magnesium foundries, high voltage switch gear and in the electronics industry. The level of SF_6 emissions has always been small. In 2013 this level was 0.6 $MtCO_2e$, 0.7 $MtCO_2e$ lower (around half) the emissions in 1990. The main emissions source was insulation of electrical equipment.

NF_3 was introduced into the 1990-2013 GHG inventory for the first time. Emissions from NF_3 are small, around 362 tCO_2e, which is estimated to be a small reduction from 1990 levels (around 415 tCO_2e). Emissions from this gas are seen in the electronics industry.

Sectoral emissions – by source

Table 4 shows the contribution to UK GHG emissions of different sectors by emissions source. By-source reporting shows emissions from the energy supply industry separately to the other sectors. Annex 1 Table 1 contains more detailed data available for all years from 1990-2013.

Energy was responsible for an estimated 469 $MtCO_2e$ or 82% of net GHG emissions in 2013. Overall, between 1990 and 2013, there has been an 13% increase in the amount of electricity supplied. The restructuring of the energy supply industry in the mid-1990s led to a significant decrease in emissions to 1999, as there was a strong move away from coal and oil generation towards use of gas. Between 1999 and 2006 emissions increased, due to the volatile and high gas price and the corresponding switching from gas to coal. This is evident through fluctuations in overall energy emissions over this period between a low of 553 $MtCO_2e$ in 1999 and a high of 569 $MtCO_2e$ in 2001. Emissions data by individual years are available in Annex 1. However between 2006 and 2013, emissions have again decreased. Most of this decrease has resulted from changes in the mix of fuel being used for generation, together with greater efficiency due to improvements in technology.

Table 4: UK GHG emissions by source sector (UNFCCC coverage), $MtCO_2e$

	1990	1995	2000	2005	2010	2011	2012	2013
1. Energy	610.8	566.9	559.4	556.5	503.2	461.3	480.4	468.9
2. Industrial processes and product use	66.4	61.1	41.1	39.5	34.5	32.7	32.7	34.6
3. Agriculture	60.5	59.5	56.4	52.5	50.3	50.2	49.7	49.5
4. Land Use, Land-Use Change and Forestry	4.0	3.3	0.8	-2.9	-4.3	-4.8	-5.0	-5.2
5. Waste	69.5	71.6	66.9	53.2	31.7	29.1	26.5	22.7
6. Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total (including LULUCF)	811.2	762.4	724.7	698.7	615.5	568.4	584.3	570.5

Source: 2013 Final UK greenhouse gas emissions statistics[10]

Note: The information covered in sector-based tables are by IPCC sector, which differs from sectors used nationally.

Further details for each sector can be found in the UK NIR describing factors such as a detailed source description, methodology and sources contributing to the sector.

Sectoral emissions – by end-user

Table 5 shows GHG emissions by sector on an end-user basis. The same overarching trends are observed. Emissions by end-user attributes the emissions from energy supply industry to the end-user of that energy rather than the source. When reported on this basis the geographical coverage presented includes the UK and CDs. Emissions from OTs are not included in the end-user analysis and as a result sectoral emissions totals will be slightly lower than their by-source equivalents where the energy sector does not impact (such as LULUCF), but are included as their own row in the table to ensure overall total emissions are consistent with UNFCCC coverage. Emissions by end user are included in this chapter as additional information only for descriptive purposes. Policies and measures are based on emissions by source discussed earlier in this chapter.

The “exports” sector represents emissions associated with the production of fuels within the UK (for example, from a refinery or a coal mine) which are subsequently exported or sent to bunkers for use outside the UK. Since these fuels are ultimately used for activities which occur outside the UK, it would not be appropriate to allocate the emissions from their production to any of the other sectors, hence they are reported separately.

Table 5: UK GHG emissions by end-use sector (UNFCCC coverage), $MtCO_2e$

IPCC sector	1990	1995	2000	2005	2010	2011	2012	2013
1. Energy	596.1	548.8	542.3	536.6	484.3	442.6	463.6	452.6
2. Industrial processes and product use	70.4	64.5	43.7	40.7	35.6	33.6	33.5	35.1
3. Agriculture	60.2	59.2	56.1	52.2	50.1	50.0	49.5	49.3
4. Land Use, Land-Use Change and Forestry (LULUCF)	4.0	3.3	0.8	-2.9	-4.3	-4.8	-5.0	-5.3
5. Waste	69.4	71.5	66.8	53.1	31.6	29.0	26.3	22.6
Exports	9.3	13.3	13.1	16.9	16.2	15.8	14.3	13.9
Overseas territories	1.8	1.8	1.9	2.1	2.2	2.2	2.1	2.1
Total (including LULUCF)	811.2	762.4	724.7	698.7	615.5	568.4	584.3	570.5

Source: 2013 Final UK greenhouse gas emissions statistics[10]

Note: The information covered in sector-based tables are by IPCC sector, which differs from sectors used nationally.

Energy

Emissions by end-user attributes the emissions from energy supply industry to the end-user of that energy rather than the source; as a result emissions from energy industries are allocated elsewhere.

Outside of the energy supply industries, 453 $MtCO_2e$ or 79% of end-use emissions in 2013 came from the energy sectors.

Table 5a: UK GHG emissions by energy end use sector and sub-sectors (UNFCCC coverage), $MtCO_2e$

IPCC sector	1990	1995	2000	2005	2010	2011	2012	2013
1. Energy	596.1	548.8	542.3	536.6	484.3	442.6	463.6	452.6
A. Fuel combustion (sectoral approach)	596.1	548.8	542.3	536.6	484.3	442.6	463.6	452.6
1. Energy industries	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2. Manufacturing industries and construction	229.6	195.3	191.4	182.2	151.8	141.2	145.9	142.3
3. Transport	132.9	137.8	142.7	147.0	133.7	131.6	130.7	128.9
4. Other sectors	227.6	211.2	204.9	204.2	195.5	166.7	184.2	178.8
5. Other	6.0	4.5	3.4	3.2	3.3	3.1	2.8	2.6
B. Fugitive emissions from fuels	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1. Solid fuels	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2. Oil and natural gas and other emissions from energy production	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C. CO_2 transport and storage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Energy sub-sectors: Manufacturing industries and construction

The manufacturing industries and construction sub-sector covers emissions from stationary combustion in all industrial sectors and industrial off-road machinery. End-user emissions in this sub-sector have fallen since 1990 in this sector. In 2013, emissions from this sub-sector were estimated to be 38% below 1990 levels and represented an estimated 25% of total emissions. A number of factors contributed to this decrease; primarily due to a reduction in emissions from industrial combustion (including iron and steel).

Energy sub-sectors: Transport

This sub-sector includes emissions from domestic aviation, road transport, diesel railways, domestic shipping (coastal, inland waterways), and aircraft support vehicles. Transport accounted for around 23% of UK GHG emissions in 2013, representing a reduction of 3% since 1990. Road transport is the most significant source of emissions in this sector and in particular emissions from passenger cars heavily influence the transport category. Although there has been an increase in both the number of passenger vehicles and the vehicle kilometres travelled, there has been a decrease in emissions from passenger cars due to an increase in vehicle efficiency and lower petrol consumption outweighing an increase in diesel consumption.

Energy sub-sectors: Other sectors

A further 181 $MtCO_2e$ or 32% of end-use emissions reductions were seen in other areas of the energy sector. Over three quarters of the emissions in this category in 2013 came from fuel combustion for domestic uses such as heating, cooking, and garden machinery. Since 1990 emissions from domestic combustion have fallen by 29%. This net change was the result of interactions between several much larger individual contributions over the decade. Three factors have had a major influence: a growth in demand for underlying energy services (such as warmer homes, hot water and home entertainment); improvement in energy efficiency; and reduction in the carbon intensity of grid electricity.

Agriculture and land use, land use change and forestry

The agriculture sector includes emissions from livestock and agricultural soils. There are also small amount of emissions of CO_2 from the breakdown of pesticides. In 2013, end-user GHG emissions from agriculture, forestry and land use combined were estimated to be 44 $MtCO_2e$ or 8% of total UK GHG emissions. This includes net emissions and removals from LULUCF.

Table 5b: UK GHG emissions by agricultural end use sector and sub-sectors (UNFCCC coverage), $MtCO_2e$

IPCC sector	1990	1995	2000	2005	2010	2011	2012	2013
3. Agriculture	60.2	59.2	56.1	52.2	50.1	50.0	49.5	49.3
A. Enteric fermentation	28.1	27.7	26.9	25.1	23.8	23.7	23.6	23.5
B. Manure management	6.8	6.7	6.3	5.7	5.3	5.3	5.3	5.3
C. Rice cultivation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D. Agricultural soils	23.1	22.9	21.9	20.4	19.7	19.6	19.4	19.5
E. Prescribed burning of savannas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
F. Field burning of agricultural residues	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
G. Liming	1.6	1.7	0.9	0.8	0.9	1.0	0.8	0.8
H. Urea application	0.4	0.2	0.1	0.2	0.3	0.4	0.3	0.2
I. Other carbon-containing fertilizers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
J. Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Joint annual emissions from these sectors have fallen by an estimated 31% between 1990 and 2013. The fall in emissions is the result of decreasing animal numbers and fertiliser use, plus expanded forest area and a tendency towards less intensive agriculture.

Table 5c: UK GHG emissions by LULUCF end use sector and sub-sectors (UNFCCC coverage), $MtCO_2e$

IPCC sector	1990	1995	2000	2005	2010	2011	2012	2013
4. Land Use, Land-Use Change and Forestry	4.0	3.3	0.8	-2.9	-4.3	-4.8	-5.0	-5.3
A. Forest land	-16.0	-15.6	-17.1	-18.7	-17.8	-17.8	-17.2	-17.2
B. Cropland	15.8	16.1	15.6	14.0	13.1	12.9	12.7	12.5
C. Grassland	-3.7	-4.2	-4.1	-4.6	-5.3	-5.7	-5.8	-5.9
D. Wetlands	0.5	0.7	0.5	0.5	0.4	0.4	0.3	0.3
E. Settlements	7.3	7.0	6.7	6.4	6.3	6.3	6.2	6.2
F. Other land	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
G. Harvested wood products	0.0	-0.6	-0.8	-0.7	-1.0	-0.9	-1.1	-1.1
H. Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

For the LULUCF sector, emissions measured by end-user are the same as those measured by source, since no emissions from energy supply are reallocated to LULUCF. However, the totals above will differ slightly from the tables by source because the emissions from OTs are omitted from end-user analysis. The UK has moved from being a net source of CO_2 from LULUCF activities in 1990 to a net sink for all years since 2001. The size of the net sink has increased over time, from -0.1 $MtCO_2e$ in 2001 to -5.3 $MtCO_2e$ in 2013 (though by source emissions in 2013 were -5.2 $MtCO_2e$, accounting for emissions from OTs). The land use categories which have the greatest effect on the net LULUCF emissions/removals are forest land (a net sink), cropland (a net source), settlement (a net source) and grassland (a net sink). Forest land is currently a decreasing sink due to the decreasing average age of trees as a consequence of historically low rates of afforestation during the 1990s. Emissions from cropland have decreased by 21% since 1990. Net removals from grassland have decreased by 60% since 1990.

Industrial processes

The industrial processes sector contains all emissions from industry except for those associated with fuel combustion. Sources include metal production, mineral products (cement and lime) and chemical production. Industrial processes (end-use) emissions have decreased by an estimated 50% since 1990. The largest reductions are from the chemical manufacturing industry, most notably the abatement of N_2O emissions from nitric and adipic acid manufacture in response to Integrated Pollution Prevention Control.

Table 5d: UK GHG emissions by industrial end use sector and sub-sectors (UNFCCC coverage), $MtCO_2e$

IPCC sector	1990	1995	2000	2005	2010	2011	2012	2013
2. Industrial processes	70.4	64.5	43.7	40.7	35.6	33.6	33.5	35.1
A. Mineral industry	9.8	8.6	8.7	8.5	5.6	6.0	5.5	5.9
B. Chemical industry	45.7	40.5	16.1	10.6	7.3	5.7	6.2	5.6
C. Metal industry	12.5	10.2	9.5	7.0	4.8	4.3	4.0	5.8
D. Non-energy products from fuels and solvent use	1.2	2.3	1.2	1.1	1.6	1.2	1.1	1.0
E. Electronic industry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
F. Product uses as ODS substitutes	0.2	1.9	7.1	12.6	15.5	15.9	16.1	16.2
G. Other product manufacture and use	1.0	1.0	1.1	0.9	0.6	0.6	0.6	0.6
H. Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Waste

The waste management sector includes emissions from waste disposed to landfill sites, waste incineration, and the treatment of waste water. Emissions from disposal of waste have decreased by an estimated 74% since 1990, primarily due to the decline in CH_4 emissions. This decrease has been realised mainly due to tighter regulation of landfills, through fitting of CH_4 recovery systems on landfills, and increasing diversion of biodegradable waste from landfill, plus more diversion away from landfills in response to the UK landfill tax and policies to meet the requirements of the EU Landfill Directive.

Table 5e: UK GHG emissions by waste end use sector and sub-sectors (UNFCCC coverage), $MtCO_2e$

IPCC sector	1990	1995	2000	2005	2010	2011	2012	2013
5. Waste	69.4	71.5	66.8	53.1	31.6	29.0	26.3	22.6
A. Solid waste disposal	62.7	65.2	60.9	47.3	25.7	22.9	20.4	16.6
B. Biological treatment of solid waste	0.0	0.0	0.2	0.7	1.1	1.2	1.2	1.3
C. Incineration and open burning of waste	1.5	1.0	0.6	0.5	0.3	0.3	0.3	0.3
D. Waste water treatment and discharge	5.3	5.3	5.2	4.7	4.4	4.5	4.4	4.4
E. Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Uncertainties

The UK GHG inventory uses error propagation and Monte Carlo simulation methods to estimate uncertainties for GWP weighted emissions of all GHGs. The uncertainty estimates from the Monte Carlo method are summarised in Table 6.

Estimated emissions of CO_2, which dominate GWP weighted emissions, have a low uncertainty of around 2%. There are much larger uncertainties associated with emissions of N_2O and CH_4 and the source which makes the major contribution to the overall uncertainty of the UK GHG inventory is agricultural soils.

The table demonstrates the estimated uncertainties by GHG, as well as overall uncertainty on total UK GHG emissions, which is 4% in 2013. The analysis of the uncertainties for N_2O is particularly difficult because the sources are diverse and there is little data available to form an assessment of the uncertainties in each source. To put this into context the central estimate of N_2O emissions was 28 $MtCO_2e$, the uncertainty analysis resulted in a 95% confidence interval of 18 to 50 $MtCO_2e$ in 2013.

The likely percentage change between 2013 and 1990 lies between -27% and -33%, with a central estimate of -30%. The uncertainty in the trend of emissions is smaller than the overall uncertainty on the emissions total in a given year. The uncertainty in the trend between years (as a percentage change) is likely to be less than the uncertainty in a given year because the methodology used is consistent throughout the time-series. Therefore, there is more certainty in the trend in emissions than the absolute emissions themselves. This gives more confidence in assessing compliance with percentage reduction targets, where it is the trend that is important.

Table 6: Summary of Monte Carlo uncertainty estimates 1990-2013 (UNFCCC coverage)

	GWP[1]	1990 emissions[2] (thousand tonnes CO_2 equivalent)	2013 emissions[2] (thousand tonnes CO_2 equivalent)	Uncertainty[3] in 2013 emissions	Percentage change between 2013 and 1990	Range of uncertainty in 2013 emissions (thousand tonnes CO_2 equivalent) 2.5 percentile	97.5 percentile	Range of likely % change between 1990 and 2013[4] 2.5 percentile	97.5 percentile
Carbon Dioxide[5]	1	599,341	469,209	2%	-22%	459,112	479,454	-23%	-20%
Methane	25	137,343	56,456	19%	-58%	46,864	68,331	-68%	-47%
Nitrous Oxide	298	57,054	27,781	58%	-51%	17,597	49,566	-67%	-35%
Hydrofluorocarbons	12 -14,800	14,553	16,263	9%	12%	14,876	17,664	-5%	34%
Perfluorocarbons	7,390 - 17,340	1,652	254	25%	-85%	196	321	-88%	-80%
Sulphur Hexafluoride	22,800	1,279	602	10%	-53%	539	663	-59%	-45%
Nitrogen Trifluoride	17,200	0.4	0.4	47%	-13%	0.2	0.5	-55%	74%
All GHGs weighted by GWP[1]		811,221.5	570,565.1	4%	-30%	551,861.2	596,612.9	-33%	-27%

Source: 2013 Final UK greenhouse gas emissions statistics

Notes:
1. The GWP (Global Warming Potential) of a greenhouse gas measures its effectiveness in global warming over 100 years relative to carbon dioxide.
2. 1990 and 2013 estimates, and the percentage change, are presented as the central estimate from the model. These differ from the actual emissions estimates.
3. Expressed as a percentage relative to the mean value 2013 emissions. Calculated as 0.5*R/E where R is the difference between 2.5 and 97.5 percentiles and E is the mean.
4. Equivalent to a 95 per cent probability that the percentage change between 1990 and 2013 is between the two values shown. Values include uncertainties for overseas territories data.
5. CO_2 emissions are net emissions. Total emissions minus removals.
6. Figures include emissions for the UK, Crown Dependencies and the Overseas Territories. Uncertainties are not calculated for different geographical coverages but would be expected to be similar.

Changes since the last Biennial Report

Since the publication of the UK's first Biennial Report in December 2013[14], various updates and revisions to methodologies have been implemented in the UK's GHG inventory that have impacted on the time-series of emissions. The most significant changes have been highlighted in Table 7 below. Further information about changes to the inventory can be found in the NIR.

Table 7: Major revisions to the UK GHG inventory since publication of the first Biennial Report

Change	Effect on inventory
New methods of estimating agriculture emissions	**Increase in estimated methane and nitrous oxide emissions from agriculture.**
Update of cropland on organic soils	**Increase in estimated carbon dioxide emissions from LULUCF.**
General updates required by IPCC guidelines	**Increase in net estimated GHG emissions and Nitrogen Trifluoride now included in the GHG inventory.**
Updated Global Warming Potentials (GWPs) as a result of IPCC guidelines	**The GWP for methane increased from 21 to 25 and the GWP for nitrous oxide has decreased from 310 to 298, meaning that when expressed by CO_2 equivalent methane emissions increased and nitrous oxide decreased.**
New information on emissions from landfill sites	**Increase in estimated methane emissions from Waste Management in 1990 but a decrease in 2012.**
Revisions to allocation of manure to various management systems	**Increase in estimated methane emissions from Waste Management.**
A number of changes have been made to the LULUCF sector including changes to modelling methodology for Forest Land and update of cropland on organic soils	**Decrease in estimated emissions from LULUCF in the 2013 GHG inventory compared with 2012, but later increased due to the update of cropland on organic soils in the 2014 GHG inventory.**

Source: National Inventory Report[1]

[14] The First Biennial Report was published in Annex 1 of the UK's Sixth National Communication: http://unfccc.int/files/national_reports/annex_i_natcom/submitted_natcom/application/pdf/uk_6nc_and_br1_2013_final_web-access[1].pdf

Table 1 in Annex 1 provides further information on GHG emissions and trends.

Quality assurance & quality control

The current UK GHG inventory complies with the relevant IPCC Guidelines and Good Practice Guidance. The inventory agency is fully accredited to ISO 9001 standards that provide institutional standards that the agency must apply to all projects. Much of the data received by Ricardo Energy & Environment for the UK GHGI compilation come from other government departments, agencies, research establishments or consultants working on behalf of UK government or for trade associations. Some of the organisations (e.g. DECC, the Office for National Statistics and the British Geological Survey) qualify as the UK's National Statistical Agencies and abide by strict statistical QA and QC standards. Other organisations (e.g. CEH, providing the LULUCF estimates; and the Environment Agency, providing regulated point source emissions data) supply important datasets for the inventory and have their own QA/QC systems.

Whilst these organisations have their own QA/QC systems, Ricardo Energy & Environment is responsible for co-ordinating inventory-wide QA/QC activities relating to the submitted datasets. In addition, Ricardo Energy & Environment works continuously with organisations supplying data to the GHG inventory to encourage them to demonstrate their own levels of QA/QC that comply with either IPCC Good Practice Guidance or the UK's Official Statistics standards.

The inventory has a well-developed QA/QC plan, which is described in section 1.6 of the NIR. This plan includes procedures to ensure the timely reporting of the NIR and CRF tables, and the archiving of all relevant information. The QA/QC plan oversees the calculation of GHG estimates and reporting to the UNFCCC and EUMM, and calculation of estimates and reporting to UK National Statistics. The key objective of the QA/QC plan is to ensure that the estimates in the GHG inventory are of a suitably high quality, and in achieving this, meet the principles of transparency, completeness, consistency, comparability and accuracy which govern the generation of all GHG inventories. Specific responsibilities have been assigned to the different QA (review) and QC (checking) activities and to different roles within the compilation and reporting process. A QA/QC manager co-ordinates all QA/QC activities. The QA/QC plan is maintained by the inventory's QA/QC manager. The plan defines the specific quality objectives and QA/QC activities required in undertaking the compilation and reporting of GHG estimates. The plan also assigns roles and responsibilities to inventory staff, and provides a timeline for completion of QA/QC activities. An overview of the UK's GHG inventory QA/QC system is illustrated in Figure 38.

To verify the emissions levels and trends reported in the GHG inventory DECC maintains a research programme of high-frequency, high-precision measurements of atmospheric trace gases at the Mace Head research station, in the Republic of Ireland. Three additional UK-based monitoring stations were also established as part of DECC's GHG inventory verification programme: Angus Tower, in Angus, Scotland; Tacolneston Head, in Norfolk; and Ridge Hill, in Herefordshire. Angus Tower was replaced by Bilsdale, Yorkshire in 2015. The observations enable estimates of UK emissions to be derived using an inversion modelling technique, known as InTEM, which provides an important cross-check for the GHG inventory. The UK is one of very few countries verifying its inventory in this manner.

Indirect greenhouse gases

The indirect GHGs emitted in significant volumes in the UK consist of nitrogen oxides (NO_x), carbon monoxide (CO), Non-CH_4 Volatile Organic Compounds (NMVOC) and sulphur dioxide (SO_2). Of these, NO_x, CO and NMVOC can increase tropospheric ozone concentration and hence radiative forcing. SO_2 contributes to aerosol formation in the atmosphere. This is believed to have a negative net radiative forcing effect, tending to cool the surface. Table 8 shows emissions from these gases since 1990.

Table 8: Indirect GHG emissions ($KtCO_2e$)

	1990	1995	2000	2005	2010	2011	2012	2013
Nitrogen oxide	2,892	2,325	1,805	1,593	1,127	1,055	1,078	1,024
Carbon monoxide	9,022	7,472	5,598	3,533	2,209	2,031	1,996	1,989
Non-methane volatile organic compounds	2,729	2,209	1,571	1,139	858	838	826	805
Sulphur dioxide	3,692	2,374	1,226	712	429	393	442	395

Source: National Inventory Report[1]

Total emissions of CO in 2013 were 1,989 $KtCO_2e$, and since 1990, emissions have decreased by 78%. A significant part of this reduction was from transport and was due the increased use of three way catalysts and fuel switching from petrol to diesel cars.

In 2013, total emissions of NOx were 1,024 $KtCO_2e$, and since 1990, emissions have decreased by 65%. The majority of this reduction was from the energy supply sector and due to abatement measures on power stations, three-way catalysts fitted to cars and stricter emissions regulations on trucks.

For SO_2 total emissions in 2013 were 395 $KtCO_2e$, and since 1990, emissions have decreased by 89%. The reductions arise mainly from the energy supply sector due to the increase in the proportion of electricity generated by combined cycle gas turbine (CCGT) stations which are more efficient than conventional coal and oil stations and have negligible SO_2 emissions.

NMVOCs total emissions for 2013 were 805 $KtCO_2e$, and since 1990, overall emissions have decreased by 71%. This has been due to various reasons, but the biggest contributor to the decrease was from the solvent and other product use sector. This sector includes; paint application, degreasing, dry cleaning and chemical products, manufacture and processing.

Chapter 2: Quantified economy-wide emission reduction (QEWER) target and progress

Introduction

The UK is committed to taking action on climate change. We need to reduce our greenhouse gas (GHG) emissions and make our transition to a clean, low-carbon economy. This is about taking action in every sector in the economy – our homes, businesses, transport and agriculture. This chapter sets out the GHG emissions reductions commitments that require action from the UK. The UK has already taken significant action to reduce emissions with most recent data showing that the UK is 30% below 1990 emission levels and is on track to meet the 34% 2020 carbon reduction target under the Climate Change Act.

The Kyoto mechanisms

The UK's Kyoto target for the first commitment period (2008 –12) was to achieve an average reduction of 12.5% compared to the fixed base year emissions (1995 for F gases and 1990 for all other gases). Our emissions statistics indicate that in 2012 UK emissions were 25.2% below fixed base year levels on a territorial emissions basis and 23.5% below after allowing for trading of permits in the EU Emissions Trading System (ETS). The UK therefore met its Kyoto Protocol (KP) first commitment period target.

Under the second commitment period (2013 – 2020) the EU has a collective target to reduce its emissions by 20% relative to base year levels over the period. The burden sharing agreement, set out for the Doha Amendment, translates efforts agreed under the EU 2020 Climate and Energy Package into the second commitment period of the KP. Under the EU Climate and Energy Package that sets targets for 2020, the EU's target is distributed between Member States to reflect their national circumstances, requirements for economic growth and scope for further emissions reductions. This resulted in a UK target to reduce emissions in the non-traded sector by 16% below 2005 levels by 2020. The UK's allocated emissions level for the second commitment period of the KP is set in line with this target, but also covers emissions from the Land Use, Land Use Change and Forestry (LULUCF) sector, which is not part of the EU 2020 target. UK emissions from the traded sector of the EU ETS are managed centrally by the Union and are not counted towards our UK target as set out in the EU's joint fulfilment agreement for the Doha Amendment. The UK's base year for assessing emissions of CO_2, CH_4, and N_2O is 1990. The UK has chosen to use 1995 as the base year for emissions of the F gases: HFCs, PFCs, SF_6 and NF_3. This is in line with most other EU member states, and in accordance with Article 3.8 of the KP.

European Union target

Alongside the EU and its Member States, the UK (plus Gibraltar) agreed to reduce economy-wide emissions by at least 20% by 2020 compared with 1990 levels. This target is fulfilled jointly between the EU Member States. The 20% emission reduction target by 2020 is unconditional and supported by the climate and energy package in place since 2009.

The reduction effort is shared out as follows:

- a 21% reduction in emissions from sectors covered by the EU ETS compared to 2005 levels;
- around 10% reduction from most other sectors compared to 2005. These sectors are covered by the Effort Sharing Decision (ESD).

Since a single, EU-wide cap on EU ETS emissions has been introduced from 2013, the effort-sharing arrangement between Member States under the ESD has been determined solely for the reduction in emissions from non-traded sectors that are not covered by the EU ETS.

The European Emissions Trading System

The EU ETS was established in 2003 by Directive 2003/87/EC and is the largest emissions trading system in the world. In the UK, the system covers around 900 installations and it covered around 40% of the UK's GHG emissions in 2013.[15] The EU ETS incentivises participants from the EU Member States and the three participating non-EU Member States (Norway, Iceland and Liechtenstein) to reduce emissions by placing a cap on total EU GHG emissions from the power and industrial sectors and enabling trading of allowances to ensure emissions reductions are delivered cost efficiently.

The current phase of the EU ETS (phase III 2013 – 20) builds upon the previous two phases and has been significantly revised to improve its effectiveness and functioning including an increase in the proportion of allowances that are auctioned. Since 2012 the EU ETS has also covered aviation emissions from flights within the EU (i.e. those departing from and arriving at an airport within the EU).

The phase III EU cap will reduce the number of available allowances by 1.74% each year, delivering an overall reduction of 21% below 2005 verified emissions by 2020. Many industrial sectors covered by the EU ETS are provided with free allocation of allowances in order to reduce the risks to their competitiveness that could result from the cost of purchasing allowances.

Besides free allocation, installations in the EU ETS can meet their obligations by purchasing allowances, which might come from installations in other EU countries, government auctions, or credits from the KP project mechanisms. This means that the emissions reductions in the EU ETS will not necessarily take place in the UK, nor will they necessarily be CO_2. While DECC leads on designing the policy, the Environment Agency leads on its administration.

Auctioning under the EU ETS

Auctioning is an effective way of distributing allowances to the market and reinforces the 'polluters pay' principle. It encourages businesses to take account of the full cost of carbon in the decisions they make. For phase III over 50% of allowances will be auctioned across the EU. This includes full auctioning for the power generation sector in the UK and most Member States.

[15] Total emissions here refers to emissions from the UK plus those from Gibraltar.

The European Commission's Auctioning Regulation governs the auctioning of phase III European Union allowances (EUAs) and European Union aviation allowances (EUAAs). It provides for the establishment of a common EU auction platform and grants member states the right to opt out and set up national platforms – the UK, Germany and Poland exercised this right. The UK's first phase III EUA auction was held on 21 November 2012.

Effort Sharing Decision

The ESD establishes binding annual GHG emission targets for Member States for the period 2013 – 2020. These targets concern emissions from most sectors not included in the EU ETS such as transport (except aviation and international maritime shipping which were included in the EU ETS from 1st January 2012), buildings, agriculture and waste. Emissions from LULUCF are not included. The UK's ESD target is a reduction of 16% compared to 2005 GHG emissions levels by 2020.

By 2020, the UK's national target along with other Member State targets will collectively deliver a reduction of around 10% in total EU emissions from the sectors covered compared with 2005 levels.

Geographical differences between the QEWER EU Target and the Chapter Projection of GHG emissions

Chapter 4 provides UK projections of GHG emissions, these projections are based on a different scope to the QEWER EU Target. Consequently these emissions do not directly align. The main differences in scope are:

Aviation:

The scope of the EU ETS is largely additional to the IPCC inventory as the EU ETS includes CO_2 emissions from flights between EU member states, emissions which are otherwise included in the Memo Item: International Aviation Bunkers.[16]

Geographical coverage:

The UK's EU target only applies to the UK and its Overseas Territory (OT) of Gibraltar. As the UK's Crown Dependencies (CDs) and its other OTs that have signed up to the UNFCCC and the KP are not in the EU, and EU targets do not apply, a geographical scope adjustment needs to be made to both inventory and projections to remain consistent with the scope of the target.

LULUCF:

LULUCF is excluded from the EU Target.

UK emission reduction targets

UK Climate Change Act 2008

The UK passed the Climate Change Act in November 2008, introducing the world's first long-term legally binding framework to reduce GHG emissions. The Act is the central piece of legislation that governs the UK approach to tackling climate change.

The Climate Change Act 2008 provides the framework for our domestic action, binding this and future governments to a target to reduce GHG emissions by at least 80% below the 1990 baseline by 2050 and by at least 34% by 2020. It also established a series of carbon budgets to help us on our pathway to 2050. These budgets set a limit on the amount of GHGs we can emit

[16] http://www.emissieregistratie.nl/erpubliek/documenten/Lucht%20(Air)/IPCC%20protocollen/Greenhouse%20gasses%20protocol/memo_CO2_CH4_N2O_international_bunkers_NIR2014.pdf

over a five year period. We will be setting the fifth carbon budget, covering the period from 2028 to 2032, by the end of June 2016.

Table 9: UK Carbon budgets

	First carbon budget (2008-12)	Second carbon budget (2013-17)	Third carbon budget (2018-22)	Fourth carbon budget (2023-27)
Carbon budget levels ($MtCO_2e$)	3,018	2,782	2,544	1,950
Percentage reduction below base year levels[1]	-26%	-31%	-37%	-52%

Source: Carbon Plan, 2011[17]

Note:
1. The percentage reduction is compared to the base year as reported in the most recent Annual Statement of Emissions[18]

Coverage of the targets set out in the Climate Change Act comprises UK territory only (i.e. England, Wales, Scotland and Northern Ireland) and not our CDs or OTs. They cover both the traded and non-traded sector, with the traded sector cap based on the UK's allocated share of allowances under the EU ETS. Legislated budgets include the impact of LULUCF, but exclude International aviation and shipping.

The base year consists of emissions of CO_2, CH_4, and N_2O in 1990, and of HFCs, PFCs and SF_6 in 1995. It also includes an allowance for net emissions from the LULUCF sector in 1990. The baseline is revised annually.

Achieving the targets

Under the Climate Change Act the Government must set out plans to meet carbon budgets and the 2050 target. In 2011, the Government published the Carbon Plan, which set out proposals for achieving the emissions reductions committed to in the first four carbon budgets, on a pathway consistent with meeting the 2050 target.[17]

Further information about policies and measures are detailed in Chapter 3.

Monitoring progress and methodology

The Climate Change Act set up the independent Committee on Climate Change (CCC) to provide advice on climate change. The Government takes into account the advice of the CCC when setting the level of carbon budgets, as well as taking into account a range of matters set out in the Act and representations by the Devolved Administrations of Scotland, Wales and Northern Ireland.

The UK government's approach to managing carbon budgets centres on a series of annually published reports:

- An annual statement of emissions which shows what emissions were in the past year and where they came from (Annual statement of emissions for 2015);[18]

[17] 2011 Carbon Plan: https://www.gov.uk/government/publications/the-carbon-plan-reducing-greenhouse-gas-emissions--2

[18] Annual Statements of Emissions: https://www.gov.uk/government/collections/annual-statements-of-emissions

- An annual report from the independent Committee on Climate Change on progress against carbon budgets (Meeting Carbon Budgets – 2015 Progress Report to Parliament);[19]
- Government's response to the Committee on Climate Change's annual progress report (Committee on Climate Change progress report: government response 2015);[20] and
- Energy and emissions projections, which assess the expected impact of our policies on future emissions trends (Energy and emissions projections: 2015).[21]

The Net Carbon Account

Each carbon budget is split into:

- a traded sector, which covers power and heavy industry and for which the limit is based on the UK's allocated share of allowances under the EU ETS cap for the relevant period; and
- a non-traded sector, which covers everything else, for example road transport, agriculture and buildings.

To calculate UK performance against these targets, data are taken from the UK GHG Inventory (as detailed in Chapter 1). The data are then adjusted to take into account removals of emissions from the atmosphere by carbon sinks associated with LULUCF activity, which provides net UK emissions. This total is then further adjusted to ensure that UK emissions in the traded sector are taken to be the same as the UK's allocated share of allowances under the EU ETS cap and to take into account any carbon units that have been bought from (or sold to) a third party outside the UK or otherwise disposed of. Once net UK emissions have been adjusted for trading the new total is referred to as the 'UK net carbon account' and is the value that is then compared against the base year. The detailed rules for these calculations are contained in the Carbon Accounting Regulations 2009 and 2015.

Further details on the approach to counting emissions and removals from the LULUCF sector can be found in Chapter 1. International aviation and shipping emissions are not currently included within legislated carbon budgets.

Progress to quantified economy-wide emission reduction target (QEWER)

Effort sharing decision

The compliance assessment for the first year 2013 under the ESD will not take place until 2016. Estimated performance based on submitted inventory suggests that the UK has met its first annual ESD target by around 14 $MtCO_2e$.[22] Tables 4a and 4b of Annex 1 provide information on progress made in achieving emissions reduction targets, including mitigation actions relevant to the contribution of the LULUCF.

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[19] CCC Progress Report to Parliament, 2015: https://www.theccc.org.uk/publication/reducing-emissions-and-preparing-for-climate-change-2015-progress-report-to-parliament/

[20] CCC's 2015 Progress Report: Government Response: https://www.gov.uk/government/publications/committee-on-climate-changes-2015-progress-report-government-response

[21] Energy & Emissions Projections, 2015: https://www.gov.uk/government/publications/updated-energy-and-emissions-projections-2015

[22] This estimate is based upon the UK estimate of non-traded emissions submitted to the EU on 30th October 2015 as part of the EU Monitoring Mechanism (EUMM).

Performance against carbon budgets.

The UK met its first carbon budget with a surplus of 36 $MtCO_2e$, as shown in the table below.[23]

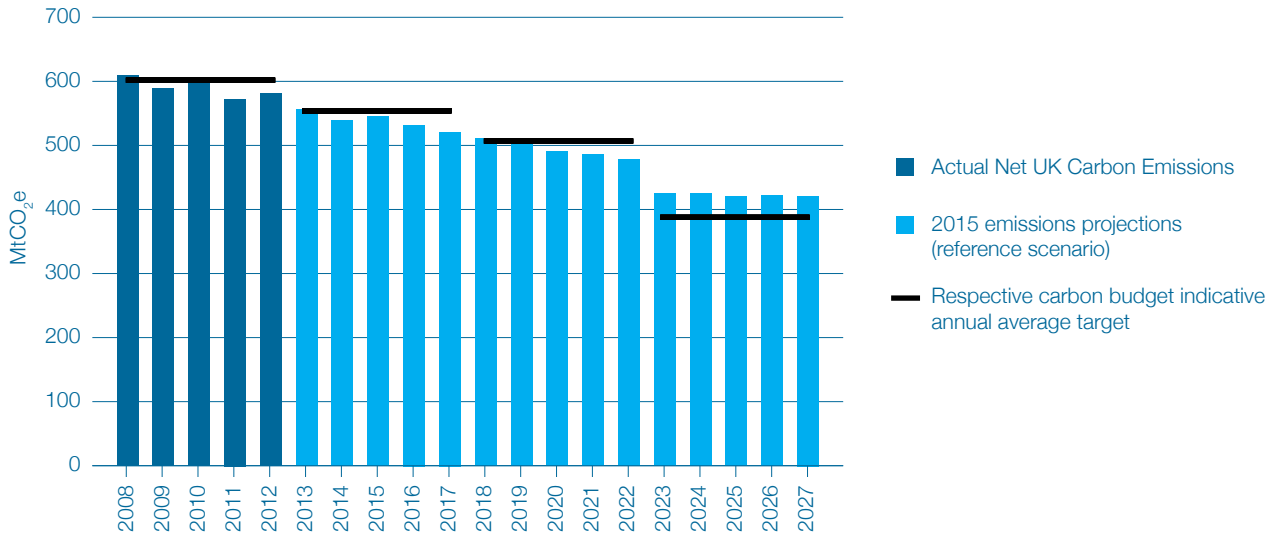
Table 10: Progress against the first carbon budget ($MtCO_2e$)

Carbon Budget 1								
Level of first carbon budget (2008-12)	Equivalent average emissions p.a.	UK Net Carbon Account					Final emissions over period (2008-12)	End period comparison to budget level
		2008	2009	2010	2011	2012		
3,018	604	616	595	605	579	587	2,982	-36

Source: Final Statement for the first Carbon Budget Period[23]

UK emissions are projected to continue to fall (see Figure 4 below). Based on the latest published projections (reference scenario), the UK is on track to meet its second and third legislated carbon budgets – with emissions projected to fall under these budgets by a total of 111 $MtCO_2e$.

Figure 4: Progress against carbon budgets



Note: Emissions reported between 2008 and 2012 are fixed based upon the final statement for the first carbon budget period.

Source: 2013 Final UK greenhouse gas emissions statistics[10], 2015 Energy and Emissions Projections[29]

The fourth carbon budget (2023 – 27) was set in June 2011 at 1950 $MtCO_2e$, or around 52% below the baseline. The latest published projections identify an expected shortfall of 187 $MtCO_2e$ over the fourth carbon budget period, which reflects the fact that detailed policy has not yet been set out that far into the future.

This challenge is not new as this short-fall was acknowledged when the budget was set in 2011. We are currently carefully assessing our approach for a post-2020 framework. We intend to say more after we set the fifth carbon budget (by the end of June 2016). Our new emissions reduction plan will be published towards the end of 2016 which will set out our proposals in full.

[23] Final Statement for the first Carbon Budget Period: https://www.gov.uk/government/statistics/final-statement-for-the-first-carbon-budget-period

Table 11: Projected performance against future carbon budgets ($MtCO_2e$)

	Second carbon budget (2013-17)	Third carbon budget (2018-22)	Fourth carbon budget (2023-27)
Carbon Budget levels	2,872	2,544	1,950
Projected territorial emissions	2,646	2,208	1,979
Projected net carbon account	2,722	2,493	2,137
Carbon budget level minus projected emissions (projected performance)	60	51	-187
Uncertainty range	(46 to 76)	(7 to 100)	(-124 to -254)

Source: 2015 Energy and Emissions Projections[29]

Further information on DECC's Energy and Emissions Projections are detailed in Chapter 4.

Chapter 3:
Policies and Measures

UK

Tackling climate change and demonstrating leadership through action is the responsibility of every part of government, central and local, and the wider public sector. Some policies are the responsibility of the Department of Energy and Climate Change (DECC) directly, while others are the responsibility of the Treasury (HMT), Department for Transport (DfT), Department for Environment, Food and Rural Affairs (Defra), Department for Communities and Local Government (DCLG), Department for Business, Innovation and Skills (BIS), Foreign and Commonwealth Office (FCO) and the Department for International Development (DFID).

The UK government's programme is supported by action taken by the devolved administrations in Scotland, Wales and Northern Ireland. While the UK government has overall responsibility for ensuring that a programme is put in place to deliver the UK's Kyoto target and its UK carbon budgets, all the administrations will play a part in meeting these targets. The approach taken by each administration will differ, drawing on the range of policies at their disposal.

Welsh Government

The Welsh government's Climate Change Annual Report 2014 was published in December 2014 and sets out the progress that has been made in reducing GHG emissions in Wales against their targets over the last year, as well as summarising some of the key actions taken to tackle the causes and consequences of climate change.

The Welsh Government's Climate Change Annual Report sets out that the Welsh Government's 3% annual emissions target for 2012 and provisional data indicates that we are also on course to meet the target for 2013. In terms of progress against the wider 40% target by 2020, the report shows that Welsh Governments total emissions have decreased by 17.9% against the 1990 baseline.

For the 40% target, emissions increased by 5% over the year to 2012. The two key factors behind this increase being firstly, a shift from natural gas back to coal in the energy sector due to the impact of changes in global fuel prices and secondly, the colder than average temperatures over the winter in 2012, compared to 2011. In setting out the contribution to the 3% target from each of the key sectors, the report shows that all sectors have reduced their emissions in comparison with the baseline for 2012, the reductions for each sector being as follows: Transport Sector (-8.2%), Residential Sector (-7.6%), Business Sector (-16.7%), Agriculture and Land-use sector (-1.2%), Resource Efficiency and Waste Sector (-20.4%) and the Devolved Public Sector (-3.1%).

In summary, the report further underlines the message that although some good progress is being made, further action is needed in order to deliver the target of a 40% reduction in total emissions by 2020. The Resource Efficiency and Waste Sector, however, shows what can be done. The implementation of Wales' Towards Zero Waste strategy has not only put Wales fourth in Europe in terms of recycling, but has also decreased emissions by 20.4% and supported significant economic benefit for Wales.

Wales' current legislative programme contains landmark pieces of legislation that further enshrine Wales' commitment to sustainable development and strengthen efforts to tackle key intergenerational challenges like climate change.

The Well-being of Future Generations Act and Environment Bill build on Wales' previous achievements as one of the first nations in the world with a constitutional duty on sustainable development.

The Well-being of Future Generations (Wales) Act places sustainable development as the central organising principle of the public sector in Wales. It sets ambitious and long-term goals for a prosperous, resilient, healthier, more equal Wales based on sustainable development principles and linked to the UN Sustainable Development Goals. In putting these goals into law, it also establishes the role of a Future Generations Commissioner and aligns accountability against the achieving of the goals as the public sector's overarching purpose.

The Environment (Wales) Bill will put in place legislation to plan and manage Wales' resources in a sustainable and joined-up way. In doing so, it sets out requirements to manage, use and enhance Wales' natural resources sustainably, enshrining the ecosystem approach from the UN Convention on Biological Diversity which is essential to ensuring the resilience of ecosystems and tackling climate change. It also puts in place the legal framework for not only statutory emission reduction targets, but also carbon budgeting towards the goal of at least an 80% reduction by 2050. In addition the Bill further strengthens action on waste thereby further supporting the move to a more circular economy.

In Wales, the Welsh Government, through the Size of Wales initiative[24] is working with the Mbale Coalition Against Poverty[25] to plant 10 million trees in Eastern Uganda. The project has 3 aims: assisting poor communities adapt to climate change; improving the livelihoods of subsistence farmers and climate change mitigation. To date 3.5 million trees have been planted.

Scottish Government

Through the Climate Change (Scotland) Act 2009, Scotland has set ambitious GHG emissions reduction targets of at least 42% by 2020, and at least 80% by 2050 compared to the 1990/1995 baseline. Scotland's framework includes fixed annual targets ensuring that the Scottish Government is held to account by its legislature in each and every year.

The Scottish Government's Cabinet Sub-Committee on Climate Change was established in October 2014 and has collective responsibility for ensuring that Scotland meets the climate change targets, set out in the Climate Change (Scotland) Act 2009. At senior official level, the Scottish Government's Climate Change Delivery Board provides leadership across the Scottish Government on delivery of the statutory emissions reduction targets.

As outlined in Low Carbon Scotland: Meeting the Emissions Reduction Targets 2013 – 2027, a comprehensive package of policies and measures is in place to meet Scotland's emission reduction targets, including expanding renewable energy production, improvements in energy

[24] http://www.sizeofwales.org.uk/

[25] http://mbalecap.org/

and resource efficiency in households and industry, transition of transport to a lower carbon basis, expansion of renewable sources of heat, and sustainable land use.

Scottish Government official statistics published in June 2015 show that, in 2013, Scotland's emissions of GHGs have fallen by 38.4%[26] from the baseline, which is more than three quarters of the way towards the statutory target of a 42% reduction by 2020. However Scotland has narrowly missed its first four statutory fixed annual targets (2010-2013), expressed as fixed amounts of GHGs. This is due to upward revisions to the baseline, making them harder to meet. Had these revisions not occurred Scotland would have met, and exceeded, all of its fixed annual targets.

The United Kingdom's Committee on Climate Change 2015 Scottish progress report, 'Reducing Emissions in Scotland',[27] was published in March 2015 and notes that Scotland has made good progress in a number of areas e.g. deploying renewable electricity generation capacity, in installing community and locally-owned energy projects and in rolling out area-based energy efficiency programmes.

In Scotland provisional statistics for 2014 show that the equivalent of 49.6% of Scotland's gross electricity consumption came from renewables – just short of Scotland's interim target of 50% by 2020. On community and locally owned energy, Scotland has reached its target for 500 MW renewables capacity by 2020, five years early. The Scottish Government's energy consumption target, to reduce consumption by 12% by 2020, is already at the required level in 2013 – down by 13.3% from the 2005 – 2007 baseline.

In June 2015 an additional package of measures was introduced to strengthen the existing emissions reductions measures already in place, covering transport, environment and energy – including designating the energy efficiency of Scotland's building's a National Infrastructure priority. Finally, work is underway on the third package of proposals and policies which will be required to meet Scotland's emissions reduction targets out to 2032 and make up for the cumulative shortfall from fixed annual targets that have been missed.

Northern Ireland Executive

The Northern Ireland Programme for Government (2011-2015) commits the Northern Ireland Executive to reduce GHG emissions by 35% on 1990 levels by 2025. A GHG Emissions Reduction Action Plan was agreed in 2011 with the aim of achieving the target. Progress is monitored and reported annually by the Environment Minister to the Executive.

The Northern Ireland Renewable Heat Incentive was introduced in November 2012 to support generators of renewable heat within the non-domestic sector and extended to the domestic sector in December 2014. This will contribute to the Northern Ireland Executive target of 10% of heat from renewable sources by 2020.

From its inception in 1996, there are now some 200,000 consumers connected to the natural gas network in Northern Ireland. Work is progressing on the £250 million extension of the natural gas network to the west of Northern Ireland that is expected to offer connection for up to a further 40,000 domestic and business customers by the end of 2017. In October 2015 plans for further expansion of the gas network to the south east of Northern Ireland were announced, providing the opportunity for around 25,000 additional homes and businesses to have access to

[26] For reporting against Scotland's statutory Climate Change Targets, Scotland's net source greenhouse gas emissions are adjusted to take into account the EU Emissions Trading System (EU ETS). They also include an estimate of emissions from international aviation and shipping attributed to Scotland. Without EU ETS adjustment the reduction from 1990 to 2013 is 34.3%.

[27] https://www.theccc.org.uk/publication/reducing-emissions-in-scotland-2015-progress-report/

the network. The proposals should deliver significant carbon savings over the period of the gas licences, through reducing dependence on oil in particular.

Supported by the Northern Ireland Renewables Obligation, renewable electricity has grown rapidly in recent years and currently stands at just over 20% of consumption (around 800MW installed capacity), thus meeting the NI Executive's Programme for Government target of 20% by 2020. The majority of this is from large scale onshore wind, however, the deployment of small scale technologies, e.g. biomass and solar photovoltaic, has also increased.

Summary of UK Policies and Measures

The emissions forecasts and policies set out in this Report are consistent with DECC's 2015 Energy and Emissions Projections (EEP), unless specified otherwise. The EEP was published on 18 November, prior to the Spending Review. The Spending Review set out the Government's fiscal plans for the next 5 years. Some Spending Review decisions impacted upon the design and funding of policies included in the EEP. It is made clear where policies were subject to Spending Review decisions throughout this Report. In line with the Biennial Review reporting guidance, any changes in policies will be reported in the next National Communication due the beginning of 2018.

Mitigation Action
Energy

Renewables Obligation (RO) *Energy/ Status : Implemented*
Sets an annual obligation on electricity suppliers to produce a proportion of their generation from renewable sources. Targets can be met by renewable generation that accrue Renewable Energy Certificate (ROCs) or by trading.

Additional Renewables in Generation (Renewable Energy Strategy) *Energy/Status: Implemented*
Increases RO targets in electricity supply so as to meet the UK's overall renewables target for 2020 as set out in the Renewables Directive (RED, 2009/28/EC).

Feed in Tariffs (FITs) *Energy/Status: Implemented*
FITs support organisations, businesses, communities and individuals to generate low-carbon electricity using small-scale (5 megawatts (MW) or less total installed capacity) systems. Electricity suppliers are obliged to pay the regulated tariffs to eligible generators.

Contract for Difference (CfD) (2014-2020) *Energy/Status: Implemented*
Offers CfDs in the electricity generation market for low carbon and renewable sources. CfDs will replace ROCs (which are due to be phased out from 2017). Current policy offers CfD for new capacity through auctions should Government's choose to hold them. There is also a bilateral negotiation underway for Hinkley Point C nuclear plant.

Contract for Difference (CfD) (2021-2035) *Energy/Status: Planned*
Planned continuation of CfDs for new low carbon capacity after 2020.

Carbon Price Floor *Energy/Status: Implemented*
We set a floor to the carbon price for the power sector above that set by the EU ETS. The additional carbon price is paid through the Carbon Price Support (CPS) payment, which is currently capped at £18 per tonne until 2019/20, following a review in 2014 that took into account the performance of the ETS price. The Carbon Price Floor (CPF) is designed to further reduce the use of emission-intensive fossil fuels and increase the proportion of electricity generation and supply from low carbon sources.

EU Emissions Trading System *Energy, Industry/Industrial Process/Status: Implemented*
Launched in 2005, EU ETS covers approx. 900 installations in the UK. It sets an emissions target (cap) for installations covered by the system (across the EU), with the carbon market determining the carbon price, and therefore where emissions can be reduced most cheaply. It guarantees that total emissions in the sectors covered will not exceed the cap set, and in doing so drives investments in low-carbon technologies, leading to cutting emissions of carbon dioxide (CO_2) and other GHGs at least cost. There is an opt-out for small emitters as well as hospitals. Aviation EU ETS currently captures CO_2 emissions from flights between airports in the European Economic Area (e.g. London to Paris) from 1 January 2013 until 31 December 2016. All EU ETS operators are required to submit annual verified emissions reports for the previous year's emissions. Data for the calendar year 2014 shows that UK installations and operators covered by the EU ETS emitted 208 $MtCO_2$ in 2014, an 11.9% reduction in carbon emissions compared to 2013.

Mitigation Action

Capacity Mechanism *Energy/Status: Implemented*

Part of the government's Electricity Market Reform package, the Capacity Market supplies backup electricity generation capacity, encouraging construction and use of low carbon and renewable generation in the electricity supply industry. The mechanism offers security of electricity supply by providing a payment for reliable sources of capacity, alongside their electricity revenues, to ensure they deliver energy when needed, encouraging investment to replace older power stations and provide backup for more intermittent and inflexible low carbon generation sources. The Capacity Market has also been designed to support the development of more active demand management in the electricity market.

Carbon Capture and Storage Programme *Energy, Industry/Industrial Process/Status: Implemented*

This policy was impacted by the Government's Spending Review on 25th November. In line with the Biennial Review reporting guidance, further detail will be provided in the next National Communication.

Large Combustion Plant Directive (LCPD) *Energy, Industry/Industrial Process/Status: Implemented*

The Large Combustion Plant Directive (LCPD, 2001/80/EC) sets limits on emissions of sulphur dioxide, nitrogen oxides, and dust from combustion plants with a thermal capacity of 50 MW or greater. In the UK, some 100 plants have taken the option to participate in a National Emissions Reduction Plan in which each receives a transferrable annual mass emission allowance.
A few others took the option of not being bound by the Directive's emission limits subject to undertaking to operate for no more than 20,000 hours after 1 January 2008 and to close by 31 December 2015.

Industrial Emissions Directive (as it applies to Large Combustion Plant) *Energy, Industry/Industrial Process/Status: Adopted*

The LCPD will be replaced from 1 January 2016 by similar although more stringent provisions set out in chapter III of the Industrial Emissions Directive (2010/75/EU) (IED). Those provisions already apply in respect to any plant newly permitted since 7 January 2013.
Transposes the IED. Sets lifetime operating hours limits on coal fired power plants that don't install abatement equipment.

Building Regulations Part L (2002+2005/6) *Energy, Industry/Industrial Process, Other (Residential),Other (Public)/Status: Implemented*

Building Regulations set minimum energy performance standards for new buildings and when people carry out controlled 'building work' to existing properties including extensions, conversions and certain categories of renovation and replacement windows and boilers.
In 2002, the elemental requirements for new buildings and extensions were strengthened. New requirements for replacement windows were introduced requiring double glazed windows. In 2005, the requirements for replacement boilers were strengthened to high efficiency B rated condensing boilers. In 2006, the requirements for new homes were strengthened by a further 20% and requirements for new non-domestic buildings by a further 25%. New insulation requirements were introduced upon the renovation of the building envelope e.g. reroofing, recladding.

Building Regulations 2010 Part L *Energy, Industry/Industrial Process, Other (Residential),Other (Public)/Status: Implemented*

Building Regulations set minimum energy performance standards for new buildings and when people carry out controlled 'building work' to existing properties including extensions, conversions and certain categories of renovation and replacement windows and boilers.
In 2010, the energy performance requirements for new homes and non-domestic buildings were strengthened by a further 25%.
The requirements for replacement boilers were strengthened to A rated condensing boilers. The requirements for replacement windows were strengthened to double glazed windows with thermally efficient glass.

Building Regulations 2013 Part L *Energy, Industry/Industrial Process, Other (Residential),Other (Public)/Status: Implemented*

Building Regulations set minimum energy performance standards for new buildings and when people carry out controlled 'building work' to existing properties including extensions, conversions and certain categories of renovation and replacement windows and boilers.
In 2013, the requirements for new homes were strengthened by a further 6% and requirements for new non-domestic buildings by a further 9%.

Energy Performance of Buildings Directive (EPBD) *Energy, Industry/Industrial Process, Other (Residential),Other (Public)/Status: Implemented*

Energy Performance Certificates (EPCs) are required when any building is sold, rented out or constructed, and sometimes after refurbishment work. EPCs give information on a building's energy efficiency on a sliding scale from 'A' (very efficient) to 'G' (least efficient). A recommendations report setting out how the rating could be improved accompanies every EPC. EPC can help occupants make their building more energy efficient by identifying costs and opportunities for improvement. A Display Energy Certificate (DEC) must be produced every year for public buildings larger than 1,000m^2. The DEC shows the actual running costs of the building and must be displayed in a prominent place. Additionally the regulations require the regular inspection of air-conditioning installations and boilers above a certain size.

Energy Performance of Buildings Directive (EPBD) Recast 2010 *Energy, Other (Public)/Status: Adopted*

Extension of the EPBD requirement for public buildings to display Energy Performance Certificates to include buildings over 250m^2 from 9 July 2015. Approximately 42,000 buildings that are occupied by a public authority in England and Wales are currently required to have a Display Energy Certificate as they are larger than 1,000m^2. With the lowering of the size threshold there will be an estimated increase of 21,500 public buildings subject to this requirement, meaning that overall, approximately 73% of all public buildings in England and Wales will be required to have a Display Energy Certificate.

Mitigation Action

Energy Performance of Buildings Directive (EPBD) 2017 Cost Optimal Review and Nearly Zero Energy Buildings (NZEB) (2018 and 2020) *Energy, Industry/Industrial Process, Other (Residential),Other (Public)/Status: Planned*

The Government is required to report to the European Commission by June 2017 to demonstrate that UK building standards for energy performance remain 'cost optimal'. Cost-optimal energy performance means that the lifetime cost-benefit analysis is positive. Minimum energy performance requirements must be compared against calculated cost-optimal levels using the Comparative Methodology Framework.

After 31 December 2018, new buildings occupied and owned by public authorities are required to be Nearly Zero-Energy Buildings (NZEB). By 31 December 2020, all new buildings are required to be NZEB. A 'nearly zero-energy building' is defined as "a building that has a very high energy performance" and the "nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby."

Private Rented Sector (PRS) Energy Efficiency Regulations *Energy, Industry/Industrial Process, Other (Residential)/ Status: Adopted*

From the 1 April 2018 there will be a requirement for any properties rented out in the PRS to have a minimum energy performance rating of E on an EPC. The regulations will come into force for new lets and renewals of tenancies with effect from 1 April 2018 and for all existing tenancies on 1 April 2020 (1 April 2023 for non-domestic properties). It will be unlawful to rent a property which breaches the requirement for a minimum E rating, unless there is an applicable exemption. Energy efficiency improvements must be carried out to bring the property up to an E rating at the minimum, unless one of the exemptions is applicable. Landlords will only have to make improvements that are cost effective.

In addition, a tenant will be able to request consent to energy efficiency measures from their landlord from 1 April 2016. From this date all domestic tenants in scope of the regulations are afforded with this right to request consent for energy efficiency improvements under the regulations.

Products Policy *Energy, Industry/Industrial Process, Other (Residential),Other (Public)/Status: Implemented, Adopted*

UK legislation to set minimum energy efficiency standards for products on sale. Mandating energy efficiency labelling of appliances. Most recently implemented by the Eco-Design for Energy Related Products Regulations (SI 2010 No 2617). Implements EU Ecodesign Directive 2009/125/EC (amending 2005/32/EC).

Carbon Trust measures *Energy, Industry/Industrial Process, Other (Public)/Status: Expired*

The Carbon Trust provided a range of measures from general advice to in-depth consultancy and accreditation, to reduce emissions and save energy and money to businesses and public sector organisations of all sizes.

Non-domestic Renewable Heat Incentive (RHI) *Energy, Industry/Industrial Process, Other (Public)/Status: Implemented*

The non-domestic RHI was introduced in November 2011; and is designed to bridge the gap between the cost of fossil fuel heat sources and renewable heat alternatives. It is open to commercial, industrial, public sector, not for profit and community generators of renewable heat in Great Britain.

Owners of participating installations are paid per kilowatt-hour of renewable heat they produce. Payments are made for 20 years, and vary, depending on technology and installed capacity.

The scheme was introduced through powers under the Energy Act 2008, and is underpinned by The RHI Scheme Regulations 2011, as subsequently amended.

At the end of September 2015, there were 12,598 installations accredited under the scheme; and around 4.7 terawatt-hours of renewable heat had been generated and paid for.

Non-domestic RHI, planned funding *Energy, Industry/Industrial Process, Other (Public)/Status: Planned*

This policy was impacted by the Spending Review on 25 November. In line with the Biennial Review reporting guidance, further detail will be provided in the next National Communication.

Small and Medium Enterprises (SME) Loans *Energy, Industry/Industrial Process/Status: Expired*

The Carbon Trust provided interest free loans of £3,000 - £400,000 for small and medium sized businesses to invest in energy efficiency equipment and renewable technologies. These loans were designed so that in most cases the forecast reduction in energy costs would be similar to the total repayment amount. Repayments were over one to four years. Projects had to meet a 'carbon threshold' of 1.5 tCO_2 saved per £1,000 loaned.

Uptake of loans was high with over £148m of loans provided over the course of scheme, delivering lifetime energy cost savings of around £450m and reduced emissions of 1.78 $MtCO_2e$.

Climate Change Agreements (CCAs) *Energy, Industry/Industrial Process/Status: Implemented*

CCAs offer participating energy-intensive industries a partial rebate from the Climate Change Levy on industrial fuels in return for meeting energy efficiency targets. From 2013 these are a 90% rebate for electricity and a 65% rebate for other fuels. Based on estimates at the start of the scheme in 2013, if all sectors meet their targets this will reduce primary energy consumption by approximately 100TWh less than it would have been from 2013-20 if primary energy consumption remained at 2008 levels.

Mitigation Action

Salix Loans *Energy, Other (Public)/Status: Implemented*

The DECC funded Salix public sector energy efficiency loan scheme has two broad components:
(1) an energy efficiency Recycling fund – long-term recycling funds, whereby a public sector body was awarded a pot of match funding for energy efficiency projects. The public sector body can continue to recycle the energy cost savings to new capital projects as long as they meet certain criteria applied by Salix (to ensure cost-effectiveness). The money is returned to Salix only when no more suitable projects can be found. Recycling funds were only awarded in the early years of the programme.
(2) energy efficiency loans – these loans are awarded by Salix (and repaid to Salix) with the money then being re-loaned by Salix to new energy efficiency projects. Salix continues to award these loans.
Salix has £134.1 million of DECC funding under management. This has resulted in excess of 13,000 energy efficiency retrofit projects. Salix estimates that these will result in lifetime financial savings of £1.4 billion and lifetime carbon savings of over million tonnes of CO_2.
This policy was impacted by the Government's Spending Review on 25 November. In line with the Biennial Review reporting guidance, further detail will be provided in the next National Communication.

Warm front (2000-2013) *Energy, Other (Residential)/Status: Expired*

Warm Front installed heating and insulation measures to make homes warmer and more energy efficient for private sector households in England vulnerable to fuel poverty. The Scheme offered energy efficiency advice, efficient lightbulbs, and grants of up to £3,500 for packages of insulation and heating improvements (or up to £6,000 where oil, low carbon or renewable technologies are recommended). The scheme assisted around 2.3 million households, with expenditure of around £3 billion over its lifetime.

EEC1, EEC2 (2002- 2008) & Baseline Carbon Emissions Reductions Target (CERT) (2008-2010) *Energy, Other (Residential)/Status: Expired*

Energy Efficiency Commitment Phase 1 (EEC I): GB wide regulation that required all electricity and gas suppliers with 15,000 or more domestic customers to achieve a combined energy saving of 62 TWh by 2005 by incentivising their customers to install energy-efficiency measures in homes. Energy Efficiency Commitment Phase 2 (EEC II) – energy suppliers with more than 50,000 domestic customers required to deliver a total of 130 TWh lifetime energy use reductions in GB households, primarily through the promotion of energy efficiency measures.
Carbon Emission Reduction Target (CERT) – GB regulation that required all domestic energy suppliers with a customer base in excess of 50,000 domestic customers to make savings in the amount of CO_2 emitted by householders. A priority group reserved a proportion of the savings for lower income, vulnerable or elderly households.

Carbon Emissions Reductions Target (CERT) uplift and extension (2010- 2012) *Energy, Other (Residential)/Status: Expired*

CERT extension – increased the targets originally set under CERT by 20% and required domestic energy suppliers with a customer base in excess of 50,000 (later increased to 250,000) to make savings in the amount of CO_2 emitted by householders. The extension also refocused subsidy towards insulation measures and away from electricity saving measures such as low energy lighting – and introduced a super priority group (households in receipt of certain means-tested benefits) to make energy reductions in low income and vulnerable households.

Community Energy Saving Programme (CESP) (2009-2012) *Energy, Other (Residential)/Status: Expired*

CESP – area based regulation that targeted households across Great Britain, in areas of low income, to improve energy efficiency standards, and reduce fuel bills. CESP was funded by an obligation on larger energy suppliers and also the larger, electricity generators.

Energy Company Obligation (ECO) 2013 *Energy, Other (Residential)/Status: Implemented*

The Energy Company Obligation (ECO) is a statutory obligation on energy suppliers with over 250,000 domestic customers and delivering over a certain amount of electricity or gas to make reductions in carbon emissions or achieve heating cost savings in domestic households. ECO focuses on insulation measures, and also heating improvements to low income and vulnerable households. It runs until March 2017.

Future Supplier Obligation (confirmed from April 2017 until 2021-2022) *Energy, Other (Residential)/Sector: Planned*

This policy was the planned extension of the ECO. This policy was impacted by the Government's Spending Review on 25 November. In line with the Biennial Review reporting guidance, further detail will be provided in the next National Communication.

Smart metering *Energy, Other (Residential), Industry/Industrial Process/Status: Adopted*

The Programme aims to replace 53 million meters with smart electricity and gas meters in all domestic properties, and smart or advanced meters in smaller non domestic sites in Great Britain by the end of 2020, impacting approximately 30 million premises. Smart meters will deliver a range of benefits to consumers, energy companies and networks:
Consumers will have near-real time information on their energy consumption to help them control energy use, and avoid wasting energy and money.
Energy networks will have better information upon which to manage and plan current activities. Smart meters will also assist the move towards smart grids which support sustainable energy supply and will help reduce the total energy needed in the system.
Our latest updated Impact Assessment, published in January 2014, estimates a positive net present benefit of £6.2 billion over the period to 2030, with total benefits of around £17.1 billion and costs of around £10.9 billion.
The Programme is being delivered in two phases: the Foundation Stage, which began in March 2011, followed by the main installation stage, which is due to begin in 2016. By the end of June 2015, more than 1.7 million meters were operating under the Programme.
Most householders will have smart meters installed during the main installation stage.

Mitigation Action

Domestic Renewable Heat Incentive (RHI) *Energy, Other (Residential)/Status: Implemented*

The domestic RHI was introduced in April 2014; and is designed to bridge the gap between the cost of fossil fuel heat sources and renewable heat alternatives. It is open to homeowners, private and social landlords and people who build their own homes in Great Britain. Tenants can also apply, but will need permission from their landlord.

Owners of participating installations are paid per KWh of renewable heat they produce. Payments are made over 7 years based on estimated renewable heat generation over 20 years, and vary depending on technology and installed capacity.

The scheme was introduced through powers under the Energy Act 2008, and is underpinned by The Domestic Renewable Heat Incentive Scheme Regulations 2014, as subsequently amended.

At the end of October 2015, there were 43,202 installations accredited under the scheme and over 481 GWh of renewable heat had been generated and paid for.[19]

Domestic Renewable Heat Incentive (RHI), post-CSR funding *Energy, Other (Residential)/Status: Planned*

This policy was impacted by the Spending Review on 25 November. In line with the Biennial Review reporting guidance further detail will be provided in the next National Communication.

CRC Energy Efficiency Scheme *Energy, Industry/Industrial Process, Other (Public)/Status: Implemented*

The CRC is a mandatory UK-wide emissions trading scheme (launched in 2010). It encourages the uptake of energy efficiency measures in large non-energy intensive private and public sector organisations that use energy not covered by the EU ETS or Climate Change Agreements. It covers 1800-1900 large users of energy across the business and public sector who are responsible for approximately 10% of UK CO_2 emissions. It is estimated that CRC will bring £1 billion energy savings to participants by 2020 and will deliver carbon dioxide emissions reductions of at least 18 $MtCO_2$ by 2027.

DECC, in partnership with the devolved administrations, is the government policy lead. Administration, auditing and enforcement is managed by environmental regulators across the UK. HMT is responsible for setting the allowance price for the scheme.

Energy Savings Opportunity Scheme (ESOS) *Energy, Industry/Industrial Process/Status: Implemented*

A mandatory energy assessment scheme for all large undertakings (non-SMEs), set up in July 2014, in response to requirements contained Article 8 of the EU Energy Efficiency Directive (2012/27/EU). Organisations which employ 250 or more people, or employ fewer than 250 people but have both an annual turnover exceeding £38.9m and an annual balance sheet total exceeding £33.4m, must measure their total energy consumption and carry out audits of the energy used by their buildings, industrial processes and transport to identify cost-effective energy saving measures, by 5 December 2015 and every four years thereafter. It is estimated that around 10,000 organisations will participate in the scheme.

ESOS is expected to drive additional energy efficiency action to help achieve our 20% energy consumption reduction target and contribute to achieving carbon budgets. DECC analysis estimates that ESOS will deliver a net benefit to the UK of £1.6 billion NPV (calculated over 15 years) and reduce energy consumption by 3TWh each year, with businesses saving over £250m on their energy bills.

Mitigation Action

Transport

Car Fuel Efficiency Policies *Transport/Status: Implemented*

Sets fuel efficiency targets for new cars to be achieved by 2015 and 2021. Complementary measures are a collection of technologies that could improve 'real world' fuel efficiency of cars which wouldn't be fully captured in new car CO_2 target and could improve fuel efficiency within the existing fleet. These include gear shift indicators, tyre pressure monitoring systems, more efficient mobile air-conditioning and low rolling resistance tyres. EC Regulation 661/2009 sets minimum requirements and introduced labelling for the rolling resistance, wet grip and external rolling noise of tyres.

Over £500m between 2015 and 2020 to support the uptake of ultra-low emission vehicles. The funding will be targeted to support the purchase of ultra-low emission cars, vans, taxis, buses and other vehicles; supporting recharging infrastructure and generous support for targeted Research & Development into Ultra Low Emission Vehicle (ULEV) related technologies.

This policy was impacted by the Government's Spending Review on 25 November. In line with the Biennial Review reporting guidance, further detail will be provided in the next National Communication.

Van Fuel Efficiency Policies *Transport/Status: Implemented*

Sets fuel efficiency targets for new Light Goods Vehicles (LGV) to be achieved by 2017 and 2020. EC Regulation 661/2009 set minimum requirements and introduced labelling for the rolling resistance, wet grip and external rolling noise of tyres.

As mentioned above, the purchase and recharging infrastructure of low emission vans is being supported by over £500 million of funding for the uptake of ULEVs.

This policy was impacted by the Government's Spending Review on 25 November. In line with the Biennial Review reporting guidance, further detail will be provided in the next National Communication.

HGV Fuel Efficiency Policies *Transport/Status: Implemented*

EC Regulation 661/2009 sets minimum requirements and introduced labelling for the rolling resistance, wet grip and external rolling noise of tyres. Industry and Government are taking a range of additional actions to reduce freight emissions, including the Freight Transport Association's Logistics Carbon Reduction Scheme, recording and reporting emissions reductions from freight, while both the Waterborne Freight Grant and Mode Shift Revenue Support in England and Wales to support modal shift. The Department's Longer Semi-trailer (LST) Trial involves 1800 LSTs up to 2 metres longer than a standard sized trailer. This is more efficient for freight operators and better for the environment due to fewer lorries being required to transport the same amount of goods and lower emissions from fewer journeys. The trial is expected to save 3000 tonnes of CO_2 emissions over the course of its 10 years.

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[28] Renewable Heat Incentive Statistics – https://www.gov.uk/government/collections/renewable-heat-incentive-statistics

Mitigation Action

Renewable Transport Fuel Obligation, (RTFO) - current 5% by volume *Transport/Status: Implemented*
The RTFO set a phased 5% target for biofuel use by diesel and petrol suppliers to be achieved by 2014. Targets are by volume rather than by energy. Implements the EU Renewables Directive (2009/28/EC).

Renewable Transport Fuel Obligation, (RTFO) - Increase target to meet RED *Transport/Status: Planned*
To set enhanced targets for biofuel use by diesel and petrol suppliers to be achieved by 2020. Implements the EU Renewables Directive (2009/28/EC).

HGV Natural Gas Policy *Transport/Status: Implemented*
The Government is helping operators establish and run fleets of low carbon HGVs through the Low Carbon Truck Trial. £11.3m funding has been provided, via competition, to part fund and test around 350 commercial low-carbon vehicles, with most using a gas or dual fuel system (diesel and gas), and to develop refuelling infrastructure. The trial is generating a body of data on carbon emissions, costs and operational performance. In addition the Office for Low Emission Vehicles has allocated £4m funding for publicly-accessible gas refuelling infrastructure.

Local Sustainable Transport Fund *Transport/Status: Implemented*
£600m of capital and revenue funding between 2010 and 2015 to support sustainable travel investments by Local Government. The projects include promoting public transport, encouraging uptake of cycling and walking, and raising awareness of the alternative transport modes available to commuters and residents Awards were made by after a competitive bidding process. Projects are assessed against published criteria. Successful projects were those judged to perform well against the twin objectives of supporting the local economy and facilitating economic development, while reducing carbon emissions.

Rail Electrification *Transport/Status: Implemented*
Major programme of rail electrification underway to replace older diesel trains with modern, zero-emission electric trains.
£1 billion of rail electrification will reduce fossil fuel use and bring quicker smoother journeys, lower CO_2 and reduce local air pollution and noise.
On completion of the current electrification programme, the proportion of the rail network which is electrified will have increased from just over 40% of track mileage to around 50%. As a result, just under 75% of all passenger journeys will be on electric trains.

PSV Fuel Efficiency Policies *Transport/Status: Implemented*
The Green Bus Fund (GBF) allows bus companies and local authorities in England to compete for funds to help them buy new low carbon emission buses – both double decker and single decker buses, including midibuses (but not minibuses) capable of achieving an equivalent 30% reduction in their GHG emissions compared to the average Euro III diesel bus of the same total passenger capacity. The Four rounds of the fund, which ran from 2009-March 2014, added around 1250 Low Carbon Emission Buses onto England's roads. The Low Emission Bus Fund, announced 11 March 2015, replaces the GBF and offers up to £30m for bus operators and local authorities across England and Wales to bid for low emission buses and supporting infrastructure. This scheme funding is open from 2016-2019.

Industry/industrial Process

Ozone Depleting Substances Regulation *Industrial Process/Industry/Industrial Process/Status: Implemented*
This regulation implements obligations under the Montreal Protocol and EU Regulations (2037/2000/EC and 1005/2009/EC) on ozone depleting substances. With some critical use exemptions, CFCs and halon use is banned and HCFC use will be banned from 2015.
Most ozone depleting substances are potent GHGs, so a reduction in their use both protects the ozone layer and provides some climate protection.

Fluorinated GHG Regulations (2006) *Industrial Process/Industry/Industrial Process/Status: Implemented*
Control (containment, prevention and reduction) of F gas emissions through recovery, leak reduction and repair and some very limited use bans. Mandatory certification requirements to work with F gases.

F-gas regulation 2014 *Industrial Processes/Industry/Industrial Process/Status: Adopted*
Introduced an 80% phase down in the quantities of F gases that can be placed on the EU market delivered via a gradually reducing quota system; a number of bans on the use of certain F gases in some new equipment; a ban on the use of very high GWP HFCs for the servicing of certain types of refrigeration equipment; some strengthening of obligations in 2006 Regulation related to leak checking, repairs, F gas recovery and technician training.

Agriculture

Agricultural Action Plan *Agriculture/Status: Implemented*
Range of resource-efficient and land management measures to reduce emissions to meet UK carbon budgets.

Nitrates Action Plan *Agriculture/Status: Implemented*
Improved compliance with the Nitrate Directive (91/676/EC). Designated revised "Nitrate Vulnerable Zones" (NVZ); established a range of mandatory measures to reduce nitrate pollution to water in NVZ. Also Code of Good Practice outside NVZs.

Catchment Sensitive Farming *Agriculture/Status: Implemented*
Delivers practical solutions and targeted support to enable farmers and land managers to take voluntary action to reduce diffuse water pollution from agriculture to protect water bodies and the environment.

Soils For Profit *Agriculture/Status: Implemented*
Provides on farm reviews and training on soils manures and nutrients. The programme closed in 2013.

Mitigation Action

Environmental Stewardship (Entry Level Schemes and Higher Level Stewardship) *Agriculture/Status: Implemented*

Provides income foregone support under Pillar 2 of the CAP for farmers to undertake management options that benefit biodiversity, resource protection and water quality.

LULUCF

Woodland Carbon Code (WCC) *LULUCF/Status: Implemented*

Voluntary Code and associated carbon registry (2013) for UK-domestic woodland carbon schemes to encourage private sector funding for woodland creation projects. To date, 208 projects across the UK have registered with the WCC covering an area of 15,600 ha and are projected to remove 5.6 $MtCO_2$ over their lifetime.

Woodfuel Implementation Plan *LULUCF, Energy/Status: Expired*

Initiative to develop supply chains, including through support for harvesting/processing and woodland access, to increase woodfuel supply from existing woodland.

Revised UK Forestry Standard *LULUCF/Status: Implemented*

Revised (2011) national standard for sustainable forest management include a new guideline on climate change, covering both adaptation and mitigation. Good practice requirements for climate change mitigation cover carbon in forest products, soil carbon management, carbon in forest ecosystems and operational carbon footprints.

Forestry Act, Felling Licence Regulations and Environmental Impact (Forestry) regulations *LULUCF/Status: Implemented*

Strong regulatory framework that controls felling and planting – generally only allowing deforestation for purposes of nature conservation and prevents afforestation of deep peat. Legislation updated 1999.

Grown in Britain *LULUCF/Status: Implemented*

Industry-led action plan announced in Government's Forestry and Woodlands Policy Statement (2013) which aspires to encourage businesses to invest in woodland creation and sustainable forest management practice. The initiative provides 'market-pull' for sustainable management by promoting the use of timber as a low carbon product, particularly in the construction sector.

Rural Development Programme *LULUCF/Status: Implemented*

Woodland creation and management grants provided through EU co-financed Rural Development Programmes in all four countries of the UK. Over the course of the Programme, funding supported the creation of 16,000 ha of woodland and improved the condition of 70,000 ha of woodland in England. Peatland restoration was supported through RDP funding in England.

Rural Development Programme (2014-2020: Countryside Stewardship) *LULUCF/Status: Implemented*

Woodland creation and management grants provided through EU co-financed Rural Development Programmes in England, Scotland, Wales and Northern Ireland. Countryside Stewardship is specifically targeted to improve water quality and biodiversity, but also includes criteria for high carbon sequestration and in locations that contribute to climate change adaptation objectives. The Programme includes a target to plant an additional 12,000 ha of woodland in England. Peatland restoration is supported through the new Countryside Stewardship scheme in England.

Waste

Waste Measures *Waste/Status: Implemented*

There are a number of waste measures with the aim of increasing recycling/reuse and reduce harmful disposal. These include:
The Waste Framework Directive (2008/98/EC) is the general framework of waste management requirements and sets rules governing the separate collection of waste.
The Landfill Directive (1999/31/EC) and the UK Landfill Tax, which set rules governing the disposal of waste to landfill, an escalating tax on biodegradable waste.
There are other waste measures targeting other waste streams, such as the Waste Incineration Directive (2000/76/EC). The overall effect is reducing landfill of biodegradable waste and associated CH_4 emissions.

Mitigation Action Discontinued policies

Zero Carbon Homes Policy *Energy, Other (Residential), Industry/Industrial Process, Other (Public)*

The Coalition Government set a target for all new buildings to have net zero carbon emissions from 2016. This was intended to be achieved by a combination of (a) strengthened minimum on-site Energy Efficiency performance requirements on fabric / design (b) Carbon compliance through on-site low carbon energy measures, such as PV, and (c) 'Allowable solutions', which are off-site carbon off-setting measures.

Rationale for discontinuing policy

The Productivity Plan announced on 10 July 2015 that the government does not intend to proceed with the zero carbon allowable solutions carbon offsetting scheme, or the proposed 2016 increase in on-site energy efficiency standards. Government is giving the industry 'breathing space' to build the highly energy efficient homes required by recent changes to building regulations. Energy requirements will be kept under review. The zero carbon standard would have placed a significant regulatory burden on house builders and developers. In addition, the carbon off-setting element of the zero carbon standard – 'allowable solutions' – in practice, would have counted as a tax on developers.

Mitigation Act Discontinued

Green Deal (closed to new entrants) *Energy, Other (Residential)*

The Green Deal programme helps householders make energy-saving improvements to their home and find the best way to pay for them. One way of paying for the upfront costs of the improvements is with Green Deal finance where repayments are made through expected savings on energy bills, though Green Deal finance is just one of the options to pay for the improvements. The position of consumers participating in the existing scheme is unchanged but due to UNFCCC reporting guidelines the policy appears as 'discontinued'.
Other options include the Green Deal Home Improvement Fund which has allowed households, including those on low incomes, to more affordably make energy efficiency improvements, whilst the Green Deal Communities scheme is helping Local Authorities deliver Green Deal energy efficiency measures on a street-by-street basis.

Rationale for discontinuing policy

The Government announced on the 23 July 2015 that it would not be making any further investment into the Green Deal Finance Company and there would be no further releases of funding under the Green Deal Home Improvement Fund. The announcement was driven primarily by financial considerations.
The Government took the decision that the case for further investment was not strong enough in terms of value for money to the taxpayer, and therefore the company made its own decision that it could not continue to purchase Green Deal plans.

Chapter 4: Projections of GHG Emissions, scenarios with measures

Overall projections of GHG emissions

In this chapter the UK presents its UK GHG emissions projections, in a scenario 'with measures', along with its assumptions and methodology. The UK projections were published in November 2015 and provide the basis for this Biennial Report. The UK updates its national emissions projections for CO_2 and the other GHGs annually, to take account of new data including revisions to policy savings estimates, fossil fuel prices, carbon price projections, growth projections and cost estimates for the power sector. There are also improvements to the underlying energy and emissions projection model.

Table 12 sets out the UK's historic emissions to 2013 and *with measures* (also referred to as 'with existing measures', or 'WEM') projections from 2015 to 2035, by GHG. The historic emissions set out in this chapter are based on the UK GHG inventory 1990 – 2013 published and submitted to the UNFCCC in October 2015. The current emissions projections up to 2035 are consistent with this inventory. The UK's GHG inventory and National System are discussed in Chapter 1.

The tables of emissions in this chapter are reported on the basis of UNFCCC coverage. UNFCCC coverage is wider than the coverage used by the UK for carbon budgets purposes, for which its national published projections are produced. The difference in coverage was 0.7% in 2013 based on the latest (1990 – 2013) inventory. Therefore whilst the projected emissions are based upon the national projections published in November 2015[29] the UK has added new projections for those overseas territories not covered in its published national projections to make due allowance for this difference.

The projections show that, including the impact of implemented and adopted measures, but excluding any use of flexible mechanisms such as EU Emissions Trading System (EU ETS) emissions trading or Joint Implementation (JI)/ Clean Development Mechanism (CDM) credits, UK GHG emissions including LULUCF are expected to be 44% below 1990 levels in 2020 and 48% below in 2030. For estimates excluding LULUCF the percentages are very similar. LULUCF emissions are reported in full, consistent with the Inventory Convention reporting and not restricted to just those allowed under Articles 3.3 and 3.4 of the Kyoto Protocol.

[29] 2015 Energy and Emissions Projections: https://www.gov.uk/government/publications/updated-energy-and-emissions-projections-2015

Table 12: UK Greenhouse gas emissions by gas (UNFCCC coverage)

$MtCO_2e$	Inventory						Projections				
GHG excluding LULUCF	**1990**	**1995**	**2000**	**2005**	**2010**	**2013**	**2015**	**2020**	**2025**	**2030**	**2035**
Carbon Dioxide	596.4	561.2	561.2	563.4	507.6	475.2	456.4	372.6	337.0	347.1	345.7
Methane	137.2	130.2	114.1	92.3	67.2	56.4	53.1	47.9	46.9	45.1	44.7
Nitrous Oxide	56.1	46.3	35.7	31.4	28.2	27.0	27.3	26.1	25.6	25.6	25.6
Hydrofluorocarbons	14.6	19.6	10.5	13.2	15.7	16.3	16.2	11.0	7.2	4.3	2.7
Perfluorocarbons	1.7	0.6	0.6	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2
Sulphur Hexafluoride	1.3	1.3	1.8	1.1	0.7	0.6	0.5	0.5	0.5	0.5	0.6
Nitrogen Trifluoride	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	**807.2**	**759.1**	**723.8**	**701.6**	**619.8**	**575.7**	**553.6**	**458.2**	**417.4**	**422.7**	**419.5**
Change from 1990	na	-10%	-10%	-10%	-20%	-30%	-30%	-40%	-50%	-50%	-50%
GHG including LULUCF											
Carbon Dioxide	599.3	563.4	561.0	559.5	502.5	469.2	451.1	368.2	334.2	346.5	346.5
Methane	137.2	130.2	114.1	92.3	67.3	56.4	53.2	48.0	47.0	45.1	44.8
Nitrous Oxide	57.2	47.3	36.7	32.2	29.0	27.7	28.0	26.8	26.3	26.3	26.4
Hydrofluorocarbons	14.6	19.6	10.5	13.2	15.7	16.3	16.2	11.0	7.2	4.3	2.7
Perfluorocarbons	1.7	0.6	0.6	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2
Sulphur hexafluoride	1.3	1.3	1.8	1.1	0.7	0.6	0.5	0.5	0.5	0.5	0.6
Nitrogen Trifluoride	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	**811.2**	**762.4**	**724.7**	**698.7**	**615.5**	**570.5**	**549.1**	**454.6**	**415.5**	**423.0**	**421.2**
Change from 1990	na	-10%	-10%	-10%	-20%	-30%	-30%	-40%	-50%	-50%	-50%
Net LULUCF emissions											
Carbon Dioxide	2.9	2.2	-0.2	-3.8	-5.1	-6.0	-5.3	-4.4	-2.8	-0.5	0.9
Methane	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1
Nitrous Oxide	1.1	1.1	1.0	0.9	0.7	0.7	0.7	0.7	0.8	0.8	0.8
Total	**4.0**	**3.3**	**0.8**	**-2.9**	**-4.3**	**-5.2**	**-4.5**	**-3.6**	**-2.0**	**0.3**	**1.7**

Source: 2013 Final UK greenhouse gas emissions statistics[10], 2015 Energy and Emissions Projections[29]

Projections by sector

The following tables set out historic and projected 'with measures' emissions by economy sector.

Table 13 shows how historical and projected GHG emissions are distributed across the UK economy. In this *by source* classification emissions are allocated to the sector which is expected to produce them directly, mainly affecting emissions related to electricity generation from power stations, which are captured by the energy sector rather than by another sector that may benefit from the activity that uses this electricity.

Table 13: UK Greenhouse gas emissions by sector (UNFCCC coverage)

$MtCO_2e$	Inventory						Projections				
Sector	**1990**	**1995**	**2000**	**2005**	**2010**	**2013**	**2015**	**2020**	**2025**	**2030**	**2035**
Energy [1]	610.8	566.9	559.4	556.5	503.2	468.9	450.6	367.2	331.4	340.1	338.7
Transport [2]	122.4	122.7	127.3	131.4	120.9	117.3	118.7	113.3	108.0	108.3	109.8
Industrial processes and product use [1]	66.4	61.1	41.1	39.5	34.5	34.6	33.6	27.2	22.9	19.6	17.8
Agriculture [1]	60.5	59.5	56.4	52.5	50.3	49.5	49.5	48.4	48.7	48.9	48.8
Land use, land use change and forestry [1]	4.0	3.3	0.8	-2.9	-4.3	-5.2	-4.5	-3.6	-2.0	0.3	1.7
Waste [1]	69.5	71.6	66.9	53.2	31.7	22.7	20.0	15.4	14.4	14.2	14.2
Total net GHG emissions	**811.2**	**762.4**	**724.7**	**698.7**	**615.5**	**570.5**	**549.1**	**454.6**	**415.5**	**423.0**	**421.2**
Memo: International Bunkers											
Aviation	15.4	20	30	34.8	31.5	31.9	32.8	36.5	38.5	40.3	42.4
Shipping	8.8	8.2	6.9	7.9	9.3	8.7	9.9	9.9	9.9	9.9	9.9

Source: 2013 Final UK greenhouse gas emissions statistics[10], 2015 Energy and Emissions Projections[29]

Notes:

[1] IPCC sector definitions

[2] Transport is a sub-sector of energy

Energy

The 'with measures' projections of emissions from the energy sector show that emissions are expected to be 40% lower than 1990 levels by 2020 and 44% below by 2030.

Table 13a: Energy sector emissions by GHG, UNFCCC coverage ($MtCO_2e$)

	1990	**1995**	**2000**	**2005**	**2010**	**2013**	**2015**	**2020**	**2025**	**2030**	**2035**
Carbon Dioxide	568.4	533.4	536.9	540.0	489.7	456.7	438.5	355.9	320.9	331.3	330.2
Methane	37.0	28.1	17.7	11.9	9.9	8.4	8.1	7.7	7.1	5.4	5.2
Nitrous Oxide	5.5	5.4	4.8	4.5	3.7	3.8	3.8	3.5	3.3	3.2	3.2
Hydrofluorocarbons	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perfluorocarbons	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
Sulphur Hexafluoride	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nitrogen Trifluoride	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	**610.8**	**566.9**	**559.4**	**556.5**	**503.2**	**468.9**	**450.6**	**367.2**	**331.4**	**340.1**	**338.7**
Change from 1990	na	-7%	-8%	-9%	-18%	-23%	-26%	-40%	-46%	-44%	-45%

There are notable trends in energy emissions across a number of economic sectors. In energy industries, the overall trend in emissions is dominated by electricity generation. The UK projections show a significant reduction in the electricity supplied from coal plants by 2020 for three main reasons: firstly, due to the impact of the Industrial Emissions Directive (IED), which means that plants that have opted out of retro-fitting pollution abatement equipment are limited as to their remaining operating hours; secondly through natural ageing and replacement of plants with different fuelled technology, and thirdly, due to the less favourable economic position of the remaining coal fired plants as a result of the Carbon Price Floor.

The other key feature of the period to 2020 is that generation from renewables is projected to grow significantly, initially as a result of the economic incentives provided by the Renewable Obligation (RO). The RO will then be replaced from 2017 by Contracts for Difference (CfD). The projected expansion of renewables capacity and generation broadly offsets the reduction in coal generation. The projected increase in renewables generation continues the strong trend experienced in recent years.

Beyond 2020 trends in electricity generation are different to those prior to 2020. In the UK's existing measures scenario, there are no new measures acting to promote low carbon technologies beyond 2020 and hence unabated gas generation increases significantly to offset the continued reduction in coal generation and growth in electricity demand. Carbon Capture and Storage (CCS) and nuclear capacity and generation are modelled to expand in the years leading up to 2035 in response to increasing carbon prices.

Emissions from the oil and gas extraction industry are projected to continue to fall as the sector contracts. Current projections do not include any contribution from non-conventional oil and gas ('fracking').

Prospects for the refinery sector have been reviewed and as a result the sector's projected emissions are now significantly lower than previously expected. The lower projections mainly reflect the closure of refinery capacity in recent years which has already reduced emissions significantly.

The energy sector also includes emissions from combustion for domestic household, public service and commercial use. The principal long-term driver of emissions in UK households is household numbers, which is increasing over the whole period both due to population growth in the UK as a whole and due to the disproportionate increase in smaller households. Emissions are also affected by annual variations in weather; the projections assume some increase in temperatures in the main heating season.

Up to 2020 the impact of secular increases in population and housing are offset by the impact of existing energy & emission reduction policies, for example, through the improved insulation of homes. Additional policies to offset the increase in emissions between 2020 and 2030 are being considered.

Energy emissions also cover those from public services, including emissions from central and local government, defence, education, health and social work. It also includes the provision of these services by the private sector. These projections assume that there is still scope to improve energy efficiency and to continue to drive down emissions. Projections also include the effect of a planned contraction in the sector in the medium term (due to government cost cutting and efficiency policies) and policy measures that encourage improved energy efficiency and emissions reductions, such as more stringent Building Regulations, minimum energy efficiency standards for new products and economic measures such as the Carbon Reduction Commitment and the Renewable Heat Incentive. Consequently total GHG emissions in this component of the energy sector are expected to fall through to the mid - 2020s before rising slightly in the late 2020s and 30s.

Energy emissions from CO_2 (and related CH_4 and N_2O emissions) in commerce are attributable to combustion, both to heat buildings and in manufacture. Emissions in this area have remained broadly as they were in the early 1990s, but are projected to fall to 31% below 1990 levels by 2020, and to 45% below by 2030. Improvements over time include the impact of policies that encourage energy efficiency and/or reduce emissions, such as more stringent Building Regulations, minimum energy efficiency standards for new products and economic measures such as the Carbon Reduction Commitment and the Renewable Heat Incentive. These are discussed in Chapter 3: Policies and Measures.

Transport

For the purposes of IPCC the domestic transport sector is a sub-category of the energy sector. In 2013, 117 $MtCO_2e$ was emitted in the transport sector, representing around a quarter of energy emissions. It is projected that as we move into the 2030s transport will comprise around a third of energy emissions. Transport emissions are projected to be 7% lower than 1990 levels by 2020 and 12% lower by 2030.

Table 13b: Transport sector emissions by GHG, UNFCCC coverage ($MtCO_2e$)

	1990	1995	2000	2005	2010	2013	2015	2020	2025	2030	2035
Carbon Dioxide	120.4	120.4	125.5	130.0	119.9	116.2	117.5	112.0	106.6	106.9	108.3
Methane	0.8	0.6	0.4	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0
Nitrous Oxide	1.3	1.7	1.5	1.2	0.9	1.0	1.1	1.3	1.4	1.4	1.4
Hydrofluorocarbons	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perfluorocarbons	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sulphur Hexafluoride	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nitrogen Trifluoride	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	**122.4**	**122.7**	**127.3**	**131.4**	**120.9**	**117.3**	**118.7**	**113.3**	**108.0**	**108.3**	**109.8**
Change from 1990	na	0%	4%	7%	-1%	-4%	-3%	-7%	-12%	-12%	-10%
Memo: International Bunkers											
Aviation	15.4	20.0	30.0	34.8	31.5	31.9	32.8	36.5	38.5	40.3	42.4
Shipping	8.8	8.2	6.9	7.9	9.3	8.7	9.9	9.9	9.9	9.9	9.9

The underlying growth in road transport use, which was interrupted by the economic recession from 2008, is projected to resume. However, measures to improve vehicle efficiency; such as the EU tailpipe emissions targets for new cars and vans, or to directly reduce emissions, such as mandating greater use of biofuels and providing incentives to encourage the adoption of electric vehicles are expected to reduce annual emissions between 2014 and 2030.

CH_4 and N_2O emissions from road transport have been changing due to changing European vehicle standards and increasing diesel cars over petrol. N_2O emissions had been falling since the mid-1990s due to reducing N_2O emissions from petrol vehicles with higher emission standards. However, since 2010 they have increased and are projected to continue to do so due to increased diesel activity with associated higher emission factors. A similar, but lagged, trend is projected for CH_4 emissions.

Emissions related to fuel combustion from aviation and shipping engaged in international transport are included as a Memo item and in accordance with the UNFCCC's reporting guidelines are not included in the UK's historic or projected emissions.

Emissions from aviation fuel loaded in the UK and its overseas territories onto international flights had increased at an average rate of around 5.1% per annum between 1990 – 2007, but fell in the recession and are now projected to increase by 1.3% per annum between 2014 and 2035. This lower rate of growth is partly explained by constraints on UK airport capacity, and on improvements in fuel efficiency in the aircraft fleet. The Department for Transport also project a modest growth in use of bio-kerosene.

The UK is working to establish an international method for allocating these emissions to national inventories and is working through the International Civil Aviation Organisation to encourage development, and with the EU, implementation of emissions trading at the international level.

Industrial processes and product use

Emissions from industrial processes, which include process emissions from cement and lime production, glass manufacture, steel production, and chemicals manufacture, have fallen sharply in the period up to 2010 compared to 1990, by 48%. Emissions have then remained relatively stable, though are projected to fall again sharply to 59% below 1990 levels by 2020 and 71% below by 2030.

Table 13c: Industrial processes and product use sector emissions by GHG, UNFCCC coverage ($MtCO_2e$)

	1990	1995	2000	2005	2010	2013	2015	2020	2025	2030	2035
Carbon Dioxide	24.8	25.0	22.7	21.9	16.4	17.2	16.6	15.4	14.8	14.5	14.2
Methane	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Nitrous Oxide	23.9	14.4	5.4	2.9	1.3	0.1	0.1	0.1	0.1	0.1	0.1
Hydrofluorocarbons	14.6	19.6	10.5	13.2	15.7	16.3	16.2	11.0	7.2	4.3	2.7
Perfluorocarbons	1.7	0.6	0.6	0.4	0.3	0.3	0.1	0.1	0.1	0.1	0.1
Sulphur Hexafluoride	1.3	1.3	1.8	1.1	0.7	0.6	0.5	0.5	0.5	0.5	0.6
Nitrogen Trifluoride	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	**66.4**	**61.1**	**41.1**	**39.5**	**34.5**	**34.6**	**33.6**	**27.2**	**22.9**	**19.6**	**17.8**
Change from 1990	na	-8%	-38%	-40%	-48%	-48%	-49%	-59%	-66%	-71%	-73%

The large historic reductions in emissions of N_2O were achieved through the introduction of abatement equipment to control fugitive emissions from adipic acid, and more recently nitric acid and subsequently by the cessation of adipic acid manufacture in the UK. Similarly, the use of abatement technology in the late 1990's led to a large reduction in emissions of HFC-23 emissions from HCFC-22 manufacture. However, this was counterbalanced by the increasing use of HFCs following the switch from cholorofluorocarbons (CFCs).

The rapid growth of HFC use since 1990 is expected to reverse in the future as EU F gas regulations require that HFCs are phased out in favour of other gases (e.g. ammonia, CO_2, hydrocarbons) or HFCs with lower GWPs.

Although industrial growth has now resumed, emissions in the industrial process sector are projected to continue to fall, as it is expected that the industrial growth will be largely concentrated in other sectors, such as the chemical industry and construction.

Land use, land use change and forestry management emissions

Table 13d: LULUCF sector emissions by GHG, UNFCCC coverage ($MtCO_2e$)

	1990	1995	2000	2005	2010	2013	2015	2020	2025	2030	2035
Carbon Dioxide	2.9	2.2	-0.2	-3.8	-5.1	-6.0	-5.3	-4.4	-2.8	-0.5	0.9
Methane	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1
Nitrous Oxide	1.1	1.1	1.0	0.9	0.7	0.7	0.7	0.7	0.8	0.8	0.8
Hydrofluorocarbons	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perfluorocarbons	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sulphur Hexafluoride	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nitrogen Trifluoride	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	**4.0**	**3.3**	**0.8**	**-2.9**	**-4.3**	**-5.2**	**-4.5**	**-3.6**	**-2.0**	**0.3**	**1.7**
Change from 1990	na	-18%	-79%	-173%	-207%	-232%	-213%	-190%	-149%	-93%	-57%

The UNFCCC basis for reporting of emissions includes all human-induced changes to land-based carbon stocks (i.e. sources and sinks of GHGs). The main drivers of change in removals are changes in rates of land use change and of the management of the land sectors together with the impact of the UK's significant increase in afforestation during the period from 1920 to 1990 and the resulting carbon uptake by forests.

The Kyoto Protocol basis for reporting of, and accounting of, emissions includes LULUCF emissions and removals associated with mandatory activities under Article 3.3 of the Kyoto Protocol – afforestation plus reforestation minus deforestation (ARD) – since 1990. In addition, since the UK has chosen to account for forest management under Article 3.4 of the Kyoto Protocol, the Kyoto basis also indicates removals up to the level of the cap agreed for the UK as part of the Marrakech Accords, since the actual uptake by forests is projected to exceed the cap in most years. In accordance with Article 3.7 of the Kyoto Protocol, and subsequent Conference of the Parties (COP) decisions, a small base year allowance of 0.33 $MtCO_2e$ related to deforestation emissions in 1990 is added to the UK base year as LULUCF was a net source of emissions in the UK in 1990.

From 1990, the amount of carbon stored in UK trees has been increasing, with the accumulation rate reaching a net sink of 5.2 $MtCO_2$/year in 2013. However, the UK's experts expect this balance to change in future as forests mature (in mature forests carbon uptake is reduced) and more are felled and by 2020 the accumulation rate will have fallen substantially. Over time LULUCF emissions are expected to switch from being a small sink to a small source of emissions (1.7 $MtCO_2e$ by 2035). The Forest Land, Cropland and Grassland categories dominate the trend. Forest Land is a shrinking net sink (due to a combination of forest management and decreasing age class distribution – discussed in more detail in the UK's National Inventory report). GHG emissions from wetlands, currently taken as peat land extraction sites, are a small component of the LULUCF sector and no detailed assumptions have been made. The settlement category is projected to have slowly increasing emissions from 2012 onwards, driven by steady rates of land use conversion to settlement.

Waste and waste management emissions

Annual emissions from waste management have fallen by 67% compared to 1990 levels in 2013 and are expected to fall to 78% below 1990 levels by 2020 and by 80% by 2030. The historic fall can largely be attributed to a reduction in CH_4 emissions from landfill sites due to the introduction of the Landfill Directive in 2000 and associated measures. These had the aim of reducing the amount of waste going to landfill and improving the collection of methane for energy recovery from landfill sites.

The continuing reduction in waste emissions is caused by the continuing decrease in landfill emissions as more waste is preferentially sent to alternative disposal routes (incineration, biological waste treatment (BWT) and recycling) and small further improvements in landfill efficiency are made. The policy which partially drives this, the Landfill Directive, expires in 2020. Therefore the proportion of waste going to landfill stops decreasing post 2020, although emissions reductions continue as landfill emissions are lagged behind disposal. Partially counteracting the decrease in landfill emissions are increases in BWT emissions and domestic wastewater emissions.

Table 13e: Waste sector emissions by GHG, UNFCCC coverage ($MtCO_2e$)

	1990	1995	2000	2005	2010	2013	2015	2020	2025	2030	2035
Carbon Dioxide	1.3	0.9	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Methane	67.1	69.5	65.1	51.3	29.8	20.8	17.9	13.2	12.2	11.9	11.8
Nitrous Oxide	1.1	1.2	1.3	1.5	1.7	1.7	1.8	2.0	2.0	2.1	2.1
Hydrofluorocarbons	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perfluorocarbons	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sulphur Hexafluoride	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nitrogen Trifluoride	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	**69.5**	**71.6**	**66.9**	**53.2**	**31.7**	**22.7**	**20.0**	**15.4**	**14.4**	**14.2**	**14.2**
Change from 1990	na	3%	-4%	-24%	-54%	-67%	-71%	-78%	-79%	-80%	-80%

Agricultural emissions

Emissions from the agriculture sector showed reductions of 18% on 1990 levels in 2013 which reflects declining livestock numbers and a reduction in the amount of synthetic fertiliser used. The historic fall in CO_2 emission is largely related to fewer emissions from mobile machinery.

Emissions are expected to be fairly stable through the 2020s and 2030s. The small increase in CH_4 emissions is partially caused by the growth in the dairy industry, while the small decrease in N_2O emissions is caused by a reduction in total UK fertiliser due to a small reduction in arable area, as well as significantly reduced application rates to grasslands through better nutrient advice.

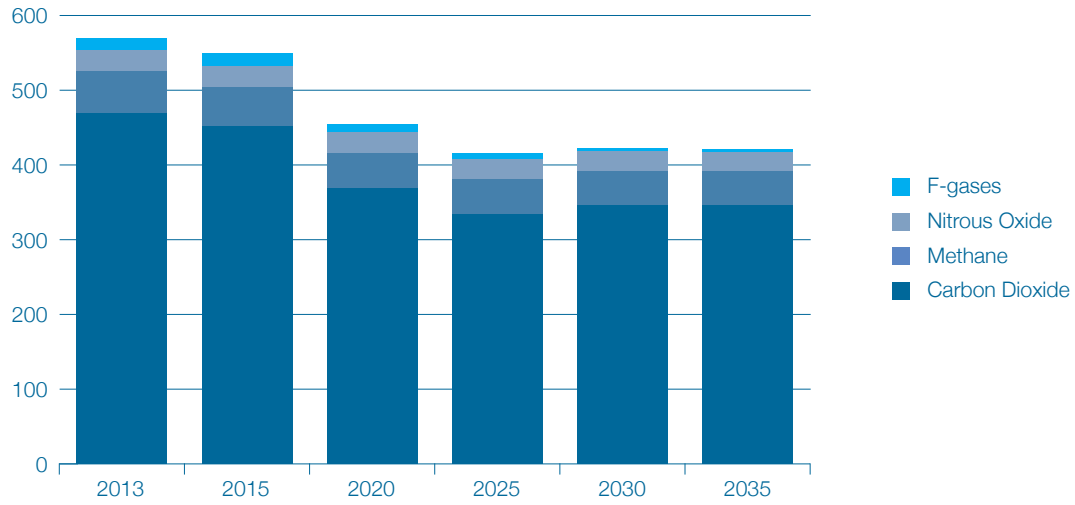
Table 13f: Agriculture sector emissions by GHG, UNFCCC coverage ($MtCO_2e$)

	1990	1995	2000	2005	2010	2013	2015	2020	2025	2030	2035
Carbon Dioxide	2.0	1.9	1.0	1.1	1.2	1.0	1.0	1.0	1.0	1.0	1.0
Methane	32.9	32.3	31.1	28.9	27.4	27.1	27.0	26.9	27.5	27.6	27.6
Nitrous Oxide	25.6	25.3	24.2	22.5	21.6	21.4	21.5	20.5	20.2	20.2	20.2
Hydrofluorocarbons	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perfluorocarbons	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sulphur Hexafluoride	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nitrogen Trifluoride	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	**60.5**	**59.5**	**56.4**	**52.5**	**50.3**	**49.5**	**49.5**	**48.4**	**48.7**	**48.9**	**48.8**
Change from 1990	na	-2%	-7%	-13%	-17%	-18%	-18%	-20%	-19%	-19%	-19%

Projections by gas

Each of the sector tables above provide information about projected emissions both by sector and by greenhouse gas. The following section describes the main emissions trends expected by greenhouse gas.

Figure 5: UK GHC projected emissions by gas, 2013–35, $MtCO_2e$



Source: 2013 Final UK greenhouse gas emissions statistics[10], 2015 Energy and Emissions Projections[29]

Carbon dioxide

Carbon dioxide emissions are declining slowly as energy efficiency, alternative fuels and decline in heavy industry offsets increasing population, transport demand and renewed economic growth.

The largest change expected is the continued and accelerating decline in CO_2 from energy supply as the power sector is decarbonised. Historically this was driven by the replacement of coal by natural gas in power stations and which is now being supplemented by a planned growth – driven by policy measures, such as the greater use of renewables.

In the energy sectors, economic and population growth is partially offset by policy measures intended to improve energy efficiency and to increase the use of renewables.

The decline in CO_2 emissions in agriculture is largely due to a continued decline in the use of off-road transport.

Methane

Methane emissions have already fallen significantly, by 59%, between 1990 and 2013 and are projected to continue to decline more modestly, by a further 20% by 2030. This is largely as a result of expected reductions in landfill waste, with some contribution from decreasing natural gas leakage due to pipe replacement and reducing coal mining.

Waste disposal on land was the largest source of CH_4 in 1990, and it is projected to fall further due to the policy-driven diversion of solid wastes to recycling and combustion for energy. Wastewater treatment CH_4 emissions reduced slightly from 1990 to 2013 and are projected to remain fairly constant.

Agriculture, which was the second largest source of CH_4 in 1990, is now by far the largest and is expected to stay so. The small projected increase is partially caused by projected growth in the dairy industry.

Coal mining, which was a major source of emissions in 1990, is now much smaller and so can contribute less to future savings, although it will continue to decline.

Fugitive emissions from natural gas distribution have already been reduced due to replacement of the UK's gas pipe infrastructure and it is projected that this will continue.

Methane emissions from other fuel combustion for energy decreased historically, driven by the switch away from coal as a fuel; however, it is now expected to increase modestly up to 2025 as the economy grows.

Nitrous oxide

The largest source of N_2O in 2013 was agriculture (fertilisation of soils) and although abatement activities, such as implementation of the Nitrates and Water Framework Directive have and will continue to reduce emissions, the projected emissions reductions are modest and we expect agriculture to remain the largest source in 2030.

N_2O emission from nitric acid and adipic acid production were the second largest source in 1990. However, following plant closures (no adipic acid production facilities remain) and the adoption of improved abatement technology, these emissions have decreased to negligible levels by 2011.

Elsewhere waste N_2O emissions are projected to partially increase due to increased Biological Waste Processes and sewage sludge decomposition. Transport N_2O emissions are also projected to partially increase due to increased diesel vehicle activity. Growth in the economy will also lead to some increased emissions elsewhere.

The fluorinated gases

Hydrofluorocarbons (HFCs)

The largest source of HFCs emissions in the 1990s was as a by-product of the manufacture of HCFC-23, used as a propellant and refrigerant. Manufacture of hydrochlorofluorocarbons (HFCFs) declined rapidly once its ozone depletion and GWP properties were recognised and as a result this reduced emissions of HFC.

However, use of HFCs increased as HFCs replaced HCFC as HCFC were phased out as a propellant and in refrigeration and air conditioning from 1995 onwards. This increase is expected to peak presently and then HFC emissions are projected to reduce by 75% between 2013 and 2030. This significant reduction is caused by the various requirements of the 2014 EU F-gas regulation, particularly the specified phase down in F gas sales and F gas bans.

UK projections include a persistent demand for HFC in firefighting and metered dose inhalers, where viable low GWP alternatives have yet to emerge.

Perfluorocarbons (PFCs)

Historically the largest source of PFCs has been as a by-product at carbon anodes in primary aluminium manufacture. However this has reduced to negligible values as it has become increasingly possible to minimise the mode of operation that leads to PFC formation. There is then a significant drop in 2012 as the larger of the two remaining primary aluminium smelters in the UK closed.

The projections show continued constant emissions of PFCs in electronics and halocarbon production.

Sulphur hexafluoride (SF_6)

The major uses of SF_6 are as a magnesium cover gas, in high-voltage electrical switch gear, as an insulator in semiconductor manufacture and in military 'AWACs'.

Emissions, though small, have declined throughout the period 1990 – 2013 for use as a cover gas due to declining industrial demand. UK projections expect that SF_6 use will now roughly stabilise at its current level. The projections show SF_6 will continue to be used as an insulator and for other minor uses including electronics.

Assessment of total effect of policies and measures

The projections presented here (the 'with measures' scenario) include the impact of all the UK's implemented and adopted policies and measures. These policies and measures and their projected CO_2e savings are detailed in the Annex.

Since the last Biennial Report, the UK has continued to provide updated analysis of policies and measures expected to help meet its EU effort sharing and renewable energy targets, and the targets for the first three carbon budgets set under the 2008 Climate Change Act. Details of these policies are in Chapter 3.

The UK treats the policies adopted before 2009, when carbon budgets were set at the time of the 2009 Budget, as part of the baseline. Figure 6 and Table 14 below show the estimated emissions savings and the effect on projected emissions attributable to policies adopted between April 2009 and the November 2015, as published in our latest UK national projections. For example, in 2020 it is expected that UK policies will deliver emissions reductions of over 60$MtCO_2e$.

Figure 6: Projected impact of adopted and implemented policies

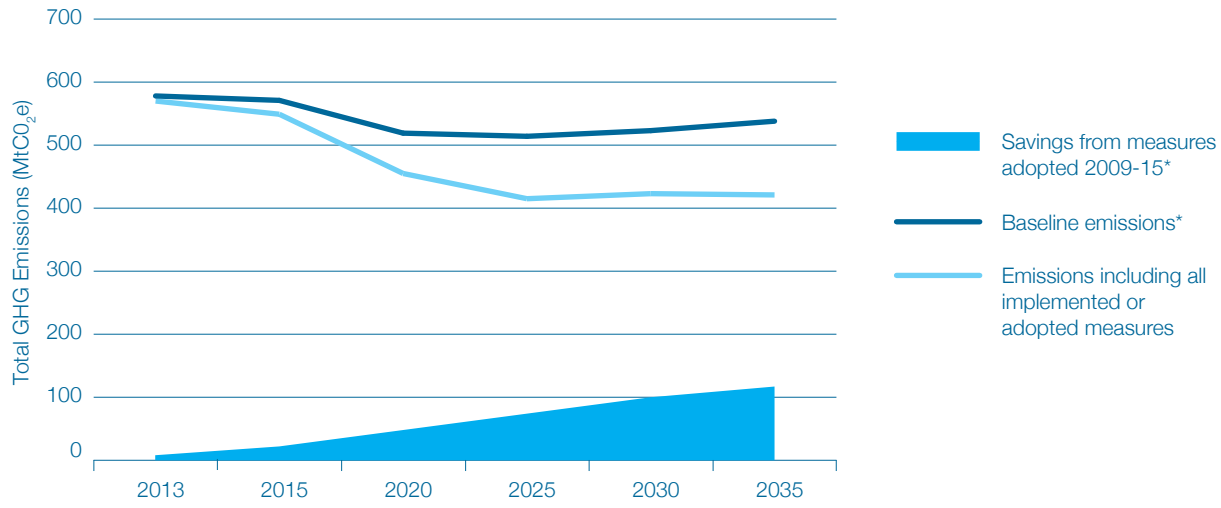


Table 14: Projections of total net GHG emissions in the 'with measures' scenario ($MtCO_2e$)

	2013	2015	2020	2025	2030	2035
Emissions excluding the impact of measures adopted between 2009-15 (baseline)*	578	571	519	514	523	538
Savings from measures adopted 2009-15 (excluding planned policies)*	8	22	65	99	100	117
Emissions including all implemented or adopted measures (excluding planned policies)	570	549	455	415	423	421

Source: 2015 Energy and Emissions Projections[29]

Note: * Due to interactions between different measures in the modelling process, the sum of emissions savings from individual policies (as provided in CTF Table 3, Annex 1) does not exactly equal the difference between the 'with measures' and baseline projection.

Projections methodology

Carbon dioxide and combustion-related other GHG

Projections of the UK's emissions of CO_2 and combustion-related emissions of other greenhouses gases (CH_4 and nitrous oxide) have been largely derived from the DECC Energy and Emissions Projections (EEP) model. This is made up of a set of interlocking sub-models of the UK energy market including final user energy sectors and the electricity supply sector. It is a top down demand model, based on econometrically estimated relationships between energy demand, energy supply, economic activity and energy prices and a bottom-up supply side model. The sector classification source, and the principal source of energy statistics, is the Digest of UK Energy Statistics (DUKES).[30]

Energy use projections are converted to emissions projections using the same fuel emissions factors used to produce the UK National Inventory, with some additional calibration to take account of any energy uses not captured in the DUKES. Industrial process emissions are calibrated by relating inventory emission to production.

The DECC model makes projections based on prospects for fossil fuel prices, carbon prices and economic growth and demographics.

The source of these projections is described in the key assumptions section, below.

These projections included scenarios for three fossil fuel price assumptions, for three GDP growth rates and a baseline including only pre-2009 policies and measures. The projections in the UK are typically presented 'with measures' and 'with additional measures', though these are on a UK-only basis and do not include emissions from crown dependencies and overseas territories. The projections reported in this chapter are based on the 'with measures' scenario which have been scaled up to meet UNFCCC requirements. This uses the UK's reference scenario assumptions as to fossil fuel prices and economic growth.

The projections start from a baseline econometric Business as Usual Projection, from which savings due to Policies and Measures are then subtracted. The projections include all firm and funded government environmental policy measures as most recently evaluated. These are all considered to be adopted policies and do not include those that only have planned status e.g. EU Eco-design energy efficiency standards where the proposals have not yet been voted on, or the proposed Building Regulations 2014 as its content has not yet been finalised.

Sectoral methodologies for carbon dioxide and combustion-related other GHG

Projections in the EEP model are based around an energy balance model which uses the energy-use sectors defined in the DUKES, not the emissions sectors defined for Biennial Reports or the IPCC categories used for the Inventory.

Growth in each sector is based on econometric models that estimate sectoral growth, energy use and emissions consistent with the key assumptions and calibrated against sectoral gross value added (GVA), tonnages, reported energy use and the inventory.

The overall modelling approach is similar to that used in the previous Biennial Report, although there have been numerous improvements in each sector.

Energy

A large part of the energy sector emissions comprise electricity and heat generation, oil refining, energy extraction and distribution, and manufacture of solid fuels (coke ovens and patent fuels).

[30] https://www.gov.uk/government/collections/digest-of-uk-energy-statistics-dukes

For the electricity generation sub-sector DECC has a sub-model – the Dynamic Despatch Model (DDM) to project investment and generation. This is a market based model that simulates in detail the operation of the electricity market and the investment decision of the market participants. It is a profit-maximisation model. This models the effect of government policies that incentivise through market mechanisms. One example would be the use of contracts for difference to incentivise investment in nuclear, renewable and low-carbon technologies.

This is supplemented by the Combined Heat and Power (CHP) model which models investment in and the supply of heat and electricity from combined heat and power plant, mostly in Industry.

The primary driver of oil refining energy use is domestic demand for oil products and an import/export adjustment as the UK has surplus refining capacity for some oil products – motor spirit and fuel oil; and a deficit of others – kerosene and diesel/gas oil.

Energy use in energy extraction and distribution is largely driven by extraction of oil and gas in the North Sea, where production has already peaked. Coal mining continues at a low level and is now predominantly opencast. For energy extraction we use projections from DECC's Energy Development Unit. In these projections the UK is not yet assuming any unconventional onshore oil or gas extraction (fracking).

Although there is scope for reducing fugitive emissions, both in energy extraction and across the distribution network, in these projections the UK government conservatively assume no reduction.

Energy use in coke manufacture is driven by demand for metallurgical coke for making iron and steel.

In projections regarding domestic energy use separate equations are used for each fuel. The primary driver of demand is household number however, there are fuel price, seasonal temperature (heating degree day) and income effects. For gas the penetration of central heating systems is also taken into account.

The primary driver of total energy demand in Commercial Services is sectoral GVA, although the elasticity is less than 1. There are also fuel price and seasonal temperature effects. Fuel share models are then used to decompose this into demands for the individual fuels.

When modelling public services the primary driver of electricity and heating fuel demand is sectoral employment. Similar to commercial services, there are also seasonal temperature effects and an observed time trend in improving energy intensity per employee. As with commercial services a fuels share model is then used to decompose this heating energy into demand for the individual fuels. In both areas of the economy additional energy efficiency improvements are policy driven.

Industrial processes

Industry energy demand and process emissions are projected on a final use sub-sectoral basis. The sub-sectors are categories defined based on those used in the DUKES, with some aggregation for the non-energy intensive sub-sectors. The sub-sectors used are iron & steel (including coke manufacture); non-ferrous metals; chemicals & pharmaceuticals; non-metallic minerals (including non-energy mining & quarrying), pulp, paper & printing; engineering and vehicles; textiles, leather & clothing; other manufacturing (including waste & water treatment); and unclassified.

In each sub-sector the primary driver is GVA, except iron & steel where a steel tonnage driver for basic oxygen and electric arc processes has been used.

Sub-sector GVAs are estimated from econometric equations that include UK GDP elasticities, World GDP elasticities, effective exchange rate elasticities and time trends.

The modelling then allows for price drivers and historical trends in energy intensity, although in the majority of cases the intensity has been observed to be constant.

Having estimated total energy demand in the sector fuel share models are used to decompose this into demands for the individual fuels. Fuel share models are logit models and include cross-price elasticities and time trends.

Process Emissions of CO_2 are stoichiometric (assuming no major changes to the processes used) and are derived from sub-sectoral output drivers.

Transport

Separate models are used for road transport, rail, aviation and shipping.

The road transport model is an econometric response surface model that is calibrated against the DfT's National Transport Model.

The econometric model is multi-modal (cars, light good vehicles (LGV), heavy goods vehicles (HGV), and public service vehicles (PSV)) and includes a population driver for cars and a manufacturing GVA driver for HGV as well as price, motor spirit/diesel engine share and fuel efficiency and biofuel substitution effects.

Most energy efficiency improvements are policy driven e.g. by EU new car emissions intensity targets, biofuel content targets and complementary measures such as lower rolling resistance tyres for HGVs.

The rail model is based on DfT's projected traffic growth, electrification of existing track and the construction of new lines, such as Crossrail and HS2.

The commercial aviation projections both international and domestic are based on the projections in the DfT's National Aviation Model.

National navigation is projected to remain largely static.

Agriculture

Agriculture is a small user of energy in the UK and therefore simple trend models are used for this sector.

Non-combustion, non-CO_2 GHG emissions

Land use, land use change and forestry management

Land use, land use change and forestry (LULUCF) emissions projections are produced by the Centre for Ecology and Hydrology under contract to DECC.

The projections take account of the dynamics of carbon stocks in the relevant pools. The LULUCF sector is divided into six land use types for reporting of emissions/removals: 5A Forest Land, 5B Cropland, 5C Grassland, 5D Wetlands, 5E Settlements, 5F Other Land. Net carbon stock changes from Harvested Wood Products are reported in 5G Other.

Emissions of GHG to the atmosphere are expressed as positive quantities, and removals of CO_2 as negative quantities. Emissions of all three GHG can be combined together into total CO_2e, using standard GWPs. The net LULUCF emission is the balance of emissions and removals across the seven categories (5A-5G): the net total is smaller than most of the category totals.

Projections are made for net emissions and removals of GHGs to 2050, arising from LULUCF activities reported in the latest (1990 – 2011) GHG inventory The UK has produced various policy scenarios to reflect a range of possible future policy choices in the period to 2050. For example, the low emission scenario emphasises bioenergy crop production and woodland creation. The projections presented here are based on a scenario that assumes the policy priority is to increase food production, and there is less focus on bioenergy crops and forestry. The high emission scenario reflects current rates of afforestation continuing beyond the period over which funding has been agreed, with a significant focus of policy on food production over carbon sequestration.

Agriculture

Activity data projections (livestock numbers, crop production, fertiliser N use) to 2030 (note that we flat line post 2030), were provided by Defra using the Food and Agricultural Policy Research Institute (FAPRI) methodology (FAPRI, 2010). The FAPRI projections are based on an economic model assuming a specific set of international prices for agricultural commodities and a particular path for the sterling exchange rate. Together these factors are important determinants of the returns to farmers and hence total agricultural production. The FAPRI activity projections are converted to agriculture emissions projections using the latest agriculture GHGI model.

Expert review of the FAPRI projections in Defra indicated that they could potentially be overly pessimistic for the dairy sector. This is due to an increasing global demand for livestock products, coupled with the removal of milk quotas in the EU; the UK has one of the most efficient milk production sectors in the EU and is well placed to satisfy increased demand. An alternative set of activity data projections was therefore established by Defra based on the British Dairy Industry's Sustainable Growth Plan (Dairy UK, 2014). The two sets of projections represent a plausible range of emissions under economically pessimistic or economically optimistic assumptions. A central projection that we use in these projections was then defined as the mid-way point between the economically pessimistic and optimistic projections of GHG emissions from 2014 to 2030.

Since the UK agricultural inventory model does not currently capture mitigation it was necessary to adjust the GHG estimates for the impacts of existing mitigation policies. In particular the English agricultural industry's GHG Action Plan (NFU, 2011), which aims to reduce English agricultural emissions by 3 $MtCO_2e$ by 2022, has been included. Monitoring by Defra suggests that by 2014 the Action Plan had reduced emissions from English agriculture by 1 $MtCO_2e$ (Defra, 2014) since its implementation in 2009. Note that the current GHGI is conservative, in line with IPCC best practice guidance, and so cannot currently account for mitigation. The GHGI improvement programme is currently addressing this.

Emissions of N_2O from agriculture are being limited both now and will be limited in the future through the Nitrate Directive. This Directive requires a mandatory Action Programme of measures for the purposes of tackling nitrate loss from agriculture.

Waste, industrial processes, business, residential, energy and transport

The emissions projections of the other GHGs covered by the Kyoto Protocol; CH_4, N_2O, HFCs, PFCs, SF_6 and NF_3, but excluding combustion-related emissions of these gases are produced by the Science division in DECC, and are broadly consistent with the assumptions underlying the projections in the DECC Energy and Emissions Projections model.

The projections have been developed to the same level of sectoral detail included in the emissions inventory and are based on a range of data sources. These include consultation with experts and stakeholders from UK government departments, industry and other organisations; technical literature; and incorporating results of studies undertaken for DECC.

Projections have been calculated using a bespoke projections system which complements the national inventory system. The projections system includes spreadsheets to pre-process data, and to feed the projections database which is linked to the national GHG emissions database. This projections system calculates emissions based on forecast activity statistics, emissions factors and various other sector specific assumptions for each of the main sources of emissions. GHG emission projections are disaggregated by sector and are calculated for each year from 2005 to 2035. These are then aggregated to provide an estimate of total projected emissions. The projections system has been designed to be transparent, flexible and easy to update.

The UK has a range of measures to reduce emissions of the non-CO_2 gases. For waste disposed to landfill, emissions of CH_4 to air are controlled through the Integrated pollution prevention and control (IPPC) Directive, implemented via the Environmental Permitting Regulations 2008, and through the Landfill Directive. The Landfill Directive states that landfill gas must be treated and used, and if the gas cannot be used to produce energy, it must be flared. The IPPC Directive also controls industrial emissions from all major industrial installations. Emissions from the manufacture of nitric acid have been mitigated based under site specific decisions regulated via IPPC, following the principles of best available technology (BAT). Many commercial, industrial and public sector organisations in the UK have obligations under the EC regulation on certain fluorinated GHGs and this regulation will limit emissions of F gases, especially from refrigeration and air conditioning equipment.

In accordance with the mechanism for producing the projections of CO_2, the non-CO_2 GHG projections are based on the 'with measures' scenario, which takes into account currently adopted and implemented policies and measures. The effect of new policies are also calculated separately with a 'without measures' scenario.

Projections are updated each year by consulting sector experts on any new information on the sector and comparing trends in actual historic emissions against future emission estimates. If there is a significant deviation between the trend in historic data and future emission estimates, or there information to inform changes to the current projection methodology, projection methodologies and assumptions are revised accordingly.

Estimation of emissions in Crown Dependencies and Overseas Territories

The UK's dependant crown dependencies and overseas territories are not included in the projections that the UK produces annually to monitor progress against its own carbon budgets. For this Biennial Report the UK has therefore supplemented its annual projection with new projections for these areas, consistent with the UK 1990 – 2013 GHG Inventory (see chapter 1).

Emissions in these Territories are only a small proportion of UK emissions, making up around 0.7% of the UK's UNFCCC coverage emissions in 2013.

In the absence of more detailed information about economic and demographic growth and policy measures for these Territories, the UK has produced simple trend projections for GHGs within each Biennial Report sector, assuming a continuation of the linear trends observed in the period 2005 – 2013.

Key assumptions

Our energy and emissions projections are based on a set of key assumptions about UK and world economic growth, demographic changes in the UK and future fuel price trajectories. The main sources of the projections are those made by the UK's Office for Budget Responsibility and Office for National Statistics, supplemented by IMF projections of world growth. Fuel prices are those produced by the Department of Energy and Climate Change. The key parameters and assumptions are documented in CTF Table 5 in Annex 1.

Updated Energy and Emissions Projections are published annually. The latest projections were published in November 2015.[31] This uses the economic assumptions and projections produced for the UK government by the Office of Budget Responsibility (OBR). UK GDP up to 2020 is based on the July 2015 Economic and Fiscal Outlook[32] and beyond 2020 is based on the June 2015 Fiscal Sustainability Report.[33]

Population projections were produced in 2012 by the UK's Office for National Statistics (ONS)[34] and alongside a supporting methodology description.[35]

Household projections are based on those produced by the Department for Communities and Local Government which combine ONS population projections with household formation propensities.[36] Projections were produced separately for England (2012), Scotland (2012), Wales (2011) and Northern Ireland (2008) and combined to produce UK figures.

World GDP is based on the IMF April 2015 World Economic Outlook[37] but extended beyond 2020 in accordance with trends until then.

Updated socio- economic growth assumptions are shown in Table 15.

Table 15: Growth Assumptions

	Actual		Projection				
% per annum	2012	2013	2015	2020	2025	2030	2035
UK GDP	0.7%	1.7%	2.4%	2.4%	2.5%	2.5%	2.5%
World GDP	3.3%	3.3%	3.3%	3.8%	3.8%	3.8%	3.8%
UK Population	0.7%	0.6%	0.7%	0.6%	0.6%	0.5%	0.4%
UK Households	0.9%	0.9%	0.9%	0.9%	0.8%	0.7%	0.7%

Source: 2015 Energy and Emissions Projections[29]

The fossil fuel price projections[38] and carbon prices projections[39] are updated annually by DECC and are subject to peer review. They are also used more widely across government.

Key fossil fuel and carbon price values are set out below in Table 16.

[31] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/477698/Updated_energy_and_emissions_projections_2015.pdf

[32] http://budgetresponsibility.org.uk/pubs/July-2015-Charts-and-tables.xls

[33] http://budgetresponsibility.org.uk/pubs/FSR-2015-Website-Charts-and-Tables.xls

[34] http://www.ons.gov.uk/ons/rel/npp/national-population-projections/2012-based-projections/index.html

[35] http://www.ons.gov.uk/ons/rel/snpp/sub-national-population-projections/2012-based-projections/rpt-snpp-2012-based-methodology-report.html

[36] https://www.gov.uk/government/statistical-data-sets/live-tables-on-household-projections

[37] http://www.imf.org/external/pubs/ft/weo/2015/01/weodata/index.aspx

[38] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/477958/2015_DECC_fossil_fuel_price_assumptions.pdf

[39] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/360323/20141001_Supporting_Tables_for_DECC-HMT_Supplementary_Appraisal_Guidance.xlsx

Table 16: Central Fossil Fuel and Carbon Prices

		Actual		Projection				
2015 prices	**Units**	**2012**	**2013**	**2015**	**2020**	**2025**	**2030**	**2035**
Crude oil (Brent 1 month)	$/bbl	116.8	111.7	63.8	85.0	120.0	120.0	120.0
Gas (NBP)	p/therm	62.4	69.8	46.5	52.3	66.8	68.3	68.3
Coal (CIF ARA)	$/tonne	96.7	83.9	59.9	69.3	82.8	87.0	87.0
EU ETS carbon price	£/tCO_2	6.5	3.9	5.9	6.6	22.6	47.1	47.1

Source: 2015 Energy and Emissions Projections[29]

Key exchange rates, as shown in Table 17, are assumed not to change from those applying in the most recent historic year, 2014.

Table 17: Key exchange rates, against Sterling

		Actual		Projection				
	Units	**2012**	**2013**	**2015**	**2020**	**2025**	**2030**	**2035**
US Dollars	$ per £	1.59	1.56	1.65	1.65	1.65	1.65	1.65
Euros	€ per £	1.23	1.18	1.24	1.24	1.24	1.24	1.24

Source: 2015 Energy and Emissions Projections[29]

QA/QC procedures

Quality assurance of modelling undertaken by government departments has taken on a greater emphasis following the publication of the Macpherson Review in 2013.[40]

Energy projections and the energy-related emission projections are produced in DECC by a small team (the 'EEP modelling team') whose key task is the production of energy and emissions projections and the communication of results. This team also puts together the overall projections and quality assures the inputs from the other teams.

Non-energy non-CO_2 projections are produced in DECC within the Science division.

LULUCF projections are produced under contract by the Centre for Ecology & Hydrology.

Transport modelling by the modelling team is based on and calibrated against the detailed models for Road, Rail and Air used within the DfT and which are in turn subject to quality assurance within DfT.

Policy savings are prepared and submitted by analytical teams in the relevant policy areas and are based on the Impact Assessments prepared for that policy. Impact assessments are prepared following central guidance to make sure energy use and GHG emissions are valued consistently across government. To ensure the quality of these appraisals, the Interdepartmental Analysts' Group (IAG) on Energy and Climate Change offers a cross-government multi-disciplinary peer review forum for policy appraisals and other analysis.

Policy savings are submitted using a standard template and are checked by the modelling team for any unaccounted overlaps and for internal consistency between energy and emissions savings. Model savings are also confirmed with the submitting teams and departments.

[40] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/206946/review_of_qa_of_govt_analytical_models_final_report_040313.pdf

Changes and major updates to projections methodology are generally submitted for peer review through presentation to the Interdepartmental Analyst Group, which also appoint a reviewer, the reviewer reports to the IAG and resolves any issues with the projections team responsible.

The UK's national emissions projections are updated on an annual cycle so as to inform the UK's progress against its carbon budgets.

Changes are made to the model incrementally and then quality assured to confirm that the change has face validity. Results from the electricity generation sub-sector modelling are quality assured independently by the team responsible for the DDM.

Both interim and final results are presented to a steering group and also circulated to stakeholders.

The annual published projections are formally reviewed by the Committee on Climate Change (CCC) and its staff.

Strengths and weaknesses of the projection methodology

Strengths

The UK's modelling methodology has the following strengths:

- the initial starting points for the projections are the latest actuals from the Inventory and DUKES. These projections are based on 2013 Inventory and 2014 energy statistics, both published in 2015. These are well-established sources of information.
- they are updated annually for the UK, as part of our monitoring against UK national carbon budgets.
- it uses authoritative national and international sources for socio economic projections.
- there is a rolling programme of review and update of the projection methodologies and econometric models. Models are tested by back-casting to see if they explain what has happened in the recent past.
- the projections distinguish between 'business as usual' and the reductions in emissions as a consequence of mitigating policies and measures.
- estimates of savings from policies and measures in the projections are taken from the impact assessments for those policies applying a common methodology across government for GHG mitigation measures.
- the model use econometric methodologies that capture long-running relationships between economic activity, energy consumption and emissions. We have a detailed model of the operation of the electricity generation sector that captures both sort-run fuel switching and long-term investment strategies.

Weaknesses

The UK's modelling methodology has the following weaknesses:

- the modelling generally assumes that historic relationships will continue to apply in the future. It can fail to capture structural changes and new technologies where these fall outside the scope of included policies and measures.
- there is considerable, recognised uncertainty in the economic and social projections that we take from external sources.

- econometric modelling is subject to estimation errors and the possibility of incorrect identification of drivers of energy use.

Sensitivity analysis

The model runs for the UK's National November 2015 projections included the following variant scenarios/sensitivities:

- low and high fossil fuel prices.
- low and high UK GDP rates.

Fossil fuel prices

The fossil fuel prices scenarios used were as follows:

Table 18: Variant Fossil Fuel Price Scenarios

Projection		Actual	Projection				
Fossil fuel	2015 Prices	2013	2015	2020	2025	2030	2035
Low Fossil Fuel Prices							
Crude oil (Brent 1 month)	$/bbl	109	44	38	75	75	75
Gas (NBP)	p/therm	11	38	30	38	46	46
Coal (CIF ARA)	$/tonne	82	53	54	71	71	71
High Fossil Fuel Prices							
Crude oil (Brent 1 month)	$/bbl	109	83	142	164	185	185
Gas (NBP)	p/therm	11	55	76	99	99	99
Coal (CIF ARA)	$/tonne	82	67	86	99	110	110

Source: 2015 Energy and Emissions Projections[29]

These scenarios were produced by applying a fundamental analysis of the drivers of the wholesale prices of the main fossil fuel prices available to the UK within the European energy market.[41] They are not sensitivities to the overall level of fossil fuel prices and do not maintain fuel cross-price ratios.

Growth sensitivities

The UK GDP growth sensitivities, set at +/- 25 basis points per annum with respect to the reference scenario, were:

Table 19: Variant UK GDP growth sensitivities

		Actual	Projection				
	Units	2013	2015	2020	2025	2030	2035
Low UK GDP Growth	%pa	1.66	2.15	2.15	2.25	2.25	2.25
High UK GDP Growth	%pa	1.66	2.65	2.65	2.75	2.75	2.75

Source: 2015 Energy and Emissions Projections[29]

Total GHG emissions using variant assumptions

These parameter variants give us four variant emissions projections:

[41] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/477958/2015_DECC_fossil_fuel_price_assumptions.pdf

Table 20: Total 'with measures' GHG emissions in variant scenarios, including LULUCF

	Actual	Projection				
$MtCO_2e$	2013	2015	2020	2025	2030	2035
Reference scenario[1]	566	545	437	394	379	373
Variant scenarios						
Low Fossil Fuel Prices	566	545	428	400	388	382
High Fossil Fuel Prices	566	542	431	391	370	362
Low UK GDP Growth	566	545	434	388	372	364
High UK GDP Growth	566	546	441	399	386	384

Source: 2015 Energy and Emissions Projections[29]

Note: [1] The reference scenario is taken directly from the UK national projections, which cover the UK only without crown dependencies and overseas territories. The reference scenario in this case also includes additional measures (i.e. planned policies). As a result the numbers will not precisely match the main projections earlier in this chapter.

The apparently perverse lower emissions in 2020 in the low fossil fuel price scenario is because in this scenario natural gas is relatively cheaper than coal causing some fuel switching in the power sector from coal to natural gas, which has lower associated emissions. In the longer term non-CCS coal is projected to have exited the power sector market and further switching from coal to natural gas is therefore not possible. The chief impact of low fossil fuel prices from the mid-2020s is therefore to increase overall energy demand rather than induce fuel switching.

Overall uncertainty

Fossil fuel prices, policy impact, economic and demographic growth are all subject to modelling error and natural variation driven by factors such as temperature.

In order to model this, randomly selected trajectories of values drawn from the uncertainty ranges for 21 key parameters, including GDP, population, fossil fuel prices, annual temperatures and policy savings were combined in a 1000 run Monte Carlo simulation to assess the overall uncertainty range for the UK's emissions projections. Figure 7 shows the results of this probabilistic analysis.

Table 21: Ninety five per cent confidence interval for total 'with measures' GHG emissions from Monte Carlo simulation including LULUCF

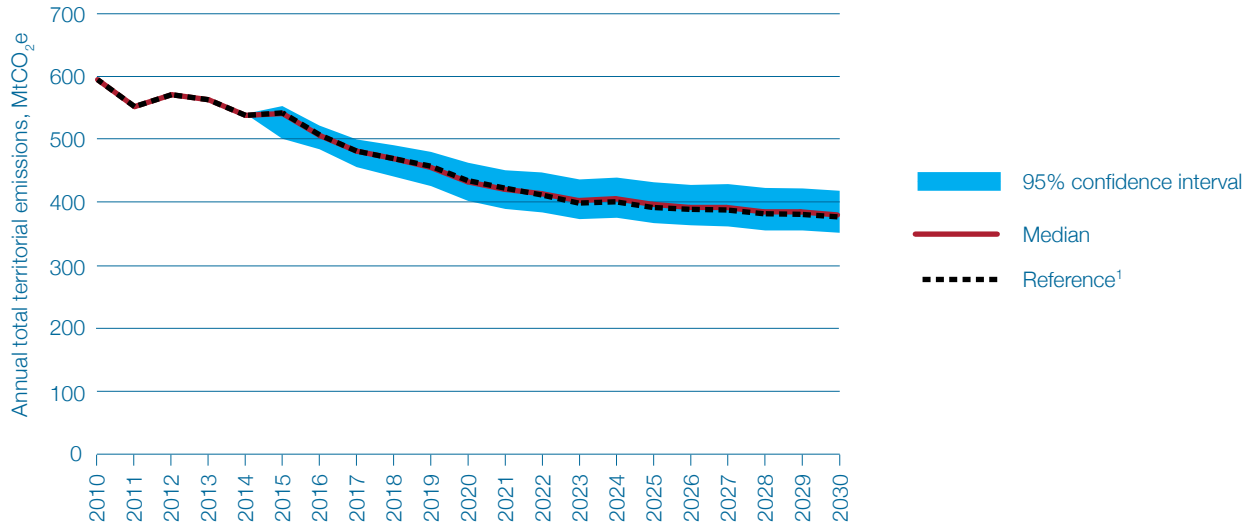
$MtCO_2e$	Inventory		Projection			
	1990	2013	2015	2020	2025	2030
Upper 2.5 Percentile	807	566	553	463	432	418
Reference scenario[1]	807	566	545	437	394	379
Lower 2.5 Percentile	807	566	500	402	367	352
Upper 2.5 percentile, diff as % of Ref.	-	-	1%	6%	10%	10%
Lower 2.5 percentile, diff as % of Ref.	-	-	-8%	-8%	-7%	-7%
Upper, as % change from 1990 values	-	-30%	-31%	-43%	-47%	-48%
Reference, as % change from 1990 values	-	-30%	-32%	-46%	-51%	-53%
Lower, as % change from 1990 values	-	-30%	-38%	-50%	-55%	-56%

Source: 2015 Energy and Emissions Projections[29]

Note: [1] The reference scenario is taken directly from the UK national projections, which cover the UK only without crown dependencies and overseas territories. The reference scenario in this case also includes additional measures (i.e. planned policies). As a result the numbers will not precisely match the main projections earlier in this chapter.

This analysis projects that in 2020, UK emissions on GHGs will be between 43% and 50% below 1990 level, with the central estimate 46% below.

Figure 7: Uncertainty in projected emissions



Source: 2015 Energy and Emissions Projections[29]

Note: [1] The reference scenario is taken directly from the UK national projections, which cover the UK only without crown dependencies and overseas territories. The reference scenario in this case also includes additional measures (i.e. planned policies). As a result the numbers will not precisely match the main projections earlier in this chapter.

Differences from the last Biennial Report

The table below summarises the differences between the projections in this and the last Biennial Report, which was based on projections produced in 2013.

The main differences between the two projections include additional implemented and adopted polices, some re-estimations of the impact of policies, improved modelling, revised fossil fuel price assumptions and lower economic growth.

The projections have also been updated to take into account improvements to the historic inventory, such as updates to refinery emissions and in the allocation of emissions between national navigation and international marine bunkers and other improvements to methods, emission factors and activity data. The effect of changes to the inventory are summarised in Chapter 1.

The net effect of these changes is to reduce projected emissions in 2020 from 26% below 1990 levels in the First Biennial Report to 43% below 1990 levels in the Second Biennial Report. Of the projected reduction of 133.5 $MtCO_2e$, between the two projections 122.3 $MtCO_2e$ is attributable to a projected reduction in CO_2 emissions.

Table 22: Changes since the last Biennial Report

$MtCO_2e$	First Biennial Report			Second Biennial Report		
GHG including LULUCF	**1990**	**2020**	**Projected change**	**1990**	**2020**	**Projected change**
Carbon Dioxide	593.5	359.8	-39%	599.3	368.2	-39%
Methane	99.2	36.3	-63%	137.2	48.0	-65%
Nitrous Oxide	68.3	33.0	-52%	57.2	26.8	-53%
Hydrofluorocarbons	11.4	8.6	-25%	14.6	11.0	-25%
Perfluorocarbons	1.4	0.2	-86%	1.7	0.2	-87%
Sulphur Hexafluoride	1.0	0.6	-40%	1.3	0.5	-63%
Nitrogen Trifluoride	na	na	na	0.0	0.0	-13%
Total GHG	774.8	438.5	-43%	811.2	454.6	-44%

Source: 2013 Energy and Emissions Projections, 2015 Energy and Emissions Projections[29]

Chapter 5: Financial assistance and support for technologies

Introduction

If the global average temperature rises more than 2°C above pre-industrial levels, significant negative impacts of climate change will be more likely. Its effects will be felt globally, but the impacts will hit the poorest hardest. Temperature increases will affect people's lives and livelihoods, and cause a radical change in the earth's biodiversity and climate systems.

The UK Government works collaboratively at an international level to ensure all countries implement what is required to reduce GHG emissions and that developing countries receive the support they need to do so.

In this chapter we discuss the support and financial assistance that the UK provides to developing countries, where climate change represents the biggest challenge to long-term global poverty reduction, to help avert the worst impacts of climate change and increase the resilience of the most vulnerable countries to a changing climate.

Financial Resources

The UK is a leader on climate finance – we are the only G7 nation to meet the 0.7% of GNI aid commitment and the only one to enshrine it in legislation. As a 0.7% donor the UK is providing significant climate finance which is helping to build resilience to climate risks, promote low carbon growth and sustainably manage natural resources, including global forests.

The UK is firmly committed, alongside other developed countries, to jointly mobilise $100bn of public and private finance a year by 2020, in the context of meaningful mitigation and transparency of action. In 2014 developed countries jointly mobilised **$62 billion** climate finance[42] to developing countries. In less than half the time available, developed countries have mobilised more than half the finance needed to reach $100 billion per year goal.

The UK is playing its part in reaching this goal. Since 2009 the UK has committed £4.52 billion of climate finance to help the world's poorest adapt to climate change and promote cleaner, greener growth. In September 2015, the Prime Minister announced that the UK will significantly increase our climate finance (to at least £5.8 billion) over the next five years, so that in 2020 the UK's annual climate finance will be double that in 2014.

[42] OECD-CPI report http://www.oecd.org/env/cc/Climate-Finance-in-2013-14-and-the-USD-billion-goal.pdf

The UK's International Climate Fund

Recognising the growing importance and urgency of tackling climate change and its impact on growth and poverty reduction, in 2010 the UK government announced the International Climate Fund (ICF). The initial budget allocation was for £2.9 billion between 2011/12 to 2014/15. This was increased by a further £969 million in 2013 and extended to 2015/16, bringing the fund to a total of £3.87 billion from 2011/12 to 2015/16. The ICF is part of the UK Official Development Assistance (ODA) budget; this budget is ring-fenced and ensures the UK is able to meet its commitment to spend 0.7% of Gross National Income (GNI) on ODA. The UK considers that climate change is the biggest threat to the long-term eradication of global poverty, and the impacts of climate change will hit the poorest hardest. Given the need to integrate climate and development finance, it makes sense climate finance forms a part of our Overseas Development Assistance.

The UK is providing new levels of climate finance in addition to historic levels of ODA; the provision of climate finance is not resulting in diverting wider development finance and we are ensuring that climate is integrated into our wider aid spending as good development is sustainable development. From 2009 to 2014/15, annual UK climate finance increased by 196% (£587M) from £300M in 2009 to reach £887 million in 2014/15, while UK ODA increased by £5.2 billion (72%) from £7.2 billion in 2009, to £12.4 billion in 14/15. So over this period non-climate ODA increased by £4.6 billion (66%).

Through the ICF, we aim to:

- Demonstrate that low carbon, climate-resilient growth at scale is feasible and desirable. This will build confidence that climate-resilient growth and adaptation are achievable, and it will help lay a key part of the foundations of a global climate change agreement;
- Support international climate negotiations, particularly through providing support for adaptation in poor countries and building an effective international architecture for delivery of climate finance;
- Drive innovation and new ideas for action, and create new partnerships with the private sector to support low carbon climate-resilient growth.

We aim to do this by:

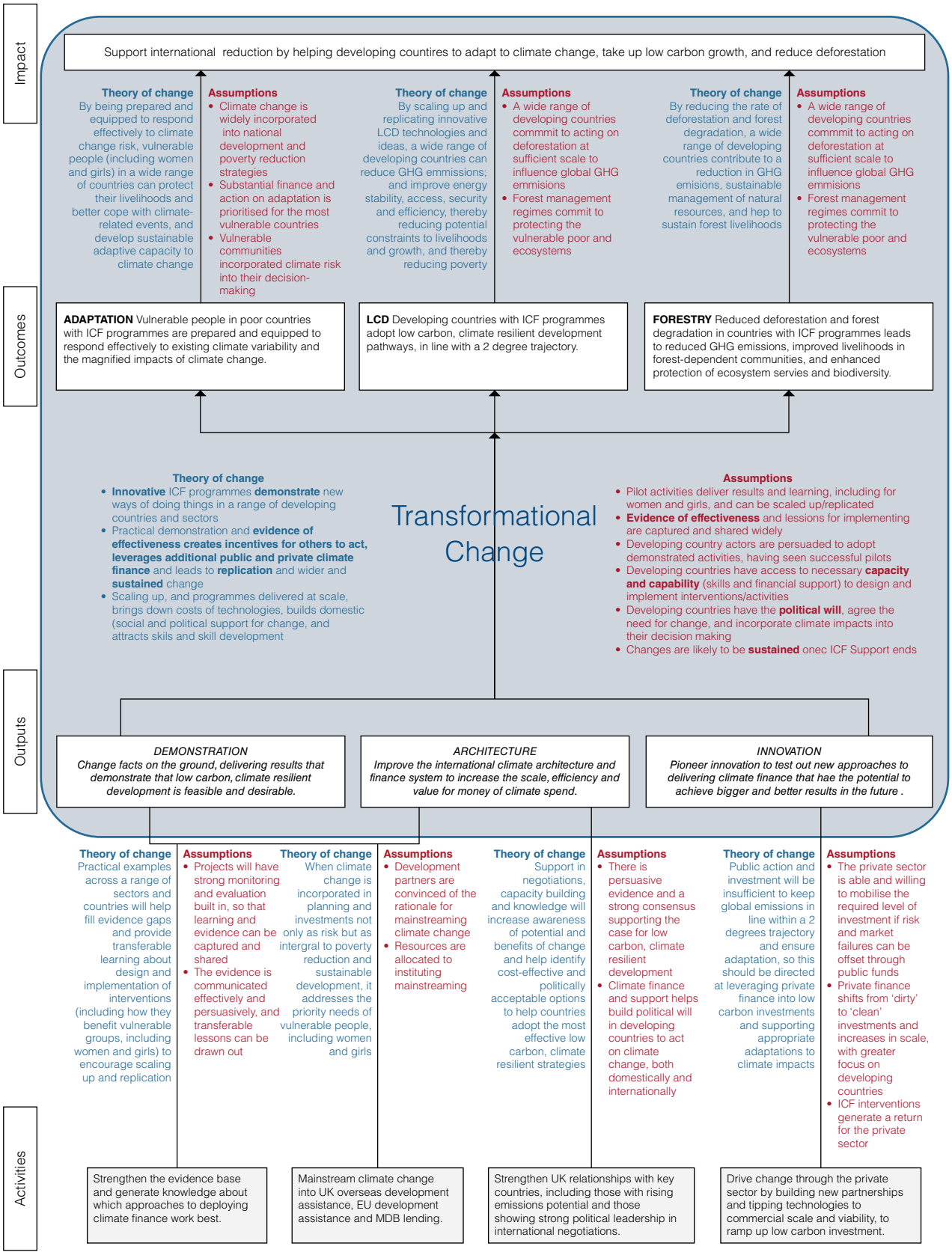
- Building global knowledge and evidence on how low carbon, climate-resilient development, including Reducing Emissions from Deforestation and Forest Degradation (REDD), supports growth and reduces poverty;
- Developing, piloting and scaling up innovative low carbon, climate-resilient programmes and approaches to reduce emissions, support adaptation and protect forests, including biodiversity;
- Supporting country level action on low carbon, climate-resilient development, including REDD;
- Building an enabling environment for private sector investment and by engaging the private sector to leverage finance and deliver action on the ground;
- Mainstreaming climate change into UK ODA, EU development assistance and Multilateral Development Bank (MDB) lending.

The ICF is seeking to deliver value-for-money and ensure that funding delivers transformational change. This will be pursued through catalysing and piloting changes in policy and actions

by others, enabling a shift from one pattern of development to another, removing barriers to private financial action and accelerating change at a country level. To foster wider transformative change and deal with the scale of the challenge presented, the ICF needs to have an impact much larger than the sum of its individual projects.

The figure below is the over-arching Theory of Change[43] developed for the ICF:

Figure 8: Theory of change, ICF



[43] This will be refreshed as part of the UK plans for the next period of climate finance from 2016.

The ICF is supporting developing countries, both through our bilateral programmes and through contributions to major international climate funds. Below are some UK-attributable results we have achieved and expect to achieve from the programmes we are supporting through the current ICF portfolio.[44]

Table 23: UK-attributable results from UK-supported programmes

Indicator	Achieved to date (reported by April 2015)[1]	Expected over project lifetime
No. of people supported to cope with the effects of climate change	15 million	53 million
No. of people with improved access to clean energy	2.6 million	34 million
No. of direct jobs created	39,000	110,000
No. of low carbon technologies supported (Units installed)	310,000	3.6 million
Level of installed capacity of clean energy (Mega Watts)	190	3,100
Amount of emissions (tCO_2e) avoided	2.3 million	440 million
Amount of public finance mobilised for climate change purposes	£1.2 billion	£3.8 billion
Amount of private finance mobilised for climate change purposes	£330 million	£3.6 billion

Source: ICF Portfolio[44]

Note 1: The UK collects results from the ICF programmes from the point at which spend is first provided, so the achieved results and expected results will increase as further programmes are added to the ICF portfolio.

These results reflect the long-term nature of climate finance interventions such as the development of clean energy power plants. Some of the indicators will report more results towards the start of a project such as mobilised public finance whereas others come later and are delivered over a much longer timeframe, such as avoided GHG emissions. Results data are only one way of assessing if the ICF is delivering on its objectives. Individual programmes have their own specific monitoring and evaluation plans, and we have a portfolio level programme of monitoring, evaluation and learning.

Prosperity Fund

The UK Foreign and Commonwealth Office (FCO) launched the Prosperity Fund in April 2011 to tackle climate change, strengthen energy security and promote an open global economy with a particular focus on emerging economies. Since its launch, the fund has supported over 500 projects. In 2014/15 priority countries included Brazil, China, India, Mexico, South Africa, South Korea and Turkey. All have dedicated programmes and there are also regional funds in Latin America and South East Asia to widen the global reach. Work is also carried out through the Organisation for Economic Co-operation and Development (OECD) and the International Energy Agency (IEA). Funding for 2014/15 is £19.52 million of which £17.92 million must be ODA eligible. In 14/15 just under half of programme funds were spent on climate projects that help create the conditions necessary to raise ambition on emissions mitigation and a shift in investment to low carbon.

UK and UNFCCC mandatory and voluntary contributions

As a signatory to the UNFCCC, the UK pays mandatory subscriptions to contribute to the running of the Secretariat which is responsible for supporting the operation of the Convention, and aims to build consensus through meetings and negotiations. Mandatory contributions are essential for the effective functioning of the Secretariat and to ensure implementation of the activities agreed by Parties.

[44] https://www.gov.uk/government/publications/international-climate-fund-impact-on-the-ground

The UK also makes voluntary contributions each year to fund priority activities within the UNFCCC such as:

- The UNFCCC Trust Fund for Supplementary Activities;
- The UNFCCC Trust Fund for Developing Country Participation; and
- The UNFCCC additional intersessional meetings.

In addition, the UK has supported the OECD Climate Change Experts Group programme and to provide some small-scale targeted support to the most progressive and vulnerable countries in the negotiations, including through the Cartagena Dialogue. Through the Climate Development Knowledge Network (CDKN) we also help developing countries to participate effectively in international negotiations, supporting leaders and negotiators of these countries to become informed, skilled, active, networked and influential actors in the international climate change talks.

Mitigation: activities undertaken by the public and private sectors to finance emissions reductions

The UK's vision is for all countries to adopt low carbon pathways, in line with a 2°C goal, which improve economic development and reduce poverty by avoiding or reducing emissions. All countries will ultimately need to move to lower carbon pathways to meet a 2°C goal. Public finance, and its ability to leverage private finance, is a means to help close the gap between current emission pathways and a pathway that is compatible with the 2°C target.

The ICF is supporting developing countries to achieve economic growth in a sustainable way, and access to affordable, reliable and sustainable energy is central to this. Interventions are being supported at the regional, national, sub-national or sectoral level through ICF bilateral and multilateral support (see CTF table 7 in Annex 1 for details of UK's financial contribution). Many of these interventions aim to lay the conditions for increasing investment at scale.

Low Carbon Development and sustainable energy

The ICF focuses on three main areas in supporting low carbon development and sustainable energy, they are:

- Achieving greater private sector investment in low carbon infrastructure and service delivery, to increase rates of deployment of technologies that are further along the innovation chain, or where abatement costs are relatively low;
- Supporting technologies critical to assist progress towards the 2°C goal, particularly where we are not on track globally, and in countries where there is the greatest potential for deployment; as well as supporting the development and deployment of locally relevant technologies, which will also support local economic and social development; and
- Enhancing the capacity of developing countries through support and provision of knowledge and monitoring tools.

The UK works both bilaterally and through multilateral organisations. The focus for our interventions in the energy sector is:

- Decarbonising energy supply and increasing clean energy access through on and off grid measures;
- Decreasing energy demand e.g. through energy efficiency measures.

Where the UK works with other partners, including multilaterally (e.g. the Climate Investment Funds – see paragraph 5.4.2), our portfolio can be more diverse (e.g. including transport or emissions from agriculture). A key focus of our portfolio has been to mobilise private sector investment in renewable energy and energy efficiency, and to demonstrate the commercial viability of these investments.

Figure 9: NAMA Facility

The NAMA (Nationally Appropriate Mitigation Action) Facility is a bilateral programme with the UK Department of Energy and Climate Change (DECC) working in partnership with the German Federal Ministry for the Environment (BMUB). NAMAs are country owned concrete projects, policies, or programmes that shift a technology or sector in a country onto a low-carbon development trajectory. The Facility seeks to fund the implementation of the most transformational parts of the NAMAs, for which countries are unable to attract private sector funding.

It has an open application process, welcoming projects across a diverse range of sectors and geographies. Two bidding rounds have been completed and a third round closed in July 2015. The UK has provided £75M into the facility, with Denmark and the European Commission also joining the Facility as donors.

The NAMA Facility is currently supporting 9 projects across a range of sectors and geographies. For example in Costa Rica the facility is supporting a 'low carbon coffee' project that will contribute to the empowerment of farmers and millers to develop sustainable livelihoods, maintain employment for up to 150,000 jobs during the harvest period and may create a positive impact on the standard of living of more than 400,000 people.

Contributing to international climate change mitigation funds

The UK has contributed £921.6 million from 2009 to 2014/15 to the **Clean Technology Fund (CTF)** – one of the Climate Investment Funds (CIFs).[45] The CTF is supporting large scale low carbon investment plans in 19 developing countries.

The CTF will also deliver significant development benefits, such as increased energy security, reduced local air pollution, and job opportunities. This is demonstrated in South Africa,[46] where the Kaxu concentrated solar power plant, the first such plant to be built in a developing country, went online in 2015. The plant is now providing power to 80,000 people in South Africa. Concentrated Solar Power (CSP) has huge and currently underexploited potential – it could deliver 11% of global electricity by 2050 – and this is just one of a number of CTF investments (underway and planned) in this technology. $1.2 billion from the CTF will contribute to development of over 1.2 GW of concentrated solar power across MENA (Middle East and North Africa), Chile, India and South Africa – around a third of the total global installed capacity of CSP.

The UK is also contributing £100 million to supporting the **Scaling Up Renewable Energy Programme (SREP)** – another of the CIFs – that aims to increase energy access through renewable energy use and demonstrates the economic, social and environmental viability of low

[45] The CIFs help developing countries pilot low-emissions and climate resilient development through funds implemented by multilateral development banks. With CIF support 63 countries are piloting transformations in clean technology, sustainable management of forests, renewable energy access, and climate resilient development (http://www-cif.climateinvestmentfunds.org/)

[46] https://www.climateinvestmentfunds.org/cif/sites/climateinvestmentfunds.org/files/CTF_TFC.12_6_Update_of_CTF_Investment_Plan_for_South_Africa_.pdf

carbon development pathways in the energy sector. This is demonstrated in Ethiopia,[47] where SREP financing will be used for 75 MW geothermal and 100 MW wind power. SREP support will also help to establish a renewable energy SME financing facility. SREP financing is expected to leverage nearly US$450 million in additional co-financing.

The **Green Climate Fund (GCF)** is set to become the world's principal multilateral climate fund, with a mandate to make 'an ambitious contribution to the global efforts towards attaining the goals set by the international community to combat climate change'. Total pledges to the GCF stand at $10.2 billion, of which the UK pledged £720 million ($1.2 billion). The GCF has formally reached 'effectiveness' meaning it can now take funding decisions, as well as accrediting 20 implementing entities to date. Programming is expected to start in 2015 and will finance mitigation and adaptation activities in developing countries, and engage with the private sector. The GCF is expected to achieve transformational on-the-ground results and develop a portfolio of low carbon programmes, which the UK expect to reduce emissions by generating and expanding access to low-emission energy. The GCF will aim to balance resources between mitigation and adaptation, with a 'significant allocation' to the private sector facility. The GCF will aim to allocate at least half of its resources for adaptation to particularly vulnerable countries, including Small Island Developing States (SIDS), Least Developed Countries (LDCs) and Africa. Adaptation programmes will focus on increasing the resilience of those most vulnerable to the impacts of climate change. The UK contribution is estimated to help at least 7 million people to cope with the impacts of climate change.

Forestry

Through the ICF, the UK is supporting global efforts to slow, halt and reverse deforestation. As well as the climate change mitigation benefits, tackling deforestation also offers big opportunities to reduce poverty and protect biodiversity, with corresponding benefits for resilience and adaptation.

The UK ICF forests strategy aims to support progress towards halving global deforestation by 2020 and halting it by 2030, leading to reduced GHG emissions, improved welfare and resilience of the poor and enhanced ecosystem services and biodiversity. It has four areas of focus, supporting:

- sustainable climate-resilient growth;
- a strong climate agreement, effective international architecture and political will to address deforestation;
- innovative new partnerships with the private sector, producing strong leverage; and
- the development needs of the poorest and most vulnerable.

Investment strategies include improving forest governance, knowledge enhancement, supporting the implementation of demand-side measures like the EU Timber Regulation, enabling stronger community-led forest management, creating new finance structures that attract private capital into programmes to reduce deforestation and incentives for forest nations to deliver ambitious REDD+ plans including results-based payments.

Through the ICF, we are supporting a number of bilateral and multilateral programmes, including the following four examples, discussed in detail below:

- Forest Governance, Markets and Climate (FGMC);
- Investments in Forests and Sustainable Land Use (IFSLU);

[47] http://www-cif.climateinvestmentfunds.org/country/ethiopia

- Forest Carbon Partnership Facility (FCPF); and
- BioCarbon Fund Initiative for Sustainable Forest Landscapes (ISFL).

The Forest Governance, Markets and Climate (FGMC) programme aims to reduce illegal logging and support governance reforms in developing countries. The programme functions as part of a wider EU initiative which combines trade regulation to stop imports of illegally-harvested timber to the EU, with development assistance to tackle weak forest sector governance that enables illegal logging. The programme is having a transformational impact, working across 15 countries to secure institutional and policy reforms. UK support focuses on Ghana, Liberia and Indonesia. Results include impacts on transparency, accountability, land tenure, human rights and governance and increasing trade in timber from legally verified origins. The UK has committed £163 million to support this work from 2011 – 18.

Investments in Forests and Sustainable Land Use is a new programme which will support a series of public-private partnerships to demonstrate how companies, communities, smallholders and governments can work collaboratively to reduce deforestation.

The programme will work with global market trends for timber, palm oil, beef, soya and other commodities. Important shifts in these markets, led by UK companies including Kingfisher and Unilever, could have a transformative impact on the production of agricultural commodities currently associated with deforestation.

The programme will use public funds in flexible and adaptive ways to develop new partnerships. The programme will support demand-side interventions to increase the sustainable sourcing of commodities; and supply-side investments in sustainable management of forests by companies and communities; and agricultural investments that use already cleared land. The programme is supported through a £60m grant from the ICF.

The **Forest Carbon Partnership Facility (FCPF)** is managed by the World Bank and was established in 2008 to assist developing countries in their efforts to reduce emissions from deforestation and forest degradation and foster conservation, sustainable management of forests, and enhancement of forest carbon stocks (all activities commonly referred to as “REDD+”) by providing value to standing forests. The FCPF has two separate but complementary funding mechanisms — the Readiness Fund and the Carbon Fund. The FCPF Readiness Fund assists developing countries to reach a capacity level at which they are ready to participate in a system of positive incentives for REDD+ (including through the Carbon Fund). In 2008, UK invested £3.5 million in the Readiness Fund. The Carbon Fund is designed to provide payments on delivery of verified emission reductions (‘payment for results’) generated by forestry programmes in countries that have come through the pipeline from the FCPF Readiness Fund. It has been operational since 2011. From 2011 to 2014 the UK has invested £56.5 million in the Carbon Fund. Forty-seven forest countries are participating in the FCPF Readiness Fund and there are eighteen countries in the Carbon Fund pipeline. The range of programmes presented to the Carbon Fund, covering different sizes and different activities, offers an opportunity to test different approaches.

To date the UK has committed £115 million to the **BioCarbon Fund Initiative for Sustainable Forest Landscapes (ISFL)** – a multilateral mechanism managed by the World Bank. The ISFL seeks to promote reduced GHG emissions from the land sector, from deforestation and forest degradation in developing countries (REDD+) and from sustainable agriculture, as well as smarter land-use planning, policies and practices. The initiative will deploy results-based finance to incentivise changes at the landscape level. Each programme under the ISLF will operate at

the jurisdiction-scale – i.e. within a landscape-wide area that is governed by a single political jurisdiction. The ISFL supports programmes which:

- improve the enabling environment for private sector investment;
- offers finance for Verified Emission Reductions associated with avoided deforestation; and
- secures private sector finance, for example through purchasing commitments for sustainable commodities produced in the jurisdiction.

Private Finance

The levels of investment needed to deliver a 2 degree world cannot be met by public finance alone – significant amounts of private investment will be key to achieving a sustainable, low-carbon transition. There is also a huge opportunity for businesses to benefit from the growth in low-carbon technologies and infrastructure, and by building sustainable business models. A key aim of the ICF is therefore to mobilise private finance.

The ICF provides an opportunity to use public finance to mobilise increased flows of private finance and test new and innovative approaches that can be replicated and scaled-up. In seeking to mobilise private finance, we are using the ICF to:

- Test innovative approaches to mobilising private climate finance to better inform future UK or other international initiatives;
- Mobilise private climate finance in ICF priority countries that would not otherwise flow to those countries, and seek to create a sustainable climate investment market;
- Mobilise private sector engagement and finance in specific sectors and/or technologies that experience difficulties in accessing private finance or which pose long term financial risks; and
- Create a better understanding of private finance within ICF priority country governments, HMG and internationally to inform future climate finance policy and climate projects, including the Green Climate Fund.

In order to accurately track private finance contributions and progress towards the $100bn p.a. climate finance goal, HMG officials (led by DECC) have been engaging with OECD-led discussions (through a process known as the 'Research Collaborative'). These discussions have resulted in an initial methodological framework for identifying leveraged private finance that could be used to calculate mobilized private finance and provide a clearer picture of donor effort towards the $100bn goal. The UK is engaging in further technical work, for example, DFID is part funding a sector-level study exploring data and methodologies for estimating private finance mobilised for adaptation.

There are several examples of how the UK is seeking to mobilise private finance, through a range of innovative and transformational projects:

Leveraging UK expertise for transformational private sector investments: In 2015, DECC launched UK Climate Investments, a joint venture with the UK Green Investment Bank. UK Climate Investments will invest up to £200 million of UK Climate Finance over three years in renewable energy and energy efficiency projects in developing countries. It will initially target three regions; East Africa, South Africa and India. It will make transformational deals with the private sector, increasing the energy supply and security in those countries through clean technology. We estimate it will make carbon savings of 32MtCO_2e, create around 3000 jobs and lever £360m of private investment. This will build on the experience of the UK's Green

Investment Bank which has been highly successful at mobilising private sector investment into the UK's green infrastructure and economy.

Transforming the private equity space for climate investments: Through the Climate Public Private Partnership (CP3), the UK as an anchor investor helped to establish two commercially run private equity funds (IFC Catalyst Fund and Asia Climate Partners) that invest in low-carbon development sub-funds and projects in developing countries. The IFC AMC Catalyst Fund reached a final fund size of US$417.75 million in June 2014 – one of the biggest (if not the biggest) emerging markets climate private equity fund of funds. The UK is an $80m anchor investor. Other investors include $50 million from an Asian Sovereign Wealth Fund, $65 million committed by a German pension fund, and $5 million from an Australian pension fund. Asia Climate Partners achieved first close in November 2014 on $391.2 million. The fund will make largely direct investments in resource efficiency sectors (energy, water, transport, technology, agribusiness), but may also make some fund investments. It will target max. 33% to India, 33% to China and 34% rest of developing Asia.

Reducing risks through a first loss position and development of local financial markets: In December 2013, The UK has invested £30 million ($48.7 million) in the **Global Climate Partnership Fund (GCPF)**. This works through local banks in developing countries to make finance available to small and medium enterprises (SMEs) and households for energy efficiency improvements and renewable energy projects and thereby develops the local financial markets for these sectors. The UK's investment and other public funds provide a risk cushion ('first loss position') to encourage private investment into the GCPF. The total fund size now stands at $367 million.

Improving the regulatory environment: With a £50 million UK Contribution, Get Fit supports the development and completion of small-scale on-grid renewable energy projects in Uganda, to both avoid an energy shortfall and promote private sector investment. It is expected that Get Fit will support at least 125 MW of additional installed capacity from at least 15 small scale renewable projects and deliver GHG savings of between 1 – 10 million tonnes of CO_2e. It is expected to support at least 3,000 jobs. It does this through topping up the existing Feed-in-Tariff for renewables and providing capacity building support to the Ugandan Energy Regulatory Authority. Get Fit represents a partnership between the governments of the UK, Germany and Norway as well as the European Union. Building on the success of the programme in Uganda, in December 2014 the UK has also rolled out scoping studies in ten sub-Saharan African countries to assess their suitability for Get Fit type feed-in tariff top-up and capacity building support.

Testing the new generation of climate finance instruments: The Global Innovation Lab is an initiative that brings together a small number of senior private and public sector actors to identify, design, and support the piloting of new climate finance instruments with the aim of unlocking billions of dollars of private investment for climate change mitigation and adaption in developing countries. The UK has been leading the development of the Lab alongside the US and Germany, and the initiative was launched in London in June 2014. Other donors who have joined the Lab are France, the Netherlands, Denmark, Norway and Japan. Other members include leaders from pension funds, investment banks, project developers and development finance institutions.

Lab from talk to action – cradle-to grave public-private financing: During the G7 Leader's Summit in May 2015, the Prime Minister announced the UK's commitment of £50 million to one of the winning proposals that emerged from the Global Innovation Lab - the Climate Development Finance Facility (CDFF, now called 'Climate Investor One'). Climate Investor One is an innovative cradle-to-grave finance facility for medium to large scale (between 25 – 75MW) renewable energy projects in developing countries. It will provide development funding to new

renewable energy projects, funding to support them during construction phase and a re-financing facility to attract institutional investors such as pension funds. By combining the several stages of investment finance into one facility, Climate Investor One provides a cradle-to-grave public-private financing solution. It was developed by FMO, the Dutch Development Bank, in partnership with South-Africa based Phoenix InfraWorks.

Improving information for investors: The UK (DFID) has contributed £4.35 million to Climatescope, while the IADB and USAID provided co-funding. Climatescope is an online information tool that ranks 55 developing countries in Latin America, the Caribbean, Africa and Asia according to their renewable energy investment attractiveness based on their related enabling framework and investment/financing, as well as existing value chains and GHG management activities. In addition to the database, an annual report is published each year.

Global Carbon Market

The UK government considers that the development of a global carbon market (built on robust accounting rules and environmental integrity) is critical to securing a cost effective shift to low carbon development globally. The establishment of a global carbon market or a number of internationally linked carbon markets should lower the global cost of mitigation and increase the incentive to invest in abatement and low carbon technologies. Putting a global cap on carbon emissions not only guarantees the level of reductions achieved but also enables countries and businesses to deliver those reductions in the most economically efficient way.

In this context, the UK has promoted the use of **market-based instruments** both domestically and internationally. We now have over a decade of experience developing policies using market approaches through initiatives such as our Climate Change Agreements, the Carbon Reduction Commitment Energy Efficiency Scheme and the UK Emission Trading Scheme of 2002, which helped shape the EU Emissions Trading System (EU ETS) that we have in operation today.

In only a few years we have built the foundations of a global carbon market, which encompasses many developed countries and a growing number of developing countries.

The UK believes that the more global the carbon market becomes, the lower the cost of mitigation becomes, allowing greater ambition in global emissions reductions. With this in mind, we believe that supporting the development of market-based instruments internationally represents a specific opportunity for developing countries, where it can be a catalyst for green growth.

The UK has invested £7 million in the **World Bank's Partnership for Market Readiness (PMR)**, a country-led initiative that builds on countries' own climate mitigation priorities, by building their capacity to design and implement market-based policies. Through the PMR, countries receive both financial and technical support to design and implement market-based policies. The PMR is supporting countries such as China, South Africa, Chile and Mexico in rolling out nationwide carbon pricing policies. In particular the PMR has supported China with expert technical advice regarding the development of the nationwide Emissions Trading System, while in Chile and South Africa the PMR has been used to provide crucial analysis of the design of planned carbon taxes.

In addition, the UK is aiming to improve access to carbon finance in least developed countries by investing £50 million in the **World Bank's Carbon Initiative for Development (Ci-Dev)**. Through Ci-Dev the UK supports some of the poorest countries to participate in the international carbon market – using the Clean Development Mechanism, Ci-Dev helps finance clean energy projects for households and communities, particularly in Africa. Ci-Dev aims to bring clean energy to 2.9 million people through solar home systems, clean cook-stoves, biogas and micro-hydropower. The project works with local project developers, teaching them how to

aggregate many projects at household or community level, calculate and get payment for the carbon that can be saved. By aggregating many small projects in this way, communities even in the poorest countries can tap into carbon and offset markets to pay for the clean energy technology that will improve their health and livelihoods.

We believe early carbon pricing can establish an effective price signal to deter outdated high-emissions technologies. Another benefit for developing countries is that carbon pricing can generate revenues that can be used for climate related projects, especially through the sale of international credits. For example the CDM has generated over $215 billion of climate finance for developing countries.

Adaptation: Assistance provided to developing countries particularly vulnerable to the adverse effects of climate change in meeting the cost of adaptation

The world's climate and weather patterns are changing. Global temperatures are rising, contributing to more extreme weather events, such as flooding and heat-waves.

The UK has spent over £550 million on ICF adaptation programmes, working with the poorest countries in the areas that are most important to those living livelihoods and are vulnerable to climate change. These areas are:

- Agriculture (food and farming systems);
- Better preparation for disasters;
- Water resources management;
- Infrastructure and urban development;
- Coastal areas;
- Ecosystems;
- Social protection; and
- Health.

UK support provided through the ICF seeks to help build adaptation knowledge, capacity, institutions and evidence as well as support direct adaptation actions. It is also helping with the development of effective national and international climate finance architecture which is needed for delivering adaptation finance.

Some examples of ICF support are:

Building Resilience and Adaptation to Climate Extremes and Disasters (BRACED) – The UK is providing up to £140 million to support countries that are at most risk of climate extremes (e.g. droughts, storms, floods and landslides), and to build the evidence on how to do this at scale to influence policy and institutional changes. The interventions will focus upon the Sahel – Senegal, Burkina Faso, Chad, Mali, Mauritania and Niger – and the Department for International Development (DFID) focal countries identified as at most risk, including: Burma, Nepal, Ethiopia, South Sudan, Sudan, Uganda and Kenya. The UK will provide grants to NGOs and their partners (local government, UN agencies and private sector) to scale up proven technologies and practices in the Sahel and DFID focal countries; research and evaluation to build the evidence on what works globally on adaptation and Disaster Risk Reduction (DRR); and, development of national and international capacity on response to climate related disasters. BRACED is expected to directly benefit 2.5 million vulnerable people, especially

women and children, in developing countries by helping them become more resilient to climate extremes. We expect the programme to reach many millions more through improved policies and institutions at the national level and better integration of DRR, climate adaptation and development programmes.

African Risk Capacity (ARC) – The ARC is a sovereign insurance pool to which the UK has provided an initial tranche of £30 million. The ARC offers parametric insurance (where payouts are made as soon as a pre-agreed trigger occurs signifying an insured extreme weather event)[48] to enable countries to respond quickly after extreme weather events and scale up social safety nets and other assistance so that people are not without food or having to sell assets. The insurance currently covers droughts, and is expected to expand to floods, tropical cyclones and other hazards. Mauritania, Niger, Senegal and Kenya have purchased insurance and are members, with more countries expected to join in coming years. ARC insurance policies currently cover 1.9 million men and women who are guaranteed an early response in the event of a drought. The UK has set aside a further £60 million to scale up ARC to provide cover to more people and for more climate risks, alongside a £10 million package of support designed to assist countries to participate in ARC.

Strengthening Adaptation and Resilience to Climate Change in Kenya (StARCK) –The UK is providing £28 million to the StARCK programme. This supports the scaling up of private sector innovation and investment in low carbon and adaptation products, services and assets[49] to build resilience to climate impacts, as part of Kenya's National Climate Change Adaptation Plan (NCCAP). The programme is being delivered through several partners including the private sector, civil society and national government for an integrated and cooperative approach. The programme intends to help 828,000 people to cope with the effects of climate change.

Contributing to international climate change adaptation funds

We contribute to international adaptation funds that work to help developing countries adapt to climate change. The UK has provided £325 million to the **Pilot Programme for Climate Resilience (PPCR)**; one of the World Bank administered Climate Investment Funds (CIFs). The PPCR focuses on a targeted number of countries for maximum impact. It is supporting countries and regions in developing holistic adaptation programmes, such as drought resistant crops, improved irrigation systems and the redesign of water storage infrastructure, flood protection or hydropower. The PPCR pilots new approaches to adaptation in some of the most vulnerable countries in the world. For example, the investment in the Kafue and Barotse sub-basins of the Zambezi River in Zambia, where PPCR will aim to reduce the negative impacts of climate hazards on agriculture. A key element is providing timely weather and climate information in local languages, and the World Bank is piloting a free SMS scheme to allow local people to share and receive information, which will also build up a better picture of climate risks.

The UK has provided £92 million to the **Least Developed Countries Fund (LDCF)** since 2006, with £50 million during this biennial reporting period. The LDCF helps vulnerable countries undertake their long term National Adaptation Planning process as well as prepare and implement National Adaptation Programmes of Action. These focus on helping the poorest and most vulnerable adapt to their immediate climate change needs.

The UK has also contributed £10 million to the **Adaptation Fund**. Projects recently under implementation include an intervention implemented by UNDP targeting adaptation in water and agriculture in Eritrea's Anseba Region.

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[48] The value of ARC payouts is linked to the estimated/modelled response costs required for that level of event.

[49] e.g. clean energy, sustainable agriculture, water management, weather monitoring.

Steps taken by government to promote, facilitate and finance transfer of technology to developing countries

The world needs increasing energy supplies to sustain economic growth and development. However, our energy resources are under pressure and CO_2e emissions from today's energy use are already changing our climate. We therefore need to accelerate the deployment of low carbon energy technologies and increase energy efficiency in order to address the global challenges of energy security, climate change and economic development. The transfer of technology will also support other areas such as improved transport and greater resilience.

ICF technology development and transfer programmes

Many ICF programmes actively support some form of technology development or transfer (see Table 8 in Annex 1). Some examples are given below:

- **Climate Innovation Centres (CICs)**: The UK is investing around £24 million in the establishment of national climate innovation centres to accelerate locally owned and developed solutions to climate change. UK funding will support job and enterprise creation; the development of locally-relevant technologies for poorer consumers; deployment of technologies that help reduce/avoid GHG emissions; and improve the resilience of the population. UK funding is supporting CICs in Kenya, Ethiopia and Vietnam as well as the design of up to 11 new CICs and the establishment of a global network to facilitate cross-learning and to make individual CICs more interconnected and efficient. CICs are expected to support hundreds of businesses developing and deploying locally relevant climate technologies.
- **Green Mini-Grids (GMGs) Africa**: The UK is providing £75m into this programme that aims to increase energy access in Africa through creating expanding deployment of clean energy mini-grids.[50] There are 3 main projects within this programme: GMGs Kenya; GMGs Tanzania; and a GMGs Africa Regional Facility. The impact is to transform the GMGs sector in Africa in line with IEA projections that 40% of universal electricity access by 2030 will be most economically delivered in this way. The outcome is creating a critical mass of experience and evidence of GMGs success in two countries, couple with improved policy and market conditions for investment in mini-grids regionally. It is expected that the 135 GMGs in operation will provide 44MW of installed capacity create 500 new jobs and deliver increased public and private capital flows into GMGs in Africa.
- **Clean Technology Fund**: The UK has invested over £900m to the CTF to support the demonstration, deployment and transfer of low-carbon technology in low and middle income countries. The fund is expected to deliver emission reductions of 1.6 billion t/CO_2e over the lifetime of the funded projects. The CTF is building a third of the world's total concentrated solar power (CSP) capacity, with the first utility scale CSP plant to be built in a developing country now providing power to 80,000 people in South Africa.
- **Carbon Capture and Storage (CCS) technologies**: The UK is providing £60m to support developing countries to advance both the technical and institutional knowledge necessary to enable the deployment of CCS technologies. The UK support is being channelled to trust funds operated by the World Bank and the Asian

[50] Mini-Grids are village or district level electrical distribution networks serving the needs of communities too distant and dispersed to be economically connected to the grid in the near to medium term – but densely populated enough to offer economies of scale in power delivery compared with individual home systems. Green Mini-grids (GMGs) are mini-grids powered by either fully renewable or hybrid (mixed renewable and fossil fuel) generation.

Development Bank. The ICF finance will support CCS capacity building through pilot projects, with the aims of demonstrating the technology and reducing the cost of the technology application across the CCS chain. In particular, we will fund the incremental financing required for CCS planning & pre-investment, capital costs for CCS units and components, and CCS related post-completion & operation activities. The trust funds will support a range of capacity building projects in China, South Africa, Indonesia and Mexico.

- **Climate and Development Knowledge Network (CDKN)**: This initiative is receiving a £52m contribution from the UK from 2013-2015. Launched in 2010, it is supporting 74 developing countries to build their knowledge, capacity and action plans on climate change. CDKN is an alliance of five private and non-governmental organisations that helps decision makers to design and deliver climate and environmental policy and programme, introduce new technologies and mobilise new funding sources.
- **Energy Sector Management Assistance Programme (ESMAP)**: The UK is providing £16m to help developing countries to increase their renewable energy capacity to drive growth and wealth creation. ESMAP is a demand-led renewable energy resource mapping programme that aims to support the scale up of renewable electricity generation by providing governments and commercial developers with better information on the location and economic viability of potential areas for development. ESMAP will strengthen the knowledge and evidence base, including the publication of 100 new research and knowledge products.

Securing policy commitments to accelerate low carbon technology deployment through multilateral initiatives

A key barrier to wider deployment of low carbon technology globally is a lack of wider international commitment to low carbon. The UK works broadly at a series of international forums to create the right regulatory environment and conditions for investment, in particular making the economic case.

We also support the UNFCCC regime's work to support low carbon technology deployment. This is done so through the UNFCCC's Technology Mechanism (its Climate Technology Centre and Network (CTCN) and Technology Executive Committee (TEC)), which aims to support and facilitate the development and deployment of low carbon technology, primarily for developing countries. We are also trying to secure broader support for a focus on phasing out fossil fuel subsidies through the G20 and by working with the Friends of Fossil Fuel Subsidy Reform. This is under the UNFCCC work to raise mitigation effort in the years leading to 2020, building on commitments agreed by G20.

We have continued to leverage the collective commitment of the international community in other key fora and institutions to deliver policy interventions and high level actions that encourage the promotion of low carbon technologies, including:

- International Energy Agency (IEA) – The UK has played a key role in supporting the IEA's increasing focus on low carbon energy technology, including through support of their flagship Energy Technology Perspectives, which is the most comprehensive analysis of global low carbon technology deployment, both in OECD and major non-OECD countries and by supporting analysis of fossil fuel subsidies for the Agency's annual World Energy Outlook;
- The UK funds various IEA Implementing Agreements relating to low carbon energy including Renewable Energy Technology Deployment IA and active engagement in the Renewable Energy Working party;

- Active memberships and provision of funding to the International Renewable Energy Association (IRENA);
- Active membership of the Clean Energy Ministerial (CEM), a multi-lateral ministerial-level forum whose members include most of the G20, to promote policies and programs that advance clean energy technology, to share lessons learned and best practices, and to encourage the transition to a global clean energy economy. The UK supports the process by providing policy input across a range of clean and low-carbon technology interests including the Carbon Capture Use and Storage (CCUS) Action Group which we co-chair with the government of Australia. Active membership of the Carbon Sequestration Leadership Forum and its Capacity Development Steering Committee;
- The UK supports Sustainable Energy for All (SE4ALL), which was initiated by the UN Secretary General and is also co-chaired by the World Bank President. The initiative developed three goals to achieve by 2030, which have since been integrated into the Global Goals:
  - Ensuring universal access to modern energy services;
  - Doubling the share of renewable energy in the global energy mix;
  - Doubling the global rate of improvement in energy efficiency.
- The DFID Secretary of State is a member of the Sustainable Energy for All initiative Advisory Board, and DFID provided early funding to help develop the SE4ALL Global Tracking and Accountability Frameworks. Since 2015 the UK has provided additional support via the SE4ALL Global Facilitation Team to enhance the capability of the initiative to co-ordinate, facilitate, and track progress towards the targets, including embedding gender considerations. Through the ICF, the UK provides funding for projects which help to deliver the aims of Sustainable Energy for All.

Bilateral relationships

The UK participates in a wide range of bilateral initiatives through which it supports low carbon development; many of these bilateral initiatives serve to also strengthen collaboration with the participating governments. To take two examples:

China

The UK uses its extensive network of climate change and energy attachés, which operates throughout China in Beijing, Chongqing, Shanghai, Guangzhou, Wuhan and Hong Kong, to support China's low carbon development. FCO through its Strategic Prosperity Fund and DECC through its Memorandum of Understanding with China's National Development and Reform Commission (NDRC) have helped support projects on, for instance, emissions trading, climate legislation and green finance. The Newton Fund, administered by the Department for Business, Innovation and Skills (BIS), and Research Councils UK (RCUK) also contribute significant funding to low carbon research projects and initiatives.

India

The UK is sharing with India its experience in meeting the challenges of energy security, low carbon growth and climate change and supporting India in its transition towards becoming a low-carbon economy. It is doing this through helping develop its energy efficiency and renewable energy capabilities and address the adaptation needs that have arisen due to climate change. The UK supports a number of projects, including those funded by the International

Climate Fund and the FCO Prosperity Fund, which aim to accelerate economic development and low carbon transition in India.

National approach to tracking and reporting provision of support

All UK climate finance is classed as ODA and is tracked by DFID on behalf of the UK government. ODA spending departments are required to identify programmes that are climate focused and the financial value of other programmes that contribute to climate goals. This data are also used for UK national statistics to track progress for the 0.7% GNI ODA spend commitment.

The UK also works closely with the OECD in reporting climate finance, this includes the use of Rio-Markers[51] and providing data on the core contributions made to multilaterals and UN organisations, this enables the OECD to calculate imputed shares for their climate finance reporting purposes. In addition the UK tracks climate finance in order to meet annual reporting requirements under Article 16 of the EU GHG Monitoring Mechanism Regulation (MMR).

The UK has good monitoring and evaluation systems in place, as recognised in the ICAI review of the ICF. We are seeking to strengthen these and include more learning elements through an **ICF Monitoring, Evaluation and Learning (MEL) programme**. The MEL will support the generation and use of evidence and knowledge from across the ICF. It will produce practical data-gathering tools where none exist; results and evidence of ICF achievements and effectiveness; learning and knowledge to support continual improvements in project selection and design, and inform the design of future funds and programmes e.g. the Green Climate Fund.

Meeting developing country needs

A key objective of the ICF is to improve the international climate architecture; one of the ways to do this is by building in-country support and greater country ownership for low carbon climate-resilient development.

The UK has an extensive network of officials based in developing countries through DFID and FCO country offices. This ensures we have a close relationship to governments and key organisations in these countries and are able to develop bilateral programmes based on developing country needs. The UK also provides support through the multilateral funds and multilateral development banks, many of these deliver programmes that are driven by developing country requirements and provide finance on the basis of plans submitted by countries.

[51] The Rio Conventions were established in 1992 on Climate Change, Biological Diversity and Desertification. Developed country Parties committed to assist developing countries in the implementation of these Conventions.

A scoring system of three values is used, in which development co-operation activities are "marked" as targeting the environment or the Rio Conventions as the "*principal*" objective or a "*significant*" objective, or as not targeting the objective.

Annex 1: Common Tabular Format Tables (CTF) supporting the UK's second biennial report to the UNFCCC

Table 1
Emissions trends: Summary

GREENHOUSE GAS EMISSIONS	*Base year* [a]	*1990*	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	*Change from base to latest reported year*
	kt CO_2 eq	*kt CO_2 eq*	*kt CO_2 eq*	*kt CO_2 eq*	*kt CO_2 eq*	*kt CO_2 eq*	*kt CO_2 eq*	*kt CO_2 eq*	*kt CO_2 eq*	*kt CO_2 eq*	*kt CO_2 eq*	*kt CO_2 eq*	*kt CO_2 eq*	*kt CO_2 eq*	*kt CO_2 eq*	*kt CO_2 eq*	*kt CO_2 eq*	*kt CO_2 eq*	*kt CO_2 eq*	*kt CO_2 eq*	*kt CO_2 eq*	*kt CO_2 eq*	*kt CO_2 eq*	*kt CO_2 eq*	*kt CO_2 eq*	*(%)*
CO_2 emissions without net CO_2 from LULUCF	596,435.23	596,435.23	604,888.14	589,371.22	574,845.10	569,588.95	561,249.67	582,681.91	557,537.07	561,143.69	553,697.04	561,170.43	570,697.73	554,113.14	565,350.56	566,483.36	563,377.83	561,867.06	553,488.65	539,601.36	488,885.58	507,591.93	464,942.45	483,707.61	475,179.69	-20.33
CO_2 emissions with net CO_2 from LULUCF	599,314.30	599,314.30	607,208.56	591,199.20	576,647.65	571,371.99	563,423.42	584,352.56	558,947.14	562,059.64	554,506.78	560,959.41	569,615.40	552,006.23	562,902.08	563,201.34	559,549.67	557,492.20	548,704.00	534,681.38	484,006.03	502,524.67	459,332.38	477,933.30	469,191.77	-21.71
CH_4 emissions without CH_4 from LULUCF	137,219.03	137,219.03	137,711.56	137,089.42	135,111.11	127,947.21	130,171.92	129,514.78	127,072.97	123,907.37	119,027.15	114,097.11	109,461.51	107,315.67	102,216.50	97,535.90	92,255.84	88,359.88	84,428.76	78,555.75	72,088.80	67,213.18	64,163.59	61,381.55	56,394.41	-58.90
CH_4 emissions with CH_4 from LULUCF	137,240.03	137,240.03	137,735.07	137,107.88	135,130.81	127,966.52	130,206.93	129,541.49	127,104.35	123,932.47	119,048.28	114,142.20	109,507.30	107,360.56	102,291.93	97,582.23	92,310.52	88,405.32	84,485.57	78,600.92	72,139.19	67,259.47	64,203.25	61,449.56	56,430.04	-58.88
N_2O emissions without N_2O from LULUCF	56,085.56	56,085.56	56,248.73	51,779.97	47,448.79	47,689.04	46,251.68	46,075.11	46,185.82	46,115.95	36,150.60	35,674.96	33,853.99	32,083.99	31,869.25	32,506.22	31,387.18	30,422.61	30,180.34	29,487.20	27,785.34	28,242.16	27,038.81	27,003.94	27,002.67	-51.85
N_2O emissions with N_2O from LULUCF	57,168.57	57,168.57	57,328.97	52,852.16	48,516.88	48,752.45	47,321.98	47,136.13	47,246.03	47,169.63	37,197.71	36,689.65	34,829.74	33,027.82	32,808.43	33,389.94	32,247.22	31,257.24	30,997.48	30,270.29	28,550.08	28,990.62	27,776.29	27,753.65	27,710.62	-51.53
HFCs	14,552.54	14,552.54	15,155.17	15,766.43	16,787.87	18,004.50	19,558.93	20,767.55	23,637.76	20,581.12	11,954.73	10,472.30	11,429.27	11,825.53	13,145.90	12,187.74	13,169.93	13,959.23	14,275.47	14,833.40	15,217.16	15,708.50	16,034.60	16,237.32	16,263.92	11.76
PFCs	1,651.53	1,651.53	1,385.15	690.36	602.74	611.40	596.94	596.36	503.12	493.73	473.96	596.79	485.59	408.23	356.61	433.86	385.15	387.67	287.84	266.25	197.33	287.71	416.94	258.86	253.38	-84.66
Unspecified mix of HFCs and PFCs	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
SF_6	1,279.06	1,279.06	1,318.54	1,358.25	1,182.90	1,223.44	1,264.37	1,305.70	1,280.08	1,328.72	1,497.71	1,817.68	1,454.11	1,495.23	1,320.78	1,116.79	1,056.04	820.51	827.34	673.33	650.51	732.73	648.24	632.27	601.56	-52.97
NF_3	0.42	0.42	0.48	0.55	0.63	0.73	0.83	0.96	1.10	1.27	1.46	1.69	1.03	1.03	0.95	0.59	0.29	0.29	0.28	0.27	0.26	0.27	0.30	0.33	0.36	-12.69
Total (without LULUCF)	**807,223.37**	**807,223.37**	**816,707.77**	**796,056.19**	**775,979.14**	**765,065.27**	**759,094.35**	**780,942.38**	**756,217.93**	**753,571.86**	**722,802.65**	**723,830.95**	**727,383.23**	**707,242.82**	**714,260.56**	**710,264.45**	**701,632.26**	**695,817.24**	**683,488.67**	**663,417.56**	**604,824.98**	**619,776.48**	**573,244.92**	**589,221.87**	**575,695.98**	**-28.68**
Total (with LULUCF)	**811,206.45**	**811,206.45**	**820,131.94**	**798,974.83**	**778,869.47**	**767,931.03**	**762,373.41**	**783,700.75**	**758,719.59**	**755,566.59**	**724,680.62**	**724,679.73**	**727,322.43**	**706,124.64**	**712,826.68**	**707,912.48**	**698,718.82**	**692,322.46**	**679,577.97**	**659,325.84**	**600,760.56**	**615,503.97**	**568,412.00**	**584,265.29**	**570,451.65**	**-29.68**
Total (without LULUCF, with indirect)	**807,223.37**	**807,223.37**	**816,707.77**	**796,056.19**	**775,979.14**	**765,065.27**	**759,094.35**	**780,942.38**	**756,217.93**	**753,571.86**	**722,802.65**	**723,830.95**	**727,383.23**	**707,242.82**	**714,260.56**	**710,264.45**	**701,632.26**	**695,817.24**	**683,488.67**	**663,417.56**	**604,824.98**	**619,776.48**	**573,244.92**	**589,221.87**	**575,695.98**	**-28.68**
Total (with LULUCF, with indirect)	**811,206.45**	**811,206.45**	**820,131.94**	**798,974.83**	**778,869.47**	**767,931.03**	**762,373.41**	**783,700.75**	**758,719.59**	**755,566.59**	**724,680.62**	**724,679.73**	**727,322.43**	**706,124.64**	**712,826.68**	**707,912.48**	**698,718.82**	**692,322.46**	**679,577.97**	**659,325.84**	**600,760.56**	**615,503.97**	**568,412.00**	**584,265.29**	**570,451.65**	**-29.68**

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	*Base year* [a]	*1990*	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	*Change from base to latest reported year*
	kt CO_2 eq	*kt CO_2 eq*	*kt CO_2 eq*	*kt CO_2 eq*	*kt CO_2 eq*	*kt CO_2 eq*	*kt CO_2 eq*	*kt CO_2 eq*	*kt CO_2 eq*	*kt CO_2 eq*	*kt CO_2 eq*	*kt CO_2 eq*	*kt CO_2 eq*	*kt CO_2 eq*	*kt CO_2 eq*	*kt CO_2 eq*	*kt CO_2 eq*	*kt CO_2 eq*	*kt CO_2 eq*	*kt CO_2 eq*	*kt CO_2 eq*	*kt CO_2 eq*	*kt CO_2 eq*	*kt CO_2 eq*	*kt CO_2 eq*	*(%)*
1. Energy	610,778.82	610,778.82	621,583.14	605,655.75	589,877.92	575,111.30	566,904.27	585,740.74	560,643.55	562,526.95	552,525.53	559,427.42	569,082.98	552,252.36	560,417.57	559,923.66	556,475.00	555,275.68	544,464.52	532,151.95	486,294.83	503,239.05	461,251.00	480,414.25	468,874.97	-23.23
2. Industrial processes and product use	66,440.95	66,440.95	64,619.44	60,255.71	57,021.82	60,370.38	61,070.35	63,212.08	64,457.18	61,354.26	43,270.88	41,120.88	39,422.60	37,209.50	39,760.71	40,700.20	39,533.51	38,405.48	40,651.88	38,721.20	32,118.23	34,543.09	32,680.31	32,695.09	34,555.85	-47.99
3. Agriculture	60,491.30	60,491.30	60,553.39	60,347.04	59,077.38	59,536.96	59,500.07	59,957.53	59,543.20	58,917.05	58,343.29	56,374.50	53,489.90	53,244.94	53,317.28	53,379.22	52,459.91	51,933.37	51,234.73	50,210.14	49,938.99	50,286.23	50,206.68	49,660.19	49,518.40	-18.14
4. Land Use, Land-Use Change and Forestry	3,983.08	3,983.08	3,424.17	2,918.64	2,890.32	2,865.76	3,279.07	2,758.36	2,501.66	1,994.74	1,877.97	848.77	-60.80	-1,118.19	-1,433.89	-2,351.97	-2,913.44	-3,494.78	-3,910.70	-4,091.72	-4,064.42	-4,272.51	-4,832.92	-4,956.58	-5,244.33	-231.67
5. Waste	69,512.31	69,512.31	69,951.80	69,797.67	70,002.02	70,046.62	71,619.66	72,032.03	71,574.00	70,773.59	68,662.95	66,908.17	65,387.76	64,536.02	60,765.01	56,261.38	53,163.84	50,202.71	47,137.54	42,334.27	36,472.94	31,708.12	29,106.92	26,452.33	22,746.76	-67.28
6. Other																										
Total (including LULUCF)	**811,206.45**	**811,206.45**	**820,131.94**	**798,974.83**	**778,869.47**	**767,931.03**	**762,373.41**	**783,700.75**	**758,719.59**	**755,566.59**	**724,680.62**	**724,679.73**	**727,322.43**	**706,124.64**	**712,826.68**	**707,912.48**	**698,718.82**	**692,322.46**	**679,577.97**	**659,325.84**	**600,760.56**	**615,503.97**	**568,412.00**	**584,265.29**	**570,451.65**	**-29.68**

[a] UNFCCC base year for the UK is 1990

Table 1 (continued)
Emissions trends: Carbon Dioxide

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Base year[a]	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Change from base to latest reported year
	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	%
1. Energy	568,352.87	568,352.87	578,736.37	563,337.62	549,798.49	542,526.74	533,409.61	553,985.41	530,953.20	535,272.70	528,087.61	536,940.74	547,954.99	531,910.62	541,755.52	541,720.57	540,038.14	539,673.15	529,486.33	517,891.99	472,580.23	489,667.43	448,038.93	466,920.83	456,679.67	-19.65
A. Fuel combustion (sectoral approach)	560,876.38	560,876.38	571,710.69	556,077.72	542,216.28	534,775.59	524,243.39	544,521.13	523,334.53	528,059.25	521,897.21	531,063.94	541,847.57	526,121.24	536,264.51	536,254.30	534,025.59	534,530.41	524,155.97	513,265.01	467,935.63	485,072.18	443,776.14	463,221.68	452,714.67	-19.28
1. Energy industries	235,779.54	235,779.54	233,566.82	222,415.07	206,208.29	204,006.42	202,242.07	203,898.13	191,221.37	196,874.89	187,552.63	198,409.51	208,554.11	206,918.54	214,571.84	212,550.53	213,384.69	220,025.14	214,672.16	209,044.78	186,109.55	192,558.81	178,815.99	190,180.46	177,472.93	-24.73
2. Manufacturing industries and construction	96,238.18	96,238.18	99,471.35	96,844.11	94,354.27	93,638.55	90,056.42	90,913.02	90,121.48	88,709.75	90,602.16	90,567.85	88,428.61	79,359.43	80,793.54	79,590.39	79,902.79	78,274.96	76,677.57	69,418.03	59,077.91	60,278.40	55,350.81	54,433.30	56,423.93	-41.37
3. Transport	114,278.03	114,278.03	113,510.95	114,936.57	116,114.24	116,598.49	115,730.77	120,317.84	121,853.47	121,471.22	122,563.41	121,862.99	122,025.55	124,467.26	124,251.56	125,774.07	126,928.54	126,824.09	128,048.09	122,683.69	118,196.64	116,639.41	115,061.65	114,601.49	113,593.71	-0.60
4. Other sectors	109,295.81	109,295.81	120,869.15	117,795.18	121,398.54	116,572.33	112,327.95	125,587.15	116,507.49	117,809.39	118,029.38	117,307.28	119,917.40	112,319.37	113,485.40	115,286.57	110,970.74	105,947.25	101,011.66	108,869.02	101,574.42	112,704.79	91,799.64	101,487.08	102,938.68	-5.82
5. Other	5,284.82	5,284.82	4,292.42	4,086.79	4,140.93	3,959.80	3,886.18	3,804.99	3,630.71	3,194.00	3,149.63	2,916.31	2,921.90	3,056.63	3,162.18	3,052.75	2,838.83	3,458.96	3,746.49	3,249.50	2,977.10	2,890.76	2,748.07	2,519.35	2,285.42	-56.76
B. Fugitive emissions from fuels	7,476.49	7,476.49	7,025.68	7,259.90	7,582.22	7,751.15	9,166.22	9,464.28	7,618.67	7,213.46	6,190.40	5,876.80	6,107.42	5,789.39	5,491.01	5,466.27	6,012.55	5,142.74	5,330.36	4,626.98	4,644.60	4,595.26	4,262.78	3,699.15	3,965.00	-46.97
1. Solid fuels	1,698.56	1,698.56	1,312.14	1,122.56	1,022.21	791.77	737.42	552.49	629.34	294.79	214.74	192.99	198.95	192.69	185.41	228.21	161.21	192.04	246.18	325.00	154.50	197.24	245.99	127.99	175.28	-89.68
2. Oil and natural gas and other emissions from energy production	5,777.92	5,777.92	5,713.55	6,137.34	6,560.01	6,959.38	8,428.80	8,911.79	6,989.33	6,918.67	5,975.66	5,683.82	5,908.47	5,596.70	5,305.60	5,238.06	5,851.34	4,950.70	5,084.18	4,301.97	4,490.10	4,398.02	4,016.79	3,571.16	3,789.72	-34.41
C. CO_2 transport and storage	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
2. Industrial processes	24,813.35	24,813.35	22,461.10	22,479.78	22,302.01	24,365.86	25,045.63	26,002.00	24,350.62	24,048.32	23,957.92	22,687.59	21,215.53	20,601.59	21,906.13	23,147.51	21,898.98	20,776.81	22,414.17	20,377.27	14,747.09	16,389.58	15,236.88	15,368.32	17,215.81	-30.62
A. Mineral industry	9,812.21	9,812.21	8,058.25	7,551.46	7,585.41	8,663.70	8,754.67	9,076.34	9,400.24	9,574.38	8,977.39	8,855.35	8,432.46	8,463.94	8,512.12	8,789.24	8,748.90	8,721.32	9,014.50	7,849.33	5,683.00	5,986.27	6,345.52	6,060.97	6,429.27	-34.48
B. Chemical industry	6,376.75	6,376.75	6,863.77	6,832.97	6,804.08	7,077.24	7,121.06	7,106.46	6,277.75	6,686.04	7,070.24	6,458.04	6,193.62	6,101.39	6,379.60	6,411.63	6,208.46	5,715.68	6,409.51	5,421.46	4,840.15	5,183.33	4,572.76	5,216.98	4,740.31	-25.66
C. Metal industry	7,391.77	7,391.77	6,388.72	5,909.32	5,511.90	6,326.95	6,844.89	7,040.39	6,452.04	6,021.67	6,672.22	6,143.47	5,311.74	4,303.66	5,268.48	5,485.41	5,840.99	5,389.94	6,038.64	5,967.68	3,353.05	3,573.08	3,098.58	3,009.32	5,013.31	-32.18
D. Non-energy products from fuels and solvent use	1,232.62	1,232.62	1,150.35	2,186.03	2,400.62	2,297.97	2,325.00	2,778.82	2,220.59	1,766.22	1,238.06	1,230.73	1,277.71	1,732.60	1,745.93	2,461.22	1,100.63	949.86	951.52	1,138.80	870.89	1,646.91	1,220.02	1,081.06	1,032.92	-16.20
E. Electronic industry																										
F. Product uses as ODS substitutes																										
G. Other product manufacture and use	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
H. Other	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	
3. Agriculture	1,964.63	1,964.63	2,376.95	2,269.16	1,540.37	1,662.08	1,903.45	1,804.88	1,700.42	1,285.59	1,156.80	1,040.03	1,001.76	1,076.76	1,215.49	1,169.87	1,050.86	1,101.72	1,249.46	1,039.34	1,275.40	1,247.30	1,385.83	1,158.43	1,019.92	-48.09
A. Enteric fermentation																										
B. Manure management																										
C. Rice cultivation																										
D. Agricultural soils																										
E. Prescribed burning of savannas																										
F. Field burning of agricultural residues																										
G. Liming	1,576.48	1,576.48	1,922.21	1,929.47	1,270.83	1,397.07	1,693.71	1,651.80	1,502.97	1,152.43	995.17	908.09	830.57	841.35	1,041.26	915.20	820.38	873.99	920.77	834.61	976.51	938.15	1,032.53	830.46	772.38	-51.01
H. Urea application	385.46	385.46	452.04	337.01	266.88	262.38	207.16	150.51	194.89	130.57	159.04	129.35	168.63	232.87	171.70	252.12	227.94	225.23	326.22	202.14	296.36	306.61	350.79	325.68	245.22	-36.38
I. Other carbon-containing fertilizers	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
J. Other	2.69	2.69	2.69	2.67	2.66	2.63	2.59	2.57	2.56	2.59	2.59	2.59	2.55	2.53	2.53	2.55	2.54	2.50	2.47	2.58	2.53	2.53	2.51	2.28	2.31	-14.16
4. Land Use, Land-Use Change and Forestry	2,879.06	2,879.06	2,320.42	1,827.98	1,802.55	1,783.04	2,173.76	1,670.65	1,410.07	915.95	809.74	-211.01	-1,082.33	-2,106.90	-2,448.48	-3,282.02	-3,828.16	-4,374.86	-4,784.65	-4,919.97	-4,879.55	-5,067.26	-5,610.07	-5,774.31	-5,987.92	-307.98
A. Forest land	-16,016.07	-16,016.07	-15,945.59	-16,096.42	-16,098.70	-15,954.25	-15,679.80	-15,833.00	-15,954.71	-16,180.89	-16,209.77	-17,144.27	-17,778.45	-17,992.04	-18,337.70	-18,414.45	-18,734.83	-18,499.27	-18,329.60	-18,141.03	-17,963.93	-17,887.42	-17,831.80	-17,320.23	-17,297.63	8.00
B. Cropland	15,130.79	15,130.79	15,108.85	14,989.84	15,173.61	15,217.88	15,443.33	15,405.24	15,450.62	15,487.14	15,536.42	15,007.64	14,715.41	14,366.51	14,094.69	13,855.45	13,554.81	13,388.61	13,037.04	12,932.17	12,918.86	12,748.01	12,570.57	12,325.00	12,150.39	-19.70
C. Grassland	-3,677.20	-3,677.20	-3,791.33	-3,910.36	-4,022.32	-4,132.27	-4,241.00	-4,347.08	-4,430.02	-4,552.90	-4,650.41	-4,150.84	-4,187.40	-4,363.70	-4,305.89	-4,576.49	-4,628.80	-5,013.98	-4,984.55	-5,135.23	-5,199.42	-5,342.28	-5,708.87	-5,867.66	-5,897.14	60.37

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	*Base year*[a]	*1990*	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	*Change from base to latest reported year*
	kt	*kt*	*kt*	*kt*	*kt*	*kt*	*kt*	*kt*	*kt*	*kt*	*kt*	*kt*	*kt*	*kt*	*kt*	*kt*	*kt*	*kt*	*kt*	*kt*	*kt*	*kt*	*kt*	*kt*	*kt*	*%*
D. Wetlands	481.73	481.73	489.32	483.23	476.50	594.64	681.11	587.28	524.93	404.97	540.93	537.03	582.92	391.16	628.83	459.14	517.64	538.91	377.28	335.69	375.20	402.63	359.19	300.49	300.49	-37.62
E. Settlements	6,919.10	6,919.10	6,846.45	6,777.65	6,721.93	6,671.45	6,611.24	6,578.48	6,553.51	6,515.92	6,524.88	6,313.00	6,267.74	6,225.51	6,186.05	6,149.07	6,114.48	6,081.16	6,050.10	6,020.97	5,993.10	5,962.95	5,933.99	5,906.74	5,876.98	-15.06
F. Other land	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.15	0.02	0.02	0.11	0.02	0.02	
G. Harvested wood products	40.72	40.72	-387.27	-415.96	-448.47	-614.41	-641.12	-720.27	-734.25	-758.28	-932.32	-773.60	-682.58	-734.38	-714.49	-754.76	-651.49	-870.30	-934.93	-932.70	-1,003.39	-951.17	-933.26	-1,118.66	-1,121.03	-2,852.92
H. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
5. Waste	1,304.38	1,304.38	1,313.72	1,284.65	1,204.23	1,034.27	890.98	889.62	532.83	537.09	494.72	502.06	525.45	524.17	473.42	445.40	389.85	315.38	338.69	292.76	282.85	287.63	280.81	260.03	264.30	-79.74
A. Solid waste disposal	NO,NE	NO,NE	NO,NE	NO,NE	NO,NE	NO,NE	NO,NE	NO,NE	NO,NE	NO,NE	NO,NE	NO,NE	NO,NE	NO,NE	NO,NE	NO,NE	NO,NE	NO,NE	NO,NE	NO,NE	NO,NE	NO,NE	NO,NE	NO,NE	NO,NE	
B. Biological treatment of solid waste																										
C. Incineration and open burning of waste	1,304.38	1,304.38	1,313.72	1,284.65	1,204.23	1,034.27	890.98	889.62	532.83	537.09	494.72	502.06	525.45	524.17	473.42	445.40	389.85	315.38	338.69	292.76	282.85	287.63	280.81	260.03	264.30	-79.74
D. Waste water treatment and discharge																										
E. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
6. Other (as specified in the summary table in CRF)																										
Memo items:																										
International bunkers	24,198.05	24,198.05	23,949.90	25,737.31	26,804.40	26,761.90	28,213.37	30,284.67	32,387.08	35,410.03	34,790.12	36,877.63	36,312.10	34,230.50	35,964.15	39,655.01	42,704.94	45,577.19	44,897.12	45,797.60	43,469.82	40,809.18	43,372.14	41,001.98	40,593.09	67.75
Aviation	15,411.35	15,411.35	15,174.11	16,797.40	17,982.70	18,785.21	19,992.06	21,144.24	22,487.36	25,029.47	27,197.88	30,016.18	29,233.40	28,691.03	29,378.55	32,208.97	34,774.03	35,306.39	35,137.12	34,360.73	32,559.14	31,495.30	32,963.96	32,098.51	31,913.59	107.08
Navigation	8,786.70	8,786.70	8,775.79	8,939.91	8,821.70	7,976.69	8,221.31	9,140.43	9,899.72	10,380.56	7,592.24	6,861.45	7,078.70	5,539.47	6,585.60	7,446.04	7,930.91	10,270.80	9,760.00	11,436.87	10,910.68	9,313.88	10,408.18	8,903.47	8,679.50	-1.22
Multilateral operations	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	
CO_2 emissions from biomass	2,545.56	2,545.56	2,609.09	2,897.95	3,021.21	4,084.41	4,327.78	4,485.63	4,609.86	4,556.24	4,969.77	5,087.05	5,872.50	6,848.21	8,448.93	7,655.50	8,749.73	9,242.38	10,135.00	12,591.69	13,656.25	16,062.83	16,510.50	17,081.17	20,414.77	701.98
CO_2 captured	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
Long-term storage of C in waste disposal sites	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
Indirect N_2O																										
Indirect CO_2	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	
Total CO_2 equivalent emissions without land use, land-use change and forestry	596,435.23	596,435.23	604,888.14	589,371.22	574,845.10	569,588.95	561,249.67	582,681.91	557,537.07	561,143.69	553,697.04	561,170.43	570,697.73	554,113.14	565,350.56	566,483.36	563,377.83	561,867.06	553,488.65	539,601.36	488,885.58	507,591.93	464,942.45	483,707.61	475,179.69	-20.33
Total CO_2 equivalent emissions with land use, land-use change and forestry	599,314.30	599,314.30	607,208.56	591,199.20	576,647.65	571,371.99	563,423.42	584,352.56	558,947.14	562,059.64	554,506.78	560,959.41	569,615.40	552,006.23	562,902.08	563,201.34	559,549.67	557,492.20	548,704.00	534,681.38	484,006.03	502,524.67	459,332.38	477,933.30	469,191.77	-21.71
Total CO_2 equivalent emissions, including indirect CO_2, without land use, land-use change and forestry	596,435.23	596,435.23	604,888.14	589,371.22	574,845.10	569,588.95	561,249.67	582,681.91	557,537.07	561,143.69	553,697.04	561,170.43	570,697.73	554,113.14	565,350.56	566,483.36	563,377.83	561,867.06	553,488.65	539,601.36	488,885.58	507,591.93	464,942.45	483,707.61	475,179.69	-20.33
Total CO_2 equivalent emissions, including indirect CO_2, with land use, land-use change and forestry	599,314.30	599,314.30	607,208.56	591,199.20	576,647.65	571,371.99	563,423.42	584,352.56	558,947.14	562,059.64	554,506.78	560,959.41	569,615.40	552,006.23	562,902.08	563,201.34	559,549.67	557,492.20	548,704.00	534,681.38	484,006.03	502,524.67	459,332.38	477,933.30	469,191.77	-21.71

[a] UNFCCC base year for the UK is 1990

Table 1 (continued)
Emissions trends: Methane

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Base year[a]	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Change from base to latest reported year
	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	%
1. Energy	1,478.75	1,478.75	1,496.46	1,477.89	1,394.32	1,090.44	1,124.36	1,062.86	989.02	893.41	787.62	708.86	654.18	625.08	560.54	546.66	476.79	443.84	426.31	409.98	403.85	395.85	383.71	381.58	336.19	-77.27
A. Fuel combustion (sectoral approach)	113.90	113.90	116.68	110.02	108.07	92.84	77.66	80.07	74.59	74.58	76.46	63.23	58.99	53.22	49.90	47.77	44.77	42.86	43.73	44.91	42.31	45.70	41.06	41.50	41.25	-63.78
1. Energy industries	7.67	7.67	7.76	7.90	8.09	9.10	9.47	9.87	9.74	10.36	11.21	10.60	11.58	12.39	11.73	12.06	11.97	10.37	10.42	10.35	10.72	10.95	9.69	9.25	8.74	13.96
2. Manufacturing industries and construction	3.35	3.35	3.34	3.24	3.18	3.45	3.39	3.41	3.34	3.27	3.24	3.14	3.22	3.25	3.57	3.19	3.06	3.02	3.02	2.84	2.54	2.85	2.86	2.73	2.86	-14.85
3. Transport	30.70	30.70	30.21	29.55	28.28	25.86	23.35	22.20	20.33	18.37	16.79	14.63	12.69	11.47	10.16	9.18	8.46	7.66	6.95	6.05	4.44	3.84	3.40	2.98	2.59	-91.55
4. Other sectors	72.02	72.02	75.26	69.22	68.42	54.31	41.35	44.49	41.08	42.47	45.14	34.77	31.43	26.02	24.35	23.26	21.21	21.72	23.22	25.57	24.53	27.99	25.04	26.48	26.99	-62.52
5. Other	0.15	0.15	0.12	0.11	0.12	0.11	0.11	0.11	0.10	0.09	0.09	0.08	0.08	0.09	0.09	0.08	0.08	0.10	0.11	0.09	0.08	0.08	0.08	0.07	0.06	-57.49
B. Fugitive emissions from fuels	1,364.85	1,364.85	1,379.78	1,367.88	1,286.25	997.60	1,046.70	982.79	914.43	818.83	711.17	645.63	595.18	571.86	510.64	498.89	432.02	400.97	382.58	365.07	361.54	350.15	342.64	340.08	294.94	-78.39
1. Solid fuels	871.53	871.53	896.25	888.82	827.66	549.54	601.13	556.23	533.10	454.12	375.82	323.31	286.93	282.09	232.29	208.55	153.88	139.17	112.69	112.89	109.12	101.39	97.08	97.81	67.45	-92.26
2. Oil and natural gas and other emissions from energy production	493.32	493.32	483.53	479.06	458.58	448.06	445.57	426.56	381.33	364.71	335.34	322.33	308.25	289.77	278.35	290.35	278.15	261.80	269.90	252.17	252.42	248.76	245.56	242.26	227.49	-53.89
C. CO_2 transport and storage																										
2. Industrial processes	11.30	11.30	10.94	11.51	10.33	11.83	9.76	10.79	9.32	7.35	6.59	6.17	5.98	6.05	6.85	6.00	5.18	5.24	5.65	4.38	4.73	4.91	4.43	4.81	5.18	-54.17
A. Mineral industry																										
B. Chemical industry	8.55	8.55	8.52	9.13	8.08	9.44	7.34	8.46	6.99	5.12	4.51	4.28	4.15	4.30	5.00	4.16	3.59	3.27	3.69	2.94	3.68	4.05	3.59	3.99	4.16	-51.28
C. Metal industry	1.48	1.48	1.38	1.45	1.46	1.51	1.54	1.53	1.56	1.49	1.47	1.27	1.23	1.13	1.20	1.20	1.05	1.11	1.05	0.99	0.76	0.57	0.57	0.65	0.82	-44.47
D. Non-energy products from fuels and solvent use	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	-44.43
E. Electronic industry																										
F. Product uses as ODS substitutes																										
G. Other product manufacture and use	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
H. Other	1.25	1.25	1.01	0.91	0.76	0.86	0.86	0.77	0.74	0.71	0.59	0.59	0.58	0.59	0.62	0.61	0.52	0.84	0.88	0.43	0.27	0.27	0.25	0.16	0.18	-85.55
3. Agriculture	1,316.23	1,316.23	1,301.04	1,300.84	1,294.76	1,302.28	1,291.41	1,310.89	1,292.92	1,297.03	1,290.70	1,245.91	1,177.94	1,154.87	1,163.05	1,171.52	1,155.88	1,148.36	1,134.80	1,108.76	1,091.94	1,097.49	1,092.30	1,088.39	1,083.73	-17.66
A. Enteric fermentation	1,117.28	1,117.28	1,104.40	1,106.28	1,105.17	1,111.75	1,103.81	1,121.06	1,103.27	1,107.59	1,106.97	1,070.75	1,011.81	993.44	1,004.46	1,011.95	1,000.03	991.98	980.07	957.47	942.85	948.78	944.62	941.97	936.64	-16.17
B. Manure management	177.60	177.60	176.69	176.19	176.55	177.55	174.82	176.99	176.81	176.27	170.81	162.46	153.91	149.58	148.24	149.44	146.10	145.25	143.57	140.25	138.65	138.42	137.62	137.27	137.97	-22.32
C. Rice cultivation	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
D. Agricultural soils	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	
E. Prescribed burning of savannas	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
F. Field burning of agricultural residues	8.22	8.22	6.86	5.11	0.04	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
G. Liming																										
H. Urea application																										
I. Other carbon-containing fertilizers																										
J. Other	13.13	13.13	13.09	13.26	13.00	12.98	12.78	12.84	12.84	13.17	12.92	12.70	12.22	11.85	10.35	10.14	9.75	11.14	11.15	11.04	10.43	10.29	10.06	9.15	9.13	-30.49
4. Land Use, Land-Use Change and forestry	0.84	0.84	0.94	0.74	0.79	0.77	1.40	1.07	1.26	1.00	0.85	1.80	1.83	1.80	3.02	1.85	2.19	1.82	2.27	1.81	2.02	1.85	1.59	2.72	1.43	69.63
A. Forest land	0.15	0.15	0.26	0.07	0.12	0.09	0.74	0.38	0.51	0.28	0.05	0.16	0.22	0.19	0.16	0.20	0.38	0.37	0.33	0.31	0.27	0.14	0.19	0.86	0.20	35.49
B. Cropland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.01	22.96
C. Grassland	0.45	0.45	0.45	0.46	0.46	0.46	0.46	0.46	0.50	0.47	0.47	1.58	1.54	1.54	2.79	1.58	1.73	1.37	1.86	1.42	1.67	1.63	1.32	1.78	1.14	152.16

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Base year [a]	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Change from base to latest reported year
	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	%
D. Wetlands	NO,NE	NO,NE	NO,NE	NO,NE	NO,NE	NO,NE	NO,NE	NO,NE	NO,NE	NO,NE	NO,NE	NO,NE	NO,NE	NO,NE	NO,NE	NO,NE	NO,NE	NO,NE	NO,NE	NO,NE	NO,NE	NO,NE	NO,NE	NO,NE	NO,NE	
E. Settlements	0.24	0.24	0.22	0.21	0.21	0.21	0.20	0.22	0.25	0.25	0.32	0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.08	-66.12
F. Other land	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
G. Harvested wood products																										
H. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
5. Waste	2,682.48	2,682.48	2,700.01	2,693.33	2,705.04	2,713.34	2,781.35	2,796.05	2,791.66	2,758.51	2,676.18	2,602.95	2,540.36	2,506.63	2,358.21	2,177.25	2,052.38	1,936.96	1,810.39	1,619.11	1,383.03	1,190.28	1,086.11	980.48	830.67	-69.03
A. Solid waste disposal	2,509.99	2,509.99	2,527.46	2,520.64	2,532.66	2,542.78	2,611.60	2,625.10	2,622.62	2,593.35	2,510.53	2,436.59	2,390.77	2,358.93	2,211.68	2,021.55	1,893.12	1,775.41	1,643.12	1,449.04	1,226.05	1,031.10	920.69	818.43	667.27	-73.42
B. Biological treatment of solid waste	0.22	0.22	0.30	0.35	0.41	0.48	0.78	1.10	1.48	2.92	3.55	4.36	6.95	7.59	8.16	11.03	14.22	15.05	18.96	21.75	22.64	24.43	25.62	26.88	28.63	12,956.68
C. Incineration and open burning of waste	5.49	5.49	5.35	5.17	4.63	3.61	3.52	3.67	0.89	0.88	0.97	0.90	0.90	0.92	1.00	0.82	0.78	0.79	0.75	0.69	0.59	0.42	0.42	0.40	0.40	-92.75
D. Waste water treatment and discharge	166.79	166.79	166.90	167.16	167.33	166.47	165.45	166.17	166.67	161.36	161.13	161.11	141.74	139.18	137.38	143.86	144.26	145.71	147.56	147.62	133.75	134.33	139.38	134.77	134.37	-19.43
E. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
6. Other (as specified in the summary table in CRF)																										
Total CH_4 emissions without CH_4 from LULUCF	5,488.76	5,488.76	5,508.46	5,483.58	5,404.44	5,117.89	5,206.88	5,180.59	5,082.92	4,956.29	4,761.09	4,563.88	4,378.46	4,292.63	4,088.66	3,901.44	3,690.23	3,534.40	3,377.15	3,142.23	2,883.55	2,688.53	2,566.54	2,455.26	2,255.78	-58.90
Total CH_4 emissions with CH_4 from LULUCF	5,489.60	5,489.60	5,509.40	5,484.32	5,405.23	5,118.66	5,208.28	5,181.66	5,084.17	4,957.30	4,761.93	4,565.69	4,380.29	4,294.42	4,091.68	3,903.29	3,692.42	3,536.21	3,379.42	3,144.04	2,885.57	2,690.38	2,568.13	2,457.98	2,257.20	-58.88
Memo items:																										
International bunkers	0.43	0.43	0.37	0.36	0.35	0.32	0.32	0.34	0.34	0.35	0.29	0.25	0.23	0.20	0.21	0.23	0.23	0.27	0.26	0.28	0.26	0.23	0.25	0.22	0.21	-51.18
Aviation	0.29	0.29	0.24	0.22	0.21	0.19	0.19	0.19	0.19	0.19	0.17	0.15	0.12	0.11	0.11	0.11	0.11	0.11	0.11	0.10	0.09	0.08	0.09	0.08	0.08	-72.42
Navigation	0.14	0.14	0.13	0.14	0.14	0.13	0.13	0.15	0.15	0.16	0.12	0.10	0.11	0.09	0.10	0.12	0.12	0.16	0.15	0.18	0.17	0.15	0.16	0.14	0.13	-7.14
Multilateral operations	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	
CO_2 emissions from biomass																										
CO_2 captured																										
Long-term storage of C in waste disposal sites																										
Indirect N_2O																										
Indirect CO_2																										

[a] UNFCCC base year for the UK is 1990

Table 1 (continued)
Emissions trends: Nitrous Oxide

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Base year[a]	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Change from base to latest reported year
	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	%
1. Energy	18.31	18.31	18.24	18.02	17.52	17.86	18.07	17.40	16.66	16.51	15.93	15.99	16.02	15.82	15.60	15.22	15.16	15.12	14.50	13.46	12.14	12.33	12.15	13.27	12.72	-30.54
A. Fuel combustion (sectoral approach)	18.18	18.18	18.10	17.88	17.37	17.70	17.88	17.19	16.48	16.34	15.76	15.84	15.86	15.68	15.47	15.09	15.01	15.00	14.37	13.35	12.03	12.23	12.00	13.14	12.62	-30.59
1. Energy industries	6.43	6.43	6.40	6.13	5.39	5.37	5.29	5.09	4.61	4.79	4.30	4.68	5.00	5.05	5.12	4.92	5.06	5.25	4.78	4.48	4.03	4.09	4.12	4.93	4.58	-28.70
2. Manufacturing industries and construction	4.44	4.44	4.40	4.46	4.26	4.27	4.13	4.01	3.89	3.79	3.79	3.73	3.76	3.78	3.81	3.85	3.82	3.84	3.83	3.67	2.96	3.02	2.70	2.89	2.58	-41.97
3. Transport	4.05	4.05	4.00	4.11	4.48	4.98	5.61	5.17	5.11	5.00	4.95	4.86	4.57	4.43	4.18	4.05	3.92	3.77	3.70	3.16	2.97	3.00	3.11	3.23	3.37	-16.73
4. Other sectors	3.10	3.10	3.18	3.05	3.11	2.96	2.74	2.81	2.76	2.67	2.63	2.48	2.44	2.33	2.26	2.18	2.13	2.03	1.95	1.94	1.97	2.03	1.99	2.01	2.02	-34.94
5. Other	0.16	0.16	0.13	0.12	0.12	0.12	0.12	0.11	0.11	0.10	0.09	0.09	0.09	0.09	0.09	0.09	0.08	0.10	0.11	0.10	0.09	0.09	0.08	0.08	0.07	-57.03
B. Fugitive emissions from fuels	0.14	0.14	0.14	0.15	0.16	0.16	0.20	0.20	0.18	0.17	0.17	0.15	0.15	0.15	0.13	0.13	0.15	0.12	0.13	0.11	0.12	0.10	0.15	0.13	0.10	-24.53
1. Solid fuels	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-58.34
2. Oil and natural gas and other emissions from energy production	0.14	0.14	0.14	0.15	0.16	0.16	0.20	0.20	0.18	0.17	0.17	0.15	0.15	0.14	0.13	0.13	0.15	0.12	0.13	0.11	0.12	0.10	0.15	0.13	0.10	-24.45
C. CO_2 transport and storage																										
2. Industrial processes	80.07	80.07	80.62	66.02	53.31	53.25	48.19	47.88	48.50	49.39	17.52	18.09	15.73	9.15	9.59	12.29	9.71	7.82	9.08	8.26	3.99	4.37	0.78	0.26	0.31	-99.62
A. Mineral industry																										
B. Chemical industry	79.86	79.86	80.42	65.80	53.10	53.03	47.96	47.66	48.27	49.17	17.29	17.88	15.53	8.97	9.39	12.09	9.51	7.64	8.89	8.10	3.86	4.25	0.67	0.14	0.15	-99.81
C. Metal industry	0.21	0.21	0.20	0.20	0.21	0.21	0.22	0.21	0.22	0.21	0.22	0.20	0.20	0.17	0.20	0.20	0.19	0.18	0.19	0.16	0.12	0.11	0.10	0.12	0.15	-27.58
D. Non-energy products from fuels and solvent use	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-44.43
E. Electronic industry																										
F. Product uses as ODS substitutes																										
G. Other product manufacture and use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.00
H. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
3. Agriculture	85.98	85.98	86.08	85.76	84.46	84.96	84.94	85.17	85.64	84.58	83.62	81.16	77.31	78.18	77.27	76.92	75.54	74.24	72.53	71.99	71.69	72.49	72.19	71.45	71.83	-16.45
A. Enteric fermentation																										
B. Manure management	7.78	7.78	7.82	7.77	7.81	7.85	7.77	7.90	7.99	7.88	7.67	7.37	7.11	6.86	6.83	6.85	6.65	6.58	6.42	6.27	6.16	6.16	6.12	6.08	6.11	-21.38
C. Rice cultivation																										
D. Agricultural soils	77.52	77.52	77.61	77.38	76.18	76.64	76.70	76.79	77.17	76.23	75.48	73.33	69.73	70.85	70.03	69.67	68.51	67.23	65.69	65.30	65.13	65.93	65.68	65.01	65.36	-15.69
E. Prescribed burning of savannas	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
F. Field burning of agricultural residues	0.21	0.21	0.18	0.13	0.00	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
G. Liming																										
H. Urea application																										
I. Other carbon-containing fertilizers																										
J. Other	0.47	0.47	0.47	0.47	0.47	0.47	0.46	0.47	0.47	0.47	0.47	0.46	0.47	0.47	0.40	0.40	0.38	0.43	0.43	0.42	0.40	0.40	0.39	0.36	0.36	-23.64
4. Land Use, Land-Use Change and Forestry	3.63	3.63	3.62	3.60	3.58	3.57	3.59	3.56	3.56	3.54	3.51	3.41	3.27	3.17	3.15	2.97	2.89	2.80	2.74	2.63	2.57	2.51	2.47	2.52	2.38	-34.63
A. Forest land	0.16	0.16	0.17	0.16	0.16	0.16	0.20	0.18	0.18	0.17	0.16	0.17	0.17	0.17	0.17	0.17	0.18	0.18	0.18	0.17	0.17	0.16	0.17	0.21	0.17	4.22
B. Cropland	2.18	2.18	2.17	2.17	2.16	2.16	2.15	2.15	2.15	2.14	2.14	2.03	1.92	1.82	1.72	1.63	1.55	1.47	1.39	1.32	1.25	1.21	1.17	1.14	1.11	-49.17
C. Grassland	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.04	0.04	0.13	0.04	0.05	0.05	0.07	0.04	0.05	0.05	0.06	0.10	0.03	-24.35

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Base year [a]	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Change from base to latest reported year
	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	%
D. Wetlands	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-86.93
E. Settlements	1.24	1.24	1.23	1.22	1.21	1.20	1.19	1.18	1.17	1.17	1.16	1.15	1.14	1.13	1.12	1.12	1.11	1.11	1.10	1.09	1.09	1.08	1.08	1.07	1.07	-13.96
F. Other land	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
G. Harvested wood products																										
H. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
5. Waste	3.85	3.85	3.82	3.96	3.93	3.96	4.01	4.17	4.19	4.27	4.24	4.47	4.54	4.52	4.48	4.65	4.91	4.91	5.16	5.25	5.42	5.58	5.62	5.64	5.76	49.72
A. Solid waste disposal																										
B. Biological treatment of solid waste	0.02	0.02	0.02	0.03	0.03	0.04	0.06	0.08	0.11	0.22	0.27	0.33	0.52	0.57	0.61	0.83	1.07	1.13	1.42	1.62	1.66	1.77	1.85	1.93	2.04	12,313.31
C. Incineration and open burning of waste	0.10	0.10	0.10	0.10	0.11	0.10	0.10	0.11	0.10	0.18	0.19	0.19	0.19	0.19	0.19	0.18	0.18	0.18	0.17	0.15	0.16	0.16	0.16	0.15	0.15	48.35
D. Waste water treatment and discharge	3.73	3.73	3.70	3.84	3.80	3.82	3.85	3.98	3.98	3.87	3.79	3.96	3.83	3.76	3.69	3.64	3.67	3.60	3.57	3.47	3.60	3.64	3.60	3.56	3.57	-4.33
E. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
6. Other (as specified in the summary table in CRF)																										
Total N_2O emissions without N_2O from LULUCF	188.21	188.21	188.75	173.76	159.22	160.03	155.21	154.61	154.99	154.75	121.31	119.71	113.60	107.66	106.94	109.08	105.33	102.09	101.28	98.95	93.24	94.77	90.73	90.62	90.61	-51.85
Total N_2O emissions with N_2O from LULUCF	191.84	191.84	192.38	177.36	162.81	163.60	158.80	158.17	158.54	158.29	124.82	123.12	116.88	110.83	110.10	112.05	108.21	104.89	104.02	101.58	95.81	97.28	93.21	93.13	92.99	-51.53
Memo items:																										
International bunkers	0.71	0.71	0.70	0.75	0.79	0.80	0.84	0.90	0.96	1.05	1.05	1.12	1.11	1.05	1.09	1.21	1.30	1.37	1.36	1.37	1.30	1.23	1.31	1.24	1.22	71.79
Aviation	0.49	0.49	0.48	0.53	0.57	0.60	0.63	0.67	0.71	0.79	0.86	0.95	0.93	0.91	0.93	1.02	1.10	1.12	1.12	1.09	1.03	1.00	1.05	1.02	1.01	106.06
Navigation	0.22	0.22	0.22	0.22	0.22	0.20	0.21	0.23	0.25	0.26	0.19	0.17	0.18	0.14	0.16	0.19	0.20	0.25	0.24	0.28	0.27	0.23	0.26	0.22	0.21	-4.55
Multilateral operations	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	
CO_2 emissions from biomass																										
CO_2 captured																										
Long-term storage of C in waste disposal sites																										
Indirect N_2O	14.25	14.25	13.75	13.47	12.72	12.20	11.67	11.23	10.43	10.23	9.65	9.39	9.19	8.79	8.68	8.40	8.31	8.08	7.74	7.03	6.18	6.06	5.71	5.80	5.53	-61.17
Indirect CO_2																										

[a] UNFCCC base year for the UK is 1990

Table 1 (continued)
Emission trends: Fluorinated Gases

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Base year [a]	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Change from base to latest reported year
	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	%
Emissions of HFCs and PFCs – (kt CO_2 equivalent)	16,204.07	16,204.07	16,540.32	16,456.79	17,390.61	18,615.90	20,155.87	21,363.91	24,140.88	21,074.85	12,428.70	11,069.09	11,914.86	12,233.76	13,502.52	12,621.59	13,555.08	14,346.90	14,563.31	15,099.65	15,414.50	15,996.21	16,451.54	16,496.18	16,517.29	1.93
Emissions of HFCs – (kt CO_2 equivalent)	14,552.54	14,552.54	15,155.17	15,766.43	16,787.87	18,004.50	19,558.93	20,767.55	23,637.76	20,581.12	11,954.73	10,472.30	11,429.27	11,825.53	13,145.90	12,187.74	13,169.93	13,959.23	14,275.47	14,833.40	15,217.16	15,708.50	16,034.60	16,237.32	16,263.92	11.76
HFC-23	0.97	0.97	1.01	1.05	1.09	1.13	1.19	1.22	1.33	1.03	0.41	0.22	0.20	0.17	0.16	0.03	0.03	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	-99.89
HFC-32	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.03	0.05	0.06	0.08	0.11	0.13	0.15	0.18	0.21	0.24	0.27	0.30	0.35	0.40	0.45	0.49	9,461.22
HFC-41	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
HFC-43-10mee	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	0.00	0.00	0.01	0.01	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.01	
HFC-125	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.05	0.08	0.13	0.19	0.25	0.34	0.39	0.46	0.53	0.59	0.72	0.76	0.81	0.86	0.99	1.07	1.12	1.17	6,148.30
HFC-134	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00	0.00	0.00	0.00	0.01	0.01	
HFC-134a	0.02	0.02	0.03	0.04	0.33	0.74	1.17	1.62	2.31	3.02	3.09	3.67	4.13	4.34	4.87	5.08	5.48	5.66	5.74	6.00	6.08	6.02	6.00	5.94	5.82	28,232.25
HFC-143	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
HFC-143a	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.04	0.07	0.11	0.16	0.22	0.27	0.33	0.38	0.43	0.47	0.52	0.56	0.58	0.60	0.62	0.64	0.65	0.65	4,446.37
HFC-152	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
HFC-152a	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.02	0.04	0.07	0.07	0.09	0.08	0.19	0.17	0.18	0.14	0.17	0.17	0.15	0.12	0.12	0.13	0.13	0.14	16,206,689.82
HFC-161	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
HFC-227ea	IE,NO	IE,NO	IE,NO	IE,NO	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.02	0.04	0.07	0.09	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.12	0.12	0.12	
HFC-236cb	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
HFC-236ea	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
HFC-236fa	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
HFC-245ca	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
HFC-245fa	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.00	0.01	0.01	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	
HFC-365mfc	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0.01	0.03	0.08	0.18	0.24	0.22	0.20	0.17	0.16	0.15	0.14	0.14	0.13	
Unspecified mix of HFCs – (kt CO_2 equivalent)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
Emissions of PFCs – (kt CO_2 equivalent)	1,651.53	1,651.53	1,385.15	690.36	602.74	611.40	596.94	596.36	503.12	493.73	473.96	596.79	485.59	408.23	356.61	433.86	385.15	387.67	287.84	266.25	197.33	287.71	416.94	258.86	253.38	-84.66
CF_4	0.18	0.18	0.15	0.07	0.06	0.05	0.04	0.05	0.04	0.04	0.04	0.05	0.04	0.03	0.02	0.03	0.02	0.02	0.02	0.02	0.01	0.02	0.03	0.01	0.01	-94.49
C_2F_6	0.03	0.03	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	-74.41
C_3F_8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.01	0.01	0.01	3,431.14
C_4F_{10}	NO	NO	NO	NO	NO	NO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NO	NO	NO	NO	
c-C_4F_8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	260.84
C_5F_{12}	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
C_6F_{14}	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
C10F18	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
c-C3F6	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
Unspecified mix of PFCs – (kt CO_2 equivalent)	13.45	13.45	13.45	13.52	33.58	60.45	87.32	67.00	25.97	18.00	7.39	9.62	4.21	6.43	1.56	2.52	3.08	2.52	1.53	0.33	0.32	1.08	2.44	2.47	2.49	-81.47
Unspecified mix of HFCs and PFCs – (kt CO_2 equivalent)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
Emissions of SF_6 – (kt CO_2 equivalent)	1,279.06	1,279.06	1,318.54	1,358.25	1,182.90	1,223.44	1,264.37	1,305.70	1,280.08	1,328.72	1,497.71	1,817.68	1,454.11	1,495.23	1,320.78	1,116.79	1,056.04	820.51	827.34	673.33	650.51	732.73	648.24	632.27	601.56	-52.97
SF_6	0.06	0.06	0.06	0.06	0.05	0.05	0.06	0.06	0.06	0.06	0.07	0.08	0.06	0.07	0.06	0.05	0.05	0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.03	-52.97
Emissions of NF_3 – (kt CO_2 equivalent)	0.42	0.42	0.48	0.55	0.63	0.73	0.83	0.96	1.10	1.27	1.46	1.69	1.03	1.03	0.95	0.59	0.29	0.29	0.28	0.27	0.26	0.27	0.30	0.33	0.36	-12.69
NF_3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-12.69

[a] UNFCCC base year for the UK is 1990

Table 2(a)
Description of quantified economy-wide emissions reduction target: base year

		Comments
Base year/ base period Emission reductions target (% of base year/base period)	1990	Legally binding target trajectories for the period 2013-2020 are enshrined in both the EU-ETS Directive (Directive 2003/87/EC and respective amendments) and the Effort Sharing Decision (Decision No 406/2009/EC). These legally binding trajectories not only result in a 20% GHG reduction in 2020 compared to 1990 but also define the EU's annual target pathway to reduce EU GHG emissions from 2013 to 2020. The Effort Sharing Decision sets annual national emission targets for all Member States for the period 2013-2020 for those sectors not covered by the EU emissions trading system (ETS), expressed as percentage changes from 2005 levels. In March 2013, the Commission formally adopted the national annual limits throughout the period for each Member State. By 2020, the national targets will collectively deliver a reduction of around 10% in total EU emissions from the sectors covered compared with 2005 levels. The emission reduction to be achieved from the sectors covered by the EU ETS will be 21% below 2005 emission levels by 2020.
Emission reductions target (% of 1990)	20%	
Period for reaching target	BY-2020	

Table 2(b)
Description of quantified economy-wide emissions reduction target: base year

Gases covered	*Covered*	*Base Year*
CO_2	Yes	1990
CH_4	Yes	1990
N_2O	Yes	1990
HFCs	Yes	1990
PFCs	Yes	1990
SF_6	Yes	1990
NF_3	No	

Sectors covered	*Covered*
Energy	Yes
Transport	Yes
Industrial Processes	Yes
Agriculture	Yes
LULUCF	No
Waste	Yes

Other: Aviation	Yes	Aviation in the scope of the EU-ETS: CO_2 emissions from all flights falling within the aviation activities listed in Annex I of the EU ETS Directive which depart from an aerodrome situated in the territory of a Member State and those which arrive in such an aerodrome from a third country, excluding small commercial emitters.

Table 2(c)
Description of quantified economy-wide emission reduction target: global warming potential values (GWP)

Gases covered	*Covered*	*GWP reference source*	*Comments*
CO_2	Yes	IPCC AR4	as adopted in UNFCCC reporting guidelines for national GHG inventories of Annex I Parties and as adopted under the EU Monitoring Mechanism Regulation
CH_4	Yes	IPCC AR4	as adopted in UNFCCC reporting guidelines for national GHG inventories of Annex I Parties and as adopted under the EU Monitoring Mechanism Regulation
N_2O	Yes	IPCC AR4	as adopted in UNFCCC reporting guidelines for national GHG inventories of Annex I Parties and as adopted under the EU Monitoring Mechanism Regulation
HFCs	Yes	IPCC AR4	as adopted in UNFCCC reporting guidelines for national GHG inventories of Annex I Parties and as adopted under the EU Monitoring Mechanism Regulation
PFCs	Yes	IPCC AR4	as adopted in UNFCCC reporting guidelines for national GHG inventories of Annex I Parties and as adopted under the EU Monitoring Mechanism Regulation
SF_6	Yes	IPCC AR4	as adopted in UNFCCC reporting guidelines for national GHG inventories of Annex I Parties and as adopted under the EU Monitoring Mechanism Regulation
NF_3	NO	IPCC AR4	

Table 2(d)
Description of quantified economy-wide emission reduction target: approach to counting emissions and removals from the LULUCF sector

Role of LULUCF sector	
LULUCF in base year level and target	excluded
Contribution of LULUCF is calculated using	

Table 2(e)I
Description of quantified economy-wide emission reduction target: market-based mechanisms under the Convention

	Possible scale of contributions of market-based mechanisms	*Comment:*
Possible scale of contributions of market-based mechanisms under the convention	0	The 2020 Climate and Energy Package allows Certified Emission Reductions (CERs) and Emission Reduction Units (ERUs) to be used for compliance purposes, subject to a number of restrictions in terms of origin and type of project and up to an established limit. In addition, the legislation foresees the possible recognition of units from new market mechanisms. Under the EU ETS the limit does not exceed 50% of the required reduction below 2005 levels. In the sectors not covered by the ETS, annual use shall not exceed to 3% of each Member States' non-ETS greenhouse gas emissions in 2005. A limited number of Member States may use an additional 1%, from projects in LDCs or SIDS subject to conditions.
CERs	0	The use of these units under the ETS Directive and the Effort Sharing Decision is subject to the limits specified above which do not separate between CERs and ERUs, but include additional criteria for the use of CERs.
ERUs	0	The use of these units under the ETS Directive and the Effort Sharing Decision is subject to the limits specified above which do not separate between CERs and ERUs, but include additional criteria for the use of CERs.
AAUs[b]	0	AAUs for the period 2013-2020 have not yet been determined. The EU expects to achieve its 20% target for the period 2013-2020 with the implementation of the ETS Directive and the ESD Decision in the non-ETS sectors which do not allow the use of AAUs from non-EU Parties.
Carry-over units	0	The time-period of the Convention target is from 1990-2020, no carry-over units will be used to achieve the 2020 target.
Other mechanism units under the Convention (specify)	0	There are general provisions in place in the EU legislation that allow for the use of such units provided that the necessary legal arrangements for the creation of such units have been put in place in the EU which is not the case at the point in time of the provision of this report.

Table 2(e)II
Description of quantified economy-wide emission reduction target: market-based mechanisms under the Convention

	Possible scale of contributions of market-based mechanisms	*Comment:*
Possible scale of contributions of market-based mechanisms under the convention	0	The 2020 Climate and Energy Package allows CERs and ERUs to be used for compliance purposes, subject to a number of restrictions in terms of origin and type of project and up to an established limit. In addition, the legislation foresees the possible recognition of units from new market mechanisms. Under the EU ETS the limit does not exceed 50% of the required reduction below 2005 levels. In the sectors not covered by the ETS, annual use shall not exceed to 3% of each Member States' non-ETS greenhouse gas emissions in 2005. A limited number of Member States may use an additional 1%, from projects in LDCs or SIDS subject to conditions.

Table 2(f)
Description of quantified economy-wide emission reduction target: any other information

In December 2009, the European Council reiterated the conditional offer of the EU to move to a 30% reduction by 2020 compared to 1990 levels as part of a global and comprehensive agreement for the period beyond 2012, provided that other developed countries commit themselves to comparable emission reductions and that developing countries contribute adequately according to their responsibilities and respective capabilities.

Table 3
Progress in achievement of the quantified economy-wide emissions reductions target: information on mitigation actions and their effects

Name of Mitigation Action	*Sectors affected*	*GHG affected*	*Objective and or activity affected*	*Type of Instrument*	*Status of implemention*	*Brief Description*	*Start Year of Implementation*	*Implementing Entity or Entitities*	*Greenhouse Gas Saving ($ktCO_2$ eq)*					
									2013	2015	2020	2025	2030	2035
New Energy Supply policies $_1$ *	Energy, Industry/Industrial Processes	CO_2, (CH_4, N_2O)	To increase the proportion of low carbon (Nuclear, CCS) and renewables electricity generation	Regulatory, Economic	Adopted, Implemented	Grouped savings produced by a selection of post-2009 energy supply policies as indicated in this table with a label '$_1$'.	2002	Department of Energy & Climate Change (DECC), Office of Gas and Electricity Markets (Ofgem)	1,530	8,620	25,097	41,789	37,901	51,689
Renewables Obligation $_1$ *	Energy	CO_2, (CH_4, N_2O)	To increase in the proportion of electricity generation and supply from renewables	Regulatory, Economic	Implemented	Sets an annual obligation on electricity suppliers to produce a proportion of their generation from renewable sources. Targets can be met by renewable generation that accrue Renewable Energy certificates (ROCs) or by trading.	2002	Department of Energy & Climate Change (DECC), Office of Gas and Electricity Markets (Ofgem)	IE	IE	IE	IE	IE	IE
EU Emissions Trading System *	Energy, Industry/ Industrial Processes, Other (Public sector)	CO_2, ($CH_{4)}$, N_2O, PFCs.	To reduce the use of emissions intensive fossil fuels and increase the use of renewables	Economic	Implemented	It sets an emissions target (cap) for installations covered by the system (across the EU), with the carbon market determining the carbon price, and therefore where emissions can be reduced most cheaply. It guarantees that total emissions in the sectors covered will not exceed the cap set, and in doing so drives investments in low-carbon technologies, leading to cutting emissions of carbon dioxide (CO_2) and other greenhouse gases at least cost.	2005	European Commission. Department of Energy & Climate Change (DECC)	IE	IE	IE	IE	IE	IE
Large Combustion Plant Directive *	Energy, Industry/ Industrial Processes	CO_2, (CH_4, N_2O)	To improve air quality by limiting industrial emisions of nitrogen oxides, sulphur dioxide and dust. This indirectly acts to mitgate GHG emission by reducing the use of high carbon (coal) generation in the electricity supply industry.	Regulatory	Implemented	The Large Combustion Plant Directive (LCPD, 2001/80/EC) sets limits on emissions of sulphur dioxide, nitrogen oxides, and dust from combustion plants with a thermal capacity of 50 MW or greater.	2007	Department for Food, Environment and Rural Affairs (DEFRA)	IE	IE	IE	IE	IE	IE
Additional Renewables in Generation (Renewable Energy Strategy) $_1$ *	Energy	CO_2, (CH_4, N_2O)	To further increase in the proportion of electricity generation and supply from renewables	Regulatory, Economic	Implemented	Increases Renewable Obligation (RO) targets in electricity supply so as meet the UK's overall renewables target for 2020 as set out in the Renewables Directive (RED, 2009/28/EC).	2009	Department of Energy & Climate Change (DECC), Office of Gas and Electricity Markets (Ofgem)	IE	IE	IE	IE	IE	IE

Name of Mitigation Action	*Sectors affected*	*GHG affected*	*Objective and or activity affected*	*Type of Instrument*	*Status of implemention*	*Brief Description*	*Start Year of Implementation*	*Implementing Entity or Entitities*	*Greenhouse Gas Saving ($ktCO_2$ eq)*					
									2013	2015	2020	2025	2030	2035
Feed in Tariffs (FITS) [1]*	Energy	CO_2, (CH_4, N_2O)	Encourage small-scale, low carbon generation	Regulatory, Economic	Implemented	Feed-in Tariffs (FITs) support organisations, businesses, communities and individuals to generate low-carbon electricity using small-scale (5 megawatts (MW) or less total installed capacity) systems. Electricity suppliers are obliged to pay the regulated tariffs to eligible generators.	2010	Department of Energy & Climate Change (DECC)	IE	IE	IE	IE	IE	IE
Industrial Emissions Directive (as it applies to Large Combustion Plant) *	Energy, Industry/ Industrial Processes	CO_2, CH_4, N_2O	Consolidates and strengthens several air quality measures, including the LCPD. Further reduce the use of high carbon (coal) generation in the electricity supply industry.	Regulatory	Adopted	The LCPD will be replaced from 1 January 2016 by similar although more stringent provisions set out in chapter III of the Industrial Emissions Directive (2010/75/EU) (IED). Those provisions already apply in respect to any plant newly permitted since 7 January 2013. Transposes theIED . Sets lifetime operating hours limits on coal fired power plants that don't install abatement equipment.	2016	Department for Food, Environment and Rural Affairs (DEFRA)	IE	IE	IE	IE	IE	IE
Capacity Mechanism [1] *	Energy	CO_2, (CH_4, N_2O)	To increase the proportion of low carbon (Nuclear, CCS) and renewables electricity generation	Economic	Adopted	Part of the government's Electricity Market Reform package, the Capacity Market supplies backup electricity generation capacity, encouraging construction and use of low carbon and renewable generation in the electricity supply industry.	2017	Department of Energy & Climate Change (DECC)	IE	IE	IE	IE	IE	IE
Contract for Difference (CfD) (2014-2020) [1] *	Energy	CO_2, (CH_4, N_2O)	To increase the proportion of low carbon (Nuclear, CCS) and renewables electricity generation	Economic	Implemented	Offers Contracts for Difference (CfDs) in the electricity generation market for low carbon and renewable sources, CfDs will replace ROCs (which are due to be phased out from 2017). Current policy offers CfD for new capacity through auctions should Government's choose to hold them. There is also a bilateral negotiation underway for Hinkley point C Nuclear plant.	2014	Department of Energy & Climate Change (DECC)	IE	IE	IE	IE	IE	IE
Contract for Difference (CfD) (2021-2035)	Energy	CO_2, (CH_4, N_2O)	To increase the proportion of low carbon (Nuclear, CCS) and renewables generation	Economic	Planned	Planned continuation of Contracts for Difference (CfDs) for new low carbon capacity after 2020.	2021	Department of Energy & Climate Change (DECC)	IE	IE	IE	IE	IE	IE

Name of Mitigation Action	*Sectors affected*	*GHG affected*	*Objective and or activity affected*	*Type of Instrument*	*Status of implemention*	*Brief Description*	*Start Year of Implementation*	*Implementing Entity or Entitities*	*Greenhouse Gas Saving ($ktCO_2$ eq)*					
									2013	2015	2020	2025	2030	2035
Carbon Capture & Storage Programme (CCS) [1] *	Energy, Industry/Industrial Processes	CO_2	To encourage the use of CCS equipment in fossil fuel generation	Economic	Implemented	This policy was impacted by the Government's Spending Review on 25th November. In line with the Biennial Review reporting guidance, further detail will be provided in the next National Communication	2017	Department of Energy & Climate Change (DECC)	IE	IE	IE	IE	IE	IE
Carbon Price Floor [1] *	Energy	CO_2, (CH_4, N_2O)	To reduce the use of emissions intensive fossil fuels and increase the use of renewables in electrcity generation	Economic	Implemented	The Carbon Price Floor (CPF) is designed to further reduce the use of emission-intensive fossil fuels and increase the proportion of electricity generation and supply from low carbon sources	2013	Department of Energy & Climate Change (DECC)	IE	IE	IE	IE	IE	IE
Building Regulations Part L (2002+2005/6)*	Energy, Industry/ Industrial Processes, Other (Public sector), Other (Residential)	CO_2, (CH_4, N_2O)	Improve energy efficiency of buildings	Regulatory	Implemented	Building Regulations set minimum energy performance standards for new buildings and when people carry out controlled 'building work' to existing properties including extensions, conversions and certain categories of renovation and replacement windows and boilers.	2002	Department of Energy & Climate Change (DECC)	7,933	8,988	10,708	8,298	5,540	2,979
Building Regulations 2010 Part L *	Energy, Industry/ Industrial Processes, Other (Public sector), Other (Residential)	CO_2, (CH_4, N_2O)	Improve energy efficiency of buildings	Regulatory	Implemented	Building Regulations set minimum energy performance standards for new buildings and when people carry out controlled 'building work' to existing properties including extensions, conversions and certain categories of renovation and replacement windows and boilers.	2010	Department for Communities and Logal Government (DCLG)	1,639	3,156	6,281	8,441	6,757	5,515
Building Regulations 2013 Part L *	Energy, Industry/ Industrial Processes, Other (Public sector), Other (Residential)	CO_2, (CH_4, N_2O)	Improve energy efficiency of buildings	Regulatory	Implemented	Building Regulations set minimum energy performance standards for new buildings and when people carry out controlled 'building work' to existing properties including extensions, conversions and certain categories of renovation and replacement windows and boilers.	2013	Department for Communities and Logal Government (DCLG)	-	20	123	195	218	223

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									2013	2015	2020	2025	2030	2035
Products Policy (Implemented) *	Energy, Industry/ Industrial Processes, Other (Public sector), Other (Residential)	CO_2, (CH_4, N_2O)	Reducing energy use and emissions from appliances and products such as white goods, lighting, televisions, heating and cooling systems and electric motors by preventing the sale of the worst performing products and promoting the sale of the most efficient.	Regulatory	Implemented	UK legislation to set minimum energy efficiency standards for products on sale. Mandating energy efficiency labelling of appliances. Most recently implemented by the Eco-Design for Energy Related Products Regulations (SI 2010 No 2617). Implements EU Ecodesign Directive 2009/125/EC (amending 2005/32/EC).	2008	Department for Food, Environment and Rural Affairs (DEFRA)	3,213	5,285	9,672	9,006	7,117	6,766
Products Policy (Adopted) *	Energy, Industry/ Industrial Processes, Other (Public sector), Other (Residential)	CO_2, (CH_4, N_2O)	Reducing energy use and emissions from appliances and products such as white goods, lighting, televisions, heating and cooling systems and electric motors by preventing the sale of the worst performing products and promoting the sale of the most efficient.	Regulatory	Adopted	UK legislation to set minimum energy efficiency standards for products on sale. Mandating energy efficiency labelling of appliances. Most recently implemented by the Eco-Design for Energy Related Products Regulations (SI 2010 No 2617). Implements EU Ecodesign Directive 2009/125/EC (amending 2005/32/EC).	2013	Department for Food, Environment and Rural Affairs (DEFRA)	-	198	3,375	5,375	6,332	6,238
Renewable Heat Incentive *	Energy, Industry/ Industrial Processes, Other (Public sector), Other (Residential)	CO_2, (CH_4, N_2O)	To encourage the generation of renewable heat in all sectors from large industrial sites down to the household level.	Economic	Implemented	The RHI is designed to bridge the gap between the cost of fossil fuel heat sources and renewable heat alternatives.	2011	Department of Energy & Climate Change (DECC)	337	1,836	1,837	1,835	1,832	1,052
Renewable heat incentive (planned funding)	Energy, Industry/ Industrial Processes, Other (Public sector), Other (Residential)	CO_2, (CH_4, N_2O)	To encourage the generation of renewable heat in all sectors from large industrial sites down to the household level.	Economic	Planned	This policy was impacted by the Government's Spending Review on 25th November. In line with the Biennial Review reporting guidance, further detail will be provided in the next National Communication	2017	Department of Energy & Climate Change (DECC)	-	-	7,402	8,181	8,157	6,837

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Smart Metering *	Energy, Industry/ Industrial Processes, Other (Residential)	CO_2, (CH_4, N_2O)	Reduce consumption of electricity and gas though provision of better management information.	Information	Adopted	The smart metering programme will replace 53 million meters with smart electricity and gas meters in all domestic properties, and smart or advanced meters in smaller non domestic sites in Great Britain by the end of 2020. Smart meters will deliver consumers with near-real time information on their energy consumption to help them control energy use, and avoid wasting energy and money. It will deliver energy networks with better information upon which to manage and plan current activities. Smart meters will also assist the move towards smart grids which support sustainable energy supply and will help reduce the total energy needed in the system.	2014	Department of Energy & Climate Change (DECC)	120	408	2,794	2,818	2,835	2,890
Carbon Trust measures *	Energy, Industry/ Industrial Processes, Other (Public sector)	CO_2, (CH_4, N_2O)	Improve energy efficiency in buildings	Information, Education	Expired	The Carbon Trust provides a range of measures from general advice to in-depth consultancy and accreditation, to reduce emissions and save energy and money to businesses and public sector organisations of all sizes.	2002	Carbon Trust	2,314	1,555	465	118	-	-
CRC Energy Efficiency Scheme *	Energy, Industry/ Industrial Processes, Other (Public sector)	CO_2, (CH_4, N_2O)	To drive emission reductions from large non-energy intensive private and public sector organisations.	Economic, Information	Implemented	The CRC is a mandatory UK-wide emissions trading scheme (launched in 2010). It encourages the uptake of energy efficiency measures in large non-energy intensive private and public sector organisations that use energy not covered by the EU ETS or Climate Change Agreements. It covers 1800-1900 large users of energy across the business and public sector.	2010	Department of Energy & Climate Change (DECC), Environment Agency (EA). Devolved administrations.	337	611	1,449	2,363	705	-

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Energy Company Obligation (ECO) *	Energy, Other (Residential)	CO_2, (CH_4, N_2O)	To improve the energy efficiency of residential and commercial buildings and address fuel poverty.	Economic, Regulatory	Implemented	The Energy Company Obligation (ECO) is a statutory obligation on energy suppliers with over 250,000 domestic customers and delivering over a certain amount of electricity or gas to make reductions in carbon emissions or achieve heating cost savings in domestic households. ECO focuses on insulation measures, and also heating improvements to low income and vulnerable households. It runs until March 2017.	2013	Department of Energy & Climate Change (DECC), Large Energy Suppliers	265	797	726	731	718	711
Future Supplier Obligation	Energy, Other (Residential)	CO_2, (CH_4, N_2O)	To improve the energy efficiency of residential and commercial buildings and address fuel poverty.	Economic, Regulatory	Planned	This policy was the planned extension of the Energy Company Obligation (ECO). This policy was impacted by the Government's Spending Review on 25th November. In line with the Biennial Review reporting guidance, further detail will be provided in the next National Communication.	2017	Department of Energy & Climate Change (DECC), Large Energy Suppliers	-	6	1,038	909	896	890
Warm Front *	Energy, Other (Residential)	CO_2, (CH_4, N_2O)	Tackling fuel poverty, improving energy efficiency for poorer households.	Economic	Expired	Warm Front installed heating and insulation measures to make homes warmer and more energy efficient for private sector households in England vulnerable to fuel poverty. The scheme offered a package of heating and insulation measures of up to £3,500 (or £6,000 where oil central heating or other alternative technologies are recommended).	2000	Department of Energy & Climate Change (DECC), Devolved administrations, Carillion Energy Services.	671	328	234	244	290	298

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EEC1, EEC2 (2002-2008) & Baseline Carbon Emissions Reductions Target (CERT) (2008-2010) *	Energy, Other (Residential)	CO_2, (CH_4, N_2O)	To require larger domestic energy supply companies to assist households to take-up cost-effective energy efficiency measures.	Regulatory	Expired	EEC I: GB wide regulation that required all electricity and gas suppliers with 15,000 or more domestic customers to achieve a combined energy saving of 62 TWh by 2005 by incentivising their customers to install energy-efficiency measures in homes. EEC II - energy suppliers with more than 50,000 domestic customers required to deliver a total of 130 TWh lifetime energy use reductions in GB households, primarily through the promotion of energy efficiency measures. Carbon Emission Reduction Target (CERT) – GB regulation that required all domestic energy suppliers with a customer base in excess of 50,000 domestic customers to make savings in the amount of CO_2 emitted by householders.	2002	Department of Energy & Climate Change (DECC), Office of Gas and Electricity Markets (Ofgem). Large domestic energy suppliers.	4,706	4,571	3,273	3,281	3,348	3,274
Carbon Emissions Reduction Target (CERT) Uplift and Extension (2010-12) *	Energy, Other (Residential)	CO_2, (CH_4, N_2O)	To require larger domestic energy supply companies to assist households to take-up cost-effective energy efficiency measures.	Regulatory	Expired	CERT extension - increased the targets originally set under CERT by 20% and required domestic energy suppliers with a customer base in excess of 50,000 (later increased to 250,000) to make savings in the amount of CO_2 emitted by householders. The extension also refocused subsidy towards insulation measures and away from electricity saving measures such as low energy lighting – and introduced a super priority group (households in receipt of certain means-tested benefits) to make energy reductions in low income and vulnerable households.	2010	Department of Energy & Climate Change (DECC), Office of Gas and Electricity Markets (Ofgem). Larger Energy Suppliers.	1,965	1,999	1,994	1,841	1,676	1,472
Community Energy Saving Programme (CESP) *	Energy, Other (Residential)	CO_2, (CH_4, N_2O)	To require larger energy companies to encourage households in areas of low income to take-up cost-effective energy efficiency measures.	Regulatory	Expired	Community Energy Saving Programme (CESP) - area based regulation that targeted households across Great Britain, in areas of low income, to improve energy efficiency standards, and reduce fuel bills. CESP was funded by an obligation on larger energy suppliers and also the larger, electricity generators.	2009	Department of Energy & Climate Change (DECC), Office of Gas and Electricity Markets (Ofgem). Larger Energy Suppliers.	125	127	127	115	111	106

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Energy Performance of Buildings Directive (EPBD) *	Energy, Industry/ Industrial processes, Other (Residential), Other (public sector)	CO_2, (CH_4, N_2O)	Encourage uptake of energy efficiency measures	Regulatory, Information	Implemented	Energy Performance Certificates (EPCs) are required when any building is sold, rented out or constructed, and sometimes after refurbishment work. EPCs give information on a building's energy efficiency in a sliding scale from 'A' (very efficient) to 'G' (least efficient).	2007	Department for Communities and Logal Government (DCLG) and the devolved administrations.	714	725	727	717	691	676
Energy Performance of Buildings Directive (EPBD) Recast 2010 *	Energy, Other (Public sector)	CO_2, (CH_4, N_2O)	Encourage uptake of energy efficiency measures	Regulatory, Information	Adopted	Extension of the Energy Performance of Buildings Directive (EPBD) requirement for public buildings to display Energy Performance Certificates to include buildings over 250m^2 from 9 July 2015.	2015	Department for Communities and Logal Government (DCLG) and the devolved administrations.	-	-	-	-	-	-
Energy Performance of Buildings Directive (EPBD) 2017 Cost Optimal Review and Nearly Zero Energy Buildings (NZEB) (2018 and 2020)	Energy, Industry/ Industrial processes, Other (residential), Other (public sector)	CO_2, (CH_4, N_2O)	Encourage uptake of energy efficiency measures	Regulatory, Information	Planned	The Government is required to report to the European Commission by June 2017 to demonstrate that UK building standards for energy performance remain 'cost optimal'. Cost-optimal energy performance means that the lifetime cost-benefit analysis is positive. Minimum energy performance requirements must be compared against calculated cost-optimal levels using the Comparative Methodology Framework.	2017	Department for Communities and Logal Government (DCLG) and the devolved administrations.	IE	IE	IE	IE	IE	IE
Private Rented Sector (PRS) Energy Efficiency Regulations *	Energy, Industry/ Industrial processes, Other (Residential)	CO_2, (CH_4, N_2O)	Improve energy efficiency of private rented property	Regulatory, Information	Adopted	From the 1 April 2018 there will be a requirement for any properties rented out in the private rented sector to have a minimum energy performance rating of E on an Energy Performance Certificate (EPC). The regulations will come into force for new lets and renewals of tenancies with effect from 1 April 2018 and for all existing tenancies on 1 April 2020 (1 April 2023 for non-domestic properties). It will be unlawful to rent a property which breaches the requirement for a minimum E rating, unless there is an applicable exemption.	2016	Department of Energy & Climate Change (DECC)	-	1	643	965	878	768

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Salix Loans *	Energy, Other (Public sector)	CO_2, (CH_4, N_2O)	To address funding barriers to achieving energy efficiency in the Public sector	Economic	Implemented	Salix Energy Efficiency Recycling Funds: A long-term recycling fund, whereby a public sector body is given match funding for a number of projects. Salix Energy Efficiency Loans: interest free loans, repayable over a 4 year period. The loan scheme is administered by the Carbon Trust. This policy was impacted by the Government's Spending Review on 25th November. In line with the Biennial Review reporting guidance, further detail will be provided in the next National Communication	2004	Department of Energy & Climate Change (DECC). Administered by the Carbon Trust.	52	78	174	230	242	230
Small and Medium Enterprises (SME) Loans *	Energy, Industry/ Industrial Processes	CO_2, (CH_4, N_2O)	To address funding barriers to achieving energy efficiency by the small and medium enterprises (SMEs)	Economic	Expired	The Carbon Trust provided interest free loans of £3,000 - £400,000 for small and medium sized businesses to invest in energy efficiency equipment and renewable technologies. These loans were designed so that in most cases the forecast reduction in energy costs would be similar to the total repayment amount.	2004	Department of Energy & Climate Change (DECC). Administered by the Carbon Trust.	101	83	56	7	-	-
Climate change agreements (CCA) *	Energy, Industry/ Industrial Processes	CO_2, (CH_4, N_2O)	To provide an incentive for energy-intensive industries to reduce energy consumption.	Economic, Voluntary Agreement/ negotiated agreement	Implemented	Climate Change Agreements offer participating energy-intensive industries a partial rebate from the Climate Change Levy on Industrial fuels in return for meeting targets for emission reductions. From 2013 these are a 90% rebate for electricity and a 65% rebate for other fuels. Target levels represent a cap on emissions if we assume compliance.	2013	Department of Energy & Climate Change (DECC). Industry Associations.	-	-	-	-	-	-

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Energy Savings Opportunity Scheme (ESOS) *	Energy, Industry/ Industrial Processes	CO_2, (CH_4, N_2O)	To encourage the uptake of energy saving opportunities.	Regualtory/ Information	Implemented	A mandatory energy assessment scheme for all large undertakings (non-SMEs) in response to requirements contained Article 8 of the EU Energy Efficiency Directive (2012/27/EU). Organisations which employ 250 or more people, or employ fewer than 250 people but have both an annual turnover exceeding £38.9m and an annual balance sheet total exceeding £33.4m, must measure their total energy consumption and carry out audits of the energy used by their buildings, industrial processes and transport to identify cost-effective energy saving measures, by 5 December 2015 and every four years thereafter. It is estimated that around 10,000 organisations will participate in the scheme.	2014	Department of Energy & Climate Change (DECC). Environment Agency.	-	-	904	877	876	888
Rail Electrification *	Transport	CO_2, (CH_4, N_2O)	To reduce travel times, costs and fossil fuel emissions	Economic	Implemented	Major programme of rail electrification underway to replace older diesel trains with modern, zero-emission electric trains.	2013	Department for Transport (DfT), Network Rail	-	-	206	239	263	281
Renewable Transport Fuel Obligation, (RTFO) - current 5% by volume *	Transport	CO_2	Reduce the fossil carbon content of transport fuels	Regulatory	Implemented	The RTFO set a phased 5% target for biofuel use by diesel and petrol suppliers to be achieved by 2014. Targets are by volume rather than by energy. Implements the EU Renewables Directive (2009/28/ EC).	2007	Department for Transport (DfT)	-	2,771	2,754	2,796	2,926	3,053
Renewable Transport Fuel Obligation, (RTFO) - Increase target to meet RED	Transport	CO_2	Reduce the fossil carbon content of transport fuels	Regulatory	Planned	To set enhanced targets for biofuel use by diesel and petrol suppliers to be achieved by 2020. Implements the EU Renewables Directive (2009/28/EC).	2009	Department for Transport (DfT)	-	0	5,564	5,303	5,284	5,332

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									2013	2015	2020	2025	2030	2035
Car Fuel Efficiency Policies *	Transport	CO_2, (CH_4, N_2O)	Improve fuel efficiency and reduce CO_2 emissions of cars	Regulatory, Information, Voluntary Agreement	Implemented	Sets fuel efficiency targets for new cars to be achieved by 2015 and 2020. Complementary measures are a collection of technologies that could improve 'real world' fuel efficiency of cars which wouldn't be fully captured in new car CO_2 target and could improve fuel efficiency within the existing fleet. These include gear shift indicators, tyre pressure monitoring systems more efficient mobile air-conditioning and low rolling resistance tyres. EC Regulation 661/2009 sets minimum requirements and introduce labelling for the rolling resistance, wet grip and external rolling noise of tyres. This policy was impacted by the Government's Spending Review on 25th November. In line with the Biennial Review reporting guidance, further detail will be provided in the next National Communication.	2012	Department for Transport (DfT)	-3	875	6,226	11,641	15,529	18,104
Van Fuel Efficiency Policies *	Transport	CO_2, (CH_4, N_2O)	Improve fuel efficiency and reduce CO_2 emissions of light goods vehicles	Regulatory, Information, Voluntary Agreement	Implemented	Sets fuel efficiency targets for new Light Goods Vehicles (LGV) to be achieved by 2017 and 2020. EC Regulation 661/2009 sets minimum requirements and introduce labelling for the rolling resistance, wet grip and external rolling noise of tyres. This policy was impacted by the Government's Spending Review on 25th November. In line with the Biennial Review reporting guidance, further detail will be provided in the next National Communication.	2012	Department for Transport (DfT)	-	124	965	2,151	2,988	3,487

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									2013	2015	2020	2025	2030	2035
HGV Fuel Efficiency Policies *	Transport	CO_2, (CH_4, N_2O)	Improve fuel efficiency and reduce CO_2 emissions of heavy goods vehicles	Regulatory, Information, Voluntary Agreement	Implemented	EC Regulation 661/2009 sets minimum requirements and introduce labelling for the rolling resistance, wet grip and external rolling noise of tyres. Industry and Government are taking a range of actions to reduce freight emissions, including the Freight Transport Association's Logistics Carbon Reduction Scheme, recording and reporting emissions reductions from freight, and Mode Shift Revenue Support in England and Wales to support modal shift.	2012	Department for Transport (DfT), Transport Association.	-	131	808	1,523	1,551	2,045
HGV natural gas policy *	Transport	CO_2, CH_4, N_2O	Fuel-switching	Economic, Research	Implemented	The Government is helping operators establish and run fleets of low carbon HGVs through the Low Carbon Truck Trial. £11.3m funding has been provided, via competition, to part fund and test around 350 commercial low-carbon vehicles, with most using a gas or dual fuel system (diesel and gas), and to develop refuelling infrastructure. The trial is generating a body of data including on carbon emissions, costs and operational performance. *Savings for this policy are captured within HGV fuel efficiency policies.*	2012	Department for Transport (DfT)	IE	IE	IE	IE	IE	IE
Local Sustainable Travel Fund *	Transport	CO_2, (CH_4, N_2O)	To allow the delivery of sustainable transport solutions that support economic growth, and reduce carbon emissions	Economic	Implemented	£600m of capital and revenue funding between 2010 and 2015 to support sustainable travel investments by Local Government. The projects include promoting public transport, encouraging uptake of cycling and walking, and raising awareness of the alternative transport modes available to commuters and residents Awards were made by after a competitive bidding process.	2011	Department for Transport (DfT), Local government.	376	487	503	307	214	139

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PSV Fuel Efficiency Policies	Transport	CO_2, CH_4, N_2O	efficiency improvements of vehicles	Economic	Implemented	The Green Bus Fund (GBF) allows bus companies and local authorities in England to compete for funds to help them buy new low carbon emission buses – both double decker and single decker buses, including midibuses (but not minibuses) capable of achieving an equivalent 30% reduction in their GHG emissions compared to the average Euro III diesel bus of the same total passenger capacity. The Four rounds of the fund, which ran from 2009-March 2014, added around 1250 Low Carbon Emission Buses onto England's roads. The Low Emission Bus Fund, announced 11 March 2015, replaces the GBF and offers up to £30m for bus operators and local authorities across England and Wales to bid for low emission buses and supporting infrastructure. This scheme funding is open from 2016-2019.	2006/07	Department for Transport (DfT)	IE	IE	IE	IE	IE	IE
Agricultural Action Plan *	Agriculture	CH_4, N_2O	Reduce emissions from farming	Voluntary Agreement, Information, Education	Implemented	Range of resource-efficient and land management measures to reduce emissions to meet UK carbon budgets	2010	Department for Food, Environment and Rural Affairs (DEFRA), Industry Associations.	833	1,385	2,972	3,607	3,607	3,607
Nitrates Action Plan *	Agriculture	N_2O	Reduce nitrate pollution to water under the nitrates directive	Regulatory, Information	Implemented	Improved compliance with the Nitrate Directive (91/676/EEC). Designated revised "Nitrate Vulnerable Zones" (NVC); established a range of mandatory measures to reduce nitrate pollution to water in NVC. Also Code of Good Practice outside NVZs.	2013	Department for Food, Environment and Rural Affairs (DEFRA), Environment Agency (EA).	IE	IE	IE	IE	IE	IE
Catchment Sensitive Farming *	Agriculture	N_2O	Reducing pollution to water	Economic, information	Implemented	Delivers practical solutions and targeted support to enable farmers and land managers to take voluntary action to reduce diffuse water pollution from agriculture to protect water bodies and the environment.	2006	Department for Food, Environment and Rural Affairs (DEFRA), Rural Development Programme for England (RDPE), Environment Agency (EA), Natural England (NE).	IE	IE	IE	IE	IE	IE

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Soils For Profit *	Agriculture	N_2O	Soil protection	Education	Implemented	Provides on farm reviews and training on soils manures and nutrients. The programme closed in 2013.	2009	Natural England (NE).	IE	IE	IE	IE	IE	IE
Environmental Stewardship (Entry Level Schemes and Higher Level Stewardship) *	Agriculture	N_2O	Biodiversity and resource protection	Economic	Implemented	Provides income foregone support under Pillar 2 of the CAP for farmers to undertake management options that benefit biodiversity, resource protection and water quality.	2005	Department for Food, Environment and Rural Affairs (DEFRA), Rural Development Programme for England (RDPE)	IE	IE	IE	IE	IE	IE
Waste measures *	Waste	CH_4	Increase recycling/reuse and reduce harmful disposal.	Fiscal, regulatory	Implemented	There are a number of waste measures with the aim of increasing recycling/reuse and reduce harmful disposal. The Waste Framework Directive (2008/98/EC): is the general framework of waste management requirements and sets rules governing the separate collection of waste. The Landfill Directive (1999/31/EC) and the UK Landfill Tax: set rules governing the disposal of waste to landfill, an escalating tax on biodegradable waste. There are other waste measures targeting other waste streams, such as the Waste Incineration Directive (2000/76/EC). The overall effect is reducing landfill of biodegradable waste and associated CH_4 emissions.	Various (earliest 1996)	Department for Food, Environment and Rural Affairs (DEFRA)	IE	IE	IE	IE	IE	IE
Ozone Depleting Substances Regulation *	Industry/Industrial Processes	HFCs	Implement obligations under the Montreal Protocol and EU Regulations (2037/2000/ EC and 1005/2009/EC) on ozone depleting substances. Indirectly reduced emissions of HFCs which are a manufacturing byproduct but increased their use as a substitute.	Regulatory	Implemented	This regulation implements obligations under the Montreal Protocol and EU Regulations (2037/2000/ EC and 1005/2009/ EC) on ozone depleting substances. With the exemption of some critical use exemptions, CFCs and halon use is banned and HCFC use will be banned from 2015. Most ozone depleting substances are potent greenhouse gases, so reductions in their use both protects the ozone layer and provides some climate protection.	2001	Department for Food, Environment and Rural Affairs (DEFRA)	IE	IE	IE	IE	IE	IE

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Fluorinated GHG Regulation *	Industry/Industrial Processes, Other (Residential)	HFCs, PFCs, SF_6	Implemention of EU MAC (2006/40) Directive and F gas Regulation (EC 842/2006) to reduce emissions of fluorinated greenhouse gases.	Regulatory	Implemented	Control (containment, prevention and reduction) of F gas emissions through recovery, leak reduction and repair and some very limited use bans. Mandatory certification requirements to work with F gases.	2007	Department for Food, Environment and Rural Affairs (DEFRA)	IE	IE	IE	IE	IE	IE
F-gas regulation 2014 *	Industry/Industrial Processes	HFCs, PFCs, SF_6	Implemention of F gas Regulation (EC 517/2014) to reduce emissions of fluorinated greenhouse gases.	Regulatory	Adopted	Introduced an 80% phase down in the quantities of F gases that can be placed on the EU market delivered via a gradually reducing quota system; a number of bans on the use of certain F gases in some new equipment; a ban on the use of very high GWP HFCs for the servicing of certain types of refrigeration equipment; some strengthening of obligations in 2006 Regulation related to leak checking, repairs, F gas recovery and technician training.	2015	Department for Food, Environment and Rural Affairs (DEFRA)	-	735	4,717	8,777	12,653	14,744
Woodland Carbon Code *	LULUCF	CO_2	Increase rate of afforestation	Voluntary Agreement, Information	Implemented	Voluntary Code and associated carbon registry (2013) for UK-domestic woodland carbon scemes to encourage private sector funding for woodland creation projects.	2011	Forestry Commission	IE	IE	IE	IE	IE	IE
Revised UK Forestry Standard *	LULUCF	CO_2, CH_4, N_2O	Enhance removals and reduce emissions through woodland creation and sustainable forest management.	Regulatory, Information	Implemented	Revised (2011) national standard for sustainable forest management to include a new guideline on climate change, covering both adaptation and mitigation.	2011	Forestry Commission	IE	IE	IE	IE	IE	IE
Forestry Act, Felling Licence Regulations and Environmental Impact (Forestry) regulations *	LULUCF	CO_2	Regulatory framework to limit deforestation and forest degradation.	Regulatory	Implemented	Strong regulatory framework that controls felling, only allows deforestation for purposes of nature conservation and prevents afforestation of deep peat. Legislation updated 1999.	1999	Forestry Commission	IE	IE	IE	IE	IE	IE
Grown in Britain *	LULUCF	CO_2	Industry-led action plan with the objective of increasing woodland creation and the use of harvested wood products.	Voluntary Agreement, Information, Education	Implemented	Industry-led action plan announced in Government's Forestry and Woodlands Policy Statement (2013) which aspires to encourage businesses to invest in woodland creation and sustainable forest management practice.	2013	Department for Food, Environment and Rural Affairs (DEFRA)	IE	IE	IE	IE	IE	IE

Name of Mitigation Action	*Sectors affected*	*GHG affected*	*Objective and or activity affected*	*Type of Instrument*	*Status of implemention*	*Brief Description*	*Start Year of Implementation*	*Implementing Entity or Entitities*	*Greenhouse Gas Saving ($ktCO_2$ eq)*					
									2013	2015	2020	2025	2030	2035
Rural Development Programme *	LULUCF	CO_2	Grant aid for afforestation	Economic	Implemented	Woodland creation grants provided through EU co-financed Rural Development Programmes in England, Wales, Scotland and Northern Ireland.	2007	Department for Food, Environment and Rural Affairs (DEFRA)	IE	IE	IE	IE	IE	IE
Woodfuel Implementation Plan *	LULUCF	CO_2	Strategy to increase woodfuel supply for renewable heat.	Information, Education, Economic	Expired	Initiative to develop supply chains, including through support for harvesting/processing and woodland access, to increase woodfuel supply from existing woodland.	2011	Forestry Commission	IE	IE	IE	IE	IE	IE

Notes

* Indicates that a mitigation action has been included in the 'with measures' projection.

IE - included elsewhere. The impact of measure has been included in the UK's emissions projection baseline, however no 'without-measure' counterfactual is available.

Table 4 – Reporting on progress

Table 4(a)II – Progress in achievement of the quantified economy-wide emission reduction targets – further information on mitigation actions relevant to the counting of emissions and removals from the land use, land use change and forestry sector in relation to activities under Article 3, paragraphs 3 & 4, of the Kyoto Protocol.

GREENHOUSE GAS SOURCE AND SINK ACTIVITIES	*Base year*	*Net Emissions/Removals*		*Accounting Parameters*	*Accounting Quantity*
		2013	*Total*		
			(kt CO_2 eq)		
A. Article 3.3 activities					-2,311.8
A.1. Afforestation and reforestation		-3,123.0	-3,123.0		-3,123.0
A.2. Deforestation		811.2	811.2		811.2
B. Article 3.4 activities					-6,074.6
B.1. Forest management [1]		-14,342.6	-14,342.6		-6,074.6
Forest management reference level (Business as Usual)				-8,268.0	
B.2. Cropland management (if elected)	NE	NE	NE		NE
B.3. Grazing land management (if elected)	NE	NE	NE		NE
B.4. Revegetation (if elected)	NA	NA	NA		NA
B.5. Wetland drainage and rewetting (if elected)	NE	NE	NE		NE
Carbon stock changes in harvested wood products pool [2]					-3,377.0
From land subject to afforestation and reforestation [3]		-26.4	-26.4		-26.4
From land subject to deforestation		IO	IO		IO
From land subject to forest management [4]		-3,350.5	-3,350.5		-3,350.5

Notes

1 Forest Management accounting quantity: From Annex to decision 2/CMP.7: '12. For the second commitment period, accountable anthropogenic greenhouse gas emissions by sources and removals by sinks resulting from forest management under Article 3, paragraph 4, shall be equal to anthropogenic greenhouse gas emissions by sources and removals by sinks in the commitment period, less the duration of the commitment period in years times the reference level inscribed in the appendix.'

2 Harvested Wood Products have been reported separately in the table above, their impact has not been included within Afforestation & Reforestation and Forest Management net emissions / removals.

3 Emissions from land subject to afforestation and reforestation have not been included in A1 totals.

4 Emissions from land subject to forest management have not been included in B1 totals.

Table 4(b) – Reporting on progress [a,b,c]

Kyoto Protocol Units[d]										*Other units*			
kt CO_2 eq										*kt CO_2 eq*			
AAUS		*ERUs*		*CERs*		*tCERs*		*lCERs*		*Units from market-based mechanisms under the Convention*		*Units from other market-based mechanisms*	
2013	2014	2013	2014	2013	2014	2013	2014	2013	2014	2013	2014	2013	2014
NO	NO	NO	18,871.47	NO	24,987.38	NO	NO	NO	NO	NO	NO	NO	NO

Notes

Abbreviations: AAUs = assigned amount units, CERs = certified emission reductions, ERUs = emission reduction units, lCERs = long-term certified emission reductions, tCERs = temporary certified emission reductions.

[a] *Reporting by a developed country Party on the information specified in the common tabular format does not prejudge the position of other Parties with regard to the treatment of units from market-based mechanisms under the Convention or other market-based mechanisms towards achievement of quantified economy-wide emission reduction targets.*

[b] For each reported year, information reported on progress made towards the emission reduction target shall include, in addition to the information noted in paragraphs 9(a-c) of the reporting guidelines, on the use of units from market-based mechanisms.

[c] Parties may include this information, as appropriate and if relevant to their target.

[d] Units surrendered by that Party for that year that have not been previously surrendered by that or any other Party.

Table 5
Summary of key variables ansd assumptions used in the projection analysis[a]

	Historical[b]								*Projected[a]*			
Key Underlying assumptions	*1990*	*1995*	*2000*	*2005*	*2010*	*2011*	*2012*	*2015*	*2020*	*2025*	*2030*	*2035*
UK GDP growth rate (per cent/per annum)	0.5%	2.5%	3.8%	2.8%	1.9%	1.6%	0.7%	2.4%	2.4%	2.5%	2.5%	2.5%
World GDP growth rate (per cent/per annum)	3.3%	3.2%	4.7%	4.7%	5.2%	4.0%	3.3%	3.3%	3.8%	3.9%	3.9%	3.9%
UK population growth (per cent/per annum)	0.3%	0.3%	0.3%	0.8%	0.8%	0.8%	0.7%	0.7%	0.6%	0.6%	0.5%	0.4%
UK households growth (per cent/per annum)	1.1%	0.7%	0.9%	0.9%	0.8%	0.7%	0.9%	0.9%	0.9%	0.8%	0.7%	0.7%
Crude oil (Brent 1 month) ($/bbl, prices)	43.4	26.6	39.7	67.7	86.4	118.3	116.8	63.8	85.0	120.0	120.0	120.0
Gas (NBP) (p/therm, prices)	NE	NE	24.9	50.4	46.1	60.0	62.4	46.5	52.3	66.8	68.3	68.3
Coal (CIF ARA) ($/tonne, prices)	79.5	69.5	50.2	75.2	100.5	129.2	96.7	59.9	69.3	82.8	87.0	87.0
EU ETS carbon price (£/tCO_2, prices)	NO	NO	NO	18.5	13.6	12.1	6.5	5.9	6.6	22.6	47.1	47.1
Electricity generation carbon price (£/tCO_2, prices)	NO	NO	NO	18.5	13.6	12.1	6.5	21.9	28.6	56.0	78.5	78.5
Pound Sterling to US Dollars exchange rate ($ per £)	1.785	1.578	1.516	1.820	1.546	1.604	1.587	1.648	1.648	1.648	1.648	1.648
Pound Sterling to Euro exchange rate (€ per £)	1.372	1.190	1.642	1.462	1.165	1.153	1.175	1.241	1.241	1.241	1.241	1.241

Notes
[a] Parties should include key underlying assumptions as appropriate.
[b] Parties should include historical data used to develop the projections.

Table 6(a)
Information on updated greenhouse gas projections under a 'with measures' scenario

	GHG Emissions & Removals								*GHG Projections*			
	(kt CO_2 eq)								*(kt CO_2 eq)*			
	Base Year[c]	*1990*	*1995*	*2000*	*2005*	*2010*	*2013*	*2015*	*2020*	*2025*	*2030*	*2035*
Sector												
Energy [a]	610,778.8	610,778.8	566,904.3	559,427.4	556,475.0	503,239.0	468,875.0	450,567.7	367,240.3	331,393.7	340,089.8	338,712.3
Transport [b]	122,378.6	122,378.6	122,721.8	127,340.4	131,422.9	120,946.3	117,260.7	118,729.8	113,286.7	108,030.0	108,285.9	109,797.4
Industry/Industrial Processes [a]	66,440.9	66,440.9	61,070.4	41,120.9	39,533.5	34,543.1	34,555.9	33,582.9	27,177.4	22,864.0	19,581.1	17,780.4
Agriculture [a]	60,491.3	60,491.3	59,500.1	56,374.5	52,459.9	50,286.2	49,518.4	49,523.4	48,367.3	48,708.7	48,861.7	48,828.0
Forestry/LULUCF [a]	3,983.1	3,983.1	3,279.1	848.8	-2,913.4	-4,272.5	-5,244.3	-4,505.6	-3,601.6	-1,961.7	298.7	1,702.8
Waste management/waste [a]	69,512.3	69,512.3	71,619.7	66,908.2	53,163.8	31,708.1	22,746.8	19,960.6	15,419.5	14,448.1	14,196.5	14,168.5
Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gas												
CO_2 Emissions including Net CO_2 from LULUCF	599,314.3	599,314.3	563,423.4	560,959.4	559,549.7	502,524.7	469,191.8	451,062.4	368,184.9	334,230.8	346,522.9	346,548.1
CO_2 excluding Net CO_2 from LULUCF	596,435.2	596,435.2	561,249.7	561,170.4	563,377.8	507,591.9	475,179.7	456,380.8	372,591.2	337,013.1	347,060.1	345,679.9
CH_4 Emissions including Net CH_4 from LULUCF	137,240.0	137,240.0	130,206.9	114,142.2	92,310.5	67,259.5	56,430.0	53,167.8	47,953.9	46,958.8	45,138.1	44,773.6
CH_4 excluding Net CH_4 from LULUCF	137,219.0	137,219.0	130,171.9	114,097.1	92,255.8	67,213.2	56,394.4	53,078.8	47,878.0	46,889.3	45,071.9	44,714.3
N_2O Emissions including Net N_2O from LULUCF	57,168.6	57,168.6	47,322.0	36,689.7	32,247.2	28,990.6	27,710.6	27,985.9	26,803.9	26,326.9	26,343.1	26,408.0
N_2O excluding Net N_2O from LULUCF	56,085.6	56,085.6	46,251.7	35,675.0	31,387.2	28,242.2	27,002.7	27,262.1	26,075.1	25,575.8	25,573.4	25,632.8
HFCs	14,552.5	14,552.5	19,558.9	10,472.3	13,169.9	15,708.5	16,263.9	16,153.2	10,969.4	7,237.6	4,285.5	2,679.0
PFCs	1,651.5	1,651.5	596.9	596.8	385.2	287.7	253.4	221.9	221.9	222.0	222.0	222.0
SF_6	1,279.1	1,279.1	1,264.4	1,817.7	1,056.0	732.7	601.6	537.3	468.5	476.4	516.0	560.9
NF_3	0.4	0.4	0.8	1.7	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4
Total with LULUCF	**811,206.4**	**811,206.4**	**762,373.4**	**724,679.7**	**698,718.8**	**615,504.0**	**570,451.7**	**549,128.9**	**454,602.9**	**415,452.8**	**423,027.9**	**421,192.0**
Total without LULUCF	**807,223.4**	**807,223.4**	**759,094.3**	**723,831.0**	**701,632.3**	**619,776.5**	**575,696.0**	**553,634.5**	**458,204.6**	**417,414.5**	**422,729.2**	**419,489.2**

Notes
[a] IPCC definition.
[b] Transport is considered as part of the energy sector.
[c] UK's base year for UNFCCC is 1990.
Numbers are reported on UNFCCC coverage and as such will not precisely match nationally published equivalents.

Table 7
Provision of public financial support: summary information in 2013[a]

	2013									
	Domestic currency (£m)					*USD ($m)*				
Allocation channels	*Core/general*	*Climate-specific*				*Core/general*	*Climate-specific*			
		Mitigation	*Adaptation*	*Cross-cutting*	*Other*		*Mitigation*	*Adaptation*	*Cross-cutting*	*Other*
Total contributions through multilateral channels:										
Multilateral climate change funds			50.0	21.0				78.2		
Other Multilateral climate change funds				248.0					387.7	
Multilateral financial institutions, including regional development banks	1391.2					2175.1				
Specialised United Nations bodies										
Total contributions through bilateral, regional and other channels		159.5	105.5	78.0	115.5		249.4	164.9	122.0	180.7
Total	**1391.2**	**159.5**	**155.5**	**347.0**	**115.5**	**2175.1**	**249.4**	**243.1**	**509.7**	**180.7**

Notes

[a] Monetary figures are rounded to the nearest (£/$)100,000

Each Party shall provide an indication of what new and additional financial resources they have provided, and clarify how they have determined that such resources are new and additional. Please provide this information in relation to table 7(a) and table 7(b).

We count the full value of the ICF spend and the full value of the eligible Prosperity Fund spend. All spend is ODA and is disbursed through all types of financial instruments. We don't count spend commitments for future years.

The UK considers that climate change is the biggest threat to the long-term eradication of global poverty, and the impacts of climate change will hit the poorest hardest. Therefore we need to intergrate climate and development finance and it no longer makes sense to insist that climate finance is additional to ODA.

The UK is providing new levels of climate finance in addition to historic levels of ODA; the provision of climate finance is not resulting in diverting wider development finance. From 2009 to 2014/15, annual UK climate finance increased by 196% (£587M) from £300M in 2009 to reach £887M in 2014/15, while UK ODA increased by £5.2bn (72%) from £7.2bn in 2009, to £12.4bn in 14/15. So over this period non-climate ODA increased by £4.6bn (66%).

2013 Exchange rate $1 = £0.6396 (source: Annual exchange rates for DAC donor countries).

Table 7
Provision of public financial support: summary information in 2014[a]

	2014									
	Domestic currency (£m)					*USD ($m)*				
Allocation channels	*Core/general*	*Climate-specific*				*Core/general*	*Climate-specific*			
		Mitigation	*Adaptation*	*Cross-cutting*	*Other*		*Mitigation*	*Adaptation*	*Cross-cutting*	*Other*
Total contributions through multilateral channels:										
Multilateral climate change funds			2.5	21.0				4.1		
Other Multilateral climate change funds				393.8					648.3	
Multilateral financial institutions, including regional development banks	1825.6					3005.6				
Specialised United Nations bodies										
Total contributions through bilateral, regional and other channels		81.2	161.5	103.8	123.5		133.8	265.9	170.8	203.4
Total	**1825.6**	**81.2**	**164.0**	**518.6**	**123.5**	**3005.6**	**133.8**	**270.0**	**819.2**	**203.4**

Notes

[a] Monetary figures are rounded to the nearest (£/$)100,000

Each Party shall provide an indication of what new and additional financial resources they have provided, and clarify how they have determined that such resources are new and additional. Please provide this information in relation to table 7(a) and table 7(b).

We count the full value of the ICF spend and the full value of the eligible Prosperity Fund spend. All spend is ODA and is disbursed through all types of financial instruments. We don't count spend commitments for future years.

The UK considers that climate change is the biggest threat to the long-term eradication of global poverty, and the impacts of climate change will hit the poorest hardest. Therefore we need to intergrate climate and development finance and it no longer makes sense to insist that climate finance is additional to ODA.

The UK is providing new levels of climate finance in addition to historic levels of ODA; the provision of climate finance is not resulting in diverting wider development finance. From 2009 to 2014/15, annual UK climate finance increased by 196% (£587M) from £300M in 2009 to reach £887M in 2014/15, while UK ODA increased by £5.2bn (72%) from £7.2bn in 2009, to £12.4bn in 14/15. So over this period non-climate ODA increased by £4.6bn (66%).

2014 Exchange rate $1 = £0.6074 (source: Annual exchange rates for DAC donor countries).

Table 7a
Provision of public financial support: contribution through multilateral channels in 2013[a]

Donor funding	*Total amount*				*Status*	*Funding source*	*Financial instrument*	*Type of support*	*Sector*
	Core/general		*Climate specific*		*Provided Committed Pledged*	*ODA OOF Other*	*Grant Concessional loan Non-concessional loan Equity Other*	*Mitigation Adaptation Cross-cutting Other*	*Energy Transport Industry Agriculture Forestry Water and sanitation Cross-cutting Other Not applicable*
	Domestic currency (£m)	*USD ($m)*	*Domestic currency (£m)*	*USD ($m)*					
Multilateral climate change funds									
1. Global Environment Facility			21.0	32.8	Provided	ODA	Grant	Cross-cutting	Not applicable
2. Least Developed Countries Fund			50.0	78.2	Provided	ODA	Grant	Adaptation	Not applicable
3. Special Climate Change Fund									
4. Adaptation Fund									
5. Green Climate Fund									
6. UNFCCC Trust Fund for Supplementary Activities									
7. Other multilateral climate change funds									
i) Climate Investment Funds			242.0	378.4	Provided	ODA	Grant	Cross-cutting	Not applicable
ii) Climate Development Knowledge Network			6.0	9.4	Provided	ODA	Grant	Cross-cutting	Not applicable
Sub-total			**319**	**499**					
Multilateral financial institutions, including regional development banks									
1. World Bank	1137.5	1778.5			Provided	ODA	Grant	Cross-cutting	Not applicable
2. International Finance Corporation									
3. African Development Bank	194.5	304.1			Provided	ODA	Grant	Cross-cutting	Not applicable
4. Asian Development Bank	59.2	92.6			Provided	ODA	Grant	Cross-cutting	Not applicable
5. European Bank for Reconstruction and Development									
6. Inter-American Development Bank									

Donor funding	*Total amount*				*Status*	*Funding source*	*Financial instrument*	*Type of support*	*Sector*
	Core/general		*Climate specific*		*Provided Committed Pledged*	*ODA OOF Other*	*Grant Concessional loan Non-concessional loan Equity Other*	*Mitigation Adaptation Cross-cutting Other*	*Energy Transport Industry Agriculture Forestry Water and sanitation Cross-cutting Other Not applicable*
	Domestic currency (£m)	*USD ($m)*	*Domestic currency (£m)*	*USD ($m)*					
7. Other									
Sub-total	**1,391.2**	**2175.1**							
Specialised United Nations bodies									
1. United Nations Development Programme (specific programmes)									
2. United Nations Environment Programme (specific programmes)									
3. Other									
Sub-total									
Total			**319.0**	**498.7**					

Notes

[a] Monetary figures are rounded to the nearest (£/$)100,000

Table 7a
Provision of public financial support: contribution through multilateral channels in 2014[a]

Donor funding	*Total amount*				*Status*	*Funding source*	*Financial instrument*	*Type of support*	*Sector*
	Core/general		*Climate specific*		*Provided* *Committed* *Pledged*	*ODA* *OOF* *Other*	*Grant* *Concessional loan* *Non-concessional loan* *Equity* *Other*	*Mitigation* *Adaptation* *Cross-cutting* *Other*	*Energy* *Transport* *Industry* *Agriculture* *Forestry* *Water and sanitation* *Cross-cutting* *Other* *Not applicable*
	Domestic currency (£m)	*USD ($m)*	*Domestic currency (£m)*	*USD ($m)*					
Multilateral climate change funds									
1. Global Environment Facility			21.0	34.6	Provided	ODA	Grant	Cross-cutting	Not applicable
2. Least Developed Countries Fund									
3. Special Climate Change Fund									
4. Adaptation Fund									
5. Green Climate Fund			2.5	4.1	Provided	ODA	Grant	Cross-cutting	Not applicable
6. UNFCCC Trust Fund for Supplementary Activities									
7. Other multilateral climate change funds									
i) Climate Investment Funds			372.7	613.6	Provided	ODA	Grant	Cross-cutting	Not applicable
ii) Climate Development Knowledge Network			21.1	34.8	Provided	ODA	Grant	Cross-cutting	Not applicable
Sub-total			**417.3**	**687.0**					
Multilateral financial institutions, including regional development banks									
1. World Bank	1565.3	2577.0			Provided	ODA	Grant		Not applicable
2. International Finance Corporation									
3. African Development Bank	207.8	342.1			Provided	ODA	Grant		Not applicable
4. Asian Development Bank	50.0	82.3			Provided	ODA	Grant		Not applicable
5. European Bank for Reconstruction and Development									
6. Inter-American Development Bank	2.5	4.1			Provided	ODA	Grant		Not applicable

Donor funding	*Total amount*				*Status*	*Funding source*	*Financial instrument*	*Type of support*	*Sector*
	Core/general		*Climate specific*		*Provided* *Committed* *Pledged*	*ODA* *OOF* *Other*	*Grant* *Concessional loan* *Non-concessional loan* *Equity* *Other*	*Mitigation* *Adaptation* *Cross-cutting* *Other*	*Energy* *Transport* *Industry* *Agriculture* *Forestry* *Water and sanitation* *Cross-cutting* *Other* *Not applicable*
	Domestic currency (£m)	*USD ($m)*	*Domestic currency (£m)*	*USD ($m)*					
7. Other					Provided	ODA	Grant		Not applicable
Sub-total	**1825.6**	**3005.6**							
Specialised United Nations bodies									
1. United Nations Development Programme (specific programmes)									
2. United Nations Environment Programme (specific programmes)									
3. Other									
Sub-total									
Total	**1825.6**	**3005.6**	**417.3**	**687.0**					

Notes

[a] Monetary figures are rounded to the nearest (£/$)100,000

Table 7b
Provision of public financial support: contribution through bilateral, regional and other channels 2013[a]

	Total amount		*Status*	*Funding source*	*Financial instrument*	*Type of support*	*Sector*	*Additional Information*
	Climate-specific		*Provided, Committed, Pledged*	*ODA OOF Other*	*Grant Concessional loan Non-concessional loan Equity Other*	*Mitigation Adaptation Cross-cutting Other*	*Energy Transport Industry Agriculture Forestry Water and sanitation Cross-cutting Other Not applicable*	
Recipient country/region/project/programme	*Domestic currency (£m)*	*USD ($m)*						
BioCarbon Fund	75.1	117.4	Provided	ODA	Grant	Other (forestry)	Forests	The BioCarbon Fund's objective is to reduce greenhouse gas emissions from the land sector, from deforestation and forest degradation in developing countries, and from sustainable agriculture, as well as to promote smarter land-use planning, policies and practices.
Carbon Market Finance for Africa (CMF-Africa)	35.8	56.0	Provided	ODA	Grant	Mitigation	Energy	The Carbon Market Finance programme will be delivered via the World Bank's Carbon Initiative for Development (Ci-Dev). It aims to build capacity and develop tools and methodologies that will help least developed countries, especially in Sub-Saharan Africa, to access finance from the carbon market.
Global Climate Partnership Fund (GCPF)	30.0	46.9	Provided	ODA	Equity	Mitigation	Energy	The GCPF will use public finance to help leverage flows of private finance to energy efficiency and small scale renewable energy projects in a range of developing countries.
Nationally Appropriate Mitigation Actions (NAMA) Facility	25.0	39.1	Provided	ODA	Grant	Mitigation	Energy	The UK Department of Energy and Climate Change (DECC) and the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) jointly set up the "NAMA Facility". The Facility is designed to support developing countries that show strong leadership on tackling climate change and want to implement transformational Nationally Appropriate Mitigating Actions (NAMA).

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	Climate-specific		*Provided, Committed, Pledged*	*ODA OOF Other*	*Grant Concessional loan Non-concessional loan Equity Other*	*Mitigation Adaptation Cross-cutting Other*	*Energy Transport Industry Agriculture Forestry Water and sanitation Cross-cutting Other Not applicable*	
Recipient country/region/project/programme	*Domestic currency (£m)*	*USD ($m)*						
GET FiT	23.5	36.7	Provided	ODA	Grant	Mitigation	Energy	The GET FiT programme supports small-scale on-grid renewable energy projects in Uganda, in an effort to both avoid an energy shortfall and promote private sector investment.
International Carbon Capture and Storage	10.1	15.8	Provided	ODA	Grant	Mitigation	Energy	Supporting developing countries to develop both the technical and institutional knowledge necessary to enable the deployment of CCS technologies.
Capital Markets Climate Initiative (CMCI)	0.1	0.2	Provided	ODA	Grant	Cross-cutting	Cross-cutting	CMCI is a programmed initiative to establish public-private dialogue and action to help mobilise and scale up private finance flows for low carbon technologies, solutions and infrastructure, with a focus on developing countries.
International 2050 Pathways partnerships	0.2	0.3	Provided	ODA	Grant	Mitigation	Cross-cutting	The UK is working directly with 10 developing country governments to help them build their own version of the UK's 2050 Calculator. The calculator will also be developed to explore global scenarios, illustrating the impacts of these scenarios on climate change.
Low Carbon Agriculture and Avoided Deforestation to reduce Poverty	4.9	7.7	Provided	ODA	Grant	Other (forestry)	Forests	Providing technical capacity building and financial resources to more than 3,700 small and medium-sized producers in the Amazon and Atlantic Forest biomes to implement sustainable low-carbon agriculture and protect forests and biodiversity.
FCO Prosperity Fund	8.6	13.4	Provided	ODA	Grant	Cross-cutting	Cross-cutting	The Prosperity Fund supports projects to create the political and economic conditions for sustainable global growth and development. The portion of spend recorded here relates to spend on climate change in the major industrialising countries.

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Accelerating Forest Tenure, Policy and Market Reforms	0.0	0.0	Provided	ODA	Grant	Other (forestry)	Forests	This project aims to reduce poverty, enhance well-being and strengthen democratic governance and development in forest areas of developing countries.
Accountability in Tanzania Programme (ACT)	3.9	6.1	Provided	ODA	Grant	Adaptation	Other (Government)	To increase the accountability and responsiveness of government to its citizens through a strengthened civil society. This includes a dedicated climate and environment window.
Achieving Water Security in the Southern Agricultural Growth Corridor	0.0	0.0	Provided	ODA	Grant	Adaptation	Water and sanitation	To ensure economic growth and poverty eradication resulting from investment in agriculture is sustainable in the context of climate change.
Adaptation for Smallholder Agricultural Programme (ASAP)	16.2	25.4	Provided	ODA	Grant	Adaptation	Agriculture	To provide knowledge and best practices to help over 6 million smallholder farmers in up 40 countries adapt to climate change. Grants will be made to: build small scale water-harvesting, water storage and irrigation systems for farmers; provide farmers with improved seeds that are drought-tolerant and help them access markets.
African Agricultural Technology Foundation (AATF) Phase 2 of DFID Funding, 2010-2013	1.9	3.0	Provided	ODA	Grant	Cross cutting	Agriculture	AATF will facilitate public-private partnerships for the transfer, development, production and deployment of agricultural technology. AATF works closely with African farmers, scientists, businesses, NGOs to identify needs of poor farmers and to match these needs with available technologies with the aim of achieving sustainable improvements in agricultural productivity for small holder farmers in Sub Saharan Africa.

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African Risk Capacity (ARC)	0.3	0.4	Provided	ODA	Grant	Adaptation	Cross-cutting	To support a parametric (index-based) weather risk insurance pool that will provide participating African countries with predictable, quick-disbursing funds with which to implement pre-defined contingency response plans in the case of a drought.
Agricultural Model Inter-Comparison and Improvement Project	1.1	1.7	Provided	ODA	Grant	Adaptation	Agriculture	To improve substantially the characterization of risk of hunger and world food security due to climate change and to enhance adaptive capacity in developing regions. DFID will fund the Sub-Saharan Africa and South Asia regional projects of a global initiative to improve crop and agricultural economic models to provide substantially improved assessments of climate impacts on the agricultural sector. The regional projects will improve the reliability and accessibility of assessments of impacts of climate change on agriculture in Sub-Saharan Africa and S.Asia and improved identification of potential adaptation strategies.
Bridging Support between Multi-stakeholder Forestry Programme 2 and Multi-stakeholder Forestry Programme 3	1.8	2.8	Provided	ODA	Grant	Other (forestry)	Forests	Credible Timber Legality Assurance System (TLAS) that is recognised by the market as a contribution to meeting an overall goal in which all traded Indonesian timber can be demonstrated legal, as a precondition for effective forest governance, sustainable forest management.
Building adaptation to climate change in health through resilient water, sanitation & hygiene	2.5	3.9	Provided	ODA	Grant	Adaptation	Water and sanitation	To support the development of effective plans for climate change adaptation in the health sector in low and low-middle income countries. This project will involve both work at an international level to develop guidance with country level pilot projects focused on water, sanitation and hygiene to test and demonstrate practical examples of adaptation in the health sector.

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Building Resilience and Adaptation to Climate Extremes and Disasters	1.9	3.0	Provided	ODA	Grant	Adaptation	Cross-cutting	This programme will help up to 10 million people, especially women and children, in developing countries cope with extreme climate and weather events such as droughts, cyclones and floods (climate extremes). This will be achieved by doing three things. By making grants to civil society organisations to scale up proven technologies and practices in the Sahel, sub-Saharan Africa and South Asia that help people withstand, and more quickly recover, from climate extremes. By identifying the best ways of doing this, and share this knowledge globally to increase the programme's overall impact. By supporting national governments to strengthen their policies and actions to respond to climate extremes.
Building Resilience in the Sahel through Adaptive Social Protection	0.0	0.0	Provided	ODA	Grant	Adaptation	Other (social infrastructure and services)	To support the building of national systems for implementing adaptive social protection in the Sahel in order to increase resilience to climate change.
Care Adaptation Learning Programme	0.8	1.3	Provided	ODA	Grant	Adaptation	Cross-cutting	Community based adaptation approaches for vulnerable communities incorporated into development policies and programmes in Ghana, Kenya, Mozambique and Niger with plans to replicate across Africa.
Caribbean Renewable Energy and Energy Efficiency Improvement Projects	0.3	0.4	Provided	ODA	Grant	Mitigation	Energy	To improve energy security in the Caribbean by providing access to finance for renewable energy and energy efficiency. This will increase the uptake of renewable energy, reduce fuel import bills and lower the cost of energy for households and businesses.

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CCMCC Promoting cooperation and avoiding conflict in managing the impacts of climate change	1.1	1.7	Provided	ODA	Grant	Adaptation	Cross-cutting	The aim of this project is to maximise benefits to poor people from international climate change finance. It will do this by generating evidence on the links between climate change and its impacts, and the likelihood of such impacts leading to either conflict or collaboration between and within communities.
Climate Centre Network	5.2	8.1	Provided	ODA	Grant	Cross-cutting	Cross-cutting	To improve access for developing countries to high quality research and information in designing climate change policies and programmes by 2015.
Climate Change Programme – Jolobayoo-O-Jibon	28.5	44.5	Provided	ODA	Grant	Adaptation	Cross-cutting	Climate change adaptation and risk reduction measures to protect and improve the lives and livelihoods of 15 million poor and vulnerable people by 2013.
Climate Development for Africa	0.3	0.4	Provided	ODA	Grant	Adaptation	Cross-cutting	The Africa owned ClimDev programme is a pan-Africa, joint AUC, UNECA and AfDB initiative to increase information, analysis and options for Africa to respond to climate change. It will help governments and regional bodies to make climate sensitive policy and development actions.
Climate High-Level Investment Programme	9.4	14.7	Provided	ODA	Grant	Cross cutting	Cross-cutting	To invest in activities which will build climate resilience and promote low carbon growth in Ethiopia. This will help 1.5 million people to cope with the effects of climate change by 2015, help Ethiopia to protect livelihoods, services, infrastructure and energy supplies from the effects of climate change, and establish its green growth path.

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Climate Proofing Growth and Development in South Asia	0.7	1.1	Provided	ODA	Grant	Cross cutting	Cross-cutting	Integrate climate change into development planning, budgeting and delivery in national and sub-national governments in Afghanistan, Bangladesh, India, Nepal and Pakistan, by strengthening planning, budgeting and delivery mechanisms, building awareness and and capacity of stakeholders, providing technical and some implementation support, helping leverage domestic finance and actively sharing knowledge by 2018.
Climate Resilient Agriculture in Africa	1.0	1.6	Provided	ODA	Grant	Adaptation	Agriculture	Improved knowledge, policies and longer-term incentives to drive increased uptake of Climate Smart Agriculture (CSA) in Eastern and Southern Africa member states.
Climate Science Research Programme	0.5	0.7	Provided	ODA	Grant	Cross-cutting	Cross-cutting	The project will aim to narrow the range of climate futures planners have to confront when designing resilient livelihood and development strategies for African regions/sub-regions. More specifically, the project will 'produce improved knowledge and climate science capacity'.
Climatescope – Clean Energy Investment Index	0.9	1.4	Provided	ODA	Grant	Mitigation	Energy	To increase private investment in renewable energy projects in poorer countries by providing investors with concrete policy and financial information. Renewable energy is a cheaper solution than fossil fuels in many developing countries and by increasing the amount of renewable energy in developing countries this will encourage growth and allow businesses to prosper.

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Comprehensive Programme on Spatial Planning and Low Carbon Development in Papua	0.7	1.0	Provided	ODA	Grant	Other (forestry)	Forests	Strengthened spatial and development plans and government supported actions on low carbon investment which will contribute towards ensuring environmental sustainability and improved awareness among civil society about low carbon development and spatial planning.
Cooperation in International Waters in Africa	3.1	4.8	Provided	ODA	Grant	Adaptation	Water and sanitation	To strengthen cooperative management and development of international waters within selected basins to facilitate sustainable climate resilient growth.
Creation of the National Fund for Climate & Environment (FONERWA)	0.5	0.8	Provided	ODA	Grant	Cross cutting	Cross-cutting	To help the Government of Rwanda achieve low carbon, climate resilient growth by providing technical assistance to help them manage FONERWA – a national fund for environment and climate change. This will help build national capacity for managing the fund.
Degraded Land Mapping for Kalimantan and Papua provinces	0.5	0.8	Provided	ODA	Grant	Other (forestry)	Forests	To make decision makers (in public and private sector) implement policies to support socially equitable oil palm expansion onto low- carbon degraded land and reduce conversion of forested areas.
Eco System Services for Poverty Alleviation	3.2	5.0	Provided	ODA	Grant	Adaptation	Cross-cutting	Funding research on the linkages between ecosystem services and poverty alleviation.To understand why ecosystems are becoming degraded and how to reverse this and to ascertain what institutional changes need to be put in place for ecosysyem management to improve for the benefit of the poor.

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Enhancing resilience in Karamoja Uganda	9.4	14.7	Provided	ODA	Grant	Adaptation	Cross-cutting	To increase resilience to extreme climate and weather events in semi-arid Karamoja through strengthening nutrition programmes, livelihoods and food security for the vulnerable communities by December 2015 with an aim of reaching 200,000 people with improved food security through participation in public works programmes.
Equity of Energy Access Research Programme Consortium	0.4	0.7	Provided	ODA	Grant	Mitigation	Energy	A southern led research consortium developing innovative knowledge for policies and practices on bioenergy, to promote access and better livelihoods for poor people in sub-Sahara Africa and South Asia.
Forest Governance, Markets and Climate	15.4	24.0	Provided	ODA	Grant	Other (forestry)	Forests	A global programme that benefits poor forest-dependent people by supporting governance and market reforms aimed at reducing the illegal use of forest resources and promoting sustainable growth in developing countries.
Future Agricultures Consortium Phase II	0.0	0.1	Provided	ODA	Grant	Cross cutting	Agriculture	The goal of the Future Agricultures Consortium is to increase agricultural productivity and reduce poverty in Sub-Saharan Africa. Its purpose is to improve policy for promoting agricultural growth and poverty reduction in Africa.
Future Proofing Cities in Africa	0.1	0.1	Provided	ODA	Grant	Cross cutting	Cross-cutting	Supporting at least 8 cities in Africa to become future proofed to climate, environment and natural resource challenges, so that they are inclusive and resilient, and have growing economies. It will help make cities work for the urban poor.
Global Network of Climate Technology Innovation Centres	6.6	10.3	Provided	ODA	Grant	Cross cutting	Cross-cutting	Piloting a global platform for applied innovation into climate technologies relevant to developing countries.

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Green Africa Power (GAP): Renewable Energy for Africa	0.0	0.0	Provided	ODA	Grant	Cross cutting	Energy	GAP is an initiative of the Private Infrastructure Development Group (PIDG) aimed at substantially increasing the deployment of large-scale renewable energy in Sub-Saharan Africa. GAP will adopt a 'cash on delivery' approach by buying power from renewable energy producers through long-term power purchase agreements (PPAs) rather than offering up-front grants or loans. This will provide private developers with cost-reflective tariffs and security of payment. GAP will then sell the power to utility companies or other wholesale customers through corresponding power sale agreements.
Green Mini-Grids Africa	0.1	0.1	Provided	ODA	Grant	Mitigation	Energy	To increase access to clean energy through the creation of an expanding market of green mini-grid installations in Africa serving rural villages unconnected to the main grid.
Improving climate change resilience in Caribbean communities	0.5	0.8	Provided	ODA	Grant	Adaptation	Cross-cutting	Support to the International Federation of Red Cross and Red Crescent Societies (IFRCS) to build climate change and disaster resilience of vulnerable communities. Safer building, flood and health protection measures will be implemented in three Caribbean states. Methodologies demonstrating cost-benefit or value for money and the efficacy of community-based approaches to building resilience will be developed and expanded.
Improving governance of Land Use, Land-Use Change and Forestry in Indonesia	2.0	3.1	Provided	ODA	Grant	Other (forestry)	Forests	Strengthen capacity of civil society and other non-state stakeholders to influence decision, policies and legislation on land-use and low carbon development.

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Initial Design of the Climate Public Private Partnership (CP3)	5.2	8.2	Provided	ODA	Grant	Mitigation	Energy	Investment in 2 commercially run private equity funds that will make investments in to low carbon, climate friendly projects in the developing world. One will be run by IFC (part of the World Bank Group), the other is in collaboration with the Asian Development Bank. The aim is to attract in institutional investors. Technical assistance will also be provided as part of the project.
Innovation challenges for environmentally-friendly technologies for the poor.	0.1	0.2	Provided	ODA	Grant	Cross cutting	Cross-cutting	To develop affordable and appropriate development solutions for poor consumers, particularly focusing on low carbon energy; water and sanitation; climate adaptation; and resource scarcity, using competitive innovation prize models as a way of ensuring payment on results and attracting a wider range of participants . The goal is to provide improved access to energy and water services for 12 million people through innovative, affordable technologies and business models for poor consumers by 2025.
International Forestry Knowledge (KnowFor)	9.6	15.0	Provided	ODA	Grant	Other (forestry)	Forests	Uptake of international forestry knowledge, evidence and tools for international forestry policy and practice.
Investments in Forestry and Climate Change	0.1	0.1	Provided	ODA	Grant	Other (forestry)	Forests	Large scale results-based partnership agreements developed and tested in up to 3 REDD+ countries. This will leverage sunstantial private sector capital into REDD+.
Low Carbon Studies	0.2	0.4	Provided	ODA	Grant	Mitigation	Cross-cutting	This knowledge work will ensure the preparation of evidence based business cases and maximise results from low carbon ICF spend.
Low Carbon Support to the Ministry of Finance	2.8	4.4	Provided	ODA	Grant	Cross cutting	Other (Government)	Supportive environment for low carbon investment established in Indonesia.

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Managing Climate Risks for Urban Poor	7.0	10.9	Provided	ODA	Grant	Adaptation	Cross-cutting	This programme will help cities plan for and invest in reducing the impacts of weather-related changes and extreme events, through a partnership with the Rockefeller foundation and the Asian Development Bank, on 2 million urban poor and vulnerable people.
Mid Term Evaluation of the International Climate Fund (ICF)	0.2	0.4	Provided	ODA	Grant	Cross cutting	Cross-cutting	To provide an assessment of the alignment of the International Climate Fund's portfolio to the Fund's strategic objectives, its expected results and the anticipated delivery of Value for Money, and the effectiveness of its monitoring and evaluation process.
Monitoring and Evaluation Support Services-International Climate Fund financing	1.0	1.6	Provided	ODA	Grant	Cross cutting	Cross-cutting	Aims to ensure that the UK International Climate Fund Programmes can demonstrate robust procedures for monitoring and evaluating value for money across its development programmes.
Multi-Stakeholder Forestry Programme – Nepal	5.5	8.6	Provided	ODA	Grant	Other (forestry)	Forests	Supporting Nepal's forestry sector contributing to inclusive economic growth, poverty reduction and tackling climate change.
Nepal Climate Change Support Programme	4.2	6.6	Provided	ODA	Grant	Adaptation	Cross-cutting	To build capacity of the Government of Nepal to develop, cost, budget and implement adaptation measures at the local level aimed at mainstreaming climate change in key development sectors (agriculture, forestry, water and energy), including through public private partnerships.
On Grid Small Scale Renewable Energy in Uganda	3.0	4.6	Provided	ODA	Grant	Mitigation	Energy	Get Fit will support the development and completion of small-scale on-grid renewable energy projects in Uganda in an effort to both avoid an energy shortfall and promote private sector investment.

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Private Sector Energy Efficiency	1.1	1.7	Provided	ODA	Grant	Mitigation	Energy	To reduce energy consumption, avoid greenhouse gas emissions and increase investment in companies benefitting from the programme by providing remote advice and funding energy audits and strategies for South Africa businesses by 31 March 2015.
Programme Design for Spatial Planning and Low Carbon Development in Papua	2.3	3.6	Provided	ODA	Grant	Cross cutting	Cross-cutting	Support to entrepreneurs to bring forward their low carbon investment proposals and support to the spatial planning function of the provincial government in Papua to avoid deforestation.
Promoting energy efficiency amongst Indonesia small and medium enterprises	0.1	0.1	Provided	ODA	Grant	Mitigation	Energy	The purpose of the project is to establish a revolving fund and build capacity in financial institutions to promote investments in energy efficiency to reduce the growth of emissions in Indonesia.
Promoting Low Carbon Development with Returnable Capital in Indonesia	4.8	7.5	Provided	ODA	Grant	Cross cutting	Cross-cutting	The DFID-AFD (Agence Française de Développement) Partnership facilitates low carbon investment (in renewable energy, energy efficiency, forestry and transport) that results in GHG emission reductions and supports the regulatory reform process.
Provision of finance to the Rwanda Fund for Climate Change and Environment	2.5	3.9	Provided	ODA	Grant	Cross cutting	Cross-cutting	To improve climate adaptation and low carbon development by providing finance to the Rwanda Fund for Climate Change and Environment from the UK International Climate Fund.
Rapid Response Facility on Climate Change	1.5	2.3	Provided	ODA	Grant	Cross cutting	Cross-cutting	To influence climate change policy in Indonesia by providing technical expertise to a range of government and non-government partners who are directly responsible or play a role in shaping policies and practices to help Indonesia meet its emission reduction targets.

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Recipient country/region/project/programme	*Domestic currency (£m)*	*USD ($m)*						
Regional Transboundary Water Resources Programme – Phase 3	3.5	5.4	Provided	ODA	Grant	Adaptation	Water and sanitation	To improve governance of shared water resources in Southern Africa, by sustainably improving local water-management capability and supporting development of key water infrastructure. This will indirectly benefit populations through more equitable sharing of water resources, reduced vulnerability to flooding, improved access to drinking water, as well as reducing risk of conflict and better food security.
Renewable Energy and Adaptation Climate Technologies (Africa Climate Change Challenge Fund)	3.3	5.1	Provided	ODA	Grant	Cross cutting	Cross-cutting	To stimulate private sector investment in developing low cost, clean energy and climate change technologies and services, such as solar power, biomass energy, irrigation and crop insurance products for small holder farmers.
Research Programme Consortium on Leveraging Agriculture for Nutrition in South Asia (LANSA)	0.7	1.1	Provided	ODA	Grant	Adaptation	Agriculture	The LANSA programme makes a significant contribution to DFID's plans to scale up our engagement in nutrition. DFID support will address the gap in the evidence base on the linkages between agriculture investments and nutrition impact in South Asia. Generate new understanding of how agriculture can deliver better nutritional outcomes in fragile and conflict affected contexts and in climate affected areas.
Results Based Financing for Low Carbon Energy Access	14.7	22.9	Provided	ODA	Grant	Mitigation	Energy	This project will use results-based financing (RBF) mechanisms to overcome identified market failures that are constraining private sector investment in renewable energy in developing countries. It will target market opportunities that offer significant potential for avoided or reduced carbon emissions, improved resilience to the impacts of climate change, economic growth, increased private sector participation, and improved service delivery for the poor.

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Scaling up of the Energy and Environment Partnership with Southern and East Africa	0.0	0.1	Provided	ODA	Grant	Mitigation	Energy	The programme aims to provide low carbon private sector development through awarding co-financing to viable projects focusing on improving energy access for poor people, improving energy supply and energy efficiency by demonstrating new technologies.
Smart Health Care Facilities in the Caribbean	0.4	0.6	Provided	ODA	Grant	Adaptation	Cross-cutting	To incorporate climate smart and disaster safety standards in health care facilities of the Caribbean.
South Asia Alliance For Climate Resilient Landscapes And Livelihoods (SAACRLL) Programme	0.0	0.0	Provided	ODA	Grant	Adaptation	Cross-cutting	Equitable access to and climate resilient management of natural resources and ecosystems by the climate vulnerable poor.
South Asia Water Governance Programme (SAWGP)	2.8	4.4	Provided	ODA	Grant	Adaptation	Water and sanitation	To improve the management of water within and between South Asian countries, reducing poverty by enabling adaptation to climate change and reducing the risk of conflict over water resources.
South Asia Water Initiative	0.0	0.0	Provided	ODA	Grant	Adaptation	Water and sanitation	SAWI focuses on the shared Himalayan Rivers of Afghanistan, Bangladesh, Bhutan, China, India, Pakistan and Nepal, where 700 million people live. The initiative builds the relationships, institutions, knowledge and trust needed to better manage regional rivers in light of climate change. It works at regional, river basin and national levels.
Strategic Climate Change Policy Fund	0.2	0.3	Provided	ODA	Grant	Mitigation	Cross-cutting	The fund will support focussed interventions including low carbon transition policy & legislation in the energy, industrial and transport sectors, modelling, impact assessments & short term support to SA government to facilitate effective preparation for COP 17.

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Recipient country/region/project/programme	*Domestic currency (£m)*	*USD ($m)*						
Strategic Climate Institutions Programme	5.0	7.9	Provided	ODA	Grant	Cross cutting	Cross-cutting	Activities to build Ethiopia's institutional capacity to respond to climate change. Includes working with private sector, government and civil society.
Strategic Influencing Fund	0.4	0.7	Provided	ODA	Grant	Cross cutting	Cross-cutting	Support to the Climate Action Network of Uganda by funding the post of National Climate Advocacy Officer hosted at Oxfam. The aim is to support Civil Society to enable them to influence climate change policy , to initiate and support national debates and campaigns on climate change.
Strengthening Adaptation and Resilience to Climate Change in Kenya (StARCK)	0.5	0.9	Provided	ODA	Grant	Cross cutting	Cross-cutting	To achieve transformational change by helping Kenya to scale up private sector innovation and investment in low carbon and adaptation products, services and assets (e.g. clean energy, sustainable agriculture, water management, weather forecasting).
Strengthening Adaptation and Resilience to Climate Change in Kenya Plus (StARCK+)	14.7	23.0	Provided	ODA	Grant	Cross-cutting	Cross-cutting	To achieve transformational change by helping Kenya to scale up private sector innovation and investment in low carbon and adaptation products, services and assets (e.g. clean energy, sustainable agriculture, water management, weather forecasting).
Strengthening knowledge and tools for climate change adaptation	1.4	2.2	Provided	ODA	Grant	Adaptation	Cross-cutting	To help people adapt to the impacts of climate by strengthening knowledge on what works best, and to use this knowledge to develop new adaptation programmes and maximise the effectiveness of the UK's International Climate Fund (ICF) and its investments.
Support effective monitoring and evaluation of the International Climate Fund	0.1	0.1	Provided	ODA	Grant	Cross-cutting	Cross-cutting	Ensuring the International Climate Fund (ICF) is effectively monitored and evaluated.

	Total amount		*Status*	*Funding source*	*Financial instrument*	*Type of support*	*Sector*	*Additional Information*
	Climate-specific		*Provided, Committed, Pledged*	*ODA OOF Other*	*Grant Concessional loan Non-concessional loan Equity Other*	*Mitigation Adaptation Cross-cutting Other*	*Energy Transport Industry Agriculture Forestry Water and sanitation Cross-cutting Other Not applicable*	
Recipient country/region/project/programme	*Domestic currency (£m)*	*USD ($m)*						
Support for Energy Sector Analysis that influences global energy decision makers	7.0	11.0	Provided	ODA	Grant	Mitigation	Energy	The UK will support the development of cutting-edge evidence and knowledge generation, client country capacity building and the leveraging of World Bank investment into sustainable energy. This will help developing countries make better informed energy policy decisions, strengthen their capacity to implement these decisions, and help accelerate a shift to clean energy lending.
Support for priority actions to operationalise the Implementation Plan for Development Resilient to Climate Change in the Caribbean	0.8	1.2	Provided	ODA	Grant	Adaptation	Cross-cutting	To increase regional, national and local climate adaptation measures for the vulnerable poor in the Caribbean.
Support for the Indonesia Climate Change Trust Fund (ICCTF)	0.1	0.2	Provided	ODA	Grant	Adaptation	Cross-cutting	To ensure the Government of Indonesia can provide more effective leadership and management of climate change programming to deliver emissions reduction and poverty reduction outcomes.
Supporting Structural Reform in the Indian Power Sector	1.5	2.3	Provided	ODA	Grant	Mitigation	Energy	Aiming to shift the power sector to a low carbon trajectory for sustainable growth.
Sustainable Crop Production Research for International Development (SCPRID)	1.5	2.3	Provided	ODA	Grant	Adaptation	Agriculture	The purpose of the project is to develop new science and technology to support the development of new crop varieties with more resistance to disease and pests and less vulnerable to abiotic shocks.

	Total amount		*Status*	*Funding source*	*Financial instrument*	*Type of support*	*Sector*	*Additional Information*
	Climate-specific		*Provided, Committed, Pledged*	*ODA OOF Other*	*Grant Concessional loan Non-concessional loan Equity Other*	*Mitigation Adaptation Cross-cutting Other*	*Energy Transport Industry Agriculture Forestry Water and sanitation Cross-cutting Other Not applicable*	
Recipient country/region/project/programme	*Domestic currency (£m)*	*USD ($m)*						
Tanzania Climate Change Institutional Strengthening Programme	0.4	0.7	Provided	ODA	Grant	Cross cutting	Cross-cutting	The programme will provide strategic support in key areas such as the development of a National Climate Change strategy and climate financing mechanism to better position Tanzania to access climate finance and then ensure its effective delivery. It will also look at mainstreaming climate change in the budgeting and planning process.
The Water Security Programme	9.3	14.6	Provided	ODA	Grant	Adaptation	Water and sanitation	To increase the resilience of poor people to climate change through secure and sustainable access to water resources. We will work with the Global Water Partnership and World Bank Water Partnership Programme to support increased investment in the information, institutions and infrastructure and building new partnerships (between government, corporations, and civil society stakeholders) needed to deliver water security in developing countries.
United Nations Secretary General's Action Agenda on Climate Change-Support in 2012-2014	1.6	2.4	Provided	ODA	Grant	Cross cutting	Cross-cutting	To support and help ensure the UN Climate Change Support Team delivers its planned workplan and outputs to help the Secretary General in making the political space and the essential case for countries to support a Global Legal Agreement by 2015.
Vietnam Climate Innovation Centre	0.2	0.3	Provided	ODA	Grant	Mitigation	Cross-cutting	To enhance growth and mitigate climate change impacts in Vietnam by providing the private sector with support to engage in climate technology innovation. This will be done through setting up a Climate Innovation Centre which provide a set of services, including capital provision, capacity building; supporting new enterprises; and conducting market analysis.

	Total amount		*Status*	*Funding source*	*Financial instrument*	*Type of support*	*Sector*	*Additional Information*
	Climate-specific		*Provided, Committed, Pledged*	*ODA OOF Other*	*Grant Concessional loan Non-concessional loan Equity Other*	*Mitigation Adaptation Cross-cutting Other*	*Energy Transport Industry Agriculture Forestry Water and sanitation Cross-cutting Other Not applicable*	
Recipient country/region/project/programme	*Domestic currency (£m)*	*USD ($m)*						
Vietnam: DFID-World Bank Climate Change Partnership	1.3	2.0	Provided	ODA	Grant	Cross cutting	Cross-cutting	To improve policy and decision-making on climate change responses of the Vietnamese Government.
World Bank Trust Fund: Support to the National Development Plan	1.8	2.8	Provided	ODA	Grant	Cross cutting	Cross-cutting	Government of Uganda Institutional Capacity Building – Financial Aid and TA to Government.
Total	**458.6**	**717.0**						

Notes

[a] Monetary figures are rounded to the nearest (£/$)100,000

Table 7b
Provision of public financial support: contribution through bilateral, regional and other channels 2014[a]

	Total amount		*Status*	*Funding source*	*Financial instrument*	*Type of support*	*Sector*	*Additional Information*
	Climate-specific		*Provided, Committed, Pledged*	*ODA OOF Other*	*Grant Concessional loan Non-concessional loan Equity Other*	*Mitigation Adaptation Cross-cutting Other*	*Energy Transport Industry Agriculture Forestry Water and sanitation Cross-cutting Other Not applicable*	
Recipient country/region/project/programme	*Domestic currency (£m)*	*USD ($m)*						
Adaptation for Smallholder Agricultural Programme	32.2	53.0	Provided	ODA	Grant	Adaptation	Agriculture	To provide knowledge and best practices to help over 6 million smallholder farmers in up 40 countries adapt to climate change. Grants will be made to: build small scale water-harvesting, water storage and irrigation systems for farmers; provide farmers with improved seeds that are drought-tolerant and help them access markets.
African Risk Capacity (ARC)	29.5	48.6	Provided	ODA	Grant	Adaptation	Cross-cutting	To support a parametric (index-based) weather risk insurance pool that will provide participating African countries with predictable, quick-disbursing funds with which to implement pre-defined contingency response plans in the case of a drought.
Forest Governance, Markets and Climate	28.2	46.5	Provided	ODA	Grant	Other (Forestry)	Forests	A global programme that benefits poor forest-dependent people by supporting governance and market reforms aimed at reducing the illegal use of forest resources and promoting sustainable growth in developing countries.
Initial Design of the Climate Public Private Partnership (CP3)	2.9	4.8	Provided	ODA	Grant	Mitigation	Energy	CP3 aims to demonstrate that climate friendly investments in developing countries, including in renewable energy, water, energy efficiency and forestry are not only ethically right but also commercially viable. It aims to attract new forms of finance such pension fund money and sovereign wealth funds, into low carbon investments and to create a track record of successful climate-friendly sub-funds that will encourage further private investment.

	Total amount		*Status*	*Funding source*	*Financial instrument*	*Type of support*	*Sector*	*Additional Information*
	Climate-specific		*Provided, Committed, Pledged*	*ODA OOF Other*	*Grant Concessional loan Non-concessional loan Equity Other*	*Mitigation Adaptation Cross-cutting Other*	*Energy Transport Industry Agriculture Forestry Water and sanitation Cross-cutting Other Not applicable*	
Recipient country/region/project/programme	*Domestic currency (£m)*	*USD ($m)*						
Climate Public-Private Partnership (CP3) – Asia Climate Partners	24.8	40.7	Provided	ODA	Equity	Mitigation	Energy	UK is an anchor investor in this private equity fund administered by the Asian Development Bank, which was set up to demonstrate to private sector investors that climate friendly investments in developing countries are financially viable.
Results Based Financing for Low Carbon Energy Access	24.7	40.6	Provided	ODA	Grant	Cross-cutting	Energy	To increase access to clean energy through the creation of an expanding market of green mini-grid installations in Africa serving rural villages unconnected to the main grid.
The Water Security Programme	11.9	19.6	Provided	ODA	Grant	Adaptation	Water and sanitation	To increase the resilience of poor people to climate change through secure and sustainable access to water resources. We will work with the Global Water Partnership and World Bank Water Partnership Programme to support increased investment in the information, institutions and infrastructure and building new partnerships (between government, corporations, and civil society stakeholders) needed to deliver water security in developing countries.
Enhancing resilience in Karamoja Uganda	11.6	19.0	Provided	ODA	Grant	Adaptation	Cross-cutting	To increase resilience to extreme climate and weather events in semi-arid Karamoja through strengthening nutrition programmes, livelihoods and food security for the vulnerable communities by December 2015 with an aim of reaching 200,000 people with improved food security through participation in public works programmes.
Support to grassroots initiatives, policy change and institutional capacity to help the most vulnerable to climate change improve their resilience to disasters	10.8	17.8	Provided	ODA	Grant	Adaptation	Cross-cutting	To help up to 10 million people, especially women and children, in developing countries cope with extreme climate and weather events such as droughts, cyclones and floods (climate extremes).

	Total amount		*Status*	*Funding source*	*Financial instrument*	*Type of support*	*Sector*	*Additional Information*
	Climate-specific		*Provided, Committed, Pledged*	*ODA OOF Other*	*Grant Concessional loan Non-concessional loan Equity Other*	*Mitigation Adaptation Cross-cutting Other*	*Energy Transport Industry Agriculture Forestry Water and sanitation Cross-cutting Other Not applicable*	
Recipient country/region/project/programme	*Domestic currency (£m)*	*USD ($m)*						
Regional Transboundary Water Resources Programme – Phase 3	10.3	17.0	Provided	ODA	Grant	Adaptation	Water and sanitation	To improve governance of shared water resources in Southern Africa, by sustainably improving local water-management capability and supporting development of key water infrastructure. This will indirectly benefit populations in the 13 shared river basins of the SADC region, in which 95 million people reside, through more equitable sharing of water resources, reduced vulnerability to flooding, improved access to drinking water, as well as reducing risk of conflict and better food security.
Strengthening Adaptation and Resilience to Climate Change in Kenya Plus (StARCK+)	9.9	16.3	Provided	ODA	Grant	Adaptation	Cross-cutting	To achieve transformational change by helping Kenya to scale up private sector innovation and investment in low carbon and adaptation products, services and assets (e.g. clean energy, sustainable agriculture, water management, weather forecasting).
Multi-Stakeholder Forestry Programme – Nepal	8.7	14.4	Provided	ODA	Grant	Cross-cutting	Forests	Supporting Nepal's forestry sector contributing to inclusive economic growth, poverty reduction and tackling climate change
Solar Nigeria Programme	8.1	13.3	Provided	ODA	Grant	Mitigation	Energy	To improve the welfare outcomes of the currently underserved communities in Lagos state and Northern Nigeria by making a significant financial contribution towards the solar power electrification of public institutions, such as schools and hospitals. The intervention is expected to, by year 2020, ensure improved welfare outcomes for more than 2.8 million people using domestic solar photovoltaic (PV) systems, with 190,000 school pupils and 4.7 million clinic patients benefiting from public institutions with PV systems, create more than 3000 jobs and ensure greater effectiveness of DFID's other health and educational sector intervention in Nigeria.

	Total amount		*Status*	*Funding source*	*Financial instrument*	*Type of support*	*Sector*	*Additional Information*
	Climate-specific		*Provided, Committed, Pledged*	*ODA OOF Other*	*Grant Concessional loan Non-concessional loan Equity Other*	*Mitigation Adaptation Cross-cutting Other*	*Energy Transport Industry Agriculture Forestry Water and sanitation Cross-cutting Other Not applicable*	
Recipient country/region/project/programme	*Domestic currency (£m)*	*USD ($m)*						
Livelihoods and Food Security Trust Fund for Burma	8.0	13.2	Provided	ODA	Grant	Cross-cutting	Cross-cutting	LIFT (Livelihood and Food Security Trust Fund) was launched in 2009 as a multi-donor trust fund firstly in response to Cyclone Nargis, and secondly, with a view to making faster progress against MDG 1 (eradicate extreme poverty and hunger).
Support for Energy Sector Analysis that influences global energy decision makers	8.0	13.2	Provided	ODA	Grant	Cross-cutting	Energy	The UK will support the development of cutting-edge evidence and knowledge generation, client country capacity building and the leveraging of World Bank investment into sustainable energy. This will help developing countries make better informed energy policy decisions, strengthen their capacity to implement these decisions, and help accelerate a shift to clean energy lending.
East Africa Geothermal Energy (EA-Geo)	7.4	12.2	Provided	ODA	Grant	Mitigation	Energy	The project will increase investment in geothermal power in East Africa. It will reduce the risk of exploratory test drilling, leading to increased investor confidence in under exploited East Africa geothermal energy. It will also improve geothermal strategy, policy and regulations that facilitate investments.
Managing Climate Risks for Urban Poor	7.0	11.6	Provided	ODA	Grant	Adaptation	Cross-cutting	This programme will help cities plan for and invest in reducing the impacts of weather-related changes and extreme events, through a partnership with the Rockefeller foundation and the Asian Development Bank, on 2 million urban poor and vulnerable people.

	Total amount		*Status*	*Funding source*	*Financial instrument*	*Type of support*	*Sector*	*Additional Information*
	Climate-specific		*Provided, Committed, Pledged*	*ODA OOF Other*	*Grant Concessional loan Non-concessional loan Equity Other*	*Mitigation Adaptation Cross-cutting Other*	*Energy Transport Industry Agriculture Forestry Water and sanitation Cross-cutting Other Not applicable*	
Recipient country/region/project/programme	*Domestic currency (£m)*	*USD ($m)*						
Humanitarian: Building Resilience in the Sahel through Adaptive Social Protection	7.0	11.5	Provided	ODA	Grant	Adaptation	Cross-cutting	To reduce poverty, hunger and vulnerability by providing the poorest households in Kenya's arid and semi-arid lands with cash transfers. This contributes to our MDGs by preventing 720,000 people from becoming poorer and help them to increase their expenditure on food, health, education and wider livelihood opportunities by 2017.
Eco System Services for Poverty Alleviation (ESPA)	6.9	11.3	Provided	ODA	Grant	Adaptation	Cross-cutting	Funding research on the linkages between ecosystem services and poverty alleviation.To understand why ecosystems are becoming degraded and how to reverse this and to ascertain what institutional changes need to be put in place for ecosysyem management to improve for the benefit of the poor.
Hunger Safety Net Programme	6.8	11.2	Provided	ODA	Grant	Cross-cutting	Cross-cutting	To reduce poverty, hunger and vulnerability by providing the poorest households in Kenya's arid and semi-arid lands with cash transfers. This contributes to our MDGs by preventing 720,000 people from becoming poorer and help them to increase their expenditure on food, health, education and wider livelihood opportunities by 2017.
International Forestry Knowledge (KnowFor)	5.7	9.3	Provided	ODA	Grant	Other (Forestry)	Forests	Uptake of international forestry knowledge, evidence and tools for international forestry policy and practice.
Cooperation in International Waters in Africa	5.0	8.2	Provided	ODA	Grant	Adaptation	Water and sanitation	To strengthen cooperative management and development of international waters within selected basins to facilitate sustainable climate resilient growth.

	Total amount		*Status*	*Funding source*	*Financial instrument*	*Type of support*	*Sector*	*Additional Information*
	Climate-specific		*Provided, Committed, Pledged*	*ODA OOF Other*	*Grant Concessional loan Non-concessional loan Equity Other*	*Mitigation Adaptation Cross-cutting Other*	*Energy Transport Industry Agriculture Forestry Water and sanitation Cross-cutting Other Not applicable*	
Recipient country/region/project/programme	*Domestic currency (£m)*	*USD ($m)*						
Strategic Partnership between BRAC, DFID and AusAid	4.7	7.7	Provided	ODA	Grant	Cross-cutting	Cross-cutting	Supporting BRAC's Development Programme in providing basic Health-care Services, Education, Water and Sanitation and Improving the Livelihoods of the poorest and most marganilised people in Bangladesh.
Promoting Low Carbon Development with Returnable Capital in Indonesia	4.3	7.1	Provided	ODA	Grant	Mitigation	Cross-cutting	The DFID-AFD Partnership facilitates low carbon investment (in renewable energy, energy efficiency, forestry and transport) that results in GHG emission reductions and supports the regulatory reform process.
Nepal Local Governance Support Programme – (climate resilient infrastructure services)	4.0	6.6	Provided	ODA	Grant	Adaptation	Cross-cutting	To improve basic service delivery by providing poor people especially women and children, community prioritised and climate resilient infrastructure by capable and accountable local government and civil society. This will benefit 2 million households and ensure 70% of community projects are prioritised by local government. This contributes towards our MDGs by reducing poverty in Nepal from 25% to 15% by 2017.
Climate Action for Middle East and North Africa (CAMENA)	4.0	6.6	Provided	ODA	Grant	Adaptation	Cross-cutting	CAMENA aims to improve the natural and social environment in the Middle East and North Africa (MENA) region through low carbon, climate resilient development contributing to enhanced employment.
Climate High-Level Investment Programme	4.0	6.6	Provided	ODA	Grant	Cross-cutting	Cross-cutting	To invest in activities which will build climate resilience and promote low carbon growth in Ethiopia. This will help 1.5 million people to cope with the effects of climate change by 2015, help Ethiopia to protect livelihoods, services, infrastructure and energy supplies from the effects of climate change, and establish its green growth path.

	Total amount		*Status*	*Funding source*	*Financial instrument*	*Type of support*	*Sector*	*Additional Information*
	Climate-specific		*Provided, Committed, Pledged*	*ODA OOF Other*	*Grant Concessional loan Non-concessional loan Equity Other*	*Mitigation Adaptation Cross-cutting Other*	*Energy Transport Industry Agriculture Forestry Water and sanitation Cross-cutting Other Not applicable*	
Recipient country/region/project/programme	*Domestic currency (£m)*	*USD ($m)*						
Building adaptation to climate change in health through resilient water, sanitation & hygiene	3.6	5.9	Provided	ODA	Grant	Adaptation	Cross-cutting	To support the development of effective plans for climate change adaptation in the health sector in low and low-middle income countries. This project will involve both work at an international level to develop guidance with country level pilot projects focused on water, sanitation and hygiene to test and demonstrate practical examples of adaptation in the health sector.
Improving governance of Land Use, Land-Use Change and Forestry in Indonesia	3.3	5.4	Provided	ODA	Grant	Other (Forestry)	Forests	To improve governance of land use, land use change and forestry in Indonesia.
Programme of Support to Agriculture in Rwanda	3.1	5.2	Provided	ODA	Grant	Adaptation	Agriculture	To sustainably increase the agricultural productivity of poor farmers by transforming Rwandan agriculture from a subsistence-based to a more commercial-based sector that accelerates agricultural growth. This will help address challenges that may limit agriculture productivity, reduce the rate at which poverty is falling, increase inequality and hamper improvements in food security and malnutrition.
Comprehensive Programme on Spatial Planning and Low Carbon Development in Papua	2.9	4.8	Provided	ODA	Grant	Cross-cutting	Cross-cutting	Strengthened spatial and development plans and government supported actions on low carbon investment which will contribute towards ensuring environmental sustainability (MDG 7) and improved awareness among civil society about LCD and spatial planning.

	Total amount		*Status*	*Funding source*	*Financial instrument*	*Type of support*	*Sector*	*Additional Information*
	Climate-specific		*Provided, Committed, Pledged*	*ODA OOF Other*	*Grant Concessional loan Non-concessional loan Equity Other*	*Mitigation Adaptation Cross-cutting Other*	*Energy Transport Industry Agriculture Forestry Water and sanitation Cross-cutting Other Not applicable*	
Recipient country/region/project/programme	*Domestic currency (£m)*	*USD ($m)*						
Strengthening Emergency Response in the Caribbean	2.9	4.7	Provided	ODA	Grant	Adaptation	Cross-cutting	This programme will assist Dominica, Grenada, St Lucia and Saint Vincent and the Grenadines better cope with natural disasters and climate change. It will expand and scale up successful pilot activities to strengthen health facilities and coastal defences that have demonstrated good value for money and helped some of the poorest communities.
Private Sector Energy Efficiency	2.8	4.7	Provided	ODA	Grant	Mitigation	Energy	To reduce energy consumption, avoid greenhouse gas emissions and increase investment in companies benefitting from the programme by providing remote advice and funding energy audits and strategies for South Africa businesses by 31 March 2015.
Arid Lands Support Programme	2.8	4.6	Provided	ODA	Grant	Cross-cutting	Cross-cutting	To improve the coping strategies for over 500,000 of the poorest people in Northern Kenya (Turkana, Wajir, Mandera and Marsabit counties) to help them to adapt to climate change and improve their livelihoods. The programme will also provide opportunities to support the poorest during drought, provide benefits for livestock insurance and increase average real value of assets owned by households.
Support to the Rwanda national fund for climate change and environment	2.5	4.2	Provided	ODA	Grant	Cross-cutting	Cross-cutting	To improve climate adaptation and low carbon development by providing finance to the Rwanda Fund for Climate Change and Environment from the UK International Climate Fund.

	Total amount		*Status*	*Funding source*	*Financial instrument*	*Type of support*	*Sector*	*Additional Information*
	Climate-specific		*Provided, Committed, Pledged*	*ODA OOF Other*	*Grant Concessional loan Non-concessional loan Equity Other*	*Mitigation Adaptation Cross-cutting Other*	*Energy Transport Industry Agriculture Forestry Water and sanitation Cross-cutting Other Not applicable*	
Recipient country/region/project/programme	*Domestic currency (£m)*	*USD ($m)*						
Vietnam Climate Innovation Centre	2.5	4.1	Provided	ODA	Grant	Cross-cutting	Cross-cutting	To enhance growth and mitigate climate change impacts in Vietnam by providing the private sector with support to engage in climate technology innovation. This will be done through setting Climate Innovation Centre which provide a set of services, including capital provision, capacity building; supporting new enterprises; and conducting market analysis. This will benefit 260,000 people and mitigate up to 340,000 tonnes of carbon dioxide equivalents (tCO_2e) by 2018.
African Agricultural Technology Foundation (AATF) Phase 2 of DFID Funding, 2010- 2013	2.1	3.5	Provided	ODA	Grant	Cross-cutting	Agriculture	AATF will facilitate public-private partnerships for the transfer, development, production and deployment of agricultural technology. AATF works closely with African farmers, scientists, businesses, NGOs to identify needs of poor farmers and to match these needs with available technologies with the aim of achieving sustainable improvements in agricultural productivity for small holder farmers in Sub Saharan Africa.
Climatescope – Clean Energy Investment Index	2.0	3.3	Provided	ODA	Grant	Mitigation	Energy	To increase private investment in renewable energy projects in poorer countries by providing investors with concrete policy and financial information. Renewable energy is a cheaper solution than fossil fuels in many developing countries and by increasing the amount of renewable energy in developing countries this will encourage growth and allow businesses to prosper.
Enhancing Community Resilience Programme	2.0	3.3	Provided	ODA	Grant	Cross-cutting	Cross-cutting	To achieve sustainable disaster-resilient communities through community-based best practices, public awareness and policy change.
Climate Development for Africa	1.9	3.2	Provided	ODA	Grant	Cross-cutting	Cross-cutting	National governments and regional bodies capacity to make climate sensitive policy sustainably strengthened.

	Total amount		*Status*	*Funding source*	*Financial instrument*	*Type of support*	*Sector*	*Additional Information*
	Climate-specific		*Provided, Committed, Pledged*	*ODA OOF Other*	*Grant Concessional loan Non-concessional loan Equity Other*	*Mitigation Adaptation Cross-cutting Other*	*Energy Transport Industry Agriculture Forestry Water and sanitation Cross-cutting Other Not applicable*	
Recipient country/region/project/programme	*Domestic currency (£m)*	*USD ($m)*						
Future Proofing African Cities for Sustainable Growth	1.9	3.1	Provided	ODA	Grant	Cross-cutting	Cross-cutting	The UK's £4.915 million will fund a project to support at least 8 cities in Africa to become future proofed to climate, environment and natural resource challenges, so that they are inclusive and resilient, and have growing economies. It will help make cities work for the urban poor.
South Asia Water Governance Programme (SAWGP)	1.9	3.0	Provided	ODA	Grant	Cross-cutting	Water and sanitation	To improve the management of water within and between South Asian countries, reducing poverty by enabling adaptation to climate change and reducing the risk of conflict over water resources. By 2018, 500 million people living in river basins will benefit from improved water management by reducing their risk of exposure to flooding and drought and enhancing regional security by improving cooperation between governments.
Providing Clean Energy to the Rural Poor of Bangladesh	1.8	3.0	Provided	ODA	Grant	Mitigation	Energy	Climate change mitigation and access to clean energy to improve the livelihoods of rural poor in off- grid areas in Bangladesh.
CCMCC Promoting cooperation and avoiding conflict in managing the impacts of climate change	1.8	3.0	Provided	ODA	Grant	Adaptation	Cross-cutting	The aim of this project is to maximise benefits to poor people from international climate change finance. It will do this by generating evidence on the links between climate change and its impacts, and the likelihood of such impacts leading to either conflict or collaboration between and within communities.
Chars Livelihoods Programme 2	1.7	2.7	Provided	ODA	Grant	Adaptation	Cross-cutting	To improve the food security, livelihoods and incomes of extremely poor people living on the Riverine Char Islands of North-Western Bangladesh.

	Total amount		*Status*	*Funding source*	*Financial instrument*	*Type of support*	*Sector*	*Additional Information*
	Climate-specific		*Provided, Committed, Pledged*	*ODA OOF Other*	*Grant Concessional loan Non-concessional loan Equity Other*	*Mitigation Adaptation Cross-cutting Other*	*Energy Transport Industry Agriculture Forestry Water and sanitation Cross-cutting Other Not applicable*	
Recipient country/region/project/programme	*Domestic currency (£m)*	*USD ($m)*						
Renewable Energy and Adaptation Climate Technologies (Africa Climate Change Challenge Fund)	1.6	2.7	Provided	ODA	Grant	Cross-cutting	Cross-cutting	To stimulate private sector investment in developing low cost, clean energy and climate change technologies and services, such as solar power, biomass energy, irrigation and crop insurance products for small holder farmers.
Climate Proofing Growth and Development in South Asia	1.4	2.4	Provided	ODA	Grant	Cross-cutting	Cross-cutting	Integrate climate change into development planning, budgeting and delivery in national and sub-national governments in Afghanistan, Bangladesh, India, Nepal and Pakistan, by strengthening planning, budgeting and delivery mechanisms, building awareness and and capacity of stakeholders, providing technical and some implementation support, helping leverage domestic finance and actively sharing knowledge by 2018.
Climate Change Programme – Jolobayoo-O-Jibon	1.4	2.3	Provided	ODA	Grant	Cross-cutting	Cross-cutting	Climate change adaptation and risk reduction measures to protect and improve the lives and livelihoods of 15 million poor and vulnerable people by 2013.
Low Carbon Support to the Ministry of Finance	1.3	2.2	Provided	ODA	Grant	Cross-cutting	Other (Government)	Supportive environment for low carbon investment established in Indonesia.
Humanitarian: Building Resilience in the Sahel through Adaptive Social Protection	1.3	2.1	Provided	ODA	Grant	Adaptation	Cross-cutting	Build the evidence and justification for adaptive social protection in the Sahel by establishing national level systems that will build the resilience of vulnerable populations and can be scaled in a time of crisis.
Caribbean Renewable Energy and Energy Efficiency Improvement Projects	1.2	1.9	Provided	ODA	Grant	Mitigation	Energy	To improve energy security in the Caribbean by providing access to finance for renewable energy and energy efficiency. This will increase the uptake of renewable energy, reduce fuel import bills and lower the cost of energy for households and businesses.

	Total amount		*Status*	*Funding source*	*Financial instrument*	*Type of support*	*Sector*	*Additional Information*
	Climate-specific		*Provided, Committed, Pledged*	*ODA OOF Other*	*Grant Concessional loan Non-concessional loan Equity Other*	*Mitigation Adaptation Cross-cutting Other*	*Energy Transport Industry Agriculture Forestry Water and sanitation Cross-cutting Other Not applicable*	
Recipient country/region/project/programme	*Domestic currency (£m)*	*USD ($m)*						
Degraded Land Mapping for Kalimantan and Papua provinces	1.1	1.8	Provided	ODA	Grant	Other (Forestry)	Forests	To make decision makers (in public and private sector) implement policies to support socially equitable oil palm expansion onto low- carbon degraded land and reduce conversion of forested areas.
Sustainable Crop Production Research for International Development (SCPRID)	1.1	1.8	Provided	ODA	Grant	Adaptation	Agriculture	The purpose of the project is to develop new science and technology to support the development of new crop varieties with more resistance to disease and pests and less vulnerable to abiotic shocks.
Achieving Water Security in the Southern Agricultural Growth Corridor	1.0	1.7	Provided	ODA	Grant	Adaptation	Water and sanitation	To ensure economic growth and poverty eradication resulting from investment in agriculture is sustainable in the context of climate change.
Ideas to Impact – Innovation challenges for climate & environment technologies for the poor.	1.0	1.7	Provided	ODA	Grant	Cross-cutting	Cross-cutting	To develop affordable and appropriate development solutions for poor consumers, particularly focusing on low carbon energy; water and sanitation; climate adaptation; and resource scarcity, using competitive innovation prize models as a way of ensuring pay.
Support for priority actions to operationalise the Implementation Plan for Development Resilient to Climate Change in the Caribbean	1.0	1.6	Provided	ODA	Grant	Cross-cutting	Cross-cutting	To increase regional, national and local climate adaptation measures for the vulnerable poor in the Caribbean.
Research Programme Consortium on Leveraging Agriculture for Nutrition in South Asia (LANSA)	0.9	1.5	Provided	ODA	Grant	Adaptation	Agriculture	The LANSA programme makes a significant contribution to DFID's plans to scale up our engagement in nutrition. DFID support will address the gap in the evidence base on the linkages between agriculture investments and nutrition impact in South Asia. Generate new understanding of how agriculture can deliver better nutritional outcomes in fragile and conflict affected contexts and in climate affected areas.

	Total amount		*Status*	*Funding source*	*Financial instrument*	*Type of support*	*Sector*	*Additional Information*
	Climate-specific		*Provided, Committed, Pledged*	*ODA OOF Other*	*Grant Concessional loan Non-concessional loan Equity Other*	*Mitigation Adaptation Cross-cutting Other*	*Energy Transport Industry Agriculture Forestry Water and sanitation Cross-cutting Other Not applicable*	
Recipient country/region/project/programme	*Domestic currency (£m)*	*USD ($m)*						
Care Adaptation Learning Programme	0.9	1.4	Provided	ODA	Grant	Adaptation	Cross-cutting	Community based adaptation approaches for vulnerable communities incorporated into development policies and programmes in Ghana, Kenya, Mozambique and Niger with plans to replicate across Africa.
Accountability in Tanzania Programme (ACT) – Civil Society Climate Change and Environment Fund	0.8	1.4	Provided	ODA	Grant	Adaptation	Cross-cutting	To increase the accountability and responsiveness of government to its citizens through a strengthened civil society. This includes a dedicated climate and environment window.
Promoting energy efficiency amongst Indonesia small and medium enterprises	0.8	1.3	Provided	ODA	Grant	Mitigation	Energy	The purpose of the project is to establish a revolving fund and build capacity in financial institutions to promote investments in energy efficiency to reduce the growth of emissions in Indonesia.
Transparency and Right to Information (in climate finance services)	0.8	1.3	Provided	ODA	Grant	Adaptation	Cross-cutting	Increased transparency and accountability in Bangladesh through changes (in government policies, processes, systems and/or activities) that will contribute to increasing transparency and accountability, and to reducing corruption in Bangladesh. Across a range of services including health, education, local government, climate finance and land administration.
On Grid Small Scale Renewable Energy in Uganda	0.7	1.2	Provided	ODA	Grant	Mitigation	Energy	To improve the environment for private investment in Uganda's renewable energy sector by supporting the construction of at least 15 on-grid small scale power plants. This will increase Uganda's energy production by circa 20%, mobilise up to £240 million iin private finance and stabilise Uganda's power sector finances by saving approximately $260m to 2.7bn during the period 2013-35, and lead to greenhouse gas emission savings of between 1 and 10 $MtCO_2e$.

	Total amount		*Status*	*Funding source*	*Financial instrument*	*Type of support*	*Sector*	*Additional Information*
	Climate-specific		*Provided, Committed, Pledged*	*ODA OOF Other*	*Grant Concessional loan Non-concessional loan Equity Other*	*Mitigation Adaptation Cross-cutting Other*	*Energy Transport Industry Agriculture Forestry Water and sanitation Cross-cutting Other Not applicable*	
Recipient country/region/project/programme	*Domestic currency (£m)*	*USD ($m)*						
Creation of the National Fund for Climate & Environment (FONERWA)	0.6	1.0	Provided	ODA	Grant	Cross-cutting	Cross-cutting	To help the Government of Rwanda achieve low carbon, climate resilient growth by providing technical assistance to help them manage FONERWA – a national fund for environment and climate change. This will help build national capacity for managing the fund.
Agricultural Model Inter-Comparison and Improvement Project	0.5	0.8	Provided	ODA	Grant	Adaptation	Agriculture	To improve substantially the characterization of risk of hunger and world food security due to climate change and to enhance adaptive capacity in developing regions. DFID will fund the Sub-Saharan Africa and South Asia regional projects of a global initiative to improve crop and agricultural economic models to provide substantially improved assessments of climate impacts on the agricultural sector. The regional projects will improve the reliability and accessibility of assessments of impacts of climate change on agriculture in SUB-SAHARAN AFRICA and S.Asia and improved identification of potential adaptation strategies.
Safeguarding Critical Infrastructure in the Eastern Caribbean	0.5	0.7	Provided	ODA	Grant	Adaptation	Cross-cutting	This programme will assist Dominica, Grenada, St Lucia and Saint Vincent and the Grenadines better cope with natural disasters and climate change. It will expand and scale up successful pilot activities to strengthen health facilities and coastal defences that have demonstrated good value for money and helped some of the poorest communities.
South Asia Alliance For Climate Resilient Landscapes And Livelihoods (SAACRLL) Programme	0.4	0.7	Provided	ODA	Grant	Cross-cutting	Cross-cutting	Equitable access to and climate resilient management of natural resources and ecosystems by the climate vulnerable poor.

	Total amount		*Status*	*Funding source*	*Financial instrument*	*Type of support*	*Sector*	*Additional Information*
	Climate-specific		*Provided, Committed, Pledged*	*ODA OOF Other*	*Grant Concessional loan Non-concessional loan Equity Other*	*Mitigation Adaptation Cross-cutting Other*	*Energy Transport Industry Agriculture Forestry Water and sanitation Cross-cutting Other Not applicable*	
Recipient country/region/project/programme	*Domestic currency (£m)*	*USD ($m)*						
Results, Evidence and Knowledge from the International Climate Fund	0.4	0.6	Provided	ODA	Grant	Cross-cutting	Cross-cutting	The purpose of the programme is to provide the evidence and learning to increase the effectiveness and measure the impact of the UK's international climate funding.
Climate Science Research Programme (CSRP)	0.4	0.6	Provided	ODA	Grant	Cross-cutting	Cross-cutting	The project will aim to narrow the range of climate futures planners have to confront when designing resilient livelihood and development strategies for African regions/sub-regions.
Strategic Climate Change Policy Fund	0.3	0.6	Provided	ODA	Grant	Mitigation	Cross-cutting	The purpose of the project is to enable the Government of South Africa to prioritise cost effective and beneficial climate-change mitigation policy measures and interventions that contribute to and support the country's positive deviation from the Green House Gas emission "business as usual trajectory".
Strengthening knowledge and tools for climate change adaptation	0.3	0.5	Provided	ODA	Grant	Adaptation	Cross-cutting	To help people adapt to the impacts of climate by strengthening knowledge on what works best, and to use this knowledge to develop new adaptation programmes and maximise the effectiveness of the UK's International Climate Fund (ICF) and its investments.
Rapid Response Facility on Climate Change	0.3	0.5	Provided	ODA	Grant	Cross-cutting	Cross-cutting	To influence climate change policy in Indonesia by providing technical expertise to a range of government and non-government partners who are directly responsible or play a role in shaping policies and practices to help Indonesia meet its emission reduction targets.

	Total amount		*Status*	*Funding source*	*Financial instrument*	*Type of support*	*Sector*	*Additional Information*
	Climate-specific		*Provided, Committed, Pledged*	*ODA OOF Other*	*Grant Concessional loan Non-concessional loan Equity Other*	*Mitigation Adaptation Cross-cutting Other*	*Energy Transport Industry Agriculture Forestry Water and sanitation Cross-cutting Other Not applicable*	
Recipient country/region/project/programme	*Domestic currency (£m)*	*USD ($m)*						
Strengthening Economic Growth through increased Energy Security in Central and South Asia.	0.3	0.5	Provided	ODA	Grant	Mitigation	Energy	The programme aims to accelerate economic growth and poverty reduction in Central and South Asia by increasing the availability of sustainable, predictable electricity within a framework of regional cooperation.
Northern Uganda: Transforming the Economy through Climate Smart Agriculture (NU-TEC)	0.3	0.5	Provided	ODA	Grant	Adaptation	Agriculture	To increase the resilience to climate change of poor farmers in Northern Uganda, and to increase their incomes.
Vietnam: DFID-World Bank Climate Change Partnership	0.3	0.4	Provided	ODA	Grant	Cross-cutting	Cross-cutting	To improve policy and decision-making on climate change responses of the Vietnamese Government.
Bridging Support between Multi-stakeholder Forestry Programme 2 and Multi-stakeholder Forestry Programme 3	0.2	0.3	Provided	ODA	Grant	Other (Forestry)	Forests	Credible Timber Legality Assurance System (TLAS) that is recognised by the market as a contribution to meeting an overall goal in which all traded Indonesian timber can be demonstrated legal, as a precondition for effective forest governance, sustainable forest management.
Development of Geothermal Energy in Montserrat	0.2	0.3	Provided	ODA	Grant	Adaptation	Energy	To support the development of geothermal energy in Montserrat, by undertaking the exploratory drilling and testing of 3 geothermal wells.
Low Carbon Studies	0.2	0.3	Provided	ODA	Grant	Mitigation	Cross-cutting	This knowledge work will ensure the preparation of evidence based business cases and maximise results from low carbon ICF spend.
Combating Infectious Diseases of Livestock (CIDLID) – including environmental contexts	0.2	0.3	Provided	ODA	Grant	Adaptation	Agriculture	To support basic and strategic biological and biotechnical research in animal health and sustainable agriculture that contributes to the achievement of the MDGs through greater understanding of how to combat diseases of domesticated livestock that affect the livelihoods of poor.

	Total amount		*Status*	*Funding source*	*Financial instrument*	*Type of support*	*Sector*	*Additional Information*
	Climate-specific		*Provided, Committed, Pledged*	*ODA OOF Other*	*Grant Concessional loan Non-concessional loan Equity Other*	*Mitigation Adaptation Cross-cutting Other*	*Energy Transport Industry Agriculture Forestry Water and sanitation Cross-cutting Other Not applicable*	
Recipient country/region/project/programme	*Domestic currency (£m)*	*USD ($m)*						
United Nations Secretary General's Action Agenda on Climate Change-Support in 2012-2014	0.2	0.3	Provided	ODA	Grant	Cross-cutting	Cross-cutting	To support and help ensure the UN Climate Change Support Team delivers its planned workplan and outputs to help the Secretary General in making the political space and the essential case for countries to support a Global Legal Agreement by 2015.
Climate Information and Services for Africa	0.2	0.3	Provided	ODA	Grant	Cross-cutting	Cross-cutting	Decisions in Africa take account of climate change risks and opportunities at regional, sub-regional (including in river basins and by power pool), national, local and community levels.
Mid Term Evaluation of the International Climate Fund (ICF)	0.1	0.2	Provided	ODA	Grant	Mitigation	Cross-cutting	To provide an assessment of the alignment of the International Climate Fund's portfolio to the Fund's strategic objectives, its expected results and the anticipated delivery of Value for Money, and the effectiveness of its monitoring and evaluation process.
Green Mini-Grids Africa Regional Facility for Market Preparation, Evidence and Policy Development	0.1	0.2	Provided	ODA	Grant	Cross-cutting	Energy	The Green Mini-Grids regional facility will improve policy, evidence and market conditions to increase investment in green mini-grids across Africa.
Building Urban Resilience to Climate Change in Tanzania	0.1	0.1	Provided	ODA	Grant	Cross-cutting	Cross-cutting	Improved urban resilience will have a positive impact on urban development at the city level, and reduce shocks to vulnerable households at the community level.
Nepal Climate Change Support Programme	0.1	0.1	Provided	ODA	Grant	Cross-cutting	Cross-cutting	To build capacity of the Government of Nepal to develop, cost, budget and implement adaptation measures at the local level aimed at mainstreaming climate change in key development sectors (agriculture, forestry, water and energy), including through public private partnerships.

	Total amount		*Status*	*Funding source*	*Financial instrument*	*Type of support*	*Sector*	*Additional Information*
	Climate-specific		*Provided, Committed, Pledged*	*ODA OOF Other*	*Grant Concessional loan Non-concessional loan Equity Other*	*Mitigation Adaptation Cross-cutting Other*	*Energy Transport Industry Agriculture Forestry Water and sanitation Cross-cutting Other Not applicable*	
Recipient country/region/project/programme	*Domestic currency (£m)*	*USD ($m)*						
Monitoring and Evaluation Support Services-International Climate Fund financing	0.1	0.1	Provided	ODA	Grant	Cross-cutting	Cross-cutting	DFID (and DECC and DEFRA) for International Climate Fund Programmes can demonstrate robust procedures for monitoring and evaluating value for money across its development programmes.
Forestry, Land-use and Governance in Indonesia	0.1	0.1	Provided	ODA	Grant	Other (Forestry)	Forests	To reduce unplanned deforestation in Indonesia.
Flexible Fund – supporting businesses to get renewable energy innovations to scale in developing countries	0.0	0.1	Provided	ODA	Grant	Cross-cutting	Cross-cutting	Facilitating sustainable development and reducing carbon emissions.
Scaling up of the Energy and Environment Partnership with Southern and East Africa	0.0	0.1	Provided	ODA	Grant	Mitigation	Energy	Greater access to clean energy services achieved through fast tracking of renewable energy project demonstration and deployment, including through technology learning, donor coordination and private sector investment.
Investments in Forests and Sustainable Land Use	0.0	0.0	Provided	ODA	Grant	Cross-cutting	Forests	To support public-private partnerships that demonstrate how companies, communities, smallholders and governments can work collaboratively to reduce deforestation and benefit forest dependent communities.
Smart Health Care Facilities in the Caribbean	0.0	0.0	Provided	ODA	Grant	Adaptation	Cross-cutting	To incorporate climate smart and disaster safety standards in health care facilities of the Caribbean.
Water for Growth	0.0	0.0	Provided	ODA	Grant	Cross-cutting	Water and sanitation	Improved resilience to water insecurity will have a positive impact on inclusive economic growth at national level and will reduce the risks of falling back into poverty at household level.

	Total amount		*Status*	*Funding source*	*Financial instrument*	*Type of support*	*Sector*	*Additional Information*
	Climate-specific		*Provided, Committed, Pledged*	*ODA OOF Other*	*Grant Concessional loan Non-concessional loan Equity Other*	*Mitigation Adaptation Cross-cutting Other*	*Energy Transport Industry Agriculture Forestry Water and sanitation Cross-cutting Other Not applicable*	
Recipient country/region/project/programme	*Domestic currency (£m)*	*USD ($m)*						
Support for the Indonesia Climate Change Trust Fund (ICCTF)	0.0	0.0	Provided	ODA	Grant	Adaptation	Cross-cutting	To ensure the GoI can provide more effective leadership and management of climate change programming to deliver emissions reduction and poverty reduction outcomes.
Green Mini-Grids Africa	0.0	0.0	Provided	ODA	Grant	Mitigation	Energy	To increase access to clean energy through the creation of an expanding market of green mini-grid installations in Africa serving rural villages unconnected to the main grid.
Nationally Appropriate Mitigation Actions (NAMA) Facility	25.0	41.2	Provided	ODA	Grant	Mitigation	Energy	The UK Department of Energy and Climate Change (DECC) and the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) jointly set up the "NAMA Facility". The Facility is designed to support developing countries that show strong leadership on tackling climate change and want to implement transformational Nationally Appropriate Mitigating Actions (NAMA).
Forest Carbon Partnership Facility-Carbon Fund (FCPF-C)	45.0	74.1	Provided	ODA	Grant	Other (Forestry)	Forests	The FCPF-C is a World Bank administered fund that is helping to build long-term reforms in forested countries that ultimately align incentives clearly towards sustainable forest management.
Global Innovation Lab for Climate Finance	0.2	0.3	Provided	ODA	Grant	Cross-cutting	Cross-cutting	The Global Innovation Lab is a global public-private initiative (set-up by the UK, German and US governments) that will identify, design, and support the piloting of new climate finance instruments with the aim of unlocking billions of dollars of fresh private investment for climate change mitigation and adaption in developing countries.

	Total amount		*Status*	*Funding source*	*Financial instrument*	*Type of support*	*Sector*	*Additional Information*
	Climate-specific		*Provided, Committed, Pledged*	*ODA OOF Other*	*Grant Concessional loan Non-concessional loan Equity Other*	*Mitigation Adaptation Cross-cutting Other*	*Energy Transport Industry Agriculture Forestry Water and sanitation Cross-cutting Other Not applicable*	
Recipient country/region/project/programme	*Domestic currency (£m)*	*USD ($m)*						
Climate Public-Private Partnership (CP3) – Asia Climate Partners	2.5	4.1	Provided	ODA	Equity	Mitigation	Energy	UK is an anchor investor in this private equity fund administered by the Asian Development Bank, which was set up to demonstrate to private sector investors that climate friendly investments in developing countries are financially viable.
International 2050 Pathways partnerships	1.0	1.7	Provided	ODA	Grant	Cross-cutting	Cross-cutting	DECC is working directly with 10 developing country governments to help them build their own version of the UK's 2050 calculator. The calculator will also be developed to explore global scenarios, illustrating the impacts of these scenarios on climate change.
Get FiT-scoping studies	2.0	3.3	Provided	ODA	Grant	Mitigation	Energy	Scoping studies to extend the Get FiT programme (scaling up private investment in small scale renewable energy plants in Uganda) into other regions of Africa. This is being delivered by KfW.
Business case development and due diligence for International Climate Fund (ICF).	0.1	0.2	Provided	ODA	Grant	Cross-cutting	Cross-cutting	Project preparation work in Mexico and South East Asia for potential opportunties to support energy efficiency programmes. Additional external legal advice as part of due diligence processes.
BioCarbon Fund Initiative for Sustainable Forest Landscapes (ISFL).	40.0	65.9	Provided	ODA	Grant	Other (Forestry)	Forests	The ISFL's objective is to reduce greenhouse gas emissions from the land sector, from deforestation and forest degradation in developing countries, and from sustainable agriculture, as well as to promote smarter land-use planning, policies and practices.
FCO Prosperity Fund	7.2	11.9	Provided	ODA	Grant	Cross-cutting	Cross-cutting	The Prosperity Fund supports projects to create the political and economic conditions for sustainable global growth and development. The portion of spend recorded here relates to spend on climate change in the major industrialising countries.

	Total amount		*Status*	*Funding source*	*Financial instrument*	*Type of support*	*Sector*	*Additional Information*
	Climate-specific		*Provided, Committed, Pledged*	*ODA OOF Other*	*Grant Concessional loan Non-concessional loan Equity Other*	*Mitigation Adaptation Cross-cutting Other*	*Energy Transport Industry Agriculture Forestry Water and sanitation Cross-cutting Other Not applicable*	
Recipient country/region/project/programme	*Domestic currency (£m)*	*USD ($m)*						
Negative ODA flow	-10.4	-17.1		ODA	Returned money	Adaptation		A number of projects have returned ODA, until this money is respent is counts as negative ODA which we have recorded against the appropriate themes.
Negative ODA flow	-6.1	-10.0		ODA	Returned money	Mitigation		
Negative ODA flow	-1.1	-1.8		ODA	Returned money	Cross-cutting		
Total	**470.1**	**773.9**						

Notes

[a] Monetary figures are rounded to the nearest (£/$)100,000

Table 8
Provision of technology development and transfer support

Recipient country and/or region	*Targetted area* *Mitigation* *Adaptation* *Mitigation and adaptation*	*Measures and activities related to technology transfer*	*Sector* *Energy* *Transport* *Industry* *Agriculture* *Water and sanitation* *Other*	*Source of the funding for the technology transfer* *Private* *Public* *Private and public*	*Activities undertaken by* *Private* *Public* *Private and public*	*Status* *Implemented* *Planned*	*Additional information*
Global	Mitigation and adaptation	Global Network of Climate Technology Innovation Centres	Other	Public	Private and public	Implemented	Pilot a global platform for applied innovation into climate technologies relevant to developing countries.
Africa	Mitigation and adaptation	Renewable Energy and Adaptation Climate Technologies (Africa Climate Change Challenge Fund)	Energy	Public	Private and public	Implemented	To stimulate private sector investment in developing low cost, clean energy and climate change technologies and services, such as solar power, biomass energy, irrigation and crop insurance products for small holder farmers.
Global	Mitigation	Climate Investment Funds – Clean Technology Fund	Energy	Public	Private and public	Implemented	The Clean Technology Fund is supporting several examples of low carbon technology. These include supporting the first utility scale CSP plant to be built in a developing country now providing power to 80,000 people in South Africa. Helping to kickstart the market in onshore wind in Mexico, which is now commercially viable, and growing without climate finance support.
Africa	Mitigation and adaptation	African Agricultural Technology Foundation (AATF) Phase 2 of DFID Funding, 2010-2013	Agriculture	Public	Private and public	Implemented	AATF will facilitate public-private partnerships for the transfer, development, production and deployment of agricultural technology. AATF works closely with African farmers, scientists, businesses, NGOs to identify needs of poor farmers and to match these needs with available technologies with the aim of achieving sustainable improvements in agricultural productivity for small holder farmers in Sub Saharan Africa.

Recipient country and/or region	*Targetted area* *Mitigation* *Adaptation* *Mitigation and adaptation*	*Measures and activities related to technology transfer*	*Sector* *Energy* *Transport* *Industry* *Agriculture* *Water and sanitation* *Other*	*Source of the funding for the technology transfer* *Private* *Public* *Private and public*	*Activities undertaken by* *Private* *Public* *Private and public*	*Status* *Implemented* *Planned*	*Additional information*
Global	Adaptation	Sustainable Crop Production Research for International Development (SCPRID)	Agriculture	Public	Private and public	Implemented	The purpose of the project is to develop new science and technology to support the development of new crop varieties with more resistance to disease and pests and less vulnerable to abiotic shocks.
Africa	Mitigation	Scaling up of the Energy and Environment Partnership with Southern and East Africa	Energy	Public	Private and public	Implemented	Greater access to clean energy services achieved through fast tracking of renewable energy project demonstration and deployment, including through technology learning, donor coordination and private sector investment.
Africa	Mitigation	Green Mini-Grids Africa	Energy	Public	Private and public	Implemented	To increase access to clean energy through the creation of an expanding market of green mini-grid installations in Africa serving rural villages unconnected to the main grid.

Notes

Many of the ICF programmes actively support some form of technology development or transfer (to a greater or lesser extent either directly or indirectly). Some specific examples are included above.

Table 9
Provision of capacity-building support

	Targetted area		
Recipient country/region	*Mitigation Adaptation Technology development and transfer Multiple areas*	*Programme or project title*	*Description of programme or project*
China, Indonesia, South Africa and Mexico	Mitigation	International Carbon Capture and Storage	Supporting developing countries to develop both the technical and institutional knowledge necessary to enable the deployment of CCS technologies.
Global	Multiple areas	Forest Governance, Markets and Climate	A global programme that benefits poor forest-dependent people by supporting governance and market reforms aimed at reducing the illegal use of forest resources and promoting sustainable growth in developing countries.
Kenya	Adaptation	Strengthening Adaptation and Resilience to Climate Change in Kenya Plus (StARCK+)	To achieve transformational change by helping Kenya to scale up private sector innovation and investment in low carbon and adaptation products, services and assets (e.g. clean energy, sustainable agriculture, water management, weather forecasting).
Africa	Adaptation	African Risk Capacity (ARC)	To support a parametric (index-based) weather risk insurance pool that will provide participating African countries with predictable, quick-disbursing funds with which to implement pre-defined contingency response plans in the case of a drought.
Global	Multiple areas	Climate Development & Knowledge Network (CDKN)	Supporting 40 developing countries to build their knowledge, capacity and action plans on climate change. CDKN is an alliance of 6 private and non-governmental organisations that helps decision makers to design and deliver climate and environmental policy and programme, introduce new technologies and mobilise new funding sources.
Global	Adaptation	Support to grassroots initiatives, policy change and institutional capacity to help the most vulnerable to climate change improve their resilience to disasters	To help up to 10 million people, especially women and children, in developing countries cope with extreme climate and weather events such as droughts, cyclones and floods (climate extremes).
Global	Multiple areas	FCO Prosperity Fund	The Prosperity Fund is supporting capacity building in developing countries. For example in shaping China's transition to a more sustainable model and stimulating green finance. We have been supporting a range of projects including seven provincial emissions trading scheme pilots. In Mexico it has supported them to adopt a national Climate Change Act based on the UK model.

	Targetted area		
Recipient country/region	*Mitigation Adaptation Technology development and transfer Multiple areas*	*Programme or project title*	*Description of programme or project*
Global	Multiple areas	International Forestry Knowledge (KnowFor)	Uptake of international forestry knowledge, evidence and tools for international forestry policy and practice. All the knowledge products supported will involve the bringing together of local stakeholder face-to-face to disseminate findings, build capacity and knowledge and promote uptake of results.
Africa	Multiple areas	Climate Development for Africa	National governments and regional bodies capacity to make climate sensitive policy sustainably strengthened.
South Asia	Multiple areas	Climate Proofing Growth and Development in South Asia	Integrate climate change into development planning, budgeting and delivery in national and sub-national governments in Afghanistan, Bangladesh, India, Nepal and Pakistan, by strengthening planning, budgeting and delivery mechanisms, building awareness and and capacity of stakeholders, providing technical and some implementation support, helping leverage domestic finance and actively sharing knowledge by 2018.
Global	Multiple areas	International 2050 Pathways partnerships	DECC is working directly with 10 developing country governments to help them build their own version of the UK's 2050 calculator. The calculator will also be developed to explore global scenarios, illustrating the impacts of these scenarios on climate change.
Indonesia	Mitigation	Promoting energy efficiency amongst Indonesia small and medium enterprises	The purpose of the project is to establish a revolving fund and build capacity in financial institutions to promote investments in energy efficiency to reduce the growth of emissions in Indonesia.
Rwanda	Multiple areas	Creation of the National Fund for Climate & Environment (FONERWA)	To help the Government of Rwanda achieve low carbon, climate resilient growth by providing technical assistance to help them manage FONERWA – a national fund for environment and climate change. This will help build national capacity for managing the fund.
Nepal	Multiple areas	Nepal Climate Change Support Programme	To build capacity of the Government of Nepal to develop, cost, budget and implement adaptation measures at the local level aimed at mainstreaming climate change in key development sectors (agriculture, forestry, water and energy), including through public private partnerships.
Vietnam	Technology development and transfer	Vietnam Climate Innovation Centre	To enhance growth and mitigate climate change impacts in Vietnam by providing the private sector with support to engage in climate technology innovation. This will be done through setting Climate Innovation Centre which provide a set of services, including capital provision, capacity building; supporting new enterprises; and conducting market analysis.

Notes

Many of the ICF programmes actively support some form of capacity building (to a greater or lesser extent either directly or indirectly). Some specific examples are included above.

Annex 2: Glossary of Terms

ARC	African Risk Capacity
ARD	Afforestation plus Reforestation minus Deforestation
AWAC	Airborne Warning and Control System
BAT	Best Available Technology
BIS	Department for Business, Innovation and Skills
BMUB	German Federal Ministry for the Environment
BRACED	Building Resilience and Adaptation to Climate Extremes and Disasters
BWT	Biological Waste Treatment
CCAs	Climate Change Agreements
CCC	Committee on Climate Change
CCGT	Combined cycle gas turbine
CCS	Carbon Capture and Storage
CCUS	Carbon Capture Use and Storage
CDFF	Climate Development Finance Facility, now called 'Climate Investor One'
CDKN	Climate and Development Knowledge Network
CDM	Clean Development Mechanism
CDs	Crown Dependencies
CEH	Centre for Ecology and Hydrology
CEM	Clean Energy Ministerial
CERT	Carbon Emissions Reduction Target
CESP	Community Energy Saving Programme
CFC	Chlorofluorocarbons
CfD	Contract for Difference
CH_4	Methane
CHP	Combined Heat and Power
CICs	Climate Innovation Centres
Ci-Dev	World Bank's Carbon Initiative for Development
CIF ARA	Monthly Coal Price Index
CIFs	Climate Investment Funds
CO	Carbon monoxide
CO_2	Carbon dioxide
COP	Conference of the Parties
CP3	Climate Public Private Partnership Programme
CPF	Carbon Price Floor
CPS	Carbon Price Support

CRC	Carbon Reduction Commitment
CRF	Common Reporting Format
CSP	Concentrated Solar Power
CSR	Comprehensive Spending Review
CSRP	Climate Science Research Programme
CTC	Climate Technology Centre
CTCN	Climate Technology Centre and Network
CTF	Clean Technology Fund (or Common Tabular Format if referring to Biennial Report tables)
DA	Devolved Administration
DCLG	Department for Communities and Local Government
DDM	Dynamic Dispatch Model
DEC	Display Energy Certificate
DECC	Department of Energy & Climate Change
Defra	Department for Environment, Food & Rural Affairs
DFID	Department for International Development
DfT	Department for Transport
DRR	Disaster Risk Reduction
DSA	Data Supply Agreements
DUKES	Digest of UK Energy Statistics
EC	European Commission
ECO	Energy Company Obligation
EEC	Energy Efficiency Commitment
EEC I	Energy Efficiency Commitment Phase 1
EEC II	Energy Efficiency Commitment Phase 2
EEP	Energy and Emissions Projections
EPBD	Energy Performance of Buildings Directive
EPC	Energy Performance Certificate
ERUs	Emissions Reduction Units
ESD	Effort Sharing Decision
ESMAP	Energy Sector Management Assistance Programme
ESOS	Energy Saving Opportunity Scheme
EU	European Union
EUAAs	European Union Aviation Allowances
EUAs	European Union Allowances
EU ETS	EU Emissions Trading System
EUMM	EU Monitoring Mechanism
F gas	Fluorinated Gas
F gases	Fluorinated Gases
FAPRI	Food and Agricultural Policy Research Institute
FCO	Foreign & Commonwealth Office
FCPF	Forest Carbon Partnership Facility
FGMC	Forest Governance, Markets and Climate
FITs	Feed-in Tariffs
FMO	Dutch Development Bank
GBF	Green Bus Fund
GCF	Green Climate Fund
GCPF	Global Climate Partnership Fund
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GMGs	Green Mini-Grids

GNI	Gross National Income
GVA	Gross Value Added
GWh	Gigawatt Hour
GWP	Global Warming Potential
ha	Hectares
HCFCs	Hydrochlorofluorocarbons
HFCs	Hydrofluorocarbons
HGV	Heavy Goods Vehicles
HMG	Her Majesty's Government
HMT	Her Majesty's Treasury
IADB	Inter-American Development Bank
IAG	Interdepartmental Analysts' Group
IAR	Independent Assessment Report
ICAI	Independent Commission for Aid Impact
ICF	International Climate Fund
IEA	International Energy Agency
IED	Industrial Emissions Directive
IFSLU	Investments in Forests and Sustainable Land Use
IPCC	Intergovernmental Panel on Climate Change
IPPC	Integrated pollution prevention and control
IRENA	International Renewable Energy Association
ISFL	Bio-Carbon Fund Initiative for Sustainable Forest Landscapes
JI	Joint Implementation
KP	Kyoto Protocol
$KtCO_2e$	Kilotonnes of carbon dioxide equivalent
KWh	Kilowatt Hour
LCPD	Large Combustion Plant Directive
LDCF	Least Developed Countries Fund
LDCs	Least Developed Countries
LGV	Light Goods Vehicle
LST	Longer Semi-Trailer
LULUCF	Land Use, Land-use Change and Forestry
MDB	Multilateral Development Bank
MEL	Monitoring, Evaluation and Learning
MENA	Middle East and North Africa
MMR	Monitoring Mechanism Regulation
Mt	Million tonnes
$MtCO_2e$	Million tonnes of carbon dioxide equivalent
MW	megawatts
N_2O	Nitrous oxide
NAMA	National Appropriate Mitigation Action
NBP	National Balancing Point
NCCAP	National Climate Change Adaptation Plan
NDRC	National Development and Reform Commission
NF_3	Nitrogen Trifluoride
NGO	Non-governmental Organisations
NIR	National Inventory Report
NISC	National Inventory Steering Committee
NMVOC	Non-CH_4 Volatile Organic Compounds
NO_x	Nitrogen Oxides

NPV	Net Present Value
NVZ	Nitrate Vulnerable Zones
NZEB	Nearly Zero Energy Buildings
OBR	Office of Budget Responsibility
ODA	Official Development Assistance
OECD	Organisation for Economic Co-operation and Development
ONS	Office For National Statistics
OTs	Overseas Territories
PCR	Programme for Climate Resilience
PFCs	Perfluorocarbons
PMR	Partnership for Market Readiness
PPCR	Pilot Programme for Climate Resilience
PRS	Private Rented Sector
PSV	Public Service Vehicles
PV	Solar Photovoltaic
QA	Quality Assurance
QC	Quality Control
QEWER	Quantified Economy-Wide Emission Reduction
RCUK	Research Councils UK
RED	Renewable Energy Directive
REDD	Reducing Emissions from Deforestation and Forest Degradation
RHI	Renewable Heat Incentive
RO	Renewables Obligation
ROCs	Renewables Obligation Certificates
RTFO	Renewable Transport Fuel Obligation
SE4ALL	Sustainable Energy for All
SF_6	Sulphur hexafluoride
SIAR	Standard Independent Assessment Report
SIDS	Small Island Developing States
SMEs	Small and Medium Sized Enterprises
SO_2	Sulphur Dioxide
SREP	Scaling Up Renewables Energy Programme
StARCK	Strengthening Adaptation and Resilience to Climate Change in Kenya
tCO_2	Tonnes of carbon dioxide
TEC	Technology Executive Committee
TWh	Terawatt-hours
UK	United Kingdom
ULEV	Ultra-low Emissions Vehicles
UNECE	United Nations Economic Commission for Europe
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development
WCC	Woodland Carbon Code
WEM	'With Existing Measures' (Projections)

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